

Manitoba Hydro

2015 General Rate Application

LOAD, DSM & RATES PANEL

Lloyd Kuczek– Vice-President, Customer Care & Energy Conservation

Lois Morrison – Division Manager, Consumer Marketing & Sales

Greg Barnlund – Division Manager, Rates & Regulatory Affairs

Paul Chard – Division Manager, Business Support Services

Colleen Galbraith – Supervisor, Affordable Energy

2014 Forecast – Summary

- Forecast is updated annually to reflect most current available market data.
- Forecast models/methods are adjusted whenever appropriate to make improvements.
- Methodology extensively reviewed during recent NFAT hearing

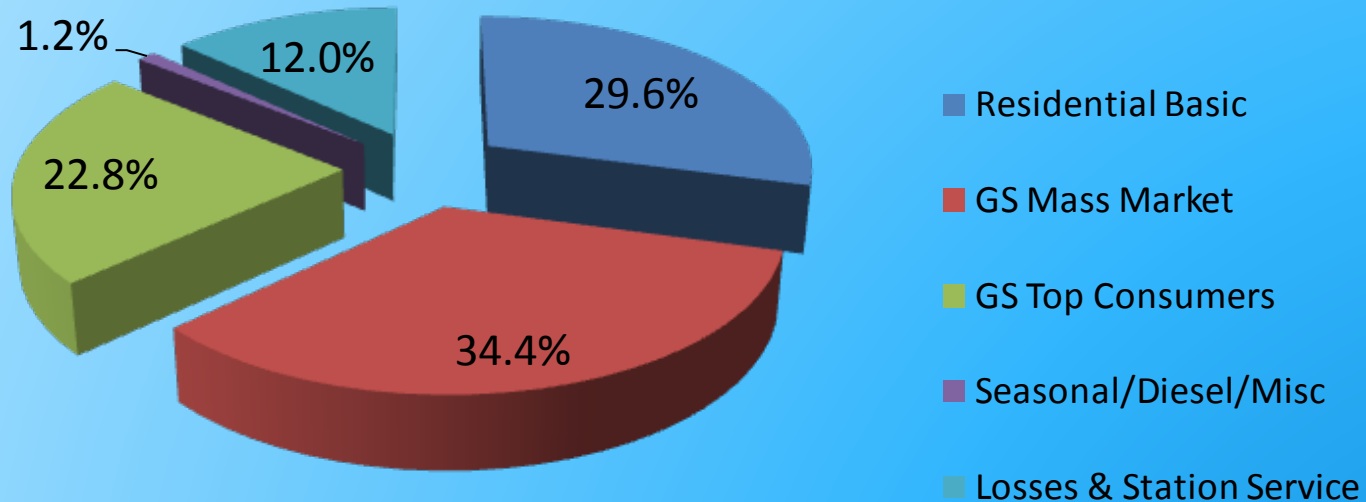
“It's good methodologies, consistent with the way they're generally done. There's some things that I would suggest doing a bit differently but in a standard GRA type of forecast.”

John Todd, Elenchus - NFAT Hearing Transcripts, April 2, 2014 page 4788.

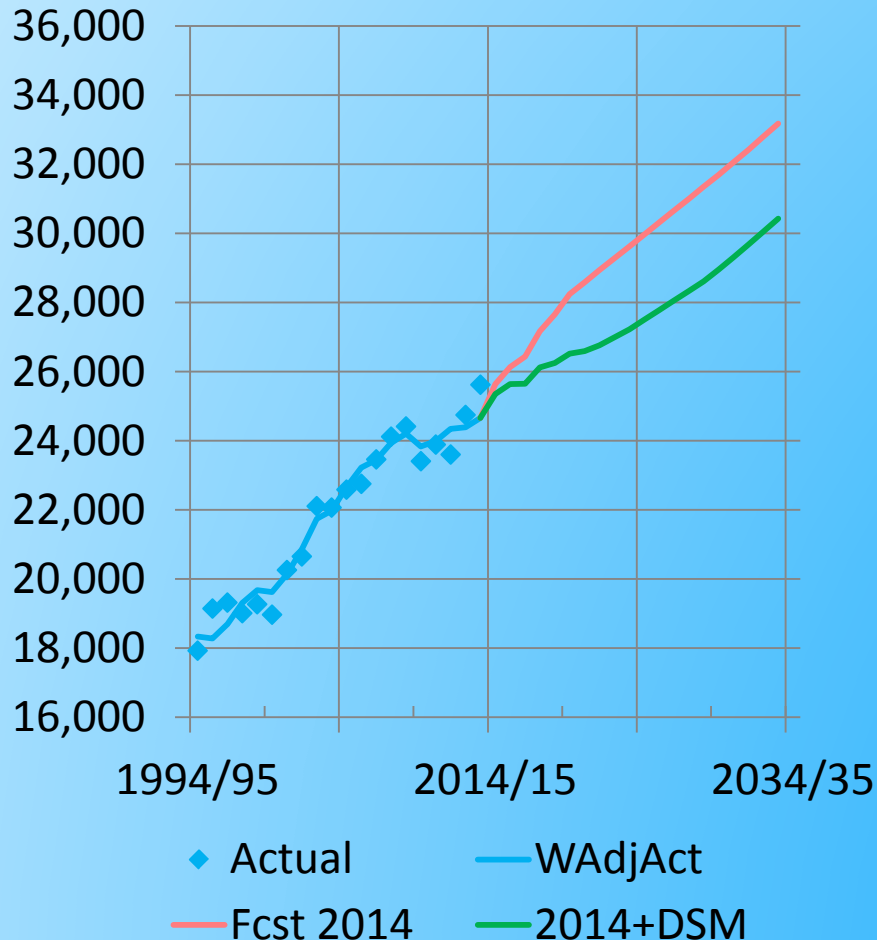
- Validation of elasticities through review by external consultant.

2014 Forecast – Sector Analysis

2013/14 FIRM ENERGY



2014 Forecast – Firm Energy (GW.h)



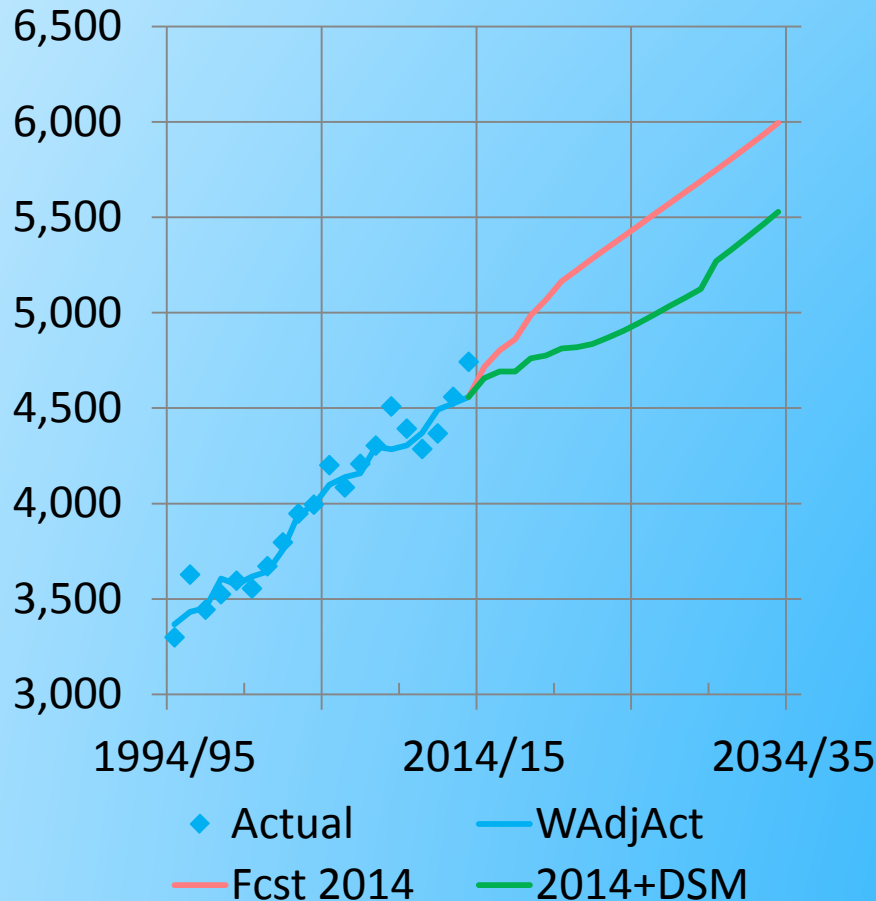
HISTORIC:

- Gross Firm Energy has grown by 333 GW.h or **1.6%** per year over last 20 years.
- Removing DSM programming, growth would have been **1.9%**

FORECAST:

- Forecast to grow at a rate of 425 GW.h or **1.5%** per year over the next 20 years.
- Adjusting for future DSM programming, growth is forecast to be **1.1%**

2014 Forecast – Total Peak (MW)



HISTORIC:

- Gross Total Peak has grown by 62 MW or **1.6%** per year over last 20 years.
- Removing DSM programming, growth would have been **2.1%**

FORECAST:

- Forecast to grow at a rate of 70 MW or **1.3%** per year over the next 20 years.
- Adjusting for future DSM programming, growth is forecast to be **0.9%**.

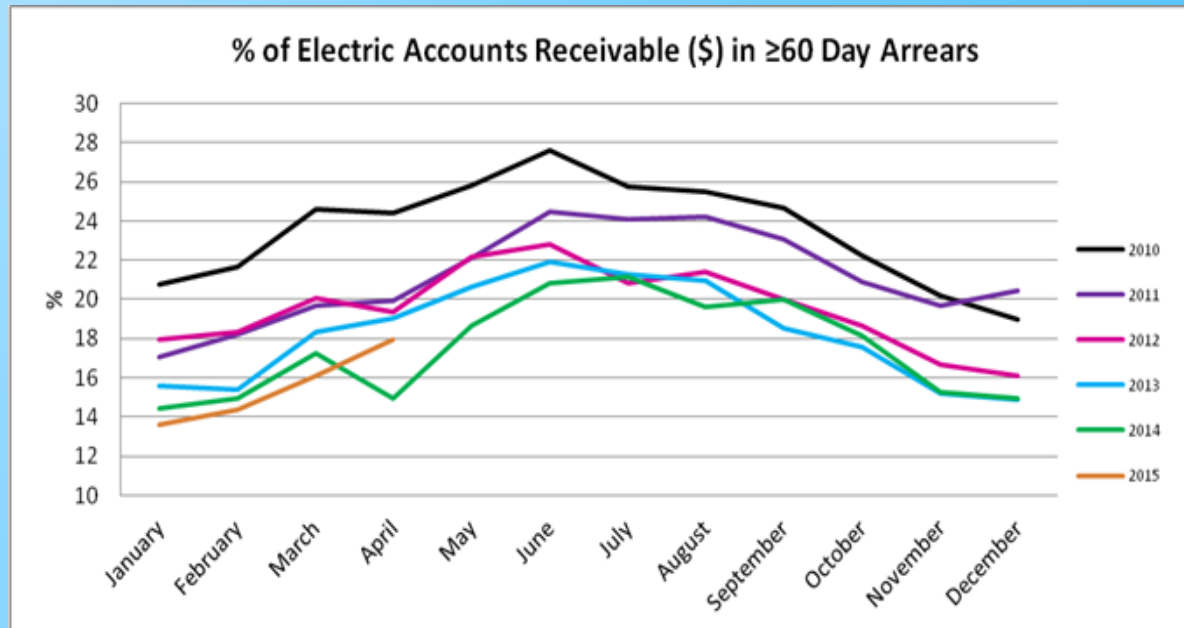
2015 Forecast - Preliminary Indications

- 1st 10 years are similar to 2014 Load Forecast
- 2nd 10 years increase by approximately 1000 GW.h primarily due to combined effect of:
 - Latter years increase in **Population Forecast**
 - Latter years increase in **MB GDP Forecast**
- Analyses still being finalized.

