

# NFAT Evidence Overview

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# Presentation Outline

- Preferred Development Plan
- Future electricity plan decisions
- NFAT Terms of Reference (TOR) multiple perspectives
- MH panels & topics
  - Preliminary explanation of specific issues
- Preferred Plan in best long term interest of Manitobans

# Preferred Development Plan

- DSM will be expanded
  - Program level & design updated on ongoing basis
- Commitments required June 2014
  - start construction in July of Keeyask G.S. for a 2019 ISD
  - 750 MW U.S. transmission interconnection
  - 250 MW export agreement with Minnesota Power (MP)
  - 100 MW & 308 MW export agreements with Wisconsin Public Service (WPS)
- Conawapa with earliest ISD of 2026
  - Decisions to construct & on timing of Conawapa not required until 2018
  - Protecting Conawapa ISD evaluated on ongoing basis considering updated DSM levels, load forecast, export negotiations, capital costs, energy prices, etc.

# NFAT Future Electricity Supply Plan Decisions

## Fundamental decision: long term Manitoba electrical future

- Should next major electrical supply be hydro or gas?
  - DSM expanded in all plans

## Associated decisions if next supply is hydro

- Should interconnection expansion opportunity be pursued?
  - need Keeyask 2019 & 250 MW MP sale
- Should interconnection be 750 MW or 250 MW?
- Should WPS 308 MW sale be pursued?
  - need 750 MW interconnection

# Development Plan Implementation Pathways

-All include DSM (& potentially wind, etc.)

1	Gas 2023 only for domestic load	Later gas generation or hydro
2	Keeyask 2023 only for domestic load	Later gas generation or Conawapa
3	Keeyask 2019, 250 MW interconnection, MP 250 MW Sale, 125 MW NSP extension, 100 MW WPS sale	Later Conawapa or gas generation
4	Keeyask 2019, 750 MW Interconnection, MP 250 MW Sale, 125 MW NSP extension, 100 MW WPS sale	Later Conawapa or gas generation
5	Keeyask 2019, 750 MW Interconnection, MP 250 MW Sale, 125 MW NSP extension, 308 MW WPS Sale	Later Conawapa or gas generation

## NFAT Terms of Reference Multiple Perspectives

- Consistent with MH mandate & NFAT TOR, MH assessed development plan alternatives from wide range of corporate & provincial societal perspectives
- Conclusion incorporates full set of perspectives
- Different methodologies & tools needed for different perspectives

# NFAT TOR Multiple Perspectives

## Market Valuation Economics

- NPV Net benefit to MH (domestic customers & project partners)

## MH Domestic Customer

- Reliability (minimum required by planning criteria & amount above criteria)
- Energy security (minimum required by planning criteria & amount above criteria)
- Rate increases (annual & cumulative)
- Financial targets (debt/equity, interest coverage, capital coverage)
- Retained earnings, fixed asset & debt levels

## Socio-economic

- Manitoba Economy - employment & income
- Training & business opportunities
- Infrastructure, services, personal & family & community life, resource use, heritage resources
- Special focus on Northern & Aboriginal communities

# NFAT TOR Multiple Perspectives (Cont'd.)

## Macro-environmental impacts & benefits

- Air, land, water, flora & fauna
- Greenhouse gases & key environmental functions

## Manitoba Government

- Financial transfers to provincial government
  - Capital tax, water rentals, debt guarantee fee
- Alignment to Manitoba Hydro Act, Sustainable Development Act, Climate Change Act, Clean Energy Strategy

## Risk

- Deal with uncertainties, mitigation, flexibility



# Different Discount Rates for Different Perspectives

Perspective	Discount Rate	Discount Rate Value
Market Valuation Economics CH 9-10,12,	WACC	5.4% (5.05% 2012) (Real)
Social Benefit Cost Ch 13	Social Discount	6.0% (Real)
MH Customer (Cumulative present value of consumers general revenue) CH 11 & PUB/MH I-149a	Social Time Preference (based on interest rate on risk free savings)	1.86% (Real)

# Four Manitoba Hydro Panels

- Load & DSM
- Need, Alternatives & Economic Evaluations
- Finance & Financial Evaluations
- Societal Issues & Overall Societal Benefits/Costs

# Load & DSM Panel

- ENERNOC Consultants – DSM Potential Study
  - Methodology, Market Potential, Achievable Potential
- DSM Philosophy & Approach
- 2013 DSM Plan plus additional programs being delivered
- 2014 DSM Options for preliminary evaluation in NFAT
  - Economics/financials of DSM options in later panels
- 2013 Load Forecast
- Historical & future load growth
- Factors affecting future load forecasts
- Manitoba load growth & other jurisdictions

