2018/19

DEMAND SIDE MANAGEMENT PLAN

MARCH 2018

MANITOBA HYDRO – HELPING MANITOBANS MOVE TOWARD A MORE SUSTAINABLE ENERGY FUTURE

Manitoba Hydro POWER SMART®

Message from Manitoba Hydro's CEO

2018-19 will be a year of significant changes for Manitoba Hydro Power Smart and the delivery of demand side management services.

As part of the Efficiency Manitoba Act, a new standalone Crown corporation — Efficiency Manitoba — is being established with the accountability to deliver electric and natural gas demand side management programs and services to consumers, businesses and industry. This will include most of the current programs and initiatives offered through Power Smart. As such, Manitoba Hydro will work closely with Efficiency Manitoba over the coming months to effect a transition to the new entity, while minimizing impacts on the delivery of services during the transition period.

More than 82,000 customers are expected to save $17 million on their collective energy bills by participating in Power Smart this year. To meet our targets, we must continue to focus on engaging customers and working with communities to promote energy efficiency. In addition to incentives, such as rebates and free energy-saving devices, we offer technical guidance and on-bill financing to make saving energy as easy and convenient as possible. Thanks to Power Smart, many customers are realizing benefits that go far beyond lower energy bills—including more comfortable homes and businesses, and improved air quality.

Manitobans who take advantage of Power Smart are also minimizing their impact on the environment. Thanks to these programs, it's estimated that greenhouse gas emissions will be reduced by approximately 256,000 tonnes in 2018-19 alone — the equivalent of taking 51,000 cars off the road for one year.

Although the delivery of demand side management to Manitobans is entering a period of change, Manitoba Hydro will continue to support our customers in meeting their energy needs. We look forward to continuing to work with government, consumers, businesses, industry partners and Efficiency Manitoba as we continue to move our province towards achieving greater energy efficiency.

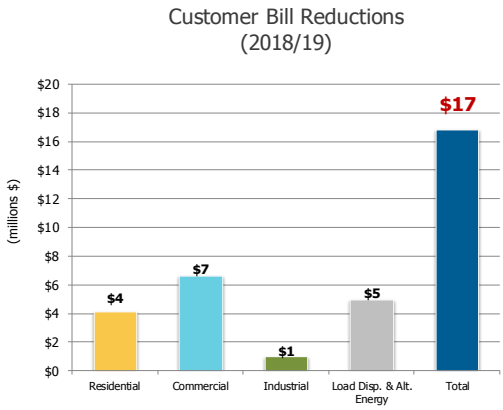
Kelvin Shepherd,
President & Chief Executive Officer, Manitoba Hydro

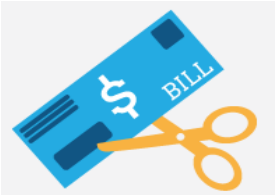
HIGHLIGHTS

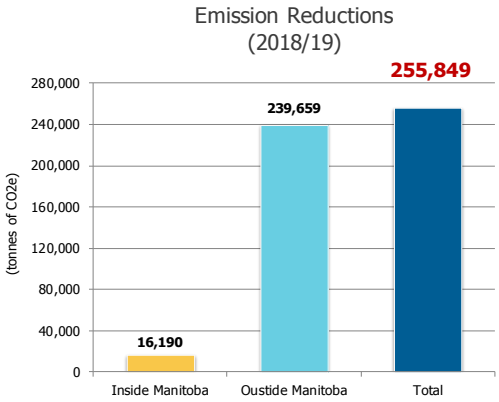
This report outlines Manitoba Hydro's Demand Side Management (DSM) plan for the 2018/19 fiscal year. The plan involves activity related to incentive-based programs and efforts associated with energy codes, performance standards and energy efficiency regulations. Manitoba Hydro has a strong commitment to DSM with a focus intent on pursuing all cost effective opportunities and continually monitoring the market for emerging trends and additional opportunities. Manitoba Hydro updates its DSM plan every year to reflect current market conditions and additional experience gained on customer response.

Helping our Customers Save

In 2018/19, customers who participate in Manitoba Hydro's Demand Side Management Programs are anticipated to enjoy a reduction of $17 million on their energy bills; $4 million for residential customers, $7 million for commercial customers, $1 million for industrial customers, and $5 million for load displacement and alternative energy customers. These are dollars that customers can choose to invest in their homes, businesses or to spend elsewhere in Manitoba.







Reducing Environmental Impacts

Greenhouse gas emission reductions arising from Manitoba Hydro's DSM investments are expected to be approximately 256,000 tonnes from 2018/19 activity alone. This is equivalent to taking over 51,000 cars off the road for one year.

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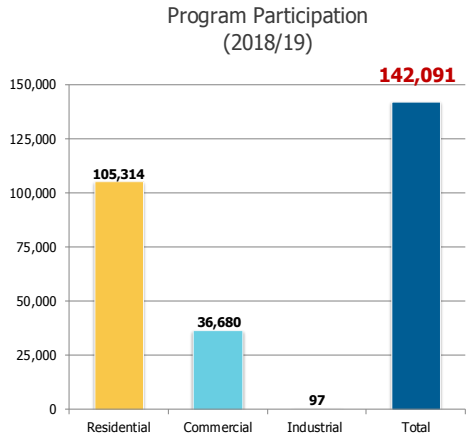
Partnering with Customers for Deeper Savings

Manitoba Hydro has been offering DSM programming to residential, commercial and industrial customers for over two and a half decades. In 2018/19, it is forecast that there will be over 142,000 participants in Manitoba Hydro's DSM incentive-based and support programs, representing approximately 105,000 residential customers, 37,000 commercial customers, and 97 industrial customers who will benefit through lower bills through their participation in Manitoba Hydro's DSM programs.



Manitoba Hydro will continue to leverage customer and stakeholder relationships to create partnerships that provide deeper energy savings and encourage harder-to-reach customers to take advantage of Power Smart opportunities and programs.

The following are examples of initiatives driving increased customer engagement and deeper energy savings:

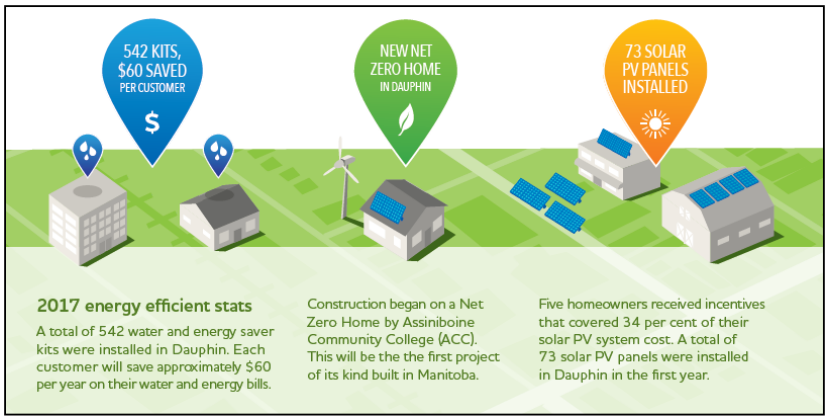
Achieving Deeper Savings with Hard-to-Reach Customers

The Affordable Energy Program has long recognized the value in partnering with a number of different government and non-government groups, including; First Nation Communities, Indigenous groups, social enterprise groups and community-based organizations. Through these partnerships, many hard to reach lower income customers have benefitted from energy efficiency upgrades. Partnerships established with the North End Community Renewal Corporation will continue through 2018/19 to promote the Affordable Energy Program.

Through the Indigenous Power Smart Program, staff members work directly with local Band leadership and Housing Coordinators to improve the energy efficiency of homes in the community. Working with these communities, 2018/19 will see approximately 1,400 homes receive energy efficiency upgrades.

Partnering at the Community Level with Energy Plans

Manitoba Hydro is working with local municipal officials in Dauphin to carry out a Community Energy Plan to help the communities achieve deeper energy efficiency improvements across all sectors (residential, commercial and industrial). Supported by energy advocates from within the communities, their community energy plan will identify and prioritize each town's energy efficiency goals and objectives, leveraging existing programs and industry partners to achieve these goals. Taking a community approach to energy efficiency allows community members to become active participants by working together to achieve a common goal.



Partnerships and Collaboration will Drive Race to Reduce to the Finish Line

The first behavioural energy efficiency initiative of its kind in Manitoba, Race to Reduce successfully demonstrates collaboration among customers, industry associations, and other key stakeholders while working in partnership with Manitoba Hydro to find even greater levels of savings than ever before. Launched on January 18, 2017, the program has secured almost seven million square feet of office space to participate in the innovative energy reduction competition.

RACE TO REDUCE

Race to Reduce encourages landlords and tenants to publicly commit to working together to reduce their buildings' total energy use by 10 per cent over the four year race. Race to Reduce participants will be publicly recognized and celebrated during the initiative's annual award ceremonies.

Helping Customers Build Efficiency Expertise "In-House"

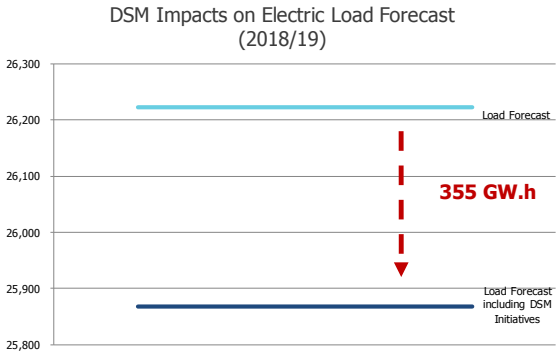
Recent enhancements to Manitoba Hydro's Performance Optimization Program, which targets large institutions, commercial and industrial buildings and processes, provide support for embedded energy managers to advocate and lead energy efficiency improvements from within the customer's operations.

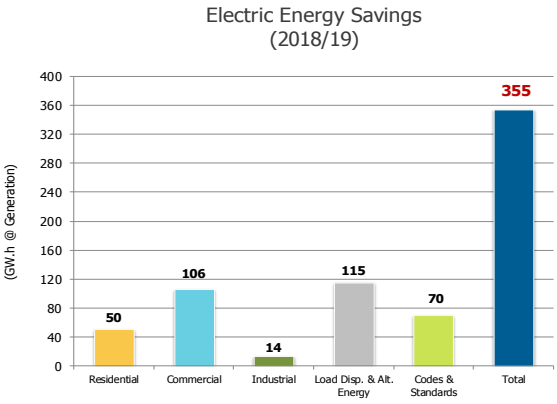
The expanded programming, known as the Energy Manager Initiative provides support for embedded energy manager salary costs; organizational, planning and technical support; energy management training, scoping and feasibility studies; and advanced energy monitoring dashboards with real time control messaging and with customized linking of energy consumption to key customer performance metrics. These enhancements provide proactive customer engagement and strengthen executive level commitment within organizations that supports critical investment in energy efficiency and productivity.

Meeting Future Energy Needs of Manitobans

Electric Energy Savings

In 2018/19, Manitoba Hydro plans to capture electricity savings of 240 MW and 355 GW.h. Along with constructing new renewable hydro generation, Demand Side Management is a key component of Manitoba Hydro's strategy for meeting the province's future energy needs. The energy savings achieved through DSM will represent 1.4% of the actual Manitoba electric load for 2017/18. In 2018/19, Manitoba Hydro plans to capture electricity energy savings of 13 MW and 50 GW.h in the residential sector, 23 MW and 106 GW.h in the commercial sector, 170 MW and 14 GW.h in the industrial sector, 16 MW and 115 GW.h through load displacement and alternative energy opportunities and 18 MW and 70 GW.h resulting from efforts relating to codes and standards.

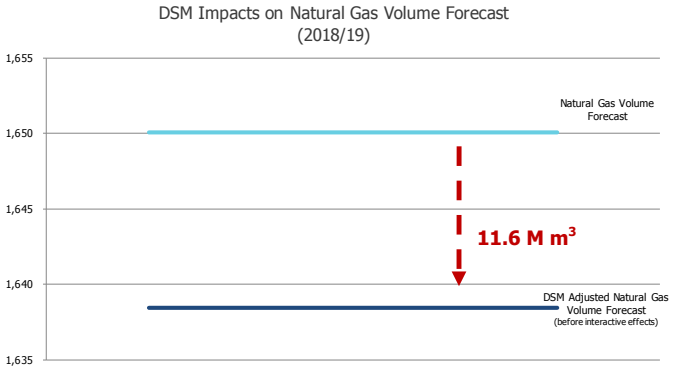




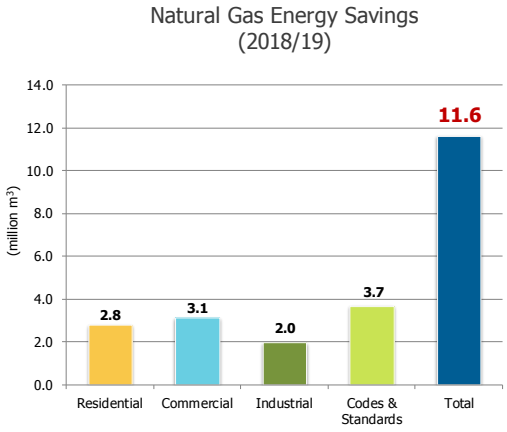
Natural Gas Savings

In 2018/19, the plan sets out to capture natural gas savings of 11.6 million cubic metres before interactive effects which represents 0.71% of the natural gas consumption for 2017/18, further reducing natural gas consumption in Manitoba. The percentage of volume calculation excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

In 2018/19, Manitoba Hydro plans to capture natural gas savings of 2.8 million cubic metres in the residential sector, 3.1 million cubic metres in the commercial sector, 2.0 million cubic metres in the industrial sector, and 3.7 million cubic metres resulting from efforts relating to codes and standards.

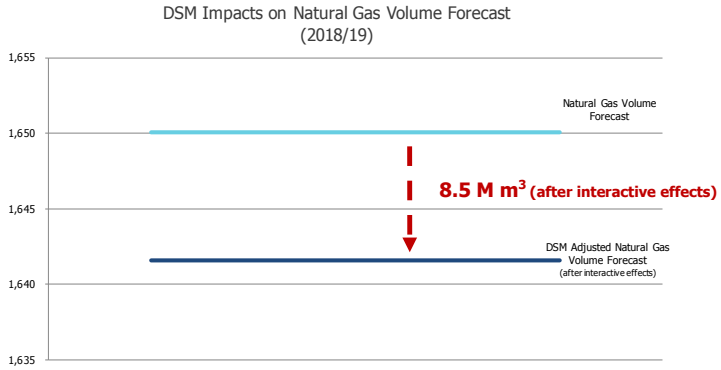


Note: The above graph excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.



As a result of some electric DSM programming, there is an increase in natural gas consumption for space heating purposes – interactive effects. The interactive effects result from the need to replace heat lost from the use of more efficient lighting and other interior equipment that use electricity.

Including an increase of 3.1 million cubic metres in natural gas consumption due to interactive effects, the plan is expected to result in net natural gas savings of 8.5 million cubic metres which represents 0.52% of the natural gas consumption for 2017/18. This percentage of volume calculation also excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.



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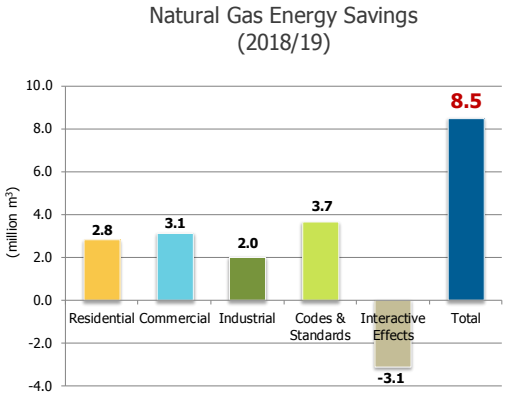
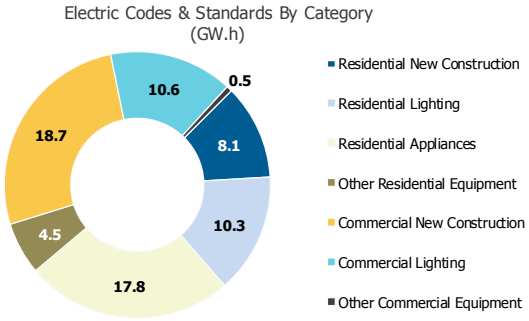
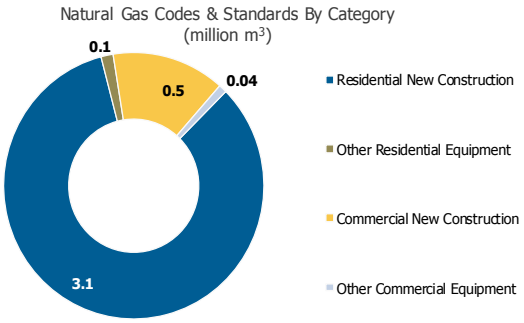


Codes, Standards & Regulations Savings

In addition to utility-directed 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 building codes and performance 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 which are then incorporated into Manitoba Power Smart programs, and subsequent energy efficiency regulations and building codes proposed by national and provincial regulators.

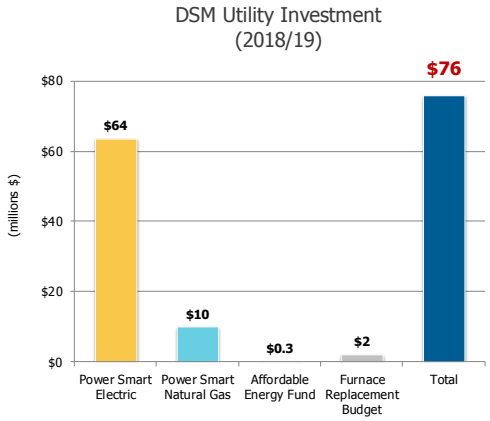
Efforts to achieve energy savings through Codes, Standards and Regulations are forecast to achieve capacity savings of 18 MW, energy savings of 70 GW.h and 3.7 million cubic metres of natural gas in 2018/19.

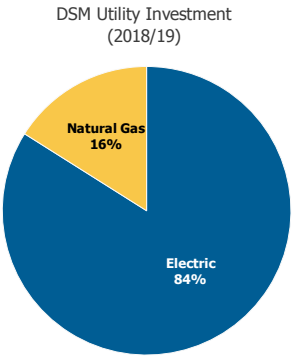




Investing in Demand Side Management

Over the next year, Manitoba Hydro expects to invest $76 million in Demand Side Management initiatives with $64 million of the costs funded through Manitoba Hydro's DSM electricity budget, $10 million funded through Manitoba Hydro's DSM natural gas budget, $0.3 million funded through the Affordable Energy Fund and $2 million funded through the Lower Income Natural Gas Furnace Replacement budget. Actual expenditures are significantly dependent on customer's decisions to participate.





Building Manitoba's Green Economy

The economic benefits of energy efficiency and alternative energy extend far beyond lowering energy bills for households and businesses in Manitoba. These investments contribute to local economic development and job creation through investments by customers and services provided by Manitoba businesses. As cited by the well-known energy efficiency industry advocate, The American Council for an Energy-Efficient Economy (ACEEE);

"Energy efficiency investments create jobs in two ways. First, the investment itself creates jobs. Often, as in construction work for a building upgrade, these projects create local jobs that cannot be outsourced. Second, the energy savings due to the investment create more jobs for years afterward as people spend the money they save on energy bills."

This year's Demand Side Management Plan is projecting activity related to energy efficient construction, retrofits and other Demand Side Management initiatives to total over 120 million dollars in 2018/19 alone. In addition, this investment in demand side management is anticipated to generate bill savings of 17 million dollars in 2018/19 alone. When a household or business lowers their energy costs, they are then able to spend that money elsewhere in the economy.

In addition to the economy wide creation of jobs arising from this local construction and renovation activity, Manitoba Hydro's programs have and will result in the direct creation of green jobs through the service providers delivering the following Power Smart programs. The following are examples of these initiatives:

Supporting Social Enterprises through the Affordable Energy Program

The Affordable Energy Program continues to support the efforts of Building Urban Industries for Local Development (BUILD) and Brandon Energy Efficiency Program (BEEP), Manitoba social enterprise contractors. Both organizations are non-profit contractors who provide training programs for people who face barriers to employment and have limited experience in the formal labour market to retrofit housing stock in a fashion that reduces poverty and benefits the environment. Through this partnership, BUILD and BEEP will employ 27 individuals, developing candidates for future job opportunities in the social enterprise and private sector overall.

Working with First Nation Communities, the Indigenous Power Smart Program provides free basic energy saving measures and free insulation along with funding which creates employment for members in the community to complete the installation. Over 5,900 total homes have been retrofitted through the program, generating 27 equivalent full time jobs of First Nation employment.

Power Smart Partners with Retailers to Offer Rebates on LEDs and Energy Efficient Products

The Residential LED Lighting Program continues to offer instant rebates on ENERGY STAR® certified lighting products province-wide at participating retailers. In 2018/19, a contract service provider is again coordinating retailer promotions, and hiring energy efficiency ambassadors to staff in-store engagement events during campaigns. One full time project manager and up to 15 part time ambassadors are employed in Manitoba as a result of the program.

Water and Energy Saver Program, Creating Savings and Jobs

The ongoing Water and Energy Saver Program employs technicians, through the contracted service provider, to coordinate community events and go door-to-door promoting the program and installing water saving devices. A total of three full time staff and up to 20 part time technicians are currently employed in Manitoba.

Retiring Old Fridges, Hiring New Faces

The Refrigerator Retirement Program continues to positively contribute to the local economy through the establishment of a local recycling facility and processing centre. Up to 20 full time green collar jobs have been created in the province as a direct result of the Power Smart Refrigerator Retirement Program. Since the program launched in 2011, approximately 63,000 refrigerators and freezers have been collected, decommissioned, and recycled by the program's contracted service provider who employs service professionals, warehouse workers, and field staff.

Installing Geothermal Systems in First Nations with First Nations

The Community Geothermal Program converts electric furnaces to geothermal heat pump systems in First Nation communities. The program supports and provides funding for Aki Energy, a non-profit social enterprise group working as liaison with individual communities to promote and coordinate installations. Jobs are created within the participating First Nation Community through the installation of the geothermal systems in the communities' homes. This community approach creates meaningful employment as they install green heating systems in their communities. To date, approximately 55 band members have received various training as it relates to GSHP systems, including installation, maintenance, and fusion certification; 21 have received full installer accreditation granted by the International Ground Source Heat Pump Association (IGSHPA).

Power Smart Shops Program Creates Jobs While Helping Small Businesses and Communities Thrive

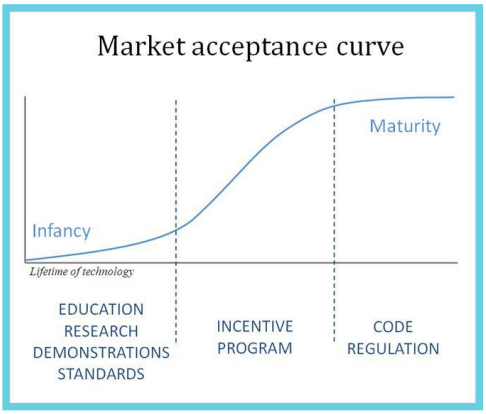
The Power Smart Shops Program for small businesses is a full-service program that offers direct installation of a variety of water and energy-saving measures, lighting walkthroughs, and enhanced incentives for lighting retrofits.

The program is delivered by a contracted service provider that employs one regional manager, one account coordinator, and four technicians, all who directly support the program. Electrical services for lighting projects requiring a licensed electrician are subcontracted to seven electrical companies based in Winnipeg, Portage la Prairie, Dauphin, Brandon and The Pas, to support projects across Manitoba. Altogether, these subcontractors have a team of over 45 electricians and apprentices working on Power Smart Shops projects. Since launching in October 2015, over 1,400 businesses in 43 communities across Manitoba have participated in the program.

DSM STRATEGY

Manitoba Hydro's DSM initiative, marketed under the Power Smart brand, is designed to encourage the efficient use of energy in residential, commercial, and industrial customer sectors. Manitoba Hydro's overall DSM strategy involves taking a broad approach to capturing energy efficiency opportunities: educating customers and industry to build awareness and understanding, creating foundations through the support of standards, motivating customers with the aid of financial tools, and entrenching energy savings through the support of federal and provincial codes and regulations.

In assessing options for pursing a DSM opportunity, Manitoba Hydro uses a number of metrics as guidelines to assess energy efficient 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. These metrics include the Total Resource Cost, Societal Cost, Rate Impact Measure, Levelized Utility Cost, and Customer Simple Payback. 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.



As outlined in the following graph, Manitoba Hydro takes a three stage approach to achieving market transformation. In the infancy stage of emerging opportunities, Manitoba Hydro supports these technologies by building customer awareness, funding demonstration projects, and investing in research and development. As market acceptance increases and the opportunity becomes cost-effective, financial incentives and/or other market intervention strategies are pursued to encourage customers to install the technology. As the product matures and market adoption grows, incentive-based programming generally becomes uneconomic. During this phase, Manitoba Hydro's strategy involves pursuing the remaining opportunities through the adoption of codes and regulations. This latter strategy also ensures permanent market transformation for the specific energy efficiency opportunity.

An Example: Changing Furnace Efficiencies in Manitoba
In 2001, only 30% of all natural gas furnaces being installed in Manitoba were high-efficient models and customer awareness of higher efficiency options was low. In response to this market situation, Manitoba Hydro launched the Power Smart Residential Loan and supporting Home Comfort and Energy Savings campaign to educate and promote the installation of high efficient natural gas furnaces. This approach laid the foundation for customers to consider the energy efficient alternative, and provided a tool for contractors to promote this technology. In 2005, to further increase market acceptance, a $245 incentive was introduced to encourage customers to choose high efficient natural gas furnaces over the less efficient alternative. By 2007, high efficiency furnaces had grown to represent 76% of all furnaces being replaced in Manitoba homes. In 2008, to accelerate the number of customers upgrading their furnaces, Manitoba Hydro increased their rebate to $500 for a limited time offering and aggressively promoted the financial and comfort benefits of upgrading a furnace. As market acceptance increased, Manitoba Hydro worked with the Province of Manitoba to develop the framework to regulate the minimum efficiency of all natural gas furnaces installed in Manitoba. On December 30, 2009, with market penetration of 86%, the Power Smart incentive ended and the Provincial regulation took effect requiring a minimum 92% AFUE for natural gas furnaces installed in Manitoba.

DEMAND SIDE MANAGEMENT PLAN

The 2018/19 DSM Plan was developed through an intensive planning process and it offers programs and initiatives to pursue opportunities in all market sectors; residential, commercial, and industrial. These programs are designed based on in-depth knowledge of the technology and the market environment. An in-depth understanding is essential to ensure that the program design is adequately and effectively addressing the appropriate target market and contains the tools and strategies to address market barriers. The following table outlines the forecasted achievements for 2018/19:

Programs	Participation Definition	2018/19 Participation	Capacity Savings (MW)	Energy Savings (GW.h)	Natural Gas Savings (million m^3)	Utility Investment (millions $)
New Homes Program	No. of houses	400	1.6	3.1	0.1	$1.3
Home Insulation Program	No. of houses	1,718	1.5	3.3	0.5	$2.7
Water and Energy Saver Program	No. of houses	14,975	0.2	2.2	0.7	$1.4
Affordable Energy Program	No. of retrofits	3,428	1.3	3.9	0.9	$6.5
Refrigerator Retirement Program	No. of appliances	7,215	0.8	7.6	-	$1.6
Residential LED Lighting Program	No. of bulbs	710,783	5.6	17.8	-	$2.1
Community Geothermal Program	No. of systems	125	1.0	2.0	-	$0.9
Appliances	No. of appliances	5,800	0.1	1.3	0.0	$0.5
Power Bars	No. of power bars	600	0.0	0.0	-	$0.0
Smart Thermostats	No. of thermostats	2,500	0.2	0.5	0.3	$0.3
Plug-in Timers	No. of timers	5,000	0.0	0.3	-	$0.0
Power Smart Residential Loan	No. of loans	3,726	0.1	0.3	0.3	$0.0
Power Smart PAYS Financing	No. of loans	166	0.0	0.1	0.0	$0.0
Residential Earth Power Loan	No. of loans	90	0.3	0.7	0.0	$0.0
Residential Programs			**12.8**	**42.9**	**2.8**	**$17.3**
Commercial Lighting Program	No. of projects	1,700	15.0	60.9	-	$11.0
LED Roadway Lighting Conversion Program	No. of conversions	33,030	2.1	14.4	-	$11.5
Commercial Building Envelope - Windows Program	No. of projects	150	0.4	1.0	0.6	$0.9
Commercial Building Envelope - Insulation Program	No. of projects	270	1.5	3.2	1.1	$1.8
Commercial Geothermal Program	No. of buildings	7	0.2	0.4	-	$0.3
Commercial HVAC Program - Boilers	No. of boilers	112	-	-	0.6	$0.6
Commercial HVAC Program - CO2 Sensors	No. of sensors	65	0.1	0.1	0.0	$0.1
Commercial HVAC Program - HRV/ERV	No. of units	11	0.1	0.2	0.1	$0.3
Commercial HVAC Program - Water Heaters	No. of water heaters	27	-	-	0.1	$0.1
Commercial Custom Measures Program	No. of projects	25	0.3	2.0	0.3	$0.6
Enhanced Building Operations Program	No. of buildings	5	0.2	1.0	0.2	$0.3
New Buildings Program	No. of buildings	15	0.8	2.8	0.1	$1.5
Commercial Refrigeration Program	No. of locations	265	1.2	8.8	0.0	$0.5
Commercial Kitchen Appliance Program	No. of appliances	19	0.0	0.1	0.0	$0.1
Network Energy Management Program	No. of licenses	1,000	0.0	0.2	0.0	$0.0
Internal Retrofit Program	No. of projects	53	0.8	4.8	0.1	$0.8
Power Smart Shops	No. of projects	807	0.3	2.1	0.0	$0.9
Race to Reduce	No. of buildings	6	0.1	0.9	0.1	$0.2
Parking Lot Controller	No. of controllers	54	0.0	1.0	-	$0.2
Power Smart for Business PAYS Financing	No. of loans	28	0.0	0.0	0.0	$0.0
Commercial Programs			**23.0**	**103.8**	**3.1**	**$31.7**
Performance Optimization Program	No. of projects	80	1.4	13.6	-	$2.5
Natural Gas Optimization Program	No. of projects	10	-	-	2.0	$0.7
Industrial Programs			**1.4**	**13.6**	**2.0**	**$3.2**
Energy Efficiency Subtotal			**37.3**	**160.3**	**8.0**	**$52.2**
Curtailable Rate Program	No. of customers	3	168.7	-	-	$6.1
Load Management			**168.7**	**0.0**	**0.0**	**$6.1**
Bioenergy Optimization Program	No. of projects	2	0.4	1.0	-	$0.5
Customer Sited Load Displacement	No. of customers	2	15.3	113.9	-	$7.1
Load Displacement & Alternative Energy			**15.7**	**114.9**	**0.0**	**$7.6**
Residential Solar Photovoltaics Program (PV)	No. of systems	264	0.0	7.4	0.0	$5.1
Commercial Solar Photovoltaics Program (PV)	No. of systems	28	0.0	2.0	0.0	$1.3
Other Emerging Technologies			**0.0**	**9.4**	**0.0**	**$6.4**
Codes, Standards & Regulations			17.9	70.5	3.7	-
Interactive Effects			-	-	-3.1	-
Program Support			-	-	-	$3.7
Demand Side Management Plan - 2018/19			**240**	**355**	**8.5**	**$76.0**

Residential

Manitoba Hydro offers a number of innovative programs, using a variety of market intervention tools including but not limited to, incentives, financing, education, and energy assessments to address opportunities in the residential market.

New Homes Program

Power Smart for New Homes is a residential new construction program providing incentives to builders and customers for the optimized design and construction of energy-efficient homes.

To be eligible for incentives, the home must be at least 20 per cent more energy efficient than a conventional new home. Completed Power Smart homes automatically qualify for the Canada Mortgage and Housing Corporation (CMHC) mortgage premium refund program, and homeowners receive an official Power Smart certificate and an EnerGuide label, if applicable.

Power Smart for New Homes offers two participation paths and will accept applications for homes built under a variety of energy efficient, sustainable, or green construction programs. In the 2018/19 year, the program will absorb the Advanced HRV Control program and begin to offer incentives on advanced HRV controls to builders who have chosen not to participate in the whole-home rebate stream.

In 2018/19, program participation is expected to be 400 new residential dwellings, which includes 300 single detached and 100 multi attached units, resulting in 3.1 GW.h and 1.6 MW of electric savings and over 84,000 cubic metres of natural gas savings. Combined with achievements to date, approximately 648 new residential dwellings will have participated resulting in 4.1 GW.h and 2.3 MW of electric savings and 0.1 million cubic metres of natural gas by the end of 2018/19.

	2015/16 to 2017/18*	2018/19	Total to 2018/19
No. of Houses	248	400	**648**
Capacity Savings (MW)	0.7	1.6	**2.3**
Energy Savings (GW.h)	1.0	3.1	**4.1**
Natural Gas Savings (million m³)	0.1	0.1	**0.1**
Utility Investment (Millions, $)	$0.9	$1.3	**$2.2**
Customer Investment (Millions, $)	$0.9	$3.6	**$4.4**
Total DSM Investment (Millions, $)	$1.7	$4.8	**$6.6**
Estimated Average Annual Bill Reduction per Customer (Electric Home): $556			
Estimated Average Annual Bill Reduction per Customer (Natural Gas Home): $203			

*Includes estimates for 2017/18

Home Insulation Program

The program encourages owners of electric and natural gas heated homes built before 1999 to upgrade their insulation to Power Smart levels and perform air sealing in their attics, walls, and foundations. The overall target market for the program is approximately 48,600 electric and 81,500 natural gas homes. The program addresses the multiple barriers to completing these upgrades, focusing on the lack of customer awareness regarding the financial and comfort benefits of increased insulation levels, the upfront capital cost of the upgrade, and the lack of priority when compared to more aesthetic and visible renovation projects. These market barriers are addressed through a comprehensive strategy that includes financial incentives to reduce the cost of the upgrade, informational materials in the form of advertising campaigns, and renovation "how to" booklets that provide technical guidance for upgrading insulation to Power Smart levels. The program is delivered through a large network of industry contractors and retailers across the province. Home owners can qualify for incentives covering up to 100% of the cost of their insulation materials on projects that meet Power Smart insulation levels.

A targeted outreach initiative, offering free in-home energy assessments, assists customers in identifying opportunities for qualifying insulation upgrades. The program also offers rebates during the spring and fall residential campaigns on weather stripping and window kits at participating retailers.

The Home Insulation Program was launched in May 2004. In 2018/19, the program is targeted to retrofit 708 electrically heated homes and 1,010 natural gas heated homes, achieving 3.3 GW.h and 1.5 MW of electric savings and 0.5 million cubic metres of natural gas savings. Combined with achievements to date, approximately 15,300 electrically heated homes and 28,500 natural gas heated homes will be retrofitted, resulting in 78.9 GW.h and 38.4 MW of electric savings and 15.4 million cubic metres of natural gas savings by the end of 2018/19. The program is forecast to reach 31% of targeted electric customers and 35% of targeted natural gas customers by the end of 2018/19.

	2004/05 to 2017/18*	2018/19	Total to 2018/19
No. of Houses	42,134	1,718	**43,852**
Capacity Savings (MW)	36.9	1.5	**38.4**
Energy Savings (GW.h)	75.7	3.3	**78.9**
Natural Gas Savings (million m³)	14.9	0.5	**15.4**
Utility Investment (Millions, $)	$44.0	$2.7	**$46.7**
Customer Investment (Millions, $)	$24.2	$1.0	**$25.2**
Total DSM Investment (Millions, $)	$68.2	$3.7	**$71.9**
Estimated Average Annual Bill Reduction per Customer (Electric): $360			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $115			

*Includes estimates for 2017/18

Affordable Energy Program

The Affordable Energy Program (AEP) was launched in December 2007. In 2018/19, program participation is expected to be 3,428 customers, resulting in 3.9 GW.h and 1.3 MW of electric savings and 0.9 million cubic metres of gas savings. Combined with achievements to date, approximately 25,797 customers will have participated resulting in 36.2 GW.h and 16.5 MW of electric savings and 11.4 million cubic metres of natural gas savings by the end of 2018/19.

The program is designed to assist lower income homeowners and renters in implementing energy efficiency upgrades, such as improved insulation, high efficiency natural gas furnaces and various basic energy efficiency measures. These upgrades can provide significant energy savings, decreasing the customer's monthly energy bills while increasing the comfort of their home. The criteria for determining program eligibility are the Low Income Cut-Off (LICO) thresholds set by Statistics Canada; customers' total household income must fall below 125% of the LICO thresholds for inclusion in the program. Based on the Power Smart Residential End Use Survey data, there are approximately 115,000 homes in Manitoba, excluding multi-unit residential buildings, which fall below the LICO 125% threshold; 97,630 customers own their home, while 17,512 customers rent. The primary targets within this market are homes with poor or fair insulation levels and standard efficient natural gas furnaces. As of 2018/19, the program projects that there are approximately 15,500 insulation customers and 3,250 standard furnace customers remaining in the market. In addition, the Affordable Energy Program targets multi-unit residential buildings (apartment style) for basic energy efficiency upgrades. There are approximately 24,300 remaining apartment suites which fall within the LICO 125% market. The program is currently working with landlords and property managers to retrofit suites with basic energy efficiency measures.

The program was designed recognizing the unique barriers lower income customers face in completing energy efficiency retrofits. Manitoba Hydro assists and encourages participation in this market by minimizing the financial burden with free insulation upgrades, a high efficiency natural gas furnace for $9.50/month for 5 years, and free basic energy efficiency measures (e.g. LEDs, showerheads, faucet aerators, etc.). The program expansion to include landlords has been successful in helping reach lower income Manitobans who rent in reducing their utility bills. The program is delivered through a number of approaches including direct participation with individual customers, through social enterprise contractors Brandon Energy Efficiency Program (BEEP) and Building Urban Industries for Local Development (BUILD), or through community groups (e.g. First Nation communities and neighbourhood or community associations). Through these approaches, customers are made aware of the value of energy efficiency retrofits, along with the benefits of participating in the program. Customers are targeted through advertising and community-based campaigns, customized information sessions, and community networks.

A community-led initiative, the Neighbourhood Approach, began in fall 2012 with the goal of completing energy efficiency upgrades on a block-by-block basis in lower income neighbourhoods. Under this approach, North End Community Renewal Corporation employs local residents BUILD to bring energy efficiency upgrade opportunities direct to the customer's door.

To date, an estimated 22,369 homes have completed energy efficiency retrofits. Of the total retrofits, approximately 11,464 insulation projects have been completed, and 5,730 furnace replacements have been completed. The program is forecast to reach 6% (898) of the remaining targeted homes with poor or fair insulation levels within the total LICO 125% market in 2018/19. The program is forecast to reach 16% (510) of the remaining standard furnaces in the LICO 125% market in 2018/19.

	2007/08 to 2017/18*	2018/19	Total to 2018/19
Total Participation	22,369	3,428	**25,797**
No. of Insulation Projects	11,464	898	**12,362**
No. of Furnaces Installed	5,730	510	**6,240**
No. of Boilers Installed	130	10	**140**
Capacity Savings (MW)	15.2	1.3	**16.5**
Energy Savings (GW.h)	32.3	3.9	**36.2**
Natural Gas Savings (million m^3)	10.4	0.9	**11.4**
Utility Investment (Millions, $)	$63.0	$6.5	**$69.5**
Customer Investment (Millions, $)	$4.5	$0.2	**$4.6**
Total DSM Investment (Millions, $)	$67.5	$6.7	**$74.2**
Estimated Average Annual Bill Reduction per Customer - Basic Measures (Electric): $70			
Estimated Average Annual Bill Reduction per Customer - Basic Measures (Natural Gas): $34			
Estimated Average Annual Bill Reduction per Customer (Electric) - Insulation: $643			
Estimated Average Annual Bill Reduction per Customer (Natural Gas) - Insulation: $194			
Estimated Average Annual Bill Reduction per Customer (Natural Gas) - Furnace: $189			

*Includes estimates for 2017/18

Water and Energy Saver Program

The Water and Energy Saver program was launched in September 2010. The program reduces residential water heating energy consumption through the use of low flow, energy efficient plumbing fixtures. Customers are offered a free water and energy saver kit with program messaging focused on the energy and water benefits and bill reductions associated with energy efficient plumbing fixtures. The program offers five channels of participation: mail, targeted direct installation, a bulk mail or installation option for multi-unit residential facilities, community events, as well as a limited time in-store rebate on qualifying showerheads.

Program participation in 2018/19 is expected to be 14,975 households, resulting in 2.2 GW.h and 0.2 MW of electric savings and 0.7 million cubic metres of gas savings. Combined with achievements to date, 213,672 customers will have participated resulting in 32.8 GW.h and 5.7 MW of electric savings and 6.4 million cubic metres of natural gas savings by the end of 2018/19. The program is forecast to reach 60% of targeted customers by the end of 2018/19.

The target market includes residential dwellings (non-LICO) that use electricity or natural gas to heat water, totaling approximately 355,000 customers.

The program continues to engage and educate customers about the environmental benefits of energy and water conservation and bill saving opportunities for customers. The program is scheduled to run until the end of March 2019.

	2010/11 to 2017/18*	2018/19	Total to 2018/19
No. of Houses	198,697	14,975	**213,672**
Capacity Savings (MW)	5.4	0.2	**5.7**
Energy Savings (GW.h)	30.6	2.2	**32.8**
Natural Gas Savings (million m³)	5.7	0.7	**6.4**
Utility Investment (Millions, $)	$11.6	$1.4	**$13.0**
Customer Investment (Millions, $)	$0.0	$0.0	**$0.0**
Total DSM Investment (Millions, $)	$11.6	$1.4	**$13.0**
Estimated Average Annual Bill Reduction per Kit (Electric): $30			
Estimated Average Annual Bill Reduction per Kit (Natural Gas): $19			

*Includes estimates for 2017/18

Refrigerator Retirement Program

The Refrigerator Retirement program was launched in June 2011. In 2018/19, the program expects to retire 5,000 refrigerators and 1,500 freezers and has been expanded to also retire 715 window air conditioners, dehumidifiers and bar fridges or small freezers. This results in an estimated 7.6 GW.h and 0.8 MW of electric savings. Combined with achievements to date, 69,785 customers will have participated resulting in 84.3 GW.h and 8.5 MW of electric savings by the end of 2018/19. The program is forecast to reach an additional 2% of the remaining potential market by the end of 2018/19, bringing the total market penetration to 16%.

The program reduces residential energy consumption through the removal of old, inefficient, and often nearly empty refrigerators and freezers. Manitoba Hydro will also collect old window air conditioning units, dehumidifiers and small fridges/freezers if accompanied with a qualifying full size refrigerator or freezer. Customers receive free in-home pick-up of qualifying working units plus a financial incentive of $50 for each qualifying full size fridge or freezer. Pick up and recycling of an air-conditioner and/or dehumidifier and bar fridge or small freezer is complimentary but customers will not receive a financial incentive for these units. The program ensures environmental recycling of each unit retired and encourages customers to retire their secondary units and not replace it in order to maximize their savings.

The remaining target market includes all single family residential homes yielding approximately 160,000 older fridges, and 155,000 older freezers and approximately 70,000 older window air-conditioners and dehumidifiers, bar fridges and small freezers.

Most customers do not know the costs of operating an underutilized refrigerator or freezer, and many lack assistance in removing the appliance from the home. Through the Refrigerator Retirement Program, customers are made aware of the costs of their second appliance and the benefits of "retiring" it. The program makes retiring easy by providing a convenient in-home pickup service and pays them to participate.

	2011/12 to 2017/18*	2018/19	Total to 2018/19
Total Participation	62,570	7,215	**69,785**
No. of Fridges	51,750	5,000	**56,750**
No. of Freezers	10,820	1,500	**12,320**
No. of Dehumidifiers	0	390	**390**
No. of Window Air Conditioning Units	0	325	**325**
Capacity Savings (MW)	7.7	0.8	**8.5**
Energy Savings (GW.h)	76.7	7.6	**84.3**
Utility Investment (Millions, $)	$12.5	$1.6	**$14.1**
Customer Investment (Millions, $)	$5.3	$0.7	**$6.0**
Total DSM Investment (Millions, $)	$17.8	$2.3	**$20.1**
Estimated Average Annual Bill Reduction per Customer (Electric) without fridge replacement: $131			
Estimated Average Annual Bill Reduction per Customer (Electric) without freezer replacement: $100			
Estimated Average Annual Bill Reduction per Customer (Electric) without dehumidifier replacement: $87			
Estimated Average Annual Bill Reduction per Customer (Electric) without AC Unit replacement: $33			

*Includes estimates for 2017/18

Residential LED Lighting Program

The Residential LED Lighting program is designed to encourage residential customers to choose the most energy efficient lighting technology for each application within their home. The program aims to increase the adoption of Light Emitting Diode (LED) technology as a replacement for incandescent and halogen screw-in light bulbs. The program offers two channels of participation: mass market retail rebate campaigns and rebates for property managers of multi-unit residential buildings.

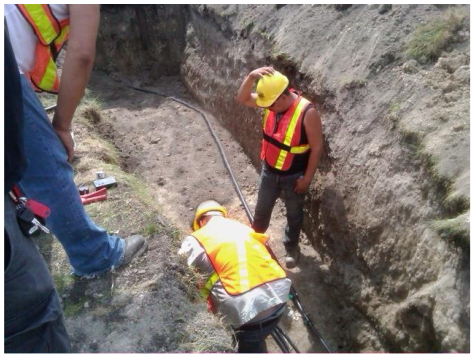
The program was launched in October 2014. In 2018/19, program participation is expected to be over 59,000 residential dwellings (over 710,000 LED bulbs) resulting in 17.8 GW.h and 5.6 MW of electric savings. Combined with achievements to date, program participation will be more than 287,000 residential dwellings (over 3.4 million LED bulbs) resulting in 108.8 GW.h and 34.3 MW of electric savings by the end of 2018/19.

The target market includes 530,000 residential dwellings and approximately 18 million screw-based sockets in which LED bulbs can be used. Consumers are slowly replacing existing incandescent and halogen bulbs with LEDs; however, the high upfront cost and low consumer awareness of specialty LED bulbs remain barriers to widespread adoption.

	2014/15 to 2017/18*	2018/19	Total to 2018/19
No. of Bulbs	2,736,279	710,783	**3,447,062**
Capacity Savings (MW)	28.7	5.6	**34.3**
Energy Savings (GW.h)	91.0	17.8	**108.8**
Utility Investment (Millions, $)	$12.8	$2.1	**$14.9**
Customer Investment (Millions, $)	$0.0	$0.0	**$0.0**
Total DSM Investment (Millions, $)	$12.8	$2.1	**$14.9**
Estimated Average Annual Bill Reduction per Bulb (Electric): $2			

*Includes estimates for 2017/18

Community Geothermal Program



The Community Geothermal Program aims to reduce customers' electric space heating costs through the adoption of geothermal heat pump systems. The program is designed to offer a customized approach for each community, with the assistance of AKI Energy, a non-profit indigenous social enterprise. To help mitigate the high capital cost barrier, a third-party provider is contracted to conduct a feasibility study and to provide a quote on the bulk purchase of the heat pump units, resulting in a much lower per unit price than the current market average. Another component of the program includes creating job opportunities and training for First Nations to take part in the installation and the on-going maintenance of the geothermal systems, with training funded by the First Nation. Manitoba Hydro provides technical guidance, assesses the energy bills to determine which homes would most benefit from geothermal installations, and explores opportunities to further maximize the number of geothermal installations within the community. Manitoba Hydro's PAYS Financing Program is vital in enabling community members to pay for the majority of the geothermal system through the energy savings which are realized by converting their heating/air conditioning systems to a geothermal system. In homes where the energy savings cannot support financing the full cost of the geothermal system through the PAYS Financing Program, Manitoba Hydro provides financial incentives.

Manitoba Hydro and Aki Energy have assisted four First Nations communities with 385 installs to date. In 2018/19, the program is expected to achieve 2.0 GW.h and 1.0 MW of electric savings. Combined with achievements to date, 510 systems will be installed, resulting in 6.8 GW.h and 2.0 MW of electric savings by the end of 2018/19.

	2013/14 to 2017/18*	2018/19	Total to 2018/19
No. of Geothermal Systems	385	125	**510**
Capacity Savings (MW)	1.0	1.0	**2.0**
Energy Savings (GW.h)	4.8	2.0	**6.8**
Utility Investment (Millions, $)	$2.8	$0.9	**$3.6**
Customer Investment (Millions, $)	$5.1	$1.9	**$7.0**
Total DSM Investment (Millions, $)	$7.9	$2.8	**$10.7**
Estimated Average Annual Bill Reduction per Customer (Electric): $1,061			

*Includes estimates for 2017/18

Appliances and Electronics Initiative

The Residential Appliances and Electronics Initiative will run again in the fall 2018. Instant rebates on Advanced Power Bars and Plug in Timers will be offered during a four week campaign as part of the overall fall 2018 Retail Rebate Campaign, which also includes rebates on LED lighting, weather stripping and other energy saving devices. Bill credits will also be offered for the purchase of designated residential appliances and will run for four months from November 2018 to February 2018. In addition, a clothesline giveaway is planned for spring 2019.

Appliances

The program helps customers reduce their energy consumption by choosing appliances that meet the highest levels of energy efficiency. A financial incentive will be available for top energy performing Clothes Washers, Clothes Washer/Dryer Combinations, and for the most energy efficient refrigerators. Customers will receive the incentive by way of a credit applied directly to their Manitoba Hydro bill.

The target market includes approximately 30,000 customers who will be purchasing a new clothes washer or clothes washer/dryer combo and approximately 20,000 customers who will be purchasing a new refrigerator. The initiative is expected to reach approximately 4% of the market.

Plug-in Timers

Plug-in Timers help customer reduce their energy consumption by using an indoor and/or outdoor plug-in timer for lights, block heaters, pool pumps, etc. Operating household devised with a plug –in timer will help save energy result in lower energy bills.

The target market for plug-in timers including 105,000 residential customers who plug the block heater in their vehicle in for more than seven hours a day and do not use a plug in timer as well as customers who leaving indoor lights on for more than 7 hours per day. The program is expected to reach 3% of the target market through the rebate campaign.

Advanced Power Bars

Advanced Power Bars help customers reduce the amount of electricity their household electronics consume. Electronics that are left plugged in can continue to consume electricity even when not in use. This category of products includes power bars that contain features such as integrated timers or smart features with automatic shut off functions that will help customers save electricity.

Virtually all households operate at least one TV and set top box, representing 470,000 customers. As many as 275,000 of these customers will operate a DVD player, and further 135,000 customers will operating some sort of gaming consoles all which make up the target market. In 2018/19, this initiative aims to reach a small percentage of customers and the focus continues to be to work with retailers to increase the availability on these types of energy saving devices. The target market for Power Bars includes all residential Manitoba Hydro residential customers using electronic devices.

In 2018/19, program participation for all components is expected to be 11,400 units resulting in 1.6 GW.h and 0.1 MW of electric savings and 3,500 cubic metres of natural gas savings. Combined with achievements to date, program participation will be approximately 25,211 units resulting in 3.4 GW.h and 0.4 MW of electric savings and 20,000 cubic metres of natural gas savings by the end of 2018/19.

	2016/17 to 2017/18*	2018/19	Total to 2018/19
No. of Units	13,811	11,400	**25,211**
Capacity Savings (MW)	0.3	0.1	**0.4**
Energy Savings (GW.h)	1.8	1.6	**3.4**
Natural Gas Savings (million m³)	0.0	0.0	**0.0**
Utility Investment (Millions, $)	$1.0	$0.5	**$1.5**
Customer Investment (Millions, $)	$0.8	$0.1	**$1.0**
Total DSM Investment (Millions, $)	$1.8	$0.7	**$2.5**
Estimated Average Annual Bill Reduction per Customer (Electric) - Clothes Washer: $27			
Estimated Average Annual Bill Reduction per Customer (Natural Gas) - Clothes Washer: $2			
Estimated Average Annual Bill Reduction per Customer (Electric) - Clothes Washer & Clothes Dryer: $30			
Estimated Average Annual Bill Reduction per Customer (Natural Gas) - Clothes Washer & Clothes Dryer: $3			
Estimated Average Annual Bill Reduction per Customer (Electric) - Refrigerator: $10			
Estimated Average Annual Bill Reduction per Customer (Electric) - Power Bar: $4			
Estimated Average Annual Bill Reduction per Customer (Electric) - Plug-in Timer: $5			

*Includes estimates for 2017/18

Smart Thermostats

Wi-Fi connected "smart" thermostats have the potential to achieve further energy savings than manual or simple programmable units. Smart thermostats vary in the system's individual algorithms and achieve enhanced savings in several ways: by learning occupant patterns; by coordinating temperature settings with occupancy; by optimizing system performance; and by taking humidity and weather conditions into account, thereby reducing HVAC runtimes. Smart thermostats also give consumers a new level of control over their household climate by enabling remote activation, voice activation, or geo-fencing to modify settings.

Manitoba Hydro ran a Smart Thermostat Pilot study throughout 2016 and into 2017, with the objective of determining the potential savings for gas-heated and electric-heated households across Manitoba. Results are expected to be released at the end of the 2017/18 fiscal year.

In late 2016, ENERGY STAR® began certifying connected thermostats and Natural Resources Canada advises ENERGY STAR certified connected thermostats can save at least 8% of the energy used for space heating and cooling in residential applications. ENERGY STAR certified connected thermostats are automatically eligible for rebates under Manitoba Hydro's Bill Credit Rebate program.

A smart thermostat Bill Credit Rebate campaign was run for four months in the 2016/17 fiscal year and was renewed for the 2017/18 fiscal year. The second campaign is offered from November 1, 2017 to February 28, 2018 and provides a $75 bill credit to residential customers who purchase an eligible smart thermostat device. The product category for smart thermostats is growing rapidly and it is estimated that by the year 2020, as many as 50% of homes will contain a smart or connected thermostat.

The 2018/19 smart thermostat rebate program is estimated to generate sales of 2,500 devices, with annual electric savings of 0.5 GW.h and 0.2 MW and natural gas savings of 0.3 million cubic metres. Combined with achievements to date, program participation will be approximately 4,875 devices resulting in 1.4 GW.h and 0.9 MW of electric savings and 0.6 million cubic metres of natural gas savings by the end of 2018/19.

