

Load Forecast and Power Smart Plans MFR 1

File most current Load Forecast and Power Smart Plan (incl. 15-year supplement)

The 2015/16 Power Smart Plan was filed as Attachment 2 to Manitoba Hydro's response to COALITION/MH I-69 during the 2015/16 & 2016/17 General Rate Application. Please find the 15-year Supplemental Report to the 2015/16 Power Smart Plan as Attachment 24 and the 2015 Load Forecast as Attachment 25 to the 2016/17 Supplemental Filing.

Power Smart Plan

2015/16

SUPPLEMENTAL REPORT: 15yr (2015 to 2030)



OCT-2015

EXECUTIVE SUMMARY

Manitoba Hydro's 2015 Power Smart Plan (Supplemental Report) outlines the Corporation's demand side management program over the next 15 years, with some programs formally approved and placeholders used for those opportunities requiring further review and analysis. This plan builds upon and is consistent with the one year 2015/16 Power Smart Plan which was prepared in consultation with the Minister responsible for Manitoba Hydro. The longer term 15 year plan was developed to accommodate the Corporation's business planning requirements, including the development of an integrated resource plan. In addition and more importantly, Manitoba Hydro's Power Smart Plan involves taking a long term strategic approach; focusing on the transformation of markets and optimization of demand side management activities. The one year plan is simply the activity within the immediate future, however it is integral to the longer term strategy and plan.

This report outlines the 15 year forecast of energy and demand savings, investments and cost effectiveness metrics to the benchmark year of 2029/30 which will be targeted through electricity and natural gas Power Smart Programs. The plan sets out to realize electricity savings of 1,288 MW and 4,619 GW.h, natural gas savings of 118 million cubic metres and combined global greenhouse gas emission reductions of 3.3 million tonnes by 2029/30. This activity represents 16.0% of the estimated electric load forecast offsetting 60% of projected load growth during this period and 6.9% of the estimated natural gas volume forecast by 2029/30, further reducing natural gas consumption in Manitoba. Manitoba Hydro's current 15 year DSM plan involves an investment of approximately \$2.6 billion (utility investment of \$1.4 billion and customer investment of an estimated \$1.2 billion, excluding cost impacts of changes to codes and standards). Of the \$1.4 billion utility investment, \$1.2 billion of the costs are funded through the Corporation's Power Smart electricity budget, \$138 million from the Power Smart natural gas budget, \$6 million from the Affordable Energy Fund and \$20 million from the Furnace Replacement budget for targeting furnace replacement.

Changes made to the electricity component of the plan include adjustments to existing programs to reflect updated information and the inclusion of emerging technologies with programming starting around 2020. The addition of emerging technologies offers the most significant change to the overall plan, however the inclusion of this category of energy savings assumes and is dependent upon future projected cost reductions. As such, this category of energy savings inherently involves a higher risk than most other DSM programs. Other categories which will present a higher risk of DSM deliverability include Conservation Rates, Fuel Choice and Load Displacement. Conservation Rates require additional approval levels in the regulatory arena; the Fuel Choice initiative must consider the Province of Manitoba's Clean Energy Strategy; and the Load Displacement Program requires the participation of a few customers, who are often influenced by a number of factors such as capital prioritization between projects, changes in the economy, etc. No significant changes were made to the natural gas component of the plan.

Combined with energy savings achieved to date, total electrical savings of 1,863 MW and 7,233 GW.h and total natural gas savings of 219 million cubic metres will be realized by 2029/30. These combined energy savings are expected to result in an overall reduction of greenhouse gas emissions of 5.3 million tonnes by 2029/30. This activity represents 25.0% of the estimated electric load forecast and 12.8% of the estimated natural gas volume forecast by 2029/30.

Including investments to date, it is expected that by 2029/30, the cumulative investment of achieving the energy savings will have been \$3.4 billion (utility investment of \$2.0 billion and customer investment of an estimated \$1.4 billion, excluding cost impacts of changes to codes and standards). Of the \$2.0 billion cumulative utility investment, \$1.7 billion of the costs are funded through the Corporation's Power Smart electricity budget, \$239 million from the Power Smart natural gas budget, \$35 million from the Affordable Energy Fund, \$31 million from the Furnace Replacement budget for targeting furnace replacement.

By reducing electricity and natural gas consumption through innovative products, participating customers can expect to save \$338 million in 2029/30 and \$2.5 billion cumulatively by 2029/30. When combined with bill reductions to date, Power Smart programs are expected to save participating customers \$ 455 million in 2029/30 and over \$ 5.3 billion cumulatively by 2029/30.

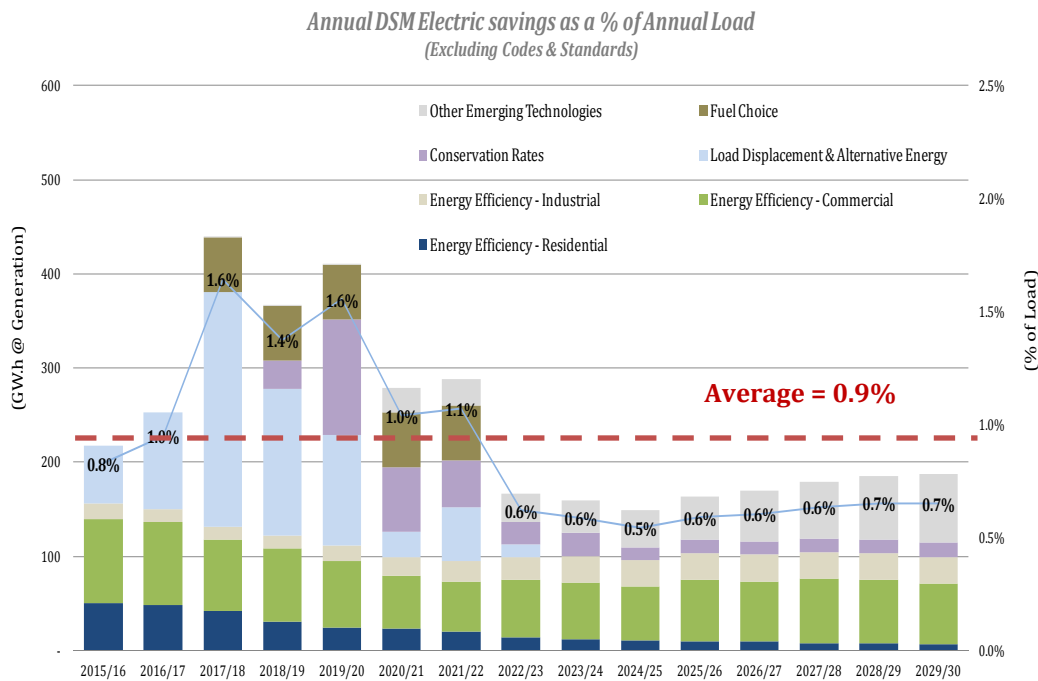
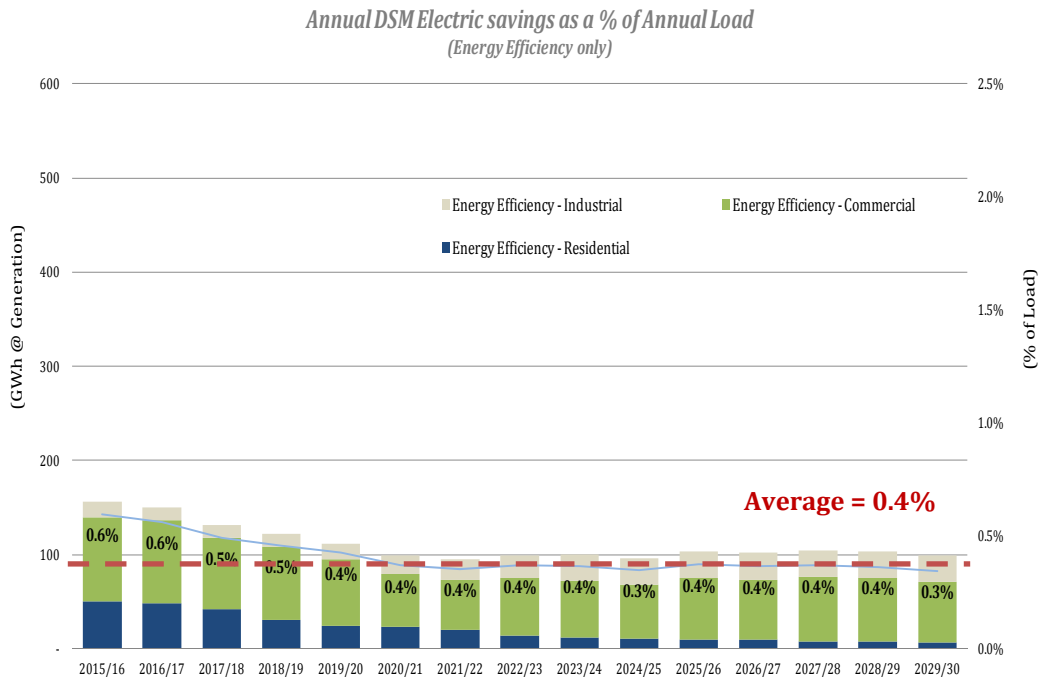
The overall Societal Cost (SC) and Total Resource Cost (TRC) metrics for the electric and natural gas Power Smart portfolio is 2.4 and 2.1, respectively. The electric Power Smart portfolio has an overall TRC of 2.3, Rate Impact Measure (RIM) of 1.0, levelized resource cost of 4.2 cents per kilowatt-hour and levelized utility cost of 1.8 cents per kilowatt-hour. The natural gas Power Smart portfolio has an overall TRC of 1.0, RIM of 0.6, levelized resource cost of 31.4 cents per cubic metre and levelized utility cost of 16.2 cents per cubic metre. Excluding the Affordable Energy Program, the natural gas Power Smart portfolio has an overall levelized utility cost of 10.8 cents per cubic metre.

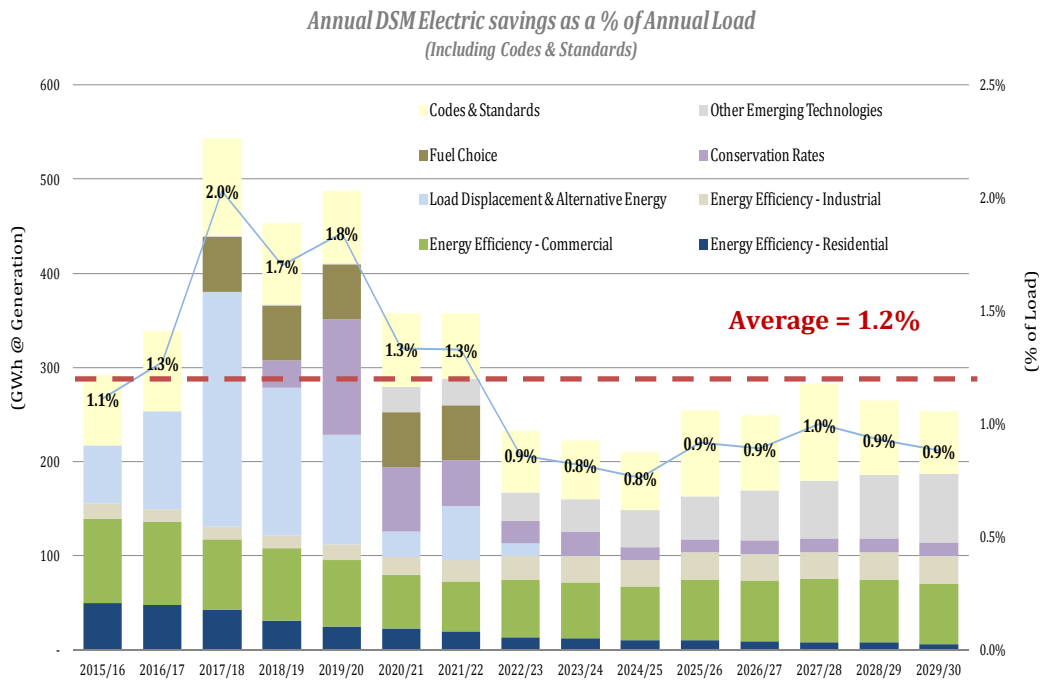
Manitoba Hydro continues to pursue all cost effective opportunities in its efforts to assist customers with managing their energy bills while balancing the Corporation's efforts to be aligned with the Government's climate change objectives. For electric savings, DSM opportunities are measured against Manitoba Hydro's marginal value of energy which has an average levelized value of 7.7 cents per kilowatt-hour. By taking this approach, Manitoba Hydro's overall electric DSM efforts will result in customers (in aggregate) having lower costs for meeting their electricity needs. Although the average levelized average resource and utility costs of the Manitoba Hydro's electric Power Smart plan are 4.2 cents per kilowatt-hour and 1.8 cents per kilowatt-hour respectively, new programs and opportunities generally involve higher costs. For example, the emerging technologies opportunities being added to this year's plan involve an average levelized resource cost of 8.9 cents per kilowatt-hour and an average levelized utility cost of 3.9 cents per kilowatt-hour.

With natural gas DSM, Manitoba Hydro benchmarks the levelized resource cost against the alternative option of customers not pursuing DSM opportunities and instead purchasing natural gas from neighbouring regions. This alternative levelized value is currently 24.6 cents per cubic metre. With Manitoba Hydro's natural gas DSM plans involving an average levelized resource cost of 31.4 cents per cubic metre, it is recognized that customers' costs are higher by taking such an aggressive approach with natural gas conservation efforts. This aggressive approach effectively values carbon at \$35.7 per tonne (i.e. the difference between the alternative cost of purchasing gas and Manitoba Hydro's levelized cost of natural gas DSM). This approach is considered reasonable as it balances the Corporation's objectives of assisting customers with managing their energy bills and while aligning these efforts with the Government's climate change objectives.

Annual Electric DSM Savings as a % of Annual Load

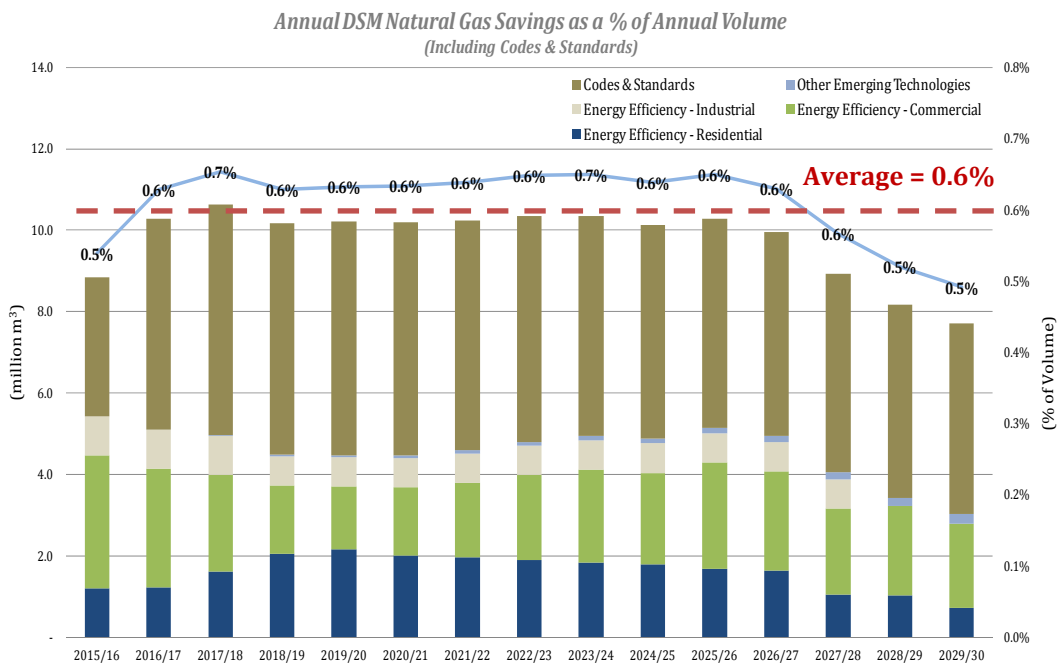
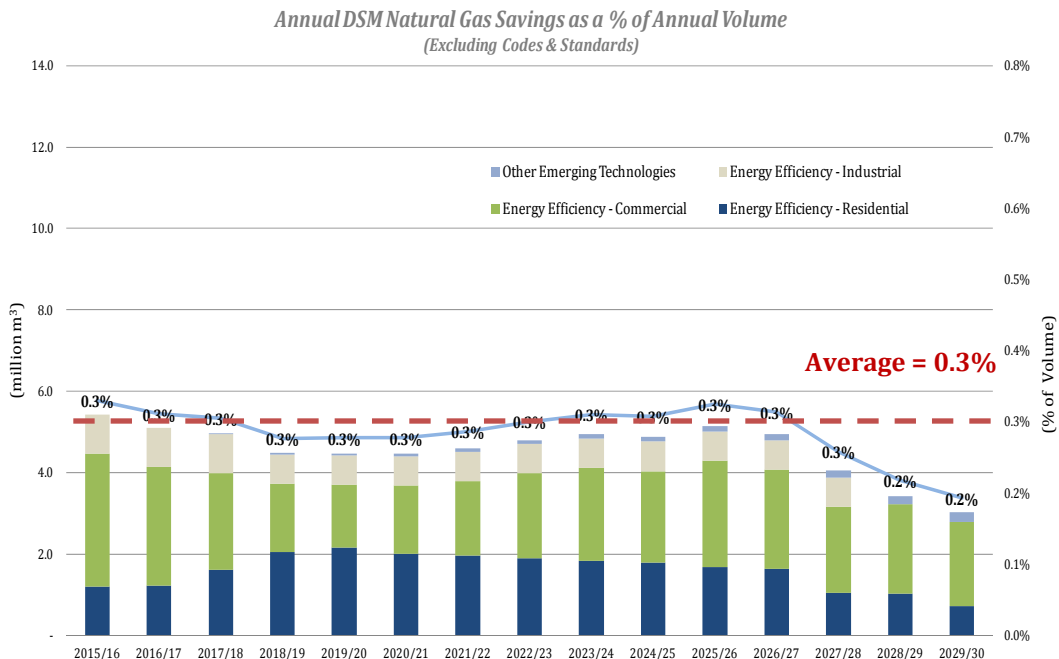
The following charts depict Manitoba Hydro’s annual electric DSM efforts in relation to annual electric load growth.

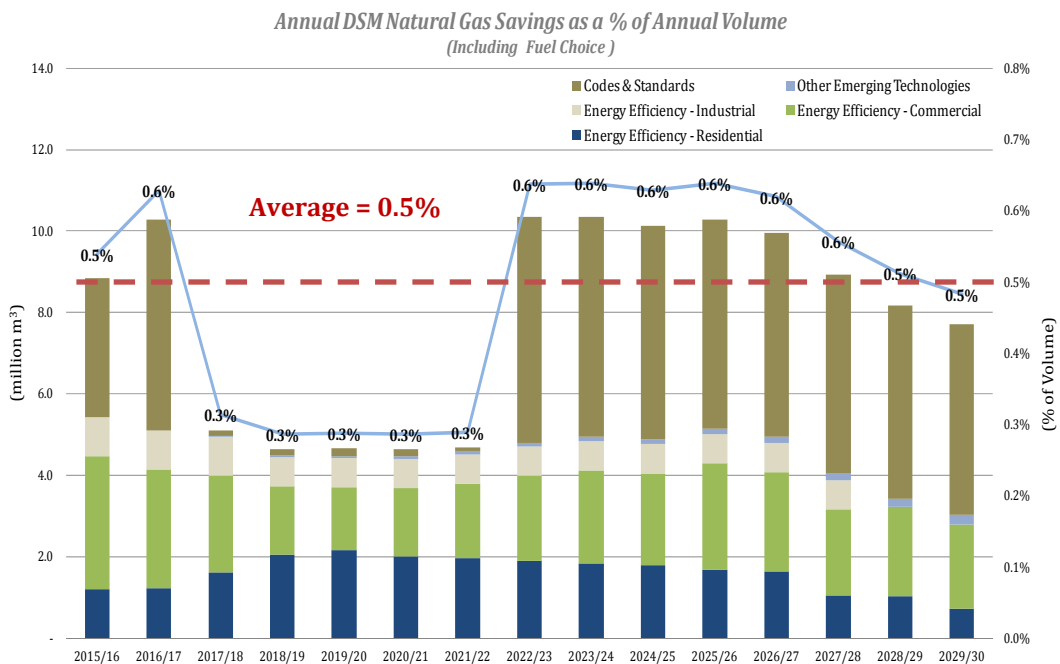




Annual Natural Gas DSM Savings as a % of Annual Volume

The following charts depict Manitoba Hydro’s annual natural gas DSM efforts in relation to annual natural gas volume growth.





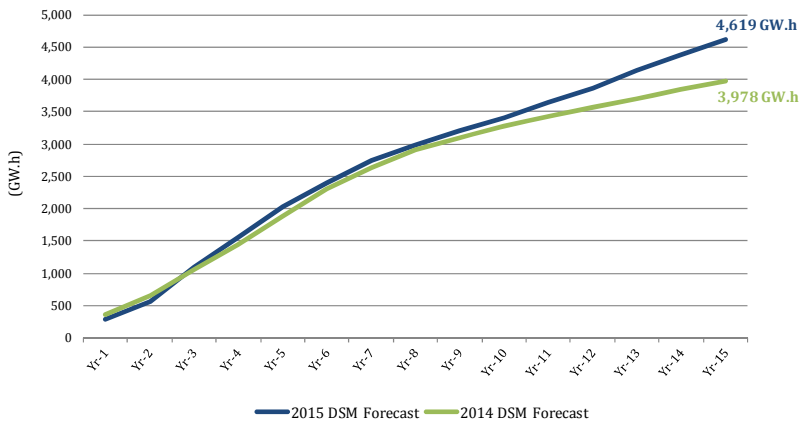
Note: The above graphs reflect a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

Changes from the 2014-17 Power Smart Plan (Supplemental Report 15 yr)

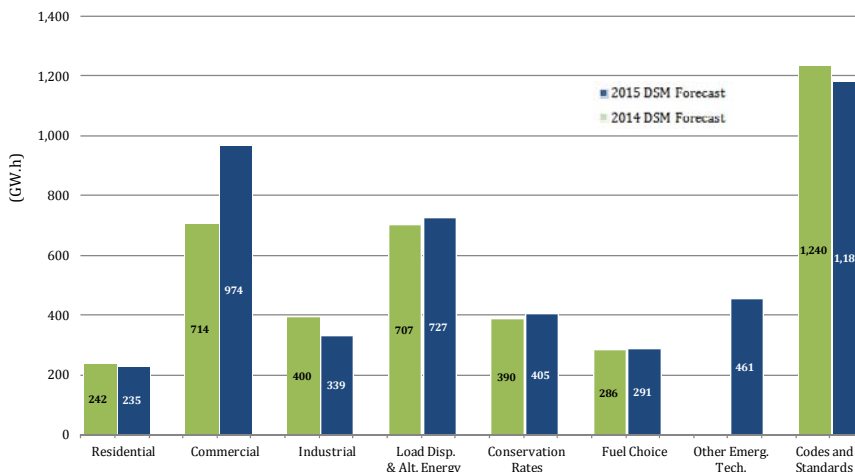
Electric DSM

Overall, energy savings are expected to increase by 16% from the 2014 DSM Forecast. The planned electric energy savings in this plan are approximately 641 GW.h higher than previously forecast in the 2014-2017 Power Smart Plan. (Refer to section 1.6 Comparison to 2014 DSM Forecast for detail).

*Forecast Electric Energy Savings
(GW.h @ generation)*



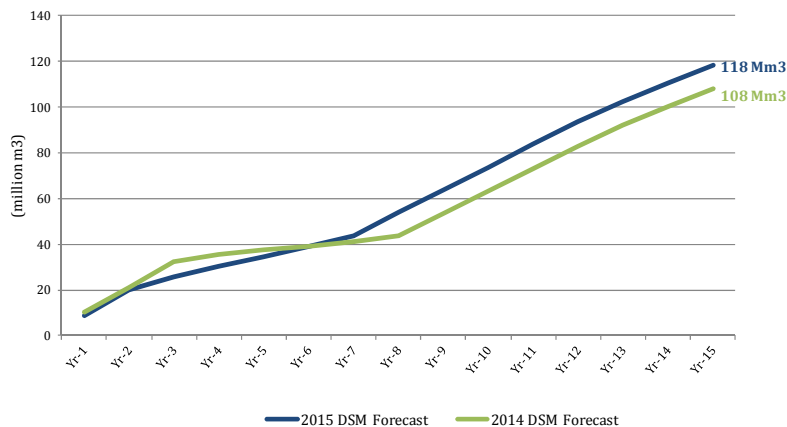
*Forecast Electric Energy Savings
(GW.h @ generation)*



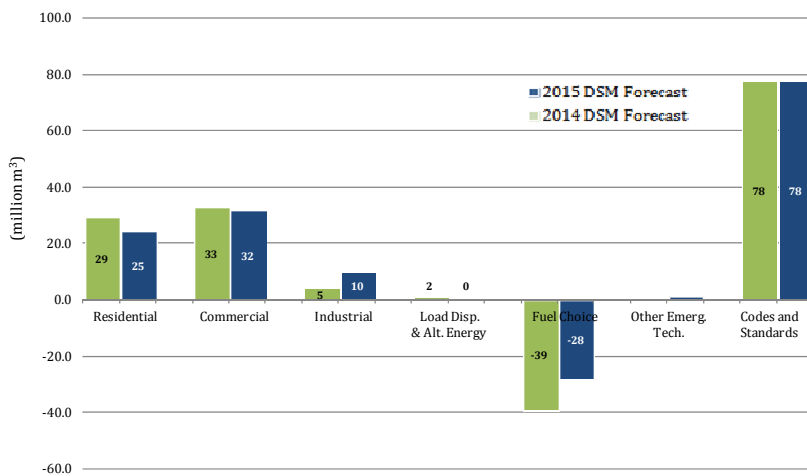
Natural Gas DSM

Overall, natural gas savings are expected to increase by 9% from the 2014 DSM Forecast. The natural gas savings expected to be achieved through this plan are 10 million cubic metres higher than previously forecast in the 2014-15 Power Smart Plan. (Refer to section 1.6 Comparison to 2014 DSM Forecast for detail).

*Forecast Natural Gas Savings
(million m³)*

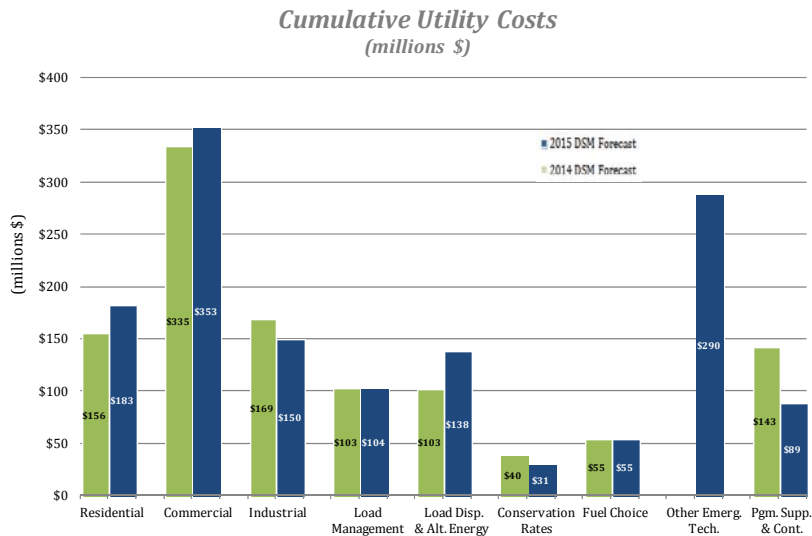
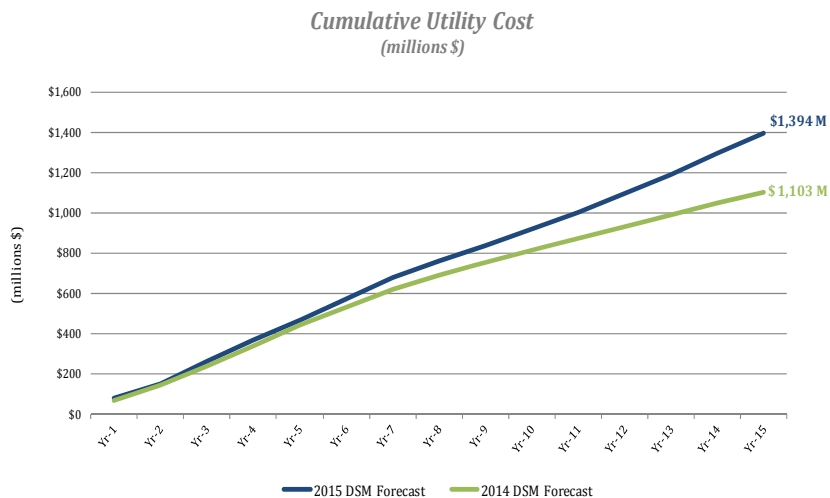


*Forecast Natural Gas Savings
(million m³)*



Utility Costs

Overall, utility costs are expected to increase by 26% from the 2014 DSM Forecast. The planned utility cost forecast in this plan is approximately \$291 million higher than previously forecast in the 2014-2017 Power Smart Plan. (Refer to section 1.6 Comparison to 2014 DSM Forecast for detail).



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- Appendix A.3 - Annual Utility Costs
- Appendix A.4 - Annual Program Administration Costs
- Appendix A.5 - Annual Program Incentive Costs

APPENDIX B - Historical Electric Savings & Costs

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APPENDIX C - 2015 Power Smart Plan Natural Gas

- Appendix C.1 - Annual Energy Savings (million m³)
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APPENDIX D - Historical Natural Gas Savings & Costs

- Appendix D.1 - Annual Energy Savings (million m³)
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- Nature of Electricity and Natural Gas Markets
- Program Categories
- Economic Effectiveness Metrics
- Other DSM Program Assumptions

1 THE 2015 POWER SMART PLAN

1.1 Introduction

Manitoba Hydro's 2015 Power Smart Plan outlines the Corporation's demand side management program over the next 15 years, with some programs formally approved and placeholders used for those programs requiring further review and analysis. The Plan was developed through an intensive planning process which builds on the Corporation's experience and continuous involvement in demand side management since 1989. This plan builds upon and is consistent with the 2015/16 Power Smart Plan which was prepared in consultation with the Minister responsible for Manitoba in accordance with the Energy Savings Act. The 15 year plan is required to accommodate the Corporation's overall longer term business planning requirements, including developing an integrated resource plan.

Manitoba Hydro's DSM plan is an input to the development of the Corporation's Integrated Power Resource Plan. To support this process, the Corporation prepares a 15 year forecast which is reviewed and updated annually to reflect current market information and trends. This supplemental report outlines the 15 year forecast underpinning the approved 2015/16 Power Smart Plan and includes the long term forecasts of energy and demand savings, budgets and cost effectiveness metrics.