# Need, Alternatives & Economic Evaluation Panel

- When new resources needed for domestic load
- Generation Planning Criteria
  - Reasonability of energy import limits
  - Viability of MH building new import line from US with no export contacts or counterparty
- Resource options
- Window of opportunity for interconnection infrastructure & exports
  - Rare confluence of essential conditions for new interconnection
- Development plans
- Economic evaluation methodology & inputs
- Discount rates
- Keeyask & Conawapa capital cost estimates
  - 2014 update (based on March 2014 Keeyask GCC award & other factors)
- Gas, wind, solar & biomass capital costs
- Transmission & interconnection capital costs

## Need, Alternatives & Economic Evaluation Panel (continued)

- Energy trends & gas/export prices
- Export contracts
  - WPS 308 MW contract signed
  - Great River Energy (GRE) 600 MW MOU signed
  - SaskPower 25 MW sale & 500 MW MOU signed
- Methodology to deal with uncertainty
- Development plan evaluation results
  - 2012 & 2013
  - Updates with preliminary 2014 cost estimates for Keeyask & Conawapa
- Evaluation of DSM alternatives
- Pathways & optionality
- Reliability comparison of development plans
- Energy security comparison of development plans

# Main Uncertainty Factors Affecting Plan Comparisons

- Factors which most affect evaluation comparisons
  - Energy prices (export, natural gas)
  - Capital costs
  - Interest & discount rates
- Important but not as critical
  - Load growth
  - DSM
  - Climate Change
  - Droughts
- Evaluation approach to most effectively consider uncertainty & risks
  - 27 probabilistic scenarios for 3 most critical factors
  - Sensitivities for other factors

# DSM Options: Additional Evaluations for March 10

DSM Options 2027/2028 Energy levels	Preferred Plan Keyyask Conawapa 750 MW	Keyyask Gas 750 MW	All Gas Plan
2013 DSM 773 GWh (1 X DSM)	X		X
2014 Option 1 1,704 GWh (2 X DSM)	X		
2014 Option 2 2,961 GWh (4 X DSM)	X	March 10 or later	March 10 or later
2014 Option 3 3,546 GWh (5 X DSM)	X	X	X

- 2013 Load Forecast & associated assumptions
- Options 2 & 3 repeated with 1300 GWh pipeline load added to 2013 Load Forecast

# Finance & Financial Evaluation Panel

- Financial targets
- Evaluation methodology
- Development plan evaluations
  - Rate increases annual & cumulative
  - Cumulative present value of consumers general revenue
  - Fixed asset & debt levels
  - Retained earnings
  - Debt/equity ratio
  - Interest coverage ratio
  - Capital coverage ratio
- Intergenerational equity
- Provincial credit rating considerations



	<b>MH Economic Evaluations (standard benefit/cost methodology)</b>	<b>MH Financial Evaluations</b>
Type of Costing	Only incremental costs/revenues that would be incurred if project proceeds	All relevant costs/revenues including reallocated & overhead costs
Operations	Project only or project with considerations of how other operations may be affected	Total financial operations of MH (similar to IFF/CEF )
Measurement	Net Present Value benefit to MH (domestic customers & project partners)	Rate increases, effect on financial targets (net of partners investment & income)
Price levels	Constant currencies with real escalation, ignoring general inflation (real \$)	Nominal currency with real escalation & inflation (current \$)
Financing	Specific funding requirements not relevant; reflected in the discounting of cash flows	Interest payments, debt repayments explicitly included
Depreciation	Depreciation not directly applicable  Residual Value calculated for project life longer than 35 year study period	Depreciation used  Residual value not needed as project cost calculated annually
Temporal	Benefit/Cost of project over its life	Year by year impacts

# Societal Issues & Overall Societal Benefits-Costs Panel

- High level comparison of plan resource alternatives considering:
  - Macro-Environmental
  - Socio-Economic
  - Partnership, Aboriginal & Northern Benefits
- Alignment to Manitoba legislation/strategies
  - Sustainable Development Act
  - Climate Change & Emissions Reduction Act
  - Manitoba's Clean Energy Strategy
- Economic impacts analysis of plans
  - Employment, GDP, income, tax revenue
- Multiple Accounts Societal Benefit-Cost Analysis
  - Quantitative & qualitative social benefit/cost components
  - Summary of quantitative & qualitative trade-offs
- Development plan pathways implementation