	2015/16 to 2017/18*	2018/19	Total to 2018/19
No. of Thermostats	2,375	2,500	**4,875**
Capacity Savings (MW)	0.7	0.2	**0.9**
Energy Savings (GW.h)	1.0	0.5	**1.4**
Natural Gas Savings (million m³)	0.3	0.3	**0.6**
Utility Investment (Millions, $)	$0.8	$0.3	**$1.1**
Customer Investment (Millions, $)	$1.3	$0.8	**$2.0**
Total DSM Investment (Millions, $)	$2.1	$1.0	**$3.1**
Estimated Average Annual Bill Reduction per Customer (Electric): $91			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $34			

*Includes estimates for 2017/18

Solar Energy Pilot Program

In April 2016 Manitoba Hydro expanded Manitobans' renewable energy options by introducing the Power Smart Solar Energy Pilot Program (SEP). This two-year pilot program offered a financial incentive towards the purchase of a Solar Photovoltaic (PV) system, and was open to residential, commercial and industrial customers who are connected to the Manitoba Hydro grid. The incentive of $1 per watt covered approximately 37 per cent of the installed cost of the system.

Launching the pilot program offered Manitoba Hydro an excellent opportunity to evaluate the opportunities and challenges of solar PV in the Manitoba market, the processes required to support the technology, and most importantly the effects the distribution grid. The program has resulted in growth in the number of solar industry suppliers, created more jobs for electrical trade workers, provided competition and drove prices down in the market, while growing Manitoba's green economy.

As enrollment in the pilot comes to an end April 30, 2018, program participation is expected to be 264 residential customers and 28 commercial customers, resulting in 9.4 GW.h of electric savings. Combined with achievements to date, 577 customers will have participated resulting in 16.4 GW.h and 0.8 MW of electric savings by the end of 2018/19. This initiative also leverages the existing Earth Power Loan, which offers on-bill financing to residential customers installing solar PV.

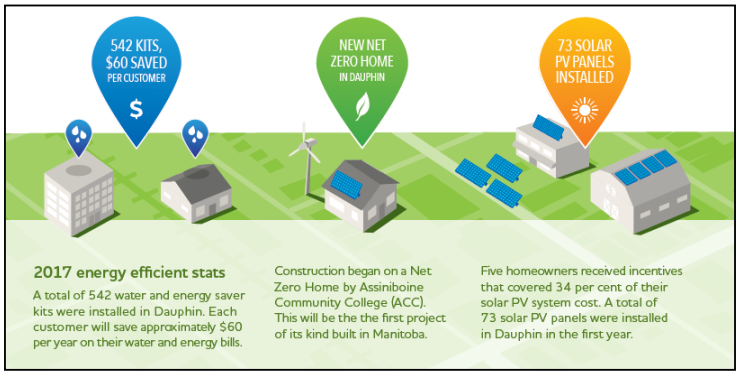
	2016/17 to 2017/18*	2018/19	Total to 2018/19
No. of Systems - Residential	267	264	**531**
No. of Systems - Commercial	18	28	**46**
Capacity Savings (MW)	0.8	0.0	**0.8**
Energy Savings (GW.h)	7.1	9.4	**16.4**
Utility Investment (Millions, $)	$4.9	$6.4	**$11.2**
Customer Investment (Millions, $)	$5.7	$12.1	**$17.8**
Total DSM Investment (Millions, $)	$10.6	$18.5	**$29.0**
Estimated Average Annual Bill Reduction per Customer (Electric) - Residential: $2,167			
Estimated Average Annual Bill Reduction per Customer (Electric) - Commercial: $5,532			

*Includes estimates for 2017/18

Community Energy Plan

Manitoba Hydro continues to promote energy efficiency using a direct and aggressive approach by partnering with communities to establish a Community Energy Program. A two year pilot scheduled to run until the fall of 2018, is currently underway with Dauphin and The Pas aimed at making these communities leaders in energy efficiency. The pilot will serve as a guide for communities to undertake energy efficiency upgrades in the residential, commercial, and industrial sectors to reduce energy consumption, and assist in lowering utility bills and overall operating costs.

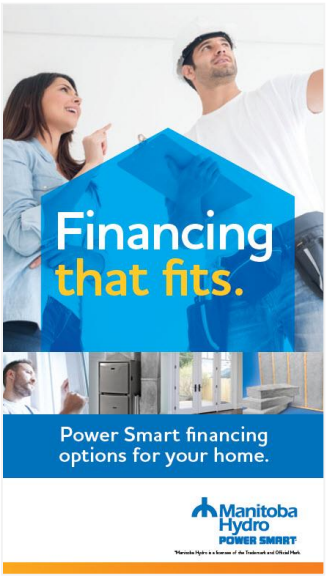
Manitoba Hydro developed an Energy Profile to assist these communities in prioritizing their energy efficiency efforts and establish goals and objectives. The Community Energy Plan will leverage Power Smart programs to assist in achieving these objectives. Taking a community approach to energy efficiency allows for community members to be active participants and work together in achieving a common goal.



The following convenient financing programs offered by Manitoba Hydro supports energy efficiency upgrades by allowing customers to finance initial project costs and pay these costs back on their monthly Manitoba Hydro bill.

Power Smart Residential Loan

The Power Smart Residential Loan (PSRL), launched in March 2001, provides customers with convenient on-bill financing to assist them in making their home more energy efficient. Under the PSRL, the following energy efficiency improvements can be made to the home: insulation, ventilation equipment, air leakage sealing, windows and doors, electric vehicle chargers, and space and water heating equipment. Participants can borrow up to $7,500 (exceptions to this are $5,500 for natural gas furnaces and $3,000 for electric vehicle chargers) and repay the amount on their energy bill over a term of up to 5 years (up to 15 years for natural gas furnaces and boilers). The target market consists of electric and natural gas homeowners in Manitoba.



In 2018/19, the program is expected to finance energy efficient upgrades for 3,726 homes, achieving 0.3 GW.h and 0.1 MW of electric savings and 0.3 million cubic metres of natural gas savings. Combined with achievements to date, 98,280 homes will be retrofitted, resulting in 12.1 GW.h and 6.7 MW of electric savings and 16.7 million cubic metres of natural gas savings by the end of 2018/19.

	2001/02 to 2017/18*	2018/19	Total to 2018/19
No. of Loans	94,554	3,726	**98,280**
Capacity Savings (MW)	6.6	0.1	**6.7**
Energy Savings (GW.h)	11.9	0.3	**12.1**
Natural Gas Savings (million m^3)	16.4	0.3	**16.7**
Average Loan Amount: $5,054			

*Includes estimates for 2017/18

Power Smart PAYS Financing

Launched in November 2012, the Power Smart Pay-As-You-Save (PAYS) Financing Program offers low-interest on-bill financing for energy efficient upgrades. This offering complements and supports existing incentive-based programs by assisting customers in managing the installation cost of their upgrade. To qualify, upgrades must have sufficient estimated annual utility bill savings to offset the monthly financing payment, thereby resulting in an energy bill that is less than or equal to the total bill prior to the retrofit. PAYS financing also differs from Manitoba Hydro's other financing programs in that the loan is transferable between homeowners when a property is sold, and is transferable from a landlord to a tenant where the tenant is responsible for paying the energy bill.

Financing is available over a term of up to 25 years (depending on the technology financed) with a 5-year fixed interest rate. Energy efficient upgrades that may qualify for financing are:

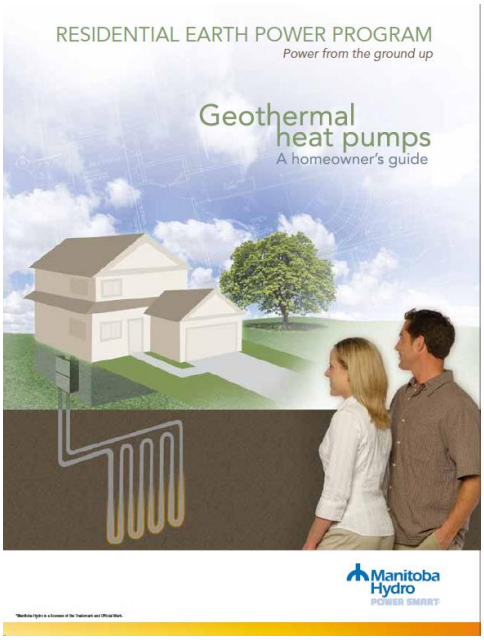
- Space heating equipment:
  - High efficiency natural gas furnaces;
  - Natural gas boilers (minimum AFUE of 85%);
  - Geothermal heat pump systems;
- Insulation upgrades;
- Drain water heat recovery systems;
- WaterSense-labeled toilets (in conjunction with energy efficient equipment).

In 2018/19, the program is expected to finance energy efficient upgrades for 166 homes, achieving 0.1 GW.h and 0.03 MW of electric savings. Combined with achievements to date, 1,127 homes will be retrofitted, resulting in 2.1 GW.h and 0.5 MW of electric savings by the end of 2018/19.

	2012/13 to 2017/18*	2018/19	Total to 2018/19
No. of Loans	961	166	**1,127**
Capacity Savings (MW)	0.5	0.0	**0.5**
Energy Savings (GW.h)	2.0	0.1	**2.1**
Natural Gas Savings (million m^3)	0.0	0.0	**-0.1**
Average Loan Amount: $8,731			

*Includes estimates for 2017/18

Residential Earth Power Loan



The Residential Earth Power Loan (REPL), launched in April 2002, supports the adoption of geothermal heat pump technology, and fosters awareness and growth of new, emerging technologies through educational materials, technical support, and training workshops. With that goal in mind, solar hot water systems were added to the loan in 2010 and solar photovoltaic (PV) systems and cold climate air source heat pump systems were added to the suite of eligible measures in 2016. Although more expensive to install, these technologies offer significant electricity savings, thereby reducing customers' monthly utility bills. The convenience and flexibility of the on-bill REPL reduces the financial barrier that exists when installing these systems.

Customers are eligible to finance up to $20,000 for geothermal heat pump systems, $7,500 for solar domestic water heating systems, $30,000* for solar PV systems, and $10,000 for cold climate air source heat pump systems. The financial terms include a 5-year fixed interest rate over a 15-year maximum amortization term. The interest rate for the balance of the financing period is established at Manitoba Hydro's cost of borrowing at the time the fixed interest rate term expires.

In 2018/19, the program participation is expected to be 90 loans, resulting in 0.7 GW.h and 0.3 MW of electric savings and 9,900 cubic metres of gas savings. Combined with achievements to date, 1,544 customers will participate resulting in 16.3 GW.h and 4.9 MW of electric savings and 3.1 million cubic metres of natural gas savings by the end of 2018/19. The program is forecasted to reach 0.6% of targeted customers by the end of 2018/19.

*Amount eligible to finance a solar PV system is based on an installed price per watt, up to a maximum of $30,000.

	2002/03 to 2017/18*	2018/19	Total to 2018/19
No. of Loans	1,454	90	**1,544**
Capacity Savings (MW)	4.6	0.3	**4.9**
Energy Savings (GW.h)	15.6	0.7	**16.3**
Natural Gas Savings (million m³)	3.0	0.0	**3.1**
Average Loan Amount: $14,844			

*Includes estimates for 2017/18

Commercial

Manitoba Hydro offers a number of innovative programs, using a variety of market intervention tools including but not limited to, incentives, financing, technical assistance, industry education and training, to address opportunities in the commercial market.

Commercial Lighting Program

The Commercial Lighting Program, launched in May 1992, reduces electricity consumption by accelerating the acceptance and adoption of energy efficient lighting technologies in Manitoba. Commercial, industrial, and agricultural customers are encouraged to install qualifying energy efficient lighting technologies in their facilities to reduce energy bills, improve the quality of lighting, as well as increase safety, security, and productivity.

The target market consists of all existing commercial, industrial, and agricultural buildings with inefficient lighting installations in Manitoba, where lighting systems operate a minimum of 2,000 hours per year. Lighting systems that operate between 1,000 to 1,999 hours per year may qualify for prorated incentives. The estimated market size is 52,500 potential lighting projects overall. Many energy efficient lighting options have higher initial capital costs, and oftentimes customers lack awareness of the technologies available and the non-energy related benefits of energy efficient lighting, thereby creating a barrier to the adoption of higher efficiency systems. In addition, many customers operate in commercial lease space where the person making decisions related to lighting upgrades may not pay the utility bill and therefore, does not realize the direct financial return. Strategies in place to address these market barriers include financial incentives, education and training, as well as technical and customer service support.

In 2018/19, program participation is expected to be 1,700 projects, resulting in 60.9 GW.h and 15.0 MW of electric savings. Combined with achievements to date, 19,910 projects will be completed resulting in 699.4 GW.h and 146.9 MW of electric savings by the end of 2018/19. The program is forecast to reach 38% of the target market by the end of 2018/19.

	1992/93 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	18,210	1,700	**19,910**
Capacity Savings (MW)	131.9	15.0	**146.9**
Energy Savings (GW.h)	638.5	60.9	**699.4**
Utility Investment (Millions, $)	$122.3	$11.0	**$133.3**
Customer Investment (Millions, $)	$47.2	$5.2	**$52.4**
Total DSM Investment (Millions, $)	$169.4	$16.2	**$185.6**
Estimated Average Annual Bill Reduction per Customer (Electric): $191			

*Includes estimates for 2017/18

LED Roadway Lighting Conversion Program

Through the Power Smart LED Roadway Lighting Conversion Program, launched in June 2015, Manitoba Hydro will convert existing High Pressure Sodium (HPS) roadway, decorative, lane and area lights to Light Emitting Diode (LED) lights over a 7-year period. Manitoba Hydro provides energy and maintenance services to over 130,000 roadway lights across the Province of Manitoba.

The current roadway lighting technology is High Pressure Sodium (HPS), which produces a yellow/orange light and has a four-year lamp life. The wattages range from 70 to 1,000 and these light fixtures were originally installed in 1991 under a past Power Smart Roadway Lighting Conversion Program to replace Mercury Vapour and Incandescent lighting.

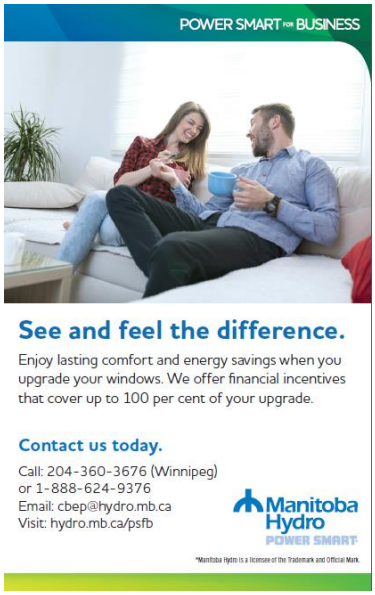
In addition to energy savings, LED roadway lighting has a significantly longer life than HPS lighting, quick turn on and off, and improved contrast and colour rendering due to their white light output. LED lights also provide the added benefit of directing the light downward onto the roadway increasing the amount of light on the road and improving drivers' visibility.

In 2018/19, program participation is expected to be 33,030 conversions, resulting in 14.4 GW.h and 2.1 MW of electric savings. Combined with achievements to date, 117,420 conversions will take place resulting in 50.6 GW.h and 7.8 MW of electric savings by the end of 2018/19. The program is forecast to reach 90% of targeted customers by the end of 2018/19.

	2014/15 to 2017/18*	2018/19	Total to 2018/19
No. of Conversions	84,390	33,030	**117,420**
Capacity Savings (MW)	5.7	2.1	**7.8**
Energy Savings (GW.h)	36.1	14.4	**50.6**
Utility Investment (Millions, $)	$36.1	$11.5	**$47.6**
Customer Investment (Millions, $)	$0.0	$0.0	**$0.0**
Total DSM Investment (Millions, $)	$36.1	$11.5	**$47.6**

*Includes estimates for 2017/18

Commercial Building Envelope - Windows Program



The Commercial Building Envelope (Windows) Program, launched in 1995, improves building envelope performance and reduces energy consumption through the installation of high performance window and doors in existing commercial buildings. In 2016/17, the program expanded its offering to include financial incentives for doors and extending incentives for curtain wall upgrades to natural gas heated buildings. The target market consists of all existing commercial customers, primarily focused on sectors such as multi-unit residential buildings, schools, hotels/motels, personal care homes, and health care facilities. The program targets facilities planning to replace existing windows and/or doors, thus presenting an economic opportunity to install higher efficiency Power Smart qualifying systems at the time of replacement.

Market barriers include the incremental product cost of high performance windows, along with a lack of awareness of the significant potential energy savings and other non-energy benefits. Windows are also measure that is often deferred if other building maintenance upgrades are required. Providing financial incentives to help offset incremental material costs, working closely with local fabricators and window suppliers and contractors, while promoting the benefits of high performance windows is effectively addressing these barriers.

It is estimated that there are approximately 750 potential window replacement projects in Manitoba each year, of a total overall market of 27,000 potential projects.

In 2018/19, program participation is expected to be 150 projects, resulting in 1.0 GW.h and 0.4 MW of electric savings and 0.6 million cubic metres of gas savings. Combined with achievements to date, participation will be 2,023 projects resulting in 25.1 GW.h and 10.3 MW of electric savings and 3.9 million cubic metres of natural gas savings by the end of 2018/19. The program is forecast to reach 7.5% of the total potential market by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	1,873	150	**2,023**
Capacity Savings (MW)	10.0	0.4	**10.3**
Energy Savings (GW.h)	24.1	1.0	**25.1**
Natural Gas Savings (million m³)	3.3	0.6	**3.9**
Utility Investment (Millions, $)	$17.3	$0.9	**$18.2**
Customer Investment (Millions, $)	$0.9	$3.9	**$4.8**
Total DSM Investment (Millions, $)	$18.2	$4.9	**$23.1**
Estimated Average Annual Bill Reduction per Customer (Electric): $213			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $412			

*Includes estimates for 2017/18

Commercial Building Envelope - Insulation Program

The Commercial Building Envelope (Insulation) Program, launched in April 2006, improves building envelope performance and reduces energy consumption by upgrading insulation levels in roof and wall areas of existing buildings. In 2016/17, the program expanded its offering to encourage a pilot program for air leakage reduction in commercial buildings.

The target market is comprised of all commercial customers with insulation levels that do not meet Power Smart levels. The program targets facilities planning to undergo extensive repairs to existing roofs and walls, presenting an economic opportunity to improve existing insulation levels at the time of renovation.

Market barriers include the capital cost of major upgrades to roofs and exterior facades, and a lack of awareness of the significant potential energy savings and other non-energy benefits associated with upgraded insulation levels. Insulation upgrades typically happen at the time of renovation, resulting in a lost opportunity if customers do not increase insulation at that time. Providing financial incentives to help offset incremental material costs and promoting the benefits of better insulated buildings are effectively addressing these barriers.

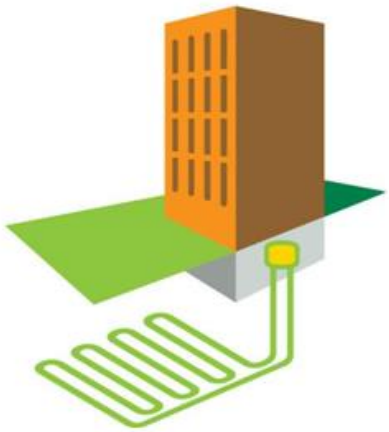
It is estimated that there are approximately 400 potential insulation replacement projects in Manitoba each year, of a total overall market of 15,000 potential projects.

In 2018/19, program participation is expected to be 270 projects, resulting in 3.2 GW.h and 1.5 MW of electric savings and 1.1 million cubic metres of natural gas savings. Combined with achievements to date, participation will be 2,534 projects resulting in 51.3 GW.h and 24.1 MW of electric savings and 16.3 million cubic metres of natural gas savings by the end of 2018/19. The program is forecast to reach 17% of the total potential market by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	2,264	270	**2,534**
Capacity Savings (MW)	22.6	1.5	**24.1**
Energy Savings (GW.h)	48.1	3.2	**51.3**
Natural Gas Savings (million m³)	15.2	1.1	**16.3**
Utility Investment (Millions, $)	$21.8	$1.8	**$23.6**
Customer Investment (Millions, $)	$14.9	$0.3	**$15.2**
Total DSM Investment (Millions, $)	$36.6	$2.2	**$38.8**
Estimated Average Annual Bill Reduction per Customer (Electric): $115			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $136			

*Includes estimates for 2017/18

Commercial Geothermal Program



The Commercial Geothermal Program, launched in 2007, encourages the installation of geothermal heat pumps in electrically heated commercial buildings. Through the program, customers are provided with information on how the geothermal heat pump technology works, the energy savings available, and other benefits to increase understanding and acceptance of the technology. Financial incentives are offered to help offset the higher capital costs of the system and increase adoption of this green heating option. The program also financially supports feasibility studies, ensuring the installation of a geothermal heat pump system is an economic option for the customer. Benefits of geothermal systems and program opportunities are communicated through the broad network of engineers, architects, consultants, contractors, and trade allies in Manitoba who have established relationships with the commercial and industrial customer base. The target market consists of existing commercial buildings that use conventional electric technologies for space heating at or approaching end of life. The high capital cost of installing a geothermal heat pump system, combined with the available supply of qualified installers and contractors in some regions of the province; challenging drilling and trenching conditions due to varying geological conditions; limited land area of many properties to accommodate the loop installation; and the proximity to the ground loop of underground facilities and services (water and sewer lines that may freeze, etc.) can make choosing geothermal as a heating/cooling option more challenging for the customer.

In 2018/19, program participation is expected to be 7 customers, resulting in 0.4 GW.h and 0.2 MW of electric savings. Combined with achievements to date, 156 customers will participate resulting in 45.3 GW.h and 17.3 MW of electric savings by the end of 2018/19. The program is forecast to reach 4% of targeted customers by the end of 2018/19.

	2007/08 to 2017/18*	2018/19	Total to 2018/19
No. of Buildings	149	7	**156**
Capacity Savings (MW)	17.2	0.2	**17.3**
Energy Savings (GW.h)	44.9	0.4	**45.3**
Utility Investment (Millions, $)	$5.5	$0.3	**$5.8**
Customer Investment (Millions, $)	$22.0	$0.1	**$22.1**
Total DSM Investment (Millions, $)	$27.5	$0.3	**$27.9**
Estimated Average Annual Bill Reduction per Customer (Electric): $5,609			

*Includes estimates for 2017/18

Commercial HVAC Program – Boilers

Launched in April 2006, the Commercial HVAC Program for Boilers seeks to transform the commercial boiler market in Manitoba by increasing awareness and adoption of energy efficient condensing and near-condensing boilers. Energy efficient boilers offer significant natural gas savings, reducing customers' monthly utility bills. The program focuses on educating building owners and operators about the benefits of energy efficient equipment and works with industry contractors, engineers, consultants, designers, and equipment dealers to promote these systems. Financial incentives ranging from $2/MBH (thousands of BTUs per hour) to $8/MBH are provided for qualifying systems. The program is designed to build market acceptance prior to a proposed minimum efficiency regulation, which is projected for adoption in April 2020.

The program's primary target market consists of commercial buildings with existing heating equipment that is at or nearing end of life. Boiler replacements are not likely to occur until existing equipment is nearing end of life and are often completed in an emergency situation during the heating season. Therefore, purchasing decisions are made with limited lead time and primarily based on the initial capital cost, not considering the annual operating costs of the system over its 25-year life. Condensing or near-condensing natural gas boilers are also more expensive to install than conventional boilers, and require modifications to the ventilation system. Financial incentives, combined with educational materials and information on the lifecycle cost advantage of installing energy efficient systems, endeavor to address these market barriers.

In 2018/19, program participation is expected to be 112 boilers, resulting 0.6 million cubic metres of gas savings. Combined with achievements to date, 1,467 boilers will be installed resulting in 14.2 million cubic metres of natural gas savings by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
No. of Boilers	1,355	112	**1,467**
Natural Gas Savings (million m³)	13.6	0.6	**14.2**
Utility Investment (Millions, $)	$13.0	$0.6	**$13.6**
Customer Investment (Millions, $)	$10.6	$0.5	**$11.1**
Total DSM Investment (Millions, $)	$23.6	$1.1	**$24.6**
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $1,346			

*Includes estimates for 2017/18

Commercial HVAC Program - C02 Sensors

Launched in April 2009, the Commercial HVAC Program for CO2 Sensors is designed to increase the awareness and adoption of CO2 sensors in commercial facilities. CO2 sensors reduce energy consumption by matching ventilation supply to occupant demand, reducing customers' monthly utility bills. CO2 sensors also improve occupant comfort by providing more consistent air quality and can extend the life of heating and cooling equipment by putting less demand on these systems.

The program's primary target market consists of over-ventilated commercial facilities with variable occupancy that have, or are considering, direct digital control systems or rooftop units to control heating, cooling, and ventilation. Installations typically occur when other major renovations are being made to the ventilation system.

CO2 sensors are not required in commercial building operation and therefore, are often one of the first retrofit measures to be overlooked, particularly in the presence of budgetary constraints. Also, customers tend to be unfamiliar with the operation of their ventilation systems and therefore, may be unaware when their building is being over-ventilated. Aggressive financial incentives, combined with promoting the lifecycle cost advantage and improved ventilation benefits of CO2 sensor technology, endeavor to address these market barriers.

In 2018/19, program participation is expected to be 65 sensors, resulting in 0.1 GW.h and 0.1 MW of electric savings and 31,000 cubic metres of gas savings. Combined with achievements to date, 511 sensors will be installed resulting in 0.6 GW.h and 0.3 MW of electric savings and 0.7 million cubic metres of natural gas savings by the end of 2018/19.

	2009/10 to 2017/18*	2018/19	Total to 2018/19
No. of Sensors	446	65	**511**
Capacity Savings (MW)	0.2	0.1	**0.3**
Energy Savings (GW.h)	0.5	0.1	**0.6**
Natural Gas Savings (million m³)	0.7	0.0	**0.7**
Utility Investment (Millions, $)	$0.5	$0.1	**$0.6**
Customer Investment (Millions, $)	$0.2	$0.0	**$0.2**
Total DSM Investment (Millions, $)	$0.7	$0.1	**$0.8**
Estimated Average Annual Bill Reduction per Customer (Electric): $174			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $139			

*Includes estimates for 2017/18

Commercial HVAC Program – HRV/ERV

The Commercial HVAC Program for Heat Recovery Ventilators (HRV) and Energy Recovery Ventilators (ERV) was launched in May 2016. An HRV/ERV introduces fresh air by having the stale and polluted air from the building pass through the heat exchanger core with a continuous stream of fresh air. As the stale air being expelled moves through the HRV system and passes the fresh air being drawn in, heat or cold is transferred and recovered. The installation of an HRV/ERV can reduce ventilation heating load from 50 to 80 per cent.

The program's primary target market consists of existing commercial buildings with mechanical ventilation and dense occupancy, such as multi-unit residential buildings, health care facilities, retail spaces, restaurants, offices, and schools. Financial incentives and educational materials serve to build awareness and understanding of HRV/ERV technology and encourage participation in the program.

In 2018/19, program participation is expected to be 11 buildings, resulting in 0.2 GW.h and 0.1 MW of electric savings and 0.1 million cubic metres of gas savings. Combined with achievements to date, 15 buildings will participate resulting in 0.2 GW.h and 0.1 MW of electric savings and 0.1 million cubic metres of natural gas savings by the end of 2018/19.

	2016/17 to 2017/18*	2018/19	Total to 2018/19
No. of Buildings	4	11	**15**
Capacity Savings (MW)	0.0	0.1	**0.1**
Energy Savings (GW.h)	0.0	0.2	**0.2**
Natural Gas Savings (million m³)	0.0	0.1	**0.1**
Utility Investment (Millions, $)	$0.2	$0.3	**$0.4**
Customer Investment (Millions, $)	$0.0	$0.1	**$0.1**
Total DSM Investment (Millions, $)	$0.2	$0.4	**$0.5**
Estimated Average Annual Bill Reduction per Customer (Electric): $2,007			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $1,618			

*Includes estimates for 2017/18

Commercial HVAC Program - Water Heaters

The Commercial HVAC Program for Water Heaters was launched in April 2015. The program is designed to reduce natural gas consumption by accelerating the adoption of high efficiency natural gas water heaters, which are approximately 30% more efficient than standard efficiency units.

The program's primary target market consists of commercial buildings with high levels of domestic hot water consumption where the current water heating system is at or nearing end of life.

High initial product costs and long payback periods serve as barriers to the purchase and installation of condensing water heaters. Financial incentives, educational materials, and information seminars endeavor to address these market barriers.

The program also supports the potential for future regulations by advancing market acceptance of condensing water heating technology in Manitoba. The program will prepare the market for a condensing water heater regulation by educating customers, contractors, and distributors about the benefits of condensing water heaters. Advertising and promotional activities increase consumer and contractor awareness of the program and the benefits of choosing high efficiency water heating options.

In 2018/19, program participation is expected to be 27 water heaters, resulting in 0.1 million cubic metres of gas savings. Combined with achievements to date, 113 water heaters will be installed resulting 0.2 million cubic metres of natural gas savings by the end of 2018/19.

	2015/16 to 2017/18*	2018/19	Total to 2018/19
No. of Water Heaters	86	27	**113**
Natural Gas Savings (million m³)	0.2	0.1	**0.2**
Utility Investment (Millions, $)	$0.4	$0.1	**$0.5**
Customer Investment (Millions, $)	$0.2	$0.1	**$0.3**
Total DSM Investment (Millions, $)	$0.6	$0.2	**$0.8**
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $544			

*Includes estimates for 2017/18

Commercial Custom Measures Program

The Power Smart Commercial Custom Measures Program, launched in 2006, is designed to encourage commercial customers to explore and implement energy efficient upgrades of their operations or facilities. This program offers support for customer-specific and unique projects or newer technologies that are not currently eligible under the other Power Smart for Business Program offerings. Technologies and projects may include digital control systems, hot water and space heating equipment, waste energy recovery systems, variable speed drive systems, and solar air and water heating systems. The program provides funding to help cover the cost of feasibility studies that are often required for larger projects and newer or emerging technologies, and implementation incentives based on projected savings from the project.

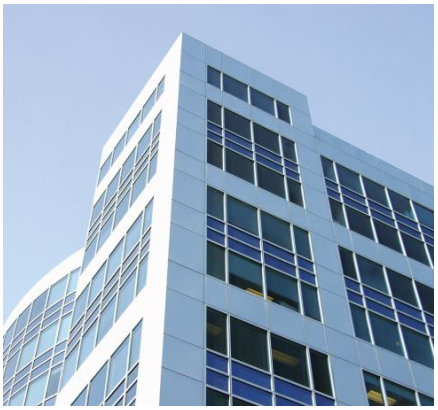
The program targets all commercial customers planning new construction, renovation or expansion projects. Often the high incremental cost of energy efficient technologies and systems, customer uncertainty of payback, and lack of awareness of energy efficient alternatives limit a customer's propensity to invest in an energy efficient project. The Custom Measures Program addresses these barriers by promoting new and innovative technologies, by offering a feasibility study incentive to provide confidence in energy savings estimates, and by offering incentives to help reduce the implementation cost. An enhanced Custom Measures Program was launched in 2015/16 addressing one of the barriers to participation, the cost of identifying and investigating savings opportunities. The cost of feasibility study proposals and reports are now completely funded by the Program for large electric projects.

In 2018/19, program participation is expected to be 25 projects, resulting in 2.0 GW.h and 0.3 MW of electric savings and 0.3 million cubic metres of gas savings. Combined with achievements to date, 144 projects will participate resulting in 29.0 GW.h and 2.5 MW of electric savings and 2.7 million cubic metres of natural gas savings by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	119	25	**144**
Capacity Savings (MW)	2.2	0.3	**2.5**
Energy Savings (GW.h)	26.9	2.0	**29.0**
Natural Gas Savings (million m³)	2.4	0.3	**2.7**
Utility Investment (Millions, $)	$5.3	$0.6	**$6.0**
Customer Investment (Millions, $)	$13.0	$0.9	**$14.0**
Total DSM Investment (Millions, $)	$18.3	$1.6	**$19.9**
Estimated Average Annual Bill Reduction per Customer (Electric): $8,088			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $4,886			

*Includes estimates for 2017/18

Enhanced Building Operations Program



The Power Smart Commercial Building Optimization Program (CBOP), launched in 2006, encourages commercial customers with existing buildings to engage in an assessment and adjustment process known as retrocommissioning (RCx) to help return their buildings' mechanical systems to their designed operating characteristics and even further optimize their operation to save energy and improve occupant comfort. The program utilizes local engineering and energy service companies to identify non-capital intensive energy conservation opportunities with relatively short payback periods. Incentives are offered to cover a portion of the cost for hiring the RCx agent as well as for implementation of the energy efficient measures identified through the investigation process.

The market consists of existing commercial buildings larger than 50,000 square feet and between 2 and 25 years of age with direct digital control systems and functioning heating, ventilating and air conditioning mechanical systems. There are approximately 500 buildings in this market, however there are significant barriers that must be overcome to reach these customers including lack of experience and availability of RCx providers in Manitoba, lack of customer awareness of the cost-saving benefits of RCx, and lack of customer time and competing priorities for capital to invest in energy efficiency projects. The program addresses these barriers by providing training and information sessions for potential and existing RCx providers, by promoting RCx at relevant industry events, and by offering incentives to reduce the capital cost and payback cycle of the RCx process. Further addressing these barriers, an enhanced program with increased incentives and revised RCx templates designed to yield more per-project savings was introduced in 2016/2017 and re-named the Enhanced Building Operations Program.

In 2018/19, program participation is expected to be 5 buildings, resulting in 1.0 GW.h and 0.2 MW of electric savings and 0.2 million cubic metres of gas savings. Combined with achievements to date, 23 buildings will participate resulting in 4.6 GW.h and 0.7 MW of electric savings and 1.0 million cubic metres of natural gas savings by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
No. of Buildings	18	5	**23**
Capacity Savings (MW)	0.5	0.2	**0.7**
Energy Savings (GW.h)	3.6	1.0	**4.6**
Natural Gas Savings (million m³)	0.8	0.2	**1.0**
Utility Investment (Millions, $)	$3.0	$0.3	**$3.3**
Customer Investment (Millions, $)	$0.2	$0.2	**$0.3**
Total DSM Investment (Millions, $)	$3.2	$0.5	**$3.7**
Estimated Average Annual Bill Reduction per Customer (Electric): $11,730			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $9,026			

*Includes estimates for 2017/18

New Buildings Program

The New Buildings Program, introduced in 2010, offers technical assistance and financial incentives for customers designing and constructing new, energy efficient commercial buildings. The program is designed to transform the commercial new construction industry in response to recent building code changes which require significant improvements in overall building energy efficiency.

The first version of the program aimed to prepare the Manitoba commercial building industry for the province's adoption of the National Energy Code of Canada for Buildings (NECB) 2011. Ninety-two buildings have been completed through this program since 2010 and more than 90 new projects are currently in design or under construction. As of December 1, 2014, all commercial buildings in Manitoba must now adhere to the province's version of the NECB called the Manitoba Energy Code for Buildings (MECB).

With the new code in force, the New Buildings Program has evolved to once again seek higher levels of energy performance in new buildings. To qualify as an official Power Smart Building, projects must be designed with an energy target that is at least 10% better than a standard, code-compliant building. Financial incentives range from $0.50/ft2 to $2.00/ft2 depending on the project's overall energy target. An Energy Modeling Assistance Incentive of up to $10,000 is also available to encourage the use of energy modeling early in a building's design process and to help develop the local energy modeling industry in support of the Power Smart and the MECB.

The target market is all new commercial buildings that are bound by the requirements of the MECB. The industry faces fundamental changes to the current methods of designing, constructing, and commissioning commercial buildings. Manitoba Hydro also worked closely with the Province's Green Building Coordination Team to develop the Green Building Policy for Government of Manitoba Funded Projects. This policy ensures the Province's investments in new construction will help transform the local market and will help build industry capacity within Manitoba.

In 2018/19, program participation is expected to be 15 new buildings, resulting in 2.8 GW.h and 0.8 MW of electric savings and 0.1 million cubic metres of gas savings. Combined with achievements to date, 114 new buildings will participate resulting in 32.7 GW.h and 8.5 MW of electric savings and 4.3 million cubic metres of natural gas savings by the end of 2018/19. The program is forecast to reach 7.5% market penetration of the new construction market in 2018/19.

	2009/10 to 2017/18*	2018/19	Total to 2018/19
No. of Buildings	99	15	**114**
Capacity Savings (MW)	7.6	0.8	**8.5**
Energy Savings (GW.h)	29.9	2.8	**32.7**
Natural Gas Savings (million m^3)	4.2	0.1	**4.3**
Utility Investment (Millions, $)	$11.5	$1.5	**$13.0**
Customer Investment (Millions, $)	$15.2	$1.2	**$16.4**
Total DSM Investment (Millions, $)	$26.7	$2.7	**$29.4**
Estimated Average Annual Bill Reduction per Customer (Electric): $13,211			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $1,023			

*Includes estimates for 2017/18

Commercial Refrigeration Program

The Commercial Refrigeration Program, launched in 2006, encourages commercial customers to reduce energy consumption by offering over 10 different product incentives for energy efficient upgrades to refrigeration display cases, walk-in boxes, mechanical rooms, and lighting. Savings are achieved by providing customers with information about best practices for maintenance, promoting energy efficient refrigeration technologies, and optimizing the operation of new and existing refrigeration equipment.

The target market is commercial customers with foodservice refrigeration equipment, primarily restaurants, grocery and convenience stores. Many of the qualifying energy efficient refrigeration systems have higher incremental costs, and equipment upgrade decisions are sometimes based on aesthetics over energy efficiency. Offering financial incentives to lower incremental costs and promoting the energy and associated bill savings along with non-energy benefits of efficient refrigeration systems, such as increased comfort in refrigeration aisles for customers and employees, reduced product spoilage, and extended equipment life for refrigeration motors and compressors, is effectively addressing these barriers.

In 2018/19, program participation is expected to be 265 projects, resulting in 8.8 GW.h and 1.2 MW of electric savings. Combined with achievements to date, participation will be 2,797 projects resulting in 87.5 GW.h and 11.9 MW of electric savings by the end of 2018/19. The program is forecast to reach 62% of targeted customers by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
No. of Locations	2,532	265	**2,797**
Capacity Savings (MW)	10.7	1.2	**11.9**
Energy Savings (GW.h)	78.7	8.8	**87.5**
Utility Investment (Millions, $)	$5.5	$0.5	**$6.0**
Customer Investment (Millions, $)	$6.3	$0.2	**$6.4**
Total DSM Investment (Millions, $)	$11.8	$0.7	**$12.5**
Estimated Average Annual Bill Reduction per Customer (Electric): $551			

*Includes estimates for 2017/18

Commercial Kitchen Appliance Program

Launched in January 2008, the Commercial Kitchen Appliances Program encourages restaurants and foodservice establishments to purchase high-efficiency kitchen equipment. The program provides rebates to customers who purchase and install high-efficiency steam cookers (electric and gas) and deep-fat fryers (gas only). To qualify, the model must either be ENERGY STAR® certified or tested for compliance with ENERGY STAR® requirements.

In comparison to standard models, many ENERGY STAR® appliances may have a higher initial purchase cost but many customers are not aware that ENERGY STAR® appliances can improve food quality, decrease cooking times, and lessen operating and maintenance costs. By providing financial incentives and promoting the various energy and non-energy benefits of high-efficiency appliances, the program endeavors to address these market barriers.

In 2018/19, the program is expected to support the installation of 19 appliances, achieving 0.1 GW.h and 0.03 MW of electric savings and 6,000 cubic metres of natural gas savings. Combined with achievements to date, 1,311 appliances will be installed resulting in 3.8 GW.h and 1.1 MW of electric savings and 1.1 million cubic metres of natural gas savings by the end of 2018/19.

	2008/09 to 2017/18*	2018/19	Total to 2018/19
No. of Appliances	1,292	19	**1,311**
Capacity Savings (MW)	1.1	0.0	**1.1**
Energy Savings (GW.h)	3.7	0.1	**3.8**
Natural Gas Savings (million m^3)	1.1	0.0	**1.1**
Utility Investment (Millions, $)	$1.1	$0.1	**$1.2**
Customer Investment (Millions, $)	$0.1	$0.0	**$0.1**
Total DSM Investment (Millions, $)	$1.2	$0.1	**$1.3**
Estimated Average Annual Bill Reduction per Customer (Electric): $602			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $282			

*Includes estimates for 2017/18

Network Energy Management Program

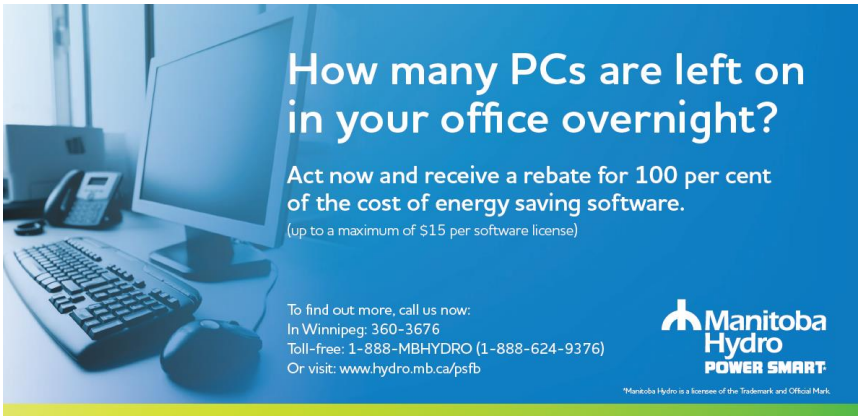
The Network Energy Management Program, launched in 2009, encourages customers to install program-approved software that conserves energy by sending personal computers (PCs) into a mode that consumes less energy when they are not in use. The program is aimed at commercial and institutional organizations that manage a network of PCs.

The target market is comprised of approximately 2,500 physical locations in the school/college and office sectors, representing approximately 300,000 PCs. Installation, configuration, and testing of this new software on existing networks can require a significant time investment. Although management may realize operational cost savings, IT staff is often cautious when implementing software that they perceive may in any way restrict their ability to access individual PCs remotely to perform maintenance and system upgrades. The program provides financial incentives and promotes the product benefits through direct marketing to both management and IT staff in order to address these barriers to adoption.

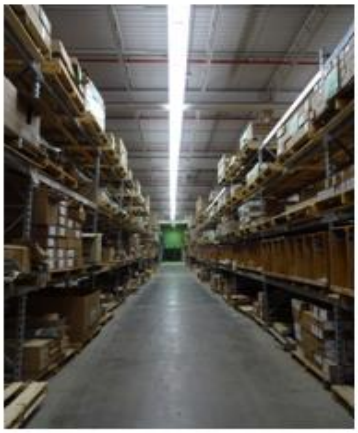
In 2018/19, program participation is expected to be 1,000 software licenses, resulting in 0.2 GW.h and 0.02 MW of electric savings. Combined with achievements to date, participation will be 6,346 software licenses resulting in 2.8 GW.h and 0.3 MW of electric savings by the end of 2018/19.

	2009/10 to 2017/18*	2018/19	Total to 2018/19
No. of Licenses	5,346	1,000	**6,346**
Capacity Savings (MW)	0.3	0.0	**0.3**
Energy Savings (GW.h)	2.7	0.2	**2.8**
Utility Investment (Millions, $)	$0.3	$0.0	**$0.3**
Customer Investment (Millions, $)	$0.1	$0.0	**$0.1**
Total DSM Investment (Millions, $)	$0.3	$0.1	**$0.4**
Estimated Average Annual Bill Reduction per Customer (Electric): $4,163			

*Includes estimates for 2017/18



Internal Retrofit Program



The Internal Retrofit Program (IRP), launched in 1993, targets energy efficient upgrades in Manitoba Hydro buildings including, but not limited to, generating stations, commercial facilities, office spaces and corporate housing. The program's efforts demonstrate Manitoba Hydro's commitment to energy conservation at large. The program provides technical assistance and financial support for the installation of Power Smart measures such as lighting, windows, insulation, heating, ventilation, and air conditioning systems and other custom measures.

In addition to achieving energy savings, the IRP strives to improve workplace safety, address operational issues, reduce maintenance costs and optimize employee comfort.

In 2018/19, it is anticipated that the program will complete 53 projects, resulting in 4.8 GW.h and 0.8 MW of electric savings and 0.1 million cubic metres of natural gas savings. Combined with achievements to date, the program will have completed 1,833 projects resulting in 78.1 GW.h and 16.3 MW of electric savings and 0.1 million cubic metres of natural gas savings by the end of 2018/19.

	1992/93 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	1,780	53	**1,833**
Capacity Savings (MW)	15.5	0.8	**16.3**
Energy Savings (GW.h)	73.3	4.8	**78.1**
Natural Gas Savings (million m^3)	0.0	0.1	**0.1**
Utility Investment (Millions, $)	$25.2	$0.8	**$26.0**

*Includes estimates for 2017/18

Power Smart Shops Program

Launched in October 2015, the Power Smart Shops Program promotes energy efficiency to the hard-to-reach small commercial market such as small restaurants, offices, clinics, and salons. More recently, the program was also extended to non-profit organizations, charities, and religious facilities across Manitoba. To be eligible, the business must be 10,000 square feet or less in size and a Manitoba Hydro commercial customer with either an electric or natural gas heating system. National chains and new construction projects are not eligible to participate.

The Power Smart Shops Program utilizes a full-service contractor delivery model and consists of a three-part offering: Firstly, the on-site direct installation of various free measures, such as bathroom and kitchen faucet aerators, low-flow pre-rinse spray valves, and basic lighting measures. Secondly, a free lighting assessment that identifies further opportunities to upgrade inefficient lighting. Lastly, the program covers 70% of material and labour costs of qualifying lighting retrofits identified in the assessment. Material sourcing and installation are coordinated by the program contractor.

The small commercial market is a proven late adopter of energy efficient technologies due to a number of unique barriers that have not been specifically addressed by Power Smart for Business programs in the past. Budgetary restrictions, limited resources, and a lack of industry exposure are all barriers that the Power Smart Shops Program endeavors to overcome. The program's aggressive incentives are intended to lessen upfront capital costs to the customer.

In 2018/19, program participation is expected to be 807 projects, resulting in 2.1 GW.h and 0.3 MW of electric savings and 12,000 cubic metres of natural gas savings. Combined with achievements to date, participation will be 3,234 projects resulting in 8.9 GW.h and 1.7 MW of electric savings and 0.1 million cubic metres of natural gas savings by the end of 2018/19.

	2009/10 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	2,427	807	**3,234**
Capacity Savings (MW)	1.4	0.3	**1.7**
Energy Savings (GW.h)	6.9	2.1	**8.9**
Natural Gas Savings (million m^3)	0.1	0.0	**0.1**
Utility Investment (Millions, $)	$3.6	$0.9	**$4.5**
Customer Investment (Millions, $)	$0.1	$0.0	**$0.2**
Total DSM Investment (Millions, $)	$3.7	$1.0	**$4.7**
Estimated Average Annual Bill Reduction per Customer (Electric): $26			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $3			

*Includes estimates for 2017/18

Race to Reduce

Manitoba Race to Reduce, launched January 2017, is a competition-based initiative designed to reduce energy consumption in participating commercial buildings by 10 per cent over a four year race. Collaboration among customers, industry associations, and other key stakeholders is an important principle of the race. Encouraged energy reduction behaviours include turning off lights in unoccupied spaces, setting back thermostats, closing window blinds in cooling season, enabling energy-saving features of office equipment, and more.

By increasing the energy efficiency, or simply reducing the energy use in these buildings, landlords and tenants can reduce operating costs while making a direct improvement to Manitoba's environment by reducing carbon emissions and improving air quality. The initiative has secured almost seven million square feet of office space in Manitoba to participate in the competition. Successful Race to Reduce participants will be publicly recognized and celebrated annually during the initiative's award ceremonies.

In 2018/19, it is expected that 6 commercial buildings will participate, resulting in 0.9 GW.h and 0.1 MW of electric savings and 0.1 million cubic metres of natural gas savings. The program is forecast to enroll 66% of targeted customers by the end of 2018/19.

	2016/17 to 2017/18*	2018/19	Total to 2018/19
No. of Buildings	32	6	**38**
Capacity Savings (MW)	0.5	0.1	**0.6**
Energy Savings (GW.h)	4.3	0.9	**5.3**
Natural Gas Savings (million m³)	0.3	0.1	**0.4**
Utility Investment (Millions, $)	$0.3	$0.2	**$0.5**
Customer Investment (Millions, $)	$0.0	$0.0	**$0.0**
Total DSM Investment (Millions, $)	$0.3	$0.2	**$0.5**
Estimated Average Annual Bill Reduction per Customer (Electric): $7,390			
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $2,448			

*Includes estimates for 2017/18

Parking Lot Controller

The Parking Lot Controller Program launched in 2016/17, and was a one year initiative designed to reduce energy consumption in parking lots of commercial buildings by providing financial incentives for the installation of qualifying devices. Parking lot controllers are electronic devices that control the electricity going to an outdoor plug, allowing building and property managers to effectively manage electricity usage in their parking lots. Parking lot controllers can reduce electricity costs by up to 50 per cent and ensure trouble-free starts for tenants, staff and guests. The market for the program is comprised of new construction and existing parking lots of multi-unit residential buildings, offices, and institutional and industrial facilities.

The program ended in 2017 and has been successful in achieving its targeted energy savings. It is expected that an additional 54 commercial building will finalize their projects in the 2018/19 year, resulting in 1.0 GW.h of electric savings. The program is forecast to capture 68% of targeted customers by the end of 2018/19.

	2016/17 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	143	54	**197**
Capacity Savings (MW)	0.0	0.0	**0.0**
Energy Savings (GW.h)	2.7	1.0	**3.8**
Utility Investment (Millions, $)	$0.5	$0.2	**$0.7**
Customer Investment (Millions, $)	$0.0	$0.0	**$0.0**
Total DSM Investment (Millions, $)	$0.5	$0.2	**$0.7**
Estimated Average Annual Bill Reduction per Customer (Electric): $25			

*Includes estimates for 2017/18

The following convenient financing program offered by Manitoba Hydro supports energy efficiency upgrades by allowing customers to finance initial project costs and pay these costs back on their monthly Manitoba Hydro bill.

Power Smart for Business PAYS Financing

The Power Smart for Business PAYS (Pay As You Save) Financing Program, launched in September 2013, to assist commercial customers in reducing their energy and water consumption by offering extended financing terms for energy efficiency upgrades such as lighting, high efficiency natural gas furnaces, condensing and near-condensing boilers, insulation, geothermal systems, CO2 sensors, custom measures (commercial and industrial applications), and WaterSense® labeled toilets and urinals. This offering complimented and supported the various incentive-based programs by assisting customers in managing the installation cost of their upgrade.

Effective September 8th, 2017, the Program was temporarily suspended from accepting any new applications, however, previously approved applications can still proceed with the financing. Based upon these pre-approvals, the program is expected to finance 28 projects in 2018/19. Combined with achievements to date, 124 technologies will be financed.

Note: Savings are included under the appropriate incentive based program.

	2013/14 to 2017/18*	2018/19	Total to 2018/19
No. of Loans	96	28	**124**
Average Loan Amount: $26,551			

*Includes estimates for 2017/18

Industrial

Manitoba industry competes in a global economy and energy efficiency is often a key indicator of the overall productivity and competitiveness of an industrial customer. Energy consumption is impacted by every aspect of an industrial operation, from the way employees work to the facilities they work in, and the way in which they process, package and deliver raw materials into finished goods for their local, national and international customers.

Manitoba Hydro offers incentive-based programs to address opportunities within the industrial market for energy efficiency improvements and co-generation of electricity. These programs take a customer-focused approach to identifying and addressing operating and production challenges in a manner that not only improves overall energy efficiency, but enhances productivity and competitiveness for Manitoba industry.

Manitoba's industrial market can be characterized as consisting of a large variety of industries with a broad size demographic of customers within each classification. While some sectors are responsible for higher percentages of consumption than others, no one industry sector is dominant within the province. In Manitoba, each sector is typically dominated by less than six customers, with the remaining customers being smaller with more specialized operations or substantively lower outputs. This diversity presents some unique challenges with program delivery as opportunities to capture substantive savings are tied directly to specific industry business cycles within each industry sector that dictate major events such as equipment change-outs, plant overhauls, facility expansions, and new plant construction. These cycles are periodic and can stretch across decades, with timing influenced heavily by market cycles and global competitive pressures.

With industry comprising nearly 40% of Manitoba's total electric and natural gas consumption, Manitoba Hydro's industrial Power Smart programs must have broad appeal in order to be relevant and responsive to the needs of a diverse population of industrial customers.

Investing in the energy efficiency for our industrial customers also increases their competitiveness in the global economy. On average, energy costs account for 5% to 15% of total operating costs for the majority of these companies, while energy intensive resource companies employing thousands of Manitobans across the north and rural regions of southern Manitoba have energy costs that range from 15% to 70% of total operating costs.

Manitoba Hydro's total industrial energy efficiency investment is returned annually to the Province's industrial sector through reduced energy costs. These investments in energy efficiency reduce labor, material and facility costs, further helping to make Manitoba industry increasingly productive and globally competitive, and supporting further investment in energy efficiency and productivity improvements.

Performance Optimization Program

The Performance Optimization Program, launched in June 1993, is designed to promote energy efficiency through the optimization of electric motor-driven industrial systems such as air compressors, pumps, fans and blowers, optimization of industrial refrigeration, process heating, electro-chemical processes systems, and implementation of plant-wide energy management systems. The program supports customers with financial incentives to assist in the identification, investigation, and implementation of system efficiency improvements throughout a facility.

The focused target market consists of approximately 2 000 industrial customers, with the program being available to both existing facilities and new construction projects. Emphasis is placed on the 300 largest customers who represent about 1/3 of the energy consumed in Manitoba. The average duration of a project from identification of the opportunity to implementation ranges from 6 months to 2 years, averaging approximately 18 months.

The actual number of project applications facilitated in any fiscal year and the savings achieved per project can vary dramatically based on project size, equipment age, and remaining life of the individual systems being optimized. However, savings levels are relatively consistent, thereby reflecting the capability within Manitoba Hydro's programs to adapt to available opportunities.