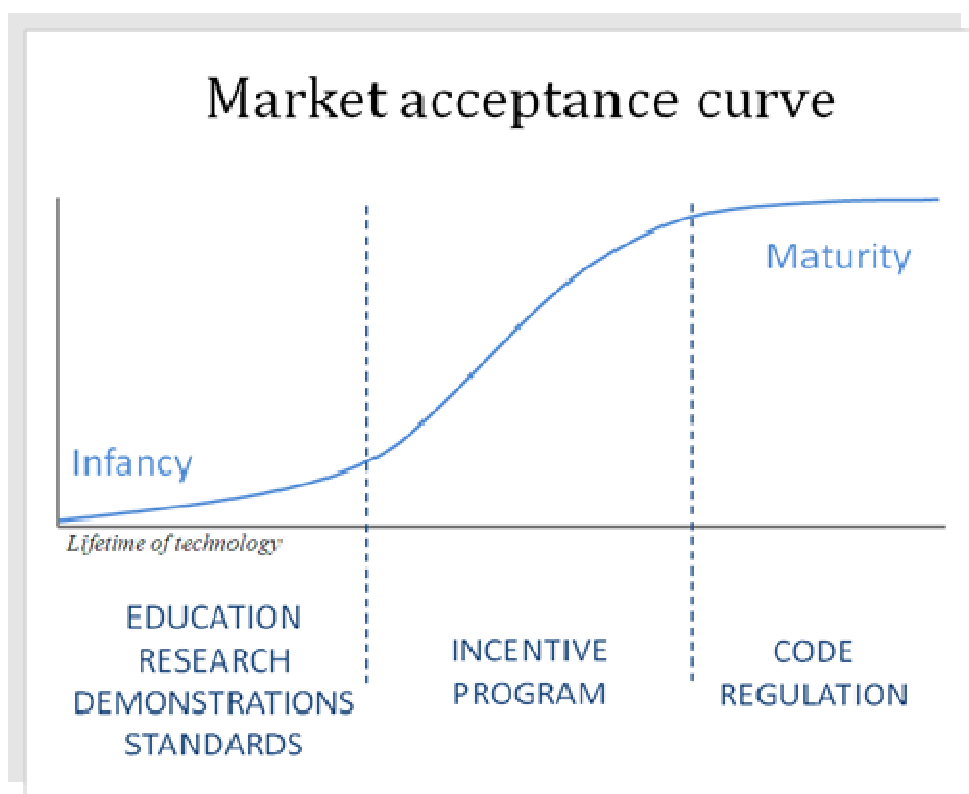
The following table outlines the forecasted achievements of over the next 15 years:

Programs	Capacity Savings (MW)	Energy Savings (GW.h)	Natural Gas Savings (million m ³)	Utility Investment (Millions \$)
New Home Program	8.4	19.2	5.4	\$3.0
Home Insulation Program	16.0	32.1	7.2	\$31.5
Water and Energy Saver Program	3.0	16.5	1.6	\$6.5
Affordable Energy Program	14.6	44.3	6.2	\$98.0
Refrigerator Retirement Program	1.7	16.6	-	\$11.3
Drain Water Heat Recovery Initiative	0.3	1.9	-	\$0.6
Residential LED Lighting Program	3.5	11.0	-	\$4.7
Community Geothermal Program	32.1	64.3	-	\$27.8
Power Smart Residential Loan	3.7	7.3	3.9	-
Power Smart PAYS Financing	1.7	3.5	0.0	-
Residential Earth Power Loan	9.1	18.2	1.4	-
Residential Programs	94.0	234.9	25.8	\$183.4
Commercial Lighting Program	112.9	436.1	-	\$109.6
LED Roadway Lighting Conversion Program	8.8	59.3	-	\$56.2
Commercial Building Envelope - Windows Program	14.5	29.7	4.0	\$19.3
Commercial Building Envelope - Insulation Program	14.8	32.3	13.0	\$37.5
Commercial Geothermal Program	43.5	87.1	-	\$44.3
Commercial HVAC Program - Boilers	-	-	5.6	\$3.5
Commercial HVAC Program - Chillers	-	9.9	-	\$1.8
Commercial HVAC Program - CO2 Sensors	2.0	3.2	1.0	\$2.7
Commercial HVAC Program - HRVs	5.7	11.6	2.9	\$6.0
Commercial HVAC Program - Air Cooled Chillers	-	15.6	-	\$6.9
Commercial HVAC Program - Water Heaters	-	-	1.3	\$1.7
Commercial Custom Measures Program	6.8	29.5	1.9	\$13.7
Commercial Building Optimization Program	4.4	21.8	4.9	\$9.9
New Buildings Program	44.6	149.9	4.1	\$20.3
Commercial Refrigeration Program	8.4	66.0	-	\$9.7
Commercial Kitchen Appliance Program	0.4	2.0	0.7	\$0.7
Network Energy Management Program	0.4	3.8	-	\$0.5
Internal Retrofit Program	2.4	7.7	-	\$6.4
Power Smart Energy Manager	1.0	4.6	0.4	\$0.6
Power Smart Shops	1.0	3.9	0.1	\$2.1
Power Smart for Business PAYS Financing	-	-	-	-
Commercial Programs	271.7	973.9	39.8	\$353.4
Performance Optimization Program	42.6	338.7	-	\$144.4
Natural Gas Optimization Program	-	-	10.1	\$6.0
Industrial Programs	42.6	338.7	10.1	\$150.4
Energy Efficiency Subtotal	408.4	1,547.4	75.7	\$687.2
Curtaillable Rate Program	157.8	-	-	\$103.5
Load Management	157.8	-	-	\$103.5
Bioenergy Optimization Program	62.1	133.9	-	\$38.7
Customer Sited Load Displacement	75.4	593.2	-	\$99.5
Load Displacement & Alternative Energy	137.5	727.1	-	\$138.3
Conservation Rates - Residential	19.6	161.6	-	\$13.4
Conservation Rates - Commercial	29.5	243.6	-	\$17.6
Conservation Rates	49.1	405.2	-	\$30.9
Fuel Choice	145.6	291.3	-27.7	\$54.6
Fuel Choice	145.6	291.3	-27.7	\$54.6
Residential Air Source Heat Pumps Program	-	6.3	-	\$2.2
Residential Future Opportunities	17.3	83.3	-	\$45.9
Residential Solar Photovoltaics Program (PV)	7.2	79.3	-	\$59.8
Residential Solar Thermal Program - Water Heating	0.3	3.0	-	\$1.5
Residential Solar Thermal Program - Pool Heating	-	2.2	1.4	\$1.1
Commercial Future Opportunities	17.3	83.3	-	\$49.6
Commercial Solar Photovoltaics Program (PV)	12.1	114.0	-	\$71.9
Commercial Variable Speed and Frequency Drives	0.1	6.6	-	\$3.4
Industrial Future Opportunities	17.3	83.3	-	\$54.4
Other Emerging Technologies	71.6	461.4	1.4	\$289.8
Impacts	970.0	3,432.3	49.5	\$1,304.4
Codes, Standards & Regulations	317.7	1,187.1	77.7	-
Interactive Effects	-	-	-9.1	-
Program Support	-	-	-	\$89.3
Power Smart Plan - 2015/16 - 2029/30	1,288	4,619	118	\$1,394

1.2 DSM Market Transformation Strategy

Manitoba Hydro's DSM strategy is to aggressively pursue all cost effective energy efficiency opportunities and continually monitor the market to identify emerging trends and opportunities which may become viable and cost effective DSM initiatives within the planning horizon with the end goal of creating a sustainable market change where the energy efficient technology or practice ("EE measure") becomes the market standard.

To accomplish this in a manner that ensures permanent market transformation to the EE measure is achieved, a long term and comprehensive approach is used that involves different market intervention strategies at the various stages of the EE measure's adoption into the market. These strategies are researched and designed using a collaborative approach considering the input and expertise of the entire delivery channel for the EE measure including designers, suppliers, retailers and target customers.



Infancy

When an EE measure is first introduced to the market, it is typically received with skepticism on the part of installers, facility owners and consumers. The market is also often characterized by limited availability of the product, higher costs and, in many cases, unverified or untested energy performance claims. These conditions make it difficult to develop and increase market acceptance for the product. Lack of informed suppliers or experienced installers is also an issue with some EE measures, as many industry participants prefer to retain their own “tried and true” supply chain and installation methods.

It is of utmost importance in this phase that these barriers are addressed otherwise the EE measure will face difficulty with achieving market penetration and may fail to enter the growth stage.

Market Intervention Strategies:

Research and Development including possible demonstrations project showcasing the EE technology are important to demonstrate the performance claims for the measure and possibly to even highlight areas where the EE measure can be improved. For technologies related to space and water heating in particular, local field demonstration experience can be critical to increasing acceptance, due to Manitoba’s climate differences from typical laboratory or field testing. Demonstrations also have additional benefits through the ability to become showcases for the purpose of education and a future basis for communications that incorporate “real world” experiences that installers and customers can identify with operational performance.

If the energy performance of the EE technology is already known or has been verified through research and demonstration, communication strategies focusing on education to the market are critical to building awareness of the EE measure and its benefits.

Policy relating to energy efficiency is a very powerful strategy for EE measures in the infancy stages as it encourages government stakeholders to be to become leaders with energy efficiency and be the early adopters of the new technology. Early adopters are critical to the successful launch of new EE measures as they help to build the base industry infrastructure by creating initial demand.

Growth

Once the barriers of the Infancy stage have been identified and a strategy to address the barriers has been successfully implemented for the EE measure, market penetration begins to rise, whether voluntarily or through a policy strategy. In the early stages of growth, there needs to be a balanced approach to creating demand for the measure while ensuring that the market has developed qualified and knowledgeable providers in order to meet the emerging demand. EE measures in early growth can face irreparable damage if the early majority adopters lose confidence in the measure due to performance that does not meet expectations.

At this stage, the product efficiency performance is established with energy benefits to the customer quantified and the non-energy benefits have been identified. However, there will still be a lack of knowledge in the market as to the optimum methods of realizing these benefits.

During later periods of the growth stage, installers and suppliers become more plentiful, there may be customers with years of successfully implementing the EE measure, and there is increased awareness of the existence of the product.

Through the majority of the growth phase, a first cost premium typically remains associated with the EE measure.

Power Smart can have a significant impact on the rate at which a product is adopted in the market regardless of the form of the program or support offered due to the immense trust that industry and consumers have in Manitoba Hydro's expertise in matters pertaining to energy efficiency.

Market Intervention Strategies:

The strategies that are employed during this phase are dependent upon the characteristics of the market the technology is directed toward, the magnitude and significance of the additional cost to the market, and the breadth of accommodation that must be made in order to effectively utilize the technology. Strategies can vary drastically not only by market segment but also by specific technology. A thorough understanding of the market, both overall characteristics and drivers and detractors to the EE measure, is essential to ensure that the program design is addressing the proper target market and contains the tools and strategies that will address the barriers present.

Marketing and communication strategies focus on comprehensive messaging that includes both the efficiency benefits and the non-energy benefits that have been attributed to the measure, and that have a perceived value to the intended target market, in order to maximize the market adoption.

With first cost still a barrier, many programs will utilize financial tools such as incentives and/or financing to encourage customer adoption of the measure. The specific tool used or the extent to which the program covers the incremental cost of the measure will vary by technology and by target market and, once again, involves consultation with the channel participants to determine the optimal contribution by Power Smart.

Equally as important to the more visible customer directed strategies are capacity building initiatives. These strategies can be especially important for those EE measures that rely on professional consultants or installers for implementation and include training, education, and certification of groups such as homebuilders, equipment installers, engineers, architects, retailers, and distributors.

In assessing options for pursuing a Power Smart program to support an EE measure, Manitoba Hydro uses a number of metrics as guidelines to assess the opportunities. These metrics assist in determining whether to pursue an opportunity, how aggressive an opportunity will be pursued, the effectiveness of program design options and the relative investment sharing between ratepayers and participating customers.

Maturity

At the maturity phase of the EE measure's life cycle, the measure's use has become the preferred installation for the majority of the installers and customers in the market. At this stage, volumes have increased to the point that prices are reduced to the same level as the technology that is being replaced, or the price of the technology is in alignment with the value perceived by the customer. With these conditions, program participants often are qualified as "free riders"; in other words, they would have adopted the measure even in the absence of a program so the incentive they received was not responsible for achieving their energy savings.

Market Intervention Strategies:

During this phase, Manitoba Hydro's strategy involves pursuing the remaining opportunities through the adoption of codes and regulations. A code or a regulation ensures permanent market transformation for the specific energy efficiency opportunity since a potential always exists that the market could revert back to the non-efficient option once Power Smart has reduced or eliminated its program support.

Manitoba Hydro is heavily engaged in both Federal level and Provincial level committees that work to establish ongoing updates to minimum energy performance standards for technologies and to determine the appropriateness of their adoption into a code or a regulation. The assessment of the most appropriate exit strategy for a technology is strategized as early as at the infancy phase of the adoption life cycle of the EE measure where possible.

1.3 Power Smart Programs

The following table provides program durations and cumulative participation for incentive based and financial loan programs over the 15 year planning horizon. For program descriptions, please refer to the current approved DSM plan (2015/16 Power Smart Plan). For programs not approved but where placeholders are used, detail program descriptions are not available at this time.

Program Duration and Cumulative Participation
2015/16 - 2029/30

Programs	Program Category	Electric	Natural Gas	Program Launch Date	Participation Definition	Cumulative Participation by 2029/30
Residential						
New Home Program	Incentive Based	✓	✓	Apr-2017	No. of houses	1,381
Home Insulation Program	Incentive Based	✓	✓	May-2004	No. of houses	58,505
Water and Energy Saver Program	Incentive Based	✓	✓	Sep-2010	No. of houses	201,247
Affordable Energy Program	Incentive Based	✓	✓	Dec-2007	No. of retrofits	45,843
Refrigerator Retirement Program	Incentive Based	✓		Jun-2011	No. of appliances	55,017
Drain Water Heat Recovery Initiative	Incentive Based	✓		Apr-2015	No. of houses	1,856
Residential LED Lighting Program	Incentive Based	✓		Apr-2014	No. of bulbs	1,089,561
Community Geothermal Program	Incentive Based	✓		Apr-2013	No. of geothermal systems	3,972
Power Smart Residential Loan	Financial Loan	✓	✓	Feb-2001	No. of loans	161,059
Power Smart PAYS Financing	Financial Loan	✓	✓	Nov-2012	No. of loans	7,252
Residential Earth Power Loan	Financial Loan	✓	✓	Apr-2002	No. of loans	3,885
Commercial						
Commercial Lighting Program	Incentive Based	✓		Apr-1992	No. of projects	20,463
LED Roadway Lighting Conversion Program	Incentive Based	✓		Apr-2014	No. of conversions	155,133
Commercial Building Envelope - Windows Program	Incentive Based	✓	✓	Dec-1995	No. of projects	5,124
Commercial Building Envelope - Insulation Program	Incentive Based	✓	✓	Dec-1995	No. of projects	5,170
Commercial Geothermal Program	Incentive Based	✓		Dec-1995	No. of buildings	1,066
Commercial HVAC Program - Boilers	Incentive Based	✓	✓	Sep-2003	No. of boilers	2,728
Commercial HVAC Program - Chillers	Incentive Based	✓		Sep-2003	No. of chillers	184
Commercial HVAC Program - CO2 Sensors	Incentive Based	✓	✓	Apr-2009	No. of sensors	2,128
Commercial HVAC Program - HRVs	Incentive Based	✓	✓	Apr-2016	No. of units	276
Commercial HVAC Program - Air Cooled Chillers	Incentive Based	✓		Apr-2017	No. of chillers	338
Commercial HVAC Program - Water Heaters	Incentive Based	✓	✓	Apr-2015	No. of water heaters	1,018
Commercial Custom Measures Program	Incentive Based	✓	✓	Dec-1995	No. of projects	384
Commercial Building Optimization Program	Incentive Based	✓	✓	Apr-2006	No. of buildings	164
New Buildings Program	Incentive Based	✓	✓	Apr-2009	No. of buildings	246
Commercial Refrigeration Program	Incentive Based	✓		Apr-2006	No. of locations	3,673
Commercial Kitchen Appliance Program	Incentive Based	✓	✓	Jan-2008	No. of appliances	2,681
Network Energy Management Program	Incentive Based	✓		May-2008	No. of licenses	30,036
Internal Retrofit Program	Incentive Based	✓	✓	Jul-1995	No. of projects	1,499
Power Smart Shops	Incentive Based	✓	✓	Feb-2009	No. of projects	5,708
Power Smart Energy Manager	Incentive Based	✓	✓	Apr-2015	No. of managers	3
Power Smart for Business PAYS Financing	Financial Loan	✓	✓	Sep-2013	No. of loans	418
Industrial						
Performance Optimization Program	Incentive Based	✓		Jun-1993	No. of projects	3,018
Natural Gas Optimization Program	Incentive Based		✓	Sep-2006	No. of projects	221
Load Management						
Curtable Rate Program	Incentive Based	✓		Nov-1993	No. of customers	97 *
Load Displacement & Alternative Energy						
Bioenergy Optimization Program	Incentive Based	✓	✓	Mar-2006	No. of projects	231
Customer Sited Load Displacement	Incentive Based	✓		Apr-2014	No. of customers	28
Conservation Rates						
	Rate Based	✓		2018/19	Rate Based	-
Fuel Choice						
	Incentive Based	✓		2017/18	No. of installations	15,720
Other Emerging Technologies						
Residential Air Source Heat Pumps Program	Incentive Based	✓		2021/22	No. of projects	1,035
Residential Future Opportunities	Incentive Based	✓		2020/21	Various	Various
Residential Solar Photovoltaics Program (PV)	Incentive Based	✓		2020/21	No. of systems	26,402
Residential Solar Thermal Program - Water Heating	Incentive Based	✓		2017/18	No. of systems	1,199
Residential Solar Thermal Program - Pool Heating	Incentive Based	✓	✓	2017/18	No. of systems	1,116
Commercial Future Opportunities	Incentive Based	✓		2020/21	Various	Various
Commercial Solar Photovoltaics Program (PV)	Incentive Based	✓		2020/21	No. of systems	1,519
Commercial Variable Speed and Frequency Drives	Incentive Based	✓		2017/18	No. of drives	569
Industrial Future Opportunities	Incentive Based	✓		2020/21	Various	Various

*Participation recurs annually

1.4 Risk Analysis

Demand Side Management (DSM) involves risk in both deliverability and cost. Deliverability risk is the risk that the DSM plan does not deliver the projected electric capacity and energy savings within the specified time frame. Cost risk is related to DSM program costs, including incentives and administration, and the associated risk of revenue loss or cost recovery due to reduced levels of energy consumption.

The cost risk of DSM to the utility customer is an important consideration in understanding the risk of both deliverability and cost for Manitoba Hydro. Most DSM measures require a significant investment by the customer (generally greater than 50 percent of total costs) with the customer's willingness and capability to invest their portion of the capital and operating expense being heavily dependent on alternative uses of capital, the reliability of energy savings and the added value of non-energy benefits related to comfort, convenience, safety, productivity and other non-energy benefit streams. As such, these risks to the customer are an important aspect of assessing the risk to Manitoba Hydro.

This section summarizes these risks, outlines Manitoba Hydro's past performance in achieving DSM targets, assesses the appropriate level of risk and describes how these risks will be managed.

1.4.1 DSM Risks

Power Smart Programs

Participation rate - DSM programs rely on customers to participate, with the level of participation impacting the electricity and natural gas savings achieved. The timing and degree of participation by customers (residential, commercial and industrial) can be greatly influenced by a number of factors including their knowledge and understanding of the measure's relevance to their needs and energy consumption, product maturity, market support, alternative uses of capital, available non-energy benefits, and external factors such as the economy and spending priorities. Capital prioritization among customers is heavily influenced by the relevance of the measure to their business priorities. In addition, periods of economic decline may reduce customer participation rates, even in instances when energy efficiency projects have high returns, due to capital rationing, balance sheet status, funding priorities and other considerations.

Energy savings per participant - Energy savings per participant could be higher or lower than forecast. While variations in energy savings among customers for a particular measure is always anticipated, it is reasonable to expect that the range of variations for a particular measure can be accounted with reasonable precision if adequate technical and market information is available.

Program cost - Non-incentive and incentive costs could be higher or lower than forecast. Measure costs and related incentive costs for Manitoba Hydro may vary over the life of a program to account for increasing measure maturity and growing market acceptance. It is generally accepted that initial entry into the market requires greater levels of engagement by the utility, including higher incentive costs, to overcome barriers associated with market knowledge and understanding, hesitance to accept new technologies and higher initial costs. A lower level of initial measure maturity results in higher upfront costs to the utility, which generally decline as the measure matures and market acceptance improves. Market maturity is influenced by materials development, product refinement,

manufacturing growth, and growth within the sales and distribution network that provides for availability and after-sales support demanded by customers. Forecasting the pace of market maturity can be challenging, influencing program costs over the life of a program, but Manitoba Hydro works closely with industry to advance market maturity and to remain aware of potential changes in the market.

While costs incurred by utilities for DSM are generally recovered through rates and avoided costs for the deferral of more costly generation, transmission and distribution assets, revenue loss from widespread market acceptance of DSM measures such as distributed generation are also accompanied by the additional costs of integrating renewable resources with highly variable outputs. Recovery of these costs is currently an active topic among utilities in California where distributed generation is approaching 5 percent of total generation resources. This is not a near-term risk for Manitoba Hydro due to its low rates and it is anticipated that regulators will have developed methodologies for addressing these costs by the time they become an issue for Manitoba.

Regulatory approval- Programs relying upon specific price signals through rate design such as Conservation Rates will be subject to approval by the Manitoba Public Utilities Board. The timing and level of energy reductions to be achieved under these initiatives may be impacted by the rulings of this Board, which may be influenced by priorities such as rate impacts to low income customers.

Codes and Standards

Government approval- Changes to codes and standards are implemented by government and subject to government approval. At present, government support for energy efficiency codes and standards is strong, with considerable interest and support from all levels of government. Harmonization across North America between Canada and the US is progressing well, creating a more uniform and persuasive market impact through common energy efficiency regulations that directly influence manufacturers. As such, it is anticipated that the influence of codes and standards will remain consistent and supportive to DSM measures over the coming decades. Growing calls for strengthened greenhouse gas emission targets and carbon economy regulation are likely to advance the push for greater use of DSM measures across Canada and the US.

Coverage - Codes and standards can apply to all or a subset of equipment and buildings, which will impact the resulting electric and natural gas savings. Energy codes present a significant opportunity for future DSM savings. Federal efforts directed towards future editions of building energy codes are well advanced, so it is anticipated that adoption of future energy codes will continue to be supportive of both electric and natural gas savings as improved methods of modeling energy performance are adopted into the marketplace. These improved and easily accessible modeling tools will highlight potential opportunities for energy savings within buildings, supporting the development of more energy efficient materials and construction practices within the construction industry.

Efficiency level- The minimum efficiency level prescribed in codes and standards can vary and this will also impact the resulting electricity and natural gas savings.

Compliance - Once a code or standard is in place, electric and natural gas savings will depend on the degree to which consumers, builders and other market players comply with the requirements and the ability of the governing bodies to monitor and enforce compliance. Compliance is a key concern for utilities as it largely rests with local municipal enforcement agencies that are often under-resourced. To support compliance, Manitoba Hydro often establishes existing codes and standards as base criteria for involvement in DSM programming, driving the market to become minimally compliant with codes and regulations related to energy performance.

1.4.2 Past DSM Performance

To gain a perspective on the risk of achieving DSM targets, it is useful to view past performance in achieving the forecast DSM targets. This section outlines Manitoba Hydro's achievements of its long term, mid-term and short term DSM targets.

Long Term Analysis (10 yr)

The 10 year electric DSM targets were compared to energy savings achieved from all past Power Smart Plans where the tenth year has concluded. Achieved electric savings surpassed planned savings for all three plans by a significant margin. This margin is reasonable and expected as these early plans were conservative in nature and additional opportunities were pursued subsequent to the plan being developed. Ultimately, this assessment demonstrates that historically Manitoba Hydro has achieved its long term electric DSM forecasts.

	10 yr Actual (GW.h)	10 yr Target (GW.h)	Difference	% Above / (Below) Target
2000 PS Plan	842	452	390	86% *
2001 PS Plan	963	511	452	88% *
2005 PS Plan	1,711	1,312	399	30%
Average	1,172	758	414	55%

* Actual savings exclude savings due to standards

Mid Term Analysis (5 yr)

To assess mid-term DSM achievability, the 5 year electric and natural gas DSM targets were compared to achieved savings. Overall, for both electricity and natural gas, achieved savings met or exceeded the targeted savings. This assessment indicates that in the mid-term, Manitoba Hydro has achieved its planned electric and natural gas forecasts. It also indicates that the variability from forecasted savings decreases as the forecast time spans are reduced.

It should be noted that the natural gas targets in the 2005 Power Smart Plan were dramatically surpassed by the savings achieved. As this was the first Power Smart Plan to include natural gas savings, the targets were conservative and were subsequently exceeded by more aggressive DSM activities.

	5 yr Actual (GW.h)	5 yr Target (GW.h)	Difference	% Above / (Below) Target
2000 PS Plan	224	250	-26	-11% *
2001 PS Plan	321	288	33	11% *
2005 PS Plan	708	634	74	12%
2006 PS Plan	826	799	27	3%
2008 PS Plan	928	834	94	11%
2009 PS Plan	1,106	1,120	-14	-1%
2010 PS Plan	1,154	1,131	23	2%
Average	752	722	30	4%

* Actual savings exclude savings due to standards

	5 yr Actual (million m ³)	5 yr Target (million m ³)	Difference	% Above / (Below) Target
2000 PS Plan	n/a	n/a	n/a	n/a
2001 PS Plan	n/a	n/a	n/a	n/a
2005 PS Plan	36.9	15.5	21.4	138% *
2006 PS Plan	42.3	38.9	3.4	9% *
2008 PS Plan	53.9	53.5	0.4	1%
2009 PS Plan	53.3	41.6	11.7	28%
2010 PS Plan	53.5	44.0	9.5	22%
Average	48.0	38.7	9.3	24%

* Actual savings exclude savings due to standards

Short Term Analysis (1 yr)

To assess short term DSM achievability, the annual electric and natural gas DSM targets were compared to achieved savings. Overall, achieved electric and natural gas energy savings surpassed the planned DSM savings. This analysis demonstrates that in the short term Manitoba Hydro has generally achieved its forecasted electric and natural gas forecasts.

It should be noted that the shortfall for electric savings in 2014/15 was mainly due to unanticipated delays in the Load Displacement Program. This initiative was a new addition to the plan and the forecasted savings did not account for the difficulty in implementing such large scale projects. This demonstrates that the timelines may vary for the implementation of some DSM projects, however this is just a year-over-year variability and not a risk to the overall achievement of DSM targets over a longer period of time.

	1 yr Actual (GW.h)	1 yr Target (GW.h)	Difference	% Above / (Below) Target
2009-2010	263	311	-48	-15%
2010-2011	268	258	10	4%
2011-2012	260	240	20	8%
2012-2013	332	173	159	92%
2013-2014	260	177	83	47%
2014-2015	281	363	-81	-22% *
Average	277	254	24	9%

* Actual savings reflect unaudited estimate

	1 yr Actual (million m ³)	1 yr Target (million m ³)	Difference	% Above / (Below) Target
2009-2010	7.3	7.9	-0.6	-8%
2010-2011	11.2	6.7	4.5	67%
2011-2012	14.4	10	4.4	44%
2012-2013	14.6	10	4.6	46%
2013-2014	9.0	10.3	-1.3	-13%
2014-2015	12.6	10.2	2.4	24% *
Average	11.5	9.2	2.3	26%

* Actual savings reflect unaudited estimate

1.4.3 Risk Management

As Manitoba Hydro's DSM plan involves a diverse offering of many programs and initiatives, the risk associated with achieving the targeted energy savings is inherently minimized through diversification. In addition, the overall risk is further reduced by undertaking ongoing and regular reviews of individual program performance and making regular adjustments to the Corporation's overall DSM plan on an annual basis.

Energy Efficiency Programs – Risk Level: Low

Energy Efficiency programs present a relatively low level of risk to the Corporation. Energy efficiency program participation and resulting savings build gradually over time which allows for adjustment to the program designs, ensuring alignment with long term targets. Program participation and resulting energy and capacity savings achieved are tracked quarterly for each initiative to provide timely feedback and opportunity for design changes. Similarly, program costs are managed by comparing expenditures to the program budget on a monthly basis to identify variances from planned expenditures. Free ridership rates and other factors that impact program energy and capacity savings are also measured on an annual basis through the impact evaluation process which also provide timely feedback. Although Manitoba Hydro's overall plan is formally adjusted on an annual basis, adjustments are made to specific programs throughout the year and implemented when deemed appropriate.

Load Displacement and Alternative Energy Programs – Risk Level: High

The risk associated with achieving the energy savings with the Load Displacement and Alternative Energy programs present a relatively high level of risk to the Corporation. This risk is generally related more towards the timing of the achievement of the energy savings. These initiatives involve a much smaller number of customers, large capital investment required by customers, complex installations and the need to integrate the projects into production processes while minimizing downtime. Since each of the smaller number of participants have large potential energy and capacity savings, there is less diversification in the load displacement portfolio, meaning variances in the timing of these projects will have a dramatic impact on annual targets for both program expenditures and energy and capacity savings. The risks will be managed by working closely with customers and by assisting them with assessing their respective business cases supporting each opportunity. Although there is a short-term timing risk related to the implementation of the projects, the long-term impact to Manitoba Hydro is relatively insignificant provided the projects are undertaken within a reasonable period of time and prior to decisions involving adding new generation supply in Manitoba. There is a reasonable probability that the majority of the identified projects will be implemented within the time frame of this plan.

Conservation Rates Initiative – Risk Level: Medium

The Conservation Rate initiatives (i.e. residential and commercial) involve a medium level of risk to the Corporation. Manitoba Hydro intends to manage this risk by using a third-party consultant to assist with the estimation of energy savings and by working closely with key stakeholders to address their specific concerns. A similar initiative has already been implemented by B.C. Hydro and Manitoba Hydro will **take** the opportunity to learn from their experiences.

Fuel Choice Initiative – Risk Level: Medium to High

Achieving the energy savings associated with the Fuel Choice initiative presents a medium to high level of risk to the Corporation. This initiative involves encouraging customers to switch from using electricity to natural gas for space heating purposes where natural gas is available. This initiative would result in participating customers having lower heating bills however **it** would result in higher regional emissions and lower global emissions. Given the dynamics associated with this initiative, Manitoba Hydro has mixed support for pursuing this initiative by its various stakeholders. For example, the provincial government is not supportive of Manitoba Hydro pursuing this opportunity while some interveners are strong advocates of Manitoba Hydro aggressively pursuing the opportunity. Manitoba Hydro is managing this risk by continuing to have discussions with its key stakeholders to assess whether the opportunity will or should be pursued.

Other Emerging Technologies – Risk Level: Medium to High

The Other Emerging Technologies category presents a medium to high level of risk to the Corporation. As these are emerging technologies, there are risks related to the pace of product development, the cost of products and market acceptance. Manitoba Hydro will manage this risk by continuing to monitor progress in technology and/or product development and by making adjustments to its DSM plan on an ongoing basis.

Codes and Standards – Risk Level: Low

The Codes and Standards category presents a low level of risk to the Corporation. Once codes are adopted in Manitoba there is still a requirement for enforcement, which is the responsibility of the Office of the Fire Commissioner and the City of Winnipeg and other larger municipal entities. Given that energy efficiency in the building code is relatively new, mechanisms for enforcement and training of code authorities will need to be formalized. Manitoba Hydro will help manage this risk by assisting code authorities and industry stakeholders with the identification of key aspects of building energy code, supporting the industry in areas of difficulty and provide training for both industry and code officials. Manitoba Hydro's longer term strategy of developing programs that are aligned with future code requirements will also assist in mitigating the risk by educating the industry on energy efficient technologies and design practices that will eventually be introduced and enforced within energy codes.

Energy savings achieved through the implementation of energy performance standards for equipment and systems are often referenced in Power Smart programs and Energy Efficiency Regulations. Energy savings achieved through federal regulations applying to goods imported into Canada are relatively secure and risk-free. Energy savings achieved through provincial regulations with lower levels of compliance enforcement are generally less secure and therefore contain greater risk in achievement. Manitoba Hydro will help manage the risks by continuing to make energy performance standards a core component of eligibility for Power Smart program incentives. In this manner, customers and vendors become accustomed to compliance with the standards, easing compliance with regulations that generally arrive once market acceptance of new energy efficient technologies has been achieved through the influence of utility programs.