Credit & Recovery- Areas Of Interest

- Is Manitoba Hydro's Credit & Recovery Performance Deteriorating?
- Are Manitoba Hydro's Credit & Recovery Activities Consistent With The Corporation's Operating Principles (“...improve efficiencies...”)?
- Are Manitoba Hydro's Credit & Recovery Activities Coordinated With It's Affordable Energy Bill Assistance Programs?

Arrears Have Been Declining



- There is always seasonal and monthly variation
- Trending in the preferred direction

Write Off Performance

Net Write Off as a Percentage of
Previous Year's General Consumers Revenue



Note: 2014/15 included extraordinary items involving non-energy write offs and accelerated write offs

Continuous Improvement

Effectiveness of Collection Activities

2008	Implementation of PUB Order 14/08 (an Order relating to Centra Gas)
2009	First Nations residential/commercial pilot to improve customer contact and consistency (later expanded)
2010	Expanded responsibility of First Nations Accounts section (band responsibility accounts) to include all First Nations, not just the ones with the largest arrears.
2011	Collection Agency Performance Improvements
2013	Centralization of collection activities
2014	Predictive Analytics
2015	Deposit Policy

Initiatives To Assist Customers Manage Energy Bills

- Equal Payment Plan
- Custom Due Date
- Arrears Management – Customized & Flexible Payment Arrangements
- Crisis intervention
 - Neighbours Helping Neighbours (NHN)
 - Vulnerable persons intervention (Social Work background)
 - Reverse and stop late payment charges
 - Suspend collection activity
- Affordable Energy Program (AEP)
- Power Smart Programs

Are Manitoba Hydro's Collection Activities Integrated?

- Majority of Referrals to NHN come from Credit & Recovery Services
- Affordable Energy Program Applications
 - Credit & Recovery Services - 424 applications mailed
 - Customer Contact Centre – 8,401 applications mailed
- Internal Referral to Affordable Energy Department
 - Credit & Recovery
 - Other areas

Customer Referrals

From: Galbraith, Colleen
Sent: Wednesday, September 03, 2014 3:08 PM
To: Kuczek, Lloyd
Subject: Customers in Arrears

Lloyd

[REDACTED] were referred to our program through Rosanne Sutton as the [REDACTED]s make very little money and owe approximately \$20 000 on their account balance. The [REDACTED]s are making faithful payments but given their expenses, income and extremely high bills in Leaf Rapids, it will take them a very long time to pay this balance off. They have applied for our program, however exceed the income threshold. I am seeking your approval to supply them with much needed insulation to help reduce further utility bills therefore allowing them to pay down their arrears sooner.

Thank you
Colleen

Customer Referrals

From: Sutton, Rosanne
Sent: Monday, April 20, 2015 4:13 PM
To: Affordable Energy Section
Cc: Galbraith, Colleen
Subject: [REDACTED] Lanark St
Customer: [REDACTED]
Acct# [REDACTED]

Mr. [REDACTED] owns this home. He is on EIA because he suffered a stroke 2 years ago which affected his vision and he is unable to work. His bill is \$2117.92 and EIA has reconciled his acct and will be paying \$442 towards the balance. He will pay \$200 at the end of April. There is a new furnace here (PS loan) and unfortunately he signed for the furnace shortly after suffering the stroke. He thinks now he did not comprehend all of the details.

Is there anything that can be done for him through the AE program? I am going to have someone contact EIA to make sure the cash assistance amount is correct - he is receiving \$45 for hydro and \$125 for gas.

He cannot find work because of his vision issues although he is really trying and would love to be able to work.

Thanks!
Rosanne Sutton
Manager
Credit & Recovery Services
Manitoba Hydro

From: Galbraith, Colleen
Sent: Tuesday, November 4, 2014 3:32 PM
To: Kuczek, Lloyd
Subject: RE: URGENT ASSISTANCE REQUIRED

Lloyd

I spoke with [REDACTED] and she will re-apply for a NHN grant. I have instructed NHN to consider her application without her daughter's name on the bill as the past due balance is minimal. It also appears [REDACTED] may be eligible for the Affordable Energy Program and in particular, free insulation. She provided her landlord's information and I have since spoken with him. An application package was placed in today's mail. Both [REDACTED] and her landlord were very thankful.

Let me know if you require anything further.

Colleen

Demand Side Management

Corporate Strategic Plan (CSP)

Vision

To be recognized as a leading utility in North America with respect to safety, reliability, rates, customer satisfaction and environmental leadership.

Mission

To provide for the continuance of a supply of energy to meet the needs of the province and to promote economy and efficiency in the development, generation, transmission, distribution, supply and end-use of energy.