In 2018/19, the program is expected to achieve 13.6 GW.h and 1.4 MW of electric savings. Combined with achievements to date, the program is expected to achieve 595.2 GW.h and 111.5 MW by the end of 2018/19.

	1993/94 to 2017/18*	2018/19	Total to 2018/19
Capacity Savings (MW)	110.1	1.4	**111.5**
Energy Savings (GW.h)	581.6	13.6	**595.2**
Utility Investment (Millions, $)	$35.8	$2.5	**$38.3**
Customer Investment (Millions, $)	$99.3	$2.3	**$101.6**
Total DSM Investment (Millions, $)	$135.1	$4.8	**$139.9**
Estimated Average Annual Bill Reduction per Customer (Electric): $8,436			

*Includes estimates for 2017/18

Natural Gas Optimization Program

The Power Smart Natural Gas Optimization Program (NGOP), launched in September 2006, is designed to support the systematic improvement of natural gas equipment and processes for industrial and large institutional customers. The program supports customers by offering financial incentives for steam trap audits, feasibility studies and for energy efficient project implementation. The program was principally developed to promote custom applications within large industrial, institutional and commercial facilities comprised of roughly 1,400 customers in Manitoba. The scope of the NGOP has been extended to allow the program to respond to all industrial customer inquiries, regardless of the size of the facility or volume of natural gas consumed.

Like the Performance Optimization Program, the NGOP is a custom program that supports a variety of technologies across a wide variety of applications, including; boiler conversions, process water and air heat recovery, process equipment and pipe insulation, boiler economizers, and other available technologies. The program is designed to address key market barriers related to project costs, available benefits, cost/benefit ratios and desired return on investment.

Current low natural gas commodity prices are challenging Manitoba Hydro customers' ability to achieve desired rates of return on investment in conservation initiatives. This highlights the importance of Manitoba Hydro in being actively involved when new facilities and uses of natural gas are being constructed, as any inefficiencies in the original facility or process will be hard to rectify in coming years.

The actual number of project applications facilitated in any fiscal year and the savings achieved per project can vary dramatically based on project size, equipment age, and remaining life of the individual systems being optimized. However, savings levels are relatively consistent, thereby reflecting the capability within Manitoba Hydro's programs to adapt to available opportunities.

In 2018/19, the program is expected to achieve 2.0 million cubic metres in natural gas savings. Combined with achievements to date, the program is expected to achieve 24.2 million cubic metres in natural gas savings by the end of 2018/19.

	2006/07 to 2017/18*	2018/19	Total to 2018/19
Natural Gas Savings (million m³)	22.2	2.0	**24.2**
Utility Investment (Millions, $)	$6.7	$0.7	**$7.4**
Customer Investment (Millions, $)	$35.5	$2.3	**$37.8**
Total DSM Investment (Millions, $)	$42.2	$3.0	**$45.2**
Estimated Average Annual Bill Reduction per Customer (Natural Gas): $37,222			

*Includes estimates for 2017/18

Load Displacement & Alternative Energy

Load Displacement occurs when customer-owned and operated facilities capable of generating heat and/or power are used to displace energy purchases that would otherwise be made from the Manitoba Hydro system in the form of electric and/or natural gas consumption. This displacement is achieved in an environmentally sustainable manner using renewable energy resources such as biomass, waste and by-product streams from common industrial processes.

Displaced energy provided under long-term contracts with customers is used by Manitoba Hydro to serve other customers' energy needs, including the export market, where the sale of renewable electric energy displaces generation that is largely fossil fuel-based. The widely distributed nature of load displacement projects, can in some cases defer the need transmission and distribution infrastructure required to move energy across the Province.

In most instances, the alternate energy resources used to facilitate load displacement are obtained locally, contributing to the Manitoba economy and displacing purchases of fossil fuels from out-of-province suppliers. In other instances, the productive use of waste and by-product streams enhances the economics of local industries and reduces environmental impacts and costs for disposal. In this manner, Manitoba Hydro's Load Displacement and Bioenergy Optimization Programs provide an important opportunity to support and expand the local economic footprint of Manitoba's energy industry in an environmentally sustainable manner.

Manitoba businesses and industry currently consume about 50,000 tonnes of processed biomass annually. Large opportunities exist for significant growth within this industry if local production of high quality refined biomass fuel expands to create a sustainable and reliable supply of biomass that encourages and supports customer investment in biomass heat and power installations.

As an example…

500,000 tonnes of pelleted biomass consumption is capable of displacing the equivalent of nearly 2,000 GW.h in annual electricity purchases for space and hot water heating. This quantity of energy represents nearly 10% of Manitoba consumption of electricity, while also serving as a key contributor to Manitoba Hydro peak winter demand requirements. Achieved over 20 years, this level of biomass consumption could contribute as much as 0.25 – 0.30% of load per year towards Manitoba Hydro's achievement of its demand side management objectives.

Similarly, 500,000 tonnes of pellet biomass consumption is capable of displacing the equivalent of nearly 225 million cubic metres of natural gas consumption for heating, representing nearly 15% of Manitoba natural gas consumption and reducing greenhouse gas emissions by about 425,000 tonnes annually.

Investments in load displacement by Manitoba Hydro and its customers are an important opportunity for Manitoba business to enhance their economic competitiveness and reduce their environmental footprint. Manitoba Hydro's Load Displacement and Bioenergy Optimization Programs are intended to support these investments and capture their associated investments for all Manitobans.

Bioenergy Optimization Program

The Bioenergy Optimization Program, launched in 2006, is designed to encourage customers to install, operate, and maintain customer-sited load displacement generation systems that employ heat only and/or combined heat and power (CHP) applications fueled by renewable energy sources, such as biomass.

To date, the target market has consisted primarily of agricultural customers that have readily available, low-cost sources of biomass, continual needs for heat and power, and the capability to operate and maintain biomass-to-energy conversion systems. The knowledge gained through the delivery of the program has helped to focus the program towards biomass heating applications. Manitoba Hydro's program further supports customers in developing a thorough understanding of the costs and benefits of bioenergy systems.

The Program is targeting schools, institutes, and public buildings in the current plan. The sizes of systems anticipated under the program are less than one MW electrical equivalent capacity.

In 2018/19, the program participation is expected to be 2 projects, resulting in 1.0 GW.h and 0.4 MW of electric savings. Combined with achievements to date, participation will be 48 projects resulting in 85.9 GW.h and 17.4 MW of electric savings by the end of 2018/19.

	2005/06 to 2017/18*	2018/19	Total to 2018/19
No. of Projects	46	2	**48**
Capacity Savings (MW)	17.0	0.4	**17.4**
Energy Savings (GW.h)	84.9	1.0	**85.9**
Utility Investment (Millions, $)	$13.0	$0.5	**$13.5**
Customer Investment (Millions, $)	$66.7	$1.0	**$67.7**
Total DSM Investment (Millions, $)	$79.8	$1.5	**$81.3**
Estimated Average Annual Bill Reduction per Customer (Electric): Variable depending on project size			

*Includes estimates for 2017/18

Load Displacement Program

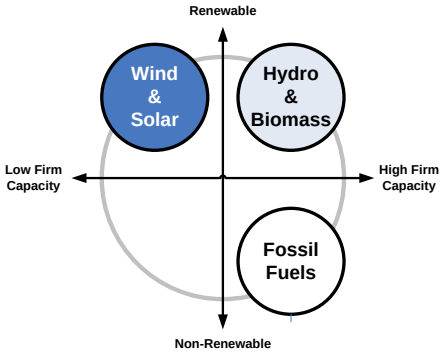
The Load Displacement Program, launched in 2014, encourages industrial and municipal customers to install, operate, and maintain customer-sited load displacement generation systems that rely on waste streams, by-products and locally-available, low-cost sources of biomass and other renewable energy sources as the fuel source. The target market consists of larger industrial and municipal customers, or customer sectors that are striving to optimize their operations while also achieving reduced energy costs and improved environmental performance.

Industrial and municipal operations with waste and by-products streams from manufacturing processes typically incur costs for disposal and treatment required to mitigate environmental liabilities. Converting waste and by-product streams into useful energy for use within the manufacturing operation is often a more sustainable practice environmentally, and a means of reducing overall energy and disposal costs. Similarly, locally-available low-cost sources of biomass such as waste wood and crop residues can be harnessed as a sustainable and economic fuel source for on-site heat and power generation.

Manitoba Hydro's Load Displacement Program supports customers with financial incentives to assist customers in evaluating the feasibility of load displacement projects, and with incentives for the implementation of equipment and systems required for load displacement generation, and maintenance of ongoing, reliable operation ensuring consistent and stable energy production that can rely on by both the customer and Manitoba Hydro.

A typical load displacement generation project can take two to three years for the analysis, design and equipment implementation. To support this process, Manitoba Hydro provides financial incentives to support feasibility studies, engineering design, procurement and installation for customer-sited generation projects on the condition that long-term contractual commitments can be secured. Some projects may also be eligible for operating incentives designed to support the cost of ongoing fuel procurement (i.e. purchased biomass).

Major customer sectors targeted by the program include forestry, chemicals, metals, oil and gas, and municipal wastewater treatment facilities. The capacity of these on-site generation systems is anticipated to provide more than 1 MW of electrical load displacement. Potential projects include existing self-generation systems that can benefit from additional investment to increase stable and reliable long-term output, improved environmental performance, and reduced operating costs.



In 2018/19, the program is expected to achieve 113.9 GW.h and 15.3 MW of new incremental electric savings. Combined with persisting savings achieved to date, the program is expected to achieve 127.2 GW.h and 18.4 MW of electric savings by the end of 2018/19.

	2014/15	2015/16	2016/17	2017/18 *	2018/19	Total to 2018/19
Capacity Savings (MW)	17.9 (1)(2)	13.2 (2)	17.2 (2)	16.6 (2)	**15.3**	**18.4**
Energy Savings (GW.h)	76.3 (1)(2)	83.3 (2)	107.2 (2)	103.4 (2)	**113.9**	**127.2**
Utility Investment (Millions, $)	$0.7 (3)	$4.6 (3)	$3.8 (3)	$0.3 (3)	**$7.1**	**$16.4**
Customer Investment (Millions, $)	$3.3 (4)	$5.3 (4)	$10.1 (4)	$0.0 (4)	**$13.8**	**$32.5**
Total DSM Investment (Millions, $)	$4.0	$9.9	$13.9	$0.3	**$20.8**	**$48.9**
Estimated Average Annual Bill Reduction per Customer (Electric): Variable depending on project size						

*Includes estimates for 2017/18

(1) Savings previously reported as annual savings under the Bioenergy Optimization Program in 2014/15, subject to being re-earned in future years.

(2) Annual capacity and energy savings that are not subject to long-term contractual commitments are not viewed as persistent savings in future years, and are therefore not considered in the cumulative total savings in subsequent years. These savings must therefore be re-earned annually within each year of the program.

(3) Utility investments include expenditures to support feasibility studies, engineering studies and capital investments in customer-owned equipment for generation projects that will be subject to long-term contractual commitments. These investments are not related to non-persistent savings achieved annually in 2014/15, 2015/16, 2016/17 & 2017/18.

(4) Customer investments include expenditures for fuel required to achieve annual non-persistent savings in 2014/15, 2015/16, 2016/17 or 2017/18, in addition to expenditures incurred to support feasibility studies, engineering studies and capital investments in customer-owned equipment for self-generation projects that will be subject to long-term contractual commitments.

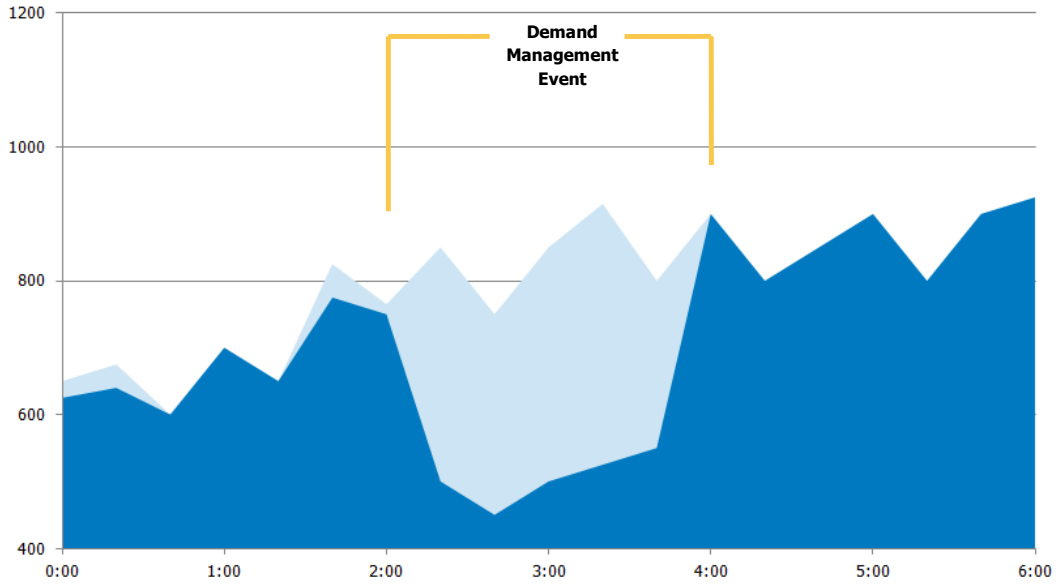
Load Management

Curtailable Rate Program

Under the Curtailable Rate Program, qualifying customers receive a monthly credit on load (kW) which can be curtailed on notice from Manitoba Hydro. To be eligible, customers' load/processes must be configured to allow them to meet the requested curtailment within the notification period as outlined under their chosen contract option.

	1990/00 to 2017/18*	2018/19	Total to 2018/19
No. of Customers	61	3	**64**
Capacity Savings (MW)	162.1	168.7	**168.7**
Utility Investment (Millions, $)	$107.5	$6.1	**$113.6**

*Includes estimates for 2017/18



Codes, Standards & Regulations

In addition to utility-directed 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 building codes and performance 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 which are then incorporated into Manitoba Power Smart programs, and subsequent energy efficiency regulations and building codes proposed by national and provincial regulators.

While the total costs for all participants in achieving codes and standards savings are largely the same as those incurred through other methods of encouraging energy efficiency, the cost for Manitoba Hydro to participate in codes and standards processes is considerably less, as the Corporation is able to leverage efforts from the other stakeholders participating in these processes including consumers, industry, and government.

There are several areas of focus for the 2018/19 year.

Building Energy Codes

The new energy code for commercial buildings, the Manitoba Energy Code for Buildings (MECB 2011), which came into force on December 1, 2014, is now seeing new construction projects submitted for permitting under more stringent requirements for energy performance. For residential construction, section 9.36 of the national building code dealing with energy efficiency in Part 9 buildings came into force on April 1, 2016. To support the market in becoming compliant with the new energy requirements in both of these codes, Manitoba Hydro will continue to offer regular consultation to the various code authorities across the Province, including the Manitoba Office of the Fire Commissioner, City of Winnipeg, and City of Brandon, etc. Widely recognized as the province's experts on energy use, and commercial and residential energy codes, Manitoba Hydro technical personnel will consult on code interpretations and plan reviews to supplement the available resources within the various planning districts and permitting offices throughout Manitoba. In addition, a series of energy code-related training and education sessions will be offered for customers in collaboration with industry and trade associations.

Late in 2016, the 2015 National Building Code was reviewed at the Building Standards Board of Manitoba which included updates to the National Energy Codes for Buildings (NECB) and Section 9.36. The updates were considered to be relatively minor and adoption is expected early in 2018. To support the newest energy code for commercial buildings, Manitoba Hydro technical staff will be chairing the 2015 NECB User's Guide Working Group. This publication will provide an update to the first User's Guide that was developed for the 2011 NECB.

In addition to assisting the market with the current codes, Manitoba Hydro has also increased the requirements for its voluntary based incentive programs in the New Buildings Program and the Power Smart for New Homes Program. The intent is to encourage home builders and commercial building designers to pursue higher levels of energy efficiency and position themselves more favourably for the

next code cycle which will see further improvements to energy efficiency in buildings. A specific program design strategy will be offering incentives to assist with the cost of energy modeling (in the case of commercial buildings) or offering higher levels of incentives for homes that are designed to meet performance thresholds. These strategies are being implemented to address a specific gap in the Manitoba market which is a lack of energy modeling professionals. Early indications are that the codes nationally will be moving towards performance based codes versus prescriptive based requirements. Having a more robust industry in place and experienced to support designing for energy efficiency will assist with this transition.

The Government of Canada released the Pan Canadian Framework in December 2016 which outlined a future strategy pertaining to energy use in buildings and, in particular, a defined path for improving efficiency in buildings through increasingly stringent changes to the National Building Code. With a goal of a "net-zero energy ready" construction mandated across Canada in buildings codes by the year 2030, Manitoba Hydro will play a key role to move both Manitoba industry and customers towards these standards over the next 10 years.

The Federal Government has also signaled the desire to pursue a retrofit code for existing buildings by 2022. A code for existing buildings will help guide energy efficiency improvements that can be made when Canadians renovate their homes and buildings. Other jurisdictions in Canada are at various stages of adoption of energy efficiency and Manitoba has a relatively small population. The aim of Manitoba Hydro staff will be to ensure that the codes that are developed keep pace with the trajectory of adoption that exists in Manitoba due to many years of Power Smart offerings.

Energy Performance Standards

At a national level, Manitoba Hydro continues to be an integral member of the CSA Standing Committee for Performance, Energy Efficiency and Renewables (SCOPEER) providing direct financial support, technical expertise and leadership to the national effort. In 2018/19, efforts will be focused on the development of Energy Performance Standards supporting implementation of Amendments 14 and 15 to Canada's Energy Efficiency Act covering energy consuming products commonly used by the residential, commercial and industrial sectors. In addition, given the direction of the Canadian Energy Strategy (CES), Manitoba Hydro will be providing guidance and support for alignment and harmonization of various Canadian and US standards. Harmonization across North America supports industry attempts to improve the energy efficiency of common energy consuming goods.

Manitoba Hydro's support for this national effort provides important consideration for Manitoba's energy needs, as they relate to our local climate and other energy drivers. As an example, common white goods purchased by Manitoba consumers are imported into Canada by local wholesalers and retailers, who are subject to federal regulations at the point of entry into Canada. Federal regulations that include consideration of Manitoba needs support the goals and objectives of Manitoba Hydro's DSM strategy, and provide an important compliance mechanism to prevent under-performing products from entering the Manitoba market.

Manitoba Hydro's expertise and knowledge surrounding energy consuming equipment and the drivers for the Province's heating and cooling requirements are well respected across Canada, making Manitoba

Hydro's voice an important influence at the federal and provincial level when changes to codes and standards are discussed. In providing this service, Manitoba Hydro projects a strong image of Manitoba's proficiency in supporting energy efficiency and climate change within Canada.

A key component of Manitoba Hydro's national effort in 2018/19 will be continued support for federal amendments 14 and 15 to Canada's Energy Efficiency Act, which is the primary regulation impacting white goods and equipment purchased by Manitoban's. Enactment of these amendments plays a key role in obtaining the savings identified in Manitoba Hydro's DSM Plan.

Energy Efficiency Regulations

As a priority action item under Manitoba's Clean Energy Strategy and Manitoba Climate Change and Green Economy Action Plan, Manitoba Hydro involvement plays an important role in the Provincial regulation of energy consuming products under The Energy Act. The provision of technical support and market data that creates the supporting justification to gain industry acceptance and government approval play a key role in Manitoba Hydro's involvement. Members from Manitoba Hydro's marketing and technical staff have been invited to consult with the Province on the development of "a Framework for Minimum Energy Performance Standards in Manitoba" that will form the basis of the Provincial strategy moving forward.

Demand Side Management Plan | 2018/19

Demand Side Management Plan

2016/17

SUPPLEMENTAL REPORT:

15 yr (2016 to 2031)

September 2016

Manitoba Hydro
POWER SMART*

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EXECUTIVE SUMMARY

Manitoba Hydro's 2016 Demand Side Management 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 is intended to be a balanced approach to pursue DSM opportunities taking into account regulatory direction to pursue mandated load targets and the Corporation's mandate to pursue the most economic resource plan, while recognizing Manitoba Hydro's current financial situation. This plan builds upon and is consistent with the one year 2016/17 Demand Side Management 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 Demand Side Management 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 2030/31 which will be targeted through electricity and natural gas Power Smart Programs. The plan sets out to realize electricity savings of 1,232 MW and 4,506 GW.h, natural gas savings of 130 million cubic metres before interactive effects and combined global greenhouse gas emission reductions of 3.3 million tonnes by 2030/31. This activity represents 15.4% of the estimated electric load forecast offsetting 59% of projected load growth during this period and 8.1% of the estimated natural gas volume forecast by 2030/31, further reducing natural gas consumption in Manitoba.

As a result of some electric DSM programming, there is an increase in natural gas consumption for space heating purposes - interactive effects. The interactive effects result from the need to replace lost heat from the more efficient use of electricity. Including 15.8 million cubic meters in natural gas consumption due to interactive effects, the plan is expected to result in net natural gas savings of 115 million cubic metres which represents 7.1% of the estimated volume forecast by 2030/31.

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, $164 million from the Power Smart natural gas budget, $4 million from the Affordable Energy Fund and $24 million from the Furnace Replacement budget for targeting furnace replacement.

Changes made to the electricity and natural gas components of the plan include adjustments to existing and future programs to reflect updated information. Moreover, this plan includes categories that present higher risk of deliverability than traditional energy efficiency efforts. Future opportunities associated with emerging technologies assume and are dependent up technology developments and anticipated 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.

Combined with energy savings achieved to date, total electrical savings of 1,860 MW and 7,355 GW.h and total natural gas savings of 258 million cubic metres before interactive effects will be realized by 2030/31. These combined energy savings are expected to result in an overall reduction of greenhouse gas emissions of 5.4 million tonnes by 2030/31. This activity represents 24.9% of the estimated electric load forecast and 16.0% of the estimated natural gas volume forecast by 2030/31. Including natural gas consumption due to interactive effects, total natural gas savings of 227 million cubic metres will be realized, representing 14.1% of the estimated natural gas volume forecast by 2030/31.

Including investments to date, it is expected that by 2030/31, the cumulative utility investment of achieving the energy savings will have been $2.1 billion (excluding cost impacts of changes to codes and standards). Of the $2.1 billion cumulative utility investment, $1.7 billion of the costs are funded through the Corporation's Power Smart electricity budget, $297 million from the Power Smart natural gas budget, $35 million from the Affordable Energy Fund, $37 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 $343 million in 2030/31 and $2.6 billion cumulatively by 2030/31. When combined with bill reductions to date, Power Smart programs are expected to save participating customers $ 472 million in 2030/31 and over $ 5.9 billion cumulatively by 2030/31.

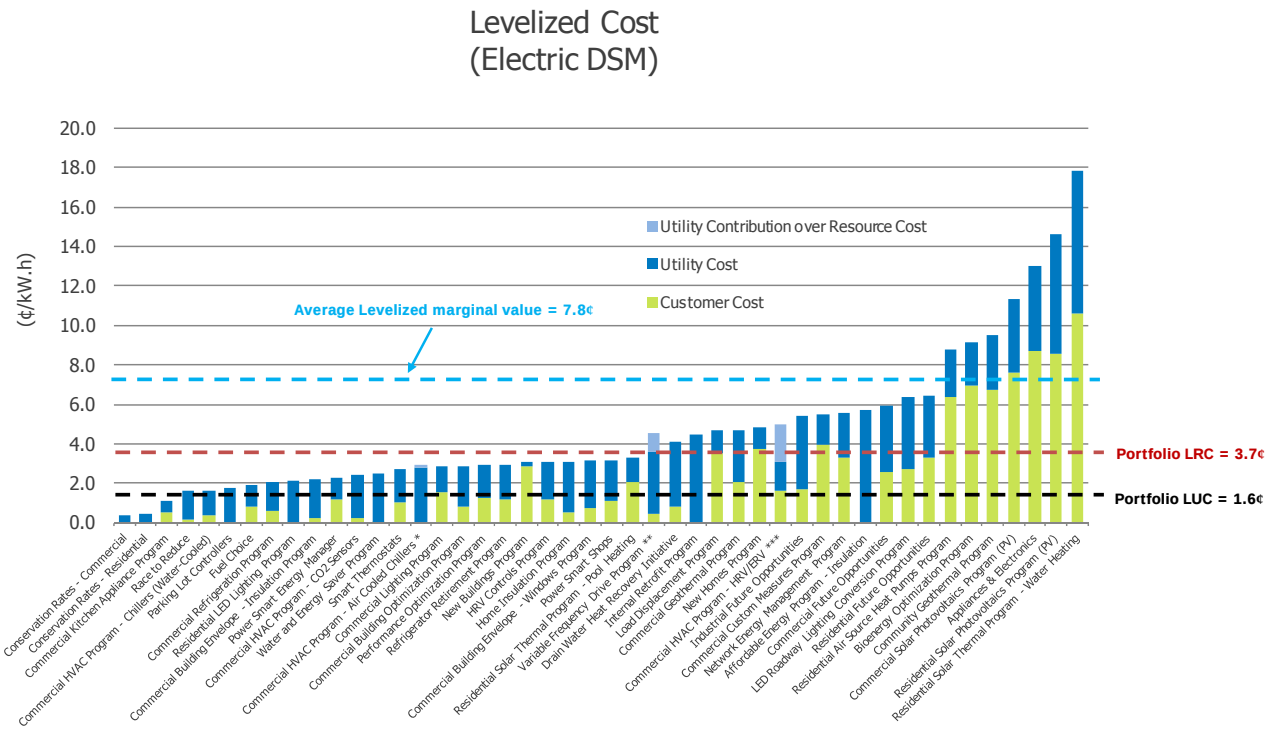
The overall Societal Cost (SC) and Total Resource Cost (TRC) metrics for the combined electric and natural gas Power Smart portfolio are 2.5 and 2.3, respectively. The electric Power Smart portfolio has an overall TRC of 2.5, Rate Impact Measure (RIM) of 1.1, levelized resource cost of 3.7 cents per kilowatt-hour and levelized utility cost of 1.6 cents per kilowatt-hour. The natural gas Power Smart portfolio has an overall TRC of 0.8, RIM of 0.5, levelized resource cost of 34.1 cents per cubic metre and levelized utility cost of 17.2 cents per cubic metre. Excluding the Affordable Energy Program, the natural gas Power Smart portfolio has an overall levelized utility cost of 12.3 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 7.8 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 Demand Side Management Plan are 3.7 cents per kilowatt-hour and 1.6 cents per kilowatt-hour respectively, new programs and opportunities generally involve higher costs.

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 21.8 cents per cubic metre. With Manitoba Hydro's natural gas DSM plans involving an average levelized resource cost of 34.1 cents per cubic metre, it is recognized that customers' costs are higher by taking such an approach with natural gas conservation efforts. This approach effectively values carbon at $64.1 per tonne (i.e. the difference between the alternative cost of purchasing gas and Manitoba Hydro's levelized cost of natural gas DSM).

Electric DSM Levelized Costs

The following chart depicts the levelized costs of Manitoba Hydro's electric DSM portfolio.



* *NOTE: Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders. Due to high levels of free ridership, the utility cost is higher than the total resource cost of the program. The light blue bar represents the utility investment beyond the resource cost.*

Utility contribution to resource cost:	*2.8 cents*
Customer contribution to resource cost:	*0.0 cents*
Total resource cost:	***2.8 cents***
Utility contribution over resource cost:	*0.1 cents*
Total cost:	***2.9 cents***

** *NOTE: Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders. Due to high levels of free ridership, the utility cost is higher than the total resource cost of the program. The light blue bar represents the utility investment beyond the resource cost.*

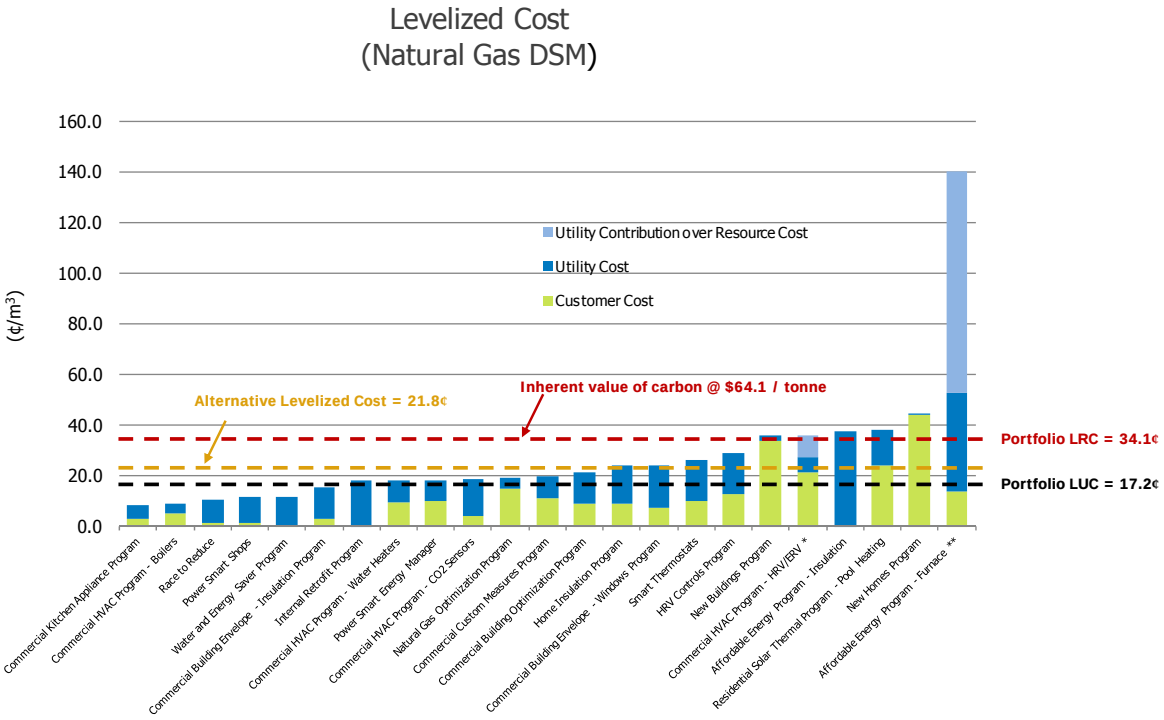
Utility contribution to resource cost:	*3.1 cents*
Customer contribution to resource cost:	*0.4 cents*
Total resource cost:	***3.6 cents***
Utility contribution over resource cost:	*1.0 cents*
Total cost:	***4.6 cents***

*** *NOTE: Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders. Due to high levels of free ridership, the utility cost is higher than the total resource cost of the program. The light blue bar represents the utility investment beyond the resource cost.*

Utility contribution to resource cost:	*1.5 cents*
Customer contribution to resource cost:	*1.6 cents*
Total resource cost:	***3.1 cents***
Utility contribution over resource cost:	*1.9 cents*
Total cost:	***5.0 cents***

Natural Gas DSM Levelized Costs

The following chart depicts the levelized costs of Manitoba Hydro's natural gas DSM portfolio.



* *NOTE: Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders. Due to high levels of free ridership, the utility cost is higher than the total resource cost of the program. The light blue bar represents the utility investment beyond the resource cost.*

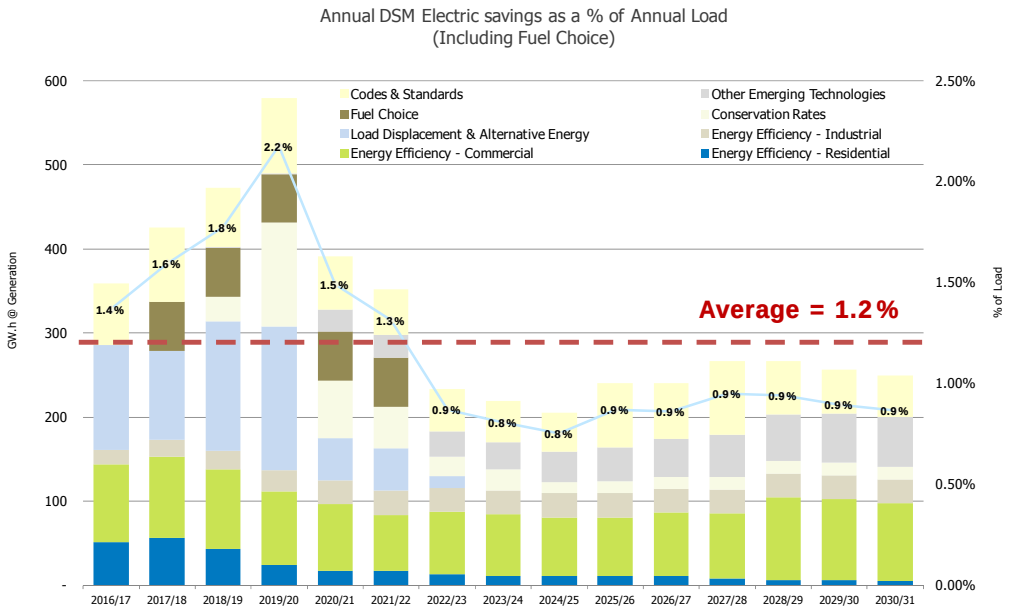
Utility contribution to resource cost:	*6.0 cents*
Customer contribution to resource cost:	*21.3 cents*
Total resource cost:	***27.3 cents***
Utility contribution over resource cost:	*9.0 cents*
Total cost:	***36.3 cents***

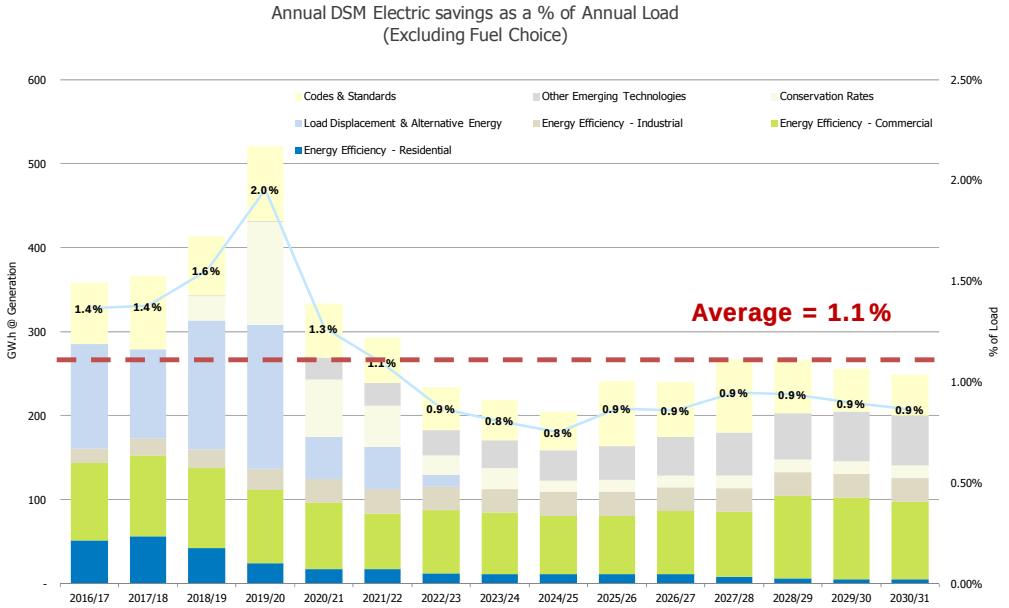
** *NOTE: Since Manitoba Hydro pays the full cost of installing a high efficiency furnace instead of only the incremental cost, the utility cost is higher than the total resource cost of the program. The light blue bar represents the utility investment beyond the resource cost.*

Utility contribution to resource cost:	*39.0 cents*
Customer contribution to resource cost:	*13.9 cents*
Total resource cost:	***52.9 cents***
Utility contribution over resource cost:	*87.5 cents*
Total cost:	***140.4 cents***

Annual Electric DSM Savings as a % of Annual Load

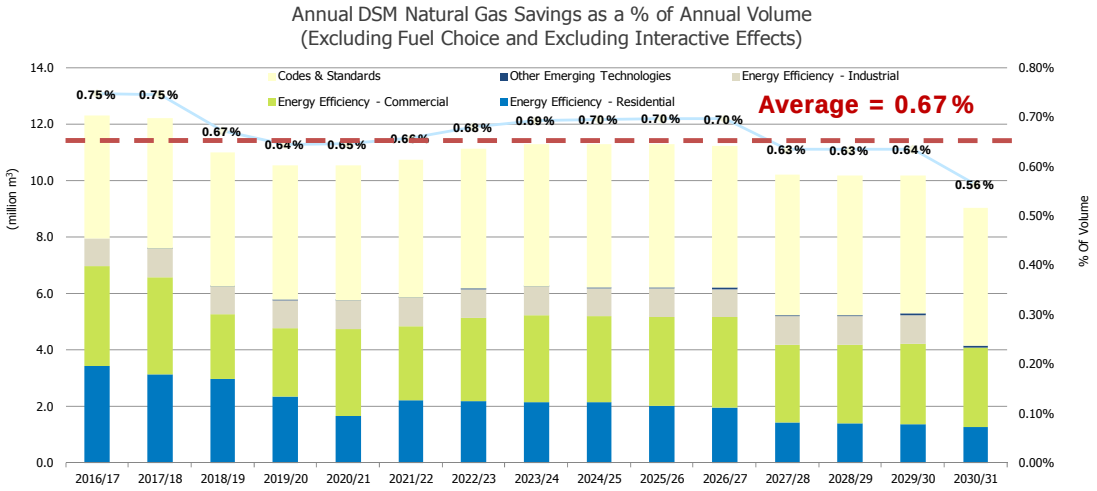
The following charts depict Manitoba Hydro's annual electric DSM efforts in relation to annual electric load growth.



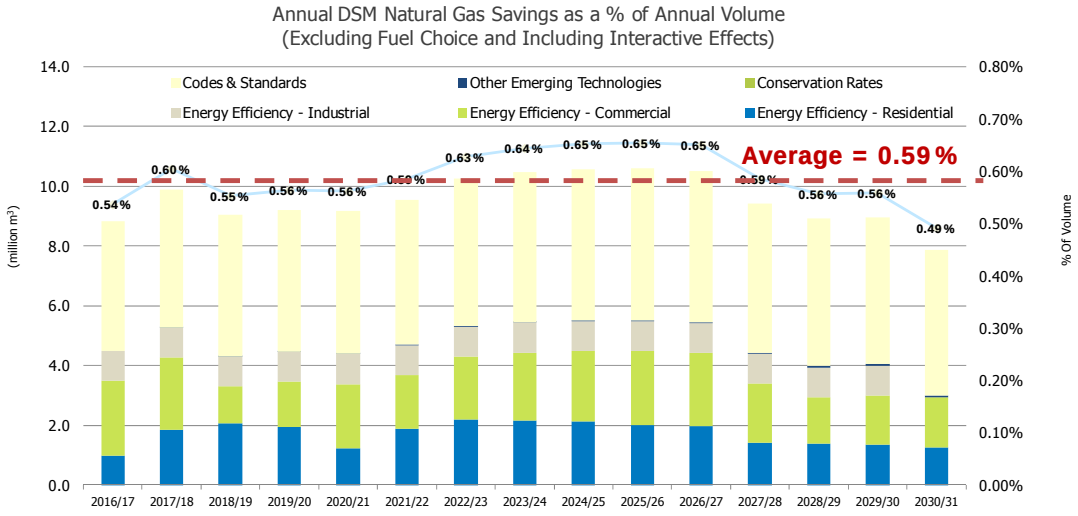


Annual Natural Gas DSM Savings as a % of Annual Volume

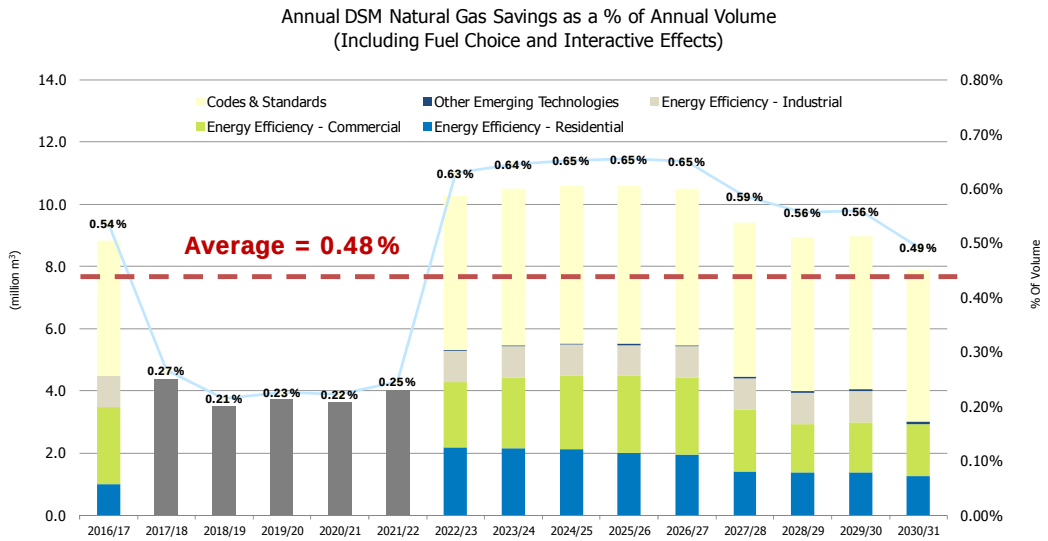
The following charts depict Manitoba Hydro's annual natural gas DSM efforts in relation to annual natural gas volume growth.



Note: The above 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.



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.

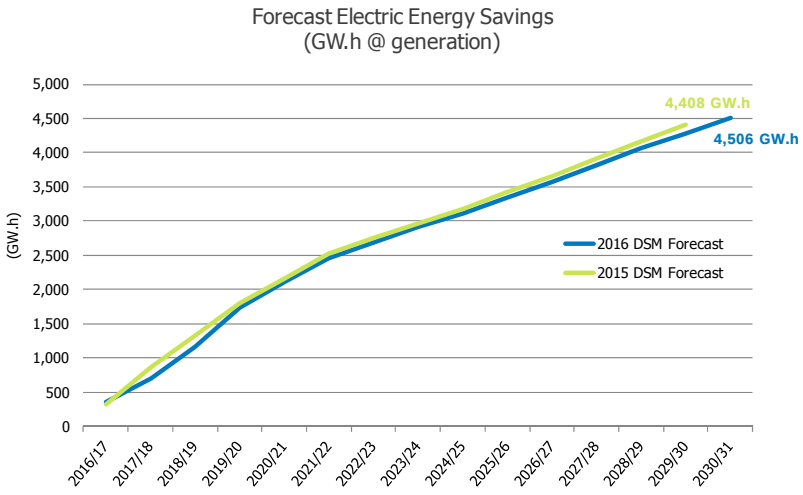


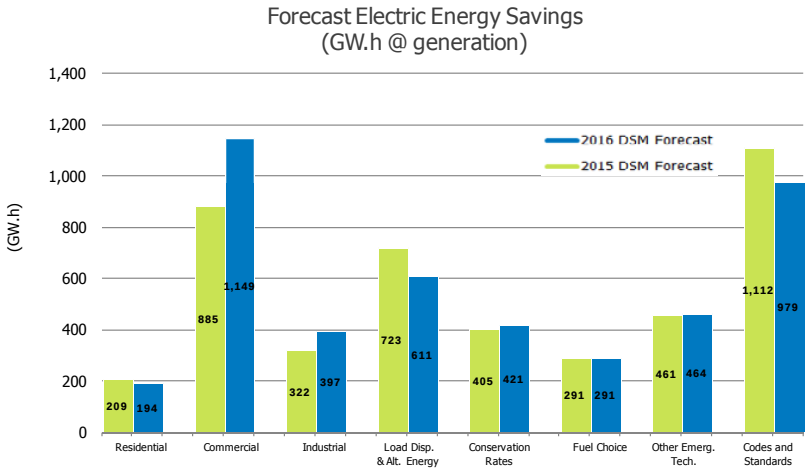
Note: The above graph reflects a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

Changes from the 2015 Power Smart Plan (Supplemental Report 15 yr)

Electric DSM

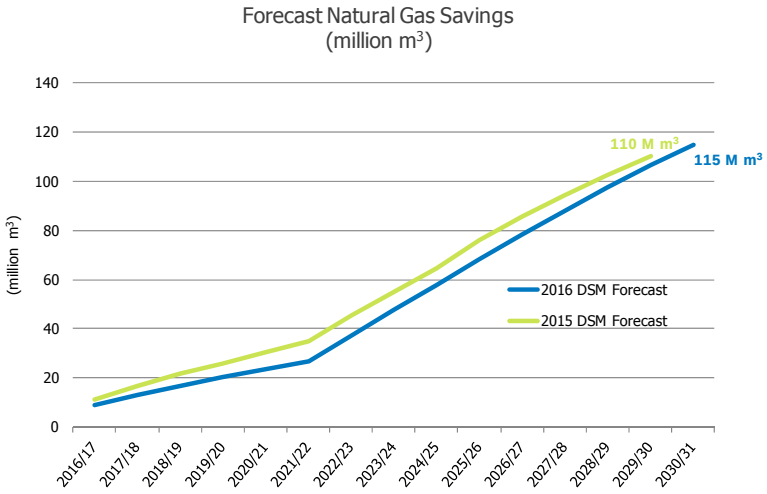
Overall, energy savings are expected to increase by 2.2% from the 2015 DSM forecast. The planned electric energy savings in this plan are approximately 98 GW.h higher than previously forecast in the 2015 Power Smart Plan due to revisions to forecast program savings based on current market information and the inclusion of an additional year at the end of the forecasting period. (Refer to section 1.6 Comparison to 2015 DSM Forecast for detail).

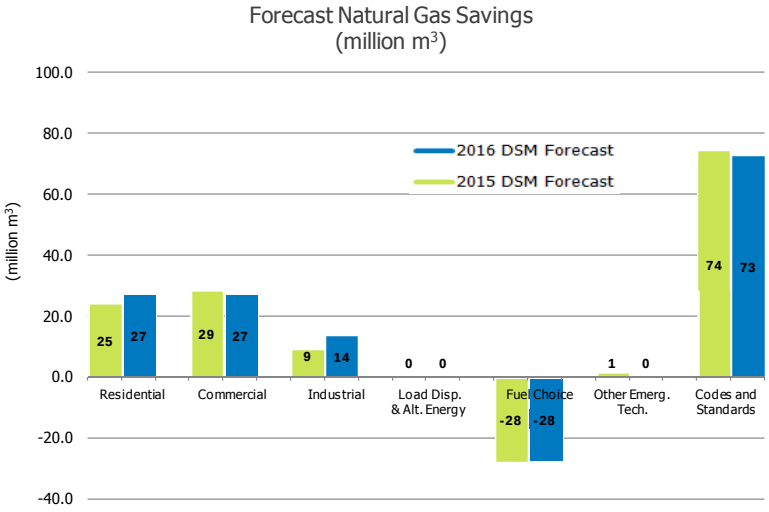




Natural Gas DSM

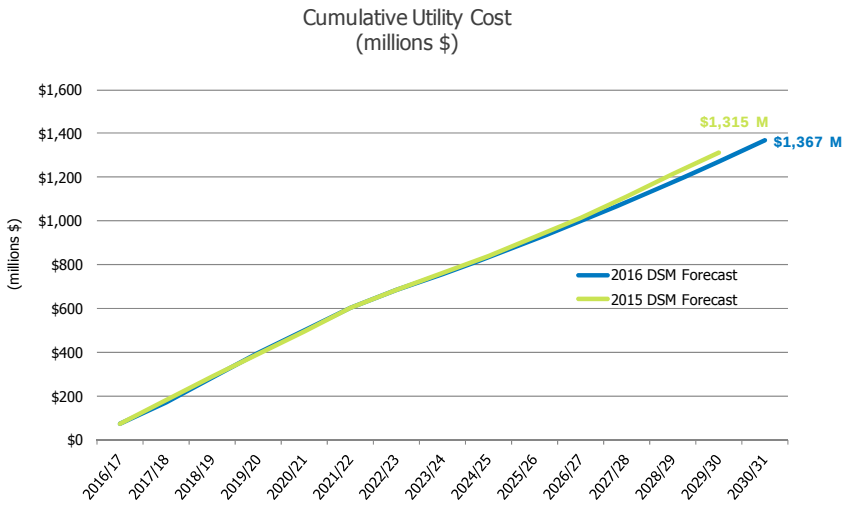
Overall, natural gas savings are expected to increase by 4.0% from the 2015 DSM forecast. The natural gas savings expected to be achieved through this plan are 4.4 million cubic metres higher than previously forecast in the 2015 Power Smart Plan due to revisions to forecast program savings based on current market information and the inclusion of an additional year at the end of the forecasting period. (Refer to section 1.6 Comparison to 2015 DSM Forecast for detail).

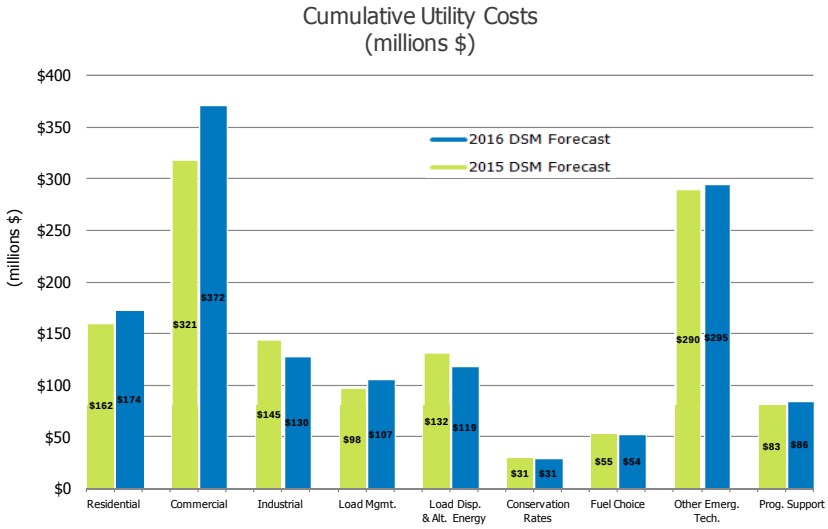




Utility Costs

Overall, utility costs are expected to increase by 4.0% from the 2015 DSM forecast. The planned utility cost forecast in this plan is approximately $52 million higher than previously forecast in the 2015 Power Smart Plan due to revisions to planned program expenditures and the inclusion of one additional year at the end of the forecasting period. (Refer to section 1.6 Comparison to 2015 DSM Forecast for detail).





1 THE 2016 DEMAND SIDE MANAGEMENT PLAN

1.1 Introduction

Manitoba Hydro's 2016 Demand Side Management 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 2016/17 Demand Side Management 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 2016/17 Demand Side Management Plan and includes the long term forecasts of energy and demand savings, budgets and cost effectiveness metrics.