1.5 Economic Assumptions

Marginal Costs

The 2015 Power Smart Plan incorporated the following forecasts to estimate the marginal benefits for energy savings resulting from the revenue realized from conserved electricity being sold in the export market, the avoided costs of new transmission and the supply of natural gas:

- Electric – The electric marginal cost forecast was prepared and compiled by the Resource Planning and Market Analysis Department. Marginal values were provided for savings at the distribution level, transmission level, generation level and for the value of curtailable load. For the 2015 Power Smart Plan, the following assumptions were applied:
 - Marginal costs were based on a uniform supply with a 100% capacity factor
 - Distribution Level Programs used a loss factor of 14% to translate back to generation
 - General Service Large Programs used a loss factor of 10% to translate back to generation
 - Generation Level Programs used a loss factor of 14% to translate to distribution level
 - US/Cdn Exchange Rates and Escalation Factors were derived from the Corporation's G911 corporate policy document issued October 9th, 2014
 - Transmission & distribution marginal costs were updated using SPD 2010/02
- Natural Gas – The alternative cost forecast for natural gas was prepared based on the natural gas price forecast which was provided by the Economic Analysis Department. Unlike the price forecast, it does not include distribution costs. The benefits of avoided greenhouse gas emissions were included in the natural gas marginal benefits used to calculate the Societal Cost (SC) and Total Resource Cost (TRC) metric. A greenhouse gas cost forecast was provided by the Energy Policy & Analysis Department.
- In addition, water benefits were calculated based on 2015 City of Winnipeg Water and Sewer rates effective January 1st, 2015.

Customer Rates

The following forecasts were used to determine the impact of customer bill reductions resulting from their Power Smart energy savings:

- Electric – The Electric Rates & Regulatory Department provided the rate forecast for electricity. Commercial and industrial program rates were determined by a weighted average based on the forecast participation by each of the Corporations' billing classes. Residential rates were consistent for all residential programs. For the 2015 Power Smart Plan, the weighted rates were based on the approved May 1st, 2014 rate forecast which assumed the 2014/15 real rates would increase by 2.0% and thereafter by 2.0% per year. This was based on the projected rate increase of 3.95% for 2015/16 and the long term rate increase of 3.95% per year (as per IFF-13) less the 2015/16 escalation rate of 2.0 % and the long term escalation rate of 2% (2013 Economic Outlook), (represented in 2015 \$).
- Natural Gas – The natural gas price forecast was prepared by the Economic Analysis Department with input from the Energy Price Outlook. For the 2015 Power Smart Plan, the following assumptions were applied:
 - Forecast starting point was the February 1st, 2014 rate
 - Commodity price changes into the future were based on the forecast of natural gas prices contained in the Energy Price Outlook which represented a consensus view of futures markets and a suite of five independent forecasting organizations
 - Non-commodity (monthly charge, transportation, distribution) price changes were based on IFF-13 assumptions on general rate increases and the Economic Outlook assumptions on Manitoba inflation. Non-commodity price changes in the post-IFF period were based on historical trends

Economic Variables

For the 2015 Power Smart Plan, the Projected Escalation, Interest, & Exchange Rates – G911 corporate policy document issued October 9th, 2014 was used to discount all forward-looking savings and costs. The real weighted average cost of capital of 4.75% was used to discount real dollar cash flows and energy savings. Rates for all historical benefits, costs, and energy savings used actual economic results for each year.

1.6 Comparison to 2014 DSM Forecast

Electric DSM Targets Comparison

The planned electric energy savings in this plan are approximately 641 GW.h higher than previously forecast in the 2014-2017 Power Smart Plan, resulting in a 16% increase. The following section highlights programs with notable changes.

New Home Program (-)

- Decrease due to revisions in future building code savings based on updated market information.

Affordable Energy Program (+)

- Reflects increase in participation levels and extension of program to Multi-unit residential buildings

Refrigerator Retirement Program (+)

- Program extended an additional 6 years.

Commercial Lighting (+)

- Increase due to greater uptake of LED technology.

LED Roadway Lighting Conversion Program (+)

- Increase due to additional replacements.

Commercial Geothermal Program (-)

- Decrease due to reductions in market penetration levels based on updated market information.

New Buildings Program (+)

- Increase due to additional savings from future building code.

Performance Optimization (-)

- Decrease due to revisions to program participation based on updated market information.

Load Displacement & Alternative Energy (+)

- Increase due to the inclusion of additional biomass opportunities.

Other Emerging Technologies (+)

- Increase due to exploration of future technologies.

Codes and Standards (-)

- Decrease reflects updated market information.

	2015 DSM Forecast (GW.h)	2014 DSM Forecast (GW.h)	Change	% Contribution to overall change
New Home Program	19.2	45.5	-26.3	-4%
Home Insulation Program	32.1	35.6	-3.5	-1%
Water and Energy Saver Program	16.5	14.0	2.5	0%
Affordable Energy Program	44.3	35.5	8.8	1%
Refrigerator Retirement Program	16.6	1.7	14.9	2%
Drain Water Heat Recovery Initiative	1.9	0.0	1.9	0%
Residential LED Lighting Program	11.0	6.8	4.3	1%
Community Geothermal Program	64.3	68.1	-3.8	-1%
Power Smart Residential Loan	7.3	8.5	-1.3	0%
Power Smart PAYS Financing	3.5	6.0	-2.5	0%
Residential Earth Power Loan	18.2	20.6	-2.4	0%
Residential Programs	234.9	242.2	-7.3	-1%
Commercial Lighting Program	436.1	289.9	146.1	23%
LED Roadway Lighting Conversion Program	59.3	40.3	19.0	3%
Commercial Building Envelope - Windows Program	29.7	36.3	-6.6	-1%
Commercial Building Envelope - Insulation Program	32.3	34.3	-1.9	0%
Commercial Geothermal Program	87.1	115.8	-28.8	-4%
Commercial HVAC Program - Boilers	-	-	-	-
Commercial HVAC Program - Chillers	9.9	9.6	0.2	0%
Commercial HVAC Program - CO2 Sensors	3.2	2.0	1.2	0%
Commercial HVAC Program - HRVs	11.6	0.0	11.6	2%
Commercial HVAC Program - Air Cooled Chillers	15.6	0.0	15.6	2%
Commercial HVAC Program - Water Heaters	-	-	-	-
Commercial Custom Measures Program	29.5	24.6	5.0	1%
Commercial Building Optimization Program	21.8	16.4	5.4	1%
New Buildings Program	149.9	55.9	94.0	15%
Commercial Refrigeration Program	66.0	70.8	-4.8	-1%
Commercial Kitchen Appliance Program	2.0	2.5	-0.5	0%
Network Energy Management Program	3.8	5.4	-1.6	0%
Internal Retrofit Program	7.7	3.1	4.6	1%
Power Smart Energy Manager	4.6	0.0	4.6	1%
Power Smart Shops	3.9	4.5	-0.6	0%
Power Smart for Business PAYS Financing	0.0	2.6	-2.6	0%
Commercial Programs	973.9	713.9	260.0	41%
Performance Optimization Program	338.7	399.8	-61.2	-10%
Natural Gas Optimization Program	-	-	-	-
Industrial Programs	338.7	399.8	-61.2	-10%
Energy Efficiency Subtotal	1,547.4	1,356.0	191.5	30%
Curtailable Rate Program	-	-	-	-
Load Management	-	-	-	-
Bioenergy Optimization Program	133.9	68.1	65.8	10%
Customer Sited Load Displacement	593.2	638.6	-45.5	-7%
Load Displacement & Alternative Energy	727.1	706.7	20.4	3%
Conservation Rates - Residential	161.6	159.7	1.9	0%
Conservation Rates - Commercial	243.6	230.4	13.2	2%
Conservation Rates	405.2	390.0	15.1	2%
Fuel Choice	291.3	285.8	5.4	1%
Fuel Choice	291.3	285.8	5.4	1%
Residential Air Source Heat Pumps Program	6.3	0.0	6.3	1%
Residential Future Opportunities	83.3	0.0	83.3	13%
Residential Solar Photovoltaics Program (PV)	79.3	0.0	79.3	12%
Residential Solar Thermal Program - Water Heating	3.0	0.0	3.0	0%
Residential Solar Thermal Program - Pool Heating	2.2	0.0	2.2	0%
Commercial Future Opportunities	83.3	0.0	83.3	13%
Commercial Solar Photovoltaics Program (PV)	114.0	0.0	114.0	18%
Commercial Variable Speed and Frequency Drives	6.6	0.0	6.6	1%
Industrial Future Opportunities	83.3	0.0	83.3	13%
Other Emerging Technologies	461.4	0.0	461.4	72%
Impacts	3,432.3	2,738.6	693.8	108%
Codes, Standards & Regulations	1,187.1	1,239.7	-52.5	-8%
Interactive Effects	-	-	-	-
Program Support	-	-	-	-
Power Smart Plan - 2015/16 - 2029/30	4,619	3,978	641	100%

Natural Gas DSM Targets Comparison

The natural gas savings expected to be achieved through this plan are 10 million cubic metres higher than previously forecast in the 2014-15 Power Smart Plan, resulting in a 9% increase. The following section highlights programs with notable changes.

New Home Program (-)

- Decrease due to revisions in future building code savings based on updated market information.

Home Insulation Program (-)

- Decrease due to a decline in forecasted average savings per application and anticipated participation levels.

Commercial HVAC Program - Boilers (+)

- Reflects program extended an additional 2 years and an increase in forecasted average savings per application.

Commercial HVAC Program - CO2 Sensors (-)

- Decrease due to a decline in forecasted average savings per application.

Commercial HVAC Program - HRVs (+)

- Increase due to new initiative offered in 2015.

Commercial Building Optimization Program (+)

- Increase due to higher anticipated participation levels.

New Buildings Program (+)

- Increase due to additional savings from future building code.

Natural Gas Optimization Program (+)

- Increase due to extension of program offering.

Load Displacement & Alt. Energy (-)

- Decrease reflects updated market opportunities.

Fuel Choice (+)

- Increase due to revisions based on updated market information.

Other Emerging Technologies (+)

- Increase due to exploration of future technologies.

Interactive Effects (-)

- Reflects greater volume required due to additional cooling effects from energy efficient lighting.

	2015 DSM Forecast (million m ³)	2014 DSM Forecast (million m ³)	Change	% Contribution to overall change
New Home Program	5.4	6.4	-1.0	-10%
Home Insulation Program	7.2	8.9	-1.7	-17%
Water and Energy Saver Program	1.6	2.5	-0.8	-8%
Affordable Energy Program	6.2	6.1	0.0	0%
Refrigerator Retirement Program	-	-	-	-
Drain Water Heat Recovery Initiative	-	-	-	-
Residential LED Lighting Program	-	-	-	-
Community Geothermal Program	-	-	-	-
Power Smart Residential Loan	3.9	4.6	-0.7	-7%
Power Smart PAYS Financing	0.0	0.1	-0.1	-1%
Residential Earth Power Loan	1.4	2.0	-0.6	-6%
Residential Programs	25.8	30.7	-4.9	-49%
Commercial Lighting Program	-	-	-	-
LED Roadway Lighting Conversion Program	-	-	-	-
Commercial Building Envelope - Windows Program	4.0	4.2	-0.2	-2%
Commercial Building Envelope - Insulation Program	13.0	13.1	-0.1	-1%
Commercial Geothermal Program	-	-	-	-
Commercial HVAC Program - Boilers	5.6	4.7	0.9	9%
Commercial HVAC Program - Chillers	-	-	-	-
Commercial HVAC Program - CO2 Sensors	1.0	2.8	-1.8	-18%
Commercial HVAC Program - HRVs	2.9	0.0	2.9	29%
Commercial HVAC Program - Air Cooled Chillers	0.0	0.0	0.0	0%
Commercial HVAC Program - Water Heaters	1.3	0.7	0.6	6%
Commercial Custom Measures Program	1.9	2.1	-0.2	-2%
Commercial Building Optimization Program	4.9	3.7	1.2	12%
New Buildings Program	4.1	1.5	2.6	26%
Commercial Refrigeration Program	0.0	0.0	0.0	0%
Commercial Kitchen Appliance Program	0.7	1.0	-0.3	-3%
Network Energy Management Program	0.0	0.0	0.0	0%
Internal Retrofit Program	0.0	0.0	0.0	0%
Power Smart Energy Manager	0.4	0.0	0.4	4%
Power Smart Shops	0.1	0.1	-0.1	-1%
Power Smart for Business PAYS Financing	0.0	0.1	-0.1	-1%
Commercial Programs	39.8	34.0	5.8	59%
Performance Optimization Program	-	-	-	-
Natural Gas Optimization Program	10.1	4.8	5.3	53%
Industrial Programs	10.1	4.8	5.3	53%
Energy Efficiency Subtotal	75.7	69.5	6.3	63%
Curtailable Rate Program	-	-	-	-
Load Management	-	-	-	-
Bioenergy Optimization Program	0.0	1.7	-1.7	-17%
Customer Sited Load Displacement	-	-	-	-
Load Displacement & Alternative Energy	0.0	1.7	-1.7	-17%
Conservation Rates - Residential	-	-	-	-
Conservation Rates - Commercial	-	-	-	-
Conservation Rates	-	-	-	-
Fuel Choice	-27.7	-38.8	11.1	112%
Fuel Choice	-27.7	-38.8	11.1	112%
Residential Air Source Heat Pumps Program	-	-	-	-
Residential Future Opportunities	-	-	-	-
Residential Solar Photovoltaics Program (PV)	-	-	-	-
Residential Solar Thermal Program - Water Heating	-	-	-	-
Residential Solar Thermal Program - Pool Heating	1.4	0.0	1.4	14%
Commercial Future Opportunities	-	-	-	-
Commercial Solar Photovoltaics Program (PV)	-	-	-	-
Commercial Variable Speed and Frequency Drives	-	-	-	-
Industrial Future Opportunities	-	-	-	-
Other Emerging Technologies	1.4	0.0	1.4	14%
Impacts	49.5	32.4	17.1	172%
Codes, Standards & Regulations	77.7	78.0	-0.3	-3%
Interactive Effects	-9.1	-2.2	-6.8	-69%
Program Support	-	-	-	-
Power Smart Plan - 2015/16 - 2029/30	118	108	10	100%

Utility Cost Comparison

The planned utility cost forecast in this plan is approximately \$291 million higher than previously forecast in the 2014-2017 Power Smart Plan, resulting in a 26% increase. The following section highlights programs with notable changes.

Affordable Energy Program (+)

- Reflects increase in participation levels and extension of program to Multi-unit residential buildings

LED Roadway Lighting Conversion Program (+)

- Increase due to additional replacements

Commercial Geothermal Program (-)

- Decrease due to reductions in market penetration levels based on updated market information.

Performance Optimization Program (-)

- Decrease due to revisions to program participation based on updated market information.

Load Displacement & Alt. Energy (+)

- Increase due to the inclusion of additional biomass opportunities.

Other Emerging Technologies (+)

- Increase due to exploration of future technologies.

Program support (-)

- Decrease resulting from revisions to support and administration costs.

	2015 DSM Utility Investment (Millions \$)	2014 DSM Utility Investment (Millions \$)	Change	% Contribution to overall change
New Home Program	\$3.0	\$2.6	\$0.4	0%
Home Insulation Program	\$31.5	\$35.4	-\$3.9	-1%
Water and Energy Saver Program	\$6.5	\$8.6	-\$2.1	-1%
Affordable Energy Program	\$98.0	\$77.8	\$20.2	7%
Refrigerator Retirement Program	\$11.3	\$6.7	\$4.6	2%
Drain Water Heat Recovery Initiative	\$0.6	\$0.0	\$0.6	0%
Residential LED Lighting Program	\$4.7	\$1.9	\$2.7	1%
Community Geothermal Program	\$27.8	\$22.9	\$4.8	2%
Power Smart Residential Loan	-	-	-	-
Power Smart PAYS Financing	-	-	-	-
Residential Earth Power Loan	-	-	-	-
Residential Programs	\$183.4	\$156.0	\$27.4	9%
Commercial Lighting Program	\$109.6	\$104.2	\$5.5	2%
LED Roadway Lighting Conversion Program	\$56.2	\$42.8	\$13.4	5%
Commercial Building Envelope - Windows Program	\$19.3	\$21.2	-\$1.9	-1%
Commercial Building Envelope - Insulation Program	\$37.5	\$38.5	-\$1.0	0%
Commercial Geothermal Program	\$44.3	\$56.2	-\$11.9	-4%
Commercial HVAC Program - Boilers	\$3.5	\$2.4	\$1.1	0%
Commercial HVAC Program - Chillers	\$1.8	\$2.1	-\$0.3	0%
Commercial HVAC Program - CO2 Sensors	\$2.7	\$2.7	\$0.1	0%
Commercial HVAC Program - HRVs	\$6.0	-	-	-
Commercial HVAC Program - Air Cooled Chillers	\$6.9	-	-	-
Commercial HVAC Program - Water Heaters	\$1.7	\$1.0	\$0.7	0%
Commercial Custom Measures Program	\$13.7	\$15.6	-\$1.9	-1%
Commercial Building Optimization Program	\$9.9	\$10.1	-\$0.1	0%
New Buildings Program	\$20.3	\$22.5	-\$2.1	-1%
Commercial Refrigeration Program	\$9.7	\$9.8	-\$0.1	0%
Commercial Kitchen Appliance Program	\$0.7	\$0.7	-\$0.1	0%
Network Energy Management Program	\$0.5	\$0.8	-\$0.3	0%
Internal Retrofit Program	\$6.4	\$2.6	\$3.8	1%
Power Smart Energy Manager	\$0.6	-	-	-
Power Smart Shops	\$2.1	\$1.9	\$0.2	0%
Power Smart for Business PAYS Financing	-	\$0.0	-	-
Commercial Programs	\$353.4	\$334.9	\$18.6	6%
Performance Optimization Program	\$144.4	\$166.9	-\$22.6	-8%
Natural Gas Optimization Program	\$6.0	\$2.4	\$3.6	1%
Industrial Programs	\$150.4	\$169.3	-\$18.9	-6%
Energy Efficiency Subtotal	\$687.2	\$660.2	\$27.0	9%
Curtable Rate Program	\$103.5	\$102.9	\$0.6	0%
Load Management	\$103.5	\$102.9	\$0.6	0%
Bioenergy Optimization Program	\$38.7	\$11.5	\$27.2	9%
Customer Sited Load Displacement	\$99.5	\$91.1	\$8.4	3%
Load Displacement & Alternative Energy	\$138.3	\$102.6	\$35.6	12%
Conservation Rates - Residential	\$13.4	\$18.0	-\$4.6	-2%
Conservation Rates - Commercial	\$17.6	\$21.5	-\$4.0	-1%
Conservation Rates	\$30.9	\$39.5	-\$8.6	-3%
Fuel Choice	\$54.6	\$54.6	\$0.1	0%
Fuel Choice	\$54.6	\$54.6	\$0.1	0%
Residential Air Source Heat Pumps Program	\$2.2	-	-	-
Residential Future Opportunities	\$45.9	-	-	-
Residential Solar Photovoltaics Program (PV)	\$59.8	-	-	-
Residential Solar Thermal Program - Water Heating	\$1.5	-	-	-
Residential Solar Thermal Program - Pool Heating	\$1.1	-	-	-
Commercial Future Opportunities	\$49.6	-	-	-
Commercial Solar Photovoltaics Program (PV)	\$71.9	-	-	-
Commercial Variable Speed and Frequency Drives	\$3.4	-	-	-
Industrial Future Opportunities	\$54.4	-	-	-
Other Emerging Technologies	\$289.8	\$0.0	\$289.8	100%
Impacts	\$1,304.4	\$959.8	\$344.6	118%
Codes, Standards & Regulations	-	\$0.0	-	-
Interactive Effects	-	\$0.0	-	-
Program Support	\$89.3	\$142.8	-\$53.5	-18%
Power Smart Plan - 2015/16 - 2029/30	\$1,393.7	\$1,102.6	\$291.1	100%

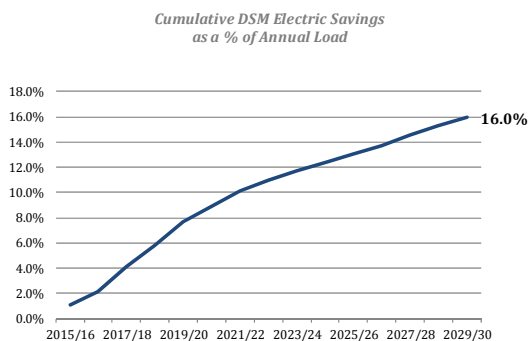
2 DEMAND SIDE MANAGEMENT

2.1 DSM Targets

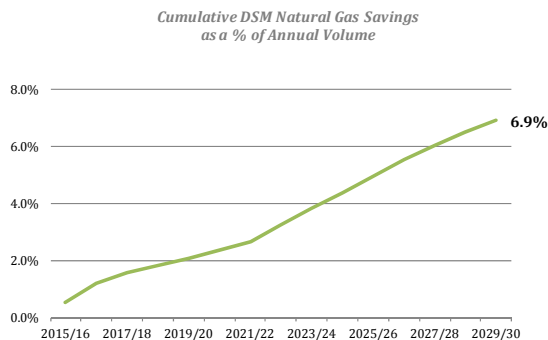
2.1.1 Electric and Natural Gas DSM Savings

In summary, the plan sets out to realize electricity savings of 1,288 MW and 4,619 GW.h, natural gas savings of 118 million cubic metres and combined global greenhouse gas emission reductions of 3.3 million tonnes by 2029/30.

This demand side management plan represents 16.0% of the estimated electric load forecast offsetting 60% of projected load growth during this period and 6.9% of the estimated natural gas volume forecast by 2029/30, further reducing natural gas consumption in Manitoba.



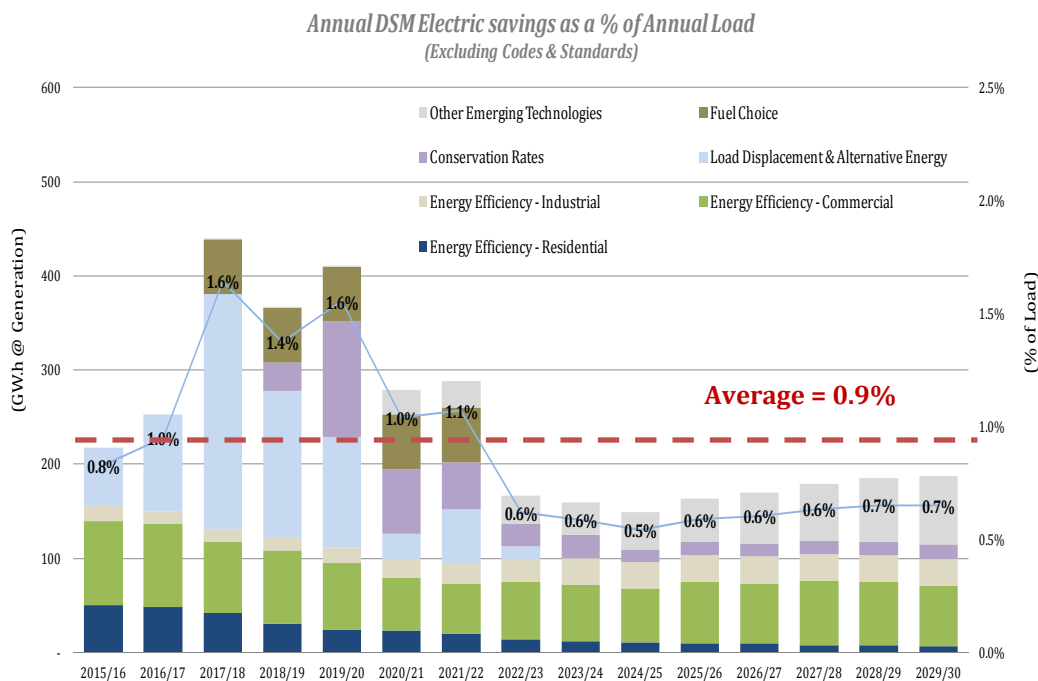
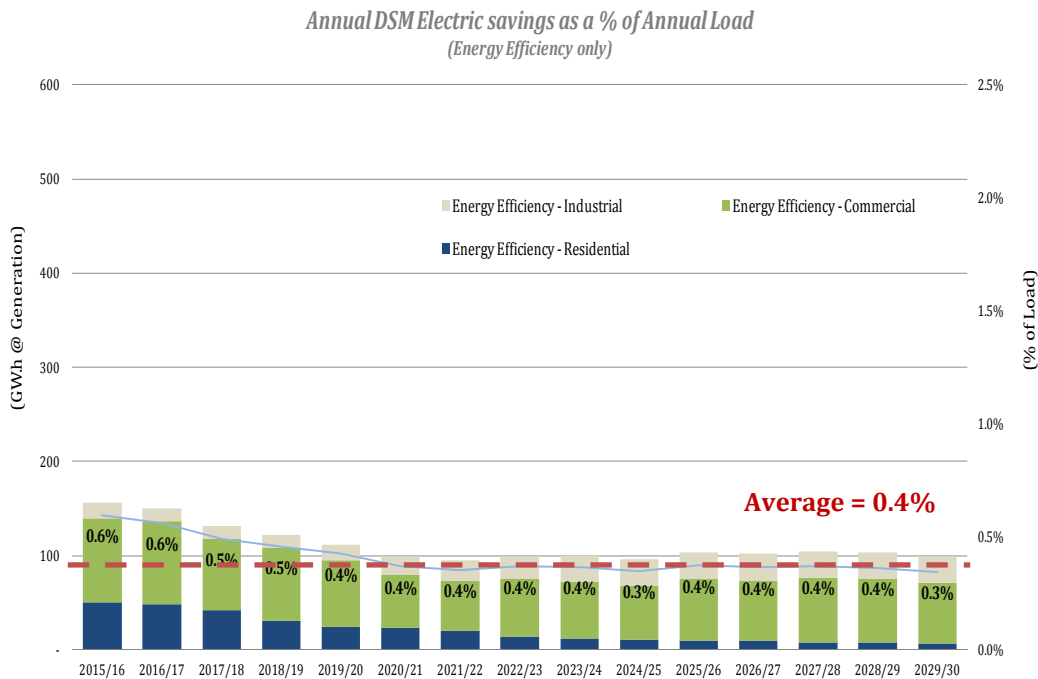
*Note: Total DSM Electric savings per the above graph includes forecast savings from program impacts and savings from Codes, Standards and Regulations.
Source of Load Forecast: 2015 Electric Load Forecast*

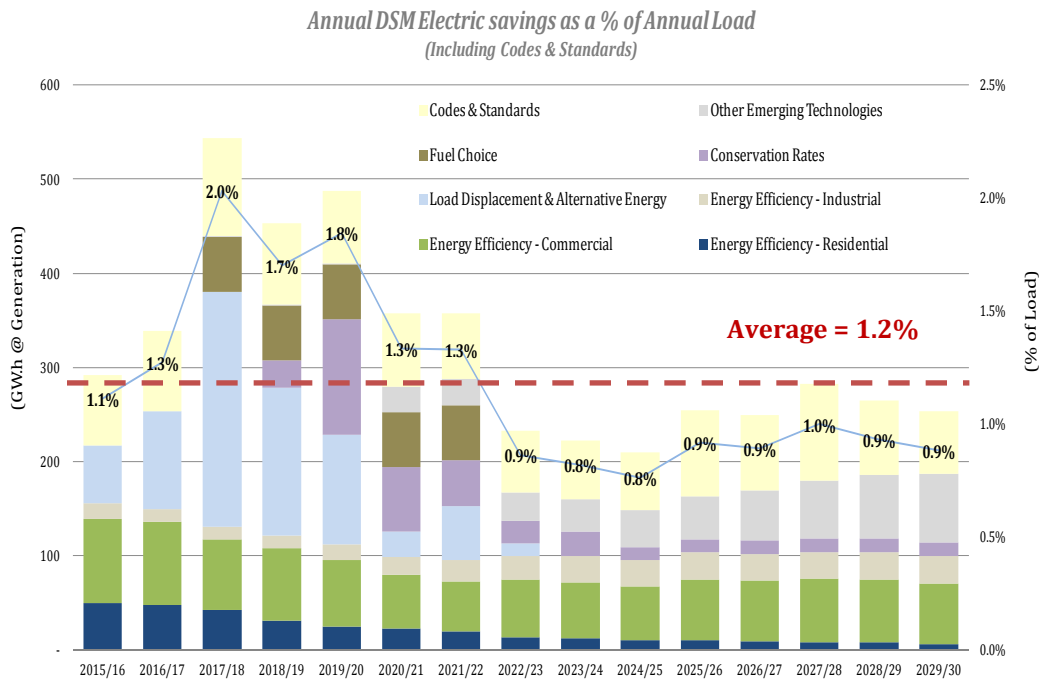


*Note: Total DSM Natural Gas savings per the above graph includes forecast savings from program impacts and Codes, Standards and Regulations
Note: The above graph reflects a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.
Source of Natural Gas Volume Forecast: 2015 Natural Gas Volume Forecast*

Annual Electric DSM Savings as a % of Annual Load

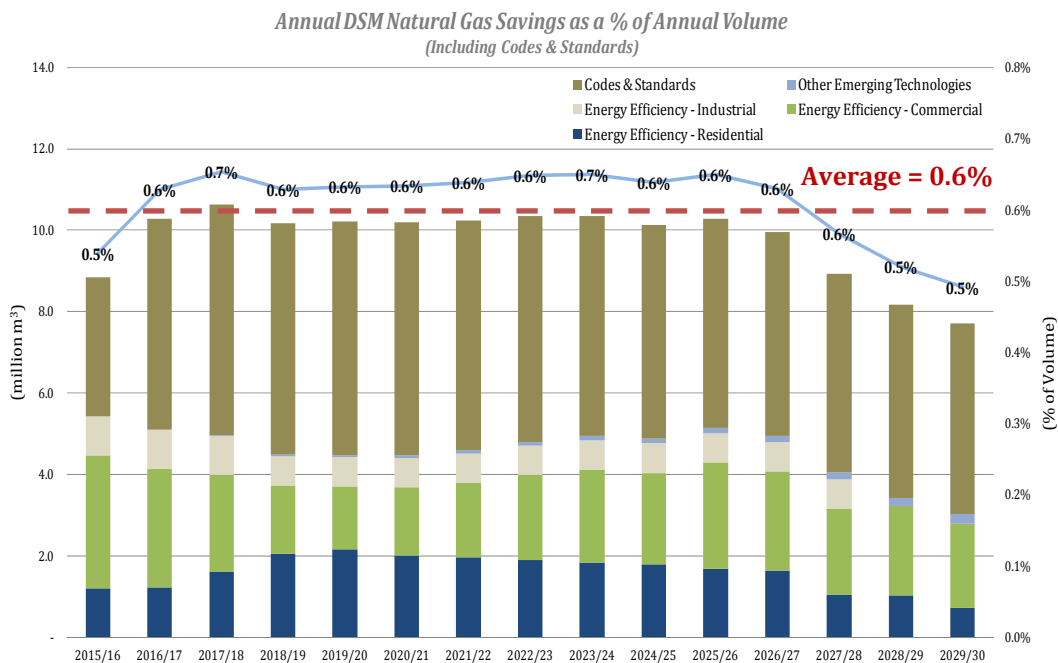
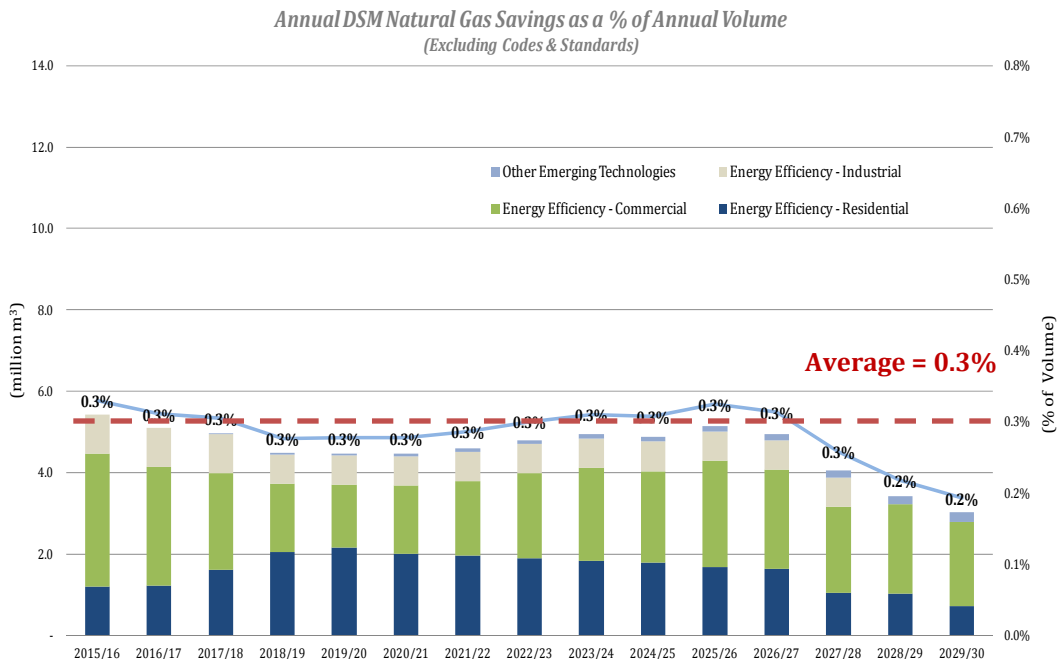
The following charts depict Manitoba Hydro’s annual electric DSM efforts in relation to annual electric load growth.