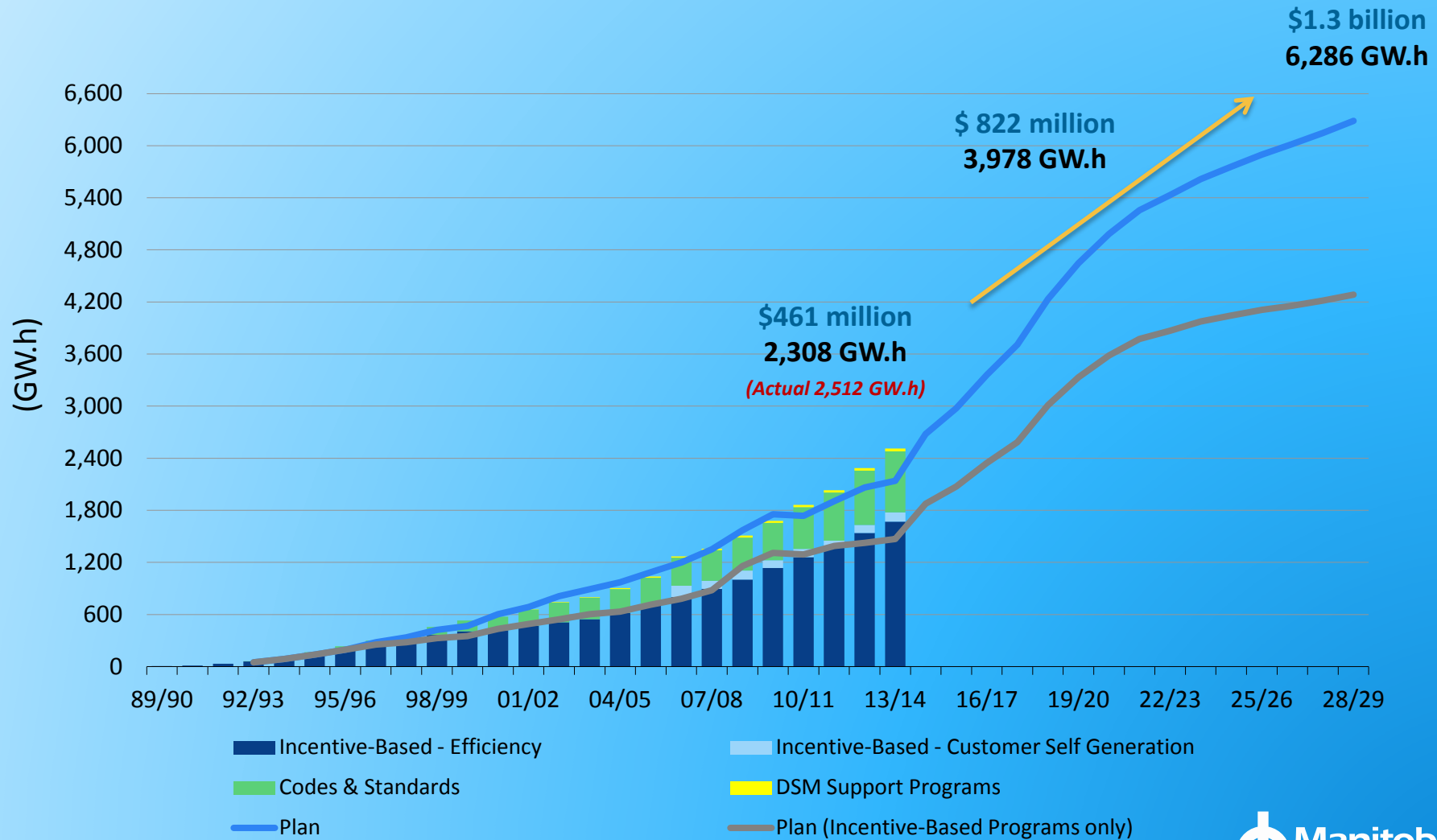
Key Areas of Focus



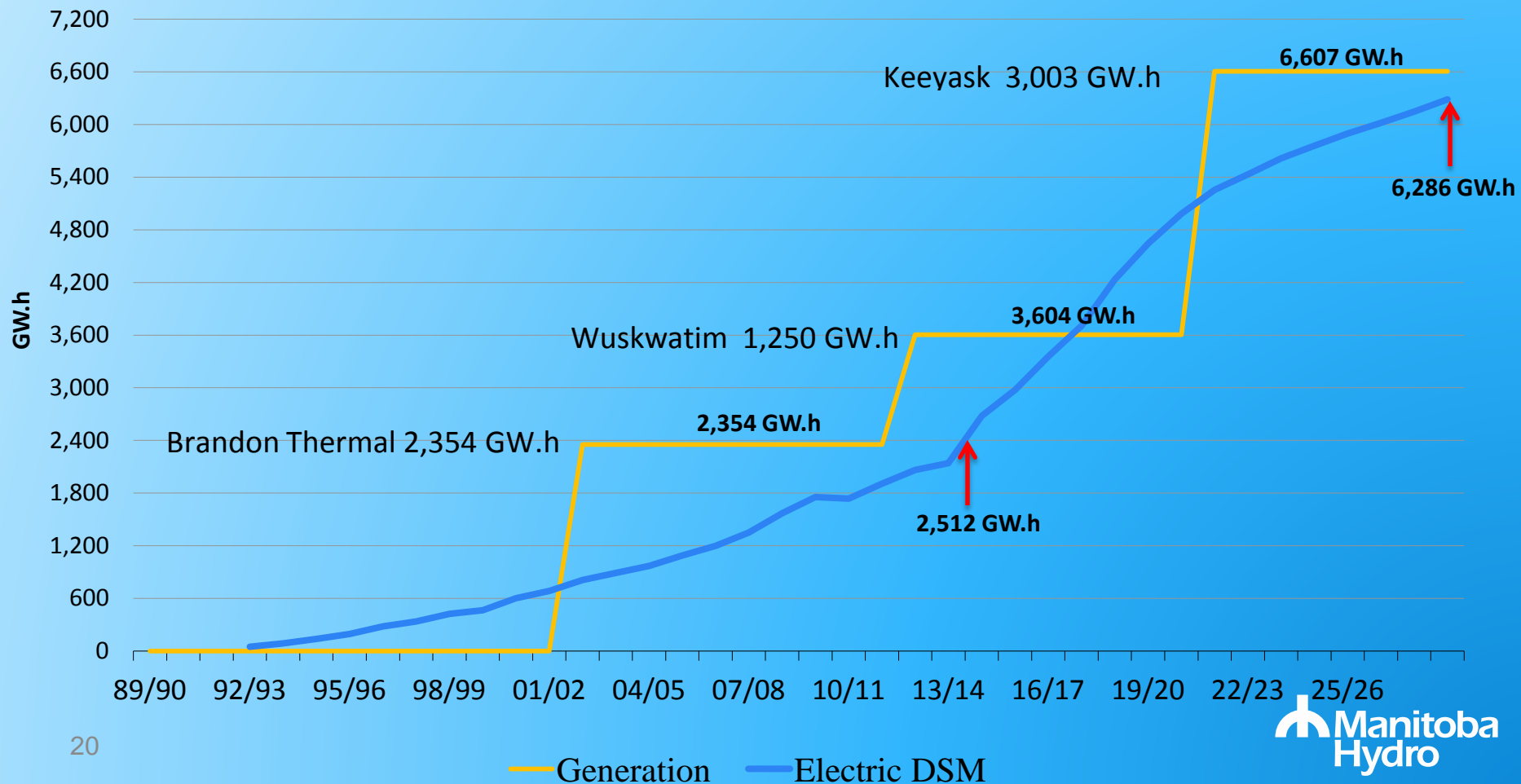
- CSP sets out Manitoba Hydro's Vision & Mission
- CSP outlines Key Areas of Focus to meet Manitobans' long-term energy needs and achieve operational excellence

**Are Manitoba Hydro's Current
DSM Activities & Costs Appropriate
In The Test Years?**

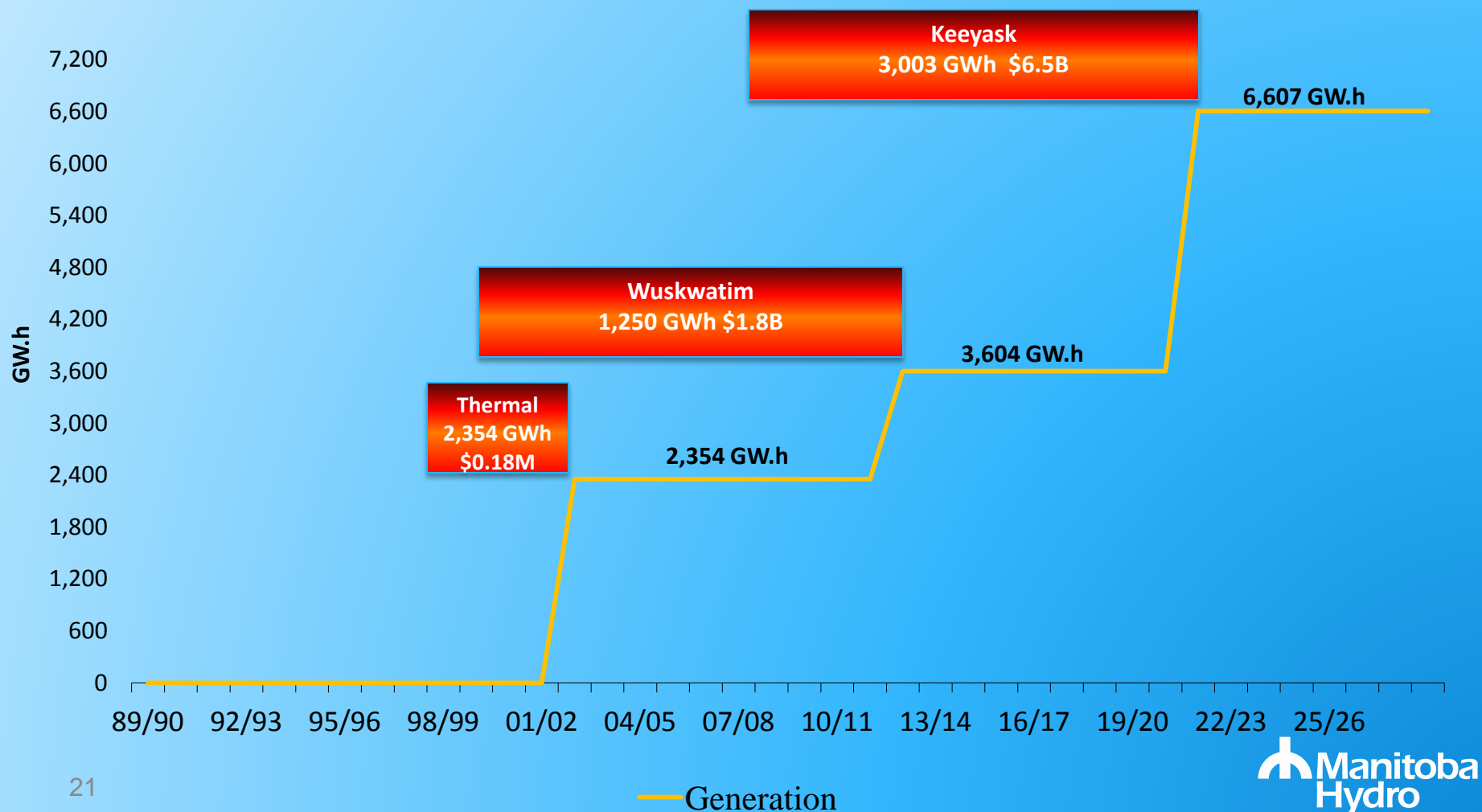
Electric DSM



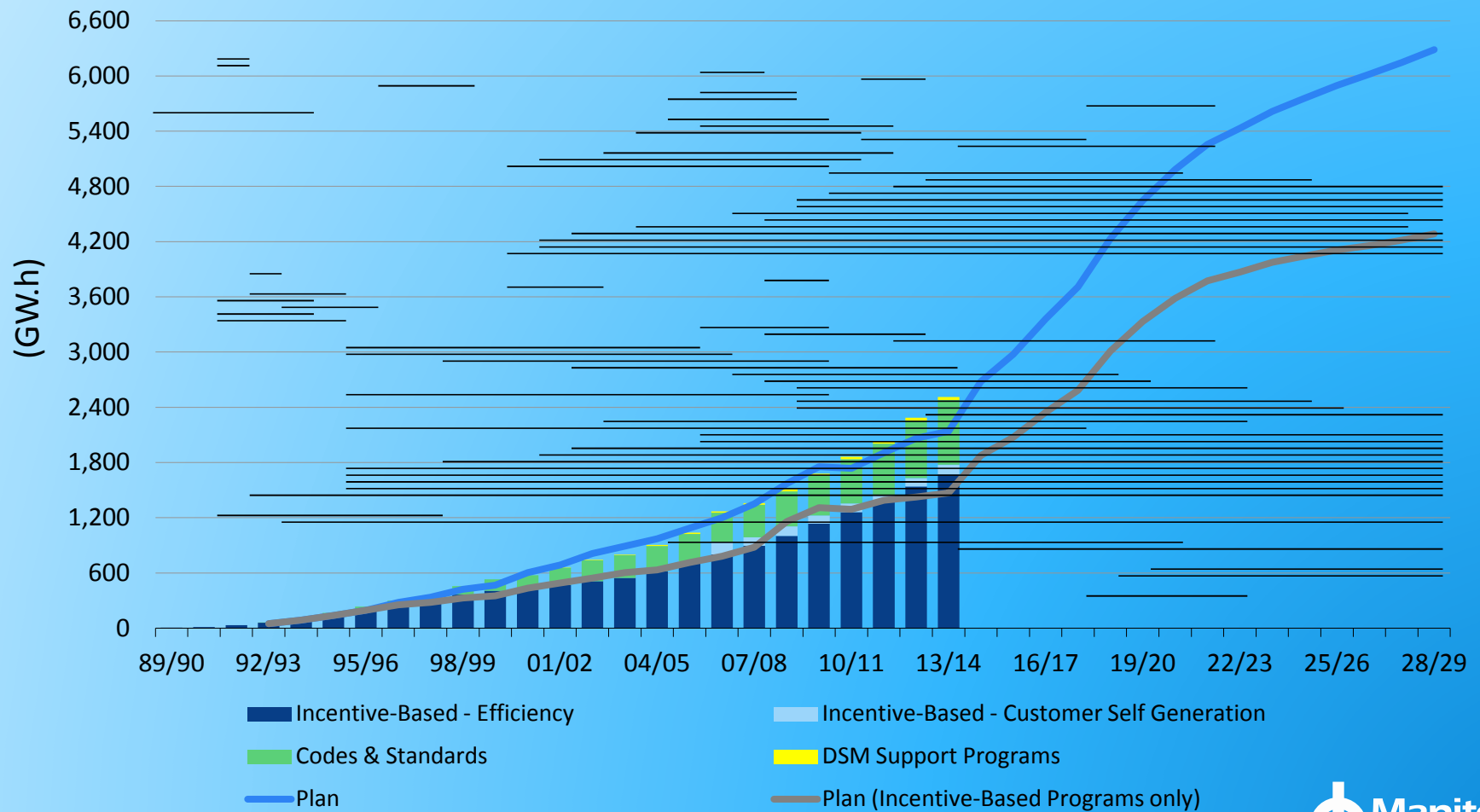
Long Term Planning & Long Implementation Time Frames



Supply Side Option Characteristics



Electric DSM



Are Manitoba Hydro's DSM Efforts Consistent With Government & PUB (NFAT) Direction?