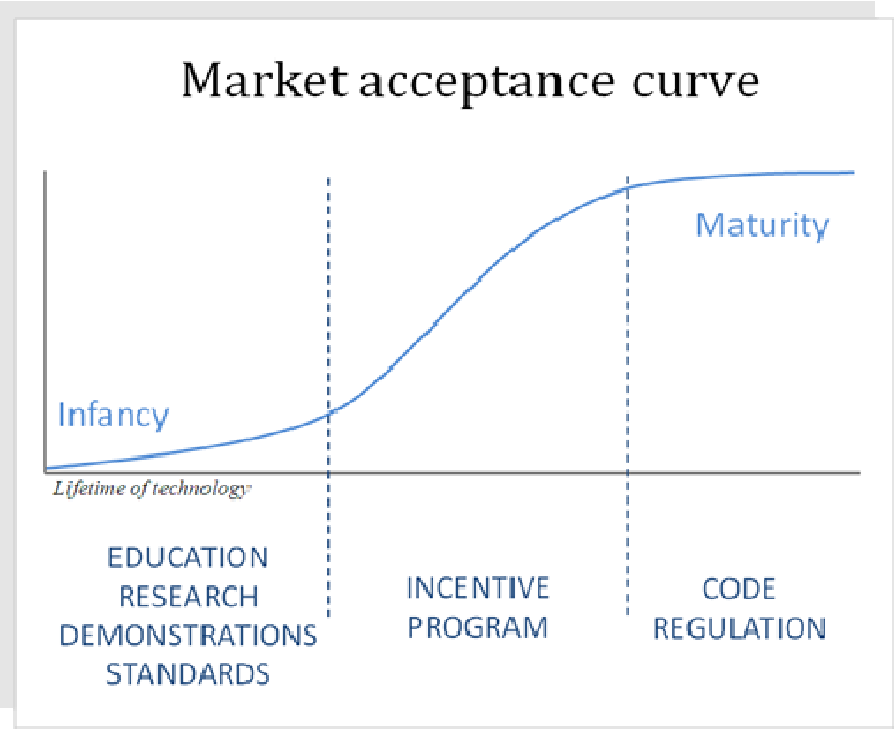
The following table outlines the forecasted achievements over the next 15 years:

Programs	Capacity Savings (MW)	Energy Savings (GW.h)	Natural Gas Savings (million m^3)	Utility Investment (millions $)
New Homes Program	8.3	18.3	7.8	$3.2
Home Insulation Program	14.6	29.3	6.4	$27.1
Water and Energy Saver Program	2.4	13.2	1.6	$5.8
Affordable Energy Program	9.7	25.2	6.9	$93.7
Refrigerator Retirement Program	0.9	8.7	-	$8.4
Drain Water Heat Recovery Initiative	0.0	0.2	-	$0.1
Residential LED Lighting Program	4.9	15.4	-	$7.4
Community Geothermal Program	25.0	50.0	-	$22.5
Appliances	0.1	0.4	0.0	$0.4
HRV Controls	1.8	4.5	0.7	$2.8
Power Bars	0.0	0.0	-	$0.0
Smart Thermostats	0.1	0.2	0.1	$0.3
Plug-in Timers	0.0	0.1	-	$0.0
Community Energy Plan	-	-	-	$1.7
Power Smart Residential Loan	2.7	5.3	5.7	$0.0
Power Smart PAYS Financing	1.7	3.4		$0.0
Residential Earth Power Loan	6.6	20.1	0.3	$0.0
Residential Programs	**78.9**	**194.5**	**29.3**	**$173.6**
Commercial Lighting Program	152.5	623.2	-	$123.3
LED Roadway Lighting Conversion Program	7.2	48.5	-	$44.4
Commercial Building Envelope - Windows Program	8.2	25.2	4.5	$23.7
Commercial Building Envelope - Insulation Program	14.9	33.8	12.6	$40.0
Commercial Geothermal Program	18.7	37.4	-	$16.7
Commercial HVAC Program - Boilers	-	-	3.1	$1.9
Commercial HVAC Program - Chillers (Water-Cooled)	-	0.9	-	$0.2
Commercial HVAC Program - CO2 Sensors	2.7	4.4	1.0	$4.0
Commercial HVAC Program - HRVs	19.7	40.3	6.4	$35.4
Commercial HVAC Program - Air Cooled Chillers	-	24.5	-	$11.9
Commercial HVAC Program - Water Heaters	-	-	2.1	$2.4
Commercial Custom Measures Program	8.0	35.1	2.2	$12.4
Commercial Building Optimization Program	3.2	15.8	3.7	$9.3
New Buildings Program	41.3	139.0	3.8	$13.2
Commercial Refrigeration Program	8.7	71.2	-	$13.5
Commercial Kitchen Appliance Program	0.2	1.3	0.3	$0.3
Network Energy Management Program	0.0	0.3	-	$0.1
Internal Retrofit Program	3.4	17.5	0.1	$10.6
Power Smart Energy Manager	3.5	15.5	1.3	$3.7
Power Smart Shops	3.8	12.5	0.1	$3.6
Race to Reduce	-	-	-	$0.8
Parking Lot Controller	-	2.6	-	$0.5
Power Smart for Business PAYS Financing	-	-	0.3	$0.0
Commercial Programs	**296.4**	**1,148.9**	**41.4**	**$371.8**
Performance Optimization Program	50.0	397.0	-	$122.2
Natural Gas Optimization Program	-	-	14.0	$7.8
Industrial Programs	**50.0**	**397.0**	**14.0**	**$130.0**
Energy Efficiency Subtotal	**425.2**	**1,740.3**	**84.7**	**$675.3**
Curtailable Rate Program	159.5	-	-	$106.6
Load Management	**159.5**	**-**	**-**	**$106.6**
Bioenergy Optimization Program	51.1	106.4	-	$37.5
Customer Sited Load Displacement	66.0	504.1	-	$81.8
Load Displacement & Alternative Energy	**117.1**	**610.6**	**-**	**$119.4**
Conservation Rates - Residential	19.6	163.5	-	$13.2
Conservation Rates - Commercial	30.9	257.1	-	$17.3
Conservation Rates	**50.6**	**420.6**	**-**	**$30.5**
Fuel Choice	145.6	291.3	-27.7	$53.8
Fuel Choice	**145.6**	**291.3**	**-27.7**	**$53.8**
Residential Air Source Heat Pumps Program	-	7.4	-	$2.5
Residential Future Opportunities	19.0	91.7	-	$50.6
Residential Solar Photovoltaics Program (PV)	3.2	35.3	-	$35.9
Residential Solar Thermal Program - Water Heating	0.0	0.2	-	$0.3
Residential Solar Thermal Program - Pool Heating	-	2.6	0.5	$1.3
Commercial Future Opportunities	19.0	91.7	-	$54.6
Commercial Solar Photovoltaics Program (PV)	14.7	138.7	-	$87.6
Commercial Variable Speed and Frequency Drives	0.1	4.7	-	$2.7
Industrial Future Opportunities	19.0	91.7	-	$59.9
Other Emerging Technologies	**75.2**	**464.1**	**0.5**	**$295.3**
Impacts	**973.2**	**3,526.8**	**57.5**	**$1,280.8**
Codes, Standards & Regulations (at generation)	259.1	979.2	72.9	-
Interactive Effects	-	-	-15.8	-
Program Support	-	-	-	$86.4
Demand Side Management Plan - 2016/17 - 2030/31	**1,232**	**4,506**	**115**	**$1,367**

1.2 DSM Market Transformation Strategy

Manitoba Hydro's DSM strategy is to 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 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 pursing 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 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 (2016/17 Demand Side Management Plan). For programs not approved but where placeholders are used, detail program descriptions are not available at this time.

Program Duration and Cumulative Participation
(2016/17 - 2030/31)

Programs	Program Category	Electric	Natural Gas	Program Launch Date	Participation Definition	Cumulative Participation by 2030/31
Residential						
New Homes Program	Incentive Based	√	√	Apr-2016	No. of houses	38,856
Home Insulation Program	Incentive Based	√	√	May-2004	No. of houses	60,440
Water and Energy Saver Program	Incentive Based	√	√	Sep-2010	No. of houses	231,427
Affordable Energy Program	Incentive Based	√	√	Dec-2007	No. of retrofits	58,238
Refrigerator Retirement Program	Incentive Based	√		Jun-2011	No. of appliances	82,737
Drain Water Heat Recovery Initiative	Incentive Based	√		Dec-2014	No. of houses	251
Residential LED Lighting Program	Incentive Based	√		Oct-2014	No. of bulbs	2,106,479
Community Geothermal Program	Incentive Based	√		Jun-2013	No. of systems	3,549
Appliances	Incentive Based	√	√	Sep-2016	No. of appliances	2,800
HRV Controls	Incentive Based	√	√	Apr-2016	No. of controllers	18,102
Power Bars	Incentive Based	√		Sep-2016	No. of power bars	200
Smart Thermostats	Incentive Based	√	√	Apr-2016	No. of thermostats	17,350
Plug-in Timers	Incentive Based	√		Sep-2016	No. of timers	17,600
Community Energy Plan	Incentive Based	√	√	Apr-2016	-	0
Power Smart Residential Loan	Financial Loan	√	√	Feb-2001	No. of loans	157,198
Power Smart PAYS Financing	Financial Loan	√	√	Nov-2012	No. of loans	5,561
Residential Earth Power Loan	Financial Loan	√	√	Apr-2002	No. of loans	1,276
Commercial						
Commercial Lighting Program	Incentive Based	√		Apr-1992	No. of projects	29,594
LED Roadway Lighting Conversion Program	Incentive Based	√		Feb-2013	No. of conversions	151,804
Commercial Building Envelope - Windows Program	Incentive Based	√	√	Dec-1995	No. of projects	3,960
Commercial Building Envelope - Insulation Program	Incentive Based	√	√	Dec-1995	No. of projects	5,680
Commercial Geothermal Program	Incentive Based	√		Dec-1995	No. of buildings	555
Commercial HVAC Program - Boilers	Incentive Based		√	Sep-2003	No. of boilers	1,930
Commercial HVAC Program - Chillers (Water-Cooled)	Incentive Based	√		Sep-2003	No. of chillers	106
Commercial HVAC Program - CO2 Sensors	Incentive Based	√	√	Apr-2009	No. of sensors	2,787
Commercial HVAC Program - HRVs	Incentive Based	√	√	Apr-2016	No. of units	631
Commercial HVAC Program - Air Cooled Chillers	Incentive Based	√		Apr-2017	No. of units	498
Commercial HVAC Program - Water Heaters	Incentive Based		√	Apr-2015	No. of water heaters	991
Commercial Custom Measures Program	Incentive Based	√	√	Dec-1995	No. of projects	443
Commercial Building Optimization Program	Incentive Based	√	√	Apr-2006	No. of buildings	139
New Buildings Program	Incentive Based	√	√	Apr-2009	No. of buildings	2,003
Commercial Refrigeration Program	Incentive Based	√		Apr-2006	No. of locations	7,547
Commercial Kitchen Appliance Program	Incentive Based	√	√	Jan-2008	No. of appliances	2,775
Network Energy Management Program	Incentive Based	√		May-2008	No. of licenses	9,346
Internal Retrofit Program	Incentive Based	√	√	Jul-1995	No. of projects	2,168
Power Smart Energy Manager	Incentive Based	√	√	Apr-2000	No. of projects	48
Power Smart Shops	Incentive Based	√	√	Feb-2009	No. of projects	5,638
Race to Reduce	Marketing Promotion	√	√	Aug-2016	No. of buildings	58
Parking Lot Controller	Incentive Based	√		Jun-2016	No. of controllers	1,131
Power Smart for Business PAYS Financing	Financial Loan	√	√	Sep-2013	No. of loans	553
Industrial						
Performance Optimization Program	Incentive Based	√		Jun-1993	No. of projects	3,086
Natural Gas Optimization Program	Incentive Based		√	Sep-2006	No. of projects	255
Load Management						
Curtailable Rate Program	Incentive Based	√		Jun-1993	No. of customers	100 *
Load Displacement & Alternative Energy						
Bioenergy Optimization Program	Incentive Based	√	√	Mar-2006	No. of projects	229
Customer Sited Load Displacement	Incentive Based	√		Apr-2014	No. of customers	15
Conservation Rates						
Conservation Rates - Residential	Rate Based	√		2017/18	Rate Based	-
Conservation Rates - Commercial	Rate Based	√		2017/18	Rate Based	-
Fuel Choice						
Fuel Choice	Incentive Based	√		2017/18	No. of installations	15,720
Other Emerging Technologies						
Residential Air Source Heat Pumps Program	Incentive Based	√		2021/22	No. of Heat Pumps	1,225
Residential Future Opportunities	Incentive Based	√		2020/21	Various	Various
Residential Solar Photovoltaics Program (PV)	Incentive Based	√		2020/21	No. of Systems	11,740
Residential Solar Thermal Program - Water Heating	Incentive Based	√		2017/18	No. of systems	102
Residential Solar Thermal Program - Pool Heating	Incentive Based	√	√	2017/18	No. of systems	891
Commercial Future Opportunities	Incentive Based	√		2020/21	Various	Various
Commercial Solar Photovoltaics Program (PV)	Incentive Based	√		2020/21	No. of Systems	1,848
Commercial Variable Speed and Frequency Drives	Incentive Based	√		2017/18	No. of drives	490
Industrial Future Opportunities	Incentive Based	√		2020/21	Various	Various

*Participation recurs annually

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 persued 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	1,707	1,312	395	30%	
2006 PS Plan	1,824	1,456	368	25%	
Average	1,334	933	**401**	**43%**	

* 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 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	1,103	1,120	-17	-2%	
2010 PS Plan	1,138	1,131	7	1%	
2011 PS Plan	1,220	969	251	26%	
Average	808	753	**55**	**7%**	

* 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	55.6	44.0	11.6	26%	
2011 PS Plan	53.6	57.1	-3.5	-6%	
Average	49.3	41.8	**7.5**	**18%**	

* 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	273	363	-90	-25%	
2015-2016	346	292	54	19%	*
Average	**286**	**259**	**27**	**10%**	

* 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	10.1	10.2	-0.1	-1%	
2015-2016	9.5	8.9	0.6	7%	*
Average	**10.9**	**9.1**	**1.7**	**19%**	

* 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 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 pursed.

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 2016 Demand Side Management 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, and generation level. For the 2016 Demand Side Management 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/CAD Exchange Rates and Escalation Factors were derived from the Corporation's P911 corporate policy document issued October 9th, 2015
    - Transmission marginal costs were updated using Report on Marginal Transmission Cost Estimates - SPD 2015/11
    - Distribution marginal costs were updated using the 2015 Distribution Marginal Cost Estimate

- 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 2016 Demand Side Management Plan, the weighted rates were based on the approved August 1st, 2015 rate forecast which assumed the 2015/16 real rates would increase by 1.8% to 2028/29 and no real rate increase from 2029/30 onward. This was based on the projected rate increase of 3.95% for 2016/17 and the long term rate increase of 2.0% per year (as per IFF-15) less the 2016/17 escalation rate of 2.1 % and the long term escalation rate of 2.1% (MbCPI per P911-1 October 9th, 2015), (represented in 2016 $).

- Natural Gas – The natural gas price forecast was prepared by the Economic Analysis Department with input from the Energy Price Outlook. For the 2016 Demand Side Management Plan, the following assumptions were applied:
  - Forecast starting point was the February 1st, 2015 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-14 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 2016 Demand Side Management Plan, the Projected Escalation, Interest, & Exchange Rates – P911 corporate policy document issued October 9th, 2015 was used to discount all forward-looking savings and costs. The real weighted average cost of capital of 4.15% 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 2015 DSM Forecast

Electric DSM Targets Comparison for 2016/17 – 2030/31

The forecast electric energy savings in this plan are approximately 98 GW.h higher than previously forecast in the 2015 Power Smart Plan, resulting in a 2.2% increase. The following section highlights programs with notable changes.

Affordable Energy Program (-)
- Decrease due to Drain Water Heat Recovery technology no longer offered in program.

Community Geothermal (-)
- Decrease due to decline in forecasted average savings per application and anticipated participation levels based on updated market information.

Commercial Lighting (+)
- Increase due to greater uptake of LED technology.

Commercial Geothermal Program (-)
- Decrease due to reductions in market penetration levels based on updated market information.

Commercial HVAC - HRVs (+)
- Increase in forecasted average savings per application and anticipated participation levels based on updated market information.

Commercial Refrigeration (+)
- Increase in anticipated participation levels based on updated market information.

Power Smart Energy Manager (+)
- Increase in anticipated participation levels based on updated market information.

Performance Optimization (+)
- Increase in anticipated participation levels based on updated market information.

Load Displacement & Alternative Energy (-)
- Decrease in anticipated number of projects based on updated market information.

Residential Solar Photovoltaics Program (-)
- Decrease in anticipated participation levels based on updated market information.

Commercial Solar Photovoltaics Program (+)
- Increase in anticipated participation levels based on updated market information.

Codes & Standards (-)
- Decrease in anticipated future codes savings relating to the new commercial construction market.

	2016 DSM Forecast (GW.h)	2015 DSM Forecast (GW.h)	Change	% Contribution to overall change
New Homes Program	18.3	19.2	-1.0	-1%
Home Insulation Program	29.3	27.8	1.5	2%
Water and Energy Saver Program	13.2	11.9	1.3	1%
Affordable Energy Program	25.2	38.0	-12.8	-13%
Refrigerator Retirement Program	8.7	16.6	-7.9	-8%
Drain Water Heat Recovery Initiative	0.2	0.0	0.2	0%
Residential LED Lighting Program	15.4	6.6	8.9	9%
Community Geothermal Program	50.0	60.5	-10.5	-11%
Appliances	0.4	0.0	0.4	0%
HRV Controls	4.5	0.0	4.5	5%
Power Bars	0.0	0.0	0.0	0%
Smart Thermostats	0.2	0.0	0.2	0%
Plug-in Timers	0.1	0.0	0.1	0%
Community Energy Plan	0.0	0.0	0.0	0%
Power Smart Residential Loan	5.3	6.7	-1.4	-1%
Power Smart PAYS Financing	3.4	3.2	0.2	0%
Residential Earth Power Loan	20.1	17.5	2.7	3%
Residential Programs	**194.5**	**208.1**	**-13.6**	**-14%**
Commercial Lighting Program	623.2	396.8	226.4	231%
LED Roadway Lighting Conversion Program	48.5	48.5	0.0	0%
Commercial Building Envelope - Windows Program	25.2	27.6	-2.4	-2%
Commercial Building Envelope - Insulation Program	33.8	30.2	3.7	4%
Commercial Geothermal Program	37.4	84.7	-47.3	-48%
Commercial HVAC Program - Chillers (Water-Cooled)	0.9	4.7	-3.9	-4%
Commercial HVAC Program - CO2 Sensors	4.4	2.9	1.4	1%
Commercial HVAC Program - HRVs	40.3	11.6	28.6	29%
Commercial HVAC Program - Air Cooled Chillers	24.5	15.6	8.8	9%
Commercial Custom Measures Program	35.1	28.9	6.2	6%
Commercial Building Optimization Program	15.8	21.5	-5.7	-6%
New Buildings Program	139.0	136.0	3.0	3%
Commercial Refrigeration Program	71.2	56.5	14.7	15%
Commercial Kitchen Appliance Program	1.3	1.1	0.2	0%
Network Energy Management Program	0.3	3.4	-3.1	-3%
Internal Retrofit Program	17.5	6.9	10.6	11%
Power Smart Energy Manager	15.5	4.6	10.9	11%
Power Smart Shops	12.5	3.3	9.2	9%
Race to Reduce	0.0	0.0	0.0	0%
Parking Lot Controller	2.6	0.0	2.6	3%
Power Smart for Business PAYS Financing	0.0	0.0	0.0	0%
Commercial Programs	**1,148.9**	**884.8**	**264.1**	**270%**
Performance Optimization Program	397.0	321.7	75.3	77%
Industrial Programs	**397.0**	**321.7**	**75.3**	**77%**
Energy Efficiency Subtotal	**1,740.3**	**1,414.6**	**325.7**	**333%**
Curtailable Rate Program	-	-	-	-
Load Management	**-**	**-**	**-**	**-**
Bioenergy Optimization Program	106.4	130.1	-23.7	-24%
Customer Sited Load Displacement	504.1	593.2	-89.0	-91%
Load Displacement & Alternative Energy	**610.6**	**723.2**	**-112.7**	**-115%**
Conservation Rates - Residential	163.5	161.6	1.9	2%
Conservation Rates - Commercial	257.1	243.6	13.5	14%
Conservation Rates	**420.6**	**405.2**	**15.4**	**16%**
Fuel Choice	291.3	291.3	0.0	0%
Fuel Choice	**291.3**	**291.3**	**0.0**	**0%**
Residential Air Source Heat Pumps Program	7.4	6.3	1.2	1%
Residential Future Opportunities	91.7	83.3	8.3	9%
Residential Solar Photovoltaics Program (PV)	35.3	79.3	-44.0	-45%
Residential Solar Thermal Program - Water Heating	0.2	3.0	-2.8	-3%
Residential Solar Thermal Program - Pool Heating	2.6	2.2	0.5	0%
Commercial Future Opportunities	91.7	83.3	8.3	9%
Commercial Solar Photovoltaics Program (PV)	138.7	114.0	24.7	25%
Commercial Variable Speed and Frequency Drives	4.7	6.6	-1.9	-2%
Industrial Future Opportunities	91.7	83.3	8.3	9%
Other Emerging Technologies	**464.1**	**461.4**	**2.6**	**3%**
Impacts	**3,526.8**	**3,295.7**	**231.1**	**236%**
Codes, Standards & Regulations (at generation)	979.2	1,112.4	-133.3	-136%
Interactive Effects	-	-	-	-
Program Support	-	-	-	-
DSM Plan - 2016/17 - 2030/31	**4,506**	**4,408**	**98**	**100%**

Natural Gas DSM Targets Comparison for 2016/17 to 2030/31

The forecast natural gas savings in this plan are 4.4 million cubic metres higher than previously forecast in the 2015 Power Smart Plan, resulting in a 4.0% increase. The following section highlights programs with notable changes.

New Home Program (+)
- Increase due to revisions in future building code savings based on updated market information.

Affordable Energy Program (+)
- Increase due to extension of program offering.

HRV Controls (+)
- Increase due to new program offering in 2016.

Power Smart Residential Loan (+)
- Increase in forecasted average savings per loan.

Residential Earth Power Loan (-)
- Decrease in anticipated number of loans based on updated market information.

Commercial HVAC Program – Boilers (-)
- Decrease in anticipated participation levels based on updated market information.

Commercial HVAC Program – HRVs (+)
- Increase in anticipated participation levels based on updated market information.

Commercial Building Optimization Program (-)
- Decrease in anticipated participation levels based on updated market information.

Natural Gas Optimization Program (+)
- Increase due to extension of program offering and increase in forecasted average savings per project.

Codes & Standards (-)
- Decrease in anticipated future codes savings relating to the new commercial construction market.

Interactive Effects (-)
- Reflects greater volume required due to increased interactive heating effects from higher electric savings from the Commercial Lighting Program.

	2016 DSM Forecast (million m^3)	2015 DSM Forecast (million m^3)	Change	% Contribution to overall change
New Homes Program	7.8	5.4	2.4	55%
Home Insulation Program	6.4	6.6	-0.1	-3%
Water and Energy Saver Program	1.6	0.9	0.7	16%
Affordable Energy Program	6.9	4.8	2.1	48%
Refrigerator Retirement Program	0.0	-	-	-
Drain Water Heat Recovery Initiative	0.0	-	-	-
Residential LED Lighting Program	0.0	-	-	-
Community Geothermal Program	0.0	-	-	-
Appliances	0.0	0.0	0.0	0%
HRV Controls	0.7	0.0	0.7	16%
Power Bars	0.0	0.0	0.0	0%
Smart Thermostats	0.1	0.0	0.1	2%
Plug-in Timers	0.0	0.0	0.0	0%
Community Energy Plan	0.0	0.0	0.0	0%
Power Smart Residential Loan	5.7	3.6	2.0	46%
Power Smart PAYS Financing	-0.3	0.0	-0.3	-7%
Residential Earth Power Loan	0.3	1.3	-1.0	-23%
Residential Programs	**29.3**	**22.6**	**6.6**	**151%**
Commercial Lighting Program	-	-	-	-
LED Roadway Lighting Conversion Program	-	-	-	-
Commercial Building Envelope - Windows Program	4.5	3.7	0.8	18%
Commercial Building Envelope - Insulation Program	12.6	12.2	0.4	10%
Commercial Geothermal Program	-	-	-	-
Commercial HVAC Program - Chillers (Water-Cooled)	-	-	-	-
Commercial HVAC Program - CO2 Sensors	1.0	0.9	0.1	2%
Commercial HVAC Program - HRVs	6.4	2.9	3.5	80%
Commercial HVAC Program - Air Cooled Chillers	0.0	0.0	0.0	0%
Commercial Custom Measures Program	2.2	1.8	0.4	8%
Commercial Building Optimization Program	3.7	4.8	-1.1	-25%
New Buildings Program	3.8	3.7	0.1	2%
Commercial Refrigeration Program	0.0	0.0	0.0	0%
Commercial Kitchen Appliance Program	0.3	0.4	0.0	-1%
Network Energy Management Program	0.0	0.0	0.0	0%
Internal Retrofit Program	0.1	0.0	0.1	2%
Power Smart Energy Manager	1.3	0.4	0.9	21%
Power Smart Shops	0.1	0.0	0.0	1%
Race to Reduce	0.0	0.0	0.0	0%
Parking Lot Controller	0.0	0.0	0.0	0%
Power Smart for Business PAYS Financing	0.3	0.0	0.3	6%
Commercial Programs	**41.4**	**36.7**	**4.8**	**109%**
Performance Optimization Program	-	-	-	-
Industrial Programs	**14.0**	**9.1**	**4.9**	**111%**
Energy Efficiency Subtotal	**84.7**	**68.4**	**16.3**	**371%**
Curtailable Rate Program	-	-	-	-
Load Management	**-**	**-**	**-**	**-**
Bioenergy Optimization Program	0.0	0.0	0.0	0%
Customer Sited Load Displacement	-	-	-	-
Load Displacement & Alternative Energy	**0.0**	**0.0**	**0.0**	**0%**
Conservation Rates - Residential	-	-	-	-
Conservation Rates - Commercial	-	-	-	-
Conservation Rates	**-**	**-**	**-**	**-**
Fuel Choice	-27.7	-27.7	0.0	0%
Fuel Choice	**-27.7**	**-27.7**	**0.0**	**0%**
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	0.5	1.4	-1.0	-22%
Commercial Future Opportunities	-	-	-	-
Commercial Solar Photovoltaics Program (PV)	-	-	-	-
Commercial Variable Speed and Frequency Drives	-	-	-	-
Industrial Future Opportunities	-	-	-	-
Other Emerging Technologies	**0.5**	**1.4**	**-1.0**	**-22%**
Impacts	**57.5**	**42.2**	**15.3**	**350%**
Codes, Standards & Regulations (at generation)	72.9	74.3	-1.4	-33%
Interactive Effects	-15.8	-6.3	-9.5	-217%
Program Support	-	-	-	-
DSM Plan - 2016/17 - 2030/31	**115**	**110**	**4**	**100%**

Utility Cost Comparison for 2016/17 to 2030/31

The forecast utility cost in this plan is approximately $52 million higher than previously forecast in the 2015 Power Smart Plan, resulting in a 4.0% increase. The following section highlights programs with notable changes.

Affordable Energy Program (+)
- Increase due to extension of program offering.

Residential LED Lighting Program (+)
- Increase due to additional spending on lighting campaign activity.

Community Geothermal Program (-)
- Decrease due to decline in forecasted average incentive per application and anticipated participation levels based on updated market information.

HRV Controls (+)
- Increase due to new program offering in 2016.

Commercial Lighting Program (+)
- Increase in anticipated participation levels and related incentive payouts based on updated market information.

Commercial Building Envelope (+)
- Increase in anticipated participation levels and related incentive payouts based on updated market information.

Commercial Geothermal Program (-)
- Decrease due to reductions in market penetration levels and related incentive payouts based on updated market information.

Commercial HVAC Program – HRVs (+)
- Increase in anticipated participation levels and related incentive payouts based on updated market information.

Performance Optimization Program (-)
- Decrease in anticipated program administration costs.

Load Displacement & Alt. Energy (-)
- Decrease in anticipated no of projects and related incentive payouts based on updated market information.

Residential Solar Photovoltaics Program (-)
- Decrease in anticipated participation levels and related incentive payouts based on updated market information.

Commercial Solar Photovoltaics Program (+)
- Increase in anticipated participation levels and related incentive payouts based on updated market information.

	2016 DSM Utility Investment (millions $)	2015 DSM Utility Investment (millions $)	Change	% Contribution to overall change
New Homes Program	$3.2	$3.0	$0.2	0%
Home Insulation Program	$27.1	$28.4	-$1.2	-2%
Water and Energy Saver Program	$5.8	$4.4	$1.4	3%
Affordable Energy Program	$93.7	$88.6	$5.2	10%
Refrigerator Retirement Program	$8.4	$9.0	-$0.6	-1%
Drain Water Heat Recovery Initiative	$0.1	$0.0	$0.1	0%
Residential LED Lighting Program	$7.4	$2.1	$5.4	10%
Community Geothermal Program	$22.5	$26.3	-$3.7	-7%
Appliances	$0.4	$0.0	$0.4	1%
HRV Controls	$2.8	$0.0	$2.8	5%
Power Bars	$0.0	$0.0	$0.0	0%
Smart Thermostats	$0.3	$0.0	$0.3	1%
Plug-in Timers	$0.0	$0.0	$0.0	0%
Community Energy Plan	$1.7	$0.0	$1.7	3%
Power Smart Residential Loan	$0.0	$0.0	$0.0	0%
Power Smart PAYS Financing	$0.0	$0.0	$0.0	0%
Residential Earth Power Loan	$0.0	$0.0	$0.0	0%
Residential Programs	**$173.6**	**$161.7**	**$11.9**	**23%**
Commercial Lighting Program	$123.3	$100.7	$22.6	43%
LED Roadway Lighting Conversion Program	$44.4	$45.2	-$0.8	-2%
Commercial Building Envelope - Windows Program	$23.7	$17.6	$6.1	12%
Commercial Building Envelope - Insulation Program	$40.0	$35.4	$4.6	9%
Commercial Geothermal Program	$16.7	$43.8	-$27.1	-52%
Commercial HVAC Program - Chillers (Water-Cooled)	$0.2	$1.3	-$1.1	-2%
Commercial HVAC Program - CO2 Sensors	$4.0	$2.5	$1.5	3%
Commercial HVAC Program - HRVs	$35.4	$6.0	$29.5	56%
Commercial HVAC Program - Air Cooled Chillers	$11.9	$6.9	$5.0	10%
Commercial Custom Measures Program	$12.4	$13.2	-$0.9	-2%
Commercial Building Optimization Program	$9.3	$9.5	-$0.2	0%
New Buildings Program	$13.2	$16.6	-$3.4	-6%
Commercial Refrigeration Program	$13.5	$8.9	$4.6	9%
Commercial Kitchen Appliance Program	$0.3	$0.4	$0.0	0%
Network Energy Management Program	$0.1	$0.4	-$0.3	-1%
Internal Retrofit Program	$10.6	$5.8	$4.8	9%
Power Smart Energy Manager	$3.7	$0.6	$3.0	6%
Power Smart Shops	$3.6	$1.8	$1.7	3%
Race to Reduce	$0.8	$0.0	$0.8	2%
Parking Lot Controller	$0.5	$0.0	$0.5	1%
Power Smart for Business PAYS Financing	$0.0	$0.0	$0.0	0%
Commercial Programs	**$371.8**	**$320.6**	**$51.2**	**98%**
Performance Optimization Program	$122.2	$139.2	-$17.0	-32%
Industrial Programs	**$130.0**	**$144.7**	**-$14.7**	**-28%**
Energy Efficiency Subtotal	**$675.3**	**$627.0**	**$48.3**	**92%**
Curtailable Rate Program	$106.6	$97.5	$9.0	17%
Load Management	**$106.6**	**$97.5**	**$9.0**	**17%**
Bioenergy Optimization Program	$37.5	$37.9	-$0.4	-1%
Customer Sited Load Displacement	$81.8	$94.0	-$12.2	-23%
Load Displacement & Alternative Energy	**$119.4**	**$131.9**	**-$12.5**	**-24%**
Conservation Rates - Residential	$13.2	$13.4	-$0.2	0%
Conservation Rates - Commercial	$17.3	$17.6	-$0.2	0%
Conservation Rates	**$30.5**	**$30.9**	**-$0.4**	**-1%**
Fuel Choice	$53.8	$54.6	-$0.9	-2%
Fuel Choice	**$53.8**	**$54.6**	**-$0.9**	**-2%**
Residential Air Source Heat Pumps Program	$2.5	$2.2	$0.3	1%
Residential Future Opportunities	$50.6	$45.9	$4.6	9%
Residential Solar Photovoltaics Program (PV)	$35.9	$59.8	-$24.0	-46%
Residential Solar Thermal Program - Water Heating	$0.3	$1.5	-$1.2	-2%
Residential Solar Thermal Program - Pool Heating	$1.3	$1.1	$0.2	0%
Commercial Future Opportunities	$54.6	$49.6	$5.0	10%
Commercial Solar Photovoltaics Program (PV)	$87.6	$71.9	$15.7	30%
Commercial Variable Speed and Frequency Drives	$2.7	$3.4	-$0.7	-1%
Industrial Future Opportunities	$59.9	$54.4	$5.5	10%
Other Emerging Technologies	**$295.3**	**$289.8**	**$5.5**	**10%**
Impacts	**$1,280.8**	**$1,231.9**	**$49.0**	**93%**
Codes, Standards & Regulations (at generation)	-	-	-	-
Interactive Effects	-	-	-	-
Program Support	$86.4	$82.9	$3.5	7%
DSM Plan - 2016/17 - 2030/31	**$1,367**	**$1,315**	**$52**	**100%**

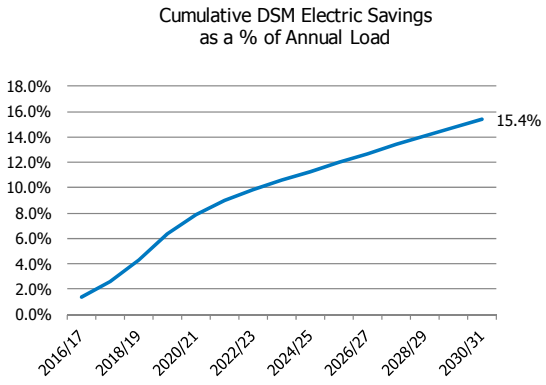
2 DEMAND SIDE MANAGEMENT

2.1 DSM Targets

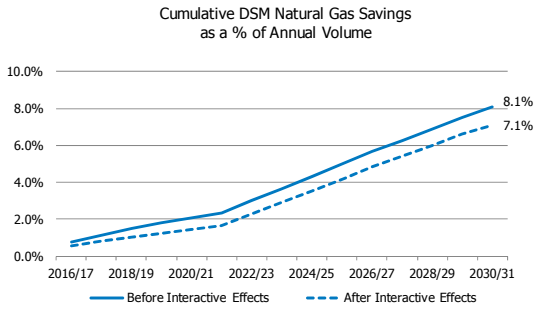
2.1.1 Electric and Natural Gas DSM Savings

In summary, the plan sets out to realize electricity savings of 1,232 MW and 4,506 GW.h, natural gas savings of 130 million cubic metres before interactive effects and combined global greenhouse gas emission reductions of 3.3 million tonnes by 2030/31.

This demand side management plan represents 15.4% of the estimated electric load forecast offsetting 59% of projected load growth during this period and 8.1% of the estimated natural gas volume forecast by 2030/31, further reducing natural gas consumption in Manitoba. Including 15.8 million cubic meters in natural gas consumption due to interactive effects, the plan is expected to result in net natural gas savings of 115 million cubic metres which represents 7.1% of the estimated volume forecast by 2030/31.



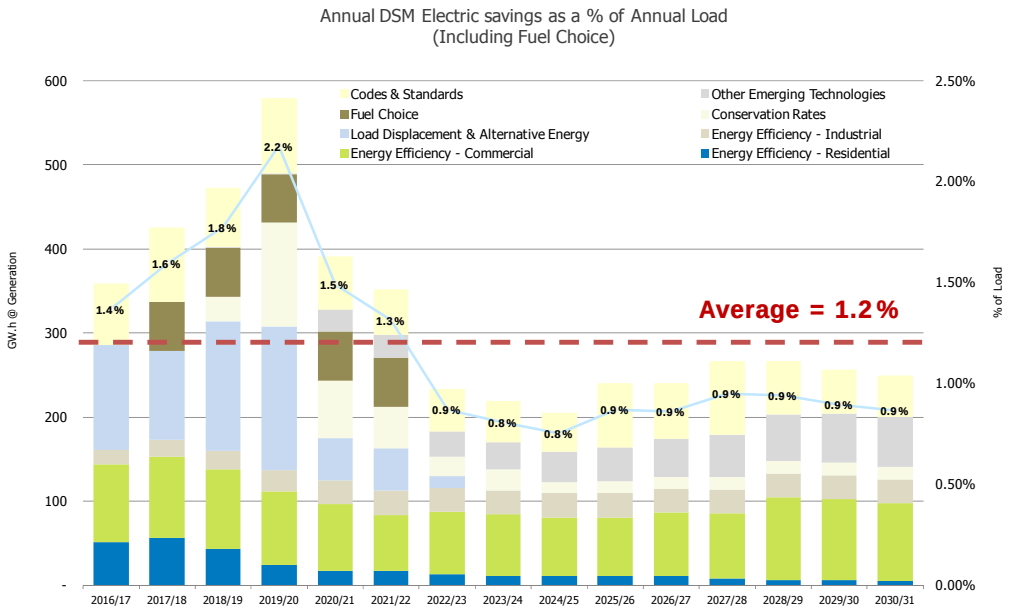
Note: Total DSM Electric savings per the above graph includes forecast savings from program impacts and savings from Codes, Standards and Regulations.
Source of Load Forecast: 2015 Electric Load Forecast.

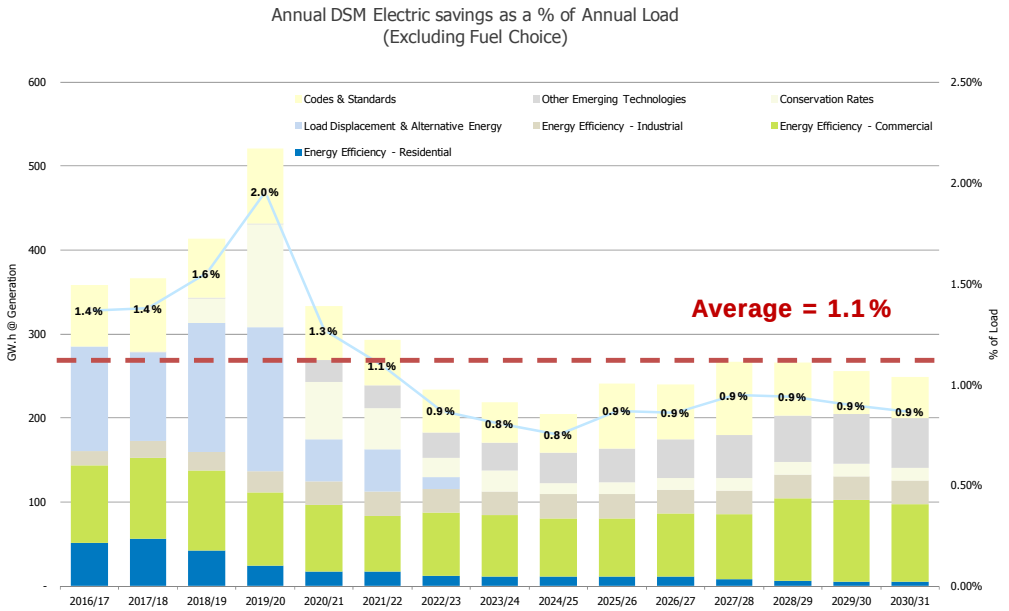


Note: Total DSM Natural Gas savings per the above graph includes forecast savings from program impacts and Codes, Standards and Regulations.
Note: The above graph reflects a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts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

Annual Electric DSM Savings as a % of Annual Load

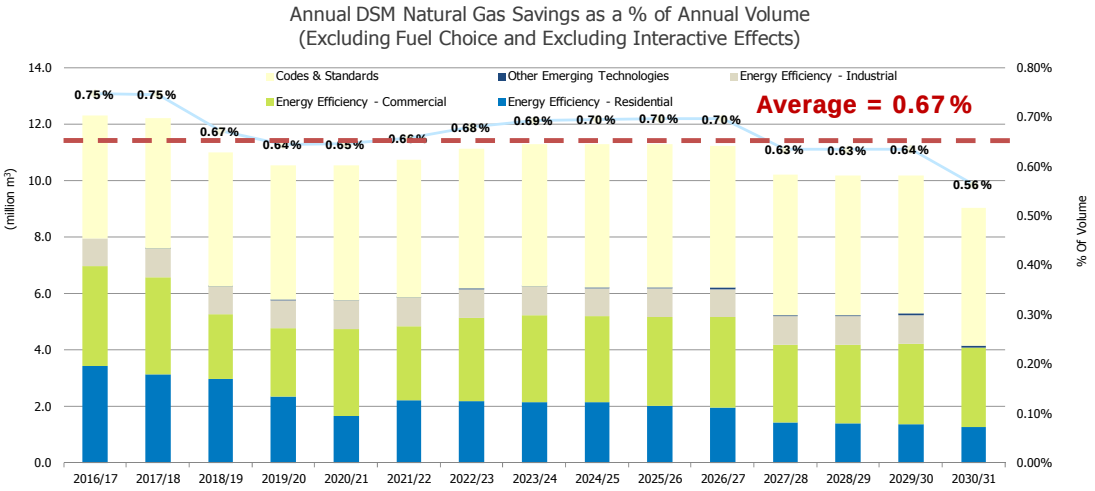
The following charts depict Manitoba Hydro's annual electric DSM efforts in relation to annual electric load growth.



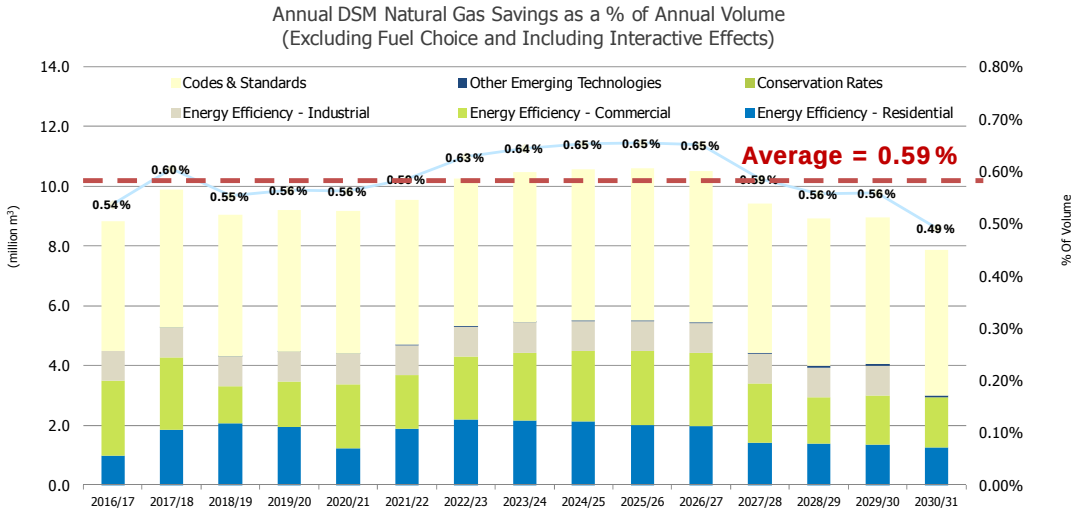


Annual Natural Gas DSM Savings as a % of Annual Volume

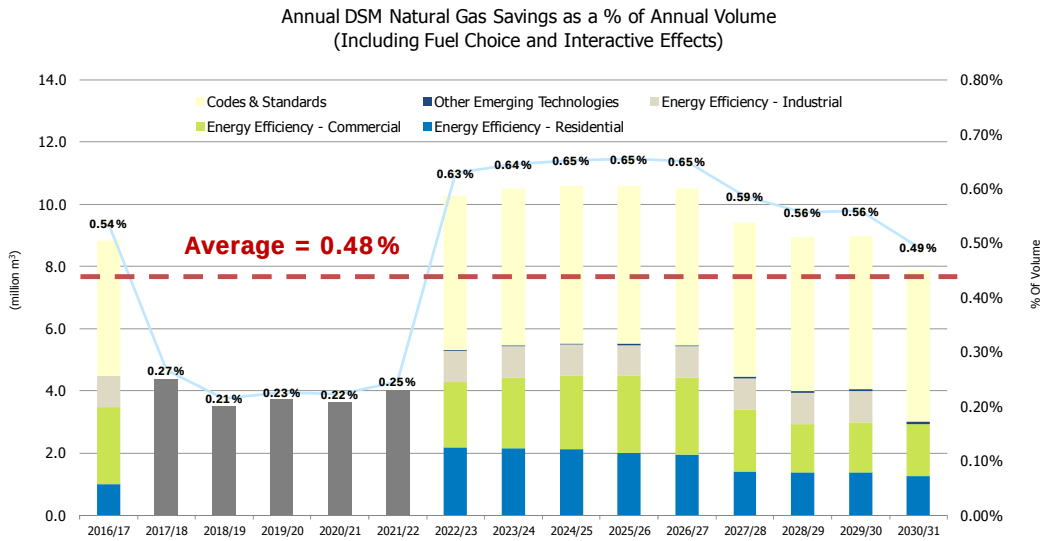
The following charts depict Manitoba Hydro's annual natural gas DSM efforts in relation to annual natural gas volume growth.



Note: The above 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.



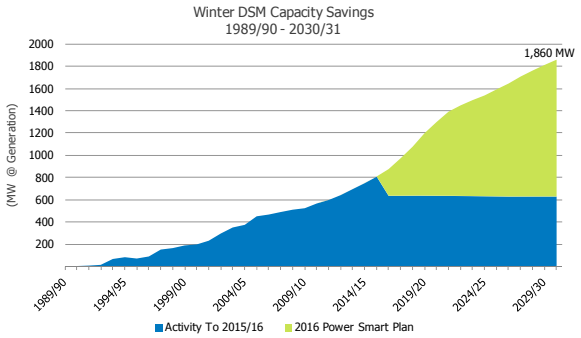
Note: The above graph reflects a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

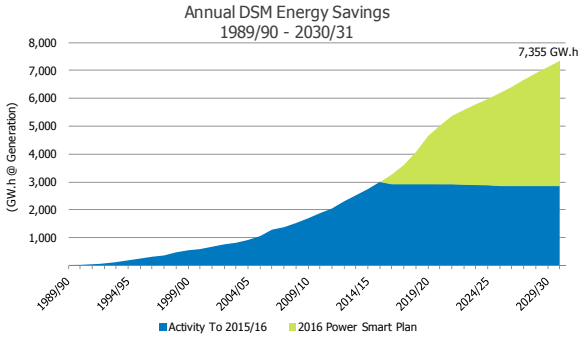


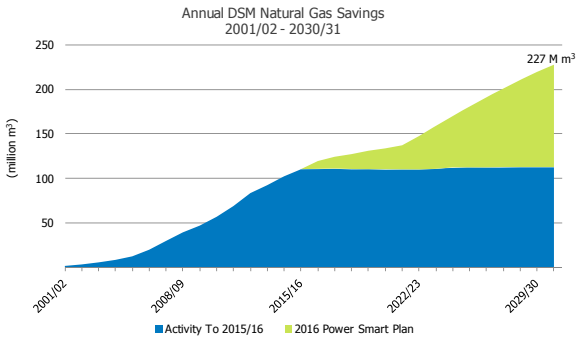
Note: The above graph reflects a percentage of volume calculation that excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

Combined with energy savings achieved to date, total electrical savings of 1,860 MW and 7,355 GW.h and total natural gas savings of 258 million cubic metres before interactive effects will be realized by 2030/31. These combined energy savings are expected to result in an overall reduction of greenhouse gas emissions of 5.4 million tonnes by 2030/31. This activity represents 24.9% of the estimated electric load forecast and 16.0% of the estimated natural gas volume forecast by 2030/31. Including natural gas consumption due to interactive effects, total natural gas savings of 227 million cubic metres will be realized, representing 14.1% of the estimated natural gas volume forecast by 2030/31.

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 2016 Demand Side Management Plan:







The following table shows detailed DSM savings associated with the 2016 Demand Side Management Plan by sector to 2030/31.

Electric and Natural Gas DSM Savings
2016/17 - 2030/31

	Winter Capacity (MW)		Annual Energy (GW.h)		Annual Energy (million m^3)		
Residential							
New Homes Program	7.3		16.0		7.8		
Home Insulation Program	12.8		25.7		6.4		
Water and Energy Saver Program	2.1		11.6		1.6		
Affordable Energy Program							
Affordable Energy Program - Insulation	8.5		22.1		6.9		
Affordable Energy Program - Furnace	n/a		n/a		0.0		
Affordable Energy Program - Total	8.5		22.1		6.9		
Refrigerator Retirement Program	0.8		7.6		-		i
Drain Water Heat Recovery Initiative	0.0		0.1		n/a		
Residential LED Lighting Program	4.3		13.5		-		i
Community Geothermal Program	22.0		43.9		n/a		
Appliances & Electronics Initiative	0.1		0.4		0.0		
HRV Controls	1.6		4.0		0.7		
Smart Thermostats	0.1		0.2		0.1		
Community Energy Plan	0.0		0.0		0.0		
Residential Programs Total (@ Meter)	59.5	7%	145.3	5%	23.5	41%	
Customer Service Initiatives / Financial Loan Programs							
Power Smart Residential Loan	2.4		4.7		5.7		
Power Smart PAYS Financing	1.5		3.0		-0.3		
Residential Earth Power Loan	5.8		17.7		0.3		
Residential CSI / Financial Loan Programs Total (@ Meter)	9.7	1%	25.3	1%	5.7	10%	
Commercial							
Commercial Lighting Program	133.8		546.7		-		i
LED Roadway Lighting Conversion Program	6.3		42.6		n/a		
Commercial Building Envelope - Windows Program	7.2		22.1		4.5		
Commercial Building Envelope - Insulation Program	13.1		29.7		12.6		
Commercial Geothermal Program	16.4		32.8		n/a		
Commercial HVAC Program - Boilers	n/a		n/a		3.1		
Commercial HVAC Program - Chillers (Water-Cooled)	0.0		0.8		n/a		
Commercial HVAC Program - CO2 Sensors	2.4		3.9		1.0		
Commercial HVAC Program - HRVs	17.3		35.3		6.4		
Commercial HVAC Program - Air Cooled Chillers	0.0		21.5		n/a		
Commercial HVAC Program - Water Heaters	n/a		n/a		2.1		
Commercial Custom Measures Program	7.1		30.8		2.2		
Commercial Building Optimization Program	2.8		13.8		3.7		
New Buildings Program	36.3		121.9		3.8		
Commercial Refrigeration Program	7.7		62.4		-		i
Commercial Kitchen Appliance Program	0.2		1.1		0.3		
Network Energy Management Program	0.0		0.3		-		i
Internal Retrofit Program	3.0		15.3		0.1		
Power Smart Energy Manager	3.1		13.6		1.3		
Power Smart Shops	3.3		11.0		0.1		i
Race to Reduce	0.0		0.0		0.0		
Parking Lot Controller	0.0		2.3		0.0		
Commercial Programs Total (@ Meter)	260.0	30%	1,007.8	32%	41.2	72%	
Customer Service Initiatives / Financial Loan Programs							
Power Smart For Business PAYS Financing	0.0		0.0		0.3		
Commercial CSI / Financial Loan Programs Total (@ Meter)	0.0	0%	0.0	0%	0.3	0%	
Industrial							
Performance Optimization Program	45.4		360.9		n/a		
Natural Gas Optimization Program	n/a		n/a		14.0		
Industrial Programs Total (@ Meter)	45.4	5%	360.9	12%	14.0	24%	
Energy Efficiency Subtotal (@ Meter)	374.6	43%	1,539.3	49%	84.7	147%	
Load Management							
Curtailable Rate Program	145.0		n/a		n/a		
Load Management Programs Total (@ Meter)	145.0	17%	n/a	0%	n/a	0%	
Load Displacement & Alternative Energy							
Bioenergy Optimization Program	46.5		96.7		n/a		
Customer Sited Load Displacement	60.0		458.3		n/a		
Load Displacement & Alt. Energy Programs Total (@ Meter)	106.5	12%	555.0	18%	n/a	0%	
Conservation Rates							
Conservation Rates - Residential	17.2		143.4		n/a		
Conservation Rates - Commercial	27.1		225.5		n/a		
Conservation Rates Total (@ Meter)	44.3	5%	368.9	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)	(48%)	
Other Emerging Technologies							
Residential Air Source Heat Pumps Program	0.0		6.5		n/a		
Residential Future Opportunities	16.7		80.4		n/a		
Residential Solar Photovoltaics Program (PV)	2.8		30.9		n/a		
Residential Solar Thermal Program - Water Heating	0.0		0.2		n/a		
Residential Solar Thermal Program - Pool Heating	0.0		2.3		0.5		
Commercial Future Opportunities	16.7		80.4		n/a		
Commercial Solar Photovoltaics Program (PV)	12.9		121.7		n/a		
Commercial Variable Speed and Frequency Drives	0.1		4.2		n/a		
Industrial Future Opportunities	17.3		83.3		n/a		
Other Emerging Technologies Total (@ Meter)	66.5	8%	410.0	13%	0.5	0%	
Program Impacts Total (@ Meter)	864.8	100%	3,128.8	100%	57.5	100%	
Interactive Effects					-15.8		
Codes, Standards and Regulations (@ Meter)	227.3		858.9		72.9		
Power Smart 2016/17 to 2030/31 Impacts (@ Meter)	1,092		3,988				
Power Smart 2016/17 to 2030/31 Impacts (@ Generation)	1,232		4,506		115		
Savings Achieved To 2015/16 (@ Meter)	555		2,521				
Savings Achieved To 2015/16 (@ Generation)	628		2,849		113		
Grand Total (@ Meter)	1,647		6,509				
Grand Total (@ Generation)	1,860		7,355		227		

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 967,405 litres of fuel oil and 330,546 litres of propane will be achieved from 2016/17 to 2030/31.

Affordable Energy Fund Other Fuel Savings
2016/17 - 2030/31
(000s, litres)

	2016/17	2017/18	2018/19-2030/31
Fuel Oil Savings			
Home Insulation Program	2.0	2.0	12.6
Water & Energy Saver Program	4.2	.0	.0
Oil & Propane Furnace Replacement	95.1	95.1	756.4
Annual Fuel Oil Savings	101.3	97.1	769.0
Cumulative Fuel Oil Savings, 2016/17 - 2030/31	101.3	198.4	967.4
Propane Savings			
Home Insulation Program	7.2	7.2	48.4
Water & Energy Saver Program	3.3	.0	.0
Oil & Propane Furnace Replacement	26.6	26.6	211.2
Annual Propane Savings	37.1	33.8	259.6
Cumulative Propane Savings, 2016/17 - 2030/31	37.1	70.9	330.5

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 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.

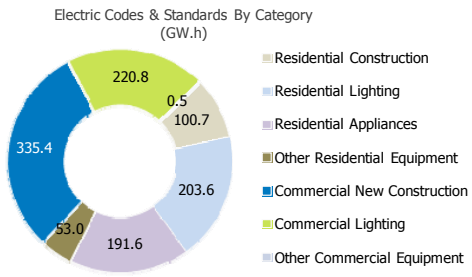
Efforts to achieve energy savings through Energy Efficient Codes and Standards initiatives are forecasted in the 2016 Demand Side Management Plan to achieve capacity savings of 299 MW, energy savings of 1106 GW.h and 83 million cubic metres of natural gas annually by 2030/31. As a result of these savings, a greenhouse gas emissions reduction of 0.9 million tonnes is expected by 2030/31.

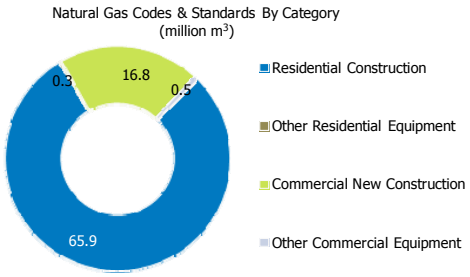
The following table and charts provide a summary of the planned energy savings in 2030/31 from codes and standards that are currently implemented in energy efficiency regulation at the provincial and national level. Future DSM plans will provide updated forecasts of savings from codes and standards based on new information, such as the pending proposals being put forward by Natural Resources Canada for Amendments 13 and 14, which include both new and enhanced energy efficiency regulations for a variety of energy consuming measures.

