MANITOBA HYDRO
DEMAND SIDE MANAGEMENT

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Manitoba Hydro

OUTLINE

- 2013 – 2016 Power Smart Plan
- Assessing Economic Opportunities
- Additional DSM & Potential Study

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2013 – 2016 Power Smart Plan

Achieved To Date

1,990 GW.h/yr

586 MW

electricity savings

+

77 million m^3/yr

natural gas savings

$537 million invested in energy efficiency

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2013 – 2016 Power Smart Plan

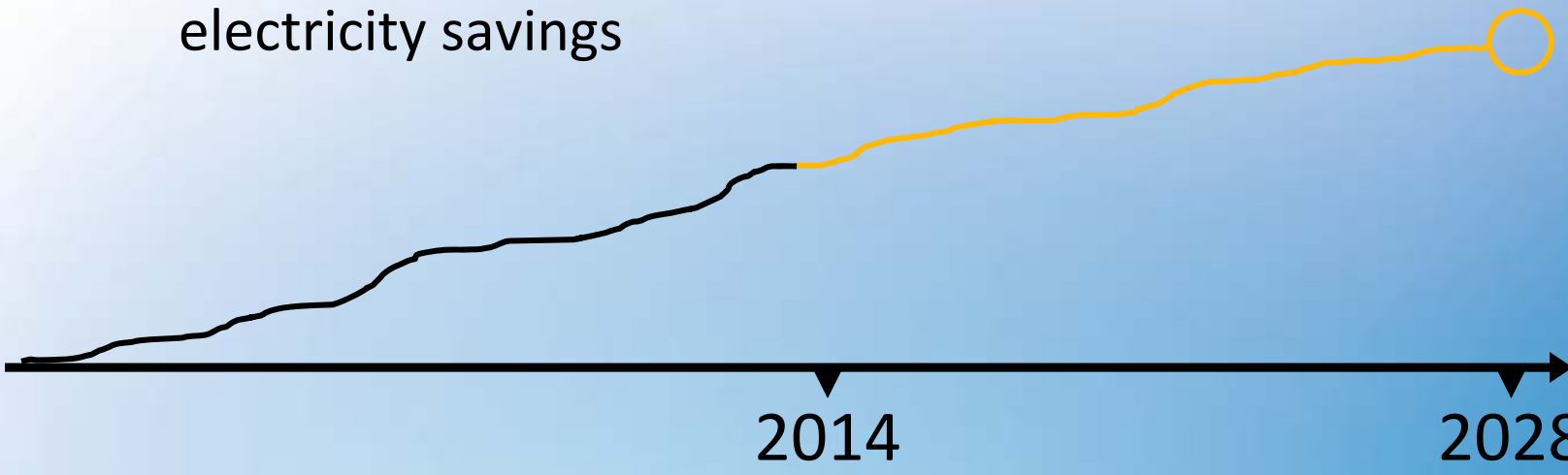
Forecast 2013/14 – 2027/28

1,552 GW.h/yr

490 MW
electricity savings

+

59 million m^3/yr
natural gas savings



$421 million to be invested in energy efficiency

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2013 – 2016 Power Smart Plan

Overall to 2027/28

3,113 GW.h/yr

846 MW
electricity savings

+

126 million m^3/yr
natural gas savings

$958 million to be invested in energy efficiency

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2013 – 2016 Power Smart Plan

How do we come up with our Plan?

2013 – 2016 Power Smart Plan

DSM Strategy:

Pursue all economic energy efficiency opportunities.

Why?

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Assessing Economic Opportunities

- Part of Manitoba Hydro's integrated resource plan.
- All options for meeting future energy requirements are assessed using standard economic evaluation.
- DSM also examined based upon economic perspective.

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Assessing Economic Opportunities

Category: New Generation •Keeyask •Conawapa •Natural Gas-fired •Wind •etc	Category: Supply Side Efficiency Enhancements •Kelsey Rerunnering •Pine Falls Rerunnering •Etc
Category: Purchases •Imports •Non-Utility Generation •etc	Category: DSM •Home Insulation Program •Commercial Lighting Program •Performance Optimization Program •etc

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Assessing Economic Opportunities

APPROACH:

- For all categories, each initiative is assessed individually
- For all categories, all customers pay the whole cost. Therefore need to consider the full cost of the installed kW.h.
    - For DSM, that is the resource cost which includes the participating customers' costs.