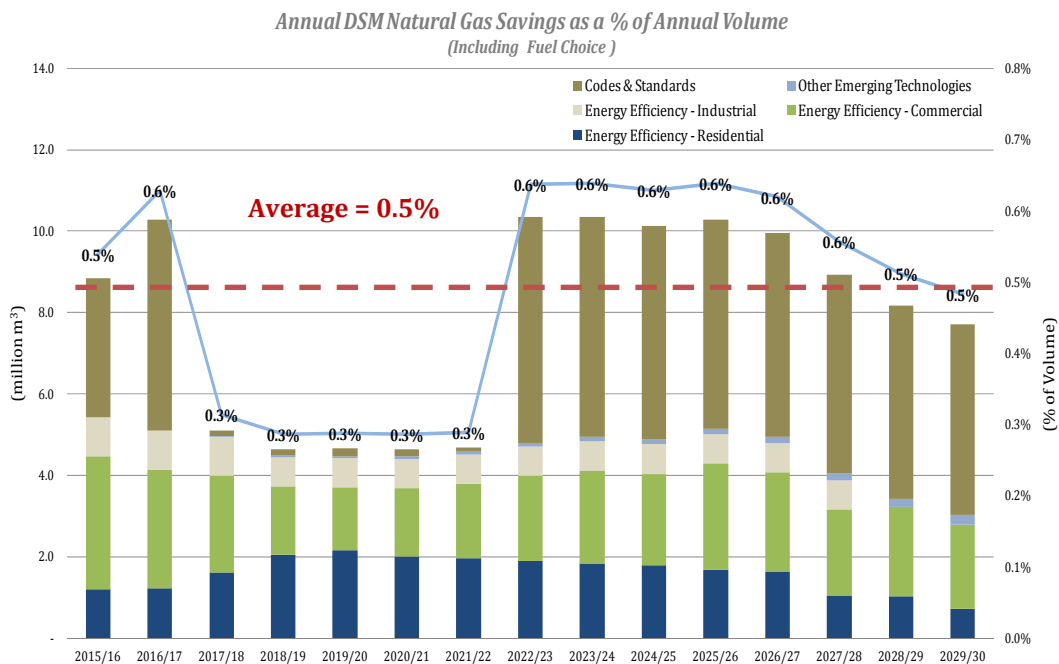




Annual Natural Gas DSM Savings as a % of Annual Volume

The following charts depict Manitoba Hydro’s annual natural gas DSM efforts in relation to annual natural gas volume growth.

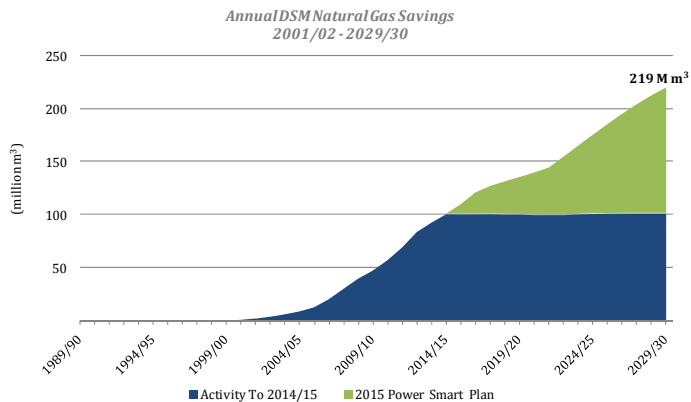
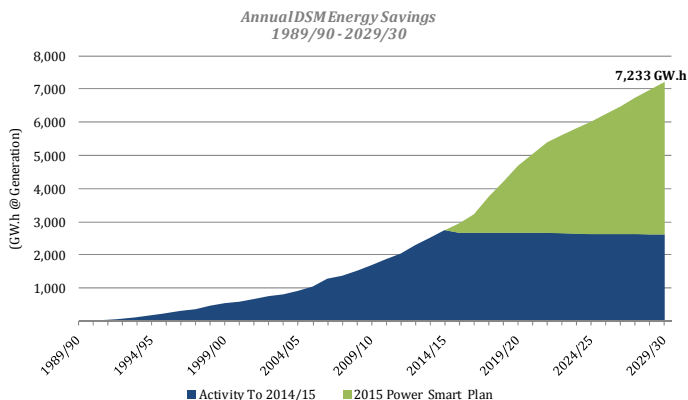
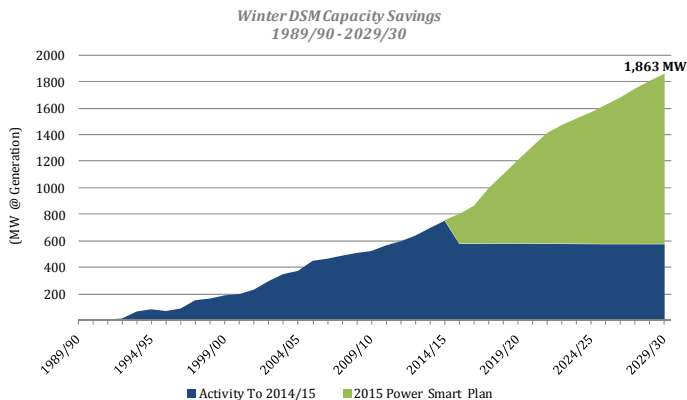




Note: The above graphs reflect a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

Combined with energy savings achieved to date, total electrical savings of 1,863 MW and 7,233 GW.h and total natural gas savings of 219 million cubic metres will be realized by 2029/30. These combined energy savings are expected to result in an overall reduction of greenhouse gas emissions of 5.3 million tonnes by 2029/30. This activity represents 25.0% of the estimated electric load forecast and 12.8% of the estimated natural gas volume forecast by 2029/30.

The following charts graphically represent the capacity, electric energy and natural gas energy savings achieved to date and the savings anticipated from future DSM activity for the 2015 Power Smart Plan:



The following table shows detailed DSM savings associated with the 2015 Power Smart Plan by sector to 2029/30.

**Electric and Natural Gas DSM Savings
2015/16 - 2029/30**

	Winter Capacity (MW)		Annual Energy (GW.h)		Annual Energy (million m ³)	
Residential						
New Home Program	7.3		16.9		5.4	
Home Insulation Program	14.1		28.2		7.2	
Water and Energy Saver Program	2.6		14.5		1.6	
Affordable Energy Program						
Affordable Energy Program - Insulation	12.8		38.8		6.2	
Affordable Energy Program - Furnace	n/a		n/a		0.0	
Affordable Energy Program - Total	12.8		38.8		6.2	
Refrigerator Retirement Program	1.5		14.6		-	i
Drain Water Heat Recovery Initiative	0.2		1.7		n/a	
Residential LED Lighting Program	3.0		9.7		-	i
Community Geothermal Program	28.2		56.4		n/a	
Residential Programs Total (@ Meter)	69.8	8%	180.7	6%	20.5	41%
Customer Service Initiatives / Financial Loan Programs						
Power Smart Residential Loan	3.3		6.4		3.9	
Power Smart PAYS Financing	1.5		3.0		0.0	
Residential Earth Power Loan	8.0		15.9		1.4	
Residential CSI / Financial Loan Programs Total (@ Meter)	12.7	1%	25.3	1%	5.4	11%
Commercial						
Commercial Lighting Program	99.0		382.5		-	i
LED Roadway Lighting Conversion Program	7.8		52.0		n/a	
Commercial Building Envelope - Windows Program	12.7		26.0		4.0	
Commercial Building Envelope - Insulation Program	13.0		28.4		13.0	
Commercial Geothermal Program	38.2		76.4		n/a	
Commercial HVAC Program - Boilers	n/a		n/a		5.6	
Commercial HVAC Program - Chillers	0.0		8.6		n/a	
Commercial HVAC Program - CO2 Sensors	1.8		2.8		1.0	
Commercial HVAC Program - HRVs	5.0		10.2		2.9	
Commercial HVAC Program - Air Cooled Chillers	0.0		13.7		0.0	
Commercial HVAC Program - Water Heaters	n/a		n/a		1.3	
Commercial Custom Measures Program	5.9		25.9		1.9	
Commercial Building Optimization Program	3.9		19.1		4.9	
New Buildings Program	39.1		131.5		4.1	
Commercial Refrigeration Program	7.4		57.9		-	i
Commercial Kitchen Appliance Program	0.3		1.7		0.7	
Network Energy Management Program	0.4		3.3		-	i
Internal Retrofit Program	2.1		6.7		n/a	
Power Smart Energy Manager	0.9		4.0		0.4	
Power Smart Shops	0.9		3.4		0.1	
Commercial Programs Total (@ Meter)	238.3	28%	854.3	28%	39.8	80%
Customer Service Initiatives / Financial Loan Programs						
Power Smart For Business PAYS Financing	0.0		0.0		0.0	
Commercial CSI / Financial Loan Programs Total (@ Meter)	0.0	0%	0.0	0%	0.0	0%
Industrial						
Performance Optimization Program	38.8		307.9		n/a	
Natural Gas Optimization Program	n/a		n/a		10.1	
Industrial Programs Total (@ Meter)	38.8	4%	307.9	10%	10.1	20%
Energy Efficiency Subtotal (@ Meter)	359.6	42%	1,368.2	45%	75.7	153%
Load Management						
Curtailable Rate Program	143.5		n/a		n/a	
Load Management Programs Total (@ Meter)	143.5	17%	n/a	0%	n/a	0%
Load Displacement & Alternative Energy						
Bioenergy Optimization Program	56.5		121.7		n/a	
Customer Sited Load Displacement	68.5		539.2		n/a	
Load Displacement & Alt. Energy Programs Total (@ Meter)	125.0	14%	661.0	22%	n/a	0%
Conservation Rates						
Conservation Rates - Residential	17.2		141.7		n/a	
Conservation Rates - Commercial	25.9		213.7		n/a	
Conservation Rates Total (@ Meter)	43.0	5%	355.4	12%	n/a	0%
Fuel Choice						
Fuel Choice	127.7		255.5		(27.7)	
Fuel Choice Total (@ Meter)	127.7	15%	255.5	8%	(27.7)	(56%)
Other Emerging Technologies						
Residential Air Source Heat Pumps Program	0.0		5.5		n/a	
Residential Future Opportunities	15.2		73.1		n/a	
Residential Solar Photovoltaics Program (PV)	6.3		69.5		n/a	
Residential Solar Thermal Program - Water Heating	0.2		2.6		n/a	
Residential Solar Thermal Program - Pool Heating	0.0		1.9		1.4	
Commercial Future Opportunities	15.2		73.1		n/a	
Commercial Solar Photovoltaics Program (PV)	10.6		100.0		n/a	
Commercial Variable Speed and Frequency Drives	0.1		5.8		n/a	
Industrial Future Opportunities	15.7		75.8		n/a	
Other Emerging Technologies Total (@ Meter)	63.4	7%	407.4	13%	1.4	0%
Program Impacts Total (@ Meter)	862.2	100%	3,047.5	100%	49.5	100%
Interactive Effects					-9.1	
Codes, Standards and Regulations (@ Meter)	278.7		1,041.3		77.7	
Power Smart 2015/16 to 2029/30 Impacts (@ Meter)	1,141		4,089			
Power Smart 2015/16 to 2029/30 Impacts (@ Generation)	1,288		4,619		118	
Savings Achieved To 2014/15 (@ Meter)	508		2,314			
Savings Achieved To 2014/15 (@ Generation)	575		2,614		101	
Grand Total (@ Meter)	1,649		6,403			
Grand Total (@ Generation)	1,863		7,233		219	

i Natural gas interactive effects reported with overall total

2.1.2 Other Fuel Savings

Through funding from the Affordable Energy Fund, residential customers using heating sources other than natural gas and electricity are eligible to participate in the Home Insulation, Water & Energy Saver and Oil & Propane Furnace Replacement programs. The following table provides the oil and propane fuel savings estimated to be achieved through this funding.

It is estimated that savings of 407,200 litres of fuel oil and 172,600 litres of propane will be achieved from 2015/16 to 2029/30.

Affordable Energy Fund Other Fuel Savings

2015/16 - 2029/30

(000s, litres)

	2015/16	2016/17	2017/18 - 2029/30
Fuel Oil Savings			
Home Insulation Program	1.7	1.4	9.4
Water & Energy Saver Program	4.0	4.0	.0
Oil & Propane Furnace Replacement	64.4	64.4	257.8
Annual Fuel Oil Savings	70.2	69.9	267.2
Cumulative Fuel Oil Savings, 2015/16 - 2029/30	70.2	140.1	407.2
Propane Savings			
Home Insulation Program	7.1	6.4	47.0
Water & Energy Saver Program	2.1	2.1	.0
Oil & Propane Furnace Replacement	18.0	18.0	72.0
Annual Propane Savings	27.2	26.5	119.0
Cumulative Propane Savings, 2015/16 - 2029/30	27.2	53.7	172.6

2.1.3 Energy Efficient Codes, Standards & Regulation Savings

Many Canadian and U.S. electric utilities, including Manitoba Hydro, have been engaged in DSM activities for more than two decades. In addition to utility specific DSM programs, Manitoba Hydro's strategy to affect change in codes and standards involves being an aggressive and active participant and, in many cases, a driving force on a number of provincial and national energy efficiency codes and standards committees. These codes and standards are subsequently referenced in national and provincial regulations that mandate minimum energy performance levels for a variety of appliances, buildings and other energy consuming measures. The focus of Manitoba Hydro's efforts on these committees is to advance the progress of product efficiency improvements through the development of test methodologies that facilitate measurement and comparison of energy performance and provide for minimum energy performance levels that reasonably represent performance improvements available from commercially viable product advancements, which are then incorporated into Manitoba Power Smart programs, and subsequent energy efficiency regulations and building codes proposed by national and provincial regulators.

Not all codes and standards are regulated, with some codes and standards being developed for the purpose of supporting good business practices that assist customers in quantifying and comparing the energy performance of measures being considered for implementation. In these instances, Manitoba Hydro supports the adoption of such non-regulated codes and standards within its Power Smart programs.

Manitoba Hydro annually prepares a forecast of the expected influence of both regulated and non-regulated codes and standards, and since 1995 this forecast has been used to adjust Manitoba Hydro's system load forecast.

Strategic Steering Committee on Performance, Energy Efficiency and Renewables

Manitoba Hydro is a leading contributor on the Canadian Standards Association's Strategic Steering Committee on Performance, Energy Efficiency and Renewables (SCOPEER). This Canadian Standards Association committee, with participation from federal and provincial authorities, electric utilities, industry associations and equipment suppliers, provides oversight and governance for the process used to develop energy performance standards and establish minimum energy performance levels for energy consuming measures across most residential, commercial and industrial sectors. SCOPEER includes Technical Committees responsible for specific end-use technology areas, including Heating, Ventilation, Air Conditioning and Refrigeration Equipment (TC 401), Industrial Equipment (TC 402), Residential Equipment (TC 403), Lighting Equipment (TC 419), Solar Equipment (TC 420) and Energy Management (TC 422). Individual Technical Subcommittees operating within each of the Technical Committees are responsible for the development of specific standards related to the energy performance of end-use measures that are vetted and approved by the SCOPEER committee for adoption. Electric utilities, equipment suppliers and consumer reference these standards within their programs and specific areas of activity, while regulatory agencies at the national and provincial level adopt these standards and their associated minimum energy performance levels into energy efficiency regulations.

Energy Savings from Codes & Standards

In many markets, the most effective and permanent form of market transformation for energy efficient technologies and practices is the regulation of energy efficient codes and standards as such regulations ensures that customers do not revert to less efficient technologies/practices once the incentives and/or promotional activities are discontinued. Consequently, the process of achieving these changes is complex and lengthy as it involves many stakeholders, varying environmental and market conditions and market acceptance to ensure successful implementation.

Efforts to achieve energy savings through Energy Efficient Codes and Standards initiatives are forecasted in the 2015 Power Smart Plan to achieve capacity savings of 353 MW, energy savings of 1299 GW.h and 87 million cubic metres of natural gas annually by 2029/30. As a result of these savings, a greenhouse gas emissions reduction of 1.0 million tonnes is expected by 2029/30.

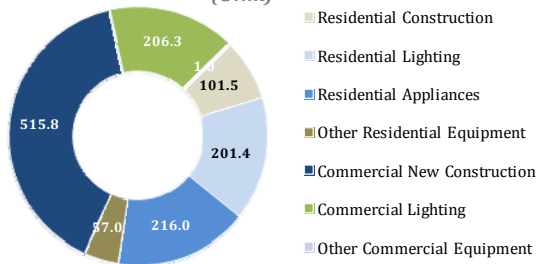
The following table and charts provide a summary of the planned energy savings in 2029/30 from codes and standards that currently implemented in energy efficiency regulation at the provincial and national level. Future DSM plans will provide updated forecasts of savings from codes and standards based on new information, such as the pending proposals being put forward by Natural Resources Canada for Amendments 13 and 14, which include both new or enhanced energy efficiency regulations for a variety of energy consuming measures.

**Energy Savings from Codes & Standards
2015/16 - 2029/30**

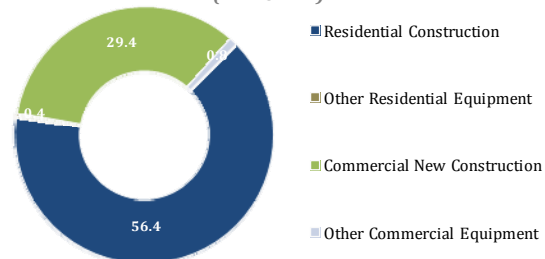
Code Category	Components	Energy and Demand Savings		Natural Gas Annual millions m ³	CO2 Reductions Annual Tonnes
		Winter MW	Annual GW.h		
Residential Construction	Insulation, Windows, Pilot Light Gas Fire Place, Furnace, Heat Recovery Ventilation, Showerhead	32.2	101.5	56.4	175,644
Residential Lighting	General Service Lamps	74.7	201.4	-	135,934
Residential Appliances	Dishwashers, Clothes Washers, Clothes Dryers, Refrigerators, Freezers, Ranges, Stoves, Cooktops	35.9	216.0	-	145,769
Other Residential Equipment	Central Air Conditioning, Residential Furnace	0.0	57.0	0.4	39,220
Commercial New Construction	Various Building Code Amendments	153.4	515.8	29.4	403,966
Commercial Lighting	General Service Lamps, Exit Signs, Fluorescent Lamp Ballasts	56.7	206.3	-	139,240
Other Commercial Equipment	Commercial Furnace, Boiler and Spray Valves	0.2	1.0	0.8	2,214
Total @ Generation		353	1299	87	1,041,987

* Totals per above include savings attributed to specific Power Smart programs and thus differ from Codes and Standards savings reported in Appendices A.1, A.2 and C.1

Electric Codes & Standards By Category (GW.h)



Natural Gas Codes & Standards By Category (million m³)



Status of Codes and Standards

The following table summarizes the status of changes to provincially and nationally regulated codes and standards included in the 2015 Power Smart Plan, including actual or expected dates for implementation.

For electricity, changes that account for 78% of total energy savings have been enacted and 22% are planned.

For natural gas, changes that account for 90% of total energy savings have been enacted and 10% are planned.

Status of Changes to Codes and Standards

Code Category	Components	Energy Annual GW.h	Natural Gas Annual million m ³	Level of Government	Expected Effective Date		
					Enacted	Announced	Planned
Residential Construction	Building Code - Insulation	17.9	6.0	MB	2008		
Residential Construction	Building Code - Various measures	71.6	45.3	MB	2010		
Residential Construction	Building Code - Various measures	11.9	5.1	MB			2020
Residential Lighting	General Service Lamps (MEPS)	90.4	-	Federal	2014		
Residential Lighting	General Service Lamps (MEPS) (Future)	111.0	-	Federal			2025
Residential Appliances	Various appliances	181.7	-	Federal			
Residential Appliances	Various appliances (Future)	34.3	-	Federal			
Other Residential Equipment	Central Air Conditioning	51.3	-	Federal	2006		
Other Residential Equipment	Central Air Conditioning (Future)	5.7	-	Federal			2020
Other Residential Equipment	Residential Furnace	-	0.4	Federal / MB	2009		
Commercial New Construction	Building Code	416.0	25.5	MB	2016		
Commercial New Construction	Building Code (Future)	99.8	3.8	MB			2020
Commercial Lighting	General Service Lamps (MEPS)	20.9	-	Federal	2014		
Commercial Lighting	General Service Lamps (MEPS) (Future)	26.6	-	Federal			2025
Commercial Lighting	Exit Signs	1.9	-	Federal	2004		
Commercial Lighting	Fluorescent lamp ballasts (New / Reno)	157.0	-	Federal	2006 / 2010		
Other Commercial Equipment	Commercial Furnace	-	0.4	Federal / MB	2009		
Other Commercial Equipment	Commercial Boilers	-	0.1	Federal / MB		2017	
Other Commercial Equipment	Commercial Spray Valves	1.0	0.3	Federal / MB	2011		
Total (GW.h)		1299			1010	0.0	289
					78%	0%	22%
Total (million m³)			87		78	0	9
					90%	0%	10%

Code, Standard & Regulation Descriptions

The following section describes each of the codes and standards listed in the Summary Table noted in Section 2.1.3 that have been taken into consideration when developing a forecast for projected savings.

Residential Construction

Building Code

Manitoba Building Code, amendment (PROVINCIAL)

Regulation 4/2008

Registered: January 11, 2008

Effective date: October 1, 2008

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

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

Building Code

Manitoba Building Code, amendment (PROVINCIAL)

Regulation 142/2010

Registered: October 4, 2010

Effective date: December 1, 2010

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

Through the delivery of the Power Smart Gold Home offering, Manitoba Hydro planned to aid the advancement of future building code by promoting and offering incentives to customers to build their home with Power Smart recommended technologies and construction practices. The Gold standard announced in 2007 required the use of heat recovery ventilators (HRV), 94 % AFUE furnaces, electronic ignition for natural gas fireplaces, R50 attic insulation, water efficient fixtures and many other building envelope improvements.

Effective December 1st, 2010, Manitoba implemented changes to the building and plumbing codes that increased energy and water efficiencies. These changes were the result of extensive consultations by the Office of the Fire Commissioner involving new homebuilders, contractors and technical experts. The new efficiencies incorporated into new construction and homes undergoing extensive renovations included:

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

Through its close working relations with key industry stakeholders and the Power Smart New Home Program offering, Manitoba Hydro succeeded in advancing these changes to the Manitoba Building code. In fact, a majority of the technologies adopted by the Manitoba Building Code for the December 1, 2010 update were part of the aforementioned Power Smart Gold Home standard requirements. Without the program providing information, education, training, and incentives for these technologies and building practices, the industry would have been less likely to adopt these technologies and transform the market. The program created demand for these technologies, provided builders an opportunity to gain experience using them, and provided trades and contractors training opportunities to advance their expertise and knowledge of the technologies.

Building Code

Manitoba Building Code, amendment (PROVINCIAL)

Regulation (Proposed)

Effective date: 2020

Manitoba Hydro is currently assessing the Power Smart New Home program. The program will promote and offer incentives to customers for the installation of energy efficient technologies and building practices within the New Home construction industry. Manitoba Hydro will work closely with industry stakeholders with the aim to build market acceptance of Power Smart New Home technologies for ease of adoption in the Manitoba Building Code in 2020. Manitoba Hydro has used a placeholder post-2020 Manitoba Building Code to account for future potential code savings beyond that realized through the Power Smart New Home program.

*Residential Lighting*General Service Lamps

National Resources Canada (FEDERAL)

Amendment 12B to Energy Efficiency Regulations

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

Effective date(s): January 1st, 2014 - 75 to 100 watt equivalent lamps

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

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

The next iteration of residential lighting regulations has not been proposed. Manitoba Hydro has used a placeholder for Minimum Energy Performance Standard beginning in 2025 to account for future potential savings. This assumed MEP accounts for the impact of light-emitting diode (or equivalent) efficient lighting technology replacing the performance levels stipulated within Amendment 12B described above.

Residential Appliances

Manitoba Hydro is a key player on the Canadian Standards Association's Strategic Steering Committee on Performance, Energy Efficiency and Renewables (SCOPEER). This committee is responsible for changes to provincial and national performance standards and legislation which have resulted in the improvement of energy utilization of numerous appliances such as dishwashers, clothes washers & dryers, refrigerators and freezers, and ranges/stoves/cooktops. The forecast of the expected influence of regulated residential appliances includes the impact of existing Natural Resources Canada requirements. Additionally, placeholder standards are projected post-2020 to determine the impact of the next increment to these existing NRCAN standards. These placeholder standards are based on future harmonization with recently emerged or pending U.S. Department of Energy residential appliance standards.

Other Residential Equipment

Central Air Conditioning

National Resources Canada (FEDERAL)

Amendment 9 to Energy Efficiency Regulations

Test Standard: CAN/CSA-C656-05

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

Effective date(s): November 15, 2006

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

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

The forecast of post-2020 increments to the above central air conditioning MEPS determines the impact of the next increment to these existing NRCAN standards. Future placeholder standards were based on future harmonization with U.S. Department of Energy residential central air conditioner standards.

Residential High Efficiency Furnace

National Resources Canada (FEDERAL)

Amendment 10 to Energy Efficiency Regulations

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

Effective date: December 31, 2009

On December 12, 2008 the Federal Government amended the Energy Act to require increased efficiency requirements for replacement gas (natural gas and propane) furnaces and boilers. Effective December 31, 2009 replacement furnaces up to 225 000 Btu/h sold in Canada are required to have a minimum AFUE of 90%.

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

The Energy Act (PROVINCIAL)

Regulation 181/2009

Published: November 12, 2009

Effective date: December 30, 2009

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

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

Commercial New Construction

Building Code

The national commitment to update the 1997 National Energy Code for Buildings (NECB) was initiated in Manitoba by the Energy Code Advisory Committee (ECAC) which was led by Manitoba Hydro. Manitoba Hydro also chaired the national Building Energy Code Collaborative (BECC), which was formed in response to the recommendations provided by ECAC. As a result of the work done by BECC, formal support was provided by jurisdictions across Canada to undertake the work to update the 1997 NECB and a national working group was formed to conduct the detailed work for updating the code. Manitoba's Minister of Labour provided formal support that signaled Manitoba's intention to adopt the document once published, however the Province still moved forward with their own energy strategy and convened a sub-committee of the Building Standards Board of Manitoba to recommend Manitoba-based energy and water efficiency recommendations that could be implemented in advance of the release of the 1997 NECB.

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

Manitoba Hydro staff continues to contribute to the national process for the development of the 2015 edition of the NECB and several Customer Engineering Services staff members formally attend regular code development meetings to ensure Manitoba Hydro objectives are met. Manitoba Hydro staff are also members of the Manitoba Building Standards Board Sub-Committee on Energy and Water Efficiency, which is responsible for recommending that the Province adopt the 2011 NECB and creation of additional recommendations specific to Manitoba that will be incorporated as amendments.

Manitoba Hydro continues to assess the New Buildings program. Commercial building code savings realized over the term beyond that of the New Buildings program have also been accounted for. Manitoba Hydro has used a placeholder post-2020 Building Code which reflects current regulatory intentions beyond the 2011 NECB described above.

Commercial Lighting

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

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

General Service Lamps

National Resources Canada (FEDERAL)

Amendment 12B to Energy Efficiency Regulations

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

Effective date(s): January 1st, 2014 - 75 to 100 watt equivalent lamps

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

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

The next iteration of commercial lighting regulations has not been proposed. Manitoba Hydro has used a placeholder for Minimum Energy Performance Standard beginning in 2025 to account for future potential savings. This assumed MEP accounts for the impact of light-emitting diode (or equivalent) efficient lighting technology replacing the performance levels stipulated within Amendment 12B described above.

Exit Signs

National Resources Canada (FEDERAL)

Amendment 8 to Energy Efficiency Regulations

Test Standard: CAN/CSA-C860-01

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

Effective date: November 1, 2004

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

Fluorescent lamp ballasts

National Resources Canada (FEDERAL)

Amendment 9 to Energy Efficiency Regulations

Test Standard: CAN/CSA-C654-M91

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

Effective date(s): November 15th, 2006 (New Construction Market)April 1st, 2010 (Renovation Market)

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

*Other Commercial Equipment*Commercial High Efficiency Furnace

National Resources Canada (FEDERAL)

Amendment 10 to Energy Efficiency Regulations

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

Effective date: December 31, 2009

On December 12, 2008 the Federal Government amended the Energy Act to require increased efficiency requirements for replacement gas (natural gas and propane) furnaces and boilers. Effective December 31, 2009 replacement furnaces up to 225 000 Btu/h sold in Canada are required to have a minimum AFUE of 90%.

Manitoba Hydro played a material role in the amendment of Canada's Energy Efficiency Act. Manitoba Hydro staff assisted the Federal Government by providing technical and market data regarding the furnace market in Manitoba and comments to the proposed Amendment during the consultation process. Power Smart programs such as the Power Smart Residential Loan, the Residential High Efficiency Furnace and Boiler Rebate, and the Commercial HVAC Program - High Efficiency Furnace incentive all influenced market adoption; increasing market penetration of high efficiency furnaces in Manitoba commercial buildings from the pre-program average of 30% to 75% at program termination. Manitoba Hydro's involvement has expedited market transformation and thus facilitated the adoption of the federal efficiency regulation.

The Energy Act (PROVINCIAL)
Regulation 181/2009
Published: November 12, 2009
Effective date: December 30, 2009

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

Manitoba Hydro played a material role in the development of the provincial efficiency regulation. Manitoba Hydro staff assisted the Manitoba Government by providing technical and market data, hosting an industry consultation with contractors and other interested parties, preparing a formal market impact study, and providing general guidance to regulatory staff. Power Smart programs such as the Residential Loan, the Residential High Efficiency Furnace and Boiler Rebate, and the Commercial HVAC Program - High Efficiency Furnace incentive all helped to expedite market adoption of high efficiency furnaces in Manitoba commercial buildings from the pre-program average of 30% to 75% at program termination. Manitoba Hydro's active involvement had expedited market transformation, and thus facilitated the adoption of the provincial efficiency regulation.

Commercial Boilers

National Resources Canada (FEDERAL)
Bulletin published: August 2010
Test Standard: HI BTS 2000, Rev 06.07 Method to Determine Efficiency of Commercial Space Heating Boilers
Proposed Effective date(s): March, 2015 (90% Min Efficiency Rating - New Construction Market)
March, 2015 (85% Min Efficiency Rating - Existing Buildings Market)

In August of 2010, Natural Resources Canada's (NRCan's) Office of Energy Efficiency (OEE) Natural Resources Canada (NRCan) proposed to amend Canada's ENERGY EFFICIENCY REGULATIONS (the Regulations) to require dealers to comply with minimum energy performance standards (MEPS) for commercial gas and oil-fired boilers, imported or shipped inter-provincially, for sale or lease in Canada. NRCan proposes that commercial packaged boilers meet minimum efficiency ratings of 90% for the New Construction mark and 85% for the Replacement Market, effective March, 2015.

Manitoba Hydro proposes that the Provincial Government enact regulations under The Energy Act, requiring a minimum performance level for all natural gas boilers sold to new Manitoba buildings. By April 1 2013, Manitoba Hydro proposes that all commercial boilers be condensing, with a minimum efficiency rating of 90%. This regulation is equivalent to the proposed federal regulation, but will be enacted two years earlier.