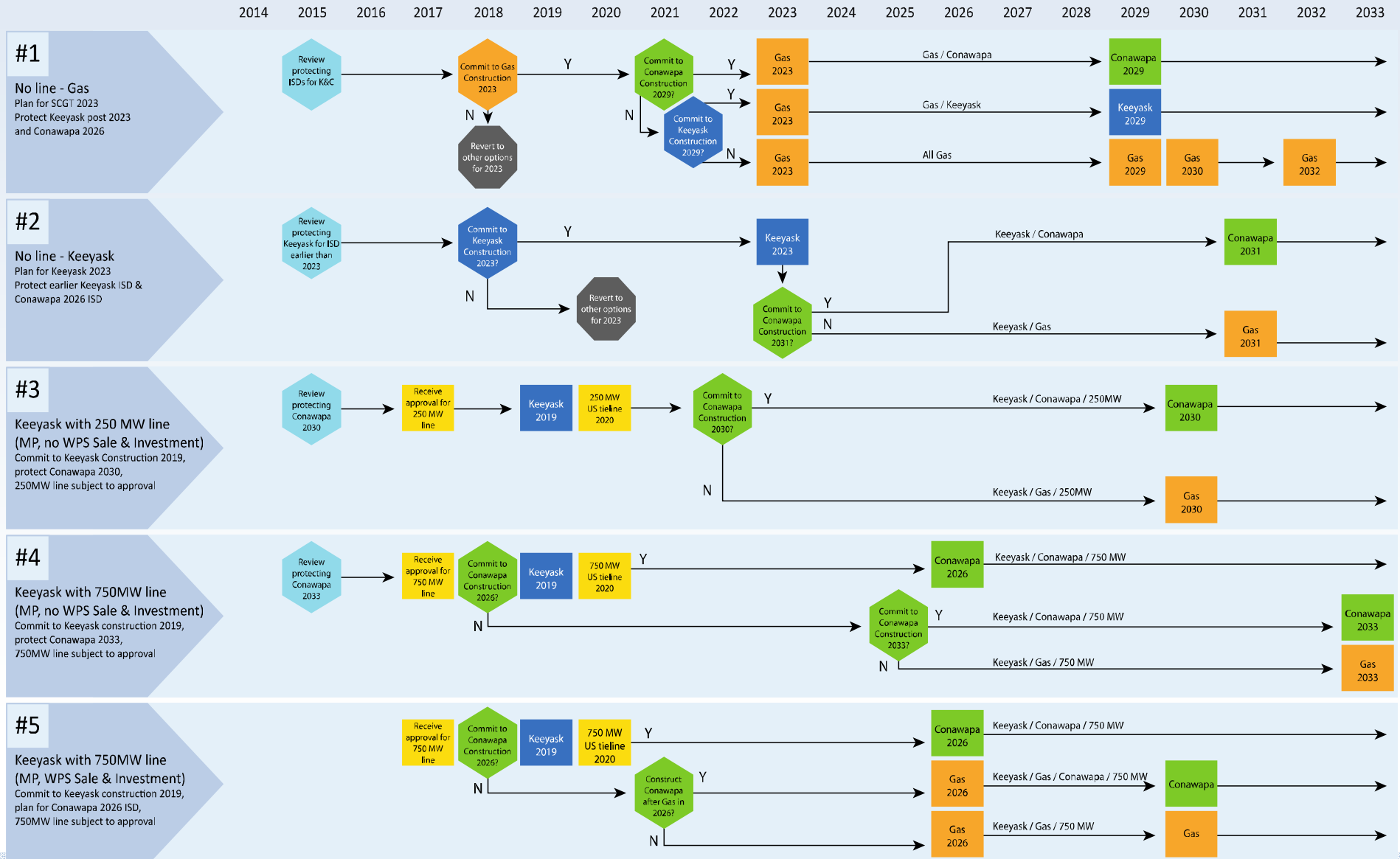
# Multiple Account Benefit-Cost Analysis

- Form of social benefit-cost analysis
  - Integrates range of perspectives
- Takes broad societal perspective - incorporates benefits & costs not reflected in MH revenues & expenditures
  - Monetizes benefits/costs where can
  - Recognizes that not all consequences can be monetized
- Also addresses important distributional considerations
- Identifies advantages or disadvantages of the alternatives & key trade-offs for different parties & interests

# Multiple Account Benefit-Cost Analysis: The Evaluation Accounts

- Market Valuation Account (incremental revenues & expenditures to MH & its partners)
- Manitoba Hydro Customer Account
- Manitoba Government Account
- Manitoba Economy Account
- Environment Account
- Social Account
- Uncertainty & Risk

# Pathway Decision Tree



## Preferred Plan Overall Most Beneficial for Manitobans

- Growing Manitoba load needs new supply in addition to DSM even if no new exports
- New interconnection & new exports beneficial
- Lowest rates in long term but medium term rates slightly higher
- Supports MH's Long-term fiscal health - highest levels of fixed assets & retained earnings; debt levels manageable
- Most enhancement - Manitoba customer load reliability & energy security
- Robust over range of possible future scenarios & risks
- Larger financial transfers to Province which benefit all Manitobans
- Greater employment, training, business & economic benefits
- Benefits to Northern & Aboriginal communities
- Large regional greenhouse gas reductions
- Capitalizes on Manitoba endowment of renewable energy

# Thank You