Energy Efficiency Act – 2012

Manitoba Hydro must, in consultation with the Minister, prepare an energy efficiency plan by March 31, 2013, and update the plan annually

- ✓ March, 2013: 3 Year 2013 – 2015 PS Plan
- ✓ March, 2014: 3 Year 2014 – 2017 PS Plan
- ✓ March, 2015: 1 Year 2015 PS Plan

Government & PUB Direction

- Enhancements To DSM In Areas Of Priority
 - ✓ Low Income Families, Aboriginal & Northern Communities
 - ✓ Customers Excluded From Eligibility Due To Arrears
 - ✓ AKI Energy Program (Geothermal)
- Advance Measures Such As Curtailable Rates & Load Displacement
- Independent Evaluations

Affordable Energy Program

Multi-Pronged Approach



DSM Efforts – Affordable Energy Program

- Elimination Of Any Confusion Regarding Eligibility Related To Arrears
- Inclusion Of Drain Water Heat Recovery Units
- Increased Focus On Street by Street Direct Marketing Approach
- Increased Support For North End Community Renewal Corporation Community (NECRC) Initiative (additional staff)
- Implemented Incentive compensation (BEEP & NECRC)

DSM Efforts - Tenants

- Extension of Affordable Energy Program To Landlords/Tenants – 2013
- Initiated installation of Drain Water Heat Recovery Units with Housing and Community Development (HCD) using BUILD
- Investigating opportunities for installation of low cost measures in MURB's
- Continuing to promote installation of Water & Energy Saver Kits in MURB's (27,827 suites participated to date)

BUILD Quote

-----Original Message-----

From: Annetta [<mailto:annetta.armstrong@buildinc.ca>]

Sent: Tuesday, March 31, 2015 10:01 AM

To: Kuczek, Lloyd; Galbraith, Colleen

Cc: Sean Hogan

Subject: next steps

Hi Lloyd and Colleen,

I wanted to thank you both again for your unwavering support of BUILD.

The meeting with Manitoba Housing was interesting and hopefully will be fruitful knowing that Hydro is fully supportive of BUILD.

Can you let me know what our next steps are in regards to the AEP and if there was any additional discussion we need to have regarding the DWHR units.

I appreciate you both.

--

Annetta Armstrong

Executive Director

BUILD

204-943-5981 ext.216

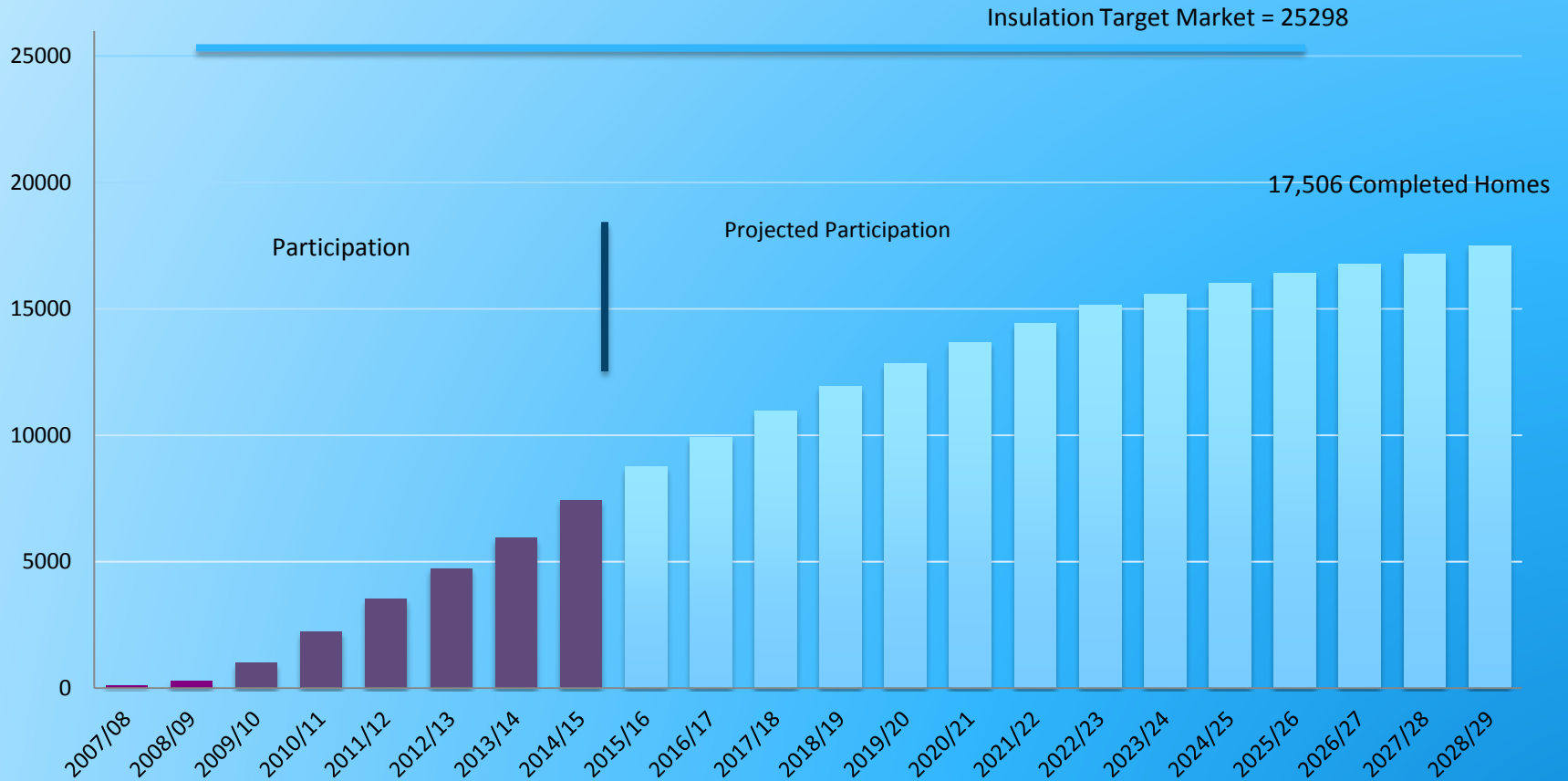
www.buildinc.ca

Affordable Energy – All Homes



Affordable Energy

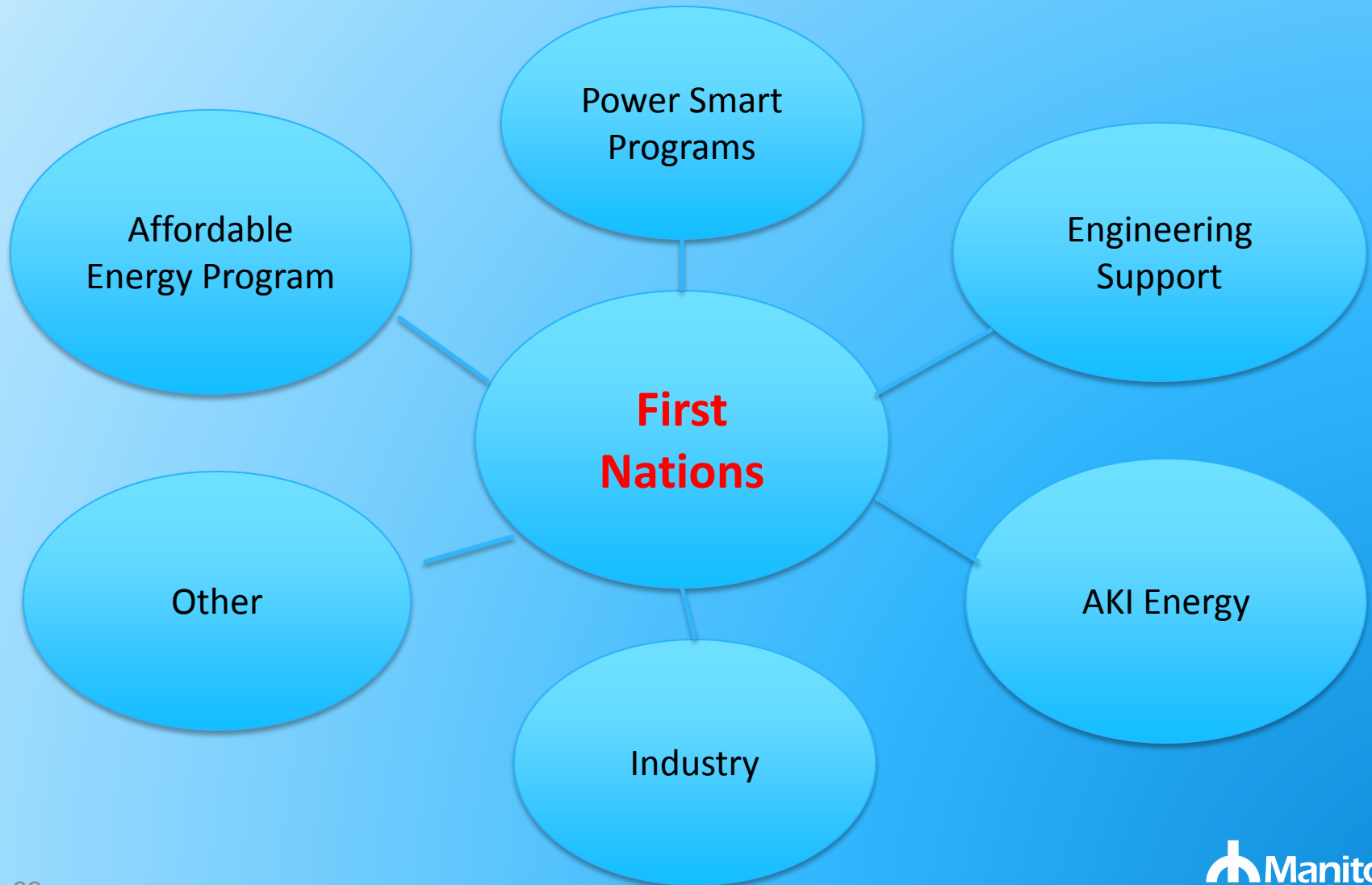
Total Program Insulation Upgrades



MMF Targeted Efforts

- MMF Representative Added To Advisory Committee
- Targeting Advertising
 - Grassroots
 - NCI FM Radio
- Targeted & Potential Partnership Outreach Efforts
 - MMF Regional Offices
 - Program Material Promotion
 - AGM September 26th & 27th (potential Booth)
 - Looking For Additional Opportunities

