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.

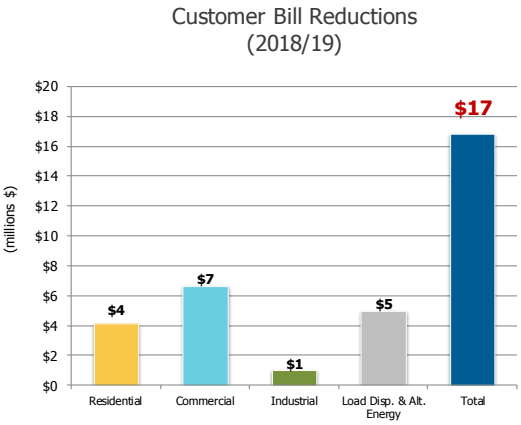
Kelvin Shepherd,
President & Chief Executive Officer, Manitoba Hydro

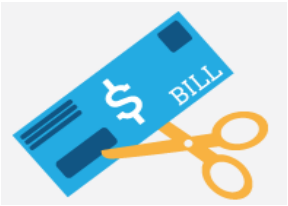
HIGHLIGHTS

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

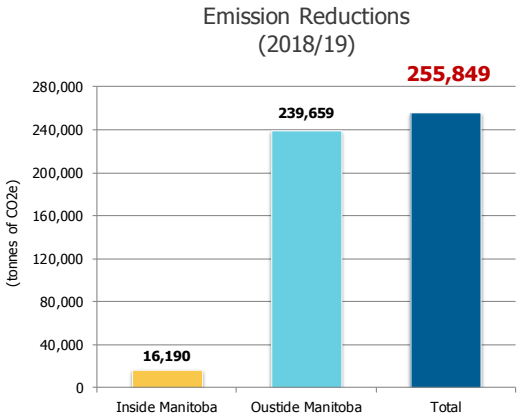
In 2018/19, customers who participate in Manitoba Hydro's Demand Side Management Programs are anticipated to enjoy a reduction of $17 million on their energy bills; $4 million for residential customers, $7 million for commercial customers, $1 million for industrial customers, and $5 million for load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





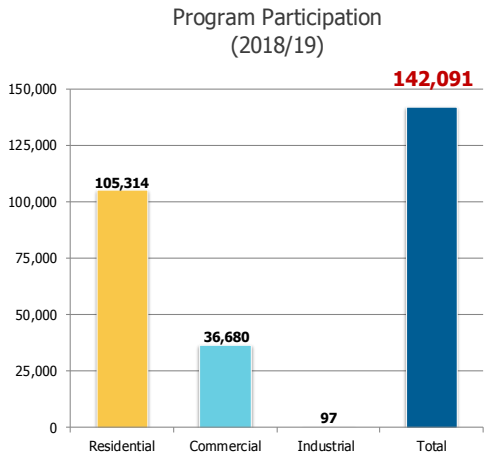
Reducing Environmental Impacts

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.



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:

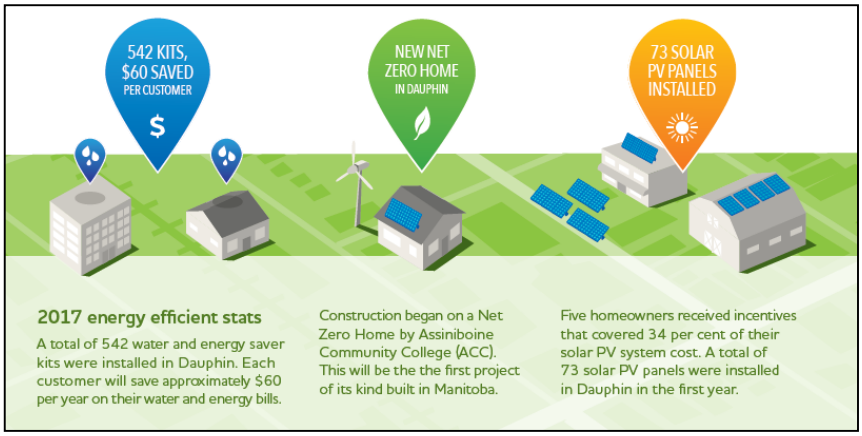
Achieving Deeper Savings with Hard-to-Reach Customers