Energy Savings from Codes & Standards
2016/17 - 2030/31

Code Category	Components	Energy and Demand Savings Winter MW	Energy and Demand Savings Annual GW.h	Natural Gas Annual millions m^3	CO2 Reductions Annual Tonnes
Residential Construction	Insulation, Windows, Pilot Light Gas Fire Place, Furnace, Heat Recovery Ventilation, Showerhead	32.1	100.7	65.9	193,127
Residential Lighting	General Service Lamps	75.5	203.6	-	137,402
Residential Appliances	Dishwashers, Clothes Washers, Clothes Dryers, Refrigerators, Freezers, Ranges, Stoves, Cooktops	31.2	191.6	-	129,301
Other Residential Equipment	Central Air Conditioning, Residential Furnace	0.4	53.0	0.3	36,274
Commercial New Construction	Various Building Code Amendments	99.2	335.4	16.8	258,280
Commercial Lighting	General Service Lamps, Exit Signs, Fluorescent Lamp Ballasts	60.8	220.8	-	149,057
Other Commercial Equipment	Commercial Furnace, Boiler and Spray Valves	0.1	0.5	0.5	1,193
Total @ Generation		299	1106	83	904,634

** 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*





Status of Codes and Standards

The following table summarizes the status of changes to provincially and nationally regulated codes and standards included in the 2016 Demand Side Management Plan, including actual or expected dates for implementation.

For electricity, changes that account for 69% of total energy savings have been enacted and 31% are planned.

For natural gas, changes that account for 87% of total energy savings have been enacted and 12% are planned.

Status of Changes to Codes and Standards

Code Category	Components	Energy GW.h	Natural Gas Annual million m^3	Level of Government	Expected Effective Date Enacted	Announced	Planned
Residential Construction	Building Code - Insulation	16.9	6.9	MB	2008		
Residential Construction	Building Code - Various measures	69.8	51.7	MB	2010		
Residential Construction	Building Code - Various measures	14.1	7.3	MB			2021
Residential Lighting	General Service Lamps (MEPS)	81.7	-	Federal	2014		
Residential Lighting	General Service Lamps (MEPS) (Future)	121.9	-	Federal			2025
Residential Appliances	Various appliances	159.6	-	Federal			
Residential Appliances	Various appliances (Future)	31.9	-	Federal			2020
Other Residential Equipment	Central Air Conditioning	47.0	-	Federal	2006		
Other Residential Equipment	Central Air Conditioning (Future)	6.0	-	Federal			2020
Other Residential Equipment	Residential Furnace	-	0.3	Federal / MB	2009		
Commercial New Construction	Building Code	223.1	13.7	MB	2016		
Commercial New Construction	Building Code (Future)	112.3	3.1	MB			2022
Commercial Lighting	General Service Lamps (MEPS)	35.0	-	Federal			2019
Commercial Lighting	General Service Lamps (MEPS) (Future)	27.0	-	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	-	0.2	Federal / MB	2009		
Other Commercial Equipment	Commercial Boilers	-	0.1	Federal / MB		2019	
Other Commercial Equipment	Commercial Spray Valves	0.5	0.1	Federal / MB	2011		
Total (GW.h)		1106			757	0.0	348
					69%	0%	31%
Total (million m^3)			83		73	0	10
					87%	0%	12%

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 October1, 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 (MBC). In fact, a majority of the technologies adopted by the MBC 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 may have postured with strong opposition to adopting the code. 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 52/2015
Registered: April 27, 2015
Effective date: April 1, 2016

In December 2012, the National Building Code's (NBC) first attempt at incorporating energy efficiency into the code for Part 9 buildings was published as section 9.36 of the NBC. Although Manitoba had already incorporated energy efficiency into the MBC in advance of this publication, an effort was made by the energy sub-committee of the Manitoba Building Standards Board to review the contents of 9.36 with the intent to align the requirements as much as possible. The review concluded with minimal changes to the pre-existing requirements of the MBC that were made effective in 2010 other than one significant change; the requirement for a drain water heat recovery system. This requirement, the first of its kind in Canada, actually resulted in an efficiency level for new homes in Manitoba that surpassed the NBC requirement and was applauded by energy efficiency advocates from across the country. Due to the recency of this requirement, an estimate of the energy savings impacts resulting from the installation of drain water heat recovery systems is not included current planning assumptions, however, Manitoba Hydro staff will provide estimates in future plans.

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
Manitoba Energy Code for Buildings
Regulation 213/2013
Registered: December 20, 2013
Effective Date: December 1, 2014

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 building codes with several Customer Engineering Services staff actively involved in national meetings to ensure Manitoba Hydro objectives are met. NECB 2015 was published December 18th, 2015 and NECB 2020 is currently in development. Manitoba Hydro staff are also members of the Manitoba Building Standards Board Sub-Committee on Energy and Water Efficiency, which is responsible for reviewing all national changes to the energy code prior to adoption in Manitoba. Review of NECB 2015 is slated to occur in 2016.

Manitoba Hydro's Commercial New Buildings program will continue to play a critical role in advancing industry knowledge and expertise ahead of requirements adopted in the Manitoba Energy Code for Buildings. 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 it 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 it pre-program average of 30% to an estimated 75% by March 2015, thus facilitating the adoption of a higher performance standard in Manitoba.

<u>Commercial Pre Rinse Spray Valve</u>
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)

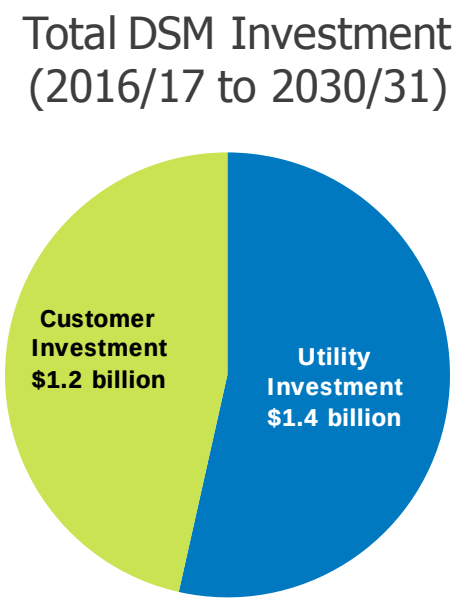
This work pertains primarily to industrial and commercial equipment that incorporates or applies to electric motors, variable speed drives, air compressors, compressed air systems, fans, pumps, transformers, power quality systems, battery charges, uninterruptible power supplies, lighting systems, refrigeration, 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 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).



2.2.2 Utility Investment

The following table provides the cumulative electric and natural gas internal DSM investment totals to 2030/31 broken down by market sector and cost basis. Including other internal DSM investments, it is expected that by 2030/31, 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 2030/31, a cumulative investment of achieving the energy savings will have been $2.1 billion.

Internal DSM Utility Investment
2016/17 - 2030/31

	Electric Cumulative Utility Costs (millions $)		Natural Gas Cumulative Utility Costs (millions $)		Total Cumulative Utility Costs (millions $)		
Residential							
New Homes Program	$3.0		$0.2		$3.2		
Home Insulation Program	$13.4		$13.7		$27.1		
Water and Energy Saver Program	$3.8		$2.0		$5.8		
Affordable Energy Program							
Affordable Energy Program - Insulation	$24.6		$45.5		$70.0		
Affordable Energy Program - Furnace	-		$23.7		$23.7		**
Affordable Energy Program - Total	$24.6		$69.2		$93.7		**
Refrigerator Retirement Program	$8.4		-		$8.4		
Drain Water Heat Recovery Initiative	$0.1		-		$0.1		
Residential LED Lighting Program	$7.4		-		$7.4		
Community Geothermal Program	$22.5		-		$22.5		
Appliances & Electronics Initiative	$0.4		-		$0.4		
HRV Controls	$1.2		$1.6		$2.8		
Smart Thermostats	$0.1		$0.2		$0.3		
Community Energy Plan	$1.4		$0.3		$1.7		
Residential Programs Total	$86.4	8%	$87.2	51%	$173.6	14%	
Commercial							
Commercial Lighting Program	$123.3		-		$123.3		
LED Roadway Lighting Conversion Program	$44.4		-		$44.4		
Commercial Building Envelope - Windows Program	$10.3		$13.3		$23.7		
Commercial Building Envelope - Insulation Program	$11.8		$28.2		$40.0		
Commercial Geothermal Program	$16.7		-		$16.7		
Commercial HVAC Program - Boilers	-		$1.9		$1.9		
Commercial HVAC Program - Chillers (Water-Cooled)	$0.2		-		$0.2		
Commercial HVAC Program - CO2 Sensors	$1.7		$2.3		$4.0		
Commercial HVAC Program - HRVs	$20.7		$14.7		$35.4		
Commercial HVAC Program - Air Cooled Chillers	$11.9		-		$11.9		
Commercial HVAC Program - Water Heaters	-		$2.4		$2.4		
Commercial Custom Measures Program	$9.2		$3.2		$12.4		
Commercial Building Optimization Program	$3.8		$5.5		$9.3		
New Buildings Program	$10.9		$2.3		$13.2		
Commercial Refrigeration Program	$13.5		-		$13.5		
Commercial Kitchen Appliance Program	$0.1		$0.2		$0.3		
Network Energy Management Program	$0.1		-		$0.1		
Internal Retrofit Program	$10.5		$0.1		$10.6		
Power Smart Energy Manager	$2.2		$1.5		$3.7		
Power Smart Shops	$3.4		$0.1		$3.6		
Race to Reduce	$0.5		$0.3		$0.8		
Parking Lot Controller	$0.5		-		$0.5		
Commercial Programs Total	$295.8	27%	$76.0	44%	$371.8	29%	
Industrial							
Performance Optimization Program	$122.2		-		$122.2		
Natural Gas Optimization Program	-		$7.8		$7.8		
Industrial Programs Total	$122.2	11%	$7.8	5%	$130.0	10%	
Energy Efficiency Subtotal	$504.4	45%	$170.9	99%	$675.3	53%	
Load Management							
Curtailable Rate Program	$106.6		-		$106.6		
Load Management Programs Total	$106.6	10%	-	0%	$106.6	8%	
Load Displacement & Alternative Energy							
Bioenergy Optimization Program	$37.5		-		$37.5		
Customer Sited Load Displacement	$81.8		-		$81.8		
Load Displacement & Alt. Energy Programs Total	$119.4	11%	-	0%	$119.4	9%	
Conservation Rates							
Conservation Rates - Residential	$13.2		-		$13.2		
Conservation Rates - Commercial	$17.3		-		$17.3		
Conservation Rates Total	$30.5	3%	-	0%	$30.5	2%	
Fuel Choice							
Fuel Choice	$53.8		-		$53.8		
Fuel Choice Total	$53.8	5%	-	0%	$53.8	4%	
Other Emerging Technologies							
Residential Air Source Heat Pumps Program	$2.5		-		$2.5		
Residential Future Opportunities	$50.6		-		$50.6		
Residential Solar Photovoltaics Program (PV)	$35.9		-		$35.9		
Residential Solar Thermal Program - Water Heating	$0.3		-		$0.3		
Residential Solar Thermal Program - Pool Heating	$0.4		$0.9		$1.3		
Commercial Future Opportunities	$54.6		-		$54.6		
Commercial Solar Photovoltaics Program (PV)	$87.6		-		$87.6		
Commercial Variable Speed and Frequency Drives	$2.7		-		$2.7		
Industrial Future Opportunities	$59.9		-		$59.9		
Other Emerging Technologies Total	$294.4	27%	$0.9	0%	$295.3	23%	
Program Impacts Total	$1,109.0	100%	$171.8	100%	$1,280.8	100%	
Program Support and Contingency Costs	$66.6		$16.0		$82.6		
Power Smart Investment Total, 2016/17- 2030/31	$1,175.6		$187.8		$1,363.5		
Other Internal DSM Investments							
Affordable Energy Fund	$3.6		$0.2		$3.8		
Cumulative Investment Total, 2016/17 - 2030/31	$1,179.2		$188.0		$1,367.2		
Spent to 2015/16	$522.9		$164.8		$687.7		
Cumulative Investment Total, 1989/90 - 2030/31	$1,702.2		$352.8		$2,055.0		

** Includes Furnace Replacement Program Expenditures

The following table outlines the total projected DSM budget including all internal sources of funding to 2030/31. A total investment of $1.4 billion is planned for the period of 2016/17 to 2030/31.

Forecasted Internal DSM Budget
2016/17 - 2030/31
(millions $)

	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	2030/31	Total
Electric DSM																
Electric Power Smart	56.8	81.3	100.7	95.6	90.3	88.5	68.2	62.0	64.1	68.4	72.7	76.7	81.0	84.9	84.4	1,175.6
Affordable Energy Fund	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	-	-	-	2.5
Annual Electric Budget	$57.1	$81.5	$101.0	$95.9	$90.6	$88.7	$68.4	$62.2	$64.4	$68.6	$72.8	$76.8	$81.0	$84.9	$84.4	$1,178.2
Natural Gas DSM																
Natural Gas Power Smart	13.7	13.3	11.8	11.0	11.0	11.1	10.6	10.7	10.6	10.8	10.5	9.7	9.8	10.1	9.6	164.1
Affordable Energy Fund	0.1	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	0.2
Furnace Replacement Budget	2.5	2.6	2.6	2.7	2.5	2.3	2.2	1.9	0.6	0.6	0.6	0.6	0.6	0.7	0.7	23.7
Annual Natural Gas Budget	$16.3	$15.9	$14.5	$13.7	$13.4	$13.4	$12.8	$12.6	$11.2	$11.4	$11.2	$10.3	$10.4	$10.7	$10.2	$188.0
Oil and Propane DSM																
Affordable Energy Fund	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	-	-	-	-	-	-	1.1
Annual Oil and Propane Budget	$0.0	$0.1	$0.1	$0.2	$0.2	$0.2	$0.2	$0.2	$0.1	-	-	-	-	-	-	$1.1
Manitoba Hydro Annual Budget	$73.4	$97.4	$115.6	$109.7	$104.2	$102.3	$81.4	$75.0	$75.6	$80.0	$83.9	$87.1	$91.4	$95.6	$94.7	
Cumulative Investment 2016/17 - 2030/31	$73.4	$170.8	$286.4	$396.1	$500.3	$602.5	$683.9	$758.9	$834.5	$914.5	$998.4	$1,085.5	$1,176.9	$1,272.6	$1,367.2	$1,367.2

Note: Figures may not add due to rounding

Including investments to date, it is expected that by 2030/31, a cumulative investment of achieving the energy savings will have been $2.1 billion, $1.7 billion of the costs are funded through the Corporation's Power Smart electricity budget, $297 million from the Power Smart natural gas budget, $35 million from the Affordable Energy Fund, and $37 million from the Furnace Replacement budget for targeting furnace replacement.

Total Internal DSM Budget
1989/90 - 2030/31
(millions $)

	Expenditures to date 1989/90 - 2015/16	15 yr planning horizon 2016/17 - 2030/31	Total 1989/90 - 2030/31
Electric DSM			
Electric Power Smart	509.6	1,175.6	1,685.2
Affordable Energy Fund	12.8	2.5	15.3
Annual Electric Budget	$522.4	$1,178.2	$1,700.5
Natural Gas DSM			
Natural Gas Power Smart	132.9	164.1	297.1
Affordable Energy Fund	18.2	0.2	18.3
Furnace Replacement Budget	13.7	23.7	37.4
Annual Natural Gas Budget	$164.8	$188.0	$352.8
Oil and Propane DSM			
Affordable Energy Fund	0.6	1.1	1.7
Annual Oil and Propane Budget	$0.6	$1.1	$1.7
Cumulative Investment 1989/90 - 2030/31	$687.7	$1,367.2	$2,055.0

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, 2016 approximately $34.1 million of the Affordable Energy Fund had been spent, leaving the remaining $4.2 million.

Affordable Energy Fund Budget
(millions $)

	Total Budget	Expeditures to Date	Remaining Total Budget
Affordable Energy Program	23.1	21.7	1.4
Geothermal Support	1.6	1.5	0.2
Community Support and Outreach	0.8	0.8	-
Oil and Propane Heated Homes	0.3	0.3	-
Special Projects			
Residential ecoENERGY Audits	0.5	0.5	-
Oil and Propane Furnace Replacement	1.1	0.2	0.9
Solar Water Heaters	0.3	0.3	-
Power Smart Residential Loan	2.1	2.0	0.1
Oil and Propane Heated Homes - Additional funding	0.3	0.1	0.2
Unallocated	0.7	-	0.7
Community Energy Development			
ecoENERGYProgram Funding	4.1	4.1	-
Power Smart PAYS Financing Program	0.4	0.1	0.3
Subtotal	$35.3	$31.5	$3.8
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	0.1	0.3
Métis Generation Fund *	0.5	0.5	-
TOTALS	$38.3	$34.1	$4.2

* Non Demand Side Management Budget
Note: 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 planning horizon.

Affordable Energy Fund Budget
(millions $)

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28-2030/31	Total
Affordable Energy Program	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	-	-	1.4
Geothermal Support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	0.2
Special Projects													
Oil and Propane Furnace Replacement	-	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.0	-	-	-	0.9
Power Smart Residential Loan	0.1	0.0	-	-	-	-	-	-	-	-	-	-	0.1
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	-	-	-	0.2
Unallocated	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
Community Energy Development													
Power Smart PAYS Financing Program	0.1	0.1	0.1	0.0	0.0	0.0	-	-	-	-	-	-	0.3
Subtotal	$0.3	$0.3	$0.4	$0.5	$0.4	$0.4	$0.4	$0.4	$0.3	$0.1	$0.1	$0.1	$3.8
Manitoba Electric Bus *	0.0	0.0	-	-	-	-	-	-	-	-	-	-	0.1
Diesel Community Green Pilot Demonstration *	0.3	-	-	-	-	-	-	-	-	-	-	-	0.3
Annual Budget	$0.7	$0.4	$0.4	$0.5	$0.4	$0.4	$0.4	$0.4	$0.3	$0.1	$0.1	$0.1	$4.2
Cumulative Budget 2016/17 - 2030/31	$0.7	$1.1	$1.5	$2.0	$2.4	$2.8	$3.3	$3.6	$3.9	$4.0	$4.1	$4.2	$4.2

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 with the interest rate being offered at 4.9% for the first five years of the loan term.

Special Projects

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. The estimated savings of the other fuel types resulting from these upgrades are provided in section 2.1.2 of this report.

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 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. The estimated savings of the other fuel types resulting from the installation of insulation in customer homes are provided in section 2.1.2 of this report.

Community Energy Development

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%.

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.

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

Unallocated
Manitoba Hydro will continue to support energy efficiency and conservation to participants throughout the planning horizon as staff will determine what future opportunities are available. As such, a placeholder for the projected funds required to support these continued efforts is conveyed as unallocated.

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 $)

		2016/17	2017/18	2018/19	2019/20 - 2030/31	Total
Furnace Replacement Budget						
Opening Balance	21.0					
Annual Additions		3.8	3.8	-	-	28.6
Annual Budget		2.5	2.6	2.6	16.0	23.7
Annual Balance	$21.0	$22.2	$23.5	$20.9	$4.9	$4.9

Note: Figures may not add due to rounding

2.3 DSM Metrics and other related measurements

2.3.1 Integrated Perspective

Metrics

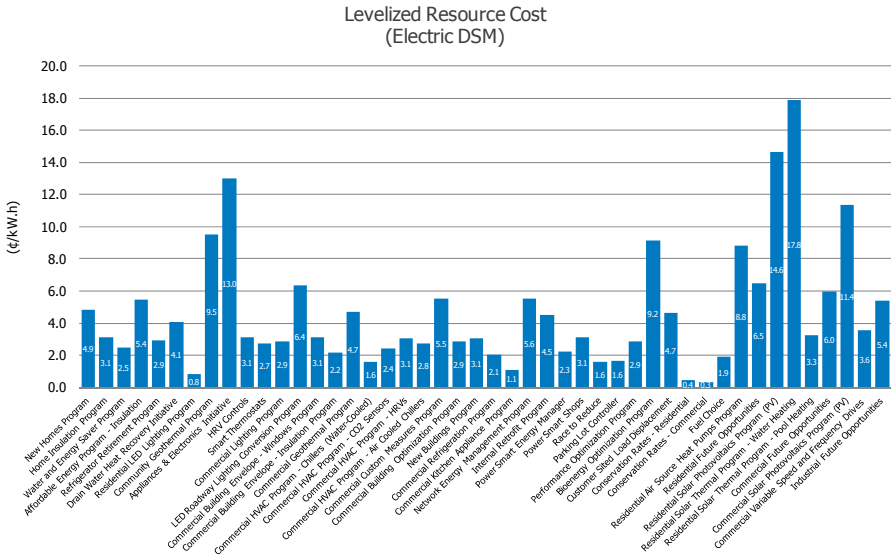
The following table outlines the cost effectiveness, from an integrated perspective, of the program offerings provided in the 2016 Demand Side Management Plan.

Integrated DSM Metrics
2016/17 - 2030/31

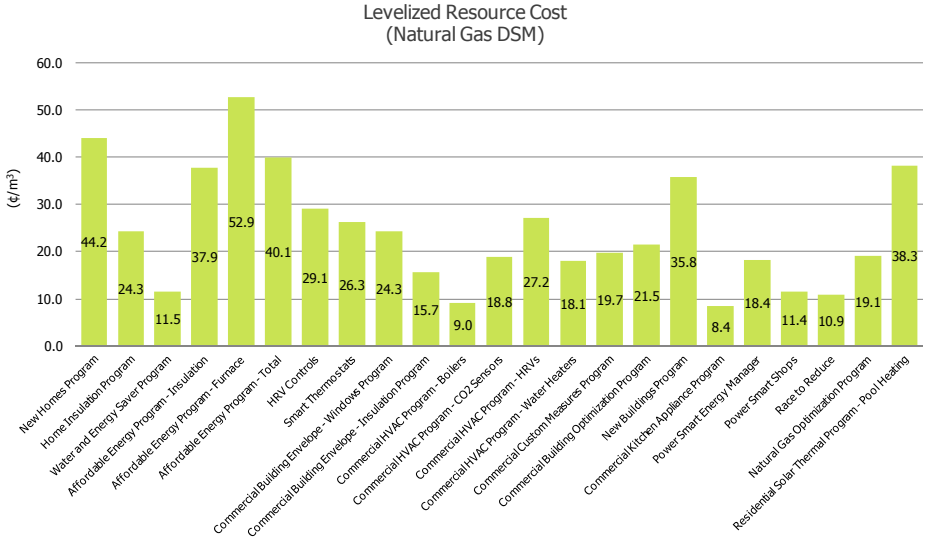
	Combined DSM		Electric DSM				Natural Gas DSM				
	SC	TRC	SC	TRC	TRC NPV	LRC (¢/kW.h)		SC	TRC	TRC NPV	LRC (¢/m³)	
Residential												
New Homes Program	1.2	1.1	3.1	2.8	$20.5	4.9		0.7	0.6	($16.8)	44.2	w c
Home Insulation Program	2.5	2.3	4.7	4.3	$41.1	3.1		1.2	1.1	$1.4	24.3	
Water and Energy Saver Program	5.4	5.1	5.3	5.0	$14.4	2.5		5.5	5.3	$8.4	11.5	w
Affordable Energy Program												
Affordable Energy Program - Insulation	1.5	1.3	2.7	2.5	$24.0	5.4		0.9	0.8	($5.8)	37.9	w
Affordable Energy Program - Furnace	0.6	0.5	n/a	n/a	n/a	n/a		0.4	0.4	($4.6)	52.9	*
Affordable Energy Program - Total	1.4	1.2	2.7	2.5	$24.0	5.4		0.8	0.7	($10.5)	40.1	* w
Refrigerator Retirement Program	1.8	1.7	2.3	2.1	$13.6	2.9		n/a	n/a	($5.5)	n/a	i
Drain Water Heat Recovery Initiative	2.0	1.8	2.0	1.8	$0.1	4.1		n/a	n/a	n/a	n/a	
Residential LED Lighting Program	10.7	9.7	13.2	12.0	$29.9	0.8		n/a	n/a	($6.1)	n/a	i
Community Geothermal Program	1.5	1.4	1.5	1.4	$19.8	9.5		n/a	n/a	n/a	n/a	
Appliances & Electronics Initiative	1.6	1.5	1.5	1.4	$0.5	13.0		0.0	0.0	$0.1	0.0	w
HRV Controls	2.1	2.0	4.0	3.6	$4.9	3.1		0.9	0.8	($0.5)	29.1	
Smart Thermostats	1.8	1.6	5.2	4.7	$0.3	2.7		1.0	0.9	($0.0)	26.3	
Community Energy Plan	0.0	0.0	0.0	0.0	($1.0)	0.0		0.0	0.0	($0.2)	0.0	
Residential Programs Total	1.8	1.6	2.7	2.5	$168.4	4.7		0.8	0.7	($29.6)	42.1	
Commercial												
Commercial Lighting Program	3.3	3.0	3.6	3.3	$410.2	2.9		n/a	n/a	($44.3)	n/a	i
LED Roadway Lighting Conversion Program	1.7	1.5	1.7	1.5	$20.9	6.4		n/a	n/a	n/a	n/a	
Commercial Building Envelope - Windows Program	2.4	2.1	4.0	3.6	$22.9	3.1		1.2	1.1	$0.9	24.3	
Commercial Building Envelope - Insulation Program	3.1	2.8	6.6	6.0	$42.8	2.2		1.8	1.6	$14.8	15.7	
Commercial Geothermal Program	3.1	2.9	3.1	2.9	$34.4	4.7		n/a	n/a	n/a	n/a	
Commercial HVAC Program - Boilers	3.0	2.7	n/a	n/a	n/a	n/a		3.0	2.7	$6.9	9.0	c
Commercial HVAC Program - Chillers (Water-Cooled)	3.0	2.7	3.0	2.7	$0.4	1.6		n/a	n/a	n/a	n/a	
Commercial HVAC Program - CO2 Sensors	3.6	3.2	7.0	6.3	$8.0	2.4		1.4	1.3	$0.7	18.8	
Commercial HVAC Program - HRVs	2.8	2.5	5.2	4.7	$42.4	3.1		1.1	1.0	($0.1)	27.2	
Commercial HVAC Program - Air Cooled Chillers	1.8	1.6	1.8	1.6	$4.4	2.8		n/a	n/a	n/a	n/a	
Commercial HVAC Program - Water Heaters	1.5	1.3	n/a	n/a	n/a	n/a		1.5	1.3	$1.2	18.1	
Commercial Custom Measures Program	1.8	1.6	1.9	1.7	$14.7	5.5		1.5	1.3	$1.6	19.7	
Commercial Building Optimization Program	2.0	1.9	3.4	3.1	$7.0	2.9		1.3	1.2	$1.0	21.5	
New Buildings Program	3.5	3.1	4.3	3.9	$341.7	3.1		0.9	0.8	($6.8)	35.8	c
Commercial Refrigeration Program	4.3	3.9	3.8	3.4	$45.4	2.1		n/a	n/a	$8.9	n/a	i
Commercial Kitchen Appliance Program	13.6	13.2	17.9	17.1	$3.2	1.1		11.5	11.2	$4.0	8.4	w
Network Energy Management Program	1.2	1.1	1.3	1.2	$0.0	5.6		n/a	n/a	($0.0)	n/a	i
Internal Retrofit Program	1.5	1.4	1.5	1.4	$3.3	4.5		n/a	n/a	n/a	n/a	i
Power Smart Energy Manager	3.2	2.9	4.3	4.0	$10.6	2.3		1.6	1.4	$1.1	18.4	w
Power Smart Shops	4.0	3.7	3.9	3.5	$11.9	3.1		9.9	9.7	$0.9	11.4	i w
Race to Reduce	3.0	2.8	3.7	3.3	$1.3	1.6		1.9	1.7	$0.2	10.9	
Parking Lot Controller	3.3	3.0	3.3	3.0	$1.0	1.6		n/a	n/a	n/a	n/a	
Commercial Programs Total	3.1	2.8	3.6	3.3	$1,026.3	3.1		1.0	0.9	($9.9)	30.5	
Industrial												
Performance Optimization Program	3.0	2.7	3.0	2.7	$234.0	2.9		n/a	n/a	n/a	n/a	
Natural Gas Optimization Program	1.4	1.3	n/a	n/a	n/a	n/a		1.4	1.3	$6.9	19.1	
Industrial Programs Total	2.7	2.5	3.0	2.7	$234.0	2.9		1.4	1.3	$6.9	19.1	
Energy Efficiency Subtotal	2.7	2.5	3.3	3.0	$1,428.8	3.3		0.9	0.9	($32.6)	32.6	
Load Management												
Curtailable 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	1.5	1.4	1.5	1.4	$48.3	9.2		n/a	n/a	n/a	n/a	
Customer Sited Load Displacement	1.6	1.4	1.6	1.4	$124.7	4.7		n/a	n/a	n/a	n/a	
Load Displacement & Alt. Energy Programs Total	1.6	1.4	1.6	1.4	$173.0	5.4		n/a	n/a	n/a	n/a	
Conservation Rates												
Conservation Rates - Residential	18.7	17.0	18.7	17.0	$161.6	0.4		n/a	n/a	n/a	n/a	
Conservation Rates - Commercial	23.9	21.7	23.9	21.7	$261.9	0.3		n/a	n/a	n/a	n/a	
Conservation Rates Total	21.6	19.6	21.6	19.6	$423.5	0.4		n/a	n/a	n/a	n/a	
Fuel Choice												
Fuel Choice	7.5	6.8	7.5	6.8	$459.5	1.9		n/a	n/a	n/a	n/a	
Fuel Choice Total	7.5	6.8	7.5	6.8	$459.5	1.9		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	($1.5)	8.8		n/a	n/a	n/a	n/a	
Residential Future Opportunities	1.6	1.4	1.6	1.4	$26.0	6.5		n/a	n/a	n/a	n/a	
Residential Solar Photovoltaics Program (PV)	0.6	0.5	0.6	0.5	($19.5)	14.6		n/a	n/a	n/a	n/a	
Residential Solar Thermal Program - Water Heating	0.4	0.4	0.4	0.4	($0.4)	17.8		n/a	n/a	n/a	n/a	
Residential Solar Thermal Program - Pool Heating	1.0	0.9	1.4	1.3	$0.2	3.3		0.8	0.7	($0.4)	38.3	
Commercial Future Opportunities	1.7	1.6	1.7	1.6	$30.6	6.0		n/a	n/a	n/a	n/a	
Commercial Solar Photovoltaics Program (PV)	0.8	0.7	0.8	0.7	($38.1)	11.4		n/a	n/a	n/a	n/a	
Commercial Variable Speed and Frequency Drives	1.6	1.5	1.6	1.5	$0.7	3.6		n/a	n/a	n/a	n/a	
Industrial Future Opportunities	2.0	1.8	2.0	1.8	$39.2	5.4		n/a	n/a	n/a	n/a	
Other Emerging Technologies Total	1.2	1.1	1.2	1.1	$37.3	8.0		0.8	0.7	($0.4)	38.3	
Program Impacts Total	2.6	2.4	2.9	2.6	$2,522.1	3.6		0.9	0.9	($33.1)	32.7	
Program Support	-	-	-	-	($44.0)	-		-	-	($10.5)	-	
Program Impacts Total (Incl. Support and Contingency Costs)	2.5	2.3	2.8	2.5	$2,478.1	3.7		0.9	0.8	($43.6)	34.0	
Other Internal DSM Investments												
Affordable Energy Fund	-	-	-	-	($2.8)	-		-	-	($0.2)	-	
Overall Portfolio Metric	2.5	2.3	2.8	2.5	$2,475.3	3.7		0.9	0.8	($43.8)	34.1	

Notes:
* Includes Furnace Replacement Program
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 Curtailable Rate Program

The following chart provides the Levelized Resource Cost of the electric program offerings in the 2016 Demand Side Management Plan.



The following chart provides the Levelized Resource Cost of the natural gas program offerings in the 2016 Demand Side Management Plan.

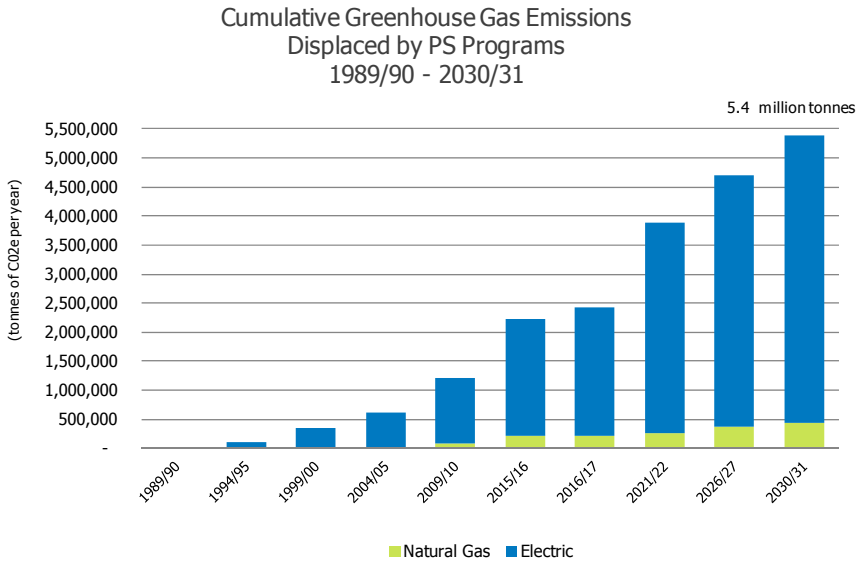


Global Greenhouse Gas Emissions Reductions

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 2016 Demand Side Management 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 Demand Side Management Plan.

	Annual CO2 Reductions (tonnes)
CO2 Reductions - Electric	3,041,540
CO2 Reductions - Natural Gas	218,098
2016/17 Power Smart Plan (2016/17 - 2030/31)	3,259,638
CO2 Reductions Achieved to Date - Electric	1,922,767
CO2 Reductions Achieved To Date - Natural Gas	214,544
Savings Achieved to 2015/16 (1989/90 - 2030/31)	2,137,311
Total Projected to 2030/31	5,396,948

Including reductions achieved to date, approximately 5.4 million tonnes are forecast to be realized due to Manitoba Hydro's Power Smart efforts by 2030/31.

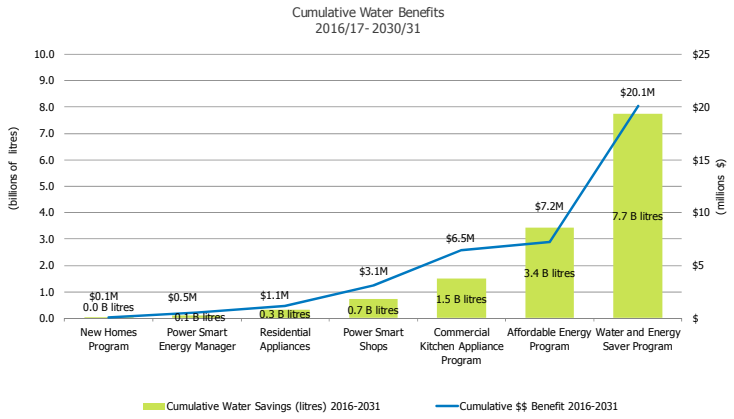


Additional Measureable Non-Energy Benefits

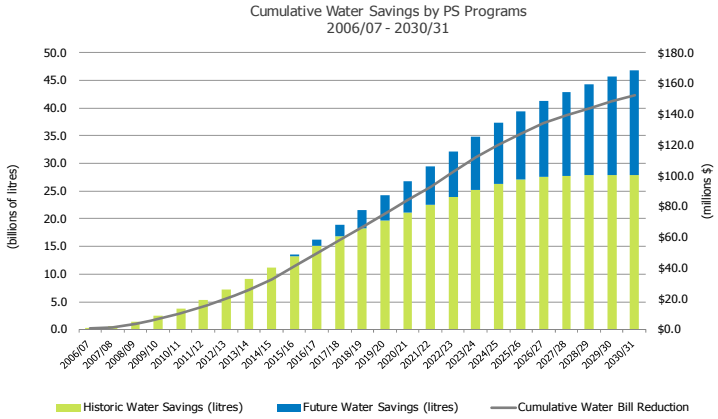
As part of the 2016 Demand Side Management Plan, the following residential and commercial programs are expected to capture additional water saving benefits:

- New Homes Program
- Power Smart Energy Manager
- Residential Appliances
- Power Smart Shops
- Commercial Kitchen Appliance Program
- Affordable Energy Program
- Water and Energy Saver Program

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 14 billion liters of water and $39 million in bill savings will be achieved from 2016/17 to 2030/31.



When combined with savings to date, Power Smart programs are expected to save approximately 47 billion liters of water and $152 million by 2030/31.



2.3.2 Utility Perspective

Metrics

The following table outlines the cost effectiveness, from a utility perspective, of the program offerings provided in the 2016 Demand Side Management Plan.

Utility DSM Metrics
2016/17 - 2030/31

	Electric DSM				Natural Gas DSM				
	RIM	NUB	NPV	LUC ($¢$/kW.h)	RIM	NUB	NPV	LUC ($¢$/m3)	
Residential									
New Homes Program	1.4	4.6	$9.3	1.1	0.7	-53.7	($10.1)	0.2	c
Home Insulation Program	1.2	1.9	$9.5	2.6	0.5	-0.8	($19.1)	12.1	
Water and Energy Saver Program	0.7	-0.1	($3.9)	2.4	0.5	-1.0	($3.8)	11.3	
Affordable Energy Program									
Affordable Energy Program - Insulation	0.9	0.8	($3.9)	5.7	0.3	-0.3	($40.0)	37.9	*
Affordable Energy Program - Furnace	n/a	n/a	n/a	n/a	0.1	-0.1	($19.7)	126.5	*
Affordable Energy Program - Total	0.9	0.8	($3.9)	5.7	0.3	-0.2	($59.7)	50.8	*
Refrigerator Retirement Program	0.6	-0.9	($14.2)	1.8	n/a	n/a	$2.7	n/a	i
Drain Water Heat Recovery Initiative	0.6	-0.2	($0.1)	3.3	n/a	n/a	n/a	n/a	
Residential LED Lighting Program	1.0	0.9	($0.4)	2.1	n/a	n/a	$2.9	n/a	i
Community Geothermal Program	1.2	1.7	$10.6	2.8	n/a	n/a	n/a	n/a	
Appliances & Electronics Initiative	0.6	-0.1	($0.4)	0.0	0.7	0.0	($0.0)	0.0	
HRV Controls	1.1	1.6	$0.7	1.9	0.4	-0.6	($2.5)	16.3	
Smart Thermostats	1.3	2.9	$0.1	1.7	0.4	-0.6	($0.4)	16.3	
Community Energy Plan	0.0	0.0	($1.0)	0.0	0.0	0.0	($0.2)	0.0	
Residential Programs Total	1.0	1.1	$6.1	2.7	0.4	-0.4	($90.2)	24.4	
Commercial									
Commercial Lighting Program	1.1	1.6	$49.4	1.3	n/a	n/a	$14.5	n/a	i
LED Roadway Lighting Conversion Program	0.8	0.6	($14.1)	3.6	n/a	n/a	n/a	n/a	
Commercial Building Envelope - Windows Program	1.1	1.5	$3.6	2.4	0.5	-0.4	($11.7)	17.2	
Commercial Building Envelope - Insulation Program	1.3	2.5	$11.4	2.0	0.5	-0.5	($28.0)	12.8	
Commercial Geothermal Program	1.3	2.2	$12.2	2.6	n/a	n/a	n/a	n/a	
Commercial HVAC Program - Boilers	n/a	n/a	n/a	n/a	0.7	-1.6	($4.5)	3.9	c
Commercial HVAC Program - Chillers (Water-Cooled)	0.8	-0.2	($0.2)	1.2	n/a	n/a	n/a	n/a	
Commercial HVAC Program - CO2 Sensors	1.3	2.7	$2.3	2.2	0.5	-0.4	($2.6)	14.5	
Commercial HVAC Program - HRVs	1.2	1.6	$7.5	3.4	0.5	-0.4	($12.2)	15.0	
Commercial HVAC Program - Air Cooled Chillers	0.6	0.0	($7.7)	2.9	n/a	n/a	n/a	n/a	
Commercial HVAC Program - Water Heaters	n/a	n/a	n/a	n/a	0.6	-0.7	($3.0)	8.8	
Commercial Custom Measures Program	1.1	1.7	$3.8	1.5	0.6	-0.6	($3.4)	8.6	
Commercial Building Optimization Program	1.0	0.9	($0.3)	2.1	0.5	-0.5	($5.3)	12.6	
New Buildings Program	1.5	17.5	$148.9	0.2	0.8	-3.0	($7.6)	1.8	c
Commercial Refrigeration Program	0.9	0.7	($3.4)	1.5	n/a	n/a	($2.4)	n/a	i
Commercial Kitchen Appliance Program	1.0	1.5	$0.1	0.6	0.6	-1.6	($0.6)	5.1	
Network Energy Management Program	0.8	0.4	($0.1)	2.3	n/a	n/a	$0.0	n/a	i
Internal Retrofit Program	1.4	1.4	$3.3	4.5	n/a	n/a	n/a	n/a	
Power Smart Energy Manager	1.2	2.6	$2.6	1.0	0.6	-0.7	($1.9)	8.2	
Power Smart Shops	1.0	1.1	$0.4	2.0	0.5	-1.0	($0.2)	10.1	i
Race to Reduce	0.9	0.6	($0.2)	1.4	0.5	-0.7	($0.4)	9.7	
Parking Lot Controller	0.7	-0.1	($0.6)	1.8	n/a	n/a	n/a	n/a	
Commercial Programs Total	1.2	2.0	$218.9	1.4	0.6	-0.4	($69.3)	13.7	
Industrial									
Performance Optimization Program	1.1	1.5	$39.1	1.6	n/a	n/a	n/a	n/a	
Natural Gas Optimization Program	n/a	n/a	n/a	n/a	0.7	-1.2	($11.4)	4.2	
Industrial Programs Total	1.1	1.5	$39.1	1.6	0.7	-1.2	($11.4)	4.2	
Energy Efficiency Subtotal	1.1	1.7	$264.2	1.6	0.5	-0.4	($170.9)	15.8	
Load Management									
Curtailable 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	1.3	2.5	$43.1	2.2	n/a	n/a	n/a	n/a	
Customer Sited Load Displacement	1.1	1.5	$38.1	1.1	n/a	n/a	n/a	n/a	
Load Displacement & Alt. Energy Programs Total	1.2	1.8	$81.2	1.3	n/a	n/a	n/a	n/a	
Conservation Rates									
Conservation Rates - Residential	0.8	-2.4	($34.3)	0.4	n/a	n/a	n/a	n/a	
Conservation Rates - Commercial	1.2	5.3	$54.1	0.3	n/a	n/a	n/a	n/a	
Conservation Rates Total	1.0	1.9	$19.7	0.4	n/a	n/a	n/a	n/a	
Fuel Choice									
Fuel Choice	1.4	4.4	$151.0	1.1	n/a	n/a	n/a	n/a	
Fuel Choice Total	1.4	4.4	$151.0	1.1	n/a	n/a	n/a	n/a	
Other Emerging Technologies									
Residential Air Source Heat Pumps Program	0.6	-1.0	($2.7)	2.4	n/a	n/a	n/a	n/a	
Residential Future Opportunities	0.8	0.2	($22.6)	3.1	n/a	n/a	n/a	n/a	
Residential Solar Photovoltaics Program (PV)	0.5	-0.1	($19.7)	6.1	n/a	n/a	n/a	n/a	
Residential Solar Thermal Program - Water Heating	0.4	-0.2	($0.3)	7.3	n/a	n/a	n/a	n/a	
Residential Solar Thermal Program - Pool Heating	0.4	-3.5	($1.1)	1.2	0.5	-0.7	($0.9)	14.2	
Commercial Future Opportunities	0.9	0.6	($11.3)	3.4	n/a	n/a	n/a	n/a	
Commercial Solar Photovoltaics Program (PV)	0.7	0.3	($32.4)	3.7	n/a	n/a	n/a	n/a	
Commercial Variable Speed and Frequency Drives	0.6	0.3	($1.3)	4.1	n/a	n/a	n/a	n/a	
Industrial Future Opportunities	0.9	0.9	($4.8)	3.7	n/a	n/a	n/a	n/a	
Other Emerging Technologies Total	0.8	0.4	($96.2)	3.7	0.5	-0.7	($0.9)	14.2	
Program Impacts Total	1.1	1.6	$419.9	1.5	0.5	-0.4	($171.8)	15.8	
Program Support	-	-	($44.0)	-	-	-	($10.5)	-	
Program Impacts Total (Incl. Support and Contingency Costs)	1.1	1.5	$376.0	1.6	0.5	-0.4	($182.3)	17.2	
Other Internal DSM Investments									
Affordable Energy Fund	-	-	($2.8)	-	-	-	($0.2)	-	
Overall Portfolio Metric	1.1	1.5	$373.2	1.6	0.5	-0.4	($182.5)	17.2	12.3 (3)

Notes:

*Includes Furnace Replacement Program

c Program assumption includes savings from Codes & Standards

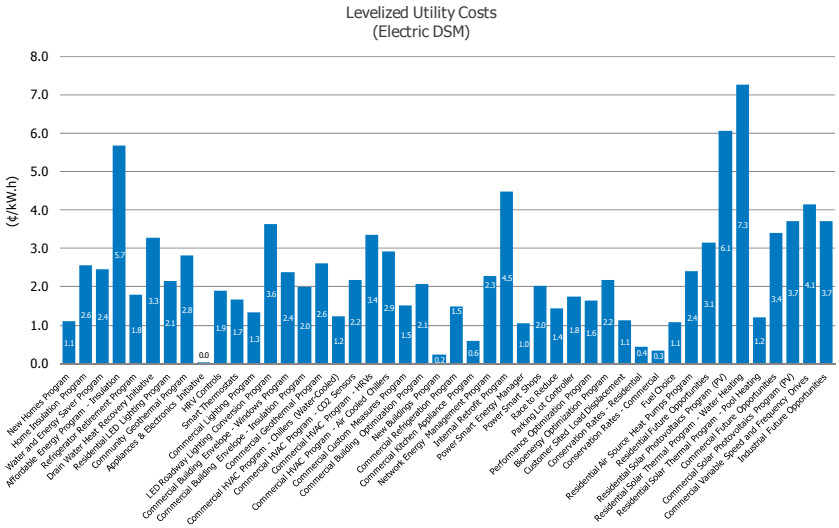
i Program reflects natural gas interactive effects

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

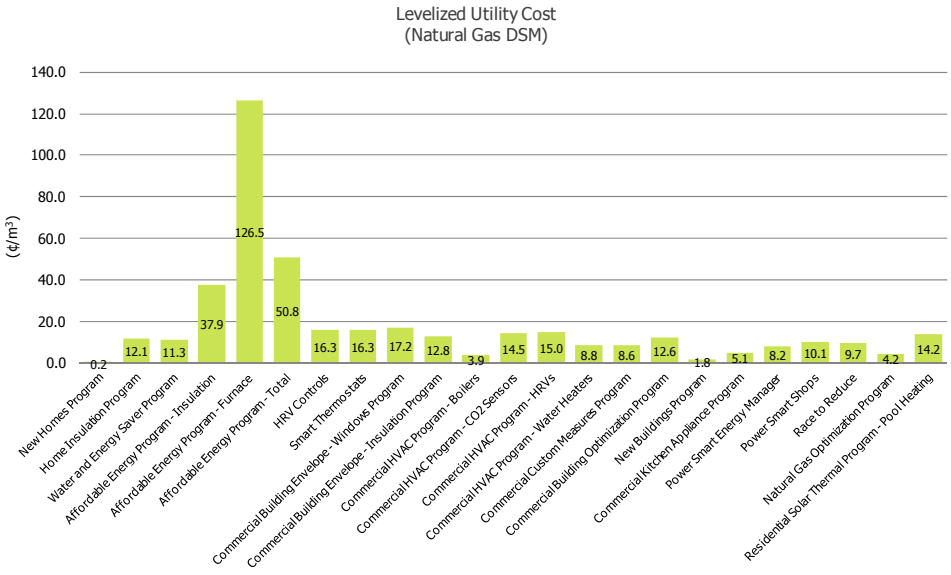
2) Overall portfolio metrics include all support, contingency and Affordable Energy Fund Expenditures and Furance Replacement Program

3) Excluding the Affordable Energy Program, overall natural gas LUC is 12.3 ¢/m^3

The following chart provides the Levelized Utility Cost of the electric program offerings in the 2016 Demand Side Management Plan.



The following chart provides the Levelized Utility Cost of the natural gas program offerings in the 2016 Demand Side Management 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 2016 Demand Side Management Plan.

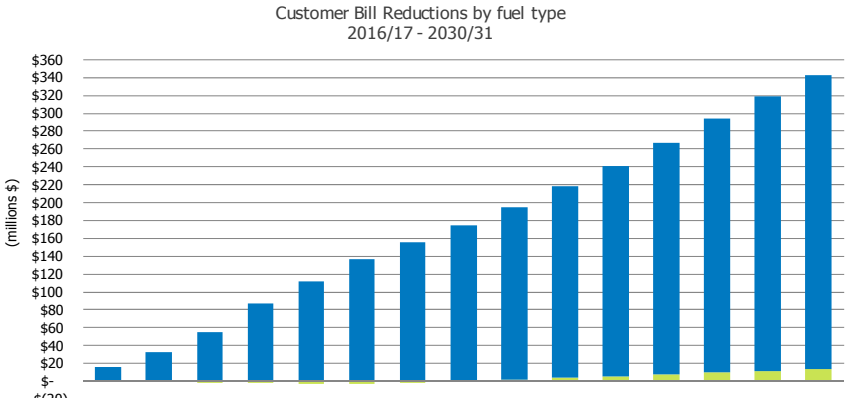
Customer DSM Metrics
2016/17 - 2030/31

	Electric DSM			Natural Gas DSM			
	Payback	PC	PC NPV	Payback	PC	PC NPV	
Residential							
New Homes Program	6.7	2.1	$11.3	16.9	0.8	($10.6)	w
Home Insulation Program	1.2	5.2	$31.7	5.9	2.0	$17.9	
Water and Energy Saver Program	0.0	24.2	$18.3	0.0	16.9	$12.0	w
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	w
Refrigerator Retirement Program	1.4	5.4	$27.8	n/a	n/a	($7.8)	i
Drain Water Heat Recovery Initiative	2.1	3.2	$0.2	n/a	n/a	n/a	
Residential LED Lighting Program	0.0	312.2	$30.4	n/a	n/a	($8.5)	i
Community Geothermal Program	13.0	1.2	$9.3	n/a	n/a	n/a	
Appliances & Electronics Initiative	4.7	1.9	$1.0	0.0	0.0	$0.1	w
HRV Controls	2.2	3.5	$4.2	5.9	1.7	$1.8	
Smart Thermostats	3.2	4.2	$0.2	7.0	2.0	$0.3	
Community Energy Plan	0.0	0.0	$0.0	0.0	0.0	$0.0	
Commercial							
Commercial Lighting Program	2.1	3.4	$360.8	n/a	n/a	($53.7)	i
LED Roadway Lighting Conversion Program	0.0	1.6	$24.0	n/a	n/a	n/a	
Commercial Building Envelope - Windows Program	1.8	4.7	$19.2	5.4	2.0	$11.0	
Commercial Building Envelope - Insulation Program	0.2	7.5	$31.4	1.3	2.8	$38.2	
Commercial Geothermal Program	5.3	2.4	$22.2	n/a	n/a	n/a	
Commercial HVAC Program - Boilers	n/a	n/a	n/a	3.4	4.0	$10.3	
Commercial HVAC Program - Chillers (Water-Cooled)	1.7	6.1	$0.7	n/a	n/a	n/a	
Commercial HVAC Program - CO2 Sensors	0.4	9.0	$5.7	1.5	2.9	$3.0	
Commercial HVAC Program - HRVs	2.9	4.2	$34.9	12.8	1.6	$10.1	
Commercial HVAC Program - Air Cooled Chillers	0.0	2.9	$12.2	n/a	n/a	n/a	
Commercial HVAC Program - Water Heaters	n/a	n/a	n/a	4.0	2.2	$3.8	
Commercial Custom Measures Program	10.3	1.6	$10.9	7.4	2.1	$4.2	
Commercial Building Optimization Program	1.9	5.0	$7.3	3.5	2.4	$5.5	
New Buildings Program	8.5	2.7	$192.8	28.0	0.9	($4.2)	
Commercial Refrigeration Program	0.4	4.7	$48.8	n/a	n/a	$10.3	i
Commercial Kitchen Appliance Program	0.0	18.4	$3.1	0.0	16.6	$4.5	w
Network Energy Management Program	2.3	1.5	$0.1	n/a	n/a	($0.0)	i
Internal Retrofit Program	0.0	1.0	$0.0	n/a	n/a	n/a	i
Power Smart Energy Manager	0.0	5.0	$8.0	0.0	2.7	$2.6	w
Power Smart Shops	0.5	4.0	$11.5	0.0	23.4	$1.1	i w
Race to Reduce	0.1	25.6	$1.4	0.1	21.0	$0.6	
Parking Lot Controller	0.1	4.8	$1.5	n/a	n/a	n/a	
Industrial							
Performance Optimization Program	0.0	2.6	$194.9	n/a	n/a	n/a	
Natural Gas Optimization Program	n/a	n/a	n/a	8.1	1.7	$15.1	
Load Management							
Curtailable Rate Program	n/a	n/a	$0.0	n/a	n/a	n/a	
Load Displacement & Alternative Energy							
Bioenergy Optimization Program	4.7	1.0	$5.3	n/a	n/a	n/a	
Customer Sited Load Displacement	5.4	1.3	$86.6	n/a	n/a	n/a	
Conservation Rates							
Conservation Rates - Residential	n/a	n/a	$195.9	n/a	n/a	n/a	
Conservation Rates - Commercial	n/a	n/a	$207.8	n/a	n/a	n/a	
Fuel Choice							
Fuel Choice	1.9	5.1	$308.4	n/a	n/a	n/a	
Other Emerging Technologies							
Residential Air Source Heat Pumps Program	9.2	1.3	$1.2	n/a	n/a	n/a	
Residential Future Opportunities	6.4	2.0	$48.7	n/a	n/a	n/a	
Residential Solar Photovoltaics Program (PV)	11.5	1.0	$0.2	n/a	n/a	n/a	
Residential Solar Thermal Program - Water Heating	24.1	0.8	($0.1)	n/a	n/a	n/a	
Residential Solar Thermal Program - Pool Heating	3.4	3.5	$1.3	9.4	1.3	$0.4	
Commercial Future Opportunities	6.0	1.9	$41.9	n/a	n/a	n/a	
Commercial Solar Photovoltaics Program (PV)	11.9	1.0	($5.7)	n/a	n/a	n/a	
Commercial Variable Speed and Frequency Drives	1.4	5.1	$2.0	n/a	n/a	n/a	
Industrial Future Opportunities	4.3	2.1	$44.0	n/a	n/a	n/a	
Other Emerging Technologies Total							
Overall Portfolio Metric	n/a	2.5	$2,091.2	n/a	1.5	$113.4	

Notes:
i Program reflects natural gas interactive effects
w Payback, PC and PC NPV include Water Savings Benefits

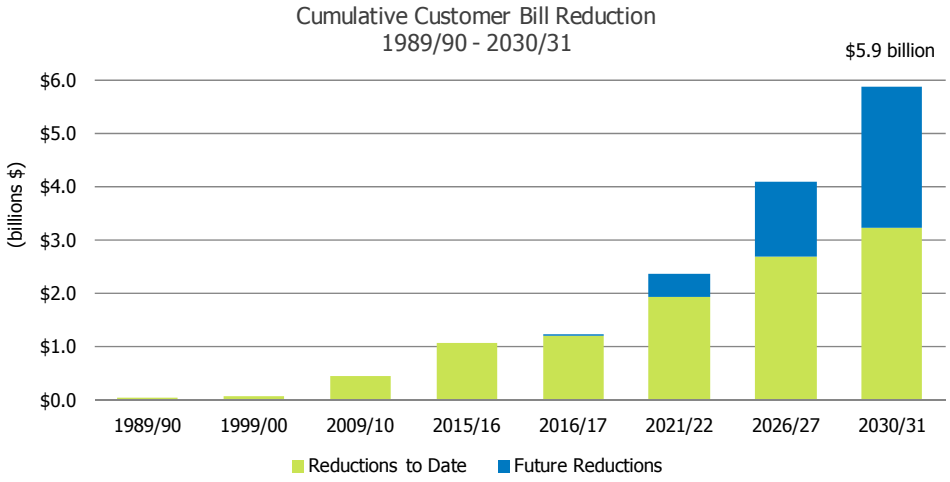
Combined Customer Bill Reductions

The following graph depicts customer bill reductions resulting from electric and natural gas programs outlined in the 2016 Demand Side Management Plan. Power Smart programs are expected to save participating customers an additional $16 million in 2016/17 alone, $343 million in 2030/31 and $2.6 billion cumulatively by 2030/31.