FIRST NATIONS - DSM



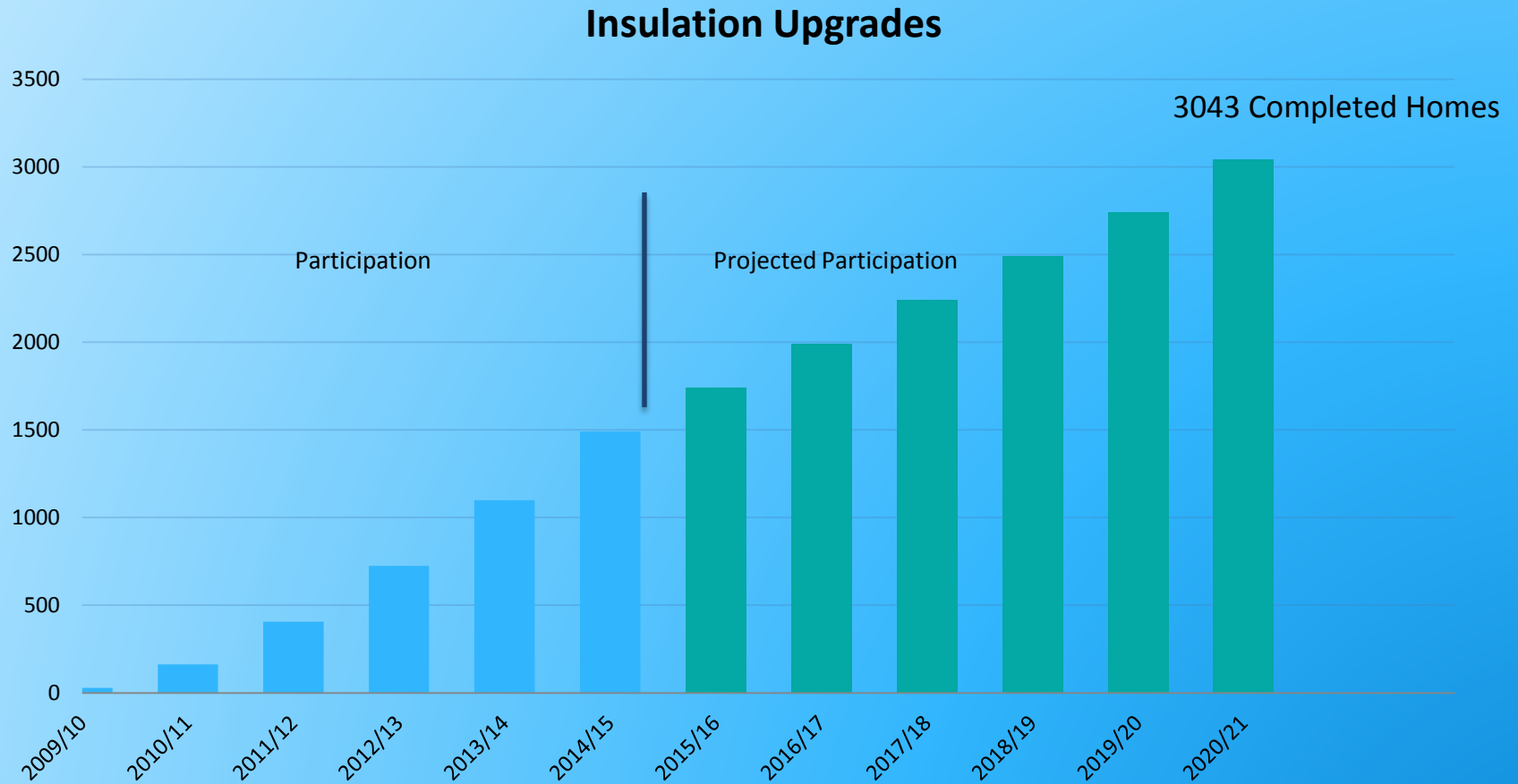
DSM Efforts – First Nation Communities

- Background
 - ✓ Taking A Community & Partnership Based Approach Since 2009
 - ✓ Partnering With AKI Energy since 2013
- Vision: Developing A First Nation Community Energy Efficiency Plan

DSM Efforts – First Nation Communities

- First Nation **Insulation** Initiative
 - ✓ Insulation, LED's, Showerheads, Faucet Aerators, Pipe Wrap, Window Kits & Draft Stoppers
 - ✓ Customized Approach - Pace Determined by Each Community
 - ✓ Dedicated Energy Service Advisor
- **No Cost** To First Nation Community
- **Achievements To Date**
 - ✓ All Communities Contacted
 - ✓ 54 Communities Participating
 - ✓ 1599 Homes Retrofited

First Nations Insulation Initiative

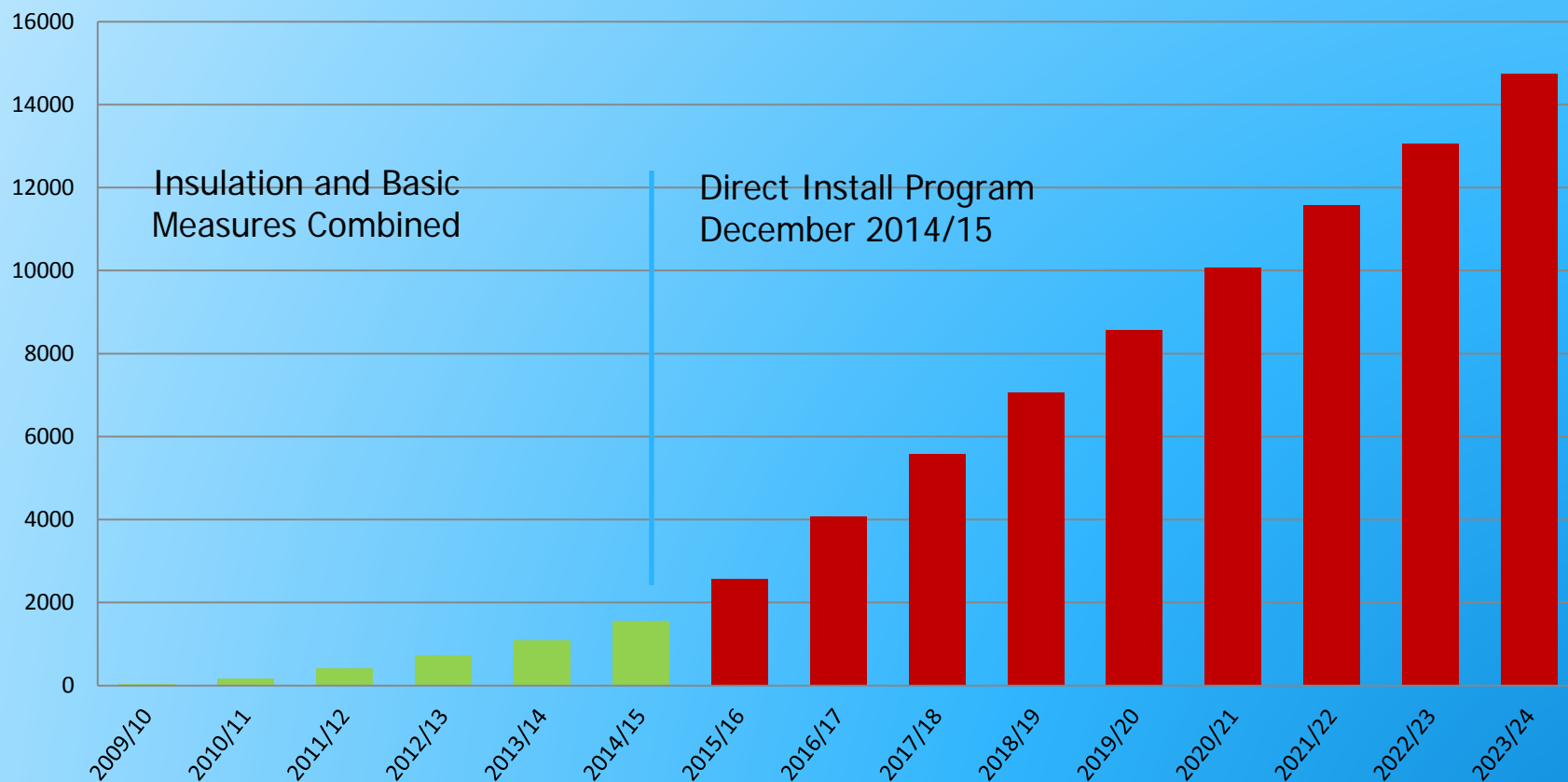


DSM Efforts – First Nation Communities

- First Nation **Basic Measures Initiative** (Nov – 2014)
 - ✓ LED's, Showerheads, Faucet Aerators, Pipe Wrap, Window Kits & Draft Stoppers
 - ✓ Customized Approach
 - ✓ Dedicated Energy Service Advisor
- **No Cost** To First Nation Community
- **Achievements To Date**
 - ✓ 60 Communities Contacted
 - ✓ 30 Communities Participating
 - ✓ 188 Homes Retrofitted

First Nations – Basic Measures Initiative

Cumulative Basic Measures Upgrades



MKO Communities

- **Insulation Efforts**

- 639 Completed Homes of Estimated 1 450
- 10 Communities Insulation Complete
- 7 Communities Insulation Underway, 83 Homes
- 3 Communities No Insulation Needed

- **Direct Install Efforts**

- 40 Completed Homes
- 2 Communities With Measures Underway
- 537 Homes Identified to Receive Measures in Near Future

AKI Energy Geothermal Initiatives

- Primarily funded by Manitoba Hydro
- Primary Sales & Program Management for Manitoba Hydro's Community Based Geothermal Program
- Significant Success with Fisher River & Peguis since 2013
- 45 First Nation Community members trained to date
- 177 Geothermal Systems installed to date

AKI Energy Geothermal Initiatives

Ongoing Progress

- Increased AKI Funding in 2014 (additional Staff Added)
- Long Plains & Sagkeeng First Nation added to Participation in 2014
- Norway House agreed to participate in 2015
- 12 Additional Communities approached By AKI Energy including Cross Lake, OCN and Easterville
- Manitoba Hydro provided financing to Peguis First Nation Community in 2014 to enhance operations

First Nation - Additional Initiatives

Ongoing Progress

- Pilot Solar Hot Water Systems – 20 homes in Peguis First Nation (2014/15)
- Drain Water Heat Recovery Units Promoted
- Commercial Audits (2015)
- Customized Marketing – Video's Of Success Stories With First Nation Communities

FISHER RIVER CREE NATION

Video Clip

First Nation - Additional Initiatives

Ongoing Progress

- Biomass Pre-Feasibility Study (2015). Roseau River, St. Theresa Point and Fairford First Nation Contacted
- Submission To Federal Government for funding to support natural gas expansion to The Pas, including OCN
- Diesel Communities – investigating alternatives (AANDC, Province & Manitoba Hydro)

DSM Efforts – Electric Heated Customers

- Enhanced Home Insulation Program (April 2014)
 - Increased and expanded incentives
 - Free in-home review
- Enhanced Building Envelope Program (July 2014)
 - Increased incentives (insulation)
 - Changed structure to support higher levels (windows)
- Enhanced CO2 Sensor Incentives (September 2014)
- Enhanced Geothermal (June 2015)
 - Industry Training underway
 - New Technical Sales staff person
- Pilot Install for Wifi/Smart Thermostats (in design)

DSM Efforts – Other Programs Enhanced

- Increased Incentives for electric savings:
 - Commercial Lighting (April 2014)
 - Commercial New Buildings (April 2014)
 - Residential Fridge Retirement (December 2014)
 - Building Optimization (April 2015)
- Added pre-rinse spray valve to Commercial Kitchens (September 2014)
- Implemented Design Changes to reach more rural electric customers
 - Commercial Refrigeration (May 2014)
 - Water & Energy Saver Program (June 2014)