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"

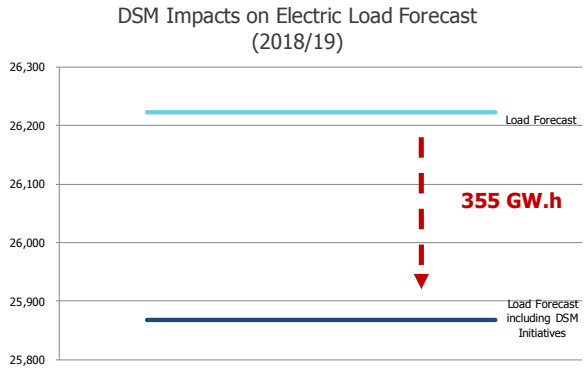
Recent enhancements to Manitoba Hydro's Performance Optimization Program, which targets large institutions, commercial and industrial buildings and processes, provide support for embedded energy managers to advocate and lead energy efficiency improvements from within the customer's operations.

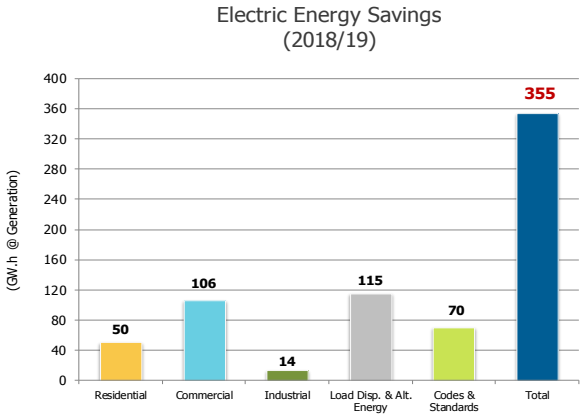
The expanded programming, known as the Energy Manager Initiative provides support for embedded energy manager salary costs; organizational, planning and technical support; energy management training, scoping and feasibility studies; and advanced energy monitoring dashboards with real time control messaging 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.

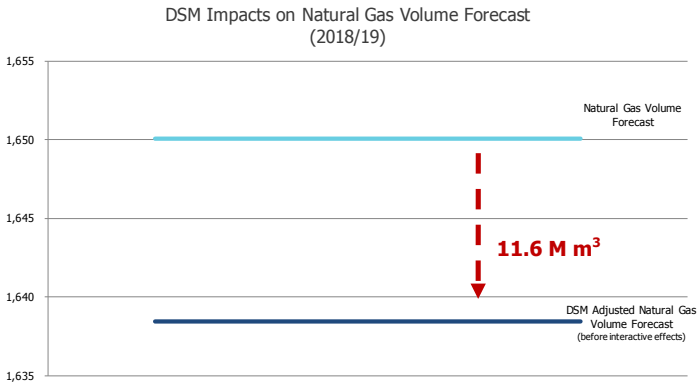




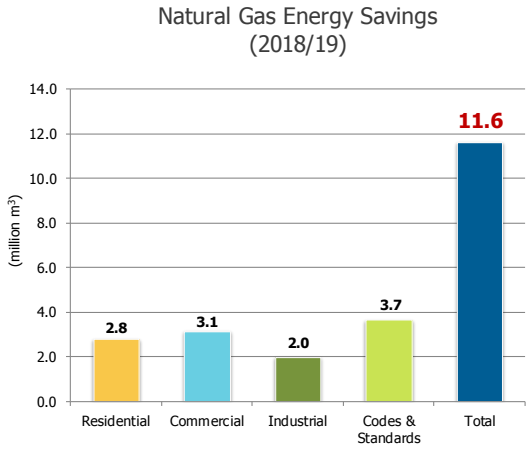
Natural Gas Savings

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.