Manitoba Hydro will play a material role in the development of a provincial efficiency regulation for commercial natural gas boilers. Manitoba Hydro staff will assist the Manitoba Government by providing technical and market data, hosting an industry consultation with contractors and other interested parties, preparing a formal market impact study, and providing general guidance to regulatory staff. The Commercial HVAC Program will continue to expedite market adoption of high efficiency boilers in all commercial buildings from its pre-program average of 30% to an estimated 72% by April 2013, thus facilitating the adoption of a provincial performance standard two years earlier than the rest of Canada.

Manitoba Hydro proposes that the Provincial Government enact regulations under The Energy Act, requiring a minimum performance level for all natural gas boilers sold to existing Manitoba buildings. By March 2015, Manitoba Hydro proposes that all commercial boilers be condensing, with a minimum efficiency rating of 90%. This is approximately 5% higher than the proposed federal regulation requiring all boilers sold to be at least 85% efficient (near-condensing).

Manitoba Hydro will play a material role in the development of a provincial efficiency regulation for commercial natural gas boilers. Manitoba Hydro staff will assist the Manitoba Government by providing technical and market data, hosting an industry consultation with contractors and other interested parties, preparing a formal market impact study, and providing general guidance to regulatory staff. The Commercial HVAC Program will continue to expedite market adoption of high efficiency boilers in all commercial buildings from its pre-program average of 30% to an estimated 75% by March 2015, thus facilitating the adoption of a higher performance standard in Manitoba.

Commercial Pre Rinse Spray Valve

Manitoba Plumbing Code

Regulation 32/2011

Adoption of National Plumbing Code of Canada 2010

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

Effective date: April 1, 2011

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

At an Industrial level, Manitoba Hydro undertakes codes and standards development work with the following organizations:

- Natural Resources Canada (NRCAN)
- Province of Manitoba
- Canadian Standards Association (CSA), including BC Hydro, Hydro Quebec, Ontario Power Authority, Ontario Ministry of Energy, etc)
- Centre for Energy Advancement through Technological Innovation (CEATI)
- US Department of Energy (DOE)
- Institute of Electronic and Electrical Engineers (IEEE)
- International Electrotechnical Commission (IEC)
- American Council for an Energy-Efficient Economy (ACEEE)
- Electric Power Research Institute (EPRI)
- Energy Solutions Center (ESC)
- American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)
- Canadian Gas Association (CGA)

This work pertains primarily to industrial and commercial equipment that incorporates or applies to electric motors, variable speed drives, air compressors, compressed air systems, fans, pumps, transformers, power quality systems, battery charges, uninterruptible power supplies, lighting systems, refrigeration, heating, ventilation and air conditioning systems, and building envelope incorporating both natural gas and electric supply.

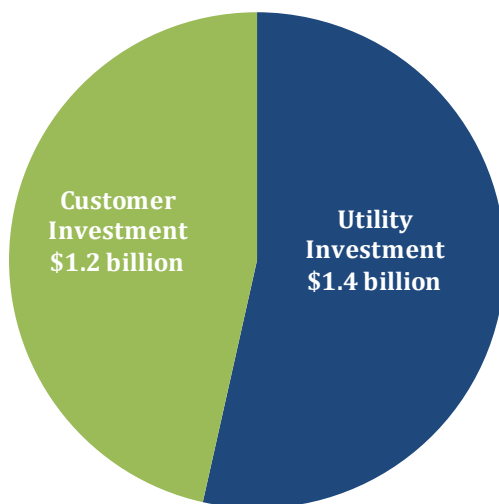
Areas of involvement include, test methods for determination of energy efficiency, performance standards, application guides for efficiency test methods and performance standards and repair standards (to maintain efficiency). Industrial codes and standards are often developed as non-regulated mechanisms designed to support good practices in the selection, operation and maintenance of energy consuming measures. As such, these codes and standards are incorporated into Manitoba Hydro's Industrial Power Smart programs supporting the savings objectives of these programs.

2.2 DSM Investment

2.2.1 Total Investment

Manitoba Hydro's current 15 year DSM plan involves a investment of approximately \$2.6 billion (utility investment of \$1.4 billion and customer investment of an estimated \$1.2 billion, excluding cost impacts of changes to codes and standards).

Total DSM Investment (2015/16 to 2029/30)



Including investments to date, it is expected that by 2029/30, a cumulative investment of achieving the energy savings will have been \$3.4 billion (utility investment of \$2.0 billion and customer investment of an estimated \$1.4 billion, excluding cost impacts of changes to codes and standards).

2.2.2 Utility Investment

The following table provides the cumulative electric and natural gas internal DSM investment totals to 2029/30 broken down by market sector and cost basis. Including other internal DSM investments, it is expected that by 2029/30, an additional cumulative utility investment amount of \$1.4 billion will have been spent on Power Smart programs and initiatives. Including investments to date, it is expected that by 2029/30, a cumulative investment of achieving the energy savings will have been \$2.0 billion.

Internal DSM Utility Investment
2015/16 - 2029/30

	Electric Cumulative Utility Costs (Millions \$)		Natural Gas Cumulative Utility Costs (Millions \$)		Total Cumulative Utility Costs (Millions \$)
Residential					
New Home Program	\$2.6		\$0.4		\$3.0
Home Insulation Program	\$16.7		\$14.8		\$31.5
Water and Energy Saver Program	\$4.6		\$1.9		\$6.5
Affordable Energy Program					
Affordable Energy Program - Insulation	\$34.4		\$43.5		\$78.0
Affordable Energy Program - Furnace	-		\$20.0		\$20.0
Affordable Energy Program - Total	\$34.4		\$63.6		\$98.0
Refrigerator Retirement Program	\$11.3		-		\$11.3
Drain Water Heat Recovery Initiative	\$0.6		-		\$0.6
Residential LED Lighting Program	\$4.7		-		\$4.7
Community Geothermal Program	\$27.8		-		\$27.8
Residential Programs Total	\$102.7	9%	\$80.7	56%	\$183.4
Commercial					
Commercial Lighting Program	\$109.6		-		\$109.6
LED Roadway Lighting Conversion Program	\$56.2		-		\$56.2
Commercial Building Envelope - Windows Program	\$11.1		\$8.2		\$19.3
Commercial Building Envelope - Insulation Program	\$12.1		\$25.5		\$37.5
Commercial Geothermal Program	\$44.3		-		\$44.3
Commercial HVAC Program - Boilers	-		\$3.5		\$3.5
Commercial HVAC Program - Chillers	\$1.8		-		\$1.8
Commercial HVAC Program - CO2 Sensors	\$1.2		\$1.5		\$2.7
Commercial HVAC Program - HRVs	\$3.5		\$2.4		\$6.0
Commercial HVAC Program - Air Cooled Chillers	\$6.9		-		\$6.9
Commercial HVAC Program - Water Heaters	-		\$1.7		\$1.7
Commercial Custom Measures Program	\$10.7		\$3.0		\$13.7
Commercial Building Optimization Program	\$3.2		\$6.7		\$9.9
New Buildings Program	\$16.5		\$3.8		\$20.3
Commercial Refrigeration Program	\$9.7		-		\$9.7
Commercial Kitchen Appliance Program	\$0.2		\$0.5		\$0.7
Network Energy Management Program	\$0.5		-		\$0.5
Internal Retrofit Program	\$6.4		-		\$6.4
Power Smart Energy Manager	\$0.5		\$0.2		\$0.6
Power Smart Shops	\$2.1		\$0.0		\$2.1
Commercial Programs Total	\$296.4	26%	\$57.0	39%	\$353.4
Industrial					
Performance Optimization Program	\$144.4		-		\$144.4
Natural Gas Optimization Program	-		\$6.0		\$6.0
Industrial Programs Total	\$144.4	12%	\$6.0	4%	\$150.4
Energy Efficiency Subtotal	\$543.4	47%	\$143.8	100%	\$687.2
Load Management					
Curtailable Rate Program	\$103.5		-		\$103.5
Load Management Programs Total	\$103.5	9%	-	0%	\$103.5
Load Displacement & Alternative Energy					
Bioenergy Optimization Program	\$38.7		-		\$38.7
Customer Sited Load Displacement	\$99.5		-		\$99.5
Load Displacement & Alt. Energy Programs Total	\$138.3	12%	-	0%	\$138.3
Conservation Rates					
Conservation Rates - Residential	\$13.4		-		\$13.4
Conservation Rates - Commercial	\$17.6		-		\$17.6
Conservation Rates Total	\$30.9	3%	-	0%	\$30.9
Fuel Choice					
Fuel Choice	\$54.6		-		\$54.6
Fuel Choice Total	\$54.6	5%	-	0%	\$54.6
Other Emerging Technologies					
Residential Air Source Heat Pumps Program	\$2.2		-		\$2.2
Residential Future Opportunities	\$45.9		-		\$45.9
Residential Solar Photovoltaics Program (PV)	\$59.8		-		\$59.8
Residential Solar Thermal Program - Water Heating	\$1.5		-		\$1.5
Residential Solar Thermal Program - Pool Heating	\$0.5		\$0.6		\$1.1
Commercial Future Opportunities	\$49.6		-		\$49.6
Commercial Solar Photovoltaics Program (PV)	\$71.9		-		\$71.9
Commercial Variable Speed and Frequency Drives	\$3.4		-		\$3.4
Industrial Future Opportunities	\$54.4		-		\$54.4
Other Emerging Technologies Total	\$289.2	25%	\$0.6	0%	\$289.8
Program Impacts Total	\$1,160.0	100%	\$144.4	100%	\$1,304.4
Program Support and Contingency Costs	\$71.2		\$16.2		\$87.4
Power Smart Investment Total, 2015/16- 2029/30	\$1,231.2		\$160.7		\$1,391.8
Other Internal DSM Investments					
Affordable Energy Fund	\$1.2		\$0.6		\$1.9
Cumulative Investment Total, 2015/16 - 2029/30	\$1,232.4		\$161.3		\$1,393.7
Spent to 2014/15	\$463.8		\$128.7		\$592.5
Cumulative Investment Total, 1989/90 - 2029/30	\$1,696.3		\$290.0		\$1,986.2

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

The following table outlines the total projected DSM budget including all internal sources of funding to 2029/30. A total investment of \$1.4 billion is planned for the period of 2015/16 to 2029/30.

Forecasted Internal DSM Budget 2015/16 - 2029/30 (Millions \$)																
	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	2029/30	Total
Electric DSM																
Electric Power Smart	61.6	57.5	97.3	93.3	89.0	91.3	95.4	71.9	67.0	70.5	76.0	81.2	87.6	94.2	96.1	1,229.8
Affordable Energy Fund	1.7	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	2.1
Annual Electric Budget	\$63.3	\$57.6	\$97.4	\$93.3	\$89.1	\$91.3	\$95.4	\$71.9	\$67.0	\$70.5	\$76.0	\$81.2	\$87.6	\$94.2	\$96.1	\$1,231.8
Natural Gas DSM																
Natural Gas Power Smart	10.3	12.7	10.7	9.4	9.5	9.3	9.4	8.8	9.3	9.2	9.3	9.2	8.2	7.7	4.8	138.0
Affordable Energy Fund	2.9	0.2	0.2	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	3.3
Furnace Replacement Budget	2.4	2.5	2.6	2.6	2.6	2.5	2.3	2.1	0.1	0.1	0.1	0.1	0.1	0.1	-	20.0
Annual Natural Gas Budget	\$15.6	\$15.4	\$13.4	\$12.1	\$12.1	\$11.9	\$11.7	\$11.0	\$9.4	\$9.3	\$9.4	\$9.3	\$8.3	\$7.8	\$4.8	\$161.3
Oil and Propane DSM																
Affordable Energy Fund	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	0.6
Annual Oil and Propane Budget	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	-	-	-	\$0.6
Manitoba Hydro Annual Budget	\$79.0	\$73.1	\$110.9	\$105.5	\$101.3	\$103.2	\$107.1	\$82.9	\$76.4	\$79.8	\$85.4	\$90.5	\$95.9	\$102.0	\$100.8	
Cumulative Investment 2015/16 - 2029/30	\$79.0	\$152.1	\$263.0	\$368.4	\$469.7	\$573.0	\$680.1	\$763.0	\$839.4	\$919.1	\$1,004.5	\$1,095.0	\$1,190.9	\$1,292.9	\$1,393.7	\$1,393.7

Note: Figures may not add due to rounding

Including investments to date, it is expected that by 2029/30, a cumulative investment of achieving the energy savings will have been \$2.0 billion, \$1.7 billion of the costs are funded through the Corporation's Power Smart electricity budget, \$239 million from the Power Smart natural gas budget, \$35 million from the Affordable Energy Fund, and \$31 million from the Furnace Replacement budget for targeting furnace replacement.

Total Internal DSM Budget 1989/90 - 2029/30 (Millions \$)			
	Expenditures to date 1989/90 - 2014/15	15 yr planning horizon 2015/16 - 2029/30	Total 1989/90 - 2029/30
Electric DSM			
Electric Power Smart	451.1	1,229.8	1,680.9
Affordable Energy Fund	12.3	2.1	14.3
Annual Electric Budget	\$463.4	\$1,231.8	\$1,695.2
Natural Gas DSM			
Natural Gas Power Smart	101.2	138.0	239.2
Affordable Energy Fund	16.5	3.3	19.8
Furnace Replacement Budget	10.9	20.0	31.0
Annual Natural Gas Budget	\$128.7	\$161.3	\$290.0
Oil and Propane DSM			
Affordable Energy Fund	0.5	0.6	1.1
Annual Oil and Propane Budget	\$0.5	\$0.6	\$1.1
Cumulative Investment 1989/90 - 2029/30	\$592.5	\$1,393.7	\$1,986.2

Note: Figures may not add due to rounding

Affordable Energy Fund

The Affordable Energy Fund is an internal fund established as a result of the Winter Heating Cost Control Act. The purpose of the Fund is to provide support for programs and services that achieve specific objectives outlined under the Act including encouraging energy efficiency and conservation through programs and services for rural and northern Manitobans, low income customers and seniors and encouraging the use of alternative energy sources such as renewable energy.

Manitoba Hydro established the Affordable Energy Fund following the passing of the Winter Heating Cost Control Act on November 20, 2006 in the Manitoba Legislature. The Affordable Energy Fund supports Manitoba Hydro's sustainable development initiatives.

The following projects and associated funding levels have been approved for support by the Affordable Energy Fund. As of March 31st, 2015 approximately \$32.0 million of the Affordable Energy Fund had been spent, leaving the remaining \$6.1 million.

Affordable Energy Fund Budget (Millions \$)

	Total Budget	Expenditures to Date	Remaining Total Budget
Affordable Energy Program	23.6	19.7	3.8
Geothermal Support	1.6	1.4	0.2
Community Support and Outreach	1.0	0.8	0.2
Oil and Propane Heated Homes	0.3	0.3	-
Special Projects			
Residential ecoENERGY Audits	0.5	0.5	-
Oil and Propane Furnace Replacement	0.5	0.2	0.4
Solar Water Heaters	0.3	0.3	0.0
Power Smart Residential Loan	2.5	1.9	0.5
Oil and Propane Heated Homes - Additional funding	0.3	0.1	0.2
Spruce Wood Loggers	0.2	-	0.2
Community Energy Development			
ecoENERGY Program Funding	4.1	4.1	-
Power Smart PAYS Financing Program	0.4	0.0	0.4
Subtotal	\$35.2	\$29.3	\$5.9
Energy & Resource Fund *	0.8	0.8	-
Manitoba Electric Bus *	1.2	1.1	0.1
FortWhyte EcoVillage *	0.1	0.1	-
Diesel Community Green Pilot Demonstration *	0.4	0.3	0.2
Métis Generation Fund *	0.5	0.5	-
TOTALS	\$38.2	\$32.0	\$6.1

Note: * Non Demand Side Management Budget
Figures may not add due to rounding

The following table identifies the programs and associated funding levels that the Affordable Energy Fund will support over the Power Smart Planning horizon.

Affordable Energy Fund Budget (Millions \$)													
	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27 - 2029/30	Total
Affordable Energy Program	3.8	-	-	-	-	-	-	-	-	-	-	-	3.8
Geothermal Support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	0.2
Community Support and Outreach	0.2	-	-	-	-	-	-	-	-	-	-	-	0.2
Oil and Propane Heated Homes Special Projects	-	-	-	-	-	-	-	-	-	-	-	-	-
Residential ecoENERGY Audits	-	-	-	-	-	-	-	-	-	-	-	-	-
Oil and Propane Furnace Replacement	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	0.4
Solar Water Heaters	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
Power Smart Residential Loan	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-	0.5
Oil and Propane Heated Homes - Additional funding	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Spruce Wood Loggers	0.2	-	-	-	-	-	-	-	-	-	-	-	0.2
Community Energy Development ecoENERGY Program Funding	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Smart PAYS Financing Program	0.1	0.1	0.1	0.1	0.0	0.0	-	-	-	-	-	-	0.4
Subtotal	\$4.6	\$0.4	\$0.4	\$0.2	\$0.1	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.9
Energy & Resource Fund *	-	-	-	-	-	-	-	-	-	-	-	-	-
Manitoba Electric Bus *	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	0.1
FortWhyte EcoVillage *	-	-	-	-	-	-	-	-	-	-	-	-	-
Diesel Community Green Pilot Demonstration *	0.2	-	-	-	-	-	-	-	-	-	-	-	0.2
Métis Generation Fund *	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Budget	\$4.8	\$0.4	\$0.4	\$0.2	\$0.1	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.1
Cumulative Budget 2015/16 - 2029/30	\$4.8	\$5.2	\$5.6	\$5.7	\$5.9	\$6.0	\$6.0	\$6.1	\$6.1	\$6.1	\$6.1	\$6.1	\$6.1

Note: Annual interest accruals are not included in the above forecast

Figures may not add due to rounding

Affordable Energy Program

The Affordable Energy Fund supports the Affordable Energy Program by targeting low-income Manitobans through an individual, community and neighbourhood approach.

Geothermal Support

The Affordable Energy Fund provides funding to support the application of geothermal technology. A portion of the fund is being used to subsidize the interest rate for Residential Earth Power Loan program participants from 6.5% to 4.9% for the first five years of the loan term.

Community Support and Outreach

The Affordable Energy Fund provides funding for additional resources for the purpose of encouraging rural and northern customers to participate in Power Smart initiatives.

Oil and Propane-Heated Homes

The Affordable Energy Fund provides incentives to allow customers with wood, oil or propane heating to participate in Power Smart programs. The estimated savings of the other fuel types resulting from the installation of insulation in customer homes are provided in the next section of this report. (Note: Additional funding provided through the special projects category)

Special Projects

Residential Energy Assessment Service (ecoENERGY Audits)

The Affordable Energy Fund contributes the incremental costs associated with providing Manitoba Hydro's In-home Energy Assessment service under the Federal ecoENERGY Retrofit program to rural and northern Manitobans.

Oil & Propane Furnace Replacement

Manitoba Hydro extended the eligibility for the Power Smart Furnace Replacement Program to those customers upgrading an oil or propane furnace to a high efficiency electric or natural gas furnace.

Residential Solar Water Heating Program

Manitoba Hydro is partnering with Natural Resources Canada to deliver a residential solar water heating initiative in Manitoba. This initiative supports the application of solar domestic hot water pre-heating systems and the development of the local solar industry.

Power Smart Residential Loan

The Affordable Energy Fund provides funding to reduce the interest rate for the Power Smart Residential Loan from a cost recovery rate of 5.5% to a rate of 3.9%.

Oil and Propane-Heated Homes – Additional Funding

This initiative provides further funding to extend the eligibility of Power Smart programs to include homes currently heated by a source other than electricity and natural gas. As this additional funding is coming from a separate Affordable Energy Fund category than the original funding, it is tracked separately.

Spruce Wood Loggers

This initiative provides funding to support Spruce Wood Loggers in upgrading their operations to include pelletizing ground wood and waste sawdust material. The pellets would provide an alternative fuel for coal-fired boilers and potentially prevent some customers in close proximity to Spruce Wood Loggers from converting to electric boilers.

Community Energy Development

ecoENERGY Program Funding – Additional Funding

Additional funding has been allocated to support the cost of offering audits in Manitoba, involving a \$100 subsidy for each audit plus the incremental cost of offering audits in rural and northern Manitoba.

Power Smart PAYS Financing Program

This initiative provides funding to reduce the interest rate for the PAYS financing program from the cost recovery rate to a rate of 3.9%.

Energy and Resource Fund

The Affordable Energy Fund provided funding to the Energy and Resource Fund. Managed by the First Peoples Economic Growth Fund, this joint initiative between the Government of

Manitoba and the Assembly of Manitoba Chiefs was created to maximize First Nations participation in Major Energy and Resource Projects.

Manitoba Electric Bus

Funding is provided to support the Manitoba Electric Bus Project; a joint initiative among the Province of Manitoba, Manitoba Hydro, Red River College, New Flyer Industries and Mitsubishi Heavy Industries. The objective of the project is to develop a commercially viable all-electric bus design with near-zero emissions for use in urban transit systems.

FortWhyte EcoVillage

The Affordable Energy Fund supported the research and design of a world-class ecovillage on land belonging to FortWhyte Alive.

Diesel Community Green Pilot Demonstration

This initiative provides funding to support a pilot demonstration focusing on green technologies in one of four diesel communities.

Métis Generation Fund for Resource & Energy Development

The Affordable Energy Fund is providing funding to the Métis Generation fund, managed by the Métis Economic Development Organization. This fund was created to enable Metis-owned businesses in Manitoba to invest in business growth and development within the resource and energy sectors in Manitoba.

Furnace Replacement Budget

The Furnace Replacement budget is an internal allocation established as a result of Public Utility Board Order 99/07. The purpose of the allocation is to establish and administer a Furnace Replacement Program for low income customers.

The following table outlines the planned additions and expenditures over the planning horizon.

Furnace Replacement Budget (Millions \$)

	2015/16	2016/17	2017/18	2018/19 - 2029/30	Total
Furnace Replacement Budget					
Opening Balance	18.2				
Annual Additions	3.8	-	-	-	22.0
Annual Budget	2.4	2.5	2.6	12.5	20.0
Annual Balance	\$18.2	\$19.5	\$17.0	\$14.4	\$1.9

Note: Figures may not add due to rounding

2.2.3 Additional External Sources

Manitoba Hydro's Power Smart programs are supported by funding from external organizations as outlined in the following table.

The Affordable Energy Program includes partnership funding from the Provincial Government. This external funding is expected to total \$2.0 million over the period of 2015/16 to 2029/30.

External Funding Budget

2015/16 - 2029/30

(Millions \$)

	2015/16	2016/17	2017/18	2018/19- 2029/30	Total
External Funding					
Affordable Energy Program	0.4	0.3	0.2	1.0	2.0
Cumulative Budget, 2015/16 - 2029/30	\$0.4	\$0.7	\$0.9	\$2.0	\$2.0

Note: Figures may not add due to rounding

2.3 DSM Metrics and other related measurements

2.3.1 Integrated Perspective

Metrics

The following table outlines the cost effectiveness, from an integrated perspective, of the program offerings provided in the 2015 Power Smart.

Integrated DSM Metrics 2015/16 - 2029/30										
	Combined DSM		Electric DSM				Natural Gas DSM			
	SC	TRC	SC	TRC	TRC NPV	LRC (¢/kWh)	SC	TRC	TRC NPV	LRC (¢/m ³)
Residential										
New Home Program	1.0	0.9	1.6	1.4	\$9.6	9.0	0.7	0.6	(\$12.3)	49.5 w c
Home Insulation Program	2.5	2.3	4.2	3.8	\$40.9	3.5	1.3	1.2	\$3.6	24.1
Water and Energy Saver Program	6.7	6.5	6.4	6.1	\$21.6	2.5	7.4	7.2	\$11.5	10.4 w
Affordable Energy Program										
Affordable Energy Program - Insulation	1.9	1.7	3.1	2.8	\$44.0	4.7	0.9	0.8	(\$6.1)	42.2 ** w
Affordable Energy Program - Furnace	0.6	0.5	n/a	n/a	n/a	n/a	0.6	0.5	(\$3.3)	47.6 ** w
Affordable Energy Program - Total	1.7	1.6	3.1	2.8	\$44.0	4.7	0.8	0.7	(\$9.5)	43.0 ** w
Refrigerator Retirement Program	1.9	1.7	2.1	1.9	\$15.3	3.2	n/a	n/a	(\$3.3)	n/a i
Drain Water Heat Recovery Initiative	4.2	3.8	4.2	3.8	\$1.7	1.9	n/a	n/a	n/a	n/a
Residential LED Lighting Program	11.6	10.5	14.1	12.8	\$20.2	0.8	n/a	n/a	(\$4.0)	n/a i
Community Geothermal Program	1.8	1.7	1.8	1.7	\$34.6	8.0	n/a	n/a	n/a	n/a
Residential Programs Total	1.9	1.8	2.6	2.4	\$188.0	4.9	0.9	0.8	(\$13.9)	40.6
Commercial										
Commercial Lighting Program	3.1	2.8	3.3	3.0	\$262.0	3.2	n/a	n/a	(\$28.1)	n/a i
LED Roadway Lighting Conversion Program	1.5	1.4	1.5	1.4	\$18.3	6.9	n/a	n/a	n/a	n/a
Commercial Building Envelope - Windows Program	3.2	2.9	4.5	4.1	\$31.6	3.3	1.5	1.4	\$3.3	20.0
Commercial Building Envelope - Insulation Program	3.3	3.0	6.2	5.6	\$37.5	2.4	2.2	2.0	\$18.6	14.3
Commercial Geothermal Program	3.3	3.0	3.3	3.0	\$77.1	4.6	n/a	n/a	n/a	n/a
Commercial HVAC Program - Boilers	3.3	3.0	n/a	n/a	n/a	n/a	3.3	3.0	\$12.6	9.3 c
Commercial HVAC Program - Chillers	1.9	1.7	1.9	1.7	\$2.4	2.4	n/a	n/a	n/a	n/a
Commercial HVAC Program - CO2 Sensors	3.0	2.7	5.9	5.4	\$4.6	3.0	1.6	1.4	\$0.8	19.5
Commercial HVAC Program - HRVs	2.3	2.1	4.6	4.2	\$12.1	3.5	1.1	1.0	\$0.1	29.0
Commercial HVAC Program - Air Cooled Chillers	1.4	1.3	1.4	1.3	\$1.3	3.0	n/a	n/a	n/a	n/a
Commercial HVAC Program - Water Heaters	1.2	1.1	n/a	n/a	n/a	n/a	1.2	1.1	\$0.2	25.6
Commercial Custom Measures Program	1.7	1.5	1.8	1.6	\$10.4	5.8	1.5	1.3	\$1.4	21.3
Commercial Building Optimization Program	2.3	2.1	4.3	3.9	\$9.4	2.2	1.4	1.3	\$1.9	21.7
New Buildings Program	3.3	3.0	4.1	3.7	\$323.7	3.4	0.9	0.8	(\$8.3)	39.2 c
Commercial Refrigeration Program	4.7	4.2	4.1	3.7	\$40.2	1.9	n/a	n/a	\$8.2	n/a i
Commercial Kitchen Appliance Program	14.9	14.5	16.9	16.2	\$4.5	1.2	14.1	13.7	\$8.5	7.2 w
Network Energy Management Program	1.6	1.4	1.6	1.5	\$1.3	4.7	n/a	n/a	(\$0.2)	n/a i
Internal Retrofit Program	1.2	1.1	1.2	1.1	\$0.7	6.4	n/a	n/a	n/a	n/a
Power Smart Energy Manager	3.3	3.0	4.2	3.8	\$2.8	2.1	2.0	1.9	\$0.6	14.2
Power Smart Shops	3.7	3.4	3.3	3.0	\$3.9	3.8	28.8	28.2	\$0.8	4.0 w
Commercial Programs Total	3.0	2.7	3.3	3.0	\$844.0	3.5	1.3	1.2	\$19.9	25.3
Industrial										
Performance Optimization Program	2.4	2.2	2.4	2.2	\$161.4	3.6	n/a	n/a	n/a	n/a
Natural Gas Optimization Program	1.2	1.1	n/a	n/a	n/a	n/a	1.2	1.1	\$1.8	24.4
Industrial Programs Total	2.2	2.0	2.4	2.2	\$161.4	3.6	1.2	1.1	\$1.8	24.4
Energy Efficiency Subtotal	2.6	2.3	3.0	2.7	\$1,193.4	3.7	1.1	1.0	\$7.7	30.1
Load Management										
Curtable Rate Program	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Load Management Programs Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Load Displacement & Alternative Energy										
Bioenergy Optimization Program	1.7	1.6	1.7	1.6	\$83.8	8.3	n/a	n/a	n/a	n/a
Customer Sited Load Displacement	1.7	1.5	1.7	1.5	\$196.6	4.7	n/a	n/a	n/a	n/a
Load Displacement & Alt. Energy Programs Total	1.7	1.5	1.7	1.5	\$280.4	5.3	n/a	n/a	n/a	n/a
Conservation Rates										
Conservation Rates - Residential	17.2	15.7	17.2	15.7	\$138.5	0.5	n/a	n/a	n/a	n/a
Conservation Rates - Commercial	21.7	19.7	21.7	19.7	\$219.5	0.4	n/a	n/a	n/a	n/a
Conservation Rates Total	19.7	17.9	19.7	17.9	\$358.0	0.4	n/a	n/a	n/a	n/a
Fuel Choice										
Fuel Choice	7.3	6.6	7.3	6.6	\$416.2	2.0	n/a	n/a	n/a	n/a
Fuel Choice Total	7.3	6.6	7.3	6.6	\$416.2	2.0	n/a	n/a	n/a	n/a
Other Emerging Technologies										
Residential Air Source Heat Pumps Program	0.8	0.7	0.8	0.7	(\$1.3)	9.2	n/a	n/a	n/a	n/a
Residential Future Opportunities	1.5	1.3	1.5	1.3	\$17.4	6.9	n/a	n/a	n/a	n/a
Residential Solar Photovoltaics Program (PV)	0.6	0.5	0.6	0.5	(\$38.8)	14.6	n/a	n/a	n/a	n/a
Residential Solar Thermal Program - Water Heating	0.7	0.6	0.7	0.6	(\$1.1)	10.8	n/a	n/a	n/a	n/a
Residential Solar Thermal Program - Pool Heating	2.4	2.2	1.3	1.1	\$0.1	3.2	2.9	2.7	\$1.8	10.9
Commercial Future Opportunities	1.6	1.5	1.6	1.5	\$21.3	6.3	n/a	n/a	n/a	n/a
Commercial Solar Photovoltaics Program (PV)	0.7	0.7	0.7	0.7	(\$34.0)	12.0	n/a	n/a	n/a	n/a
Commercial Variable Speed and Frequency Drives	1.5	1.4	1.5	1.4	\$0.8	3.9	n/a	n/a	n/a	n/a
Industrial Future Opportunities	1.8	1.7	1.8	1.7	\$28.3	5.7	n/a	n/a	n/a	n/a
Other Emerging Technologies Total	1.1	1.0	1.1	1.0	(\$7.4)	8.9	2.9	2.7	\$1.8	10.9
Program Impacts Total	2.4	2.2	2.6	2.4	\$2,240.7	4.0	1.1	1.0	\$9.6	29.8
Program Support and Contingency Costs	-	-	-	-	\$0.0	-	-	-	\$0.0	-
Program Impacts Total (incl. Support and Contingency Costs)	2.4	2.1	2.5	2.3	\$2,194.8	4.1	1.1	1.0	(\$0.8)	31.3
Other Internal DSM Investments										
Affordable Energy Fund	-	-	-	-	(\$1.1)	-	-	-	(\$0.6)	-
Overall Portfolio Metric	2.4	2.1	2.5	2.3	\$2,193.7	4.2	1.1	1.0	(\$1.4)	31.4

Notes:

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

AFP Electric - Total:

Excluding AEF & External costs, SC is 3.1, TRC is 2.9, TRC NPV is \$44.2M, and LRC is 4.7 ¢/kWh

AFP Natural Gas - Total:

Excluding AEF & External costs, w/o Furnace Replacement Program, SC is 0.9, TRC is 0.8, TRC NPV is -\$6.2M, and LRC is 42.1 ¢/m³

c Program assumption includes savings from Codes & Standards

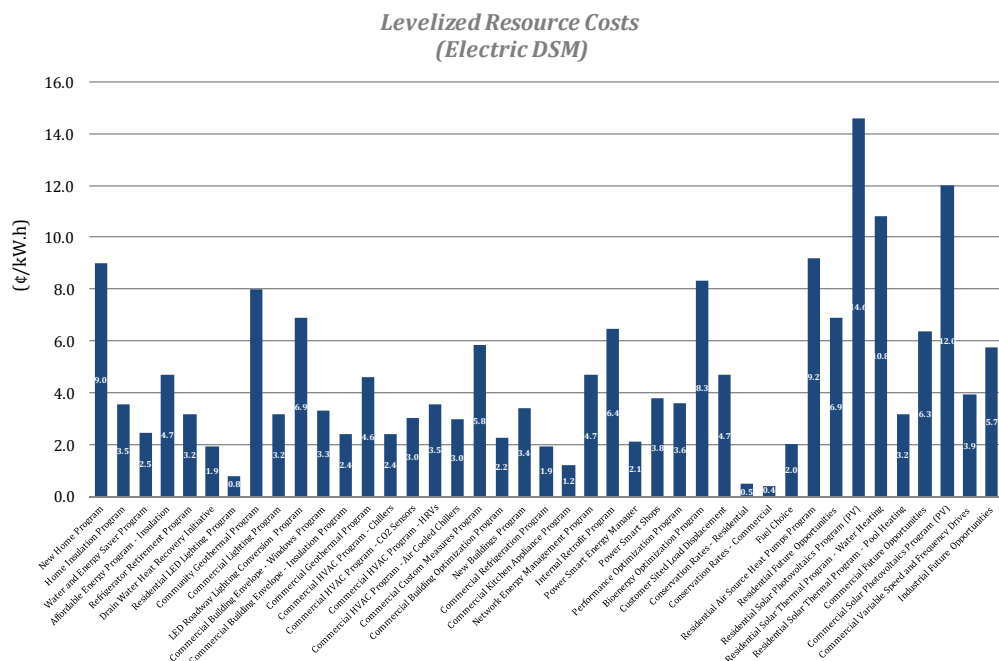
i Program reflects natural gas interactive effects

w SC, TRC and TRC NPV include Water Savings Benefits

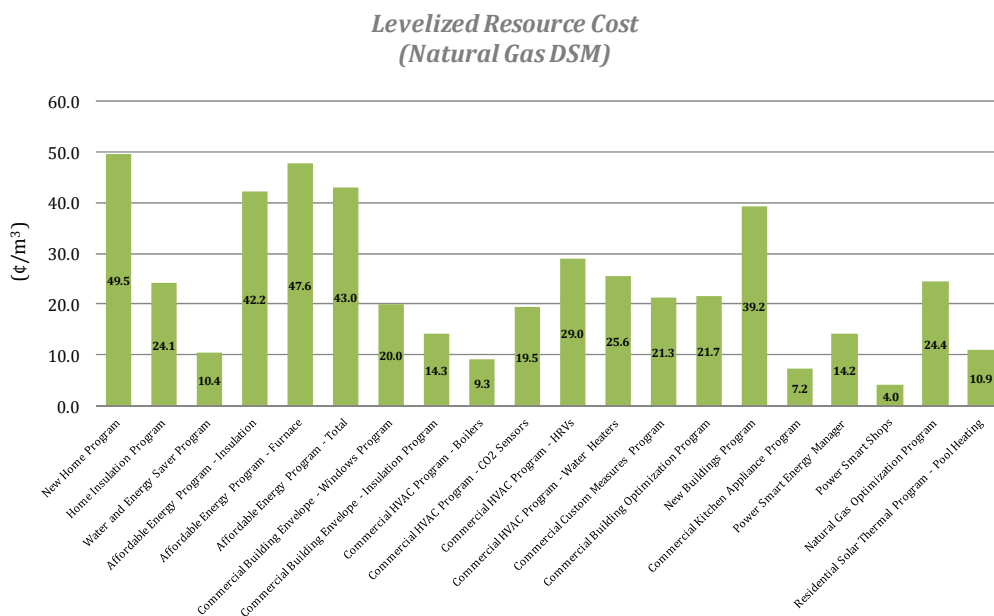
1) Overall portfolio metrics do not include Customer Service Initiatives / Financial Loan Programs nor Curtable Rate Program

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

The following chart provides the Levelized Resource Cost of the electric program offerings in the 2015 Power Smart Plan.