DSM Efforts – Energy Codes

- Manitoba Amendments to National Building Code - approved on April 27, 2015
 - ✓ First jurisdiction in North America to mandate drain water heat recovery technology
- Manitoba Amendment to National Energy Code for Building came into effect December 1, 2014
 - First time energy efficiency had been considered in commercial building code
- Manitoba Amendments to National Building Code came into effect December 2010 (two years in advance of National efforts)
- Colleen Kuruluk – Vice Chair, Building Standards Board of Manitoba; Chair for Subcommittees pertaining to Energy Efficiency

DSM Efforts – Energy Codes/Standards

- Steering Committee for Performance, Energy Efficiency and Renewables (SCOPEER)
- Total Funding \$1.45 million annually
 - \$478,300 NRCan
 - \$224,900 Ontario Ministry of Energy
 - \$207,230 BC Hydro
 - **\$202,990 Manitoba Hydro**
- Primary Technical Contribution provided by staff from 3 electric utilities: Quebec Hydro, BC Hydro and **Manitoba Hydro**
- CSA 2015 Award of Merit Recipient – Dale Friesen

DSM Efforts – Load Displacement

- Annual program **target** (by 2028/29) of **95 MW** and **639 GWh** supported by a budget of \$86 million.
- Aggressively pursuing **8 potential projects** representing over 370 GWh of self-generation with additional combined heat and power benefits.
- Solicited active interest within forestry, chemical, water and waste water treatment, municipal waste, oil production and manufacturing sectors

DSM Efforts – Curtailable Rates Program

- Demand response options in other jurisdictions to be reviewed and value proposition assessed for application in Manitoba
- Needs to be a win/win situation
- External stakeholder consultations planned for the fall of 2015

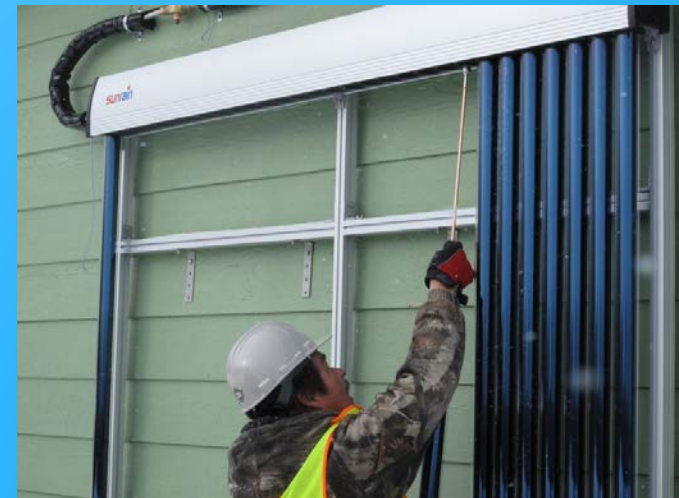
DSM Efforts – Emerging Technologies

Cold Climate Air Source Heat Pumps

- Field performance monitoring of two units to determine actual Manitoba performance
- Active participant in national CSA initiative to develop standardized test methods and MEPS

Solar Thermal Water Heating

- Peguis First Nation pilot targeting 20 community homes



DSM Efforts – Emerging Technologies

Biomass to Energy Demonstrations

- Demonstrated five biomass to energy pathways with 50 percent funding from NRCAN Clean Energy Fund
- Evaluating options for use in remote communities

Commercial Building Envelope Performance

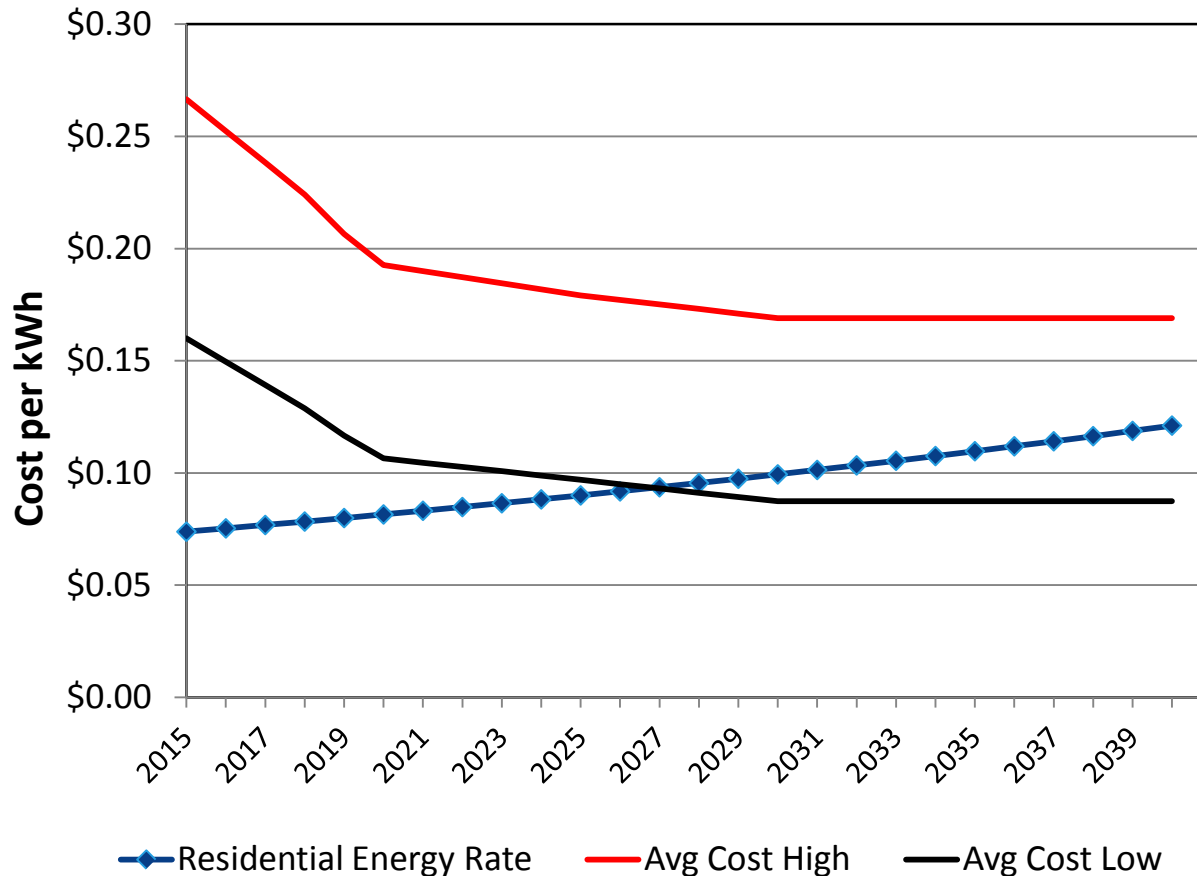
- Working with NRCAN to develop North American standard for air tightness testing based on joint RRC/MH research
- Exploring potential savings and energy code inclusion in National Energy Code for Buildings

Solar Trough Demonstration

- Supported installation and monitoring of solar trough for evaluation of performance in cold climates

DSM Efforts – Distributed Solar PV

Grid Parity



Average Cost Approach

Ignores the time value of money (i.e. no financing costs)

Grid Parity Projection

Using Average Cost:

- 2026 to 2028 under lowest cost scenario

Using Levelized Cost:

- 2038 to 2040 under the low cost scenario

DSM Efforts – Residential Solar Impacts

Detached Homes & Cottages (#)	Installed Panels (#)	Average Annual Energy (MWh - 20 Yr Avg)	Average Winter Capacity (MW - 20 Yr Avg)	Average Summer Capacity (MW - 20 Yr Avg)
10	80	24	0.00	0.01
100	800	245	0.02	0.08
1,000	8,000	2,449	0.22	0.80
10,000	80,000	24,489	2.24	8.01
100,000	800,000	244,892	22.36	80.14
375,000 33%	Total MB Single-Family Dwellings & Cottages Penetration			
123,750	990,000	303,054	27.68	99.17

DSM Efforts – Commercial Solar Impacts

Business & Multi-Family (#)	Installed Panels (#)	Average Annual Energy (MWh - 20 Yr Avg)	Average Winter Capacity (MW - 20 Yr Avg)	Average Summer Capacity (MW - 20 Yr Avg)
10	1,670	612	0.06	0.20
100	16,700	6,122	0.56	2.00
1,000	167,000	61,223	5.59	20.03
10,000	1,670,000	612,230	55.91	200.35
85,000	Total MB Com & Ind Businesses and Multi-Family Housing (est)			
20%	Penetration			
17,000	2,839,000	1,040,790	95.05	340.59



Third-party Evaluations

Scope	Consultant	Year Completed
DSM Portfolio Review	Dunsky Energy Consulting	2009
Affordable Energy Program Review	Dunsky Energy Consulting	2015
Residential Home Insulation Program Impact Evaluation	Econoler	In progress
Commercial Building Envelope Program Evaluation	Navigant Consulting	In progress
Industrial Performance Optimization Program Evaluation	Econoler	In progress