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Assessing Economic Opportunities

Cost Effectiveness Metrics

Overall	• Total Resource Cost • Societal Cost
Participating Customer	• Payback • Participating Customer
Utility (Ratepayers)	• Levelized Utility Cost • Rate Impact Measure • NPV

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Assessing Economic Opportunities

Cost Effectiveness Metrics

Total Resource Cost (TRC)

$$\text{TRC} = \frac{\text{PV (Marginal Value of Energy Savings) + PV (Measurable Non-Energy Benefits)}}{\text{PV (Incremental Product Costs + Program Administration \& Delivery Costs)}}$$

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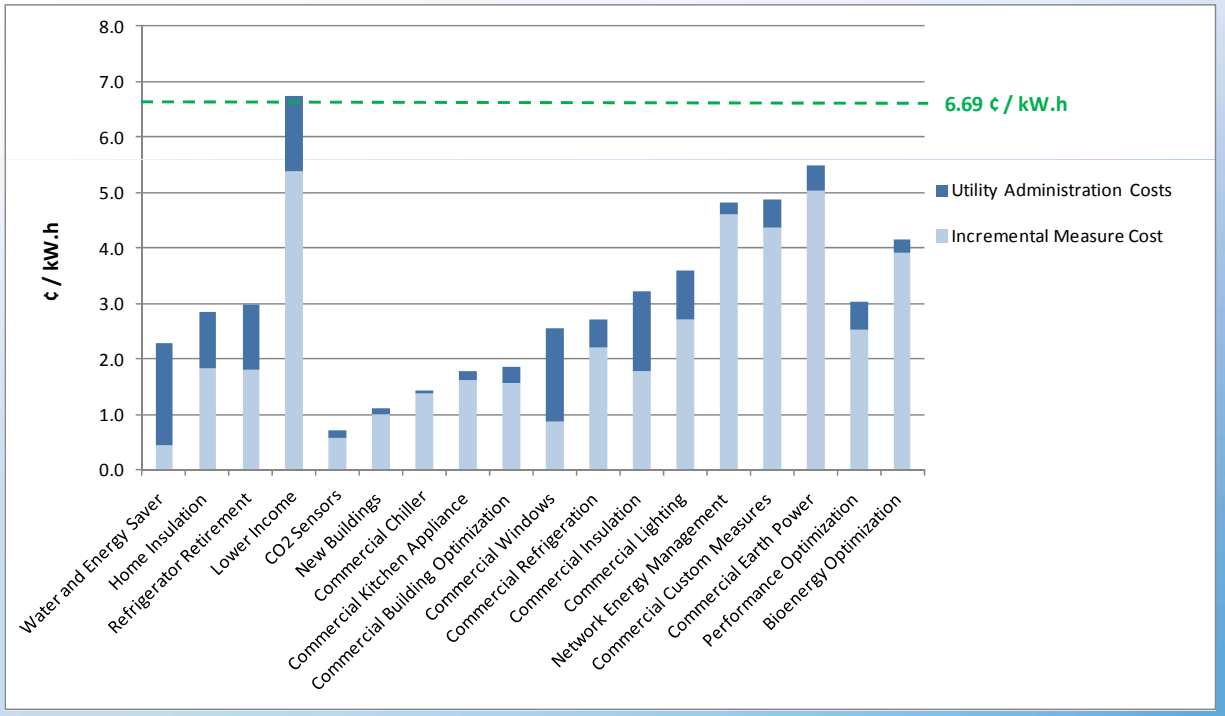
Assessing Economic Opportunities

LEVELIZED RESOURCE COST (2012$)



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Assessing Economic Opportunities

Cost Effectiveness Metrics

How is the cost shared?