The following chart provides the Levelized Resource Cost of the natural gas program offerings in the 2015 Power Smart Plan.

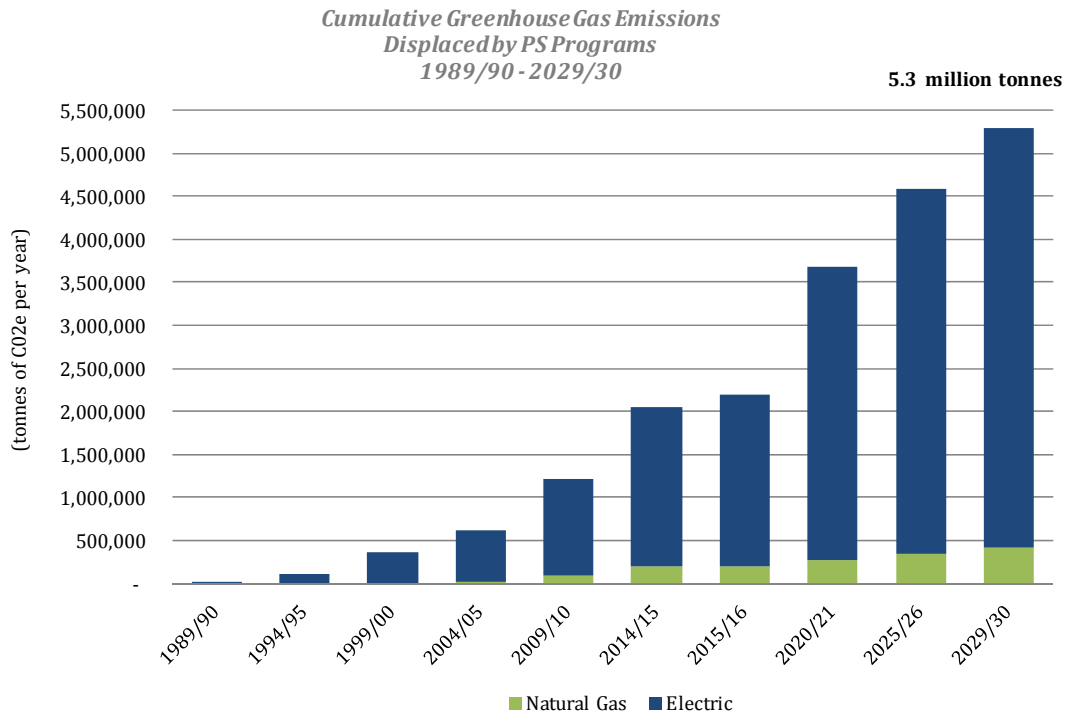


Global Greenhouse Gas Emissions Reductions

The following chart and graph depict the aggregate global greenhouse gas emissions reductions resulting from the electricity and natural gas DSM programs outlined in the 2015 Power Smart Plan, including greenhouse gas emission reductions resulting from Manitoba Hydro's Power Smart efforts since 1989. Global greenhouse gas emission reductions of 3.3 million tonnes are forecast to be achieved due to energy savings outlined in the Power Smart Plan.

	Annual CO ₂ Reductions (tonnes)
CO ₂ Reductions - Electric	3,118,131
CO ₂ Reductions - Natural Gas	224,867
2015/16 Power Smart Plan (2015/16 - 2029/30)	3,342,998
CO ₂ Reductions Achieved to Date - Electric	1,764,312
CO ₂ Reductions Achieved To Date - Natural Gas	192,468
Savings Achieved to 2014/15 (1989/90 - 2029/30)	1,956,780
Total Projected to 2029/30	5,299,778

Including reductions achieved to date, approximately 5.3 million tonnes are forecast to be realized due to Manitoba Hydro's Power Smart efforts by 2029/30.

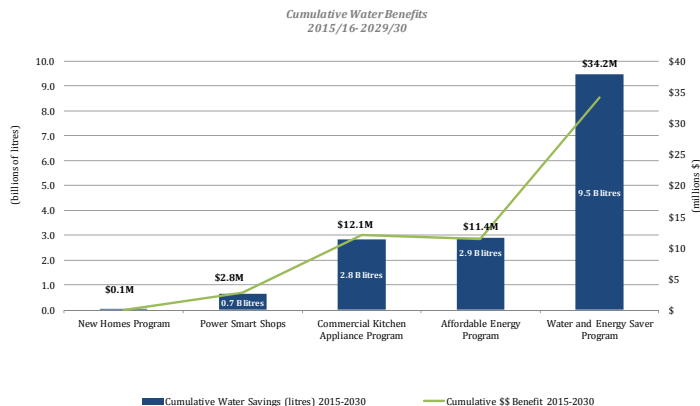


Additional Measureable Non-Energy Benefits

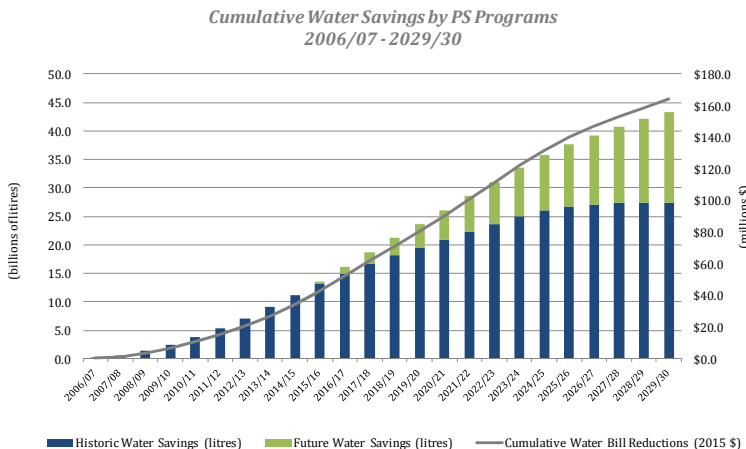
As part of the 2015 Power Smart Plan, the following residential and commercial programs are expected to capture additional water saving benefits:

- Water and Energy Saver Program
- Affordable Energy Program
- Commercial Kitchen Appliance Program
- Power Smart Shops

The following graph depicts cumulative water savings in litres and cumulative customer dollar savings from each of the above programs. It is estimated that savings of approximately 16 billion liters of water and \$61 million in bill savings will be achieved from 2015/16 to 2029/30.



When combined with savings to date, Power Smart programs are expected to save approximately 43 billion liters of water and \$164 million by 2029/30.



2.3.2 Utility Perspective

Metrics

The following table outlines the cost effectiveness, from a utility perspective, of the program offerings provided in the 2015 Power Smart Plan.

	Utility DSM Metrics 2015/16 - 2029/30							
	Electric DSM				Natural Gas DSM			
	RIM	NUB	NPV	LUC (¢/kWh)	RIM	NUB	NPV	LUC (¢/m ³)
Residential								
New Home Program	1.3	4.1	\$6.7	0.9	0.8	-12.7	(\$4.6)	0.5 c
Home Insulation Program	1.1	1.5	\$6.1	3.1	0.6	-0.6	(\$16.7)	12.2
Water and Energy Saver Program	0.8	-0.1	(\$4.4)	2.4	0.6	-0.7	(\$3.2)	10.5
Affordable Energy Program								
Affordable Energy Program - Insulation	0.9	0.6	(\$9.0)	4.6	0.3	-0.2	(\$35.5)	41.2 **
Affordable Energy Program - Furnace	n/a	n/a	n/a	n/a	0.1	-0.1	(\$18.2)	122.3 **
Affordable Energy Program - Total	0.9	0.6	(\$9.0)	4.6	0.3	-0.1	(\$35.7)	54.2 **
Refrigerator Retirement Program	0.6	-0.8	(\$17.5)	1.9	n/a	n/a	\$1.1	n/a i
Drain Water Heat Recovery Initiative	0.7	-0.6	(\$1.0)	1.9	n/a	n/a	n/a	n/a
Residential LED Lighting Program	1.0	1.0	(\$0.2)	2.0	n/a	n/a	\$1.2	n/a j
Community Geothermal Program	1.1	1.6	\$10.7	2.9	n/a	n/a	n/a	n/a
Residential Programs Total	1.0	0.9	(\$8.7)	2.8	0.4	-0.3	(\$75.9)	26.8
Commercial								
Commercial Lighting Program	1.0	1.0	(\$1.7)	1.8	n/a	n/a	\$5.6	n/a i
LED Roadway Lighting Conversion Program	0.7	0.6	(\$19.6)	4.5	n/a	n/a	n/a	n/a
Commercial Building Envelope - Windows Program	1.3	2.2	\$8.8	2.3	0.6	-0.3	(\$6.9)	12.9
Commercial Building Envelope - Insulation Program	1.2	2.0	\$7.7	2.3	0.6	-0.3	(\$21.4)	11.9
Commercial Geothermal Program	1.2	1.7	\$18.6	3.1	n/a	n/a	n/a	n/a
Commercial HVAC Program - Boilers	n/a	n/a	n/a	n/a	0.8	-0.7	(\$5.5)	4.7 c
Commercial HVAC Program - Chillers	0.6	-1.2	(\$3.3)	1.1	n/a	n/a	n/a	n/a
Commercial HVAC Program - CO2 Sensors	1.2	2.2	\$1.1	2.6	0.7	-0.3	(\$1.4)	10.5
Commercial HVAC Program - HRVs	1.2	2.3	\$3.0	2.1	0.8	-0.5	(\$2.3)	5.7
Commercial HVAC Program - Air Cooled Chillers	0.5	-0.4	(\$6.2)	2.8	n/a	n/a	n/a	n/a
Commercial HVAC Program - Water Heaters	n/a	n/a	n/a	n/a	0.6	-0.3	(\$1.5)	11.4
Commercial Custom Measures Program	1.0	0.8	(\$1.2)	2.2	0.7	-0.3	(\$2.5)	9.8
Commercial Building Optimization Program	1.0	1.0	\$0.1	1.3	0.6	-0.3	(\$5.3)	12.7
New Buildings Program	1.3	7.6	\$90.3	0.4	0.8	-0.8	(\$5.8)	3.4 c
Commercial Refrigeration Program	1.0	0.7	(\$1.8)	0.8	n/a	n/a	(\$1.3)	n/a i
Commercial Kitchen Appliance Program	1.0	1.3	\$0.1	0.7	0.7	-1.1	(\$0.9)	4.9
Network Energy Management Program	1.0	1.1	\$0.1	0.7	n/a	n/a	\$0.0	n/a i
Internal Retrofit Program	1.1	1.1	\$0.7	6.4	n/a	n/a	n/a	n/a
Power Smart Energy Manager	1.2	2.8	\$0.7	0.8	0.8	-1.0	(\$0.3)	2.8
Power Smart Shops	0.8	0.4	(\$1.0)	3.3	0.7	-1.9	(\$0.1)	4.0
Commercial Programs Total	1.1	1.5	\$96.1	1.6	0.7	-0.3	(\$49.7)	10.0
Industrial								
Performance Optimization Program	0.9	0.8	(\$15.8)	2.3	n/a	n/a	n/a	n/a
Natural Gas Optimization Program	n/a	n/a	n/a	n/a	0.8	-0.5	(\$6.2)	4.8
Industrial Programs Total	0.9	0.8	(\$15.8)	2.3	0.8	-0.5	(\$6.2)	4.8
Energy Efficiency Subtotal	1.0	1.2	\$71.6	1.9	0.6	-0.3	(\$131.7)	14.8
Load Management								
Curtable Rate Program	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Load Management Programs Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Load Displacement & Alternative Energy								
Bioenergy Optimization Program	1.4	3.1	\$63.2	1.7	n/a	n/a	n/a	n/a
Customer Sited Load Displacement	1.1	1.5	\$43.6	1.1	n/a	n/a	n/a	n/a
Load Displacement & Alt. Energy Programs Total	1.2	1.9	\$106.8	1.2	n/a	n/a	n/a	n/a
Conservation Rates								
Conservation Rates - Residential	0.8	-3.8	(\$45.5)	0.5	n/a	n/a	n/a	n/a
Conservation Rates - Commercial	1.1	3.0	\$23.0	0.4	n/a	n/a	n/a	n/a
Conservation Rates Total	0.9	-0.1	(\$22.5)	0.4	n/a	n/a	n/a	n/a
Fuel Choice								
Fuel Choice	1.3	3.9	\$123.2	1.1	n/a	n/a	n/a	n/a
Fuel Choice Total	1.3	3.9	\$123.2	1.1	n/a	n/a	n/a	n/a
Other Emerging Technologies								
Residential Air Source Heat Pumps Program	0.5	-1.2	(\$2.7)	2.6	n/a	n/a	n/a	n/a
Residential Future Opportunities	0.7	-0.1	(\$27.1)	3.4	n/a	n/a	n/a	n/a
Residential Solar Photovoltaics Program (PV)	0.5	-0.4	(\$39.3)	4.8	n/a	n/a	n/a	n/a
Residential Solar Thermal Program - Water Heating	0.5	-0.9	(\$1.6)	3.2	n/a	n/a	n/a	n/a
Residential Solar Thermal Program - Pool Heating	0.3	-3.0	(\$1.1)	1.9	0.7	-1.9	(\$1.1)	3.5
Commercial Future Opportunities	0.8	0.4	(\$16.8)	3.6	n/a	n/a	n/a	n/a
Commercial Solar Photovoltaics Program (PV)	0.7	0.0	(\$35.0)	4.0	n/a	n/a	n/a	n/a
Commercial Variable Speed and Frequency Drives	0.7	0.3	(\$1.5)	3.9	n/a	n/a	n/a	n/a
Industrial Future Opportunities	0.9	0.6	(\$11.4)	4.0	n/a	n/a	n/a	n/a
Other Emerging Technologies Total	0.7	0.1	(\$136.5)	3.9	0.7	-1.9	(\$1.1)	3.5
Program Impacts Total	1.0	1.2	\$142.5	1.7	0.6	-0.3	(\$132.8)	14.6
Program Support and Contingency Costs	-	-	\$0.0	-	-	-	\$0.0	-
Program Impacts Total (Incl. Support and Contingency Costs)	1.0	1.1	\$96.7	1.8	0.6	-0.3	(\$143.2)	16.1
Other Internal DSM Investments								
Affordable Energy Fund	-	-	\$0.0	-	-	-	(\$0.6)	-
Overall Portfolio Metric	1.0	1.1	\$95.6	1.8	0.6	-0.3	(\$143.8)	16.2

Notes:

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

AEF Electric - Total:

Excluding AEF costs, RIM is 0.9, NUB is 0.66, NPV is -\$7.6M, and LUC is 4.4 ¢/kWh

AEF Natural Gas - Total:

Excluding AEF costs, without Furnace Replacement Program, RIM is 0.4, NUB is -0.2, NPV is -\$32.9M, and LUC is 37.6 ¢/m³

c Program assumption includes savings from Codes & Standards

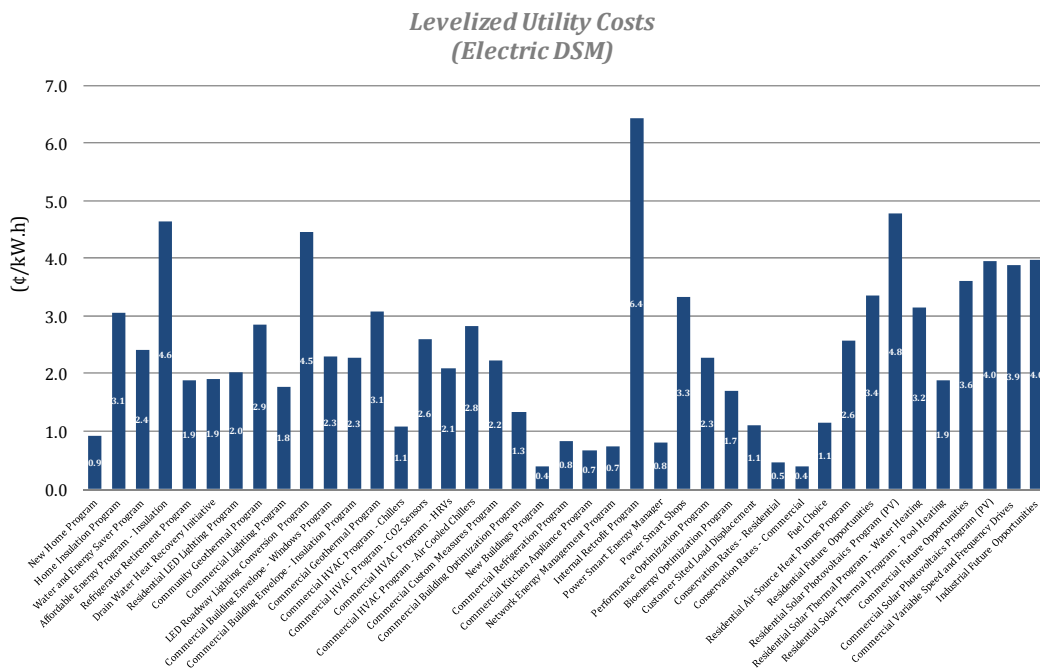
i Program reflects natural gas interactive effects

j) Overall portfolio metrics do not include Customer Service Initiatives / Financial Loan Programs nor Curtailable Rate Program

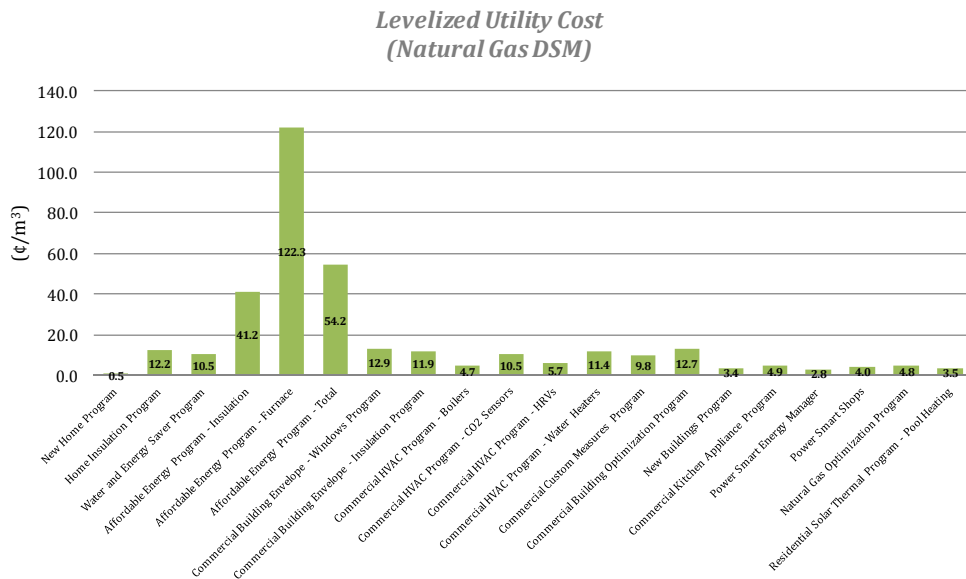
2) Overall portfolio metrics include all support, contingency and Affordable Energy Fund Expenditures and Furnace Replacement Program

3) Excluding the Affordable Energy Program, overall natural gas LUC is 10.8 ¢/m³

The following chart provides the Levelized Utility Cost of the electric program offerings in the 2015 Power Smart Plan.



The following chart provides the Levelized Utility Cost of the natural gas program offerings in the 2015 Power Smart Plan.



2.3.3 Customer Perspective

Metrics

The following table outlines the cost effectiveness, from a participating customer perspective, of the program offerings provided in the 2015 Power Smart Plan.

	Customer DSM Metrics 2015/16 - 2029/30					
	Electric			Natural Gas DSM		
	Payback	PC	PC NPV	Payback	PC	PC NPV
Residential						
New Home Program	19.4	1.1	\$2.9	21.7	0.7	(\$9.9) <i>w</i>
Home Insulation Program	1.1	5.4	\$34.8	6.0	2.0	\$17.8
Water and Energy Saver Program	0.1	28.2	\$26.0	0.0	21.3	\$14.5 <i>w</i>
Affordable Energy Program						
Affordable Energy Program - Insulation	n/a	n/a	n/a	n/a	n/a	n/a
Affordable Energy Program - Furnace	n/a	n/a	n/a	n/a	n/a	n/a
Affordable Energy Program - Total	n/a	n/a	n/a	n/a	n/a	n/a
Refrigerator Retirement Program	1.6	4.7	\$32.9	n/a	n/a	(\$4.3) <i>i</i>
Drain Water Heat Recovery Initiative	0.0	5.9	\$2.7	n/a	n/a	n/a
Residential LED Lighting Program	0.0	0.0	\$20.4	n/a	n/a	(\$4.9) <i>i</i>
Community Geothermal Program	9.9	1.5	\$23.9	n/a	n/a	n/a
Commercial						
Commercial Lighting Program	3.3	3.5	\$263.7	n/a	n/a	(\$30.9) <i>i</i>
LED Roadway Lighting Conversion Program	0.0	1.6	\$27.1	n/a	n/a	n/a
Commercial Building Envelope - Windows Program	1.5	4.3	\$22.8	1.2	2.2	\$9.0
Commercial Building Envelope - Insulation Program	0.3	7.7	\$29.8	1.4	2.9	\$36.0
Commercial Geothermal Program	5.4	2.7	\$58.5	n/a	n/a	n/a
Commercial HVAC Program - Boilers	n/a	n/a	n/a	2.4	4.0	\$16.4
Commercial HVAC Program - Chillers	2.8	3.0	\$5.7	n/a	n/a	n/a
Commercial HVAC Program - CO2 Sensors	0.6	7.9	\$3.6	3.0	2.3	\$2.0
Commercial HVAC Program - HRVs	4.5	3.8	\$9.2	13.7	1.2	\$1.5
Commercial HVAC Program - Air Cooled Chillers	2.3	2.8	\$7.6	n/a	n/a	n/a
Commercial HVAC Program - Water Heaters	n/a	n/a	n/a	5.1	1.7	\$1.4
Commercial Custom Measures Program	9.3	1.7	\$11.6	6.5	2.0	\$3.4
Commercial Building Optimization Program	1.8	4.9	\$9.3	3.5	2.3	\$6.4
New Buildings Program	8.3	3.0	\$233.4	25.7	0.8	(\$6.7)
Commercial Refrigeration Program	0.3	4.3	\$42.0	n/a	n/a	\$8.7 <i>i</i>
Commercial Kitchen Appliance Program	0.2	18.2	\$4.5	0.2	19.7	\$9.2 <i>i</i>
Network Energy Management Program	2.4	1.5	\$1.3	n/a	n/a	(\$0.2) <i>i</i>
Internal Retrofit Program	0.0	1.0	\$0.0	n/a	n/a	n/a
Power Smart Energy Manager	0.0	4.4	\$2.1	0.0	2.4	\$0.7
Power Smart Shops	0.5	5.2	\$5.0	0.0	30.7	\$0.9 <i>w</i>
Industrial						
Performance Optimization Program	3.3	2.8	\$177.2	n/a	n/a	n/a
Natural Gas Optimization Program	n/a	n/a	n/a	9.0	1.3	\$6.1
Load Management						
Curtable Rate Program	n/a	n/a	\$0.0	n/a	n/a	n/a
Load Displacement & Alternative Energy						
Bioenergy Optimization Program	3.1	1.1	\$20.6	n/a	n/a	n/a
Customer Sited Load Displacement	4.1	1.4	\$153.0	n/a	n/a	n/a
Conservation Rates						
Conservation Rates - Residential	n/a	n/a	\$184.0	n/a	n/a	n/a
Conservation Rates - Commercial	n/a	n/a	\$196.5	n/a	n/a	n/a
Fuel Choice						
Fuel Choice	1.9	5.1	\$293.0	n/a	n/a	n/a
Other Emerging Technologies						
Residential Air Source Heat Pumps Program	9.3	1.4	\$1.4	n/a	n/a	n/a
Residential Future Opportunities	6.5	2.1	\$44.4	n/a	n/a	n/a
Residential Solar Photovoltaics Program (PV)	12.8	1.0	\$0.5	n/a	n/a	n/a
Residential Solar Thermal Program - Water Heating	14.9	1.2	\$0.5	n/a	n/a	n/a
Residential Solar Thermal Program - Pool Heating	2.1	6.1	\$1.2	2.7	3.8	\$2.6
Commercial Future Opportunities	6.0	1.9	\$38.1	n/a	n/a	n/a
Commercial Solar Photovoltaics Program (PV)	12.0	1.0	\$1.1	n/a	n/a	n/a
Commercial Variable Speed and Frequency Drives	2.4	3.9	\$2.3	n/a	n/a	n/a
Industrial Future Opportunities	4.3	2.2	\$39.6	n/a	n/a	n/a
Other Emerging Technologies Total						
Overall Portfolio Metric	n/a	2.4	\$2,087.3	n/a	1.6	\$121.4

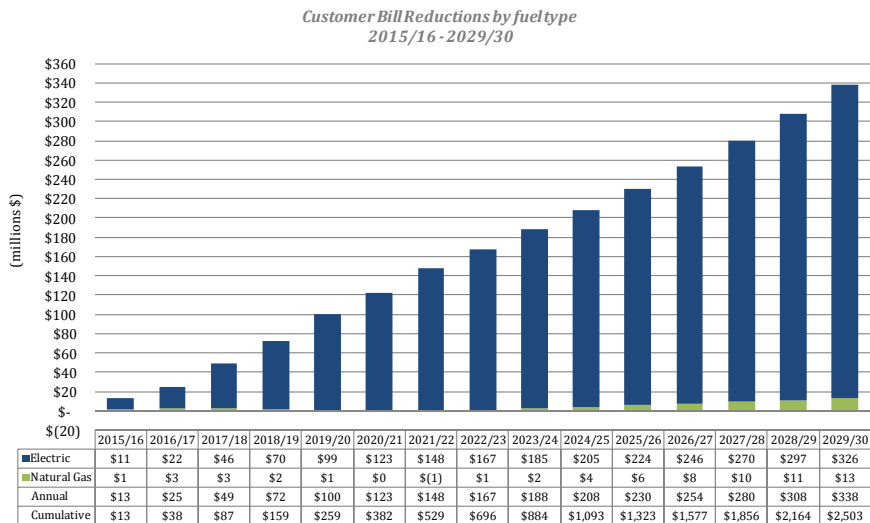
Notes:

i Program reflects natural gas interactive effects

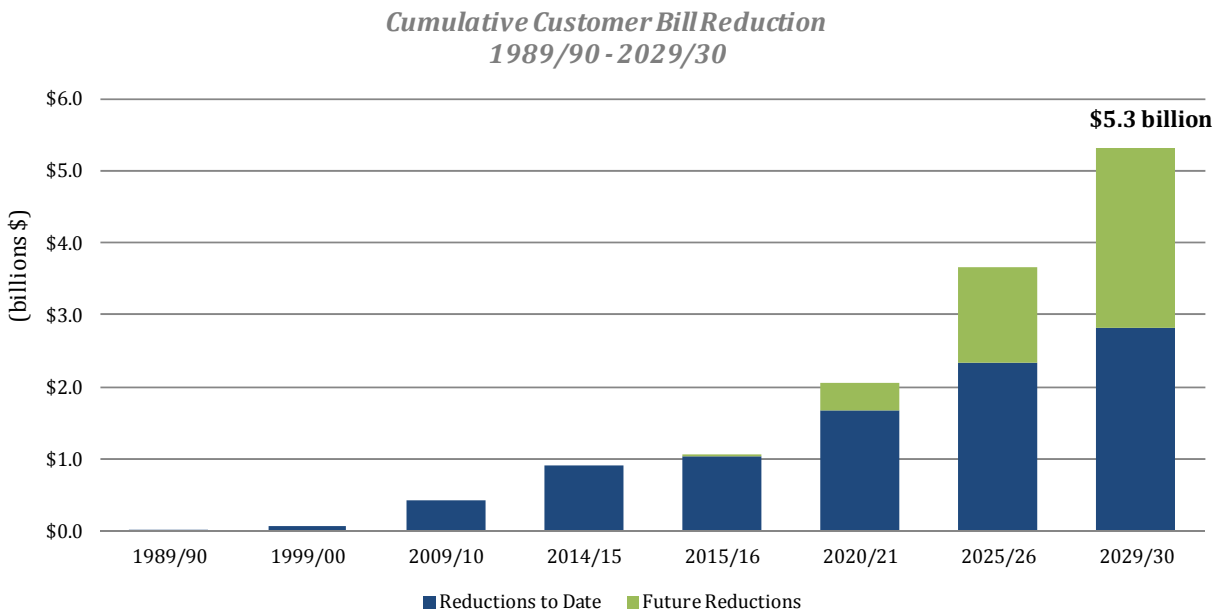
w Payback, PC and PC NPV include Water Savings Benefits

Combined Customer Bill Reductions

The following graph depicts customer bill reductions resulting from electric and natural gas programs outlined in the 2015 Power Smart Plan. Power Smart programs are expected to save participating customers an additional \$13 million in 2015/16 alone, \$338 million in 2029/30 and \$2.5 billion cumulatively by 2029/30.