	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	2030/31
Electric	$15	$32	$56	$87	$112	$137	$155	$174	$193	$214	$236	$259	$285	$307	$330
Natural Gas	$1	$0	$(0)	$(1)	$(2)	$(3)	$(2)	$0	$2	$4	$6	$8	$10	$12	$13
Annual	$16	$33	$55	$86	$109	$133	$154	$174	$195	$218	$241	$267	$295	$319	$343
Cumulative	$16	$49	$104	$190	$299	$433	$586	$761	$956	$1,174	$1,415	$1,682	$1,977	$2,296	$2,639

When combined with bill reductions to date, Power Smart programs are expected to save participating customers $ 472 million in 2030/31 and over $ 5.9 billion cumulatively by 2030/31.



Demand Side
Management Plan
2016/17

SUPPLEMENTAL REPORT:
15 yr (2016 to 2031)

APPENDIX A - 2016 DEMAND SIDE MANAGEMENT PLAN - ELECTRIC

ELECTRIC DSM

APPENDIX A.1

2016 Demand Side Management Plan
Winter Capacity Savings (MW)

		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	2030/31	MW at Generation 2030/31	
RESIDENTIAL																		
Incentive Based																		
New Homes Program		0.1	0.3	0.7	1.0	1.4	2.2	2.9	3.5	4.2	4.7	5.3	5.8	6.4	6.9	7.3	8	
Home Insulation Program		1.8	3.3	4.7	6.0	7.2	8.3	9.4	10.3	11.3	12.1	12.8	12.8	12.8	12.8	12.8	15	
Affordable Energy Program		1.2	2.2	3.2	4.1	4.7	5.2	5.8	6.2	6.7	7.1	7.4	7.7	8.0	8.2	8.5	10	
Water and Energy Saver Program		0.7	1.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2	
Refrigerator Retirement Program		1.1	2.1	2.9	3.6	4.2	4.7	4.7	4.7	4.7	4.7	3.7	2.9	2.2	1.5	0.8	1	
Drain Water Heat Recovery Initiative		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Residential LED Lighting Program		5.7	7.7	8.9	8.3	7.9	7.3	6.8	6.2	5.7	5.2	5.0	4.8	4.6	4.4	4.3	5	
Community Geothermal Program		1.2	2.8	4.4	6.2	8.0	9.8	12.2	14.1	15.7	17.4	19.5	21.0	21.7	22.0	22.0	25	
Appliances		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	
HRV Controls		0.5	1.1	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	2	
Power Bars		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Smart Thermostats		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	
Plug-in Timers		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Community Energy Plan		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Subtotal	12.6	21.2	28.7	33.1	37.3	41.5	45.6	49.0	52.1	55.1	57.7	58.9	59.6	59.7	59.5	68	7%
Customer Service Initiatives / Financial Loan Programs																		
Power Smart Residential Loan		0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.4	3	
Power Smart PAYS Financing		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	1.4	1.5	2	
Residential Earth Power Loan		0.2	0.3	0.5	0.6	0.7	0.8	1.0	1.3	1.8	2.3	2.9	3.5	4.2	5.0	5.8	7	
	Subtotal	0.4	0.9	1.3	1.7	2.0	2.5	2.9	3.5	4.2	4.9	5.8	6.7	7.6	8.6	9.7	11	1%
COMMERCIAL																		
Incentive Based																		
Commercial Lighting Program		11.1	22.5	34.4	44.4	53.5	62.3	71.1	79.6	87.3	94.8	102.0	109.8	117.9	126.3	133.8	153	
LED Roadway Lighting Conversion Program		1.4	2.8	4.4	6.1	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	7	
Commercial Building Envelope - Windows Program		0.4	0.7	1.0	1.4	1.8	2.3	2.7	3.2	3.6	4.2	4.8	5.4	6.0	6.6	7.2	8	
Commercial Building Envelope - Insulation Program		1.2	2.3	3.1	3.9	4.7	5.6	6.4	7.2	8.1	8.9	9.7	10.6	11.4	12.3	13.1	15	
Commercial Geothermal Program		0.3	0.8	1.4	2.2	3.2	4.3	5.5	6.7	7.9	9.2	10.6	12.0	13.5	14.9	16.4	19	
Commercial HVAC Program - Chillers (Water-Cooled)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial HVAC Program - CO2 Sensors		0.3	0.7	1.1	1.5	1.9	2.4	2.8	3.3	3.3	3.3	3.2	3.0	2.8	2.6	2.4	3	
Commercial HVAC Program - HRVs		0.1	0.4	0.8	1.4	2.1	2.9	3.9	5.0	6.4	7.8	9.4	11.2	13.1	15.1	17.3	20	
Commercial HVAC Program - Air Cooled Chillers		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial Custom Measures Program		0.3	0.7	1.1	1.5	1.9	2.3	2.7	3.2	3.6	4.1	4.6	5.2	5.8	6.4	7.1	8	
Commercial Building Optimization Program		0.0	0.1	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.6	2.8	3	
New Buildings Program		0.7	2.6	3.3	4.3	5.5	7.0	10.2	13.5	16.7	20.0	23.2	26.5	29.8	33.0	36.3	41	
Commercial Refrigeration Program		0.7	1.4	2.1	2.8	3.2	3.5	3.9	4.3	4.7	5.1	5.6	6.1	6.6	7.2	7.7	9	
Commercial Kitchen Appliance Program		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	
Network Energy Management Program		0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Internal Retrofit Program		0.3	0.5	0.7	0.9	1.5	2.0	2.4	2.5	2.6	2.7	2.7	2.8	2.9	3.0	3.0	3	
Power Smart Shops		0.7	1.3	2.0	2.5	3.1	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	4	
Power Smart Energy Manager		-	-	0.1	0.3	0.6	0.9	1.2	1.6	1.9	2.2	2.5	2.8	3.0	3.1	3.1	4	
Race to Reduce		0.4	0.7	0.9	1.0	0.7	-	-	-	-	-	-	-	-	-	-	-	
Parking Lot Controller		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Subtotal	18.1	37.8	57.0	75.0	91.2	106.2	124.0	141.2	157.5	174.0	190.3	207.4	225.1	242.9	260.0	296	30%
Customer Service Initiatives / Financial Loan Programs																		
Power Smart for Business PAYS Financing		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																		
Performance Optimization Program		1.9	4.2	6.8	9.7	13.0	16.2	19.5	22.7	26.0	29.2	32.5	35.7	38.9	42.2	45.4	50	
	Subtotal	1.9	4.2	6.8	9.7	13.0	16.2	19.5	22.7	26.0	29.2	32.5	35.7	38.9	42.2	45.4	50	5%
	ENERGY EFFICIENCY SUBTOTAL	33.0	64.1	93.8	119.5	143.5	166.4	192.0	216.4	239.8	263.2	286.2	308.7	331.2	353.5	374.6	425	44%
LOAD MANAGEMENT																		
Curtailable Rate Program		145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	160	
	LOAD MANAGEMENT SUBTOTAL	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	160	16%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																		
Bioenergy Optimization Program		11.1	12.6	15.1	19.1	29.1	39.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	51	
Customer Sited Load Displacement		11.3	17.6	33.3	53.0	56.5	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	66	
	LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	22.4	30.2	48.4	72.1	85.6	99.5	106.5	106.5	106.5	106.5	106.5	106.5	106.5	106.5	106.5	117	12%
CONSERVATION RATES																		
Conservation Rates - Residential		-	-	3.1	10.8	11.9	13.1	14.4	15.9	16.1	16.2	16.4	16.6	16.8	17.0	17.2	20	
Conservation Rates - Commercial		-	-	-	5.2	11.3	15.3	16.5	17.7	19.0	20.3	21.6	22.9	24.3	25.7	27.1	31	
	CONSERVATION RATES SUBTOTAL	-	-	3.1	16.0	23.2	28.4	30.9	33.6	35.1	36.5	38.0	39.6	41.1	42.7	44.3	51	5%
FUEL CHOICE																		
Fuel Choice		-	25.5	51.1	76.6	102.2	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	146	
	FUEL CHOICE SUBTOTAL	-	25.5	51.1	76.6	102.2	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	127.7	146	15%
OTHER EMERGING TECHNOLOGIES																		
Residential Air Source Heat Pumps Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Residential Future Opportunities		-	-	-	-	1.5	3.0	4.6	6.1	7.6	9.1	10.6	12.1	13.7	15.2	16.7	19	
Residential Solar Photovoltaics Program (PV)		-	-	-	-	0.0	0.0	0.1	0.1	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3	
Residential Solar Thermal Program - Water Heating		-	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 Solar Thermal Program - Pool Heating		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial Future Opportunities		-	-	-	-	1.5	3.0	4.6	6.1	7.6	9.1	10.6	12.1	13.7	15.2	16.7	19	
Commercial Solar Photovoltaics Program (PV)		-	-	-	-	0.1	0.2	0.5	1.0	1.8	3.0	4.4	6.2	8.3	10.6	12.9	15	
Commercial Variable Speed and Frequency Drives		-	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	
Industrial Future Opportunities		-	-	-	-	1.6	3.1	4.7	6.3	7.9	9.4	11.0	12.6	14.2	15.7	17.3	19	
	OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	0.0	0.0	0.0	4.7	9.5	14.4	19.7	25.2	31.1	37.5	44.3	51.5	59.0	66.5	75	8%
Impacts (at meter)		200	265	341	429	504	577	617	649	679	710	741	772	803	834	865		
Impacts (at generation)		222	295	381	480	565	647	692	729	763	798	833	868	903	939	973	973	100%
Codes, Standards & Regulations (at meter)		16	37	53	73	87	97	108	118	127	145	162	186	202	215	227		
Codes, Standards & Regulations (at generation)		18	42	60	83	99	111	123	134	145	165	184	212	231	245	259	259	
POWER SMART 2016 to 2030 Impacts (at meter)		216	302	394	503	591	674	724	767	807	855	903	958	1,005	1,050	1,092		
POWER SMART 2016 to 2030 Impacts (at generation)		240	337	442	564	664	758	815	863	908	963	1,017	1,080	1,134	1,184	1,232	1,232	
POWER SMART SAVINGS TO DATE																		
Incentive Based Program Impacts (at meter)		313	313	313	313	313	313	312	311	309	307	307	307	307	307	307		
Incentive Based Program Impacts (at generation)		353	353	353	353	353	353	352	350	348	346	346	346	346	346	346	346	
Customer Service Initiatives Program Impacts (at meter)		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
Customer Service Initiatives Program Impacts (at generation)		11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	
Discontinued Programs (at meter)		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60		
Discontinued Programs (at generation)		68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	
Impacts of Codes & Standards (at meter)		178	178	178	178	178	178	178	178	178	178	178	178	178	178	178		
Impacts of Codes & Standards (at generation)		202	202	202	202	202	202	202	202	202	202	202	202	202	202	202	202	
TOTAL MW (at meter)		**777**	**862**	**955**	**1,063**	**1,151**	**1,234**	**1,284**	**1,325**	**1,363**	**1,410**	**1,458**	**1,513**	**1,560**	**1,604**	**1,647**		
TOTAL MW (at generation)		**874**	**971**	**1,076**	**1,198**	**1,298**	**1,392**	**1,448**	**1,495**	**1,538**	**1,591**	**1,645**	**1,708**	**1,762**	**1,812**	**1,860**	**1,860**	

Note: May not add up due to rounding.

ELECTRIC DSM

APPENDIX A.2

2016 Demand Side Management Plan
Annual Energy Savings (GW.h)

		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	2030/31	GW.h at Generation 2030/31	
RESIDENTIAL																		
Incentive Based																		
New Homes Program		0.3	0.9	1.8	2.7	3.7	5.4	6.8	8.2	9.5	10.7	11.8	13.0	14.0	15.1	16.0	18	
Home Insulation Program		3.5	6.6	9.4	12.0	14.4	16.7	18.8	20.7	22.5	24.2	25.7	25.7	25.7	25.7	25.7	29	
Affordable Energy Program		2.8	5.2	7.7	10.1	11.7	13.2	14.6	16.0	17.4	18.6	19.4	20.1	20.8	21.5	22.1	25	
Water and Energy Saver Program		4.1	8.1	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	13	
Refrigerator Retirement Program		11.0	20.6	28.5	34.7	40.9	45.6	45.6	45.6	45.6	45.6	36.2	28.2	21.5	14.5	7.6	9	
Drain Water Heat Recovery Initiative		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	
Residential LED Lighting Program		17.9	24.4	28.1	26.2	25.0	23.3	21.5	19.8	18.1	16.3	15.8	15.2	14.7	14.1	13.5	15	
Community Geothermal Program		2.4	5.5	8.9	12.4	15.9	19.5	24.4	28.1	31.4	34.7	39.1	42.0	43.4	43.9	43.9	50	
Appliances		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0	
HRV Controls		1.4	2.8	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5	
Power Bars		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	
Smart Thermostats		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	
Plug-in Timers		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	
Community Energy Plan		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Subtotal	44.4	75.0	100.8	114.6	128.0	140.0	148.2	154.9	161.0	166.6	164.4	160.6	156.6	151.2	145.3	166	5%
Customer Service Initiatives / Financial Loan Programs																		
Power Smart Residential Loan		0.3	0.7	1.0	1.3	1.6	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5	
Power Smart PAYS Financing		0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3	
Residential Earth Power Loan		0.4	0.7	1.0	1.3	1.6	2.2	3.0	4.1	5.4	7.1	8.8	10.6	12.7	15.1	17.7	20	
	Subtotal	0.9	1.8	2.7	3.5	4.3	5.4	6.8	8.4	10.2	12.3	14.5	16.9	19.5	22.3	25.3	29	1%
COMMERCIAL																		
Incentive Based																		
Commercial Lighting Program		44.4	90.4	137.1	177.7	215.4	251.2	287.6	322.2	353.9	385.2	414.9	447.1	480.9	515.4	546.7	623	
LED Roadway Lighting Conversion Program		9.4	18.9	29.8	40.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	42.6	49	
Commercial Building Envelope - Windows Program		1.4	2.3	3.4	4.6	5.9	7.3	8.8	10.2	11.7	13.3	15.0	16.8	18.6	20.3	22.1	25	
Commercial Building Envelope - Insulation Program		2.6	5.2	6.9	8.8	10.7	12.5	14.4	16.3	18.2	20.1	22.0	24.0	25.9	27.8	29.7	34	
Commercial Geothermal Program		0.7	1.6	2.8	4.4	6.5	8.6	11.0	13.3	15.8	18.4	21.2	24.0	26.9	29.9	32.8	37	
Commercial HVAC Program - Chillers (Water-Cooled)		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1	
Commercial HVAC Program - CO2 Sensors		0.4	1.1	1.8	2.5	3.2	3.9	4.7	5.5	5.5	5.5	5.3	5.0	4.6	4.2	3.9	4	
Commercial HVAC Program - HRVs		0.2	0.7	1.6	2.8	4.3	6.0	8.0	10.3	13.0	16.0	19.3	22.9	26.7	30.9	35.3	40	
Commercial HVAC Program - Air Cooled Chillers		-	0.8	2.0	3.3	4.8	6.2	7.8	9.5	11.2	13.0	14.7	16.4	18.1	19.8	21.5	24	
Commercial Custom Measures Program		1.5	3.2	4.9	6.6	8.3	10.0	11.8	13.7	15.8	17.8	20.0	22.6	25.3	28.1	30.8	35	
Commercial Building Optimization Program		0.1	0.7	1.5	2.4	3.4	4.3	5.4	6.5	7.6	8.8	10.0	10.9	11.9	12.9	13.8	16	
New Buildings Program		2.5	8.7	11.2	14.4	18.5	23.5	34.4	45.3	56.3	67.2	78.2	89.1	100.1	111.0	121.9	139	
Commercial Refrigeration Program		6.4	13.3	20.8	27.3	29.9	32.5	35.1	37.9	41.2	44.3	47.6	51.2	55.0	58.9	62.4	71	
Commercial Kitchen Appliance Program		1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1	
Network Energy Management Program		0.1	0.3	0.6	0.6	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	
Internal Retrofit Program		1.7	3.0	4.5	5.8	8.0	9.5	11.1	11.6	12.2	12.8	13.3	13.8	14.3	14.8	15.3	17	
Power Smart Shops		2.5	5.0	7.5	9.0	10.6	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.0	12	
Power Smart Energy Manager		-	-	0.5	1.4	2.7	4.1	5.4	6.8	8.1	9.5	10.9	12.2	13.1	13.6	13.6	15	
Race to Reduce		3.8	6.1	7.6	8.8	6.2	-	-	-	-	-	-	-	-	-	-	-	
Parking Lot Controller		1.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	3	
	Subtotal	81.0	165.5	248.4	325.2	385.6	438.1	503.6	567.3	628.7	690.0	750.5	814.1	879.6	945.6	1,007.8	1,149	33%
Customer Service Initiatives / Financial Loan Programs																		
Power Smart for Business PAYS Financing		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																		
Performance Optimization Program		15.5	33.5	54.1	77.3	103.1	128.9	154.7	180.4	206.2	232.0	257.8	283.5	309.3	335.1	360.9	397	
	Subtotal	15.5	33.5	54.1	77.3	103.1	128.9	154.7	180.4	206.2	232.0	257.8	283.5	309.3	335.1	360.9	397	11%
	ENERGY EFFICIENCY SUBTOTAL	141.7	275.8	406.0	520.6	621.1	712.4	813.3	911.1	1,006.0	1,100.9	1,187.2	1,275.1	1,365.0	1,454.2	1,539.3	1,740	49%
LOAD MANAGEMENT																		
Curtailable Rate Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LOAD MANAGEMENT SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																		
Bioenergy Optimization Program		29.5	34.8	41.8	48.8	66.3	84.5	96.7	96.7	96.7	96.7	96.7	96.7	96.7	96.7	96.7	106	
Customer Sited Load Displacement		83.5	122.5	254.7	403.1	430.7	458.3	458.3	458.3	458.3	458.3	458.3	458.3	458.3	458.3	458.3	504	
	LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	113.1	157.3	296.5	451.9	497.0	542.8	555.0	555.0	555.0	555.0	555.0	555.0	555.0	555.0	555.0	611	17%
CONSERVATION RATES																		
Conservation Rates - Residential		-	-	25.8	90.2	99.2	109.1	120.0	132.0	133.6	135.2	136.8	138.4	140.1	141.7	143.4	163	
Conservation Rates - Commercial		-	-	-	43.2	94.2	127.5	137.5	147.7	158.1	168.7	179.6	190.7	202.1	213.7	225.5	257	
	CONSERVATION RATES SUBTOTAL	-	-	25.8	133.4	193.4	236.6	257.5	279.7	291.7	303.9	316.4	329.1	342.1	355.4	368.9	421	12%
FUEL CHOICE																		
Fuel Choice		-	51.1	102.2	153.3	204.4	255.5	255.5	255.5	255.5	255.5	255.5	255.5	255.5	255.5	255.5	291	
	FUEL CHOICE SUBTOTAL	-	51.1	102.2	153.3	204.4	255.5	255.5	255.5	255.5	255.5	255.5	255.5	255.5	255.5	255.5	291	8%
OTHER EMERGING TECHNOLOGIES																		
Residential Air Source Heat Pumps Program		-	-	-	-	-	0.2	0.5	1.0	1.5	2.1	2.8	3.6	4.5	5.5	6.5	7	
Residential Future Opportunities		-	-	-	-	7.3	14.6	21.9	29.2	36.5	43.9	51.2	58.5	65.8	73.1	80.4	92	
Residential Solar Photovoltaics Program (PV)		-	-	-	-	0.1	0.2	0.6	1.2	2.5	4.8	8.1	12.5	18.0	24.3	30.9	35	
Residential Solar Thermal Program - Water Heating		-	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	
Residential Solar Thermal Program - Pool Heating		-	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.9	2.3	3	
Commercial Future Opportunities		-	-	-	-	7.3	14.6	21.9	29.2	36.5	43.9	51.2	58.5	65.8	73.1	80.4	92	
Commercial Solar Photovoltaics Program (PV)		-	-	-	-	0.7	2.0	4.8	9.8	17.3	27.9	41.6	58.7	78.4	100.0	121.7	139	
Commercial Variable Speed and Frequency Drives		-	0.1	0.6	1.1	1.5	1.9	2.2	2.6	2.9	3.2	3.4	3.6	3.8	4.0	4.2	5	
Industrial Future Opportunities		-	-	-	-	7.6	15.2	22.7	30.3	37.9	45.5	53.0	60.6	68.2	75.8	83.3	92	
	OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	0.2	0.7	1.3	24.8	49.3	75.4	104.2	136.2	172.2	212.6	257.6	306.3	358.0	410.0	464	13%
Impacts (at meter)		255	484	831	1,261	1,541	1,797	1,957	2,105	2,244	2,388	2,527	2,672	2,824	2,978	3,129		
Impacts (at generation)		285	544	934	1,416	1,732	2,021	2,201	2,370	2,527	2,689	2,846	3,010	3,182	3,356	3,527	3,527	100%
Codes, Standards & Regulations (at meter)		64	142	204	282	338	386	430	473	514	581	638	715	771	816	859		
Codes, Standards & Regulations (at generation)		74	161	232	322	385	440	491	539	585	662	728	815	879	930	979	979	
POWER SMART 2016 to 2030 Impacts (at meter)		319	626	1,035	1,543	1,879	2,182	2,387	2,578	2,758	2,968	3,165	3,387	3,595	3,794	3,988		
POWER SMART 2016 to 2030 Impacts (at generation)		359	706	1,166	1,738	2,118	2,460	2,692	2,909	3,112	3,351	3,573	3,825	4,061	4,287	4,506	4,506	
POWER SMART SAVINGS TO DATE																		
Incentive Based Program Impacts (at meter)		1,448	1,448	1,448	1,448	1,447	1,447	1,436	1,426	1,416	1,394	1,394	1,394	1,394	1,394	1,394		
Incentive Based Program Impacts (at generation)		1,628	1,628	1,628	1,628	1,627	1,627	1,615	1,603	1,591	1,566	1,566	1,566	1,566	1,566	1,566	1,566	
Customer Service Initiatives Program Impacts (at meter)		29	29	29	29	29	29	29	29	29	29	29	29	29	29	29		
Customer Service Initiatives Program Impacts (at generation)		33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	
Discontinued Programs (at meter)		368	368	368	368	368	368	368	368	368	368	368	368	368	368	368		
Discontinued Programs (at generation)		417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	
Impacts of Codes & Standards (at meter)		731	731	731	731	731	731	731	731	731	731	731	731	731	731	731		
Impacts of Codes & Standards (at generation)		833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	833	
TOTAL GW.h (at meter)		**2,895**	**3,202**	**3,611**	**4,119**	**4,454**	**4,757**	**4,951**	**5,132**	**5,302**	**5,490**	**5,686**	**5,908**	**6,116**	**6,315**	**6,509**		
TOTAL GW.h (at generation)		**3,270**	**3,617**	**4,077**	**4,649**	**5,027**	**5,370**	**5,589**	**5,794**	**5,986**	**6,199**	**6,422**	**6,674**	**6,909**	**7,135**	**7,355**	**7,355**	

Note: May not add up due to rounding.

ELECTRIC DSM

2016 Demand Side Management Plan
Annual Utility Costs (000's $)

APPENDIX A.3

	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	2030/31	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Homes Program	$292	$459	$757	$901	$580	-	-	-	-	-	-	-	-	-	-	$2,989	
Home Insulation Program	$1,679	$1,493	$1,429	$1,355	$1,251	$1,168	$1,130	$1,012	$977	$956	$818	$174	-	-	-	$13,443	
Affordable Energy Program	$2,096	$2,033	$2,019	$2,020	$1,534	$1,527	$1,524	$1,525	$1,530	$1,515	$1,424	$1,435	$1,448	$1,462	$1,478	$24,570	
Water and Energy Saver Program	$1,199	$1,353	$1,242	-	-	-	-	-	-	-	-	-	-	-	-	$3,794	
Refrigerator Retirement Program	$1,911	$1,602	$1,469	$1,178	$1,228	$988	$47	-	-	-	-	-	-	-	-	$8,423	
Drain Water Heat Recovery Initiative	$91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$91	
Residential LED Lighting Program	$3,008	$2,561	$1,870	-	-	-	-	-	-	-	-	-	-	-	-	$7,438	
Community Geothermal Program	$1,105	$1,357	$1,563	$1,668	$1,679	$1,764	$2,280	$1,891	$1,719	$1,809	$2,257	$1,694	$1,084	$676	-	$22,546	
Appliances	$363	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$363	
HRV Controls	$419	$434	$372	-	-	-	-	-	-	-	-	-	-	-	-	$1,225	
Power Bars	$9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$9	
Smart Thermostats	$53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$53	
Plug-in Timers	$26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$26	
Community Energy Plan	$62	$118	$120	$123	$125	$81	$82	$84	$86	$88	$90	$92	$93	$95	$97	$1,437	
Subtotal	$12,312	$11,411	$10,842	$7,245	$6,397	$5,528	$5,064	$4,513	$4,312	$4,367	$4,589	$3,395	$2,625	$2,234	$1,576	$86,409	8%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Residential Earth Power Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
COMMERCIAL																	
Incentive Based																	
Commercial Lighting Program	$8,257	$8,145	$8,209	$8,499	$8,227	$8,085	$8,291	$8,224	$7,851	$7,787	$7,842	$8,124	$8,568	$8,853	$8,304	$123,265	
LED Roadway Lighting Conversion Program	$10,993	$9,858	$10,957	$10,801	$1,778	-	-	-	-	-	-	-	-	-	-	$44,388	
Commercial Building Envelope - Windows Program	$501	$483	$512	$564	$603	$643	$657	$671	$685	$759	$811	$833	$850	$868	$887	$10,326	
Commercial Building Envelope - Insulation Program	$799	$722	$664	$709	$724	$738	$754	$775	$791	$808	$825	$848	$865	$884	$902	$11,808	
Commercial Geothermal Program	$461	$569	$622	$785	$983	$1,028	$1,099	$1,169	$1,212	$1,274	$1,384	$1,423	$1,518	$1,563	$1,617	$16,705	
Commercial HVAC Program - Chillers (Water-Cooled)	$192	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$192	
Commercial HVAC Program - CO2 Sensors	$181	$187	$200	$204	$213	$218	$225	$232	$2	$2	$2	$2	$2	$2	$2	$1,675	
Commercial HVAC Program - HRVs	$475	$768	$888	$957	$1,023	$1,093	$1,168	$1,340	$1,433	$1,533	$1,735	$1,840	$1,951	$2,201	$2,312	$20,716	
Commercial HVAC Program - Air Cooled Chillers	-	$463	$605	$655	$708	$763	$820	$879	$940	$960	$980	$1,001	$1,022	$1,043	$1,066	$11,903	
Commercial Custom Measures Program	$404	$459	$469	$479	$489	$499	$535	$573	$612	$625	$666	$795	$841	$858	$876	$9,180	
Commercial Building Optimization Program	$158	$174	$206	$217	$228	$233	$244	$250	$262	$268	$281	$287	$301	$329	$336	$3,772	
New Buildings Program	$1,049	$1,770	$1,267	$1,570	$1,884	$2,261	$549	$561	-	-	-	-	-	-	-	$10,911	
Commercial Refrigeration Program	$450	$720	$763	$742	$722	$851	$863	$924	$1,000	$909	$1,081	$1,097	$1,214	$1,163	$1,030	$13,530	
Commercial Kitchen Appliance Program	$78	$29	-	-	-	-	-	-	-	-	-	-	-	-	-	$107	
Network Energy Management Program	$27	$44	$55	-	-	-	-	-	-	-	-	-	-	-	-	$127	
Internal Retrofit Program	$935	$980	$977	$848	$1,270	$967	$988	$434	$443	$452	$419	$428	$437	$446	$456	$10,480	
Power Smart Shops	$674	$619	$632	$635	$649	$240	-	-	-	-	-	-	-	-	-	$3,449	
Power Smart Energy Manager	$78	$167	$289	$320	$249	$202	$206	$210	$214	$219	$101	$44	-	-	-	$2,204	
Race to Reduce	$128	$131	$134	$137	-	-	-	-	-	-	-	-	-	-	-	$530	
Parking Lot Controller	$358	$169	-	-	-	-	-	-	-	-	-	-	-	-	-	$527	
Subtotal	$26,200	$26,457	$27,449	$28,122	$19,748	$17,820	$16,399	$16,240	$15,445	$15,595	$16,126	$16,720	$17,553	$18,171	$17,748	$295,795	27%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Performance Optimization Program	$3,310	$5,129	$6,592	$7,359	$8,154	$8,327	$8,502	$8,682	$8,865	$9,053	$9,244	$9,439	$9,639	$9,842	$10,050	$122,187	
Subtotal	$3,310	$5,129	$6,592	$7,359	$8,154	$8,327	$8,502	$8,682	$8,865	$9,053	$9,244	$9,439	$9,639	$9,842	$10,050	$122,187	11%
ENERGY EFFICIENCY SUBTOTAL	$41,822	$42,996	$44,883	$42,725	$34,300	$31,675	$29,965	$29,435	$28,622	$29,015	$29,960	$29,555	$29,817	$30,247	$29,374	$504,391	45%
LOAD MANAGEMENT																	
Curtailable Rate Program	$6,112	$6,241	$6,373	$6,508	$6,645	$6,786	$6,929	$7,075	$7,225	$7,378	$7,533	$7,693	$7,855	$8,021	$8,190	$106,566	
LOAD MANAGEMENT SUBTOTAL	$6,112	$6,241	$6,373	$6,508	$6,645	$6,786	$6,929	$7,075	$7,225	$7,378	$7,533	$7,693	$7,855	$8,021	$8,190	$106,566	10%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	$848	$1,664	$2,702	$3,942	$10,120	$10,733	$7,475	$8	$9	$9	$9	$9	$9	$10	-	$37,547	
Customer Sited Load Displacement	$3,911	$12,235	$27,850	$22,404	$5,284	$6,207	$458	$420	$426	$433	$442	$452	$461	$451	$412	$81,846	
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	$4,758	$13,898	$30,552	$26,346	$15,404	$16,941	$7,932	$428	$435	$442	$451	$461	$471	$461	$412	$119,393	11%
CONSERVATION RATES																	
Conservation Rates - Residential	-	$2,042	$2,085	$2,129	$1,631	$1,110	$1,134	$579	$591	$603	$308	$315	$321	$328	-	$13,177	
Conservation Rates - Commercial	-	$1,532	$2,085	$2,662	$2,718	$1,110	$1,134	$1,158	$1,182	$1,207	$616	$629	$643	$656	-	$17,331	
CONSERVATION RATES SUBTOTAL	-	$3,574	$4,171	$4,791	$4,349	$2,220	$2,267	$1,736	$1,773	$1,810	$924	$944	$964	$984	-	$30,509	3%
FUEL CHOICE																	
Fuel Choice	-	$10,315	$10,524	$10,746	$10,973	$11,205	-	-	-	-	-	-	-	-	-	$53,765	
FUEL CHOICE SUBTOTAL	-	$10,315	$10,524	$10,746	$10,973	$11,205	-	-	-	-	-	-	-	-	-	$53,765	5%
OTHER EMERGING TECHNOLOGIES																	
Residential Air Source Heat Pumps Program	-	-	-	-	$40	$116	$158	$185	$206	$223	$252	$289	$314	$347	$354	$2,485	
Residential Future Opportunities	-	-	-	-	$4,131	$4,219	$4,308	$4,399	$4,492	$4,587	$4,683	$4,782	$4,883	$4,987	$5,092	$50,563	
Residential Solar Photovoltaics Program (PV)	-	-	-	$49	$162	$246	$414	$777	$1,441	$2,507	$3,774	$4,984	$6,284	$7,377	$7,854	$35,870	
Residential Solar Thermal Program - Water Heating	$5	$51	$50	$53	$57	$58	$24	-	-	-	-	-	-	-	-	$299	
Residential Solar Thermal Program - Pool Heating	$2	$19	$19	$20	$22	$22	$24	$26	$28	$30	$33	$35	$40	$43	$48	$410	
Commercial Future Opportunities	-	-	-	-	$4,458	$4,552	$4,648	$4,746	$4,846	$4,949	$5,053	$5,160	$5,269	$5,380	$5,494	$54,554	
Commercial Solar Photovoltaics Program (PV)	-	-	-	$160	$557	$1,011	$1,895	$3,360	$5,058	$7,297	$9,594	$12,167	$14,240	$15,966	$16,304	$87,609	
Commercial Variable Speed and Frequency Drives	$8	$142	$187	$191	$191	$193	$192	$196	$198	$200	$197	$201	$205	$209	$214	$2,723	
Industrial Future Opportunities	-	-	-	-	$4,892	$4,996	$5,101	$5,209	$5,319	$5,431	$5,546	$5,663	$5,783	$5,905	$6,030	$59,877	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	$15	$212	$257	$473	$14,510	$15,413	$16,765	$18,897	$21,589	$25,222	$29,133	$33,282	$37,018	$40,215	$41,390	$294,388	27%
Subtotal of Programs	$52,708	$77,237	$96,760	$91,590	$86,182	$84,240	$63,858	$57,573	$59,644	$63,867	$68,001	$71,934	$76,124	$79,928	$79,365	$1,109,011	100%
Program Support	$4,129	$4,033	$3,956	$4,039	$4,124	$4,212	$4,301	$4,391	$4,484	$4,579	$4,676	$4,774	$4,875	$4,978	$5,083	$66,635	
Total Utility Costs (2016 to 2030)	$56,837	$81,270	$100,716	$95,629	$90,307	$88,451	$68,159	$61,964	$64,129	$68,446	$72,677	$76,708	$80,999	$84,906	$84,449	$1,175,646	
Total Committed to Date																$509,592	
TOTAL UTILITY COSTS (1989 to 2030)	**$56,837**	**$81,270**	**$100,716**	**$95,629**	**$90,307**	**$88,451**	**$68,159**	**$61,964**	**$64,129**	**$68,446**	**$72,677**	**$76,708**	**$80,999**	**$84,906**	**$84,449**	**$1,685,237**	

Note: May not add up due to rounding.

ELECTRIC DSM

APPENDIX A.4

2016 Demand Side Management Plan
Annual Administration Costs (000's $)

	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	2030/31	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Homes Program	$188	$229	$299	$375	$112	-	-	-	-	-	-	-	-	-	-	$1,204	
Home Insulation Program	$795	$748	$723	$686	$617	$566	$557	$468	$459	$462	$347	$174	-	-	-	$6,600	
Affordable Energy Program	$1,037	$1,002	$1,023	$1,044	$1,005	$1,026	$1,048	$1,070	$1,092	$1,104	$1,081	$1,104	$1,127	$1,151	$1,175	$16,091	
Water and Energy Saver Program	$891	$1,098	$1,016	-	-	-	-	-	-	-	-	-	-	-	-	$3,004	
Refrigerator Retirement Program	$1,461	$1,244	$1,164	$939	$983	$798	$47	-	-	-	-	-	-	-	-	$6,636	
Drain Water Heat Recovery Initiative	$21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$21	
Residential LED Lighting Program	$1,024	$949	$813	-	-	-	-	-	-	-	-	-	-	-	-	$2,785	
Community Geothermal Program	$368	$377	$376	$384	$392	$401	$412	$418	$426	$435	$447	$453	$458	$465	-	$5,812	
Appliances	$143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$143	
HRV Controls	$66	$86	$88	-	-	-	-	-	-	-	-	-	-	-	-	$240	
Power Bars	$8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$8	
Smart Thermostats	$18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$18	
Plug-in Timers	$15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$15	
Community Energy Plan	$62	$118	$120	$123	$125	$81	$82	$84	$86	$88	$90	$92	$93	$95	$97	$1,437	
Subtotal	$6,095	$5,851	$5,623	$3,551	$3,235	$2,872	$2,147	$2,040	$2,062	$2,089	$1,964	$1,822	$1,679	$1,712	$1,273	$44,014	17%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Residential Earth Power Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
COMMERCIAL																	
Incentive Based																	
Commercial Lighting Program	$2,398	$2,673	$2,729	$2,787	$2,846	$2,906	$2,967	$3,030	$3,094	$3,159	$3,226	$3,294	$3,364	$3,435	$3,508	$45,417	
LED Roadway Lighting Conversion Program	$433	$401	$399	$244	$249	-	-	-	-	-	-	-	-	-	-	$1,727	
Commercial Building Envelope - Windows Program	$272	$305	$312	$320	$327	$334	$341	$348	$355	$363	$372	$381	$389	$397	$405	$5,220	
Commercial Building Envelope - Insulation Program	$334	$310	$331	$352	$360	$367	$375	$383	$391	$400	$408	$417	$425	$434	$444	$5,732	
Commercial Geothermal Program	$234	$234	$254	$249	$270	$273	$271	$294	$288	$300	$328	$313	$320	$340	$334	$4,303	
Commercial HVAC Program - Chillers (Water-Cooled)	$125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$125	
Commercial HVAC Program - CO2 Sensors	$124	$112	$116	$117	$121	$122	$124	$127	$2	$2	$2	$2	$2	$2	$2	$977	
Commercial HVAC Program - HRVs	$93	$66	$64	$65	$66	$68	$69	$71	$72	$74	$75	$77	$79	$80	$82	$1,102	
Commercial HVAC Program - Air Cooled Chillers	-	$95	$79	$80	$82	$83	$85	$87	$89	$91	$93	$95	$97	$99	$101	$1,255	
Commercial Custom Measures Program	$109	$111	$113	$116	$118	$121	$123	$126	$129	$131	$134	$137	$140	$143	$146	$1,896	
Commercial Building Optimization Program	$149	$137	$139	$142	$145	$148	$152	$155	$158	$161	$165	$168	$172	$175	$179	$2,346	
New Buildings Program	$589	$449	$458	$468	$478	$538	$549	$561	-	-	-	-	-	-	-	$4,088	
Commercial Refrigeration Program	$118	$323	$330	$337	$344	$352	$359	$367	$374	$382	$390	$399	$407	$416	$424	$5,322	
Commercial Kitchen Appliance Program	$9	$9	-	-	-	-	-	-	-	-	-	-	-	-	-	$17	
Network Energy Management Program	$20	$22	$25	-	-	-	-	-	-	-	-	-	-	-	-	$67	
Internal Retrofit Program	$307	$282	$288	$294	$185	$189	$193	$197	$201	$205	$210	$214	$218	$223	$228	$3,433	
Power Smart Shops	$194	$178	$182	$185	$189	$97	-	-	-	-	-	-	-	-	-	$1,024	
Power Smart Energy Manager	$78	$119	$192	$196	$200	$204	$208	$213	$217	$222	$104	$106	$108	$110	-	$2,275	
Race to Reduce	$128	$131	$134	$137	-	-	-	-	-	-	-	-	-	-	-	$530	
Parking Lot Controller	$57	$32	-	-	-	-	-	-	-	-	-	-	-	-	-	$89	
Subtotal	$5,771	$5,990	$6,146	$6,089	$5,981	$5,801	$5,816	$5,957	$5,371	$5,490	$5,507	$5,602	$5,720	$5,854	$5,852	$86,946	33%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Performance Optimization Program	$1,198	$1,645	$1,679	$1,715	$1,751	$1,788	$1,826	$1,864	$1,904	$1,944	$1,985	$2,027	$2,070	$2,114	$2,158	$27,668	
Subtotal	$1,198	$1,645	$1,679	$1,715	$1,751	$1,788	$1,826	$1,864	$1,904	$1,944	$1,985	$2,027	$2,070	$2,114	$2,158	$27,668	11%
ENERGY EFFICIENCY SUBTOTAL	$13,064	$13,485	$13,449	$11,355	$10,967	$10,460	$9,789	$9,861	$9,337	$9,523	$9,456	$9,451	$9,469	$9,679	$9,283	$158,628	61%
LOAD MANAGEMENT																	
Curtailable Rate Program	$4	$4	$4	$4	$4	$4	$5	$5	$5	$5	$5	$5	$5	$5	$5	$70	
LOAD MANAGEMENT SUBTOTAL	$4	$4	$4	$4	$4	$4	$5	$5	$5	$5	$5	$5	$5	$5	$5	$70	0%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	$315	$209	$278	$109	$335	$342	$333	$8	$9	$9	$9	$9	$9	$10	-	$1,984	
Customer Sited Load Displacement	$661	$481	$584	$481	$458	$323	$117	$73	$72	$71	$72	$74	$76	$58	$10	$3,610	
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	$976	$689	$861	$590	$793	$665	$450	$81	$80	$80	$82	$83	$85	$67	$10	$5,594	2%
CONSERVATION RATES																	
Conservation Rates - Residential	-	$2,042	$2,085	$2,129	$1,631	$1,110	$1,134	$579	$591	$603	$308	$315	$321	$328	-	$13,177	
Conservation Rates - Commercial	-	$1,532	$2,085	$2,662	$2,718	$1,110	$1,134	$1,158	$1,182	$1,207	$616	$629	$643	$656	-	$17,331	
CONSERVATION RATES SUBTOTAL	-	$3,574	$4,171	$4,791	$4,349	$2,220	$2,267	$1,736	$1,773	$1,810	$924	$944	$964	$984	-	$30,509	12%
FUEL CHOICE																	
Fuel Choice	-	$684	$689	$704	$719	$734	-	-	-	-	-	-	-	-	-	$3,530	
FUEL CHOICE SUBTOTAL	-	$684	$689	$704	$719	$734	-	-	-	-	-	-	-	-	-	$3,530	1%
OTHER EMERGING TECHNOLOGIES																	
Residential Air Source Heat Pumps Program	-	-	-	-	$40	$83	$84	$86	$88	$90	$92	$94	$96	$98	$100	$951	
Residential Future Opportunities	-	-	-	-	$1,631	$1,665	$1,700	$1,736	$1,773	$1,810	$1,849	$1,888	$1,928	$1,968	$2,010	$19,959	
Residential Solar Photovoltaics Program (PV)	-	-	-	$49	$108	$118	$122	$182	$288	$443	$614	$788	$930	$1,089	$1,154	$5,883	
Residential Solar Thermal Program - Water Heating	$5	$43	$42	$43	$43	$44	$24	-	-	-	-	-	-	-	-	$244	
Residential Solar Thermal Program - Pool Heating	$2	$15	$15	$15	$16	$16	$16	$16	$17	$17	$17	$18	$19	$19	$19	$236	
Commercial Future Opportunities	-	-	-	-	$870	$888	$907	$926	$946	$966	$986	$1,007	$1,028	$1,050	$1,072	$10,645	
Commercial Solar Photovoltaics Program (PV)	-	-	-	$160	$163	$167	$170	$174	$177	$302	$308	$315	$321	$328	$335	$2,919	
Commercial Variable Speed and Frequency Drives	$8	$97	$99	$102	$104	$106	$108	$110	$113	$115	$118	$120	$123	$125	$128	$1,575	
Industrial Future Opportunities	-	-	-	-	$1,631	$1,665	$1,700	$1,736	$1,773	$1,810	$1,849	$1,888	$1,928	$1,968	$2,010	$19,959	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	$15	$155	$156	$368	$4,605	$4,751	$4,833	$4,967	$5,174	$5,553	$5,833	$6,116	$6,372	$6,645	$6,828	$62,371	24%
Subtotal of Programs	$14,058	$18,592	$19,330	$17,813	$21,437	$18,836	$17,344	$16,650	$16,370	$16,972	$16,300	$16,600	$16,894	$17,381	$16,126	$260,702	100%
Program Support	$4,129	$4,033	$3,956	$4,039	$4,124	$4,212	$4,301	$4,391	$4,484	$4,579	$4,676	$4,774	$4,875	$4,978	$5,083	$66,635	
Total Administration Costs (2016 to 2030)	$18,187	$22,625	$23,286	$21,852	$25,562	$23,047	$21,644	$21,042	$20,854	$21,550	$20,975	$21,374	$21,770	$22,359	$21,209	$327,337	
Total Committed to Date																$226,268	
TOTAL ADMINISTRATION COSTS (1989 to 2030)	**$18,187**	**$22,625**	**$23,286**	**$21,852**	**$25,562**	**$23,047**	**$21,644**	**$21,042**	**$20,854**	**$21,550**	**$20,975**	**$21,374**	**$21,770**	**$22,359**	**$21,209**	**$553,605**	

Note: May not add up due to rounding.

ELECTRIC DSM

APPENDIX A.5

2016 Demand Side Management Plan
Annual Incentive Costs (000's $)

	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	2030/31	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Homes Program	$104	$230	$458	$525	$468	-	-	-	-	-	-	-	-	-	-	$1,785	
Home Insulation Program	$884	$745	$706	$669	$635	$603	$573	$545	$519	$494	$471	-	-	-	-	$6,843	
Affordable Energy Program	$1,059	$1,031	$996	$976	$528	$501	$477	$456	$438	$410	$343	$331	$320	$311	$303	$8,479	
Water and Energy Saver Program	$308	$255	$227	-	-	-	-	-	-	-	-	-	-	-	-	$790	
Refrigerator Retirement Program	$450	$358	$305	$240	$245	$190	-	-	-	-	-	-	-	-	-	$1,787	
Drain Water Heat Recovery Initiative	$70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$70	
Residential LED Lighting Program	$1,984	$1,612	$1,057	-	-	-	-	-	-	-	-	-	-	-	-	$4,653	
Community Geothermal Program	$737	$980	$1,187	$1,284	$1,286	$1,363	$1,868	$1,473	$1,293	$1,374	$1,811	$1,242	$625	$211	-	$16,734	
Appliances	$220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$220	
HRV Controls	$354	$348	$284	-	-	-	-	-	-	-	-	-	-	-	-	$985	
Power Bars	$2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	
Smart Thermostats	$35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$35	
Plug-in Timers	$12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$12	
Community Energy Plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	$6,217	$5,560	$5,219	$3,693	$3,162	$2,656	$2,917	$2,473	$2,249	$2,279	$2,625	$1,573	$946	$522	$303	$42,395	5%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Residential Earth Power Loan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
COMMERCIAL																	
Incentive Based																	
Commercial Lighting Program	$5,859	$5,472	$5,480	$5,712	$5,381	$5,179	$5,323	$5,194	$4,757	$4,627	$4,616	$4,830	$5,204	$5,418	$4,796	$77,847	
LED Roadway Lighting Conversion Program	$10,560	$9,458	$10,558	$10,557	$1,528	-	-	-	-	-	-	-	-	-	-	$42,661	
Commercial Building Envelope - Windows Program	$228	$178	$199	$244	$276	$310	$316	$323	$330	$396	$439	$452	$462	$472	$481	$5,106	
Commercial Building Envelope - Insulation Program	$466	$412	$333	$356	$364	$371	$378	$391	$400	$408	$417	$431	$440	$449	$459	$6,076	
Commercial Geothermal Program	$227	$334	$368	$537	$712	$755	$828	$875	$923	$973	$1,056	$1,110	$1,198	$1,223	$1,283	$12,403	
Commercial HVAC Program - Chillers (Water-Cooled)	$68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$68	
Commercial HVAC Program - CO2 Sensors	$57	$75	$84	$88	$92	$96	$101	$105	-	-	-	-	-	-	-	$697	
Commercial HVAC Program - HRVs	$382	$703	$824	$892	$956	$1,025	$1,099	$1,269	$1,361	$1,459	$1,660	$1,763	$1,872	$2,121	$2,230	$19,614	
Commercial HVAC Program - Air Cooled Chillers	-	$368	$526	$575	$626	$679	$735	$792	$851	$869	$887	$906	$925	$945	$965	$10,649	
Commercial Custom Measures Program	$295	$348	$355	$363	$371	$378	$412	$447	$483	$494	$532	$658	$701	$716	$731	$7,284	
Commercial Building Optimization Program	$10	$37	$66	$74	$83	$84	$93	$95	$104	$106	$116	$118	$129	$153	$157	$1,426	
New Buildings Program	$460	$1,321	$809	$1,102	$1,407	$1,724	-	-	-	-	-	-	-	-	-	$6,823	
Commercial Refrigeration Program	$332	$397	$433	$405	$378	$499	$504	$557	$626	$527	$691	$698	$807	$748	$606	$8,208	
Commercial Kitchen Appliance Program	$70	$20	-	-	-	-	-	-	-	-	-	-	-	-	-	$90	
Network Energy Management Program	$7	$22	$30	-	-	-	-	-	-	-	-	-	-	-	-	$59	
Internal Retrofit Program	$628	$698	$689	$554	$1,085	$779	$795	$237	$242	$247	$210	$214	$218	$223	$228	$7,047	
Power Smart Shops	$480	$441	$451	$450	$459	$143	-	-	-	-	-	-	-	-	-	$2,425	
Power Smart Energy Manager	-	$48	$97	$124	$49											-	
Race to Reduce	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Parking Lot Controller	$301	$137	-	-	-	-	-	-	-	-	-	-	-	-	-	$438	
Subtotal	$20,429	$20,467	$21,303	$22,033	$13,768	$12,020	$10,582	$10,283	$10,074	$10,104	$10,620	$11,119	$11,833	$12,317	$11,896	$208,849	25%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Performance Optimization Program	$2,112	$3,484	$4,913	$5,644	$6,403	$6,538	$6,677	$6,818	$6,962	$7,109	$7,259	$7,412	$7,569	$7,729	$7,892	$94,519	
Subtotal	$2,112	$3,484	$4,913	$5,644	$6,403	$6,538	$6,677	$6,818	$6,962	$7,109	$7,259	$7,412	$7,569	$7,729	$7,892	$94,519	11%
ENERGY EFFICIENCY SUBTOTAL	$28,758	$29,511	$31,435	$31,370	$23,333	$21,215	$20,176	$19,574	$19,285	$19,492	$20,504	$20,104	$20,348	$20,568	$20,091	$345,763	41%
LOAD MANAGEMENT																	
Curtailable Rate Program	$6,108	$6,237	$6,369	$6,504	$6,641	$6,781	$6,925	$7,071	$7,220	$7,373	$7,528	$7,688	$7,850	$8,016	$8,185	$106,496	
LOAD MANAGEMENT SUBTOTAL	$6,108	$6,237	$6,369	$6,504	$6,641	$6,781	$6,925	$7,071	$7,220	$7,373	$7,528	$7,688	$7,850	$8,016	$8,185	$106,496	13%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program	$533	$1,455	$2,424	$3,833	$9,785	$10,391	$7,142	-	-	-	-	-	-	-	-	$35,563	
Customer Sited Load Displacement	$3,250	$11,754	$27,266	$21,923	$4,826	$5,884	$340	$347	$355	$362	$370	$378	$386	$394	$402	$78,236	
LOAD DISPLACEMENT & ALTERNATIVE ENERGY SUBTOTAL	$3,783	$13,209	$29,691	$25,756	$14,611	$16,275	$7,482	$347	$355	$362	$370	$378	$386	$394	$402	$113,799	13%
CONSERVATION RATES																	
Conservation Rates - Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Conservation Rates - Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CONSERVATION RATES SUBTOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
FUEL CHOICE																	
Fuel Choice	-	$9,631	$9,835	$10,043	$10,255	$10,471	-	-	-	-	-	-	-	-	-	$50,235	
FUEL CHOICE SUBTOTAL	-	$9,631	$9,835	$10,043	$10,255	$10,471	-	-	-	-	-	-	-	-	-	$50,235	6%
OTHER EMERGING TECHNOLOGIES																	
Residential Air Source Heat Pumps Program	-	-	-	-	-	$33	$74	$98	$118	$133	$160	$195	$218	$249	$255	$1,534	
Residential Future Opportunities	-	-	-	-	$2,501	$2,553	$2,607	$2,662	$2,719	$2,776	$2,835	$2,895	$2,956	$3,018	$3,082	$30,604	
Residential Solar Photovoltaics Program (PV)	-	-	-	-	$54	$129	$292	$595	$1,154	$2,064	$3,160	$4,196	$5,354	$6,288	$6,700	$29,986	
Residential Solar Thermal Program - Water Heating	-	$8	$9	$11	$14	$14	-	-	-	-	-	-	-	-	-	$55	
Residential Solar Thermal Program - Pool Heating	-	$4	$4	$5	$6	$7	$8	$9	$11	$13	$15	$18	$21	$24	$29	$174	
Commercial Future Opportunities	-	-	-	-	$3,588	$3,664	$3,741	$3,820	$3,901	$3,983	$4,067	$4,153	$4,241	$4,330	$4,422	$43,910	
Commercial Solar Photovoltaics Program (PV)	-	-	-	-	$394	$844	$1,725	$3,187	$4,881	$6,995	$9,286	$11,853	$13,918	$15,638	$15,969	$84,690	
Commercial Variable Speed and Frequency Drives	-	$45	$88	$90	$87	$87	$84	$86	$85	$85	$79	$81	$82	$84	$86	$1,148	
Industrial Future Opportunities	-	-	-	-	$3,262	$3,331	$3,401	$3,473	$3,546	$3,621	$3,697	$3,776	$3,855	$3,937	$4,020	$39,918	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	$56	$101	$105	$9,905	$10,661	$11,932	$13,930	$16,415	$19,669	$23,300	$27,165	$30,646	$33,570	$34,562	$232,017	27%
Subtotal of Programs	$38,649	$58,645	$77,430	$73,777	$64,745	$65,404	$46,515	$40,922	$43,275	$46,896	$51,702	$55,334	$59,229	$62,547	$63,239	$848,309	100%
Program Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Incentive Costs (2016 to 2030)	$38,649	$58,645	$77,430	$73,777	$64,745	$65,404	$46,515	$40,922	$43,275	$46,896	$51,702	$55,334	$59,229	$62,547	$63,239	$848,309	
Total Committed to Date																$282,990	
TOTAL INCENTIVE COSTS (1989 to 2030)	**$38,649**	**$58,645**	**$77,430**	**$73,777**	**$64,745**	**$65,404**	**$46,515**	**$40,922**	**$43,275**	**$46,896**	**$51,702**	**$55,334**	**$59,229**	**$62,547**	**$63,239**	$1,131,299	

Note: May not add up due to rounding.