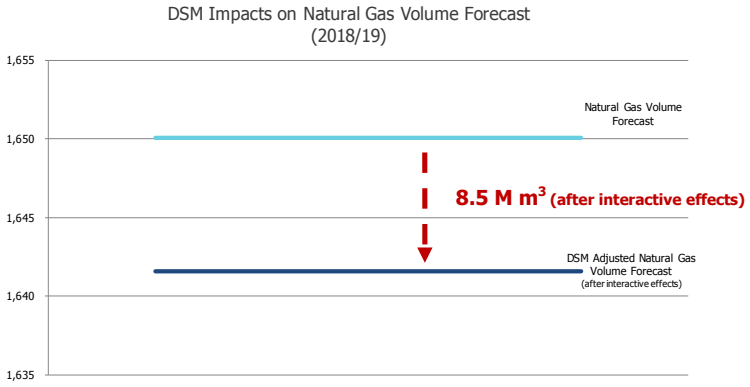


Note: The above graph excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

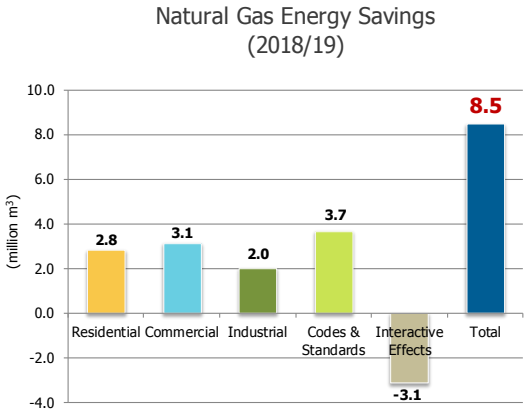


As a result of some electric DSM programming, there is an increase in natural gas consumption for space heating purposes – interactive effects. The interactive effects result from the need to replace heat lost from the use of more efficient lighting and other interior equipment that use electricity.

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.



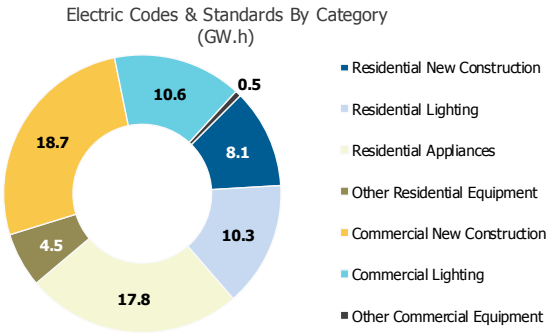
Note: The above graph excludes the natural gas consumption of both Manitoba Hydro Power Stations and Special Contracts in the volume forecast.

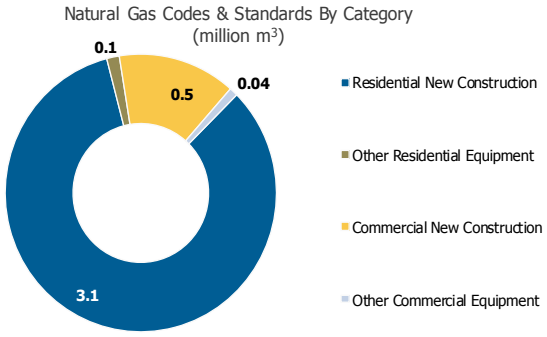


Codes, Standards & Regulations Savings

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.