Overall	• Total Resource Cost • Societal Cost
Participating Customer	• Payback • Participating Customer
Utility (Ratepayers)	• Levelized Utility Cost • Rate Impact Measure • NPV

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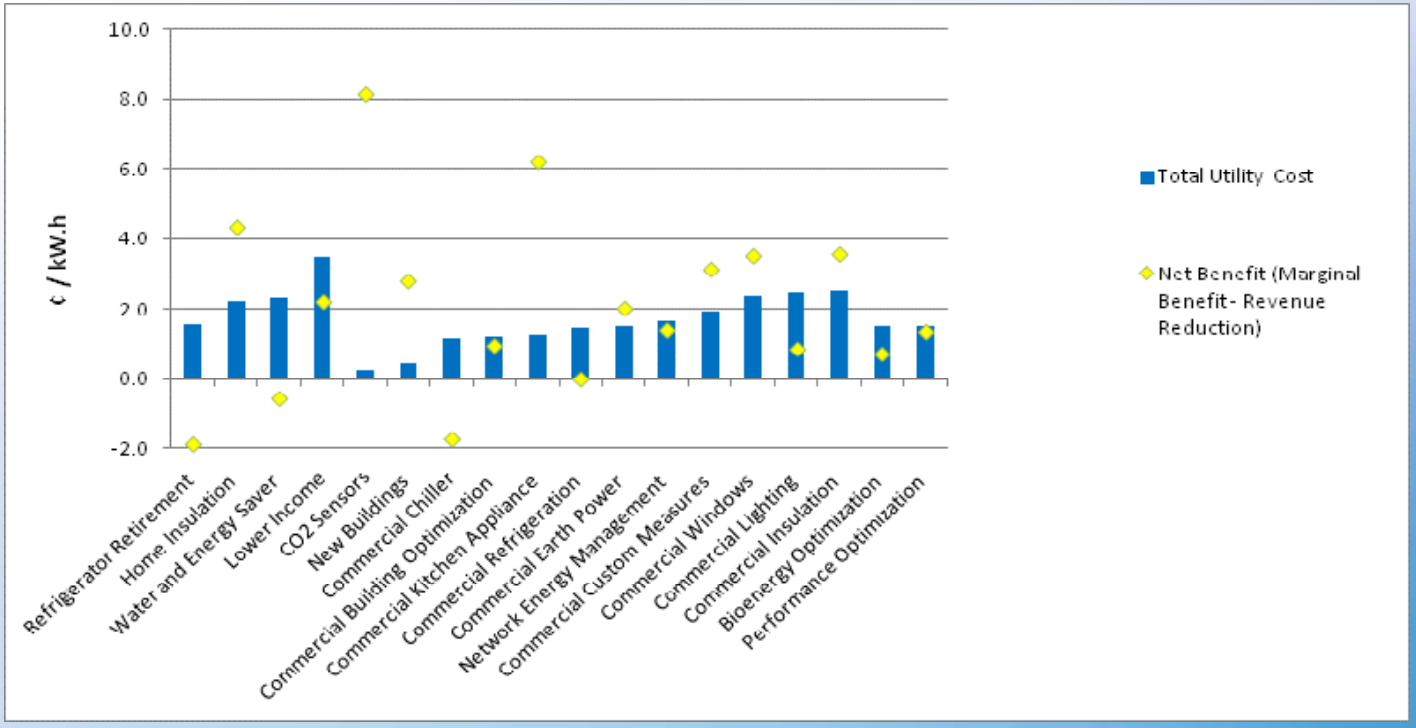
Assessing Economic Opportunities

LEVELIZED UTILITY COST (2012$)



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Assessing Economic Opportunities

Rate Payer Impacts (2012$)

DSM Program	RIM (B/C ratio)	NPV (millions)
Refrigerator Retirement	0.6	($5.1)
Home Insulation	1.2	$3.7
Water and Energy Saver	0.7	($1.8)
Lower Income	0.9	($1.2)
CO2 Sensors	2.1	$0.8
New Buildings	1.4	$25.4
Commercial Chiller	0.6	($2.6)
Commercial Building Optimization	1.0	($0.2)
Commercial Kitchen Appliance	1.4	$0.9
Commercial Refrigeration	0.8	($2.9)
Commercial Earth Power	1.1	$1.7
Network Energy Management	1.0	($0.0)
Commercial Custom Measures	1.2	$1.6
Commercial Windows	1.1	$1.5
Commercial Lighting	0.8	($28.3)
Commercial Insulation	1.1	$1.4
Bioenergy Optimization	0.9	($4.8)
Performance Optimization	1.0	($3.1)

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2013 – 2016 Power Smart Plan

- Opportunities identified as available and economic today are included in the Plan.
- Additional opportunities already under development:
  - Residential Community Geothermal – Launched June 2013
  - Residential Lighting
  - New Homes
  - Roadway Lighting
- Once approved for implementation are included in future DSM Plan updates.