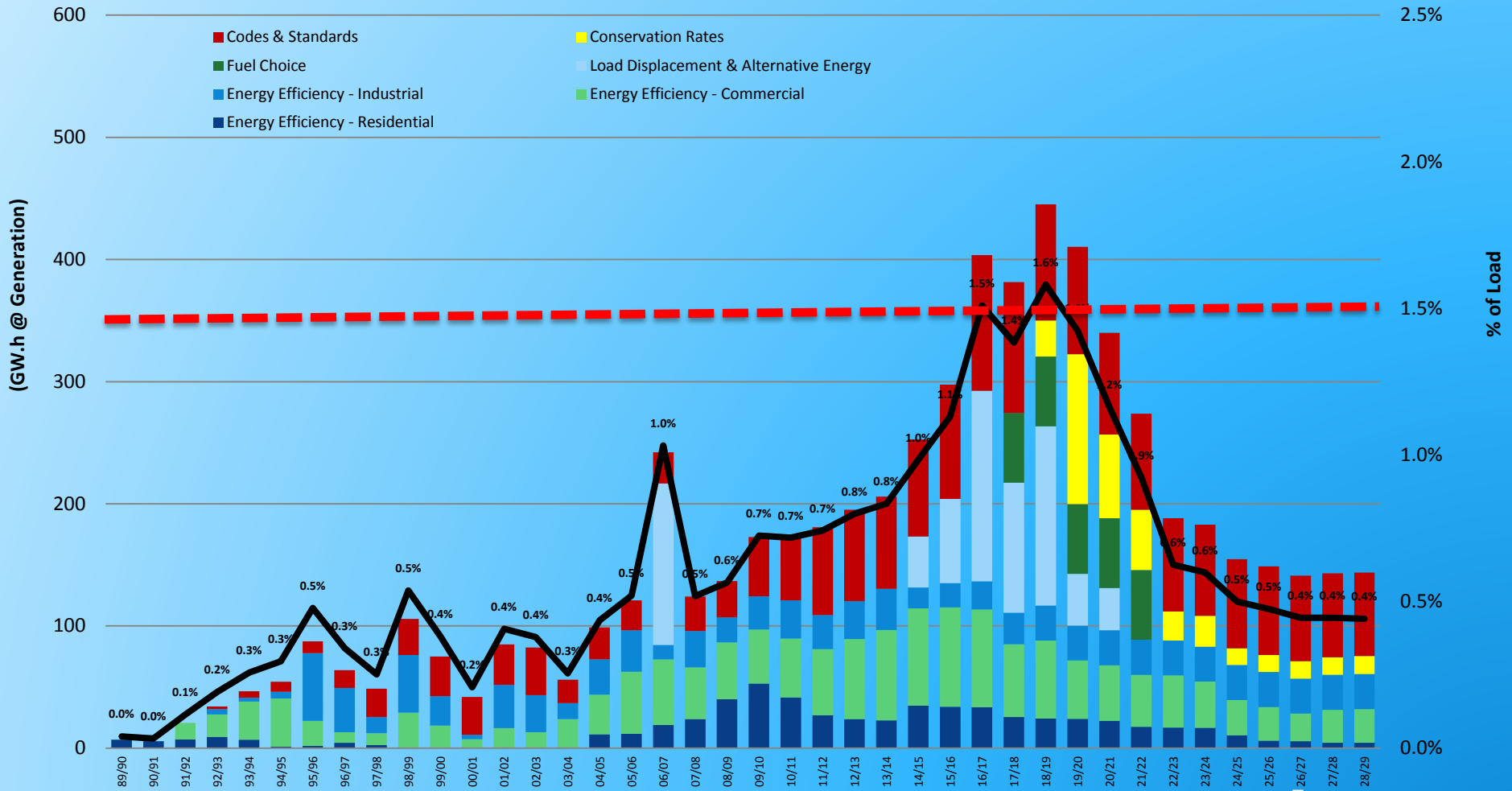
Draft DSM Evaluation Schedule

	External Evaluation				Internal Process Evaluation			
Residential Incentive Programs	2014/15	2015/16	2016/17	2017/18	2014/15	2015/16	2016/17	2017/18
Affordable Energy Program	x				x			
Home Insulation	x				x			
Refrigerator Retirement		x						
Residential LED Lighting		x						
Water & Energy Saver			x					
Commercial Incentive Programs	2014/15	2015/16	2016/17	2017/18	2014/15	2015/16	2016/17	2017/18
Commercial Building Envelope	x					x		
Commercial Building Optimization							x	
Commercial Custom Measures						x		
Commercial Earth Power				x				x
Commercial Lighting			x					
Commercial New Buildings		x						
Commercial Refrigeration				x				
Internal Retrofit							x	
LED Roadway Lighting								x
Industrial Incentive Programs	2014/15	2015/16	2016/17	2017/18	2014/15	2015/16	2016/17	2017/18
Natural Gas Optimization				x				
Performance Optimization	x							
Bioenergy Optimization			x					

Uncertainty Of Manitoba Hydro's Future DSM Costs?

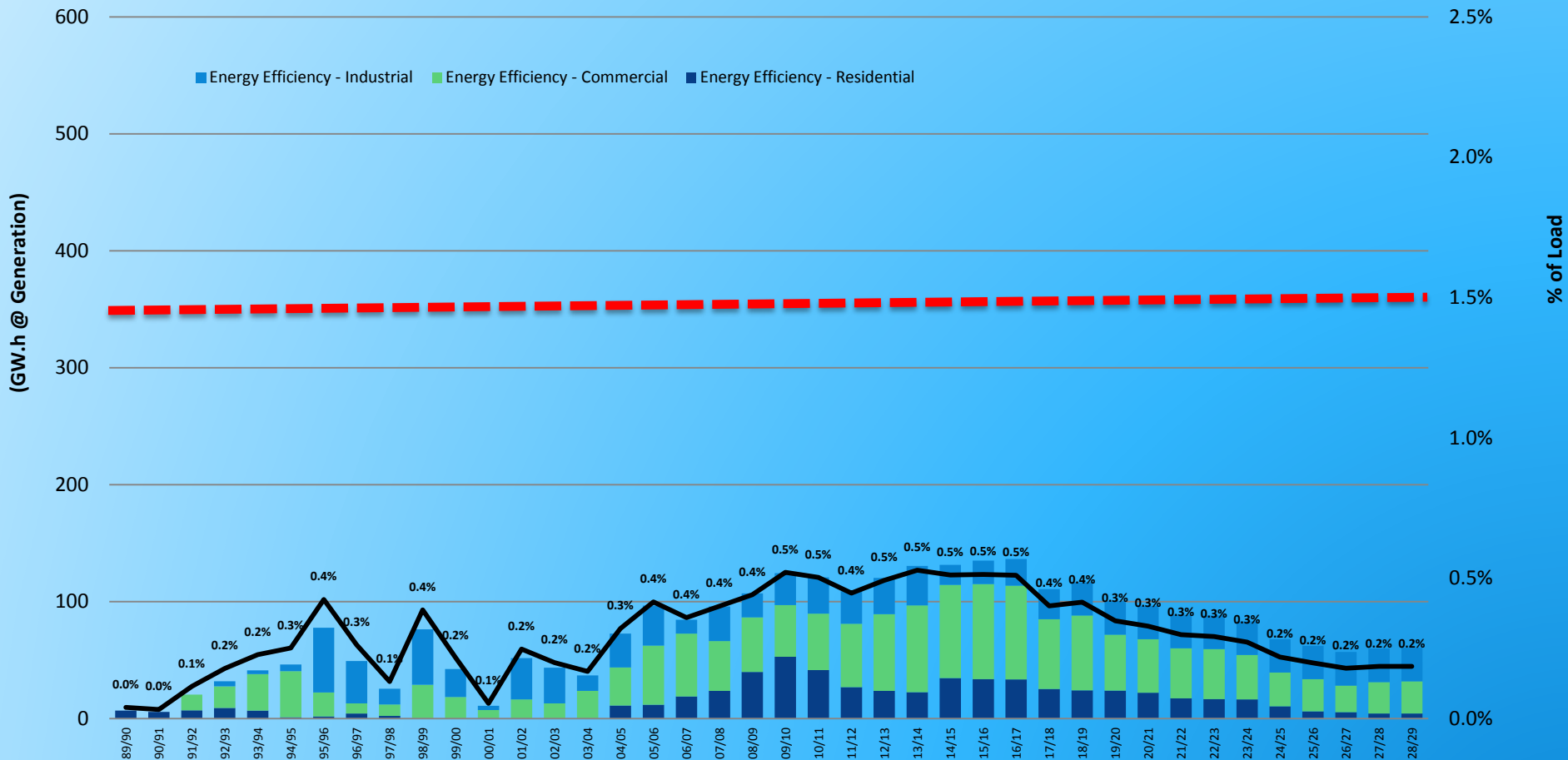
- Manitoba Hydro's Forecast Capital & Operating Cost Is Based On Current DSM Model & Existing Power Smart Plan
- Given The Desire For More DSM – future DSM costs may be higher

Incremental Energy Savings

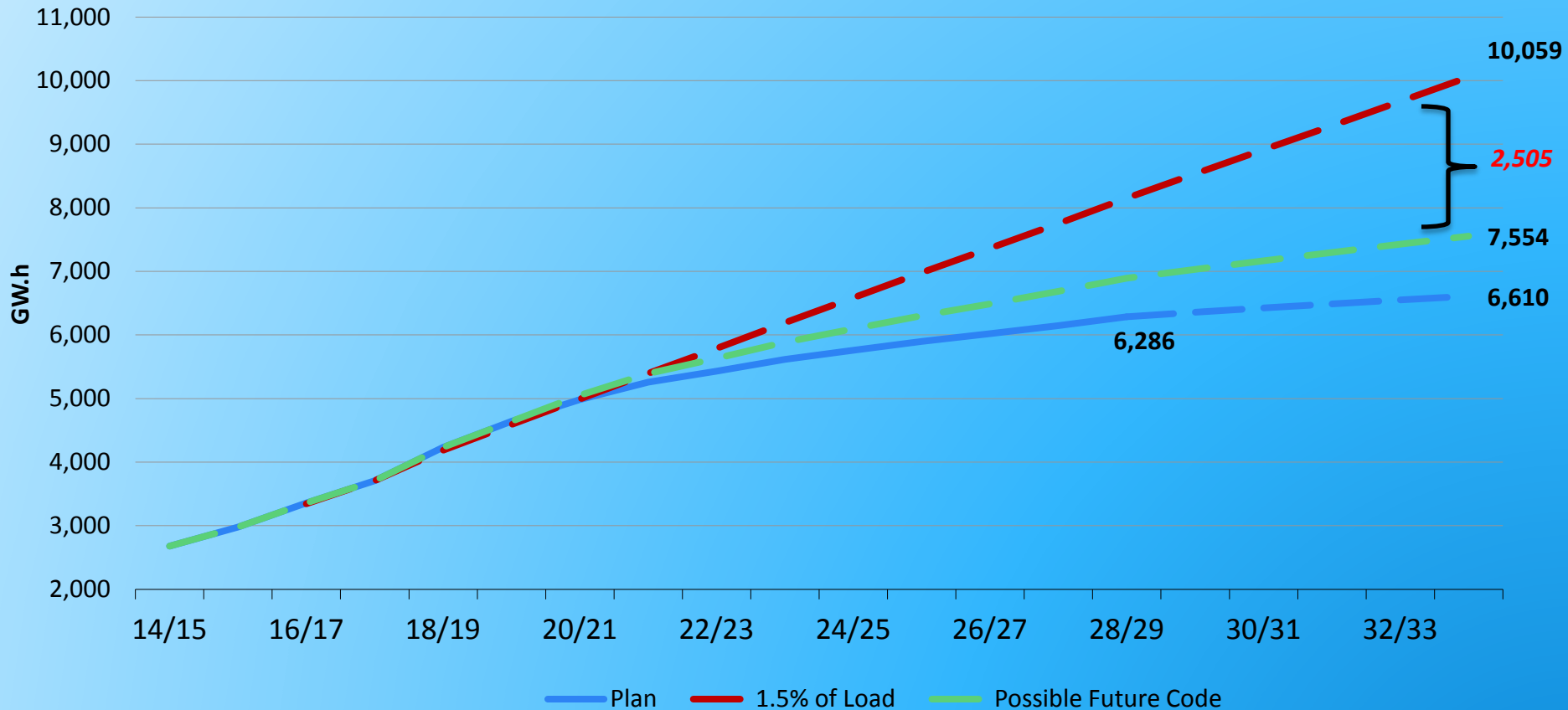


Incremental Energy Savings

(excluding Codes & Standards, Fuel Choice, Conservation Rates, Load Displacement)