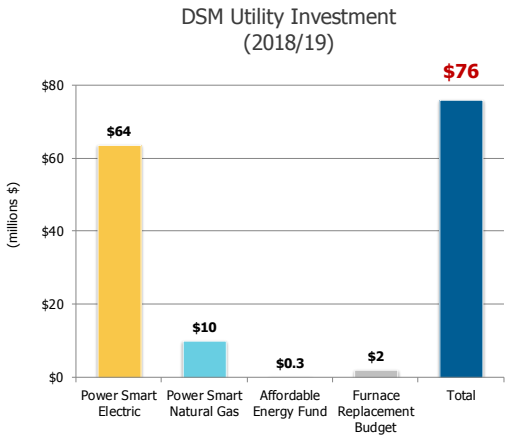
Efforts to achieve energy savings through Codes, Standards and Regulations are forecast to achieve capacity savings of 18 MW, energy savings of 70 GW.h and 3.7 million cubic metres of natural gas in 2018/19.

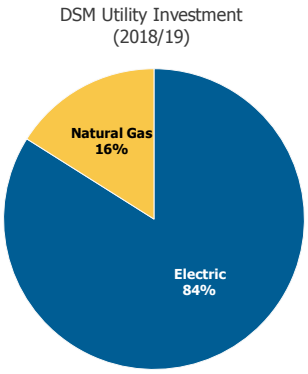




Investing in Demand Side Management

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

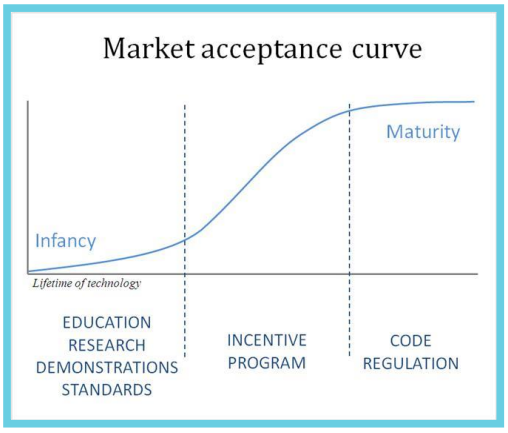
The Power Smart Shops Program for small businesses is a full-service program that offers direct installation of a variety of water and energy-saving measures, lighting walkthroughs, and enhanced incentives for lighting retrofits.

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 m^3)	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 m^3)	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.

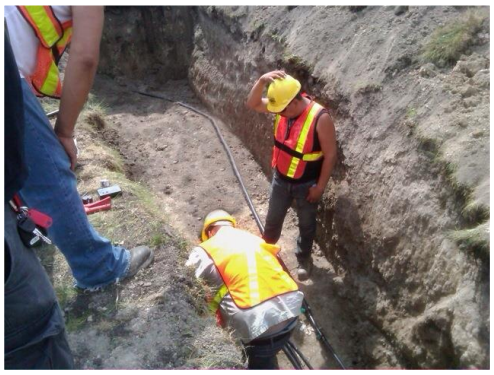
The program was launched in October 2014. In 2018/19, program participation is expected to be over 59,000 residential dwellings (over 710,000 LED bulbs) resulting in 17.8 GW.h and 5.6 MW of electric savings. Combined with achievements to date, program participation will be more than 287,000 residential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

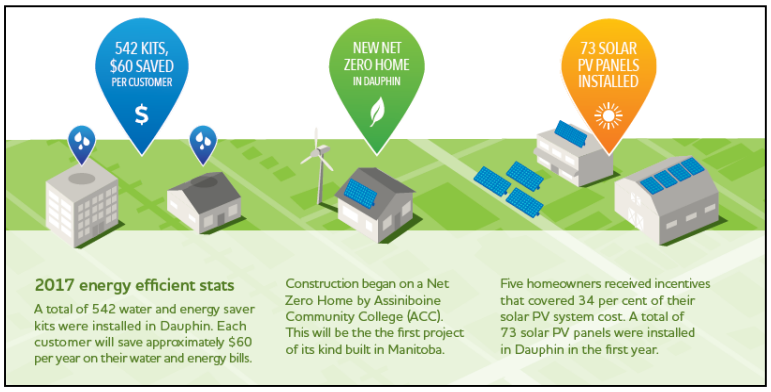
	2016/17 to 2017/18*	2018/19	Total to 2018/19
No. of Systems - Residential	267	264	**531**
No. of Systems - Commercial	18	28	**46**
Capacity Savings (MW)	0.8	0.0	**0.8**
Energy Savings (GW.h)	7.1	9.4	**16.4**
Utility Investment (Millions, $)	$4.9	$6.4	**$11.2**
Customer Investment (Millions, $)	$5.7	$12.1	**$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.