When combined with bill reductions to date, Power Smart programs are expected to save participating customers \$ 455 million in 2029/30 and over \$ 5.3 billion cumulatively by 2029/30.



2016/17 Supplemental Filing

2015 Power Smart Plan
Annual Utility Costs
(1989/90 - 2014/15)
(000's)

Load Forecast and Power Smart Plans MFR 1

Savings To Date Utility Costs

Table with columns for years (1989/90 to 2013/14), Interim Estimate 2014/15, and Cumulative 2014/15. Rows include Residential Incentive Based programs (Home Insulation, Affordable Energy, etc.), Customer Service Initiatives (Power Smart, Residential Earth Power), Discontinued/Completed programs (Residential Appliance, New Homes), Residential Exploratory Programs (LED Light, Solar Power), Commercial Incentive Based programs (Commercial Lighting, Commercial Earth Power), Commercial Exploratory Programs (Heat Recovery), and Industrial programs (Performance Optimization, Industrial (Basic)).

Note: May not add up due to rounding

2016/17 Supplemental Filing

Load Forecast and Power Smart Plans MFR 1

Savings To Date Utility Costs

Table with columns for years from 1989/90 to 2014/15, and subtotals for Interim Estimate 2014/15 and Cumulative 2014/15. Rows include Residential (Incentive Based, Customer Service Initiatives, Discontinued/Completed, Residential Exploratory Programs), Commercial (Incentive Based, Customer Service Initiatives, Discontinued/Completed, Commercial Exploratory Programs), and Industrial. A GRAND TOTAL row is at the bottom.

Note: May not add up due to rounding

Savings To Date Utility Costs

Table with columns for years 1989/90 to 2014/15 and Interim Estimate 2014/15 and Cumulative 2014/15. Rows include Residential Incentive Based programs (e.g., Home Insulation Program, Affordable Energy Program), Commercial Incentive Based programs (e.g., Commercial Lighting Program, Commercial Insulation Program), Industrial Performance Optimization Program, Efficiency Programs Subtotal, Customer Self-Generation Programs, and Rate/Load Management Programs. A Grand Total row is at the bottom.

Note: May not add up due to rounding

2016/17 Supplemental Filing

Load Forecast and Power Smart Plans MFR 1

NATURAL GAS DSM

APPENDIX C.1

2015 Power Smart Plan
Annual Energy Savings (million m³)

	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	2029/30	
RESIDENTIAL																
Incentive Based																
New Home Program	-	0.0	0.1	0.2	0.3	0.9	1.5	2.1	2.7	3.3	3.7	4.2	4.6	5.0	5.4	
Home Insulation Program	0.7	1.3	1.9	2.6	3.2	3.8	4.4	5.0	5.5	6.1	6.7	7.2	7.2	7.2	7.2	
Water and Energy Saver Program	0.8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
Affordable Energy Program	1.4	2.6	3.9	5.0	5.6	6.0	6.3	6.6	6.3	6.1	5.8	5.6	5.9	6.2	6.2	
Subtotal	2.8	5.6	7.6	9.4	10.7	12.4	13.9	15.3	16.2	17.1	17.8	18.6	19.4	20.1	20.5	41%
Customer Service Initiatives / Financial Loan Programs																
Power Smart Residential Loan	0.3	0.6	0.8	1.1	1.4	1.6	1.9	2.2	2.4	2.7	2.9	3.2	3.4	3.7	3.9	
Power Smart PAYS Financing	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	
Residential Earth Power Loan	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.3	1.4	
Subtotal	0.4	0.8	1.1	1.5	1.9	2.2	2.6	2.9	3.3	3.6	4.0	4.3	4.7	5.0	5.4	11%
COMMERCIAL																
Incentive Based																
Commercial Building Envelope - Windows Program	0.3	0.5	0.8	1.1	1.3	1.6	1.8	2.1	2.4	2.6	2.9	3.2	3.4	3.7	4.0	
Commercial Building Envelope - Insulation Program	0.8	1.7	2.5	3.4	4.3	5.1	6.0	6.9	7.7	8.6	9.5	10.4	11.2	12.1	13.0	
Commercial HVAC Program - Boilers	1.0	2.0	3.1	3.3	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	
Commercial HVAC Program - CO2 Sensors	0.1	0.1	0.2	0.3	0.5	0.6	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Commercial HVAC Program - HRVs	-	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.3	1.5	1.8	2.2	2.5	2.9	
Commercial HVAC Program - Water Heaters	0.0	0.1	0.2	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.5	1.4	1.4	1.3	
Commercial Custom Measures Program	0.1	0.2	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.6	1.7	1.9	1.9	
Commercial Building Optimization Program	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.0	2.4	2.7	3.1	3.5	4.0	4.5	4.9	
New Buildings Program	0.4	0.9	0.9	1.0	1.1	1.2	1.4	1.7	2.1	2.4	2.8	3.1	3.4	3.8	4.1	
Commercial Kitchen Appliance Program	0.3	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Internal Retrofit Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart Energy Manager	-	-	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Power Smart Shops	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Subtotal	3.2	6.7	9.6	11.9	14.2	16.5	18.9	21.5	24.3	27.0	29.8	32.4	34.9	37.4	39.8	80%
Customer Service Initiatives / Financial Loan Programs																
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																
Natural Gas Optimization Program	1.0	1.9	2.9	3.6	4.3	5.0	5.8	6.5	7.2	7.9	8.6	9.4	10.1	10.1	10.1	
Subtotal	1.0	1.9	2.9	3.6	4.3	5.0	5.8	6.5	7.2	7.9	8.6	9.4	10.1	10.1	10.1	20%
ENERGY EFFICIENCY SUBTOTAL																
	7.3	15.0	21.2	26.4	31.1	36.1	41.1	46.3	51.0	55.7	60.3	64.7	69.0	72.6	75.7	153%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL																
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
FUEL CHOICE																
Fuel Choice	-	-	-5.5	-11.1	-16.6	-22.1	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	
FUEL CHOICE SUBTOTAL	-	-	-5.5	-11.1	-16.6	-22.1	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-27.7	-56%
OTHER EMERGING TECHNOLOGIES																
Residential Solar Thermal Program - Pool Heating	-	-	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	-	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	3%
Impacts																
	7.3	15.0	15.7	15.4	14.6	14.2	13.7	18.9	23.8	28.5	33.3	37.8	42.3	46.1	49.5	100%
Interactive Effects																
	-1.9	-3.7	-4.2	-4.9	-5.7	-6.3	-6.9	-7.4	-7.8	-8.2	-7.9	-7.8	-8.3	-8.7	-9.1	
Subtotal	5	11	11	10	9	8	7	12	16	20	25	30	34	37	40	
Codes, Standards & Regulations																
	3	9	14	20	26	31	37	43	48	53	58	63	68	73	78	
POWER SMART 2015 to 2029 Impacts																
	9	20	26	30	35	39	44	54	64	74	84	94	102	111	118	
POWER SMART SAVINGS TO DATE																
Incentive Based Program Impacts	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Customer Service Initiatives Program Impacts	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Discontinued Programs	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
Interactive Effects	-15	-15	-14	-15	-15	-15	-15	-15	-14	-13	-13	-13	-13	-13	-13	
Impacts of Codes & Standards	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
TOTAL m3	109	120	126	131	135	139	144	154	164	175	185	195	204	212	219	

Note: May not add up due to rounding.

2015 Power Smart Plan
Annual Utility Costs
(000's \$)

	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	2029/30	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Home Program	-	\$45	\$79	\$114	\$168	-	-	-	-	-	-	-	-	-	-	\$407	
Home Insulation Program	\$1,240	\$1,251	\$1,229	\$1,254	\$1,262	\$1,257	\$1,227	\$1,230	\$1,182	\$1,187	\$1,195	\$1,184	\$117	-	-	\$14,816	
Water and Energy Saver Program	\$922	\$1,016	-	-	-	-	-	-	-	-	-	-	-	-	-	\$1,939	
Affordable Energy Program	\$1,619	\$3,823	\$3,548	\$3,303	\$3,094	\$2,864	\$2,728	\$2,596	\$2,961	\$2,931	\$2,901	\$2,872	\$2,842	\$2,813	-	\$40,895	
Subtotal	\$3,781	\$6,135	\$4,856	\$4,672	\$4,524	\$4,122	\$3,955	\$3,826	\$4,142	\$4,118	\$4,096	\$4,056	\$2,959	\$2,813	-	\$58,056	48%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Smart PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residential Earth Power Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Behavioural Energy Efficiency Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
COMMERCIAL																	
Incentive Based																	
Commercial Building Envelope - Windows Program	\$839	\$435	\$471	\$480	\$490	\$500	\$509	\$520	\$530	\$541	\$551	\$563	\$574	\$585	\$597	\$8,184	
Commercial Building Envelope - Insulation Program	\$1,443	\$1,472	\$1,501	\$1,556	\$1,588	\$1,619	\$1,652	\$1,706	\$1,740	\$1,775	\$1,810	\$1,847	\$1,884	\$1,921	\$1,960	\$25,474	
Commercial HVAC Program - Boilers	\$1,080	\$1,111	\$1,140	\$13	\$13	\$13	\$13	\$14	\$14	\$14	\$15	\$15	\$15	\$15	\$16	\$3,500	
Commercial HVAC Program - CO2 Sensors	\$114	\$125	\$139	\$149	\$160	\$172	\$185	\$198	\$209	\$9	\$9	\$10	\$10	\$10	\$10	\$1,508	
Commercial HVAC Program - HRVs	-	\$111	\$117	\$124	\$131	\$139	\$149	\$160	\$173	\$185	\$198	\$210	\$223	\$237	\$251	\$2,409	
Commercial HVAC Program - Water Heaters	\$88	\$99	\$97	\$111	\$128	\$146	\$167	\$189	\$215	\$243	\$221	-	-	-	-	\$1,705	
Commercial Custom Measures Program	\$167	\$170	\$173	\$196	\$199	\$203	\$208	\$212	\$237	\$242	\$246	\$251	\$256	\$261	-	\$3,021	
Commercial Building Optimization Program	\$303	\$317	\$323	\$355	\$388	\$396	\$430	\$439	\$476	\$485	\$524	\$534	\$575	\$587	\$599	\$6,730	
New Buildings Program	\$767	\$978	\$199	\$305	\$415	\$529	\$647	-	-	-	-	-	-	-	-	\$3,840	
Commercial Kitchen Appliance Program	\$198	\$202	\$74	-	-	-	-	-	-	-	-	-	-	-	-	\$474	
Internal Retrofit Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Smart Energy Manager	-	\$31	\$40	\$41	\$41	-	-	-	-	-	-	-	-	-	-	\$153	
Power Smart Shops	\$3	\$6	\$6	\$6	\$7	\$7	-	-	-	-	-	-	-	-	-	\$36	
Subtotal	\$5,000	\$5,058	\$4,280	\$3,336	\$3,560	\$3,725	\$3,961	\$3,437	\$3,593	\$3,493	\$3,576	\$3,430	\$3,537	\$3,617	\$3,432	\$57,035	47%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Natural Gas Optimization Program	\$511	\$522	\$532	\$406	\$414	\$423	\$431	\$440	\$449	\$458	\$467	\$476	\$486	-	-	\$6,015	
Subtotal	\$511	\$522	\$532	\$406	\$414	\$423	\$431	\$440	\$449	\$458	\$467	\$476	\$486	-	-	\$6,015	5%
ENERGY EFFICIENCY SUBTOTAL	\$9,293	\$11,715	\$9,668	\$8,415	\$8,499	\$8,269	\$8,347	\$7,703	\$8,184	\$8,069	\$8,139	\$7,962	\$6,982	\$6,429	\$3,432	\$121,106	99%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer Sited Load Displacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
FUEL CHOICE																	
Fuel Choice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUEL CHOICE SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
OTHER EMERGING TECHNOLOGIES																	
Residential Solar Thermal Program - Pool Heating	-	-	\$35	\$30	\$32	\$35	\$38	\$41	\$45	\$49	\$54	\$60	\$66	\$74	\$83	\$641	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	-	\$35	\$30	\$32	\$35	\$38	\$41	\$45	\$49	\$54	\$60	\$66	\$74	\$83	\$641	1%
Subtotal of Programs	\$9,293	\$11,715	\$9,703	\$8,444	\$8,531	\$8,304	\$8,385	\$7,744	\$8,229	\$8,118	\$8,193	\$8,021	\$7,048	\$6,503	\$3,515	\$121,747	100%
Program Support	\$992	\$956	\$974	\$994	\$1,013	\$1,034	\$1,054	\$1,075	\$1,097	\$1,119	\$1,141	\$1,164	\$1,187	\$1,211	\$1,235	\$16,248	
Total Utility Costs (2015 to 2029)	\$10,285	\$12,671	\$10,678	\$9,438	\$9,544	\$9,337	\$9,439	\$8,820	\$9,326	\$9,237	\$9,334	\$9,185	\$8,236	\$7,714	\$4,750	\$137,995	
Total Committed to Date																\$101,217	
TOTAL UTILITY COSTS (1989 to 2029)	\$10,285	\$12,671	\$10,678	\$9,438	\$9,544	\$9,337	\$9,439	\$8,820	\$9,326	\$9,237	\$9,334	\$9,185	\$8,236	\$7,714	\$4,750	\$239,211	

Note: May not add up due to rounding.

2015 Power Smart Plan
Annual Administration Costs
(000's \$)

	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	2029/30	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Home Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Home Insulation Program	\$353	\$361	\$336	\$358	\$363	\$356	\$323	\$323	\$272	\$274	\$279	\$266	\$117	-	-	\$3,981	
Water and Energy Saver Program	\$562	\$619	-	-	-	-	-	-	-	-	-	-	-	-	-	\$1,181	
Affordable Energy Program	\$181	\$695	\$671	\$646	\$627	\$563	\$575	\$574	\$1,057	\$1,064	\$1,069	\$1,075	\$1,080	\$1,084	-	\$10,960	
Subtotal	\$1,096	\$1,675	\$1,007	\$1,004	\$990	\$919	\$897	\$896	\$1,329	\$1,338	\$1,349	\$1,341	\$1,197	\$1,084	-	\$16,122	56%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Smart PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residential Earth Power Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Behavioural Energy Efficiency Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
COMMERCIAL																	
Incentive Based																	
Commercial Building Envelope - Windows Program	\$74	\$75	\$77	\$78	\$80	\$81	\$83	\$85	\$86	\$88	\$90	\$92	\$94	\$95	\$97	\$1,275	
Commercial Building Envelope - Insulation Program	\$77	\$78	\$80	\$81	\$83	\$85	\$86	\$88	\$90	\$92	\$94	\$95	\$97	\$99	\$101	\$1,328	
Commercial HVAC Program - Boilers	\$279	\$285	\$290	\$13	\$13	\$13	\$13	\$14	\$14	\$14	\$15	\$15	\$15	\$15	\$16	\$1,024	
Commercial HVAC Program - CO2 Sensors	\$68	\$69	\$70	\$72	\$73	\$75	\$76	\$78	\$79	\$9	\$9	\$10	\$10	\$10	\$10	\$718	
Commercial HVAC Program - HRVs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial HVAC Program - Water Heaters	\$62	\$63	\$49	\$50	\$51	\$52	\$53	\$54	\$55	\$56	\$6	-	-	-	-	\$551	
Commercial Custom Measures Program	\$95	\$97	\$99	\$101	\$103	\$105	\$107	\$109	\$112	\$114	\$116	\$118	\$121	\$123	-	\$1,521	
Commercial Building Optimization Program	\$255	\$195	\$199	\$203	\$207	\$211	\$216	\$220	\$224	\$229	\$233	\$238	\$243	\$248	\$253	\$3,375	
New Buildings Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Kitchen Appliance Program	\$60	\$62	\$63	-	-	-	-	-	-	-	-	-	-	-	-	\$185	
Internal Retrofit Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Smart Energy Manager	-	\$31	\$40	\$41	\$41	-	-	-	-	-	-	-	-	-	-	\$153	
Power Smart Shops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	\$970	\$956	\$968	\$639	\$652	\$622	\$635	\$648	\$661	\$602	\$562	\$568	\$579	\$591	\$477	\$10,130	35%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Natural Gas Optimization Program	\$187	\$191	\$195	\$149	\$152	\$155	\$158	\$161	\$164	\$167	\$171	\$174	\$178	-	-	\$2,200	
Subtotal	\$187	\$191	\$195	\$149	\$152	\$155	\$158	\$161	\$164	\$167	\$171	\$174	\$178	-	-	\$2,200	8%
ENERGY EFFICIENCY SUBTOTAL	\$2,254	\$2,822	\$2,170	\$1,791	\$1,793	\$1,696	\$1,690	\$1,705	\$2,153	\$2,107	\$2,082	\$2,083	\$1,954	\$1,675	\$477	\$28,452	99%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer Sited Load Displacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
FUEL CHOICE																	
Fuel Choice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUEL CHOICE SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
OTHER EMERGING TECHNOLOGIES																	
Residential Solar Thermal Program - Pool Heating	-	-	\$27	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27	\$28	\$29	\$320	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	-	\$27	\$21	\$21	\$22	\$23	\$23	\$24	\$25	\$25	\$26	\$27	\$28	\$29	\$320	1%
Subtotal of Programs	\$2,254	\$2,822	\$2,197	\$1,812	\$1,814	\$1,718	\$1,712	\$1,728	\$2,177	\$2,132	\$2,107	\$2,109	\$1,981	\$1,703	\$506	\$28,771	100%
Program Support	\$992	\$956	\$974	\$994	\$1,013	\$1,034	\$1,054	\$1,075	\$1,097	\$1,119	\$1,141	\$1,164	\$1,187	\$1,211	\$1,235	\$16,248	
Total Administration Costs (2015 to 2029)	\$3,245	\$3,778	\$3,171	\$2,805	\$2,828	\$2,752	\$2,767	\$2,803	\$3,274	\$3,251	\$3,249	\$3,273	\$3,168	\$2,914	\$1,741	\$45,019	
Total Committed to Date																\$42,919	
TOTAL ADMINISTRATION COSTS (1989 to 2029)	\$3,245	\$3,778	\$3,171	\$2,805	\$2,828	\$2,752	\$2,767	\$2,803	\$3,274	\$3,251	\$3,249	\$3,273	\$3,168	\$2,914	\$1,741	\$87,938	

Note: May not add up due to rounding.

2016/17 Supplemental Filing

Load Forecast and Power Smart Plans MFR 1

NATURAL GAS DSM

2015 Power Smart Plan
Annual Incentive Costs
(000's \$)

APPENDIX C.4

	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	2029/30	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Home Program	-	\$45	\$79	\$114	\$168	-	-	-	-	-	-	-	-	-	-	\$407	
Home Insulation Program	\$887	\$890	\$893	\$896	\$899	\$902	\$904	\$907	\$910	\$913	\$916	\$918	-	-	-	\$10,835	
Water and Energy Saver Program	\$360	\$397	-	-	-	-	-	-	-	-	-	-	-	-	-	\$758	
Affordable Energy Program	\$1,438	\$3,128	\$2,877	\$2,658	\$2,468	\$2,301	\$2,154	\$2,022	\$1,903	\$1,867	\$1,832	\$1,797	\$1,762	\$1,728	-	\$29,935	
Subtotal	\$2,685	\$4,460	\$3,849	\$3,668	\$3,534	\$3,203	\$3,058	\$2,929	\$2,814	\$2,780	\$2,748	\$2,715	\$1,762	\$1,728	-	\$41,934	45%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Residential Earth Power Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Behavioural Energy Efficiency Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
COMMERCIAL																	
Incentive Based																	
Commercial Building Envelope - Windows Program	\$765	\$360	\$394	\$402	\$410	\$418	\$426	\$435	\$444	\$453	\$462	\$471	\$480	\$490	\$500	\$6,909	
Commercial Building Envelope - Insulation Program	\$1,366	\$1,394	\$1,421	\$1,475	\$1,504	\$1,535	\$1,565	\$1,618	\$1,650	\$1,683	\$1,717	\$1,751	\$1,786	\$1,822	\$1,858	\$24,146	
Commercial HVAC Program - Boilers	\$801	\$826	\$850	-	-	-	-	-	-	-	-	-	-	-	-	\$2,477	
Commercial HVAC Program - CO2 Sensors	\$46	\$56	\$68	\$77	\$87	\$97	\$108	\$120	\$130	-	-	-	-	-	-	\$790	
Commercial HVAC Program - HRVs	-	\$111	\$117	\$124	\$131	\$139	\$149	\$160	\$173	\$185	\$198	\$210	\$223	\$237	\$251	\$2,409	
Commercial HVAC Program - Water Heaters	\$26	\$36	\$48	\$62	\$77	\$94	\$114	\$136	\$160	\$186	\$216	-	-	-	-	\$1,154	
Commercial Custom Measures Program	\$71	\$73	\$74	\$95	\$96	\$98	\$100	\$102	\$125	\$128	\$130	\$133	\$136	\$138	-	\$1,500	
Commercial Building Optimization Program	\$48	\$122	\$124	\$152	\$181	\$184	\$215	\$219	\$251	\$256	\$291	\$296	\$332	\$339	\$346	\$3,356	
New Buildings Program	\$767	\$978	\$199	\$305	\$415	\$529	\$647	-	-	-	-	-	-	-	-	\$3,840	
Commercial Kitchen Appliance Program	\$137	\$141	\$11	-	-	-	-	-	-	-	-	-	-	-	-	\$289	
Internal Retrofit Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart Energy Manager	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart Shops	\$3	\$6	\$6	\$6	\$7	\$7	-	-	-	-	-	-	-	-	-	\$36	
Subtotal	\$4,030	\$4,102	\$3,313	\$2,697	\$2,908	\$3,102	\$3,326	\$2,790	\$2,933	\$2,891	\$3,014	\$2,862	\$2,958	\$3,026	\$2,955	\$46,906	50%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Natural Gas Optimization Program	\$324	\$331	\$337	\$258	\$263	\$268	\$274	\$279	\$285	\$290	\$296	\$302	\$308	-	-	\$3,815	
Subtotal	\$324	\$331	\$337	\$258	\$263	\$268	\$274	\$279	\$285	\$290	\$296	\$302	\$308	-	-	\$3,815	4%
ENERGY EFFICIENCY SUBTOTAL	\$7,039	\$8,893	\$7,499	\$6,623	\$6,706	\$6,573	\$6,658	\$5,998	\$6,031	\$5,962	\$6,057	\$5,879	\$5,028	\$4,754	\$2,955	\$92,655	100%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Customer Sited Load Displacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
FUEL CHOICE																	
Fuel Choice	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
FUEL CHOICE SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
OTHER EMERGING TECHNOLOGIES																	
Residential Solar Thermal Program - Pool Heating	-	-	\$8	\$9	\$11	\$13	\$15	\$18	\$21	\$24	\$29	\$34	\$40	\$46	\$54	\$322	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	-	\$8	\$9	\$11	\$13	\$15	\$18	\$21	\$24	\$29	\$34	\$40	\$46	\$54	\$322	0%
Subtotal of Programs	\$7,039	\$8,893	\$7,507	\$6,632	\$6,717	\$6,586	\$6,673	\$6,016	\$6,052	\$5,986	\$6,086	\$5,912	\$5,068	\$4,800	\$3,009	\$92,976	100%
Program Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Incentive Costs (2015 to 2029)	\$7,039	\$8,893	\$7,507	\$6,632	\$6,717	\$6,586	\$6,673	\$6,016	\$6,052	\$5,986	\$6,086	\$5,912	\$5,068	\$4,800	\$3,009	\$92,976	
Total Committed to Date																\$60,642	
TOTAL INCENTIVE COSTS (1989 to 2029)	\$7,039	\$8,893	\$7,507	\$6,632	\$6,717	\$6,586	\$6,673	\$6,016	\$6,052	\$5,986	\$6,086	\$5,912	\$5,068	\$4,800	\$3,009	\$153,619	

Note: May not add up due to rounding.

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Interim Estimates 2014/15	Benchmark 2029/30
RESIDENTIAL															
incentive Based															
Home Insulation Program	-	-	-	-	0.3	2.2	3.9	5.6	7.6	9.0	10.2	11.3	12.0	12.7	12.7
Affordable Energy Program	-	-	-	-	-	-	0.0	0.1	0.7	2.3	3.5	4.6	5.8	7.1	7.1
Water and Energy Saver Program	-	-	-	-	-	-	-	-	-	0.8	1.8	2.8	3.4	4.0	4.0
	-	-	-	-	0.3	2.2	3.9	5.6	8.3	12.2	15.4	18.7	21.1	23.7	23.7
CUSTOMER SERVICE INITIATIVES															
Power Smart Residential Loan Program	1.2	2.1	3.5	5.6	7.8	9.6	11.3	12.3	13.9	14.3	14.6	14.9	15.2	15.5	15.5
Residential Earth Power Loan Program	-	0.1	0.1	0.5	0.8	1.0	1.3	1.4	1.7	2.1	2.4	2.7	2.9	2.9	2.9
ecoEnergy	-	0.1	0.4	1.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Solar Water Heater Program	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-2000	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
Power Smart Energy Manager	-0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Residential PAYS	-	-	-	-	-	-	-	-	-	-	-	-0.0	-0.0	-0.0	-0.0
	1.2	2.4	4.3	7.7	11.3	13.2	15.3	16.4	18.3	19.0	19.7	20.3	20.8	21.0	21.0
DISCONTINUED/COMPLETED															
Residential Thermostats Program	-	-	-	-	-	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
High Efficiency Furnace and Boiler Program	-	-	-	-	0.6	2.6	4.0	5.8	6.9	7.0	7.0	7.0	7.0	7.0	7.0
New Homes Program	-	-	-	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.6
	-	-	-	0.0	0.7	2.9	4.4	6.3	7.5	7.7	7.7	7.7	7.7	7.7	7.7
RESIDENTIAL TOTAL	1.2	2.4	4.3	7.7	12.2	18.2	23.6	28.3	34.1	38.8	42.8	46.6	49.6	52.5	52.5
COMMERCIAL															
Incentive Based															
Commercial Insulation Program	-	-	-	-	-	0.3	1.1	2.1	3.2	5.4	6.8	7.8	9.2	11.1	11.1
Commercial Windows Program	-	-	-	-	-	0.0	0.1	0.2	0.5	0.8	1.3	1.6	1.9	2.3	2.3
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	0.1	0.2	0.3	1.4	1.5	1.5	1.5
City Of Winnipeg Power Smart Agreement Program	-	0.1	0.1	0.2	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	0.0	0.0	0.1	0.1	0.1	0.1	0.5	0.5
Power Smart Shops Program	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Commercial Building Optimization Program	-	-	-	-	-	-	-	0.1	0.2	0.4	0.4	0.4	0.6	0.6	0.0
New Buildings Program	-	-	-	-	-	-	-	-	-	-	0.4	2.8	2.9	3.0	3.0
HVAC-Boiler	-	-	-	-	-	0.4	2.5	4.8	6.2	6.2	7.2	8.2	9.5	10.9	10.9
HVAC-CO2 Sensor	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.6	0.6
	-	0.1	0.1	0.2	0.6	1.4	4.4	8.0	11.0	13.8	17.2	23.4	26.6	31.4	30.8
DISCONTINUED/COMPLETED															
Commercial Spray Valves Program	-	-	-	-	-	0.8	1.1	2.1	2.4	2.4	-	-	-	-	-
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	0.8	1.1	2.1	2.4	2.4	-	-	-	-	-
CUSTOMER SERVICE INITIATIVES															
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1
	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1
COMMERCIAL TOTAL	-	0.1	0.1	0.2	0.6	2.2	5.5	10.1	13.4	16.2	17.2	23.4	26.6	31.5	30.9
INDUSTRIAL															
Natural Gas Optimization Program	-	-	-	-	-	-	1.7	3.8	4.9	8.0	10.5	12.5	13.4	15.0	15.0
	-	-	-	-	-	-	1.7	3.8	4.9	8.0	10.5	12.5	13.4	15.0	15.0
EFFICIENCY PROGRAMS SUBTOTAL	1.2	2.4	4.4	7.9	12.8	20.5	30.8	42.3	52.4	63.1	70.5	82.5	89.6	99.0	98.4
CUSTOMER SELF-GENERATION PROGRAMS															
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RATE/LOAD MANAGEMENT PROGRAMS															
Interactive Effects	-	-0.0	-0.0	-1.2	-2.6	-3.0	-3.8	-5.9	-8.9	-10.5	-11.3	-12.0	-13.0	-14.5	-13.3
Subtotal after Interactive Effects	1.2	2.4	4.4	6.7	10.2	17.5	27.0	36.4	43.5	52.6	59.2	70.4	76.6	84.5	85.1
Codes, Standards & Regulations	0.3	0.7	1.1	1.6	2.0	2.4	2.7	3.0	3.5	4.4	9.9	13.2	16.0	16.0	16.0
Power Smart Impacts	1.6	3.1	5.5	8.2	12.2	19.8	29.7	39.4	47.0	57.0	69.1	83.6	92.7	100.5	101.2

Note: May not add up due to rounding.