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Additional DSM Opportunities

- Manitoba Hydro is continuing and, where economically feasible, expanding its commitment to demand side management (DSM).

- DSM Potential Study – Refining Manitoba Hydro's Power Smart Planning.

DSM Potential Study

- **Technical Potential** – The absolute level of DSM without regard for cost and other barriers is defined as Technical Potential.
- **Economic Potential** – Represents the adoption of all energy efficient measures which are cost-effective from a resource perspective (MRC >1).
- **Market Potential** – Represent the absolute level of savings that are technically feasible, economically attractive assuming ideal market conditions.
- **Achievable Potential** – Recognizes that market conditions are not ideal and projects savings that may be reasonably captured considering market barriers.

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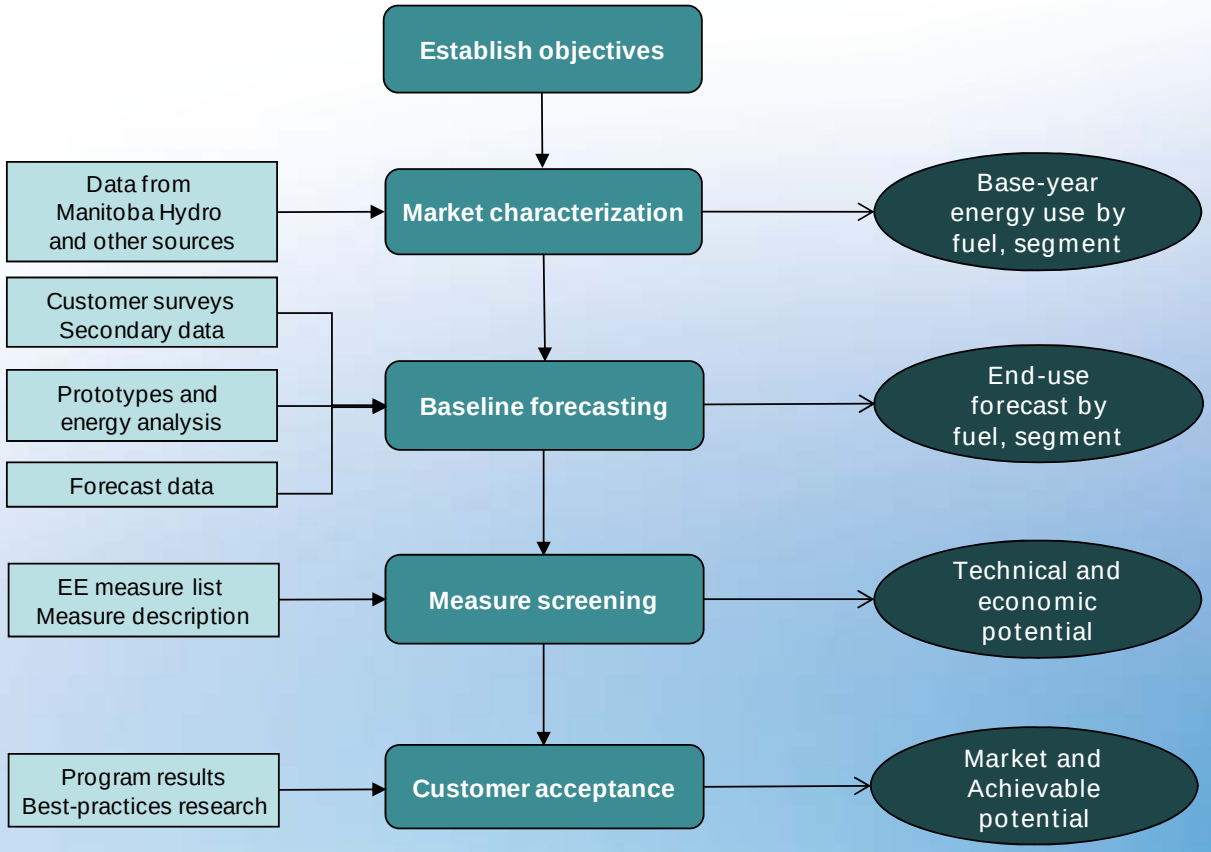
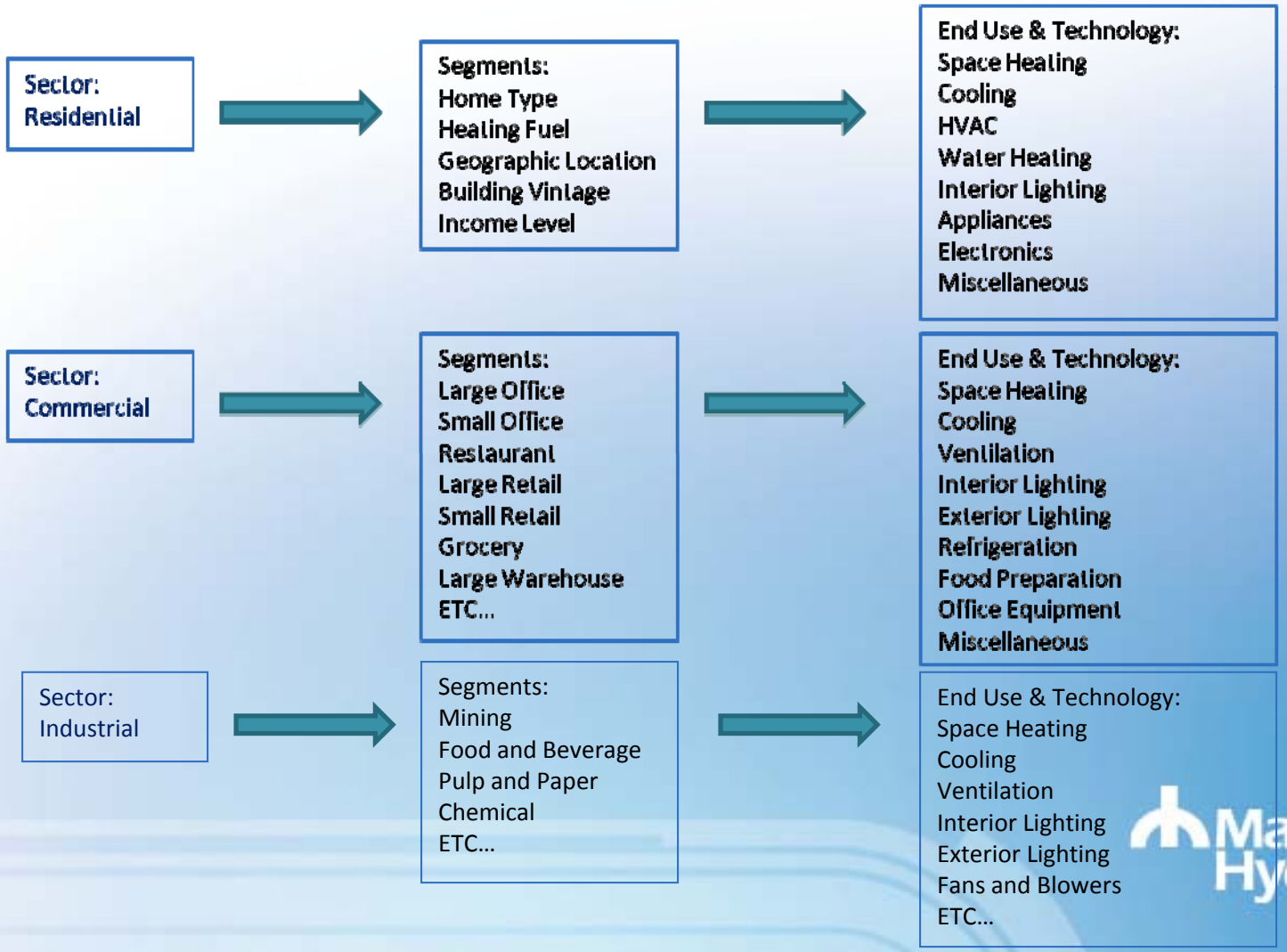
DSM Potential Study