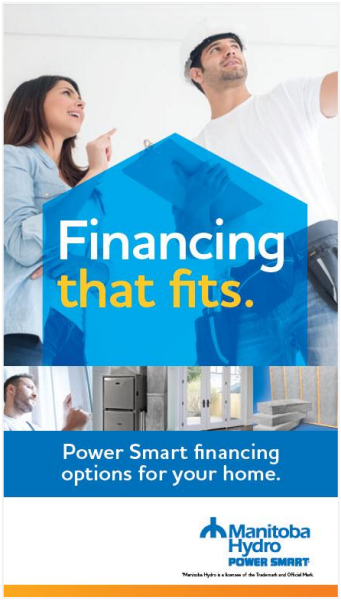
Manitoba Hydro developed an Energy Profile to assist these communities in prioritizing their energy efficiency efforts and establish goals and objectives. The Community Energy Plan will leverage Power Smart programs to assist in achieving these objectives. Taking a community approach to energy efficiency 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 m³)	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).

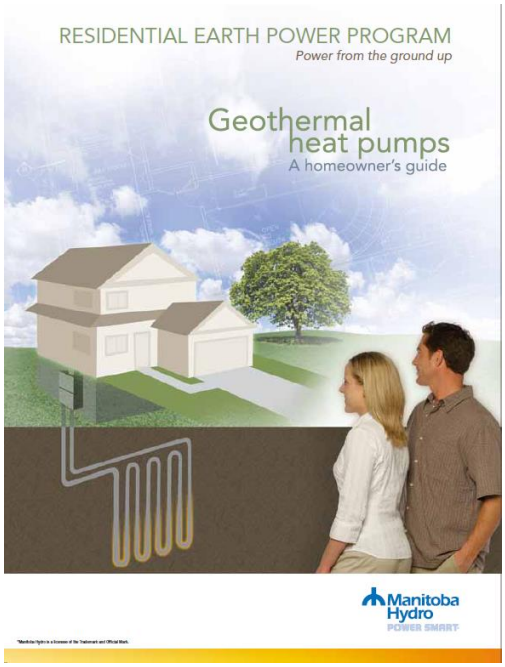
In 2018/19, the program is expected to finance energy efficient upgrades for 166 homes, achieving 0.1 GW.h and 0.03 MW of electric savings. Combined with achievements to date, 1,127 homes will be retrofitted, resulting in 2.1 GW.h and 0.5 MW of electric savings by the end of 2018/19.

	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 m³)	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.

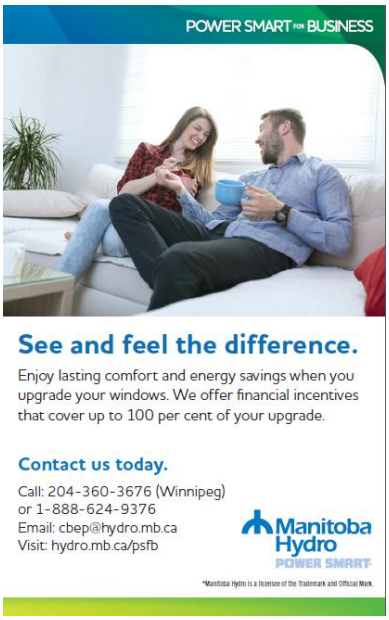
In addition to energy savings, LED roadway lighting has a significantly longer life than HPS lighting, quick turn on and off, and improved contrast and colour rendering due to their white light output. LED lights also provide the added benefit of directing the light downward onto the roadway increasing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