Savings To Date File Name

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Interim Estimate 2014/15	Cumulative Total 2014/15
RESIDENTIAL															
Incentive Based															
Home Insulation Program	-	-	-	-	\$354	\$1,760	\$2,873	\$2,710	\$2,902	\$2,210	\$2,104	\$1,411	\$1,117	\$1,235	\$18,677
Affordable Energy Program	-	-	-	-	\$74	-	\$160	\$204	\$733	\$791	\$822	\$642	\$3,029	\$622	\$7,077
Water and Energy Saver Program	-	-	-	-	-	-	-	-	\$40	\$680	\$1,024	\$775	\$761	\$1,250	\$4,530
Subtotal	-	-	-	-	\$428	\$1,760	\$3,033	\$2,914	\$3,675	\$3,681	\$3,951	\$2,827	\$4,908	\$3,107	\$30,284
CUSTOMER SERVICE INITIATIVES															
Power Smart Residential Loan Program	\$366	\$97	\$44	-	\$14	\$168	-	-	-	-	-	-	-	\$510	-
Residential Earth Power Loan Program	-	-	-	-	-	-	-	-	-	-	\$36	\$53	\$111	\$14	\$214
ecoEnergy	\$210	\$249	\$253	\$312	-	\$599	\$468	-	\$557	\$378	\$470	-	\$2	-	\$3,268
Residential PAYS	-	-	-	-	-	-	-	-	-	-	\$18	\$425	\$90	\$24	\$557
Solar Water Heater Program	-	-	-	-	-	-	-	\$0	\$2	-	-	-	-	-	\$2
Subtotal	\$576	\$346	\$297	\$307	\$5	\$767	\$447	-	\$2	-	-	-	-	\$548	\$2,014
DISCONTINUED/COMPLETED															
Residential Thermostats Program	-	-	-	-	-	\$184	\$127	\$37	\$1	-	-	-	-	-	\$349
New Homes Program	-	\$11	\$67	\$84	\$57	\$89	\$133	\$0	\$85	\$108	\$64	\$5	-	-	\$704
High Efficiency Furnace and Boiler Program	-	-	-	-	\$547	\$1,261	\$2,046	\$3,119	\$1,509	\$30	-	-	-	-	\$8,513
Subtotal	-	\$11	\$67	\$84	\$604	\$1,535	\$2,306	\$3,157	\$1,595	\$138	\$64	\$5	-	-	\$9,566
RESIDENTIAL EXPLORATORY															
Residential Solar Power Program	-	-	-	-	-	-	-	-	-	\$7	\$8	-	-	-	\$15
RESIDENTIAL TOTAL	\$576	\$357	\$364	\$391	\$1,037	\$4,062	\$5,787	\$5,859	\$5,183	\$3,510	\$4,001	\$2,549	\$4,548	\$3,655	\$41,880
COMMERCIAL															
Incentive Based															
Commercial Insulation Program	-	-	-	-	-	\$401	\$796	\$995	\$1,224	\$2,186	\$1,752	\$1,108	\$1,728	\$2,661	\$12,851
Commercial Windows Program	-	-	-	-	-	\$123	\$271	\$455	\$768	\$988	\$1,093	\$796	\$964	\$1,056	\$6,513
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	\$158	\$152	\$158	\$505	\$264	\$96	\$1,313
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Kitchen Appliances Program	-	-	-	-	-	-	\$16	\$54	\$29	\$47	\$27	\$15	\$149	\$337	
Power Smart Shops Program	-	-	-	-	-	-	\$1	\$15	\$79	\$94	\$11	\$0	\$1	\$202	
Commercial Building Optimization Program	-	-	-	-	\$71	\$219	\$152	\$155	\$231	\$203	\$118	\$92	\$125	\$79	\$1,445
New Buildings Program	-	-	-	-	-	-	\$141	\$106	\$191	\$198	\$1,043	\$198	\$520	\$2,397	
HVAC - Boiler Program	-	-	-	-	\$98	\$579	\$1,598	\$1,359	\$1,103	\$1,216	\$915	\$1,178	\$1,276	\$1,324	\$10,647
HVAC - CO2 Sensor Program	-	-	-	-	-	-	-	-	-	-	\$36	\$11	\$124	\$171	
HVAC - Water Heaters Program	-	-	-	-	-	-	-	-	-	-	-	-	\$16	\$16	
Power Smart Energy Manager	-	-	-	-	-	-	\$114	\$93	\$70	\$0	\$51	\$0	\$1	\$329	
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	\$151	\$92	\$243	\$243	
Subtotal	-	-	-	-	\$169	\$1,321	\$2,933	\$3,229	\$3,773	\$5,059	\$4,344	\$4,936	\$4,675	\$6,024	\$36,465
DISCONTINUED/COMPLETED															
Commercial Spray Valves Program	-	-	-	-	-	\$122	\$53	\$120	\$26	\$21	\$1	\$0	\$0	-	\$344
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	\$122	\$53	\$120	\$26	\$21	\$1	\$0	\$0	-	\$344
COMMERCIAL EXPLORATORY															
Commercial Hot Water Program	-	-	-	-	-	-	-	-	\$22	\$30	\$14	\$0	\$2	-	\$69
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	\$4	\$11	-	-	-	\$15
Subtotal	-	-	-	-	-	-	-	-	\$22	\$35	\$25	\$0	\$2	-	\$83
COMMERCIAL TOTAL	-	-	-	-	\$169	\$1,443	\$2,986	\$3,349	\$3,821	\$5,115	\$4,371	\$4,937	\$4,677	\$6,024	\$36,892
INDUSTRIAL															
Natural Gas Optimization Program	-	-	-	-	\$96	\$35	\$279	\$329	\$589	\$694	\$707	\$753	\$480	\$560	\$4,521
Subtotal	-	-	-	-	\$96	\$35	\$279	\$329	\$589	\$694	\$707	\$753	\$480	\$560	\$4,521
EFFICIENCY PROGRAMS SUBTOTAL	\$576	\$357	\$364	\$391	\$1,302	\$5,540	\$9,052	\$9,537	\$9,593	\$9,318	\$9,079	\$8,239	\$9,705	\$10,239	\$83,293
CUSTOMER SELF-GENERATION PROGRAMS															
Bioenergy Optimization Program	-	-	-	-	-	-	\$13	\$8	-	-	-	-	-	-	\$21
Support Costs	\$678	\$484	\$455	\$696	\$1,068	\$2,150	\$1,769	\$1,768	\$1,828	\$1,283	\$1,743	\$1,393	\$968	\$1,621	\$17,903
GRAND TOTAL	\$1,255	\$841	\$819	\$1,087	\$2,370	\$7,690	\$10,834	\$11,312	\$11,421	\$10,601	\$10,821	\$9,632	\$10,673	\$11,861	\$101,217

Note: May not add up due to rounding.

Savings To Date File Name

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Interim Estimate 2014/15	Cumulative Total 2014/15
RESIDENTIAL															
Incentive Based															
Home Insulation Program	-	-	-	-	\$161	\$504	\$737	\$587	\$465	\$494	\$518	\$184	\$187	\$336	\$4,173
Affordable Energy Program	-	-	-	-	\$74	-	\$136	\$127	\$181	\$907	\$369	\$226	\$759	\$135	\$2,913
Water and Energy Saver Program	-	-	-	-	-	-	-	-	\$40	\$125	\$595	\$728	\$540	\$931	\$2,958
Subtotal	-	-	-	-	\$234	\$504	\$873	\$715	\$685	\$1,526	\$1,482	\$1,138	\$1,485	\$1,402	\$10,044
CUSTOMER SERVICE INITIATIVES															
Power Smart Residential Loan Program	\$366	\$97	\$44	-	\$14	\$168	-	-	-	-	\$36	\$53	\$111	\$510	\$214
Residential Earth Power Loan Program	-	-	-	-	-	-	-	-	-	-	\$36	\$53	\$111	\$14	\$214
ecoEnergy	\$210	\$249	\$253	\$312	-	\$599	\$468	-	\$557	\$378	\$470	\$53	\$111	\$2	\$3,268
Residential PAYS	-	-	-	-	-	-	-	-	-	-	\$18	\$425	\$90	\$24	\$557
Solar Water Heater Program	-	-	-	-	-	-	-	\$0	\$2	-	-	-	-	-	\$2
Subtotal	\$576	\$346	\$297	\$307	\$5	\$767	\$447	\$0	\$2	\$378	\$470	\$53	\$111	\$548	\$2,014
DISCONTINUED/COMPLETED															
Residential Thermostats Program	-	-	-	-	-	\$105	\$91	\$18	\$1	-	-	-	-	-	\$215
New Homes Program	-	\$11	\$67	\$69	\$19	\$30	\$48	\$0	\$15	-	\$17	\$1	-	-	\$276
High Efficiency Furnace and Boiler Program	-	-	-	-	\$247	\$276	\$433	\$350	\$192	\$17	-	-	-	-	\$1,515
Subtotal	-	\$11	\$67	\$69	\$266	\$411	\$572	\$368	\$208	\$17	\$17	\$1	-	-	\$2,006
RESIDENTIAL EXPLORATORY															
Residential Solar Power Program	-	-	-	-	-	-	-	-	-	\$7	\$8	-	-	-	\$15
RESIDENTIAL TOTAL	\$576	\$357	\$364	\$376	\$505	\$1,682	\$1,892	\$871	\$806	\$1,233	\$1,486	\$856	\$1,125	\$1,951	\$14,079
COMMERCIAL															
Incentive Based															
Commercial Insulation Program	-	-	-	-	-	\$71	\$73	\$170	\$173	\$218	\$270	\$114	\$93	\$517	\$1,699
Commercial Windows Program	-	-	-	-	-	\$78	\$83	\$120	\$138	\$167	\$174	\$98	\$69	\$190	\$1,117
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	\$57	\$59	\$92	\$94	\$139	\$76	\$517
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Kitchen Appliances Program	-	-	-	-	-	-	\$8	\$23	\$10	\$27	\$19	\$9	\$9	\$59	\$156
Power Smart Shops Program	-	-	-	-	-	\$1	\$15	\$79	\$92	\$11	-	\$1	-	\$1	\$199
Commercial Building Optimization Program	-	-	-	-	\$71	\$219	\$114	\$152	\$152	\$80	\$68	\$77	\$79	\$79	\$1,164
New Buildings Program	-	-	-	-	-	-	\$141	\$106	\$119	\$125	\$336	\$89	\$110	\$110	\$1,026
HVAC - Boiler Program	-	-	-	-	\$98	\$270	\$286	\$247	\$342	\$258	\$288	\$301	\$304	\$435	\$2,829
HVAC - CO2 Sensor Program	-	-	-	-	-	-	-	-	-	-	\$25	\$10	\$31	\$31	\$66
HVAC - Water Heaters Program	-	-	-	-	-	-	-	-	-	-	-	-	\$16	\$16	\$16
Power Smart Energy Manager	-	-	-	-	-	-	\$114	\$91	\$70	-	\$51	-	\$1	-	\$327
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	-	\$151	\$92	-	\$243
Subtotal	-	-	-	-	\$169	\$638	\$710	\$906	\$1,139	\$1,074	\$1,117	\$1,207	\$884	\$1,514	\$9,359
DISCONTINUED/COMPLETED															
Commercial Spray Valves Program	-	-	-	-	-	\$50	\$30	\$25	\$17	\$2	\$1	-	\$0	-	\$126
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	\$0	\$0	\$0	-	\$0
Subtotal	-	-	-	-	-	\$50	\$30	\$25	\$17	\$2	\$1	\$0	\$0	-	\$126
COMMERCIAL EXPLORATORY															
Commercial Hot Water Program	-	-	-	-	-	-	-	-	\$22	\$30	\$14	-	\$2	-	\$68
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	-	\$11	-	-	-	\$11
Subtotal	-	-	-	-	-	-	-	-	\$22	\$30	\$25	-	\$2	-	\$79
COMMERCIAL TOTAL	-	-	-	-	\$169	\$688	\$740	\$931	\$1,178	\$1,107	\$1,143	\$1,207	\$886	\$1,514	\$9,564
INDUSTRIAL															
Natural Gas Optimization Program	-	-	-	-	\$96	\$35	\$89	\$86	\$163	\$116	\$172	\$244	\$201	\$150	\$1,352
Subtotal	-	-	-	-	\$96	\$35	\$89	\$86	\$163	\$116	\$172	\$244	\$201	\$150	\$1,352
EFFICIENCY PROGRAMS SUBTOTAL	\$576	\$357	\$364	\$376	\$770	\$2,405	\$2,721	\$1,887	\$2,147	\$2,456	\$2,801	\$2,307	\$2,213	\$3,615	\$24,995
CUSTOMER SELF-GENERATION PROGRAMS															
Bioenergy Optimization Program	-	-	-	-	-	-	\$13	\$8	-	-	-	-	-	-	\$21
Support Costs	\$678	\$484	\$455	\$696	\$1,068	\$2,150	\$1,769	\$1,768	\$1,828	\$1,283	\$1,743	\$1,393	\$968	\$1,621	\$17,903
GRAND TOTAL	\$1,255	\$841	\$819	\$1,072	\$1,838	\$4,555	\$4,503	\$3,663	\$3,974	\$3,739	\$4,544	\$3,700	\$3,181	\$5,236	\$42,919

Note: May not add up due to rounding.

Savings To Date File Name

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Interim 2014/15	Cumulative 2014/15
RESIDENTIAL															
Incentive Based															
Home Insulation Program	-	-	-	-	\$193	\$1,256	\$2,137	\$2,123	\$2,438	\$1,717	\$1,585	\$1,226	\$931	\$899	\$14,505
Affordable Energy Program	-	-	-	-	-	-	\$22	\$335	\$1,349	\$1,178	\$453	\$416	\$2,271	\$487	\$6,511
Water and Energy Saver Program	-	-	-	-	-	-	-	-	\$555	\$430	\$47	\$222	\$319	\$319	\$1,572
Subtotal	-	-	-	-	\$193	\$1,256	\$2,159	\$2,458	\$3,787	\$3,449	\$2,468	\$1,690	\$3,423	\$1,704	\$22,587
DISCONTINUED/COMPLETED															
Residential Thermostats Program	-	-	-	-	-	\$79	\$35	\$20	-	-	-	-	-	-	\$134
New Homes Program	-	-	-	\$15	\$38	\$60	\$86	-	\$71	\$108	\$47	\$4	-	-	\$428
High Efficiency Furnace and Boiler Program	-	-	-	-	\$300	\$985	\$1,613	\$2,769	\$1,317	\$14	-	-	-	-	\$6,998
Subtotal	-	-	-	\$15	\$338	\$1,124	\$1,734	\$2,789	\$1,387	\$121	\$47	\$4	-	-	\$7,560
RESIDENTIAL TOTAL	-	-	-	\$15	\$531	\$2,380	\$3,893	\$5,247	\$5,175	\$3,570	\$2,515	\$1,693	\$3,423	\$1,704	\$30,147
COMMERCIAL															
Incentive Based															
Commercial Insulation Program	-	-	-	-	-	\$330	\$723	\$825	\$1,051	\$1,968	\$1,482	\$993	\$1,635	\$2,144	\$11,152
Commercial Windows Program	-	-	-	-	-	\$45	\$188	\$335	\$629	\$821	\$919	\$698	\$895	\$865	\$5,396
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	\$81	\$93	\$66	\$410	\$125	\$20	\$796
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	\$8	\$31	\$19	\$20	\$8	\$6	\$90	\$181
Power Smart Shops Program	-	-	-	-	-	-	-	-	\$1	\$2	-	\$0	-	-	\$3
Commercial Building Optimization Program	-	-	-	-	-	-	-	\$41	\$78	\$51	\$38	\$24	\$48	-	\$281
New Buildings Program	-	-	-	-	-	-	-	-	\$73	\$74	\$74	\$707	\$108	\$409	\$1,371
HVAC - Boiler Program	-	-	-	-	-	\$308	\$1,312	\$1,112	\$762	\$958	\$628	\$877	\$970	\$889	\$7,815
HVAC - CO2 Sensor Program	-	-	-	-	-	-	-	-	-	-	\$11	\$0	\$0	\$93	\$105
Power Smart Energy Manager	-	-	-	-	-	-	-	\$2	-	\$0	-	\$0	-	-	\$2
Subtotal	-	-	-	-	-	\$683	\$2,223	\$2,323	\$2,634	\$3,985	\$3,227	\$3,729	\$3,788	\$4,511	\$27,103
DISCONTINUED/COMPLETED															
Commercial Spray Valves Program	-	-	-	-	-	\$72	\$24	\$95	\$9	\$18	-	\$0	-	-	\$218
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	\$72	\$24	\$95	\$9	\$18	-	\$0	-	-	\$218
COMMERCIAL EXPLORATORY															
Commercial Hot Water Program	-	-	-	-	-	-	-	-	-	-	-	\$0	-	-	\$0
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	\$4	-	-	-	-	\$4
Subtotal	-	-	-	-	-	-	-	-	-	\$4	-	\$0	-	-	\$4
COMMERCIAL TOTAL	-	-	-	-	-	\$755	\$2,246	\$2,418	\$2,643	\$4,008	\$3,227	\$3,729	\$3,788	\$4,511	\$27,326
INDUSTRIAL															
Natural Gas Optimization Program	-	-	-	-	-	-	\$190	\$243	\$426	\$578	\$535	\$509	\$278	\$410	\$3,169
Subtotal	-	-	-	-	-	-	\$190	\$243	\$426	\$578	\$535	\$509	\$278	\$410	\$3,169
EFFICIENCY PROGRAMS SUBTOTAL	-	-	-	\$15	\$531	\$3,135	\$6,329	\$7,908	\$8,243	\$8,156	\$6,277	\$5,932	\$7,490	\$6,625	\$60,642
CUSTOMER SELF-GENERATION PROGRAMS															
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GRAND TOTAL	-	-	-	\$15	\$531	\$3,135	\$6,329	\$7,908	\$8,243	\$8,156	\$6,277	\$5,932	\$7,490	\$6,625	\$60,642

Note: May not add up due to rounding.

Appendix E - Program Evaluation Criteria

Manitoba Hydro's Power Smart programs take into account the underlying differences in the electricity and natural gas industries and the nature of the programs evaluated. Power Smart programs are assessed annually to ensure the individual programs as well as the overall portfolio of programs are cost-effective and meeting intended market transformation objectives and targets.

Nature of Electricity and Natural Gas Markets

The nature of the electricity and natural gas markets are similar, however unique differences exist and need to be considered in Manitoba Hydro's Power Smart initiative.

For electricity, lower consumption in Manitoba and lower utility revenue is offset by higher revenues realized by selling the conserved energy in the export market. Lower electricity consumption also defers the need to invest in new transmission facilities that would be required to meet future domestic demand. Load management and certain types of demand response initiatives are also unique elements of electricity markets (e.g. short term price volatility creates opportunities for cost-effective load management and demand response initiatives). The combined effect results in an economic case for Manitoba Hydro to aggressively pursue electricity DSM in Manitoba.

With natural gas, lower consumption in Manitoba is offset by lower natural gas purchases from Alberta. In general, this is a one-to-one relationship as Manitoba Hydro passes the cost of primary natural gas and transportation through to its customers with no mark up on the commodity. Load management opportunities are generally not available in the natural gas market as these operational issues are handled through natural gas storage facilities.

Program Categories

Customer Service Programs

Customer service programs are those programs offered as part of the overall Power Smart initiative that represent the customer service levels that would be expected of a utility. Customer service programs and services are assessed by the aggregate value realized by both the Corporation's customers and the Corporation. These assessments are undertaken on an ongoing basis and require a qualitative evaluation of the benefits. Service levels are then adjusted accordingly.

Cost-Recovery Programs

Cost-recovery programs are those programs where the cost associated with the program is recovered from participating customers through fees or charges (e.g. interest rates). The cost-effectiveness of these programs is assessed annually with fees or charges adjusted accordingly.

Financial Loan Programs

Financial Loan Programs assists participating customers in the installation and/or upgrade of energy efficient measures by offering low interest financing opportunities.

Incentive Based Programs

Incentive based programs are those programs where Power Smart uses a financial incentive to encourage customer participation. Assessments provide feedback on the success and cost-effectiveness of individual programs and the Power Smart portfolio. The results of these assessments drive program design and strategy modifications.

Energy Efficient Codes and Standards

In many markets, the most effective and permanent form of market transformation for energy efficient technologies and practices is the adoption of energy efficient codes and standards as it ensures that customers do not revert to less efficient technologies/practices once the incentives and/or promotional activities are discontinued. Consequently, the process of achieving these changes is complex and lengthy as it involves many stakeholders, varying environmental and market conditions and market acceptance.

Manitoba Hydro's strategy to affect change in codes and standards involves being an aggressive and active participant and in many cases, a driving force on a number of provincial and national energy efficiency codes and standards committees (e.g. Manitoba Hydro representatives often chair committees). The focus of Manitoba Hydro's efforts on these committees is towards developing new energy efficient technologies, developing energy efficient codes and standards and facilitating market acceptance of new technologies and building design practices.

Economic Effectiveness Metrics

Manitoba Hydro uses a number of cost effective metrics to assess energy efficient opportunities, including whether to pursue an opportunity, how aggressively an opportunity will be pursued, effectiveness of program design options and the relative investment from ratepayers and participants. In addition to quantitative assessments, Manitoba Hydro also considers various qualitative factors including equity (i.e. reasonable participation by various ratepayer sectors such as lower income) and overall contribution towards having a balanced energy conservation strategy and plan.

Quantitative assessments include using the following cost effective metrics:

Integrated Metrics

- Societal Cost (SC);
- Total Resource Cost (TRC);
- Total Resource Cost NPV (TRC NPV);
- Levelized Resource Cost (LRC)

Utility Metrics

- Rate Impact Measure Cost (RIM);
- Net Utility Benefit (NUB);
- Utility Net Present Value (Utility NPV)
- Levelized Utility Cost (LUC);

Customer Metrics

- Simple Customer Payback calculation;
- Participating Customer Cost (PC); and
- Participating Customer Cost Net Present Value (PC NPV).

Integrated Metrics

Societal Cost (SC)

The Societal Cost (SC) metric measures the net economic benefit as measured by the TRC, plus additional indirect benefits such the avoided environmental or societal externalities (e.g. reduced health care costs, increase productivity, employment) and “non-priced” benefits enjoyed by participants (improved comfort, improved health).

$$SC = \frac{(PV (\text{Marginal Benefits}) \times 1.10) + PV (\text{Measurable Non-Energy benefits})}{PV (\text{Total Program Admin Costs} + \text{Incremental Product Costs})}$$

Where:

- For electricity, the Marginal Benefits includes the revenue realized by Manitoba Hydro from conserved electricity being sold in the export market, the avoided cost of new infrastructure (e.g. electric transmission facilities)
- Measurable non-energy benefits (e.g. water savings);
- For natural gas, the Marginal Benefits includes Manitoba Hydro’s avoided cost of purchasing natural gas, avoided transportation costs, the value of reduced greenhouse gas emissions (GHGs) and measurable non-energy benefits (e.g. water savings);
- Total Program Admin Costs includes the administrative costs involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incremental Product Costs includes the total incremental cost associated with implementing an energy efficient opportunity. It is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.

Total Resource Cost (TRC)

The Total Resource Cost (TRC) metric assesses whether the benefits that are associated with an energy efficiency program are greater than the costs. This assessment is undertaken irrespective of who realizes the benefits and who pays the costs with any economic transfers between the Corporation and the participating customer being excluded.

In general, if program offers greater benefits relative to costs, then a program for pursuing the opportunity should be considered, however Manitoba Hydro will also consider supporting certain programs where the benefits are less than the costs. In the latter case, the rationale driving the support will be driven by other qualitative factors such as supporting emerging technologies (e.g. solar panels) or targeting low participation market sectors (e.g. lower income). The Total Resource Cost metric is defined as follows:

$$\text{TRC} = \frac{\text{PV (Marginal Benefits)} + \text{PV (Measurable Non-Energy Benefits)}}{\text{PV (Total Program Admin Costs + Incremental Product Costs)}}$$

Where:

- For electricity, the Marginal Benefits includes the revenue realized by Manitoba Hydro from conserved electricity being sold in the export market, the avoided cost of new infrastructure (e.g. electric transmission facilities);
- Measurable non-energy benefits (e.g. water savings);
- For natural gas, the Marginal Benefits includes Manitoba Hydro's avoided cost of purchasing natural gas, avoided transportation costs, the value of reduced greenhouse gas emissions (GHGs) and measurable non-energy benefits (e.g. water savings);
- Total Program Admin Costs includes the administrative costs involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incremental Product Costs includes the total incremental cost associated with implementing an energy efficient opportunity. It is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.

Total Resource Cost Net Present Value (TRC NPV)

The Total Resource Cost Net Present Value (TRC NPV) calculation reveals if the economic value of the benefits that are associated with an energy efficiency program are greater than the costs.

$$\text{TRC NPV} = (\text{PV (Marginal Benefits)} + \text{PV (Measurable Non-Energy Benefits)}) - \text{PV (Total Program Admin Costs + Incremental Product Costs)}$$

Where:

- For electricity, the Marginal Benefits includes the revenue realized by Manitoba Hydro from conserved electricity being sold in the export market, the avoided cost of new infrastructure (e.g. electric transmission facilities) and measurable non-energy benefits (e.g. water savings);
- For natural gas, the Marginal Benefits includes Manitoba Hydro's avoided cost of purchasing natural gas, avoided transportation costs, the value of reduced greenhouse gas emissions (GHGs) and measurable non-energy benefits (e.g. water savings);
- Total Program Admin Costs includes the administrative costs involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incremental Product Costs includes the total incremental cost associated with implementing an energy efficient opportunity. It is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.

Levelized Resource Cost (LRC)

The Levelized Resource Cost (LRC) is used to determine the overall economic resource cost of energy saved through an energy efficiency program. The LRC provides a levelized cost of energy saved per unit over a fixed time period. The Levelized Resource Cost is defined as follows:

$$\text{LRC} = \frac{\text{PV (Incremental Product Costs + Total Program Admin Costs)}}{\text{PV (Energy)}}$$

Where:

- Incremental Product Costs includes the total incremental cost associated with implementing an energy efficient opportunity. It is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.
- Utility Program Admin Costs includes administrative costs incurred by Manitoba Hydro for staff involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Energy includes the annual energy savings.

Utility Metrics

Rate Impact Measure Cost (RIM)

The Rate Impact Measure (RIM) metric is used to provide an indication of the long term impact of an energy efficient program on energy rates. The metric is a benefit/cost ratio that represents the economic impact of a program from the ratepayer's perspective. All program related savings and costs incurred by the utility, including revenue loss and incentive payments, are taken into account in this assessment. The Rate Impact Measure metric is defined as follows:

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

Where:

- For electricity, the Utility Marginal Benefits includes the revenue realized by Manitoba Hydro from conserved electricity being sold in the export market and the avoided cost of new infrastructure (e.g. electric transmission facilities);
- For natural gas, the Utility Marginal Benefits includes Manitoba Hydro's avoided cost of purchasing natural gas and avoided transportation costs;
- Revenue Loss includes Manitoba Hydro's lost revenue associated with the participants' reduced energy consumption (i.e. customer energy bill reductions);
- Utility Program Admin Costs includes administrative costs incurred by Manitoba Hydro for staff involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incentives include the funds transferred from Manitoba Hydro to the participant associated with implementing the Power Smart measure.

Net Utility Benefit (NUB)

The Net Utility Benefit (NUB) metric is used to measure the energy saving benefits to the utility net of any revenue losses. Marginal benefits, after deductions from lost revenue are compare to the cost incurred by the by the utility. The Net Utility Benefit metric is defined as follows:

$$\text{NUB} = \frac{\text{PV (Utility Marginal Benefits) - PV (Revenue Loss)}}{\text{PV (Utility Program Admin Costs + Incentives)}}$$

Where:

- For electricity, the Utility Marginal Benefits includes the revenue realized by Manitoba Hydro from conserved electricity being sold in the export market and the avoided cost of new infrastructure (e.g. electric transmission facilities);
- For natural gas, the Utility Marginal Benefits includes Manitoba Hydro's avoided cost of purchasing natural gas and avoided transportation costs;
- Revenue Loss includes Manitoba Hydro's lost revenue associated with the participants' reduced energy consumption (i.e. customer energy bill reductions);
- Utility Program Admin Costs includes administrative costs incurred by Manitoba Hydro for staff involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incentives include the funds transferred from Manitoba Hydro to the participant associated with implementing the Power Smart measure.

Utility Net Present Value (Utility NPV)

The Utility Net Present Value (Utility NPV) calculation reveals from the Utility's perspective, if the economic value of the benefits that are associated with an energy efficiency program are greater than the costs.

$$\text{Utility NPV} = \text{PV (Marginal Benefits - Revenue Loss)} - \text{PV (Utility Program Admin Costs + Incentives)}$$

Where:

- For electricity, the Utility Marginal Benefits includes the revenue realized by Manitoba Hydro from conserved electricity being sold in the export market and the avoided cost of new infrastructure (e.g. electric transmission facilities);
- For natural gas, the Utility Marginal Benefits includes Manitoba Hydro's avoided cost of purchasing natural gas and avoided transportation costs;
- Revenue Loss includes Manitoba Hydro's lost revenue associated with the participants' reduced energy consumption (i.e. customer energy bill reductions);
- Utility Program Admin Costs includes administrative costs incurred by Manitoba Hydro for staff involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incentives include the funds transferred from Manitoba Hydro to the participant associated with implementing the Power Smart measure.

Levelized Utility Cost (LUC)

The Levelized Utility Cost (LUC) is used to provide an economic cost value for the energy saved through an energy efficiency program. The LUC provides the total cost of the conserved energy based upon the utility's investment on behalf of the ratepayer on a per unit basis levelized over a fixed time period. The cost value allows for a comparison to other supply options and other DSM programs occurring over different timeframes. The Levelized Utility Cost is defined as follows:

$$\text{LUC} = \frac{\text{PV (Utility Program Admin Costs + Incentives)}}{\text{PV (Energy)}}$$

Where:

- Utility Program Admin Costs includes administrative costs incurred by Manitoba Hydro for staff involved in program planning, design, marketing, implementation and evaluation. It includes all costs associated with offering the Power Smart program, except for customer incentive costs;
- Incentives includes the funds transferred from Manitoba Hydro to the participant associated with implementing the Power Smart measure;
- Energy includes the annual energy savings.

Customer Metrics

Simple Customer Payback Calculation (Payback)

The Simple Customer Payback calculation provides the simple payback of implementing an energy efficient opportunity for customers. This value outlines the amount of time required before the customer recovers the incremental product cost. The value is useful in projecting customer participation rates for energy efficient opportunities. The Customer Payback is defined as follows:

$$CP = \frac{\text{Participant Costs - Incentives}}{\text{Annual Bill Reductions}}$$

Where:

- Participant Costs includes the participant's total incremental cost associated with implementing the energy efficient opportunity, which is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.
- Incentives includes funds provided by Manitoba Hydro and external parties to the participant associated with implementing the energy efficient opportunity;
- Annual Bill Reductions include the first year dollar reductions in the customer's electricity, natural gas, and water bills.

Participating Customer Cost (PC)

The Participating Customer Cost (PC) metric evaluates from a customer perspective if the benefits that are associated with an energy efficiency program are greater than the costs over the life of the measure. The Participating Customer Cost is defined as follows:

$$PC = \frac{PV(\text{Incentives} + \text{Revenue Loss})}{PV(\text{Incremental Product Costs})}$$

Where:

- Incentives include the funds transferred from Manitoba Hydro to the participant associated with implementing the Power Smart measure.
- Revenue Loss includes Manitoba Hydro's lost revenue associated with the participants' reduced energy consumption (i.e. customer energy and measurable non-energy (i.e. water) bill reductions);
- Incremental Product Costs includes the total incremental cost associated with implementing an energy efficient opportunity. It is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.

Participating Customer Cost Net Present Value (PC NPV)

The Participating Customer Cost Net Present Value (PC NPV) calculation reveals from the customer's perspective, if the economic value of the benefits that are associated with an energy efficiency program are greater than the costs over the life of the measure.

$$\text{PC NPV} = \text{PV (Incentives + Revenue Loss)} - \text{PV (Incremental Product Costs)}$$

Where:

- Incentives include the funds transferred from Manitoba Hydro to the participant associated with implementing the Power Smart measure.
- Revenue Loss includes Manitoba Hydro's lost revenue associated with the participants' reduced energy consumption (i.e. customer energy and measurable non-energy (i.e. water) bill reductions);
- Incremental Product Costs includes the total incremental cost associated with implementing an energy efficient opportunity. It is the difference in costs between the energy efficient technology and the standard technology that would have been installed in the absence of the program.

Other DSM Program Assumptions

Market Transformation

Market transformation is a strategic intervention to achieve a lasting, significant share of energy efficient products and services in targeted markets. Manitoba Hydro's Power Smart strategy focuses on creating a sustainable market change where energy efficient technologies and practices become the market standard.

However, market transformation is difficult to measure. Manitoba Hydro has made significant progress in developing specific methodologies for measuring its impacts. Wherever possible, Manitoba Hydro has attempted to obtain sales/technology specific data to calculate a program's true effect. Difficulties arise in 1) obtaining sales data for areas outside of Manitoba for comparison purposes and in 2) obtaining sales information for Manitoba that fall outside of Power Smart program participation. In some instances, qualitative information is used to determine a program's impact on the market. Manitoba Hydro plans to continue work to further quantify and report on the influence of market transformation within the Manitoba marketplace.

Participant Reinvestment

Participant reinvestment is a marketing assumption which measures the program's influence on a participant's decision to repurchasing the energy efficient technology once the initial product life of the energy efficient technology has ended.

Interactive Effects

Interactive effects are related to the impacts of implementing certain electric efficiency opportunities. As a consequence of implementing a more efficient technology, less heat is often produced. The interactive effect refers to the offsetting need to supplement heat as a result of implementing the energy efficient technology. For example, a CFL emits less heat than a traditional incandescent light bulb; therefore it will take more natural gas to heat the area after the CFL is installed. With the creation of natural gas DSM, electric DSM programs are required to quantify increases in natural gas usage due to interactive effects.