Overview of Approach



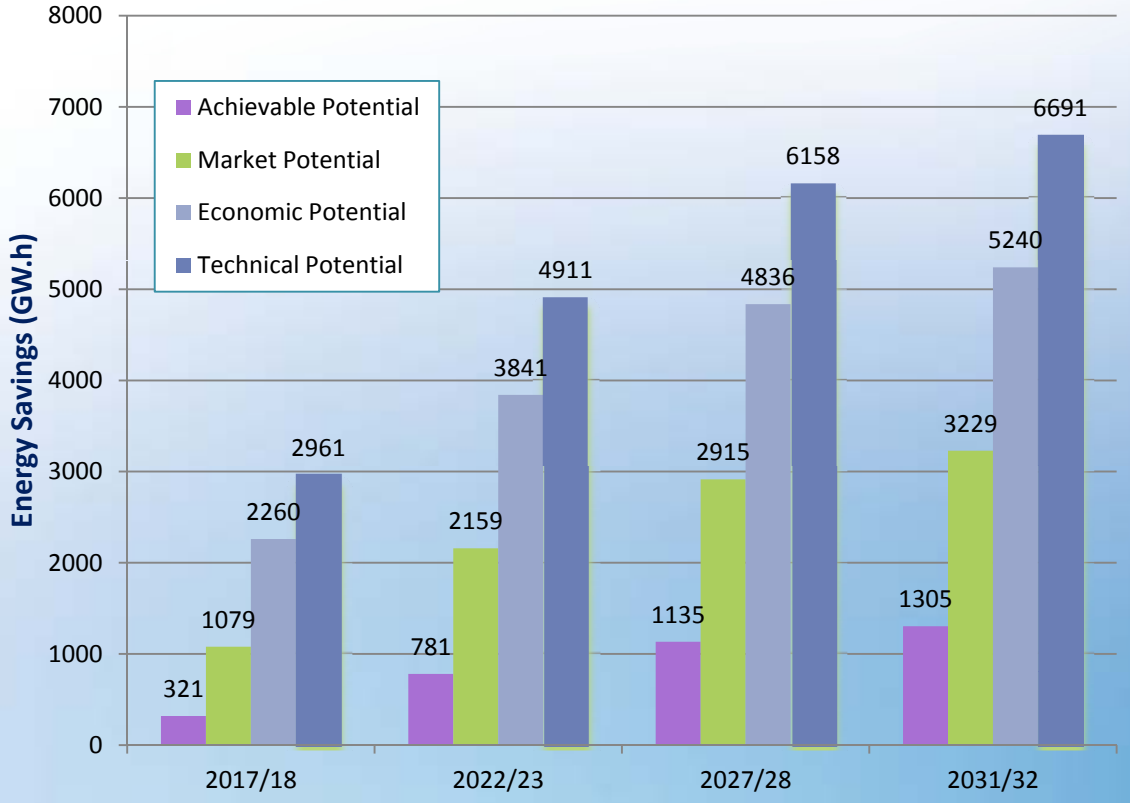
DSM Potential Study

Overview of Approach



DSM Potential Study