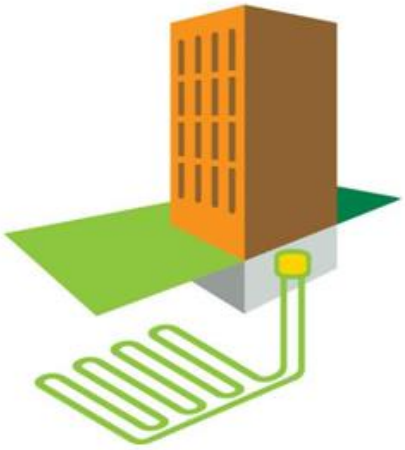
It is estimated that there are approximately 400 potential insulation replacement projects in Manitoba each year, of a total overall market of 15,000 potential projects.

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 m^3)	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.

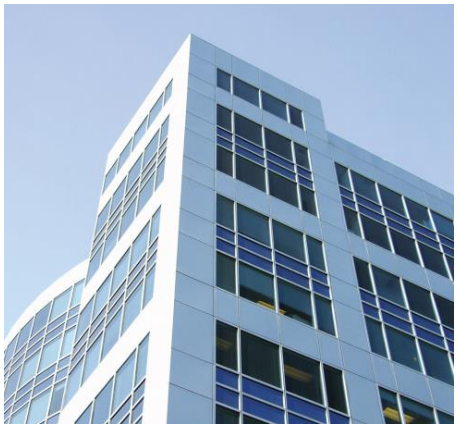
The program targets all commercial customers planning new construction, renovation or expansion projects. Often the high incremental cost of energy efficient technologies and systems, customer uncertainty of payback, and lack of awareness of energy efficient alternatives limit a customer's propensity 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 m^3)	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 m^3)	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 m³)	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 m³)	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

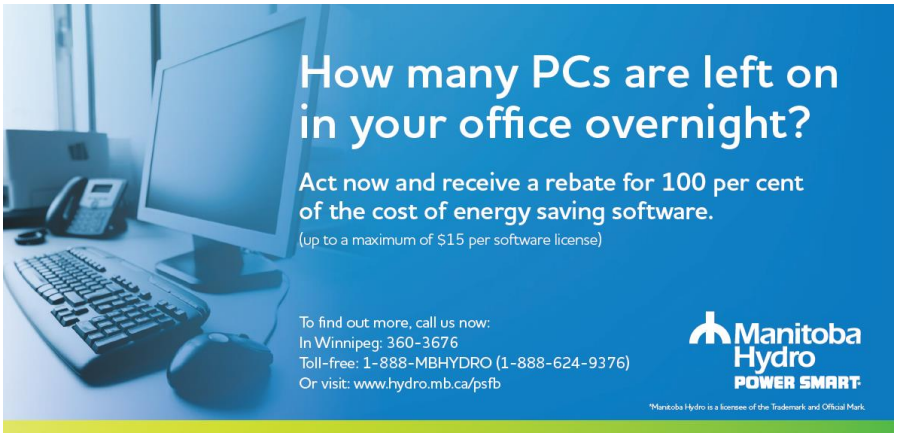
The Network Energy Management Program, launched in 2009, encourages customers to install program-approved software that conserves energy by sending personal computers (PCs) into a mode that consumes less energy when they are not in use. The program is aimed at commercial and institutional organizations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