Electric DSM

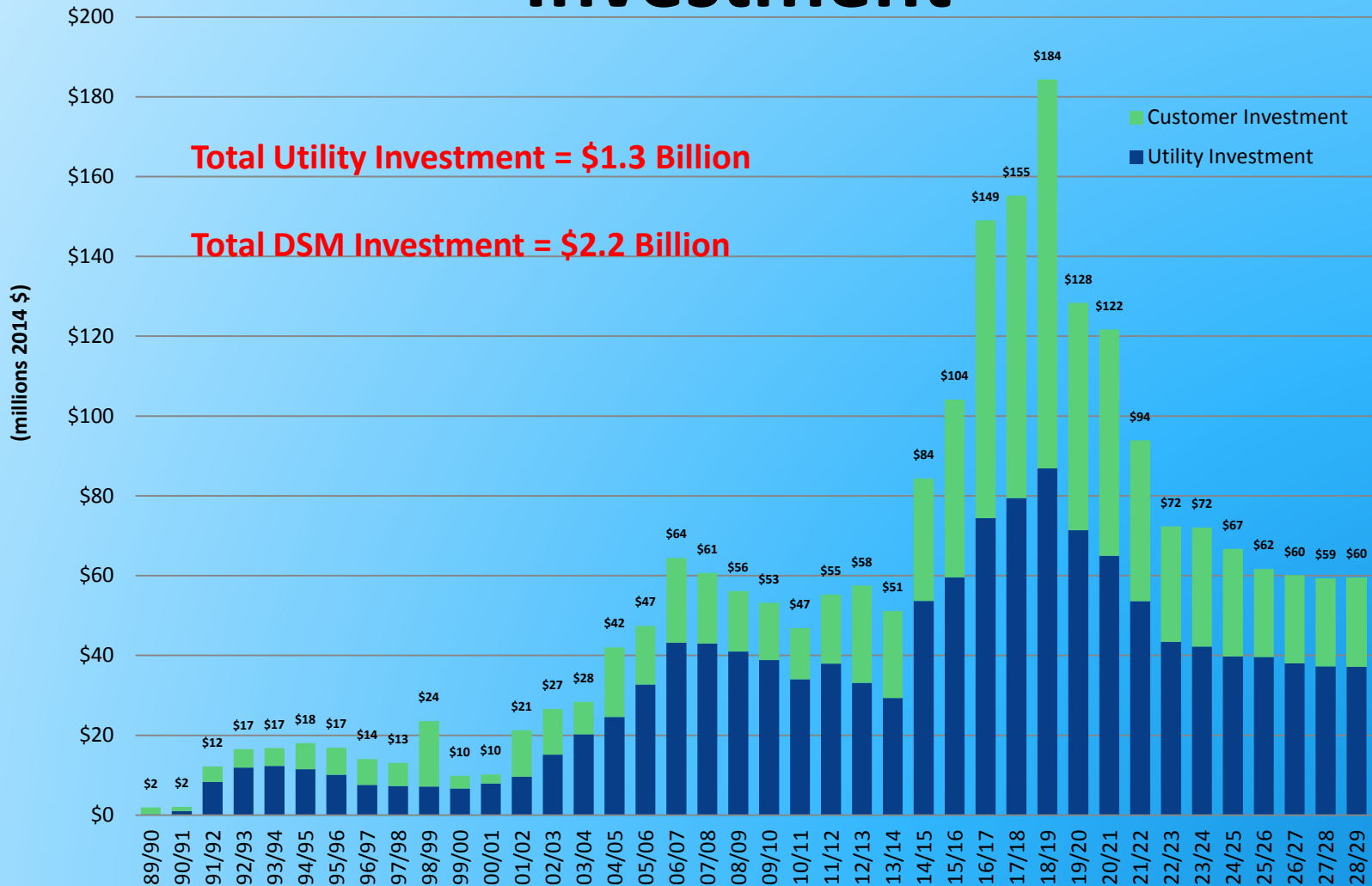


Potential Additional DSM Costs (20 Years)

Assumption	Utility	Customer	Total
New Entity	-	n/a	-
DSM (@ 3.5 cents / kW.h)	-	-	-
DSM (@ 4.0 cents / kW.h)	\$1.0 B	\$700 M	\$1.7 B
DSM (@ 5.0 cents / kW.h)	-	-	-
DSM (@ 6.0 cents / kW.h)	-	-	-
DSM (@ 7.0 cents / kW.h)	-	-	-

Are Manitoba Hydro's DSM Activities & Investments Consistent With The Corporation's Operating Principles – “improve efficiencies”

Leverage Participating Customer's Investment



Leveraging Third Party Partnerships

Affordable Energy Program

- AKI Energy
- Brandon Energy Efficiency Program (BEEP)
- Building Urban Industries For Local Development (BUILD)
- Manitoba Green Retrofit (MGR)
- North End Community Renewal Corporation
- Salvation Army
- Numerous First Nation Communities
- Prairie House Performance
- 10 Insulation Contractors, 41 Furnace Installers & 140 supporting contractors

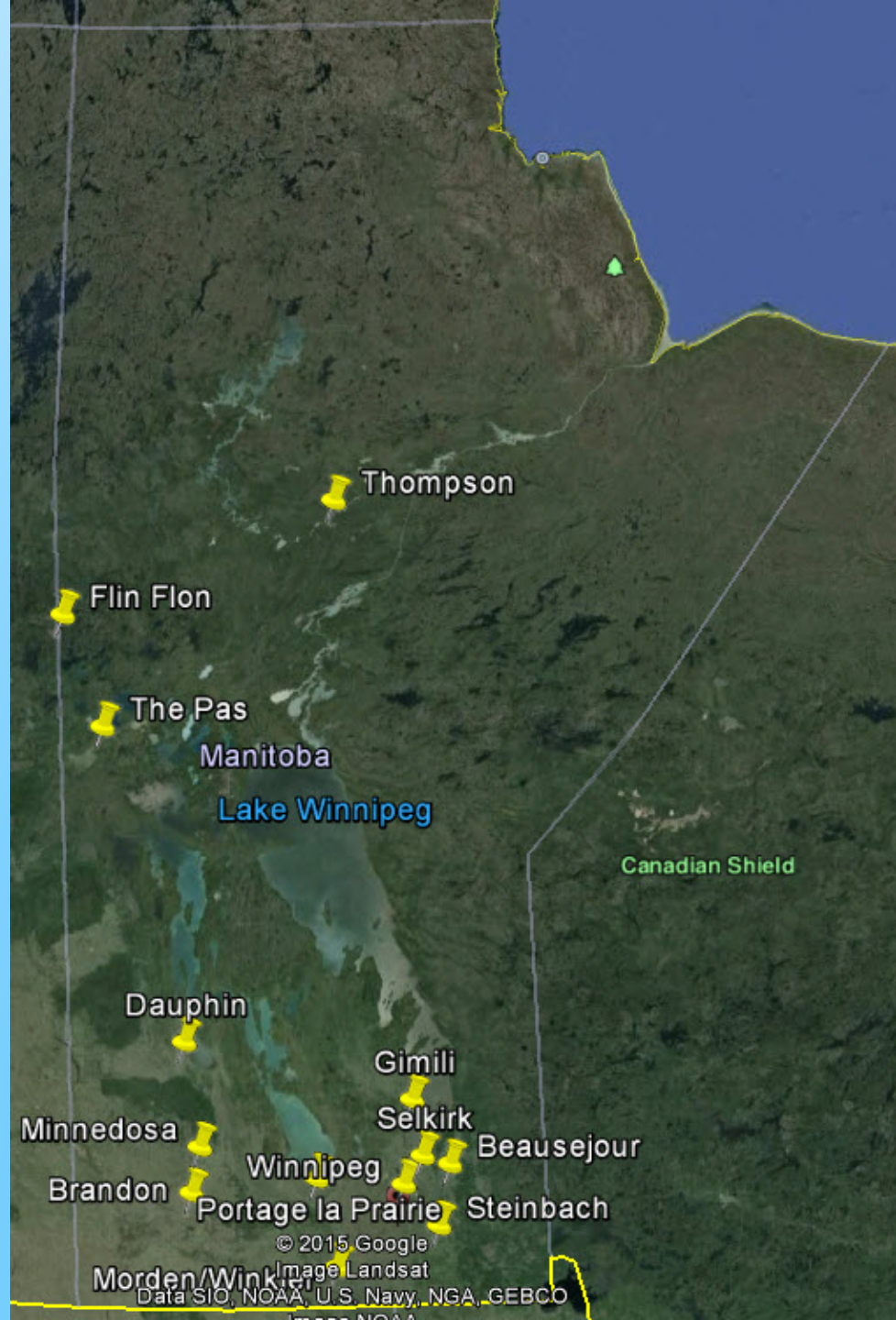
Leveraging Third Party Partnerships

Other DSM Programs

- **ecoFITT** – delivers Water & Energy Saver Program and Pre-Rinse Spray Valve Program
- **JES** – delivers Refrigerator Retirement Program
- **Summerhill** delivers Residential LED Lighting Program
- **TST Services** – redesign of Commercial Building Optimization Program
- Leverage Sales Force of over **2500 Retailers & Contractors** Across Manitoba via Power Smart Agreements

Capture Synergies Available Within Manitoba Hydro

- Integrate Customer Care & DSM Efforts
- Access To Significant Resources On As Needed Basis
 - Billing Data
 - Billing Services (credit rebates, loan payments)
 - Legal, IT, Human Resources, Accounting, Purchasing, Treasury, Credit & Collections, Creative Services, Public Affairs, Technical
- Integrated Natural Gas & Electricity DSM Efforts
- Province Wide Coverage



The Russell Inn Hotel & Conference Centre

March 2015

The INNside Scoop

Manitoba Hydro Partners & Helps the Russell Inn Company Once Again

The Russell Inn, and our associated properties (Jolly Lodger, Cedar House, Stone Haus, etc.) for the last 20 years, have utilized clear

bulbs, also referred to as Christmas

After 2 years of working closely with Manitoba Hydro, and Hydro giving the manufacturer guidance to build a better product that meets the challenges of our climate, we are proud to say that we now have the newest generation LED bulb system in place, warranted for up to -50 temperatures and an expected lifetime of 13 years, based on 8 hours per day of usage.

“Our special thank you goes out to all the folks at Manitoba Hydro, as they continue to be Manitoba’s jewel Crown corporation that believes in their corporate and social responsibilities.”

The cost of these lights is expensive with operating expense and bulb replacement costing approximately \$12 000/year. That cost does not include Joe’s time to replace and repair. Through Manitoba Hydro, we found an excellent replacement - a new generation LED system, but it was prohibitively expensive.

assisted The Russell Inn substantially with the installation of our Geothermal heating and cooling system.

Above: Nick Ogryzlo, Energy Services Advisor, with Manitoba Hydro, presenting Daymon Guillax with a cheque for \$12 000

THANK YOU