Energy Efficiency Potential Projections



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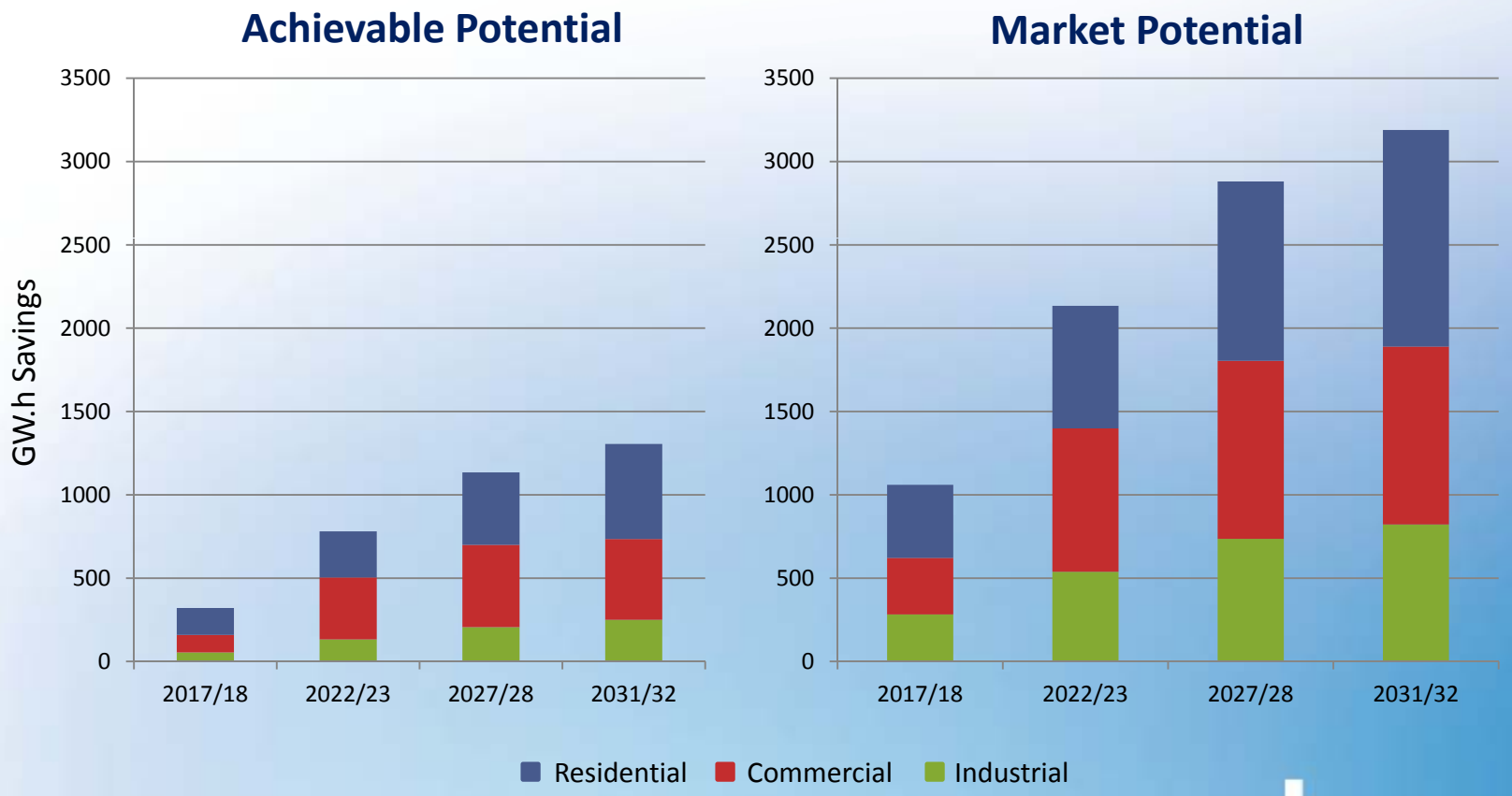
DSM Potential Study