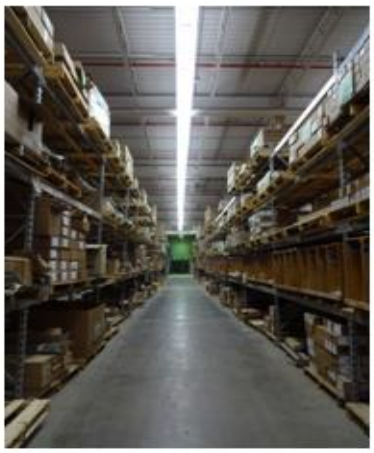
	2009/10 to 2017/18*	2018/19	Total to 2018/19
No. of Licenses	5,346	1,000	**6,346**
Capacity Savings (MW)	0.3	0.0	**0.3**
Energy Savings (GW.h)	2.7	0.2	**2.8**
Utility Investment (Millions, $)	$0.3	$0.0	**$0.3**
Customer Investment (Millions, $)	$0.1	$0.0	**$0.1**
Total DSM Investment (Millions, $)	$0.3	$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 m³)	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 m³)	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 m^3)	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 m^3)	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

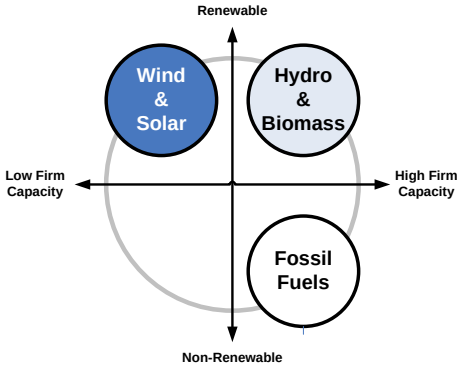
The Load Displacement Program, launched in 2014, encourages industrial and municipal customers to install, operate, and maintain customer-sited load displacement generation systems that rely on waste streams, by-products and locally-available, low-cost sources of biomass and other renewable energy sources 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.

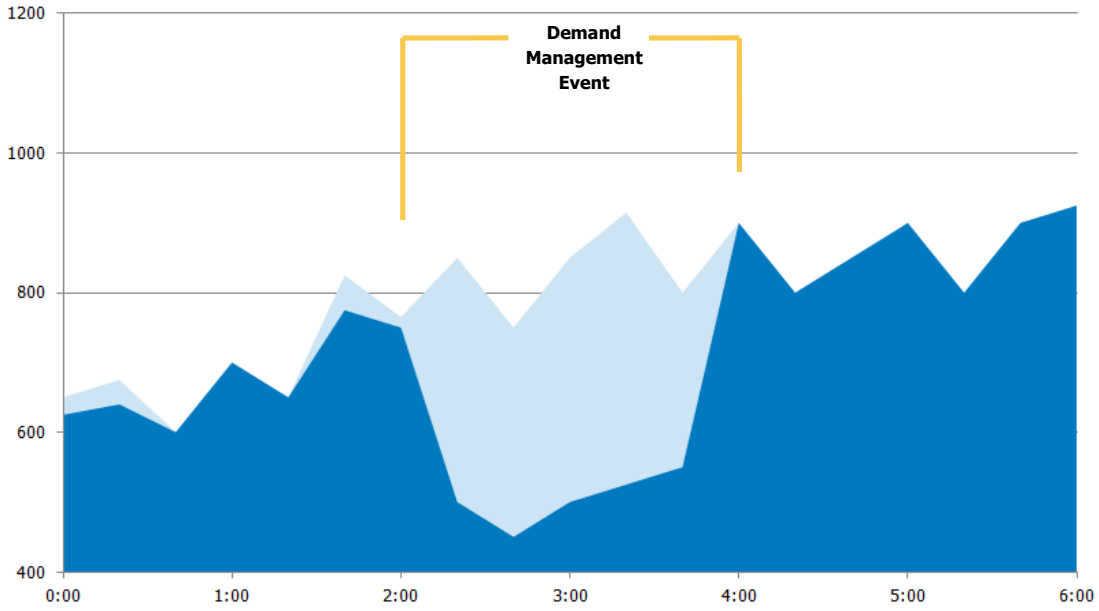
Load Management

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

*Manitoba Hydro is a licensee of the Trademark and Official Mark.