Demand Side
Management Plan
2016/17

SUPPLEMENTAL REPORT:
15 yr (2016 to 2031)

APPENDIX B - HISTORICAL SAVINGS & COSTS - ELECTRIC

Appendix B.1 - Annual Capacity Savings (MW)

Appendix B.2 - Annual Energy Savings (GW.h)

Appendix B.3 - Annual Utility Costs

Appendix B.4 - Annual Program Administration Costs

Appendix B.5 - Annual Program Incentive Costs

ELECTRIC DSM

APPENDIX B.1

2016 Demand Side Management Plan
Annual Capacity Savings (MW)
(Savings to Date)
(1989/90 - 2015/16)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Interim Estimate 2015/16	Benchmark 2030/31	At Generation 2030/31
RESIDENTIAL																													
Incentive Based																													
Home Insulation Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	2.0	5.2	8.0	10.7	13.8	16.4	18.8	22.1	24.5	26.9	29.1	29.1	33
Affordable Energy Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.4	0.7	1.5	3.0	4.1	5.1	6.9	9.1	9.1	10
Refrigerator Retirement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	1.7	2.7	3.8	5.1	-	-
Community Geothermal Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.0	1.0	1
Water and Energy Saver Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	1.3	2.0	2.6	3.2	3.9	3.9	4
Drain Water Heat Recovery Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0
Residential LED Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.1	7.2	7.2	8
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	2.0	5.2	8.1	11.0	14.5	18.6	23.9	29.9	35.0	44.2	55.4	50.2	57
Customer Service Initiatives																													
Power Smart Residential Loan Program	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.8	1.1	1.4	1.6	2.0	2.7	3.0	3.9	4.2	4.4	4.7	5.0	5.2	5.4	5.4	6
Residential Earth Power Loan Program	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.6	1.1	1.4	2.1	2.5	3.0	3.3	3.8	3.9	3.9	3.9	4.0	4.0	5
ecoEnergy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residential PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.3	0.4	0.4	0.4	0
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0
Solar Water Heater Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Smart Energy Manager	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	0.0	0
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.0	1.5	2.2	2.9	3.6	5.0	5.7	7.1	7.7	8.4	8.8	9.4	9.7	10.0	10.0	11
DISCONTINUED/COMPLETED																													
Residential Appliance Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	1.0	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	2
New Homes Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	1.0	1.2	1.5	1.6	1.6	1.6	1.6	1.6	1.6	2
Seasonal LED Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
Outdoor Timer Program	0.3	0.5	0.9	1.2	1.5	1.9	2.0	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3
Residential Hot Water Program	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
Water Tank Rental Program	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Residential Thermostats Program	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residential Retrofit Program	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Residential Applaince Buy Back Program	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Efficiency Furnace and Boiler Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0
Energy Efficient Light Fixtures Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.3	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	1
Compact Fluorescent Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	3.1	4.2	5.7	10.2	19.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	28
Subtotal	0.3	0.5	1.0	1.3	1.6	1.9	2.1	2.4	2.5	2.5	2.6	2.6	2.6	2.6	2.5	4.2	5.9	7.8	10.3	15.8	25.8	31.4	31.7	31.7	31.7	31.7	31.7	31.7	36
RESIDENTIAL TOTAL	0.3	0.5	1.0	1.3	1.6	1.9	2.1	2.4	2.5	2.5	2.6	2.6	3.1	3.6	4.0	7.2	10.8	16.5	23.4	32.5	47.4	57.7	63.9	70.3	76.0	85.6	97.0	91.9	105
COMMERCIAL																													
Incentive Based																													
Commercial Lighting Program	-	-	-	0.5	2.6	5.7	9.2	10.8	11.6	15.1	16.4	17.4	18.5	19.7	21.7	24.2	27.7	31.1	34.1	38.5	42.3	45.7	48.8	56.5	65.5	73.9	84.2	84.2	96
Commercial Earth Power Program	-	-	-	-	-	-	-	0.1	0.8	1.1	1.5	1.7	2.0	2.4	3.8	4.2	5.4	7.4	8.7	9.3	10.3	11.2	11.9	12.4	13.6	14.3	14.5	14.5	17
Commercial Insulation Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.7	1.8	3.2	4.8	6.2	7.4	10.2	11.8	14.4	14.4	16
Commercial Windows Program	-	-	-	-	-	-	-	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.8	1.1	1.5	1.7	1.8	2.1	3.0	4.0	4.8	5.6	6.3	7.0	7.2	7.2	8
Internal Retrofit Program	-	-	-	0.0	0.3	0.6	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.7	2.2	2.4	2.8	3.0	3.2	5.4	8.3	11.7	11.9	12.2	12.3	12.6	12.6	14
Commercial Custom Measures Program	-	-	-	-	-	-	-	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.9	0.9	0.9	1.0	1.1	1.2	1.2	1.4	1.7	1.7	1.8	1.8	1.8	1.8	2
Commercial Refrigeration Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.8	1.3	1.6	1.9	2.1	3.5	4.5	5.9	6.6	6.6	8
HVAC Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	0.1	0.1	0.2	0.2	0.2	0.7	0.9	0.9	1
Power Smart Shops Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0
Commercial Building Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.4	0.4	0.4	-	-
Network Energy Manager Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0
New Buildings Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.5	2.0	4.4	6.2	6.2	6.2	6.2	6.2	7
LED Roadway Lighting Conversion Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.4	1.4	2
HVAC - CO2 Sensors Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.1	0.2	0.2	0
Subtotal	-	-	-	0.5	2.9	6.3	9.8	11.8	13.5	17.6	19.7	21.1	22.7	24.6	28.8	32.5	37.8	44.3	50.2	57.6	67.2	77.8	88.0	101.0	117.0	133.1	150.9	150.5	172
DISCONTINUED/COMPLETED																													
Commercial Comprehensive Program	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
Infared Heat Lamps Program	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1
Livestock Waterer Program	-	-	-	-	-	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	-	-
Street Light Program	-	-	0.9	3.1	5.4	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	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8
Sentinel Light Program	-	-	0.5	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.3	1.6	2.0	2.1	2.2	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6	3
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.5	1
Commercial Air Barriers Program	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.2	0.2	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	0.3	0.3	0
Agricultural Demand Controller Program	-	-	-	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1
HVAC - Chillers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aboriginal Commercial Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Parking Lot Controllers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial Spray Valves Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.3	0.3	-	-	-	-	-	-	-
Agricultural Heat Pads Program	-	-	-	-	-	-	-	-	-	0.7	1.0	1.2	1.6	2.0	2.2	2.6	2.7	2.8	3.2	3.5	3.6	3.9	4.1	4.3	4.6	6.0	6.0	6.0	7
Subtotal	-	-	2.2	5.7	9.0	10.6	10.7	10.8	10.8	11.4	11.8	12.0	12.5	12.9	13.3	13.9	15.3	15.8	16.4	16.9	17.4	17.9	17.9	18.3	18.7	20.0	20.0	20.0	23
COMMERCIAL TOTAL	-	-	2.2	6.3	11.9	16.9	20.5	22.5	24.2	29.1	31.5	33.2	35.2	37.5	42.1	46.4	53.1	60.1	66.6	74.5	84.6	95.6	105.9	119.3	135.7	153.1	170.9	170.5	194
INDUSTRIAL																													
Performance Optimization Program	-	-	-	-	-	0.3	1.1	4.6	5.8	37.4	39.1	39.5	48.4	52.9	54.1	57.6	61.7	63.2	66.2	68.7	72.0	75.5	78.9	87.6	91.0	93.0	94.7	94.7	104
Subtotal	-	-	-	-	-	0.3	1.1	4.6	5.8	37.4	39.1	39.5	48.4	52.9	54.1	57.6	61.7	63.2	66.2	68.7	72.0	75.5	78.9	87.6	91.0	93.0	94.7	94.7	104
DISCONTINUED/COMPLETED																													
Industrial (Basic) Program	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Industrial (GSL) Program	-	-	-	0.3	0.4	1.6	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	5
High Efficiency Motors Program	-	-	0.1	0.7	1.3	1.8	2.3	3.0	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	4
Emergency Preparedness Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Efficient Motors (QMR) Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	0.1	1.0	1.7	3.4	6.6	7.4	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	9
INDUSTRIAL TOTAL	-	-	0.1	1.0	1.7	3.7	7.7	12.0	13.9	45.5	47.3	47.6	56.6	61.1	62.2	65.8	69.8	71.3	74.4	76.9	80.2	83.7	87.1	95.7	99.2	101.1	102.8	102.8	113
EFFICIENCY PROGRAMS SUBTOTAL	0.3	0.5	3.3	8.6	15.2	22.6	30.3	36.9	40.6	77.1	81.4	83.4	94.9	102.2	108.4	119.4	133.7	148.0	164.4	183.8	212.2	236.9	256.9	285.3	310.9	339.9	370.8	365.2	412
CUSTOMER SELF-GENERATION PROGRAMS																													
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.3	14.3	14.3	14.3	14.3	14.3	14.4	9.4	14.2	22.2	12.1	12.1	13
Customer Sited Load Displacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.0	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.3	14.3	14.3	14.3	14.3	14.3	14.4	9.4	14.2	22.2	24.1	12.1	13
RATE/LOAD MANAGEMENT PROGRAMS																													
Curtailable Rates Program	-	-	-	-	40.7	46.4	24.7	32.7	80.0	48.2	58.0	57.1	68.0	110.3	148.5	153.8	189.1	183.3	180.6	172.8	149.2	154.5	147.2	144.8	146.3	142.5	145.0	-	-
PROGRAM IMPACTS	0.3	0.5	3.3	8.6	55.9	69.0	55.0	69.6	120.6	125.3	139.4	140.5	162.9	212.5	256.9	273.2	337.1	345.5	359.3	370.9	375.6	405.8	418.5	439.5	471.4	504.5	539.9	377.3	425
CODES, STANDARDS & REGULATIONS	-	-	-	0.5	1.6	3.3	5.4	8.4	13.6	20.4	28.0	35.2	42.9	52.0	56.1	61.8	66.9	72.4	78.6	85.1	92.0	99.5	114.6	131.6	148.7	162.3	177.7	177.7	202
Total Impact @ Meter	**0.3**	**0.5**	**3.3**	**9.1**	**57.5**	**72.3**	**60.4**	**78.0**	**134.2**	**145.7**	**167.4**	**175.6**	**205.8**	**264.5**	**313.1**	**334.9**	**404.1**	**418.0**	**437.9**	**456.0**	**467.6**	**505.2**	**533.1**	**571.1**	**620.1**	**666.8**	**717.6**	**554.9**	
Total Impact @ Generation	**0.3**	**0.6**	**3.7**	**10.3**	**63.9**	**80.4**	**67.5**	**87.1**	**149.2**	**162.4**	**186.5**	**196.0**	**229.6**	**294.6**	**348.4**	**373.0**	**449.6**	**465.6**	**488.3**	**509.2**	**523.2**	**565.7**	**597.7**	**640.9**	**696.4**	**749.4**	**807.0**	**627.9**	**628**

Note: May not add up due to rounding.

ELECTRIC DSM

APPENDIX B.2

2016 Demand Side Management Plan
Annual Energy Savings (GW.h)
(Savings to Date)
(1989/90 - 2015/16)

		1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Interim Estimate 2015/16	Benchmark 2030/31	At Generation 2030/31
RESIDENTIAL																														
Incentive Based																														
Home Insulation Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	4.2	10.7	16.5	22.1	28.4	33.8	38.7	44.9	49.4	53.8	58.1	58.1	**66**
Affordable Energy Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.1	2.0	4.2	6.4	9.3	11.8	15.0	19.2	19.2	**22**
Refrigerator Retirement Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.9	19.6	29.3	38.9	51.8	-	**-**
Community Geothermal Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6	2.6	2.6	**3**
Water and Energy Saver Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.5	12.6	15.7	18.8	22.7	22.7	**26**
Drain Water Heat Recovery		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	**0**
Residential LED Lighting Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.9	26.0	26.0	**30**
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	4.2	10.7	17.0	23.2	30.4	38.0	65.6	86.3	106.2	141.0	180.5	128.7	**147**
Customer Service Initiatives																														
Power Smart Residential Loan Program		-	-	-	-	-	-	-	-	-	-	-	-	0.9	1.6	2.2	2.7	3.2	3.9	4.6	5.2	6.9	7.4	7.8	8.4	8.8	9.3	9.6	9.6	**11**
Residential Earth Power Loan Program		-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	1.0	2.8	4.8	6.1	8.8	10.2	11.2	11.8	12.8	13.3	13.2	13.3	13.7	13.7	**16**
ecoEnergy		-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	**1**
Residential PAYS		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	1.3	1.4	1.5	1.5	**2**
Commercial PAYS		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	**0**
Solar Water Heater Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	**0**
Power Smart Energy Manager		-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.2	2.4	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	**3**
R-2000		-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**0**
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	1.6	3.4	6.0	9.3	11.7	13.8	17.2	19.1	21.9	23.0	24.4	25.5	27.3	27.9	28.8	28.8	**33**
DISCONTINUED/COMPLETED																														
Residential Appliance Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6	7.6	12.1	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	**15**
New Homes Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	1.9	2.9	3.7	4.3	5.0	5.5	5.5	5.5	5.5	5.5	5.5	**6**
Seasonal LED Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	1.3	2.3	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	**4**
Outdoor Timer Program		5.0	8.9	15.3	20.6	24.8	29.2	30.9	34.7	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	**42**
Residential Hot Water Program		-	-	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	**1**
Water Tank Rental Program		-	-	-	-	-	-	-	0.1	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	**1**
Residential Thermostats Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**0**
Residential Retrofit Program		-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0**
Residential Appliance Buy Back Program		-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
High Efficiency Furnace and Boiler Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	**1**
Energy Efficient Light Fixtures Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	1.0	2.1	2.6	3.7	4.5	4.5	4.5	4.5	4.5	4.5	**5**
Compact Fluorescent Lighting Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	15.4	20.6	28.1	49.9	85.8	107.5	107.5	107.5	107.5	107.5	107.5	107.5	**122**
	Subtotal	5.0	8.9	15.7	21.0	25.1	29.6	31.3	35.1	37.2	37.5	37.6	37.6	37.6	37.6	37.6	45.8	53.7	65.4	79.8	108.8	147.9	171.3	172.6	172.6	172.6	172.6	172.6	172.6	**197**
RESIDENTIAL TOTAL		5.0	8.9	15.7	21.0	25.1	29.6	31.3	35.1	37.2	37.5	37.6	37.6	39.2	41.0	43.6	56.8	69.7	89.9	114.0	151.1	200.1	232.3	262.5	284.4	306.1	341.6	381.9	330.0	**376**
COMMERCIAL																														
Incentive Based																														
Commercial Lighting Program		-	-	-	2.9	17.0	35.9	55.0	61.2	67.4	85.4	90.8	94.9	100.2	105.6	116.2	132.6	153.1	175.8	193.9	218.9	239.5	258.7	281.2	309.0	341.7	371.8	423.8	423.8	**483**
Commercial Earth Power Program		-	-	-	-	-	-	-	0.3	1.1	1.8	2.9	3.2	4.0	5.1	7.8	8.8	11.1	15.3	18.6	20.2	23.6	26.0	27.8	29.9	34.8	37.7	38.1	38.1	**43**
Commercial Insulation Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	1.9	4.1	6.6	9.7	12.5	15.6	22.6	26.8	31.8	31.8	**36**
Commercial Windows Program		-	-	-	-	-	-	-	0.1	0.4	0.6	0.7	0.9	1.0	1.4	1.8	2.3	3.2	3.9	4.5	5.2	7.3	9.7	11.7	13.9	15.5	17.3	18.7	18.7	**21**
Internal Retrofit Program		-	-	-	0.2	1.2	2.7	3.3	3.8	4.3	4.9	5.4	5.9	6.1	6.9	9.4	12.2	14.4	17.0	18.0	19.8	29.5	41.4	53.6	55.2	57.4	58.4	59.7	59.7	**68**
Commercial Custom Measures Program		-	-	-	-	-	-	-	0.4	0.4	2.6	10.0	10.8	11.7	12.2	12.8	12.8	12.9	13.1	15.4	15.9	17.4	18.8	20.2	21.0	21.3	21.4	22.2	22.2	**25**
Commercial Refrigeration Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	3.0	4.3	5.5	7.0	8.7	21.2	30.0	41.8	47.5	47.5	**54**
HVAC Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5	3.7	4.1	4.3	4.8	5.3	7.1	8.2	9.4	10.2	12.5	15.8	15.8	**18**
Commercial Kitchen Appliances Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.5	0.6	0.7	0.7	0.8	1.1	2.6	2.6	**3**
Power Smart Shops Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.7	0.7	0.7	0.7	0.7	1.2	1.2	**1**
Commercial Building Optimization Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.6	0.9	0.9	1.0	2.9	2.9	2.9	-	**-**
Network Energy Manager Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.2	0.2	0.7	0.8	0.8	0.8	**1**
New Buildings Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	6.4	8.1	13.7	20.0	20.0	**23**
LED Roadway Lighting Conversion Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	9.4	9.4	**11**
HVAC - CO2 Sensors Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.1	0.1	0.3	0.3	0.3	**0**
	Subtotal	-	-	-	3.1	18.2	38.6	58.3	65.8	73.6	95.3	109.7	115.6	123.1	131.1	147.9	171.1	198.4	231.1	259.6	293.9	336.1	380.8	428.7	484.2	546.6	607.5	694.7	691.8	**789**
DISCONTINUED/COMPLETED																														
Commercial Comprehensive Program		-	-	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	**2**
Infared Heat Lamps Program		-	-	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	**4**
Livestock Waterer Program		-	-	-	-	-	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.1	-	**-**
Street Light Program		-	-	3.9	13.5	23.2	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	**34**
Sentinel Light Program		-	-	2.3	4.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	**9**
City Of Winnipeg Power Smart Agreement Program		-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	1.2	7.6	9.6	10.1	10.3	10.8	11.1	11.5	11.6	11.6	11.6	11.6	11.6	**13**
Commercial Clothes Washers Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7	**1**
Commercial Air Barriers Program		-	-	-	-	-	-	-	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	**1**
Agricultural Demand Controller Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
HVAC - Chillers		-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	0.3	**0**
Aboriginal Commercial Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Commercial Parking Lot Controllers		-	-	-	-	-	-	-	0.8	1.6	3.7	4.1	4.4	5.9	6.8	8.8	11.5	20.0	27.9	30.5	32.4	34.9	38.1	39.4	39.4	39.4	39.4	39.4	39.4	**45**
Commercial Spray Valves Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	2.9	4.8	5.2	5.2	-	-	-	-	-	-	**-**
Agricultural Heat Pads Program		-	-	-	-	-	-	-	-	-	3.5	5.5	6.7	9.2	11.6	12.9	15.4	16.4	17.0	21.8	24.3	25.4	28.4	30.2	32.0	34.5	45.3	45.3	45.3	**52**
	Subtotal	-	-	11.3	23.4	35.8	42.7	42.8	43.8	44.7	50.3	52.8	54.4	58.6	62.1	66.1	72.0	87.9	100.4	109.2	115.9	120.6	127.2	125.6	127.7	130.3	140.9	140.8	140.7	**160**
COMMERCIAL TOTAL		-	-	11.3	26.5	54.0	81.3	101.1	109.6	118.3	145.5	162.5	170.0	181.7	193.2	214.0	243.1	286.3	331.5	368.9	409.8	456.7	508.0	554.3	611.9	676.9	748.4	835.5	832.5	**949**
INDUSTRIAL																														
Performance Optimization Program		-	-	-	-	-	2.4	7.2	35.1	43.5	85.9	107.7	110.8	142.9	170.5	181.5	207.6	238.6	249.3	276.4	294.9	319.6	347.9	373.1	441.8	471.4	485.9	500.4	500.4	**550**
	Subtotal	-	-	-	-	-	2.4	7.2	35.1	43.5	85.9	107.7	110.8	142.9	170.5	181.5	207.6	238.6	249.3	276.4	294.9	319.6	347.9	373.1	441.8	471.4	485.9	500.4	500.4	**550**
DISCONTINUED/COMPLETED																														
Industrial (Basic) Program		-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0**
Industrial (GSL) Program		-	-	-	0.1	0.7	9.7	32.7	32.7	32.7	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	**36**
High Efficiency Motors Program		-	-	0.4	4.8	7.7	10.3	13.3	17.9	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	**24**
Emergency Preparedness Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Efficient Motors (QMR) Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
	Subtotal	-	-	0.4	4.9	8.3	20.0	46.0	50.6	54.2	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.6	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5	54.5	**60**
INDUSTRIAL TOTAL		-	-	0.4	4.9	8.3	22.4	53.2	85.7	97.7	140.4	162.3	165.4	197.5	225.1	236.0	262.2	293.1	303.9	330.9	349.3	374.1	402.4	427.6	496.3	525.9	540.4	554.9	554.9	**610**
EFFICIENCY PROGRAMS SUBTOTAL		5.0	8.9	27.4	52.3	87.5	133.3	185.6	230.5	253.2	323.5	362.4	373.0	418.4	459.2	493.6	562.0	649.1	725.3	813.8	910.3	1,030.9	1,142.7	1,244.4	1,392.6	1,508.9	1,630.4	1,772.2	1,717.4	**1,936**
CUSTOMER SELF-GENERATION PROGRAMS																														
Bioenergy Optimization Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.3	120.1	84.2	94.0	80.1	86.6	70.3	82.5	99.3	120.7	72.7	72.7	**80**
Customer Sited Load Displacement		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70.0	-	**-**
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.3	120.1	84.2	94.0	80.1	86.6	70.3	82.5	99.3	120.7	142.7	72.7	**80**
RATE/LOAD MANAGEMENT PROGRAMS																														
Curtailable Rates Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
PROGRAM IMPACTS		5.0	8.9	27.4	52.3	87.5	133.3	185.6	230.5	253.2	323.5	362.4	373.0	418.4	459.2	493.6	562.0	659.4	845.4	898.0	1,004.3	1,111.0	1,229.2	1,314.7	1,475.2	1,608.2	1,751.1	1,914.9	1,790.1	**2,016**
CODES, STANDARDS & REGULATIONS		-	-	-	1.9	6.6	13.7	22.3	35.2	55.5	81.5	110.1	137.3	166.5	200.7	217.6	240.5	261.9	284.3	309.1	335.2	377.8	422.8	485.9	551.5	614.4	665.7	731.2	731.2	**833**
Total Impact @ Meter		**5.0**	**8.9**	**27.4**	**54.2**	**94.1**	**147.1**	**207.9**	**265.6**	**308.7**	**405.0**	**472.4**	**510.3**	**584.9**	**659.9**	**711.2**	**802.5**	**921.2**	**1,129.7**	**1,207.1**	**1,339.5**	**1,488.8**	**1,652.1**	**1,800.6**	**2,026.6**	**2,222.6**	**2,416.8**	**2,646.1**	**2,521.3**	
Total Impact @ Generation		**5.7**	**10.2**	**31.2**	**61.6**	**107.0**	**166.8**	**234.9**	**299.4**	**348.0**	**455.9**	**531.9**	**574.8**	**658.5**	**742.9**	**800.9**	**903.9**	**1,037.5**	**1,270.3**	**1,358.8**	**1,508.7**	**1,678.4**	**1,863.2**	**2,032.1**	**2,286.6**	**2,508.1**	**2,728.0**	**2,988.0**	**2,848.5**	**2,849**

Note: May not add up due to rounding.
** Includes savings for Downtown Office project based on planning assumptions*

ELECTRIC DSM

APPENDIX B.3

2016 Demand Side Management Plan
Annual Utility Costs
(1989/90 - 2015/16)
($000's $)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Interim Estimate 2015/16	Cumulative 2015/16
RESIDENTIAL																												
Incentive Based																												
Home Insulation Program	-	-	-	-	$180	$279	$179	$171	$313	$35	$4	$37	$60	$61	$119	$676	$1,031	$1,793	$1,474	$1,665	$1,664	$1,356	$1,258	$1,268	$1,109	$1,791	$1,933	**$18,454**
Affordable Energy Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$40	$96	$203	$1,131	$1,900	$671	$802	$929	$746	$1,984	$5,017	**$13,519**
Lower Income First Nations Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$5	$13	$2	$6	$39	$57	$142	$185	$190	$199	-	**$839**
Refrigerator Retirement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$11	$79	$1,482	$1,603	$1,620	$1,693	$2,241	**$8,729**
Community Geothermal Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$443	$621	$677	**$1,741**
Behavioral Energy Efficiency Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drain Water Heat Recovery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$60	$32	**$92**
Water and Energy Saver Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$0	$17	-	-	$78	$49	$454	$440	$777	$410	$438	$627	**$3,290**
Solar Water Heater Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	$0	$0	$0	$2	-	**$3**
New Homes Program (Re-design)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$27	$1	$33	$96	**$157**
Residential LED Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2,662	$2,510	**$5,171**
Subtotal	-	-	-	-	$180	$279	$179	$171	$313	$35	$4	$37	$60	$61	$120	$676	$1,092	$1,902	$1,679	$2,880	$3,663	$2,617	$4,124	$4,789	$4,519	$9,484	$13,134	**$51,996**
Customer Service Initiatives																												
Power Smart Residential Loan Program	-	-	-	-	-	-	-	-	-	-	-	$45	$76	$20	$9	$0	$1	$9	-$1	-$6	-$73	-$37	-$29	-$72	-$63	-$45	$64	**-$101**
Residential Earth Power Loan Program	-	-	-	-	-	-	-	-	-	-	-	-	$2	$47	$97	$343	$872	-$92	$71	$207	$160	$102	$85	$125	$258	-$46	$8	**$2,239**
ecoEnergy	-	-	-	-	-	-	-	-	-	-	-	$0	$0	$0	$0	-$10	-$42	$71	$163	-$19	$141	$101	$112	-$29	$1	$0	-	**$489**
Residential PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$27	$229	$43	$27	$130	**$455**
R-2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	$45	$78	$66	$105	$333	$831	-$12	$232	$182	$229	$166	$196	$252	$239	-$64	$203	**$3,082**
Discontinued/Completed																												
Residential Appliance Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$17	$12	$9	$88	$1,452	$1,881	$1,709	$394	$12	$1	$1	$0	$0	-	**$5,578**
New Homes Program	-	-	-	$27	$108	$69	$160	$93	$49	$26	$1	$15	$111	$251	$194	$272	$558	$851	$622	$631	$571	$209	$250	$45	$12	$11	-	**$5,135**
Aboriginal Residential Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$5	$13	-	-	-	-	-	-	-	-	-	**$18**
Seasonal LED Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$78	$368	$348	$337	$23	-	-	-	-	-	-	**$1,154**
Outdoor Timer Program	$124	$189	$168	$133	$67	$40	$14	$2	$7	$3	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$748**
Residential Hot Water Program	-	-	$119	-	-	-	$1	$47	$20	$12	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$202**
Water Tank Rental Program	-	-	-	-	-	-	$14	$302	$304	$59	$4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$682**
Residential Thermostats Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$8	$4	$7	$66	$33	$10	$0	-	-	-	-	-	-	**$128**
Residential Retrofit Program	-	$43	$18	$84	-	-	$3	-	-	-	-	-	-	$12	-	$12	$43	-	-	-	-	-	-	-	-	-	-	**$203**
Residential Applaince Buy Back Program	-	-	$36	$8	-	-	-	-	-	-	-	-	$14	$25	$5	$61	$23	-	-	-	-	-	-	-	-	-	-	**$172**
High Efficiency Furnace and Boiler Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$3	-	-	-	-	-	-	-	-	-	-	-	**$3**
Energy Efficient Light Fixtures Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$146	$478	$378	$184	$241	$311	-	-	-	-	**$1,738**
Compact Fluorescent Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$18	$711	$943	$769	$898	$1,264	$1,568	$997	$2	-	-	-	-	-	**$7,169**
Subtotal	$124	$232	$341	$253	$175	$109	$193	$445	$379	$99	$8	$15	$111	$283	$256	$1,013	$1,785	$3,688	$4,260	$4,329	$2,739	$1,458	$564	$46	$12	$11	-	**$22,929**
Residential Exploratory Programs																												
LED Light Fixtures Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	-	$0	$0	-	-	**$1**
Residential Solar Power Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	$2	-	-	-	-	**$4**
Residential Air Source Heat Pumps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$13	-	**$13**
Residential Conservation Rates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	**$0**
New Home Program (Re-design)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community Energy Plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$12	**$12**
Smart Thermostats	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$150	**$150**
Set Top Boxes Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$20	$1	-	-	-	-	-	**$21**
Exploratory Programs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$20	$3	$2	$0	$0	$13	$162	**$200**
RESIDENTIAL TOTAL	$124	$232	$341	$253	$355	$388	$372	$615	$692	$135	$12	$97	$249	$410	$481	$2,022	$3,708	$5,579	$6,172	$7,391	$6,651	$4,244	$4,885	$5,088	$4,771	$9,444	$13,498.6	**$78,207**
COMMERCIAL																												
Incentive Based																												
Commercial Lighting Program	-	-	$74	$803	$1,764	$2,113	$2,126	$905	$782	$1,571	$717	$538	$852	$1,033	$2,354	$4,761	$5,881	$6,878	$7,242	$7,678	$7,204	$6,604	$6,349	$7,772	$6,642	$7,194	$8,029	**$97,867**
Commercial Earth Power Program	-	-	-	-	$10	$35	$58	$50	$172	$91	$107	$90	$141	$245	$557	$246	$471	$595	$342	$220	$380	$296	$291	$265	$168	$192	$230	**$5,253**
Commercial Insulation Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$203	$248	$236	$227	$264	$233	$452	$517	$586	$432	**$3,397**
Commercial Windows Program	-	-	-	-	$5	$19	$31	$97	$130	$48	$35	$62	$57	$133	$104	$216	$294	$372	$369	$438	$1,001	$1,210	$987	$927	$813	$815	$484	**$8,648**
Internal Retrofit Program	-	-	$80	$193	$330	$404	$120	$159	$134	$179	$91	$239	$115	$242	$538	$630	$550	$4,556	$4,253	$2,609	$2,120	$1,852	$745	$812	$760	$710	$707	**$23,128**
Commercial Custom Measures Program	-	-	-	-	$14	$48	$79	$60	-	$170	$422	$108	$123	$70	$136	$10	$7	$113	$182	$237	$208	$229	$237	$56	$14	$17	$79	**$2,620**
Commercial Refrigeration Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$217	$293	$285	$173	$182	$169	$335	$614	$651	$905	$515	**$4,339**
HVAC Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$163	$192	$69	$210	$159	$311	$210	$149	$193	$374	$420	**$2,450**
Commercial HVAC Program - HRVs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	**$2**
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$90	$82	$35	$31	$12	$4	$18	$71	**$343**
Power Smart Shops Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$60	$240	$141	$46	$0	$6	$40	$225	**$759**
Commercial Building Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	-	$168	$55	$38	$28	$26	$36	$39	$92	$125	$33	$330	**$970**
Network Energy Manager Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	$20	$68	$82	$23	$6	$55	$15	$2	**$274**
New Buildings Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	$135	$95	$161	$288	$298	$116	$593	$1,346	$1,443	**$4,476**
LED Roadway Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$11	$726	$13,699	**$14,435**
HVAC - CO2 Sensors Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$1	$2	$2	$2	$1	$7	$58	**$74**
Subtotal	-	-	$154	$996	$2,123	$2,619	$2,414	$1,272	$1,219	$2,060	$1,372	$1,037	$1,289	$1,724	$3,690	$5,863	$7,749	$13,257	$13,167	$12,094	$12,059	$11,519	$9,827	$11,276	$10,554	$12,979	$26,726	**$168,036**
Customer Service Initiatives																												
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$123	$76	$131	-	**$329**
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$123	$76	$131	-	**$329**
Discontinued/Completed																												
Commercial Comprehensive Program	-	$43	$82	$24	$3	$87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$238**
Power Smart Energy Manager	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$77	$115	$86	$108	$22	$0	$0	$0	$13	**$422**
Infared Heat Lamps Program	-	$12	$195	$23	$4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$233**
Livestock Waterer Program	-	-	-	-	-	$111	$98	$70	$18	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$301**
Street Light Program	-	$74	$1,015	$1,459	$1,364	$1,053	$13	-	$36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$5,014**
Sentinel Light Program	-	$21	$895	$764	$803	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$2,483**
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$4	$2,487	$1,749	$4,284	$1,728	$194	$62	$44	$79	-	-	$1	-	-	**$10,469**
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$53	$43	$135	$64	$63	$59	$48	$2	-	**$466**
Commercial Air Barriers Program	-	-	-	-	$6	$20	$33	$74	$60	$3	$8	$27	$18	$15	$16	$6	$4	-	$5	-	-	-	-	-	-	-	-	**$296**
Agricultural Demand Controller Program	-	-	$22	$436	$152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$609**
HVAC - Chillers	-	-	-	-	$0	$1	$2	$61	$58	-	-	-	$6	$46	-	$122	$10	-	-	$0	-	-	-	$1	$1	$1	-	**$310**
Aboriginal Commercial Program	-	-	-	-	-	-	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	**$0**
Commercial Parking Lot Controllers	-	-	-	-	$28	$96	$158	$86	$78	$149	$17	$43	$171	$95	$250	$324	$984	$867	$568	$375	$505	$526	$282	$9	-	$1	-	**$5,610**
Commercial Spray Valves Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$36	$27	$22	$9	$5	$0	$0	$0	-	-	**$99**
Agricultural Heat Pads Program	-	-	-	-	-	-	$2	$51	$27	$71	$72	$39	$51	$59	$53	$116	$67	$62	$58	$42	$114	$98	$8	$1	$2	$3	-	**$995**
Subtotal	-	$149	$2,209	$2,705	$2,359	$1,367	$306	$343	$277	$225	$97	$109	$245	$218	$2,806	$2,318	$5,350	$2,695	$983	$659	$894	$879	$330	-	$52	$6	$13	**$27,544**
Commercial Exploratory Programs																												
Race To Reduce Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$7	**$7**
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	$1	-	-	$6	-	**$6**
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	$1	-	-	$6	$7	**$14**
COMMERCIAL TOTAL	-	$149	$2,363	$3,701	$4,482	$3,986	$2,720	$1,614	$1,497	$2,285	$1,469	$1,147	$1,534	$1,942	$6,496	$8,180	$13,099	$15,952	$14,150	$12,753	$12,953	$12,398	$10,157	$11,349	$10,681	$13,121	$26,746	**$196,923**
INDUSTRIAL																												
Performance Optimization Program	-	-	$59	$130	$170	$356	$369	$341	$504	$310	$211	$334	$861	$2,783	$1,056	$1,469	$1,569	$1,026	$3,127	$2,489	$2,890	$2,749	$2,938	$2,746	$2,173	$1,962	$1,945	**$34,570**
Subtotal	-	-	$59	$130	$170	$356	$369	$341	$504	$310	$211	$334	$861	$2,783	$1,056	$1,469	$1,569	$1,026	$3,127	$2,489	$2,890	$2,749	$2,938	$2,746	$2,173	$1,962	$1,945	**$34,570**
Discontinued/Completed																												
Industrial (Basic) Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial (GSL) Program	-	-	$43	$221	$242	$443	$780	$271	$252	$66	$9	$4	-	-	-	-	-	$35	-	-	-	-	-	-	-	-	-	**$2,366**
High Efficiency Motors Program	-	$15	$211	$522	$428	$346	$325	$361	$494	$36	$2	-	-	-	-	-	-	-	-	-	$0	-	-	-	-	-	-	**$2,741**
Emergency Preparedness Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$80	$69	$7	$1	$0	$0	$0	-	**$158**
Efficient Motors (QMR) Program	-	-	-	$16	$37	$14	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$70**
Subtotal	-	$15	$254	$759	$708	$803	$1,107	$632	$746	$102	$11	$4	-	-	-	-	-	$35	-	$81	$69	$7	$1	$0	$0	$0	-	**$5,334**
INDUSTRIAL TOTAL	-	$15	$314	$889	$878	$1,158	$1,476	$972	$1,251	$413	$222	$337	$861	$2,783	$1,056	$1,469	$1,569	$1,062	$3,127	$2,570	$2,959	$2,756	$2,939	$2,746	$2,173	$1,962	$1,945	**$39,904**
EFFICIENCY PROGRAMS SUBTOTAL	$124	$395	$3,018	$4,843	$5,714	$5,533	$4,568	$3,202	$3,439	$2,832	$1,703	$1,581	$2,645	$5,135	$8,033	$11,672	$18,375	$22,592	$23,449	$22,714	$22,563	$19,399	$17,981	$19,183	$17,625	$24,527	$42,190	**$315,034**
CUSTOMER SELF-GENERATION PROGRAMS																												
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,764	$1,556	$1,718	$1,488	$1,605	$1,721	$348	$698	$552	$448	**$11,899**
Customer Sited Load Displacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$674	$4,750	**$5,424**
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,764	$1,556	$1,718	$1,488	$1,605	$1,721	$348	$698	$1,226	$5,198	**$17,322**
RATE/LOAD MANAGEMENT PROGRAMS																												
Curtailable Rates Program	-	-	-	$60	$451	$1,124	$1,037	$1,042	$916	$1,187	$1,502	$1,974	$2,656	$4,097	$5,418	$5,574	$6,364	$6,351	$6,416	$6,345	$5,728	$5,702	$5,799	$5,762	$5,971	$5,945	$6,112	**$93,534**
Support Costs	-	$235	$2,346	$2,872	$2,089	$1,181	$1,438	$1,184	$957	$1,260	$1,835	$2,533	$2,288	$2,997	$3,055	$3,286	$3,108	$6,538	$6,399	$5,805	$5,003	$3,775	$6,870	$4,859	$3,984	$4,374	$3,429	**$83,701**
GRAND TOTAL	**$124**	**$630**	**$5,364**	**$7,774**	**$8,255**	**$7,838**	**$7,043**	**$5,428**	**$5,312**	**$5,280**	**$5,040**	**$6,088**	**$7,589**	**$12,229**	**$16,506**	**$20,532**	**$27,848**	**$37,246**	**$37,820**	**$36,582**	**$34,782**	**$30,480**	**$32,372**	**$30,152**	**$28,278**	**$36,072**	**$56,929**	**$509,592**

Note: May not add up due to rounding.

ELECTRIC DSM

APPENDIX B.4

2016 Demand Side Management Plan
Annual Administration Costs
(1989/90 - 2015/16)
(000's $)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Interim Estimate 2015/16	Cumulative 2015/16
RESIDENTIAL																												
Incentive Based																												
Home Insulation Program	-	-	-	-	$180	$279	$179	$171	$313	$35	$4	$37	$60	$61	$119	$245	$395	$270	$205	$210	$186	$212	$242	$441	$422	$658	$885	**$5,807**
Affordable Energy Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$40	-	$164	$835	$1,154	$79	$738	$840	$683	$685	$1,306	**$6,526**
Lower Income First Nations Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$5	$13	$2	$6	$39	$57	$142	$185	$190	$199	-	**$839**
Refrigerator Retirement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$11	$79	$1,163	$1,242	$1,262	$1,323	$1,705	**$6,786**
Community Geothermal Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$198	$385	$468	**$1,051**
Behavioral Energy Efficiicency Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drain Water Heat Recovery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$31	$20	**$51**
Water and Energy Saver Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$0	$17	-	-	$78	$49	$84	$255	$359	$291	$301	$431	**$1,864**
Solar Water Heater Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	-	**$2**
New Homes Program (Re-design)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$27	$1	$33	$96	**$157**
Residential LED Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$799	$697	**$1,496**
Subtotal	-	-	-	-	$180	$279	$179	$171	$313	$35	$4	$37	$60	$61	$120	$245	$456	$283	$371	$1,128	$1,439	$511	$2,540	$3,096	$3,047	$4,417	$5,608	**$24,579**
Customer Service Initiatives																												
Power Smart Residential Loan Program	-	-	-	-	-	-	-	-	-	-	-	$45	$76	$20	$9	$0	$1	$9	-$1	-$6	-$73	-$37	-$29	-$72	-$63	-$45	$64	**-$101**
Residential Earth Power Loan Program	-	-	-	-	-	-	-	-	-	-	-	-	$2	$47	$97	$343	$872	-$92	$71	$207	$160	$102	$85	$125	$258	-$46	$8	**$2,239**
ecoEnergy	-	-	-	-	-	-	-	-	-	-	-	$0	$0	$0	$0	-$10	-$42	$71	$163	-$19	$141	$101	$112	-$29	$1	$0	-	**$489**
Residential PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$27	$229	$43	$27	$130	**$455**
R-2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-	-	-	-	-	-	$45	$78	$66	$105	$333	$831	-$12	$232	$182	$229	$166	$196	$252	$239	-$64	$203	**$3,082**
Discontinued/Completed																												
Residential Appliance Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$17	$12	$9	$88	$530	$587	$402	$106	$11	$1	-	$0	$0		**$1,765**
New Homes Program	-	-	-	$27	$108	$69	$160	$93	$49	$26	$1	$15	$111	$251	$194	$262	$496	$731	$514	$531	$459	$89	$204	$33	$12	$11		**$4,446**
Aboriginal Residential Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$5	$13	-	-	-	-	-	-	-	-		**$18**
Seasonal LED Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$49	$219	$240	$271	$2	-	-	-	-	-		**$781**
Outdoor Timer Program	$93	$145	$127	$109	$46	$40	$14	$2	$7	$3	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$587**
Residential Hot Water Program	-	-	$113	-	-	-	$1	$47	$20	$12	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$195**
Water Tank Rental Program	-	-	-	-	-	-	$14	$302	$304	$59	$4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$682**
Residential Thermostats Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$8	$4	$7	$46	$23	$4	$0	-	-	-	-	-		**$92**
Residential Retrofit Program	-	$43	$18	$84	-	-	-	-	-	-	-	-	-	$12	$43	-	-	-	-	-	-	-	-	-	-	-		**$200**
Residential Applaince Buy Back Program	-	-	$18	$8	-	-	-	-	-	-	-	-	-	$14	$25	$5	$61	-	-	-	-	-	-	-	-	-		**$131**
High Efficiency Furnace and Boiler Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$3	-	-	-	-	-	-	-	-	-		**$3**
Energy Efficient Light Fixtures Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$58	$378	$309	$121	$94	$183	-	-	-		**$1,143**
Compact Fluorescent Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$18	$570	$700	$551	$655	$620	$507	$404	$2	-	-	-		**$4,026**
Subtotal	$93	$187	$277	$229	$154	$109	$190	$444	$379	$99	$8	$15	$111	$283	$256	$862	$1,452	$2,147	$2,396	$2,138	$1,196	$598	$390	$33	$12	$11	-	**$14,070**
Residential Exploratory Programs																												
LED Light Fixtures Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	-	$0	$0	-		**$1**
Residential Solar Power Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	$2	-	-	-		**$4**
Residential Air Source Heat Pumps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$13		**$13**
Residential Conservation Rates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0		**$0**
New Home Program (Re-design)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
Community Energy Plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$12	**$12**
Smart Thermostats	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$150	**$150**
Set Top Boxes Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$20	$1	-	-	-	-		**$21**
Exploratory Programs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$20	$3	$2	$0	$0	$13	$162	**$200**
RESIDENTIAL TOTAL	$93	$187	$277	$229	$334	$388	$368	$615	$692	$135	$12	$97	$249	$410	$481	$1,439	$2,739	$2,418	$3,000	$3,448	$2,884	$1,278	$3,128	$3,382	$3,298	$4,377	$5,973	**$41,931**
COMMERCIAL																												
Incentive Based																												
Commercial Lighting Program	-	-	$74	$592	$675	$568	$471	$330	$435	$330	$249	$273	$341	$706	$972	$1,691	$1,686	$2,036	$1,975	$1,817	$1,879	$1,850	$1,846	$1,767	$1,858	$2,417	$2,119	**$28,957**
Commercial Earth Power Program	-	-	-	-	$10	$35	$58	$27	$58	$21	$10	$32	$67	$123	$249	$131	$185	$189	$205	$129	$119	$97	$121	$82	$87	$115	$145	**$2,299**
Commercial Insulation Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$133	$137	$43	$44	$31	$30	$148	$198	$227	$79	**$1,070**
Commercial Windows Program	-	-	-	-	$5	$19	$31	$60	$58	$6	$1	$20	$11	$36	$27	$54	$49	$146	$155	$99	$114	$117	$116	$169	$184	$214	$125	**$1,817**
Internal Retrofit Program	-	-	$80	$193	$330	$404	$120	$159	$134	$179	$91	$239	$115	$242	$538	$630	$550	$4,556	$4,253	$2,609	$2,120	$1,852	$745	$812	$760	$378	$260	**$22,349**
Commercial Custom Measures Program	-	-	-	-	$14	$48	$79	$37	-	$71	$71	$65	$80	$51	$55	$8	$1	$74	$33	$204	$85	$89	$138	$11	$7	$14	$34	**$1,267**
Commercial Refrigeration Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$217	$205	$187	$93	$95	$83	$134	$120	$113	$154	$96	**$1,497**
HVAC Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$65	$20	$13	$13	$17	$16	$17	$10	$16	$78	$60	**$324**
Commercial HVAC Program - HRVs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	**$2**
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$45	$35	$13	$18	$8	$2	$9	$12	**$143**
Power Smart Shops Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$60	$237	$138	$46	-	$6	$40	$178	**$707**
Commercial Building Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	-	$168	$55	$38	$20	$17	$27	$27	$68	$77	$33	$319	**$849**
Network Energy Manager Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$20	$63	$70	$23	$6	$8	$5	$2	**$198**
New Buildings Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$95	$161	$179	$187	$37	$268	$397	$204	**$1,527**
LED Roadway Lighting Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$11	$726	$865	**$1,602**
HVAC - CO2 Sensors Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	$1	$1	$1	$2	$1	$5	$30	**$42**
Subtotal	-	-	$154	$785	$1,035	$1,074	$759	$614	$686	$607	$421	$629	$614	$1,159	$1,842	$2,514	$2,921	$7,414	$6,997	$5,247	$4,989	$4,563	$3,451	$3,239	$3,596	$4,811	$4,529	**$64,650**
Customer Service Initiatives																												
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$123	$76	$131	-	**$329**
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$123	$76	$131	-	**$329**
Discontinued/Completed																												
Commercial Comprehensive Program	-	$43	$61	$24	$3	$87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$218**
Power Smart Energy Manager	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1	-	$112	$86	$108	$22	-	$0	$0	$13	**$343**
Infared Heat Lamps Program	-	$12	$105	$23	$4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$144**
Livestock Waterer Program	-	-	-	-	-	$96	$85	$62	$18	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$265**
Street Light Program	-	$74	$1,015	$1,459	$1,364	$1,053	$13	-	$36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$5,014**
Sentinel Light Program	-	$21	$895	$764	$803	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$2,483**
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	$4	$1,803	$911	$895	$409	$52	$62	$44			$7	$1	-	-	**$3,995**
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$34	$38	$41	$35	$29	$22	$2	-	**$200**
Commercial Air Barriers Program	-	-	-	-	$6	$20	$33	$60	$58	$1	$1	$14	$9	$8	$8	$4	$1	-	$1	-	-	-	-	-	-	-	-	**$224**
Agricultural Demand Controller Program	-	-	$22	$314	$109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$445**
HVAC - Chillers	-	-	-	-	$0	$1	$2	$60	$58	-	-	-	$2	$17	-	$10	$2	-	-	$0	-	-	-	-	$1	$1	-	**$155**
Aboriginal Commercial Program	-	-	-	-	-	-	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	**$0**
Commercial Parking Lot Controllers	-	-	-	-	$28	$96	$158	$60	$58	$53	$4	$26	$130	$76	$188	$254	$455	$168	$113	$141	$144	$79	$31	$1	-	$1	-	**$2,262**
Commercial Spray Valves Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$12	$14	$5	$6	$1	$0	$0	$0	-	-	**$39**
Agricultural Heat Pads Program	-	-	-	-	-	-	$2	$51	$27	$32	$24	$17	$20	$27	$23	$72	$40	$40	$27	$18	$31	$27	$8	$1	$2	$3	-	**$491**
Subtotal	-	$149	$2,099	$2,583	$2,316	$1,353	$293	$293	$256	$89	$29	$57	$161	$132	$2,022	$1,251	$1,394	$630	$207	$372	$349	$177		$37	$25	$6	$13	**$16,274**
Commercial Exploratory Programs																												
Race To Reduce Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$7	**$7**
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	$1	-	-	$6	-	**$6**
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	$1	-	-	$6	$7	**$14**
COMMERCIAL TOTAL	-	$149	$2,253	$3,368	$3,351	$2,427	$1,052	$907	$941	$696	$450	$686	$775	$1,291	$3,864	$3,765	$4,314	$8,044	$7,204	$5,620	$5,338	$4,741	$3,432	$3,399	$3,697	$4,954	$4,550	**$81,267**
INDUSTRIAL																												
Performance Optimization Program	-	-	$59	$130	$170	$250	$188	$226	$207	$161	$177	$170	$244	$1,680	$350	$172	$311	$373	$481	$575	$438	$395	$409	$356	$367	$371	$375	**$8,637**
Subtotal	-	-	$59	$130	$170	$250	$188	$226	$207	$161	$177	$170	$244	$1,680	$350	$172	$311	$373	$481	$575	$438	$395	$409	$356	$367	$371	$375	**$8,637**
Discontinued/Completed																												
Industrial (Basic) Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industrial (GSL) Program	-	-	$43	$196	$204	$153	$292	$271	$252	$36	$9	$4	-	-	-	-	-	$35	-	-	-	-	-	-	-	-	-	**$1,494**
High Efficiency Motors Program	-	$15	$186	$239	$190	$169	$185	$206	$265	$36	$2	-	-	-	-	-	-	-	-	$0	-	-	-	-	-	-	-	**$1,494**
Emergency Preparedness Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$80	$69	$7	$1	$0	$0	$0	-	**$158**
Efficient Motors (QMR) Program	-	-	-	$16	$37	$14	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$70**
Subtotal	-	$15	$229	$450	$431	$336	$480	$477	$517	$73	$11	$4	-	-	-	-	-	$35	-	$81	$69	$7	$1	$0	$0	$0	-	**$3,216**
INDUSTRIAL TOTAL	-	$15	$288	$580	$601	$586	$669	$703	$724	$234	$188	$174	$244	$1,680	$350	$172	$311	$409	$481	$656	$508	$402	$410	$357	$367	$371	$375	**$11,853**
EFFICIENCY PROGRAMS SUBTOTAL	$93	$351	$2,818	$4,177	$4,286	$3,401	$2,089	$2,225	$2,358	$1,065	$650	$957	$1,269	$3,380	$4,696	$5,376	$7,364	$10,871	$10,684	$9,723	$8,729	$6,420	$6,970	$7,138	$7,362	$9,702	$10,897	**$135,051**
CUSTOMER SELF-GENERATION PROGRAMS																												
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,764	$1,556	$73	$286	$306	$520	$348	$13	$537	$360	**$5,764**
Customer Sted Load Displacement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$371	$750	**$1,121**
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,764	$1,556	$73	$286	$306	$520	$348	$13	$909	$1,110	**$6,886**
RATE/LOAD MANAGEMENT PROGRAMS																												
Curtailable Rates Program	-	-	-	$60	$87	$156	$55	$39	$37	$27	$28	$28	$8	$8	$12	$15	$9	$7	$9	$5	$6	$7	$9	$5	$5	$5	$4	**$630**
Support Costs	-	$235	$2,346	$2,872	$2,089	$1,181	$1,438	$1,184	$957	$1,260	$1,835	$2,533	$2,288	$2,997	$3,055	$3,286	$3,108	$6,538	$6,399	$5,805	$5,003	$3,775	$6,870	$4,859	$3,984	$4,374	$3,429	**$83,701**
GRAND TOTAL	**$93**	**$586**	**$5,165**	**$7,108**	**$6,462**	**$4,737**	**$3,581**	**$3,448**	**$3,352**	**$2,352**	**$2,512**	**$3,517**	**$3,565**	**$6,386**	**$7,763**	**$8,677**	**$10,481**	**$19,180**	**$18,648**	**$15,607**	**$14,025**	**$10,509**	**$14,369**	**$12,351**	**$11,364**	**$14,990**	**$15,440**	**$226,268**

Note: May not add up due to rounding.