Potential Projections by Sector



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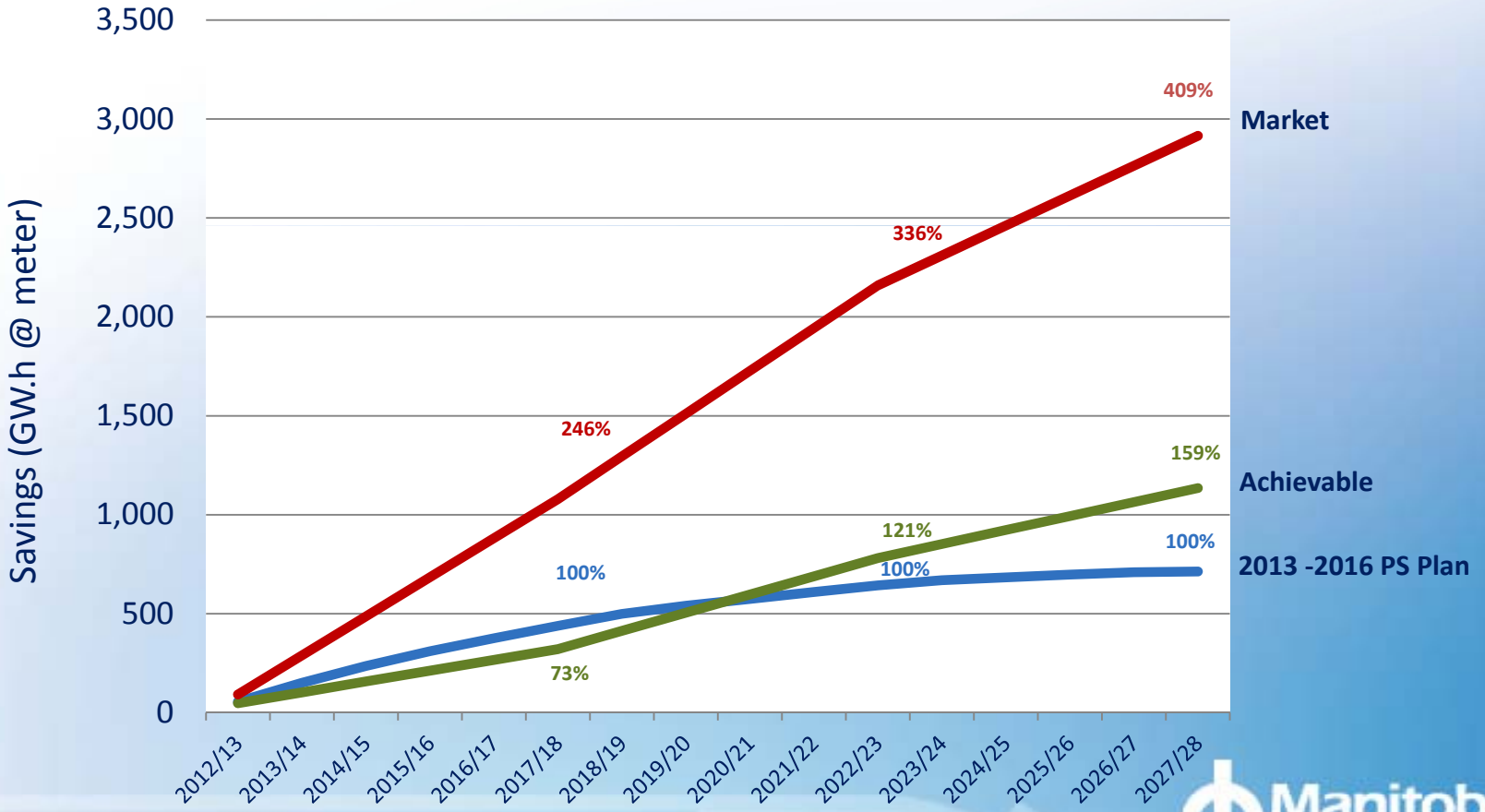
DSM Potential Study

Compared to 2013 – 2016 Power Smart Plan



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Additional DSM & Potential Study

Comparison at Forecast Year 2027/28 (at meter)

	GW.h	%	MW	%
2013-16 Power Smart Plan 2012/13 through 2027/28	713	100%	154	100%
DSM Market Potential Study				
Achievable	1135	159%	233	151%
Market	2915	408%	644	418%

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DSM Summary

- Manitoba Hydro is continuing and, where economically feasible, expanding its commitment to demand side management (DSM).
- As demonstrated in Chapter 12 increasing the DSM within a reasonable range for this analysis did not change the “conclusion”
- Manitoba Hydro will update its Power Smart Plan, in consultation with government as required by the Energy Savings Act, by March 31, 2014, which will incorporate the information contained in the DSM Market Potential Study. In the process of updating the DSM plan, Manitoba Hydro will evaluate the possibility of a higher level of DSM.
- Power Smart staff have already been assessing emerging new energy efficiency opportunities and the corporation intends to pursue these opportunities at the appropriate time.

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Thank you