ELECTRIC DSM

APPENDIX B.5

2016 Demand Side Management Plan
Annual Incentive Costs
(1989/90 - 2015/16)
($000's $)

		1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Interim Estimate 2015/16	Cumulative 2015/16
RESIDENTIAL																													
Incentive Based																													
Home Insulation Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$431	$636	$1,523	$1,269	$1,455	$1,478	$1,144	$1,016	$826	$687	$1,133	$1,048	**$12,647**
Affordable Energy Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$96	$39	$296	$746	$592	$64	$88	$62	$1,298	$3,711	**$6,993**
Lower Income First Nations Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Refrigerator Retirement Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$319	$361	$358	$370	$536	**$1,943**
Community Geothermal Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$245	$236	$208	**$689**
Behavioral Energy Efficiency Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Drain Water Heat Recovery		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$30	$12	**$42**
Water and Energy Saver Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$370	$184	$417	$119	$137	$197	**$1,426**
Solar Water Heater Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
New Homes Program (Re-design)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Residential LED Lighting Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,862	$1,813	**$3,675**
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$431	$636	$1,619	$1,308	$1,752	$2,224	$2,106	$1,583	$1,693	$1,472	$5,066	$7,526	**$27,416**
Discontinued/Completed																													
Residential Appliance Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$922	$1,295	$1,307	$288	$0	-	$1	-	-	-	**$3,812**
New Homes Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$10	$61	$120	$108	$100	$112	$120	$46	$12	-	-	-	**$689**
Aboriginal Residential Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Seasonal LED Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$29	$149	$109	$66	$21	-	-	-	-	-	-	**$373**
Outdoor Timer Program		$31	$45	$40	$24	$21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$161**
Residential Hot Water Program		-	-	$6	-	-	-	-	$0	$0	$0	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$6**
Water Tank Rental Program		-	-	-	-	-	-	-	-	-	$0	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$0**
Residential Thermostats Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$21	$10	$5	-	-	-	-	-	-	-	**$36**
Residential Retrofit Program		-	-	-	-	-	-	$3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$3**
Residential Applaince Buy Back Program		-	-	$17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$23	-	-	-	-	-	-	-	-	-	**$40**
High Efficiency Furnace and Boiler Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Energy Efficient Light Fixtures Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$88	$100	$69	$62	$147	$128	-	-	-	-	**$595**
Compact Fluorescent Lighting Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$141	$243	$218	$243	$643	$1,061	$593	-	-	-	-	-	**$3,143**
	Subtotal	$31	$45	$64	$24	$21	-	$3	$0	-	$0	-	-	-	-	-	$151	$333	$1,541	$1,865	$2,191	$1,543	$860	$174	$13	-	-	-	**$8,859**
Residential Exploratory Programs																													
LED Light Fixtures Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Residential Solar Power Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Residential Air Source Heat Pumps		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	**$0**
Residential Conservation Rates		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
New Home Program (Re-design)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Community Energy Plan		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Smart Thermostats		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Set Top Boxes Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Exploratory Programs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-	**$0**
RESIDENTIAL TOTAL		$31	$45	$64	$24	$21	-	$3	$0		$0		-	-	-	-	$582	$969	$3,161	$3,172	$3,943	$3,767	$2,966	$1,757	$1,705	$1,472	$5,067	$7,526	**$36,275**
COMMERCIAL																													
Incentive Based																													
Commercial Lighting Program		-	-	-	$211	$1,088	$1,545	$1,655	$575	$347	$1,241	$469	$266	$512	$327	$1,382	$3,070	$4,194	$4,842	$5,267	$5,861	$5,325	$4,754	$4,503	$6,005	$4,784	$4,777	$5,910	**$68,910**
Commercial Earth Power Program		-	-	-	-	-	-	-	$23	$114	$70	$97	$58	$74	$122	$308	$114	$285	$406	$137	$91	$261	$199	$169	$183	$81	$77	$85	**$2,953**
Commercial Insulation Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$69	$111	$193	$183	$233	$202	$304	$319	$359	$353	**$2,327**
Commercial Windows Program		-	-	-	-	-	-	-	$37	$72	$42	$34	$42	$46	$97	$77	$162	$245	$226	$214	$339	$887	$1,092	$871	$759	$629	$601	$359	**$6,832**
Internal Retrofit Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$447	**$447**
Commercial Custom Measures Program		-	-	-	-	-	-	-	$23	-	$100	$352	$43	$43	$18	$81	$3	$6	$39	$149	$33	$123	$140	$99	$46	$7	$4	$45	**$1,353**
Commercial Refrigeration Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$87	$98	$81	$86	$86	$201	$494	$538	$752	$419	**$2,842**
HVAC Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$97	$172	$56	$198	$143	$295	$192	$140	$177	$296	$360	**$2,126**
Commercial HVAC Program - HRVs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Commercial Kitchen Appliances Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$44	$47	$23	$13	$3	$2	$9	$59	**$200**
Power Smart Shops Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	$3	-	$0	-	-	$46	**$52**
Commercial Building Optimization Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$7	$9	$9	$13	$24	$48	-	$11	**$121**
Network Energy Manager Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	-	$4	$12	-	-	$47	$10		**$76**
New Buildings Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$2	$135	-	-	$109	$111	$79	$325	$949	$1,239	**$2,949**
LED Roadway Lighting Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$12,833	**$12,833**
HVAC - CO2 Sensors Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	$0	$1	$1	$0	$2	$29	**$32**
	Subtotal	-	-	-	$211	$1,088	$1,545	$1,655	$658	$533	$1,452	$951	$408	$674	$564	$1,848	$3,349	$4,828	$5,843	$6,170	$6,846	$7,070	$6,955	$6,376	$8,037	$6,957	$7,835	$22,197	**$104,054**
Discontinued/Completed																													
Commercial Comprehensive Program		-	-	$20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$20**
Power Smart Energy Manager		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$77	$3	-	-	-	$0	-	-		**$80**
Infared Heat Lamps Program		-	-	$90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$90**
Livestock Waterer Program		-	-	-	-	-	$15	$13	$8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$36**
Street Light Program		-	-	-	$0	-	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$0**
Sentinel Light Program		-	-	-	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$0**
City Of Winnipeg Power Smart Agreement Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	$684	$839	$3,389	$1,320	$142	-	-	$157	$71		-	-		**$6,474**
Commercial Clothes Washers Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$53	$9	$98	$23	$28	$30	$26	-		**$267**
Commercial Air Barrier Program		-	-	-	-	-	-	-	$14	$2	$2	$8	$13	$9	$7	$8	$2	$2	-	$5	-	-	-	-	-	-	-		**$72**
Agricultural Demand Controller Program		-	-	-	$122	$43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**$164**
HVAC - Chillers		-	-	-	-	-	-	-	$1	$0	-	-	-	$3	$29	-	$112	$8	-	-	-	-	-	-	$1	-	-		**$154**
Aboriginal Commercial Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-		**$0**
Commercial Parking Lot Controllers		-	-	-	-	-	-	-	$26	$20	$96	$13	$17	$41	$20	$62	$70	$530	$699	$455	$234	$361	$447	$250	$9	-	-		**$3,348**
Commercial Spray Valves Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$24	$13	$17	$3	$4	-	$0	-	-		**$60**
Agricultural Heat Pads Program		-	-	-	-	-	-	-	-	-	$39	$49	$22	$31	$31	$29	$44	$27	$22	$32	$24	$83	$71	-	-	-	-		**$504**
	Subtotal	-	-	$110	$122	$43	$15	$13	$50	$22	$136	$69	$52	$84	$87	$783	$1,066	$3,956	$2,065	$776	$287	$545	$702	$350		$26	-	-	**$11,270**
Commercial Exploratory Programs																													
Race To Reduce Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Heat Recovery Ventilation Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
COMMERCIAL TOTAL		-	-	$110	$333	$1,131	$1,560	$1,668	$707	$555	$1,589	$1,020	$461	$759	$651	$2,631	$4,416	$8,784	$7,908	$6,946	$7,133	$7,615	$7,658	$6,726	$7,949	$6,984	$7,835	$22,197	**$115,324**
INDUSTRIAL																													
Performance Optimization Program		-	-	-	-	-	$106	$181	$115	$297	$149	$34	$163	$617	$1,103	$706	$1,298	$1,258	$653	$2,646	$1,914	$2,452	$2,354	$2,529	$2,389	$1,807	$1,591	$1,570	**$25,932**
	Subtotal	-	-	-	-	-	$106	$181	$115	$297	$149	$34	$163	$617	$1,103	$706	$1,298	$1,258	$653	$2,646	$1,914	$2,452	$2,354	$2,529	$2,389	$1,807	$1,591	$1,570	**$25,932**
Discontinued/Completed																													
Industrial (Basic) Program																													-
Industrial (GSL) Program		-	-	-	$26	$38	$290	$488	-	-	$30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$871**
High Efficiency Motors Program		-	-	$25	$283	$238	$177	$139	$155	$229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1,247**
Emergency Preparedness Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Efficient Motors (QMR) Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
	Subtotal	-	-	$25	$309	$277	$467	$627	$155	$229	$30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$2,118**
INDUSTRIAL TOTAL		-	-	$25	$309	$277	$572	$808	$269	$526	$179	$34	$163	$617	$1,103	$706	$1,298	$1,258	$653	$2,646	$1,914	$2,452	$2,354	$2,529	$2,389	$1,807	$1,591	$1,570	**$28,051**
EFFICIENCY PROGRAMS SUBTOTAL		$31	$45	$199	$666	$1,428	$2,132	$2,479	$977	$1,081	$1,767	$1,053	$624	$1,376	$1,754	$3,337	$6,296	$11,011	$11,722	$12,765	$12,990	$13,834	$12,978	$11,012	$12,044	$10,262	$14,493	$31,292	**$179,650**
CUSTOMER SELF-GENERATION PROGRAMS																													
Bioenergy Optimization Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,645	$1,201	$1,298	$1,201	-	$685	$15	$88	**$6,134**
Customer Sited Load Displacement		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$302	$4,000	**$4,302**
	Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,645	$1,201	$1,298	$1,201	-	$685	$317	$4,088	**$10,437**
RATE/LOAD MANAGEMENT PROGRAMS																													
Curtailable Rates Program		-	-	-	-	$364	$968	$982	$1,004	$879	$1,161	$1,474	$1,946	$2,648	$4,089	$5,406	$5,559	$6,356	$6,344	$6,407	$6,340	$5,722	$5,695	$5,790	$5,757	$5,966	$5,940	$6,108	**$92,904**
GRAND TOTAL		**$31**	**$45**	**$199**	**$666**	**$1,792**	**$3,100**	**$3,461**	**$1,980**	**$1,960**	**$2,928**	**$2,527**	**$2,570**	**$4,024**	**$5,844**	**$8,743**	**$11,855**	**$17,367**	**$18,066**	**$19,172**	**$20,975**	**$20,756**	**$19,972**	**$18,003**	**$17,801**	**$16,914**	**$20,751**	**$41,489**	**$282,990**

Note: May not add up due to rounding.

Demand Side
Management Plan
2016/17

SUPPLEMENTAL REPORT:
15 yr (2016 to 2031)

APPENDIX C - 2016 DEMAND SIDE MANAGEMENT PLAN - NATURAL GAS

Appendix C.1 - Annual Energy Savings (million m^3)

Appendix C.2 - Annual Utility Costs

Appendix C.3 - Annual Program Administration Costs

Appendix C.4 - Annual Program Incentive Costs

NATURAL GAS DSM

APPENDIX C.1

2016 Demand Side Management Plan
Annual Energy Savings (million m^3)

		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	2030/31	
RESIDENTIAL																	
Incentive Based																	
New Homes Program		0.0	0.1	0.2	0.4	0.6	1.4	2.1	2.9	3.7	4.5	5.2	5.9	6.6	7.3	**7.8**	
Home Insulation Program		0.7	1.3	1.9	2.6	3.2	3.8	4.3	4.9	5.4	5.9	6.4	6.4	6.4	6.4	**6.4**	
Affordable Energy Program		1.3	2.6	3.8	4.9	5.4	5.8	6.1	6.2	6.1	6.0	5.9	5.9	6.3	6.6	**6.9**	
Water and Energy Saver Program		0.7	1.2	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**	
Appliances		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**	
HRV Controls		0.2	0.5	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**	
Smart Thermostats		0.1	0.1	0.1	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	3.0	5.8	8.3	10.3	11.5	13.2	14.9	16.4	17.6	18.8	19.9	20.6	21.7	22.7	**23.5**	41%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart Residential Loan		0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.1	3.5	3.9	4.2	4.6	5.0	5.3	**5.7**	
Power Smart PAYS Financing		-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	**-0.3**	
Residential Earth Power Loan		0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	**0.3**	
	Subtotal	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.1	3.5	3.9	4.3	4.6	5.0	5.4	**5.7**	10%
COMMERCIAL																	
Incentive Based																	
Commercial Building Envelope - Windows Program		0.3	0.5	0.7	1.0	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.5	3.8	4.1	**4.5**	
Commercial Building Envelope - Insulation Program		1.1	2.2	3.0	3.8	4.6	5.4	6.1	6.9	7.8	8.6	9.4	10.2	11.0	11.8	**12.6**	
Commercial HVAC Program - Boilers		1.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	3.0	3.1	3.1	3.1	3.1	**3.1**	
Commercial HVAC Program - CO2 Sensors		0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.2	1.2	1.1	1.1	1.1	1.0	**1.0**	
Commercial HVAC Program - HRVs		0.0	0.1	0.3	0.5	0.8	1.1	1.4	1.9	2.3	2.9	3.5	4.1	4.8	5.6	**6.4**	
Commercial HVAC Program - Water Heaters		0.1	0.2	0.4	0.6	0.8	1.1	1.3	1.7	2.0	2.4	2.4	2.4	2.3	2.2	**2.1**	
Commercial Custom Measures Program		0.1	0.2	0.3	0.5	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8	2.0	**2.2**	
Commercial Building Optimization Program		0.0	0.2	0.4	0.6	0.9	1.2	1.4	1.7	2.0	2.4	2.7	2.9	3.2	3.5	**3.7**	
New Buildings Program		0.1	0.3	0.4	0.5	0.6	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.1	3.5	**3.8**	
Commercial Kitchen Appliance Program		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	**0.3**	
Internal Retrofit Program		-	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	**0.1**	
Power Smart Energy Manager		-	-	0.0	0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.3	**1.3**	
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**	
Race to Reduce		0.3	0.5	0.7	0.8	0.6	-	-	-	-	-	-	-	-	-	**-**	
	Subtotal	3.5	6.9	9.2	11.6	13.8	15.9	18.8	21.9	24.9	28.0	30.8	33.5	36.0	38.6	**41.2**	72%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing		0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**0.3**	
	Subtotal	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**0.3**	0%
INDUSTRIAL																	
Natural Gas Optimization Program		1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	**14.0**	
	Subtotal	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	**14.0**	24%
ENERGY EFFICIENCY SUBTOTAL		8.0	15.6	21.8	27.6	32.5	37.6	43.6	49.6	55.2	60.9	66.2	71.0	76.0	80.9	**84.7**	147%
LOAD DISPLACEMENT & ALTERNATIVE ENERGY																	
Bioenergy Optimization Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	
Customer Sited Load Displacement		-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	
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	**-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	**-27.7**	-48%
OTHER EMERGING TECHNOLOGIES																	
Residential Solar Thermal Program - Pool Heating		-	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	**0.5**	
OTHER EMERGING TECHNOLOGIES SUBTOTAL		-	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	**0.5**	1%
Impacts		8.0	10.0	10.8	11.0	10.4	10.0	16.0	22.0	27.7	33.4	38.8	43.6	48.6	53.6	**57.5**	100%
Interactive Effects		-3.5	-5.8	-7.7	-8.8	-10.1	-11.1	-11.8	-12.4	-13.0	-13.5	-13.5	-13.7	-14.4	-15.1	**-15.8**	
	Subtotal	4	4	3	2	0	-1	4	10	15	20	25	30	34	39	**42**	
Codes, Standards & Regulations		4	9	14	18	23	28	33	38	43	48	53	58	63	68	**73**	
POWER SMART 2016 to 2030 Impacts		9	13	17	21	23	27	37	48	58	68	78	88	97	107	**115**	
POWER SMART SAVINGS TO DATE																	
Incentive Based Program Impacts		77	77	77	77	76	76	76	76	76	76	76	76	76	76	**76**	
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		-17	-17	-18	-18	-18	-18	-17	-17	-15	-15	-15	-15	-15	-15	**-15**	
Impacts of Codes & Standards		22	22	22	22	22	22	22	22	22	22	22	22	22	22	**22**	
TOTAL m^3 (at meter)		**120**	**124**	**127**	**131**	**134**	**137**	**147**	**159**	**170**	**181**	**191**	**201**	**210**	**219**	**227**	

Note: May not add up due to rounding.

NATURAL GAS DSM

2016 Demand Side Management Plan
Annual Utility Costs (000's $)

APPENDIX C.2

	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	2030/31	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Homes Program	$41	$44	$51	$54	$15	-	-	-	-	-	-	-	-	-	-	$205	
Home Insulation Program	$1,769	$1,295	$1,296	$1,285	$1,235	$1,203	$1,179	$1,090	$1,104	$1,073	$1,053	$91	-	-	-	$13,673	
Affordable Energy Program	$3,841	$3,752	$3,566	$3,390	$3,196	$3,087	$2,991	$2,907	$2,833	$2,769	$2,713	$2,665	$2,624	$2,587	$2,555	$45,475	
Water and Energy Saver Program	$835	$684	$530	-	-	-	-	-	-	-	-	-	-	-	-	$2,050	
Drain Water Heat Recovery Initiative	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Appliances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HRV Controls	$575	$565	$461	-	-	-	-	-	-	-	-	-	-	-	-	$1,601	
Smart Thermostats	$227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$227	
Community Energy Plan	$11	$21	$21	$22	$22	$14	$15	$15	$15	$15	$16	$16	$16	$17	$17	$254	
Subtotal	$7,299	$6,361	$5,925	$4,750	$4,468	$4,305	$4,185	$4,012	$3,952	$3,858	$3,781	$2,772	$2,640	$2,604	$2,572	$63,484	43%
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	$594	$552	$716	$765	$803	$855	$873	$892	$960	$981	$1,025	$1,047	$1,069	$1,092	$1,115	$13,339	
Commercial Building Envelope - Insulation Program	$1,949	$1,915	$1,586	$1,627	$1,681	$1,725	$1,781	$1,828	$1,880	$1,930	$1,970	$2,022	$2,064	$2,118	$2,163	$28,238	
Commercial HVAC Program - Boilers	$857	$881	$8	$8	$8	$8	$8	$9	$9	$9	$9	$9	$10	$10	$10	$1,852	
Commercial HVAC Program - CO2 Sensors	$233	$232	$253	$271	$301	$317	$341	$353	$2	$2	$2	$2	$2	$2	$2	$2,316	
Commercial HVAC Program - HRVs	$286	$527	$618	$669	$717	$769	$824	$952	$1,020	$1,094	$1,245	$1,322	$1,404	$1,590	$1,673	$14,711	
Commercial HVAC Program - Water Heaters	$148	$143	$163	$188	$211	$234	$269	$304	$350	$394	-	-	-	-	-	$2,402	
Commercial Custom Measures Program	$154	$157	$179	$183	$187	$191	$195	$219	$224	$229	$234	$239	$244	$272	$278	$3,183	
Commercial Building Optimization Program	$205	$259	$280	$302	$325	$331	$355	$363	$388	$397	$424	$432	$461	$490	$501	$5,514	
New Buildings Program	$153	$440	$270	$367	$469	$575	-	-	-	-	-	-	-	-	-	$2,274	
Commercial Kitchen Appliance Program	$178	$62	-	-	-	-	-	-	-	-	-	-	-	-	-	$240	
Internal Retrofit Program	-	$37	$40	-	-	-	-	-	-	-	-	-	-	-	-	$77	
Power Smart Energy Manager	$52	$115	$199	$230	$201	$137	$137	$141	$144	$147	$68	$26				$1,454	
Power Smart Shops	$21	$19	$20	$20	$21	$9	-	-	-	-	-	-	-	-	-	$110	
Race to Reduce	$69	$71	$72	$74	-	-	-	-	-	-	-	-	-	-	-	$285	
Subtotal	$4,899	$5,410	$4,402	$4,702	$4,922	$5,151	$4,785	$5,061	$4,978	$5,182	$4,977	$5,100	$5,236	$5,527	$5,663	$75,995	51%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Natural Gas Optimization Program	$484	$494	$504	$515	$526	$537	$548	$560	$572	$584	$596	$609	$621	$635	-	$7,782	
Subtotal	$484	$494	$504	$515	$526	$537	$548	$560	$572	$584	$596	$609	$621	$635	-	$7,782	5%
ENERGY EFFICIENCY SUBTOTAL	$12,682	$12,265	$10,831	$9,968	$9,915	$9,992	$9,518	$9,633	$9,502	$9,623	$9,354	$8,481	$8,498	$8,765	$8,235	$147,261	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	$3	$41	$41	$44	$47	$49	$52	$56	$61	$65	$71	$77	$85	$93	$103	$888	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	$3	$41	$41	$44	$47	$49	$52	$56	$61	$65	$71	$77	$85	$93	$103	$888	1%
Subtotal of Programs	$12,685	$12,305	$10,872	$10,011	$9,962	$10,041	$9,570	$9,689	$9,563	$9,688	$9,425	$8,558	$8,583	$8,858	$8,338	$148,149	100%
Program Support	$971	$960	$951	$971	$992	$1,013	$1,034	$1,056	$1,078	$1,101	$1,124	$1,148	$1,172	$1,197	$1,222	$15,989	
Total Utility Costs (2016 to 2030)	$13,656	$13,265	$11,823	$10,982	$10,954	$11,054	$10,604	$10,745	$10,641	$10,789	$10,549	$9,706	$9,755	$10,055	$9,560	$164,138	
Total Committed to Date																$132,944	
TOTAL UTILITY COSTS (1989 to 2030)	**$13,656**	**$13,265**	**$11,823**	**$10,982**	**$10,954**	**$11,054**	**$10,604**	**$10,745**	**$10,641**	**$10,789**	**$10,549**	**$9,706**	**$9,755**	**$10,055**	**$9,560**	$297,083	

Note: May not add up due to rounding.

NATURAL GAS DSM

APPENDIX C.3

2016 Demand Side Management Plan
Annual Administration Costs (000's $)

	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	2030/31	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Homes Program	$40	$43	$48	$50	$11	-	-	-	-	-	-	-	-	-	-	$191	
Home Insulation Program	$479	$424	$427	$425	$383	$356	$338	$258	$270	$237	$213	$91	-	-	-	$3,902	
Affordable Energy Program	$614	$591	$603	$614	$590	$601	$612	$624	$636	$648	$661	$675	$689	$703	$717	$9,578	
Water and Energy Saver Program	$479	$462	$359	-	-	-	-	-	-	-	-	-	-	-	-	$1,300	
Drain Water Heat Recovery Initiative	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Appliances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HRV Controls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Smart Thermostats	$77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$77	
Community Energy Plan	$11	$21	$21	$22	$22	$14	$15	$15	$15	$15	$16	$16	$16	$17	$17	$254	
Subtotal	$1,700	$1,540	$1,458	$1,110	$1,006	$972	$965	$897	$921	$901	$890	$782	$705	$719	$734	$15,302	47%
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	$70	$109	$113	$115	$119	$121	$124	$127	$130	$133	$137	$140	$143	$146	$149	$1,874	
Commercial Building Envelope - Insulation Program	$67	$160	$177	$196	$200	$211	$216	$228	$233	$246	$251	$265	$271	$285	$291	$3,298	
Commercial HVAC Program - Boilers	$272	$278	$8	$8	$8	$8	$8	$9	$9	$9	$9	$9	$10	$10	$10	$665	
Commercial HVAC Program - CO2 Sensors	$124	$112	$116	$117	$121	$122	$124	$127	$2	$2	$2	$2	$2	$2	$2	$977	
Commercial HVAC Program - HRVs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial HVAC Program - Water Heaters	$71	$55	$53	$54	$56	$57	$58	$59	$60	$62	-	-	-	-	-	$585	
Commercial Custom Measures Program	$83	$84	$86	$88	$90	$92	$94	$96	$98	$100	$102	$104	$106	$108	$111	$1,441	
Commercial Building Optimization Program	$182	$167	$170	$174	$178	$181	$185	$189	$193	$197	$201	$206	$210	$214	$219	$2,867	
New Buildings Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial Kitchen Appliance Program	$51	$52	-	-	-	-	-	-	-	-	-	-	-	-	-	$103	
Internal Retrofit Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Power Smart Energy Manager	$52	$80	$128	$130	$133	$136	$139	$142	$145	$148	$69	$70	$72	$73	-	$1,517	
Power Smart Shops	$13	$12	$12	$12	$13	$6	-	-	-	-	-	-	-	-	-	$68	
Race to Reduce	$69	$71	$72	$74	-	-	-	-	-	-	-	-	-	-	-	$285	
Subtotal	$1,053	$1,179	$936	$968	$916	$935	$948	$976	$870	$896	$772	$796	$813	$839	$782	$13,679	42%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Natural Gas Optimization Program	$184	$187	$191	$195	$200	$204	$208	$212	$217	$222	$226	$231	$236	$241	-	$2,954	
Subtotal	$184	$187	$191	$195	$200	$204	$208	$212	$217	$222	$226	$231	$236	$241	-	$2,954	9%
ENERGY EFFICIENCY SUBTOTAL	$2,937	$2,907	$2,585	$2,273	$2,122	$2,110	$2,121	$2,085	$2,008	$2,019	$1,888	$1,809	$1,754	$1,799	$1,516	$31,935	98%
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	$3	$33	$32	$33	$34	$34	$35	$36	$37	$37	$38	$39	$40	$41	$41	$515	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	$3	$33	$32	$33	$34	$34	$35	$36	$37	$37	$38	$39	$40	$41	$41	$515	
Subtotal of Programs	$2,941	$2,940	$2,618	$2,306	$2,156	$2,145	$2,156	$2,121	$2,045	$2,056	$1,926	$1,848	$1,794	$1,840	$1,557	$32,450	100%
Program Support	$971	$960	$951	$971	$992	$1,013	$1,034	$1,056	$1,078	$1,101	$1,124	$1,148	$1,172	$1,197	$1,222	$15,989	
Total Administration Costs (2016 to 2030)	$3,912	$3,899	$3,569	$3,277	$3,148	$3,157	$3,190	$3,177	$3,123	$3,157	$3,050	$2,996	$2,967	$3,037	$2,780	$48,440	
Total Committed to Date																$61,931	
TOTAL ADMINISTRATION COSTS (1989 to 2030)	**$3,912**	**$3,899**	**$3,569**	**$3,277**	**$3,148**	**$3,157**	**$3,190**	**$3,177**	**$3,123**	**$3,157**	**$3,050**	**$2,996**	**$2,967**	**$3,037**	**$2,780**	$110,371	

Note: May not add up due to rounding.

NATURAL GAS DSM

2016 Demand Side Management Plan
Annual Incentive Costs (000's $)

APPENDIX C.4

	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	2030/31	Cumulative Total	
RESIDENTIAL																	
Incentive Based																	
New Homes Program	$1	$1	$3	$4	$4	-	-	-	-	-	-	-	-	-	-	$13	
Home Insulation Program	$1,290	$871	$869	$860	$852	$847	$841	$832	$834	$836	$839	-	-	-	-	$9,771	
Affordable Energy Program	$3,227	$3,161	$2,962	$2,776	$2,606	$2,486	$2,379	$2,283	$2,197	$2,120	$2,051	$1,991	$1,935	$1,884	$1,838	$35,897	
Water and Energy Saver Program	$356	$222	$171	-	-	-	-	-	-	-	-	-	-	-	-	$750	
Drain Water Heat Recovery Initiative	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Appliances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
HRV Controls	$575	$565	$461	-	-	-	-	-	-	-	-	-	-	-	-	$1,601	
Smart Thermostats	$150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$150	
Community Energy Plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	$5,598	$4,821	$4,466	$3,640	$3,462	$3,333	$3,220	$3,115	$3,031	$2,957	$2,891	$1,991	$1,935	$1,884	$1,838	$48,182	42%
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	$524	$443	$603	$650	$684	$734	$749	$765	$830	$848	$889	$907	$927	$946	$966	$11,466	
Commercial Building Envelope - Insulation Program	$1,882	$1,755	$1,408	$1,432	$1,481	$1,513	$1,565	$1,600	$1,647	$1,683	$1,719	$1,757	$1,794	$1,833	$1,872	$24,941	
Commercial HVAC Program - Boilers	$584	$603	-	-	-	-	-	-	-	-	-	-	-	-	-	$1,187	
Commercial HVAC Program - CO2 Sensors	$109	$120	$137	$154	$180	$195	$217	$227	-	-	-	-	-	-	-	$1,338	
Commercial HVAC Program - HRVs	$286	$527	$618	$669	$717	$769	$824	$952	$1,020	$1,094	$1,245	$1,322	$1,404	$1,590	$1,673	$14,711	
Commercial HVAC Program - Water Heaters	$77	$88	$109	$133	$155	$178	$211	$244	$290	$332	-	-	-	-	-	$1,817	
Commercial Custom Measures Program	$71	$73	$93	$95	$97	$99	$101	$124	$126	$129	$132	$135	$137	$164	$167	$1,742	
Commercial Building Optimization Program	$24	$92	$110	$128	$147	$150	$170	$174	$195	$199	$222	$227	$251	$276	$282	$2,647	
New Buildings Program	$153	$440	$270	$367	$469	$575	-	-	-	-	-	-	-	-	-	$2,274	
Commercial Kitchen Appliance Program	$126	$10	-	-	-	-	-	-	-	-	-	-	-	-	-	$137	
Internal Retrofit Program	-	$37	$40	-	-	-	-	-	-	-	-	-	-	-	-	$77	
Power Smart Energy Manager	-	$35	$72	$99	$68	$1											
Power Smart Shops	$8	$8	$8	$8	$8	$3	-	-	-	-	-	-	-	-	-	$42	
Race to Reduce	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	$3,846	$4,231	$3,467	$3,735	$4,005	$4,216	$3,837	$4,085	$4,109	$4,285	$4,206	$4,303	$4,423	$4,688	$4,881	$62,315	54%
Customer Service Initiatives / Financial Loan Programs																	
Power Smart for Business PAYS Financing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
INDUSTRIAL																	
Natural Gas Optimization Program	$300	$306	$313	$319	$326	$333	$340	$347	$355	$362	$370	$378	$386	$394	-	$4,828	
Subtotal	$300	$306	$313	$319	$326	$333	$340	$347	$355	$362	$370	$378	$386	$394	-	$4,828	4%
ENERGY EFFICIENCY SUBTOTAL	$9,744	$9,358	$8,246	$7,694	$7,793	$7,882	$7,397	$7,547	$7,494	$7,604	$7,466	$6,671	$6,744	$6,966	$6,719	$115,326	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	$14	$17	$20	$24	$28	$33	$38	$45	$52	$62	$373	
OTHER EMERGING TECHNOLOGIES SUBTOTAL	-	$8	$9	$11	$13	$14	$17	$20	$24	$28	$33	$38	$45	$52	$62	$373	0%
Subtotal of Programs	$9,744	$9,366	$8,255	$7,705	$7,806	$7,896	$7,414	$7,568	$7,518	$7,632	$7,499	$6,710	$6,789	$7,018	$6,781	$115,699	100%
Program Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Incentive Costs (2016 to 2030)	$9,744	$9,366	$8,255	$7,705	$7,806	$7,896	$7,414	$7,568	$7,518	$7,632	$7,499	$6,710	$6,789	$7,018	$6,781	$115,699	
Total Committed to Date																$71,147	
TOTAL INCENTIVE COSTS (1989 to 2030)	**$9,744**	**$9,366**	**$8,255**	**$7,705**	**$7,806**	**$7,896**	**$7,414**	**$7,568**	**$7,518**	**$7,632**	**$7,499**	**$6,710**	**$6,789**	**$7,018**	**$6,781**	$186,846	

Note: May not add up due to rounding.

Demand Side
Management Plan
2016/17

SUPPLEMENTAL REPORT:
15 yr (2016 to 2031)

APPENDIX D - HISTORICAL SAVINGS & COSTS – NATURAL GAS

Appendix D.1 - Annual Energy Savings (million m^3)

Appendix D.2 - Annual Utility Costs

Appendix D.3 - Annual Program Administration Costs

Appendix D.4 - Annual Program Incentive Costs

NATURAL GAS DSM

2016 Demand Side Management Plan
Annual Energy Savings
(Savings to Date)
(million m^3)

APPENDIX D.1

	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	2014/15	Interim Estimate 2015/16	Benchmark 2030/31
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	13.3	**13.3**
Affordable Energy Program	-	-	-	-	-	-	0.0	0.1	0.7	2.3	3.5	4.6	5.772	7.2	8.2	**8.2**
Water and Energy Saver Program	-	-	-	-	-	-	-	-	-	0.8	1.8	2.8	3.4	3.9	4.5	**4.5**
	-	-	-	-	0.3	2.2	3.9	5.6	8.3	12.2	15.4	18.7	21.1	23.8	26.1	**26.1**
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	15.7	**15.7**
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	3.0	3.1	**3.1**
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	**2.3**
Solar Water Heater Program	-	-	-	-	-	-	-	-	0.0	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	**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	**0.3**
Residential PAYS	-	-	-	-	-	-	-	-	-	-	-	-0.0	-0.0	-0.0	-0.1	**-0.1**
	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	21.1	21.5	**21.5**
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	**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	**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	**0.6**
	-	-	-	0.0	0.7	2.9	4.4	6.3	7.5	7.7	7.7	7.7	7.7	7.7	7.7	**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	52.6	55.3	**55.3**
COMMERCIAL																
Incentive Based																
Commercial Insulation Program	-	-	-	-	-	0.3	1.1	2.1	3.2	5.4	6.8	7.8	9.2	11.0	12.3	**12.3**
Commercial Windows Program	-	-	-	-	-	0.0	0.1	0.2	0.5	0.8	1.3	1.6	1.9	2.4	2.6	**2.6**
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	0.1	0.2	0.3	1.4	1.5	1.5	1.9	**1.9**
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	**0.8**
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	0.0	0.0	0.1	0.1	0.1	0.1	0.4	1.0	**1.0**
Power Smart Shops Program	-	-	-	-	-	-	-	-	0.0	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	0.6	**-**
New Buildings Program	-	-	-	-	-	-	-	-	-	-	0.4	2.8	2.9	3.0	3.6	**3.6**
HVAC-Boiler	-	-	-	-	-	0.4	2.5	4.8	6.2	6.2	7.2	8.2	9.5	10.6	11.5	**11.5**
HVAC-CO2 Sensor	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	0.5	0.6	**0.6**
HVAC-Hot Water Heater															0.1	**0.1**
Internal Retrofit Program	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	**0.0**
	-	0.1	0.1	0.2	0.6	1.4	4.4	8.0	11.0	13.8	17.2	23.4	26.6	31.0	35.0	**34.4**
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	**0.0**
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	**0.0**
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	31.0	35.0	**34.4**
INDUSTRIAL																
Natural Gas Optimization Prorgram	-	-	-	-	-	-	1.7	3.8	4.9	8.0	10.5	12.5	13.4	14.9	15.4	**15.4**
	-	-	-	-	-	-	1.7	3.8	4.9	8.0	10.5	12.5	13.4	14.9	15.4	**15.4**
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	98.4	105.7	**105.1**
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	-14.8	-17.6	**-14.7**
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	83.6	88.1	**90.4**
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	19.0	22.4	**22.4**
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**	**102.6**	**110.5**	**112.8**

Note: May not add up due to rounding.

NATURAL GAS DSM

APPENDIX D.2

2016 Demand Side Managment Plan
Annual Utility Costs
(2001/02 - 2015/16)
(000's $)

		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	2014/15	Interim Estimate 2015/16	Cumulative Total 2015/16
RESIDENTIAL																	
Incentive Based																	
Home Insulation Program		-	-	-	-	$357	$1,776	$2,899	$2,735	$2,925	$2,215	$2,108	$1,414	$1,117	$1,352	$1,105	**$20,002**
Affordable Energy Program		-	-	-	-	$74	-	$160	$466	$1,542	$4,424	$5,025	$5,451	$5,159	$7,717	$2,174	**$32,193**
Solar Water Heater Program		-	-	-	-	-	-	-	-	-	$0	$0	$1	$1	$1	-	**$4**
Water and Energy Saver Program		-	-	-	-	-	-	-	-	$40	$681	$1,026	$777	$761	$813	$1,128	**$5,227**
	Subtotal	-	-	-	-	$431	$1,776	$3,059	$3,201	$4,507	$7,320	$8,160	$7,643	$7,039	$9,882	$4,407	**$57,425**
CUSTOMER SERVICE INITIATIVES																	
Power Smart Residential Loan Program		$431	$112	$50	-$5	$15	$179	-$22	-$108	-$655	-$702	-$545	-$646	-$563	-$404	$454	**-$2,408**
Residential Earth Power Loan Program		-	-	-	-	-	-	-	-	-	-	$36	$53	$111	-$20	$38	**$219**
ecoEnergy		$248	$287	$289	$346	-$10	$637	$489	-$108	$566	$382	$470	-$116	$2	$0	-	**$3,481**
Solar Heater		-	-	-	-	-	-	-	$0	$2	-	-	-	-	-	-	**$2**
Residential PAYS		-	-	-	-	-	-	-	-	-	-	$18	$425	$90	$91	-	**$624**
	Subtotal	$679	$398	$339	$341	$5	$816	$467	-$216	-$88	-$320	-$21	-$283	-$360	-$333	$492	**$1,917**
DISCONTINUED/COMPLETED																	
Residential Thermostats Program		-	-	-	-	-	$186	$128	$38	$1	-	-	-	-	-	-	**$352**
New Homes Program		-	$11	$67	$85	$58	$90	$135	$0	$86	$108	$64	$5	-	-	-	**$709**
High Efficiency Furnace and Boiler Program		-	-	-	-	$551	$1,272	$2,064	$3,147	$1,521	$31	-	-	-	-	-	**$8,587**
	Subtotal	-	$11	$67	$85	$609	$1,549	$2,327	$3,185	$1,608	$138	$64	$5	-	-	-	**$9,649**
RESIDENTIAL TOTAL		$679	$409	$407	$426	$1,046	$4,141	$5,853	$6,170	$6,027	$7,138	$8,202	$7,365	$6,679	$9,550	$4,899	**$68,991**
COMMERCIAL																	
Incentive Based																	
Commercial Insulation Program		-	-	-	-	-	$404	$803	$1,004	$1,234	$2,190	$1,755	$1,110	$1,728	$2,071	$1,603	**$13,903**
Commercial Windows Program		-	-	-	-	-	$124	$273	$459	$774	$990	$1,095	$798	$964	$1,244	$713	**$7,434**
Commercial Custom Measures Program		-	-	-	-	-	-	-	-	$139	$153	$158	$506	$264	$154	$366	**$1,740**
City Of Winnipeg Power Smart Agreement Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Commercial Kitchen Appliances Program		-	-	-	-	-	-	-	$16	$54	$29	$47	$27	$15	$162	$233	**$583**
Power Smart Shops Program		-	-	-	-	-	-	$1	$15	$80	$94	$12	$0	$1	$4	$8	**$215**
Commercial Building Optimization Program		-	-	-	-	$72	$221	$154	$156	$232	$203	$118	$92	$125	$76	-	**$1,450**
New Buildings Program		-	-	-	-	-	-	-	$142	$107	$192	$199	$1,045	$198	$336	$1,443	**$3,662**
HVAC - Boiler Program		-	-	-	-	$99	$584	$1,612	$1,371	$1,112	$1,218	$917	$1,181	$1,276	$1,282	$878	**$11,531**
HVAC - CO2 Sensor Program		-	-	-	-	-	-	-	-	-	-	-	$36	$11	$63	$51	**$161**
Commercial Hot Water Program		-	-	-	-	-	-	-	-	$22	$31	$14	$0	$2	$44	$82	**$195**
Power Smart Energy Manager		-	-	-	-	-	-	$116	$94	$70	$0	$51	$0	$1	$1	-	**$333**
	Subtotal	-	-	-	-	$171	$1,333	$2,959	$3,258	$3,825	$5,100	$4,367	$4,795	$4,584	$5,439	$5,377	**$41,207**
CUSTOMER SERVICE INITIATIVES																	
Commercial PAYS		-	-	-	-	-	-	-	-	-	-	-	$151	$92	$33	$181	**$457**
DISCONTINUED/COMPLETED																	
Commercial Spray Valves Program		-	-	-	-	-	$123	$54	$121	$27	$21	$1	$0	$0	-	-	**$347**
Commercial Clothes Washers Program		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
	Subtotal	-	-	-	-	-	$123	$54	$121	$27	$21	$1	$0	$0	-	-	**$347**
COMMERCIAL EXPLORATORY																	
Heat Recovery Ventilation Program		-	-	-	-	-	-	-	-	-	$4	$11	-	-	$6	-	**$20**
	Subtotal	-	-	-	-	-	-	-	-	-	$4	$11	-	-	$6	-	**$20**
COMMERCIAL TOTAL		-	-	-	-	$171	$1,456	$3,013	$3,379	$3,851	$5,125	$4,379	$4,946	$4,677	$5,477	$5,558	**$42,031**
INDUSTRIAL																	
Natural Gas Optimization Prorgram		-	-	-	-	$97	$35	$282	$332	$593	$696	$708	$754	$480	$587	$557	**$5,121**
	Subtotal	-	-	-	-	$97	$35	$282	$332	$593	$696	$708	$754	$480	$587	$557	**$5,121**
EFFICIENCY PROGRAMS SUBTOTAL		$679	$409	$407	$426	$1,313	$5,632	$9,147	$9,880	$10,472	$12,958	$13,290	$13,065	$11,836	$15,614	$11,014	**$116,144**
CUSTOMER SELF-GENERATION PROGRAMS																	
Bioenergy Optimization Program		-	-	-	-	-	-	$13	$8	-	-	-	-	-	-	-	**$21**
Support Costs		$5	$90	$120	$361	$1,072	$1,353	$1,318	$2,000	$1,930	$1,605	$1,767	$1,527	$1,234	$1,370	$1,028	**$16,780**
GRAND TOTAL		**$684**	**$499**	**$526**	**$787**	**$2,385**	**$6,985**	**$10,478**	**$11,888**	**$12,402**	**$14,563**	**$15,057**	**$14,592**	**$13,070**	**$16,984**	**$12,042**	**$132,944**

Note: May not add up due to rounding.

NATURAL GAS DSM

2016 Demand Side Management Plan
Annual Administration Costs
(2001/02 - 2015/16)
(000's $)

APPENDIX D.3

	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	2014/15	Interim Estimate 2015/16	Cumulative Total 2015/16
RESIDENTIAL																
Incentive Based																
Home Insulation Program	-	-	-	-	$162	$508	$743	$593	$468	$495	$519	$185	$187	$382	$313	**$4,556**
Affordable Energy Program	-	-	-	-	$74	-	$138	$128	$182	$4,096	$4,501	$5,035	$4,809	$1,778	$468	**$21,208**
Solar Water Heater Program	-	-	-	-	-	-	-	-	-	$0	$0	$1	$1	$1	-	**$4**
Water and Energy Saver Program	-	-	-	-	-	-	-	-	$40	$125	$596	$729	$540	$558	$774	**$3,363**
Subtotal	-	-	-	-	$236	$508	$881	$721	$690	$4,716	$5,616	$5,950	$5,537	$2,719	$1,555	**$29,130**
CUSTOMER SERVICE INITIATIVES																
Power Smart Residential Loan Program	$431	$112	$50	-$5	$15	$179	-$22	-$108	-$655	-$702	-$545	-$646	-$563	-$404	$454	**-$2,408**
Residential Earth Power Loan Program	-	-	-	-	-	-	-	-	-	-	$36	$53	$111	-$20	$38	**$219**
ecoEnergy	$248	$287	$289	$346	-$10	$637	$489	-$108	$566	$382	$470	-$116	$2	$0	-	**$3,481**
Solar Heater	-	-	-	-	-	-	-	$0	$2	-	-	-	-	-	-	**$2**
Residential PAYS	-	-	-	-	-	-	-	-	-	-	$18	$425	$90	$91	-	**$624**
Subtotal	$679	$398	$339	$341	$5	$816	$467	-$216	-$88	-$320	-$21	-$283	-$360	-$333	$492	**$1,917**
DISCONTINUED/COMPLETED																
Residential Thermostats Program	-	-	-	-	-	$106	$92	$18	$1	-	-	-	-	$0	-	**$217**
New Homes Program	-	$11	$67	$70	$19	$30	$48	$0	$15	-	$17	$1	-	-	-	**$279**
High Efficiency Furnace and Boiler Program	-	-	-	-	$249	$279	$437	$353	$194	$17	-	-	-	-	-	**$1,528**
Subtotal	-	$11	$67	$70	$268	$414	$578	$371	$209	$17	$17	$1	-	$0	-	**$2,024**
RESIDENTIAL TOTAL	$679	$409	$407	$411	$510	$1,739	$1,925	$876	$812	$4,413	$5,612	$5,668	$5,177	$2,387	$2,047	**$33,071**
COMMERCIAL																
Incentive Based																
Commercial Insulation Program	-	-	-	-	-	$72	$74	$172	$174	$218	$270	$114	$93	$136	$220	**$1,543**
Commercial Windows Program	-	-	-	-	-	$78	$83	$121	$140	$167	$174	$99	$69	$104	$195	**$1,229**
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	$57	$59	$92	$95	$139	$123	$157	**$721**
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	$8	$23	$10	$27	$19	$9	$83	$40	**$220**
Power Smart Shops Program	-	-	-	-	-	-	$1	$15	$79	$92	$12	-	$1	$4	$6	**$211**
Commercial Building Optimization Program	-	-	-	-	$72	$221	$154	$115	$153	$152	$80	$68	$77	$76	-	**$1,168**
New Buildings Program	-	-	-	-	-	-	-	$142	$107	$119	$125	$337	$89	$99	$204	**$1,222**
HVAC - Boiler Program	-	-	-	-	$99	$273	$289	$249	$344	$259	$288	$302	$304	$377	$212	**$2,996**
HVAC - CO2 Sensor Program	-	-	-	-	-	-	-	-	-	-	-	$25	$10	$46	$13	**$94**
Commercial Hot Water Program	-	-	-	-	-	-	-	-	$22	$31	$14	-	$2	$44	$54	**$167**
Power Smart Energy Manager	-	-	-	-	-	-	$116	$92	$70	-	$51	-	$1	$1	-	**$330**
Subtotal	-	-	-	-	$171	$644	$717	$914	$1,170	$1,107	$1,134	$1,059	$794	$1,093	$1,101	**$9,902**
CUSTOMER SERVICE INITIATIVES																
Commercial PAYS	-	-	-	-	-	-	-	-	-	-	-	$151	$92	$33	$181	**$457**
DISCONTINUED/COMPLETED																
Commercial Spray Valves Program	-	-	-	-	-	$50	$30	$25	$17	$2	$1	-	$0	-	-	**$127**
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-	$0	-	-	-	**$0**
Subtotal	-	-	-	-	-	$50	$30	$25	$17	$2	$1	$0	$0	-	-	**$127**
COMMERCIAL EXPLORATORY																
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	-	$11	-	-	$6	-	**$16**
Subtotal	-	-	-	-	-	-	-	-	-	-	$11	-	-	$6	-	**$16**
COMMERCIAL TOTAL	-	-	-	-	$171	$694	$747	$939	$1,188	$1,109	$1,146	$1,209	$886	$1,131	$1,282	**$10,502**
INDUSTRIAL																
Natural Gas Optimization Prorgram	-	-	-	-	$97	$35	$90	$86	$164	$117	$173	$244	$201	$150	$200	**$1,557**
Subtotal	-	-	-	-	$97	$35	$90	$86	$164	$117	$173	$244	$201	$150	$200	**$1,557**
EFFICIENCY PROGRAMS SUBTOTAL	$679	$409	$407	$411	$777	$2,469	$2,762	$1,901	$2,163	$5,639	$6,930	$7,122	$6,265	$3,668	$3,529	**$45,130**
CUSTOMER SELF-GENERATION PROGRAMS																
Bioenergy Optimization Program	-	-	-	-	-	-	$13	$8	-	-	-	-	-	-	-	**$21**
Support Costs	$5	$90	$120	$361	$1,072	$1,353	$1,318	$2,000	$1,930	$1,605	$1,767	$1,527	$1,234	$1,370	$1,028	**$16,780**
GRAND TOTAL	**$684**	**$499**	**$526**	**$772**	**$1,849**	**$3,822**	**$4,092**	**$3,909**	**$4,093**	**$7,244**	**$8,697**	**$8,649**	**$7,499**	**$5,038**	**$4,557**	**$61,931**

Note: May not add up due to rounding.

NATURAL GAS DSM

2016 Demand Side Management Plan
Annual Incentive Costs
(2001/02 - 2015/16)
(000's $)

APPENDIX D.4

	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	2014/15	Interim Estimate 2015/16	Cumulative Total 2015/16
RESIDENTIAL																
Incentive Based																
Home Insulation Program	-	-	-	-	$195	$1,267	$2,156	$2,142	$2,457	$1,720	$1,589	$1,229	$931	$970	$791	**$15,446**
Affordable Energy Program	-	-	-	-	-	-	$22	$338	$1,360	$328	$525	$417	$350	$5,939	$1,706	**$10,985**
Solar Water Heater Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Water and Energy Saver Program	-	-	-	-	-	-	-	-	-	$556	$430	$47	$222	$255	$354	**$1,864**
Subtotal	-	-	-	-	$195	$1,267	$2,178	$2,480	$3,817	$2,604	$2,543	$1,693	$1,502	$7,163	$2,852	**$28,295**
DISCONTINUED/COMPLETED																
Residential Thermostats Program	-	-	-	-	-	$80	$36	$20	-	-	-	-	-	-	-	**$136**
New Homes Program	-	-	-	$15	$39	$60	$86	-	$71	$108	$47	$4	-	-	-	**$431**
High Efficiency Furnace and Boiler Program	-	-	-	-	$303	$994	$1,627	$2,794	$1,327	$14	-	-	-	-	-	**$7,059**
Subtotal	-	-	-	$15	$341	$1,134	$1,749	$2,814	$1,398	$122	$47	$4	-	-	-	**$7,625**
RESIDENTIAL TOTAL	-	-	-	$15	$536	$2,402	$3,927	$5,294	$5,216	$2,725	$2,591	$1,697	$1,502	$7,163	$2,852	**$35,920**
COMMERCIAL																
Incentive Based																
Commercial Insulation Program	-	-	-	-	-	$333	$729	$833	$1,060	$1,972	$1,485	$995	$1,635	$1,935	$1,383	**$12,360**
Commercial Windows Program	-	-	-	-	-	$45	$190	$338	$634	$823	$921	$699	$895	$1,140	$518	**$6,204**
Commercial Custom Measures Program	-	-	-	-	-	-	-	-	$82	$94	$66	$411	$125	$32	$209	**$1,019**
City Of Winnipeg Power Smart Agreement Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**-**
Commercial Kitchen Appliances Program	-	-	-	-	-	-	-	$8	$31	$19	$20	$8	$6	$79	$193	**$363**
Power Smart Shops Program	-	-	-	-	-	-	-	-	$1	$2	-	$0	-	-	$2	**$5**
Commercial Building Optimization Program	-	-	-	-	-	-	-	$42	$79	$52	$38	$24	$48	-		**$282**
New Buildings Program	-	-	-	-	-	-	-	-	-	$73	$74	$708	$108	$237	$1,239	**$2,440**
HVAC - Boiler Program	-	-	-	-	-	$311	$1,323	$1,122	$768	$959	$629	$879	$970	$905	$666	**$8,533**
HVAC - CO2 Sensor Program	-	-	-	-	-	-	-	-	-	-	-	$11	$0	$17	$38	**$67**
Commercial Hot Water Program	-	-	-	-	-	-	-	-	-	-	-	$0	-	-	$28	**$28**
Power Smart Energy Manager	-	-	-	-	-	-	-	$2	-	$0	-	$0	-	-		**$2**
Subtotal	-	-	-	-	-	$689	$2,243	$2,344	$2,655	$3,993	$3,234	$3,737	$3,788	$4,346	$4,276	**$31,303**
DISCONTINUED/COMPLETED																
Commercial Spray Valves Program	-	-	-	-	-	$73	$24	$96	$9	$18		$0	-	-		**$220**
Commercial Clothes Washers Program	-	-	-	-	-	-	-	-	-	-	-		-	-		
Subtotal	-	-	-	-	-	$73	$24	$96	$9	$18			-	-	-	**$220**
COMMERCIAL EXPLORATORY																
Heat Recovery Ventilation Program	-	-	-	-	-	-	-	-	-	$4	-	-	-	-		**$4**
Subtotal	-	-	-	-	-	-	-	-	-	$4	-	-	-	-	-	**$4**
COMMERCIAL TOTAL	-	-	-	-	-	$762	$2,266	$2,440	$2,664	$4,016	$3,234	$3,737	$3,788	$4,346	$4,276	**$31,528**
INDUSTRIAL																
Natural Gas Optimization Prorgram	-	-	-	-	-	-	$212	$265	$461	$616	$554	$519	$278	$438	$357	**$3,700**
Subtotal	-	-	-	-	-	-	$212	$265	$461	$616	$554	$519	$278	$438	$357	**$3,700**
EFFICIENCY PROGRAMS SUBTOTAL	-	-	-	$15	$536	$3,163	$6,406	$7,998	$8,340	$7,356	$6,378	$5,953	$5,569	$11,947	$7,485	**$71,147**
CUSTOMER SELF-GENERATION PROGRAMS																
Bioenergy Optimization Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**-**
Support Costs																**-**
GRAND TOTAL	**-**	**-**	**-**	**$15**	**$536**	**$3,163**	**$6,406**	**$7,998**	**$8,340**	**$7,356**	**$6,378**	**$5,953**	**$5,569**	**$11,947**	**$7,485**	**$71,147**

Note: May not add up due to rounding.

Demand Side
Management Plan
2016/17

SUPPLEMENTAL REPORT:
15 yr (2016 to 2031)

APPENDIX E - PROGRAM EVALUATION CRITERIA

Appendix E.1 - Nature of Electricity and Natural Gas Markets

Appendix E.2 - Program Categories

Appendix E.3 - Economic Effectiveness Metrics

Appendix E.4 - Other DSM Program Assumptions

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.

Appendix E.1 - 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 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.

Appendix E.2 - 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 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.

Appendix E.3 - Economic Effectiveness Metrics

Manitoba Hydro uses a number of cost effective metrics to assess energy efficient opportunities, including whether to pursue an opportunity, how 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)
- 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 heath).

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders.

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:

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders.

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. Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders.

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:

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings or the associated incremental product costs related to free riders.

- 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:

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings.

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:

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings.

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.

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings.

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:

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

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. Manitoba Hydro pays incentives to free riders but does not include the savings.
- 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 include 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:

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

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.

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.

Appendix E.4 - 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.

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