

Nalcor Energy Marketing

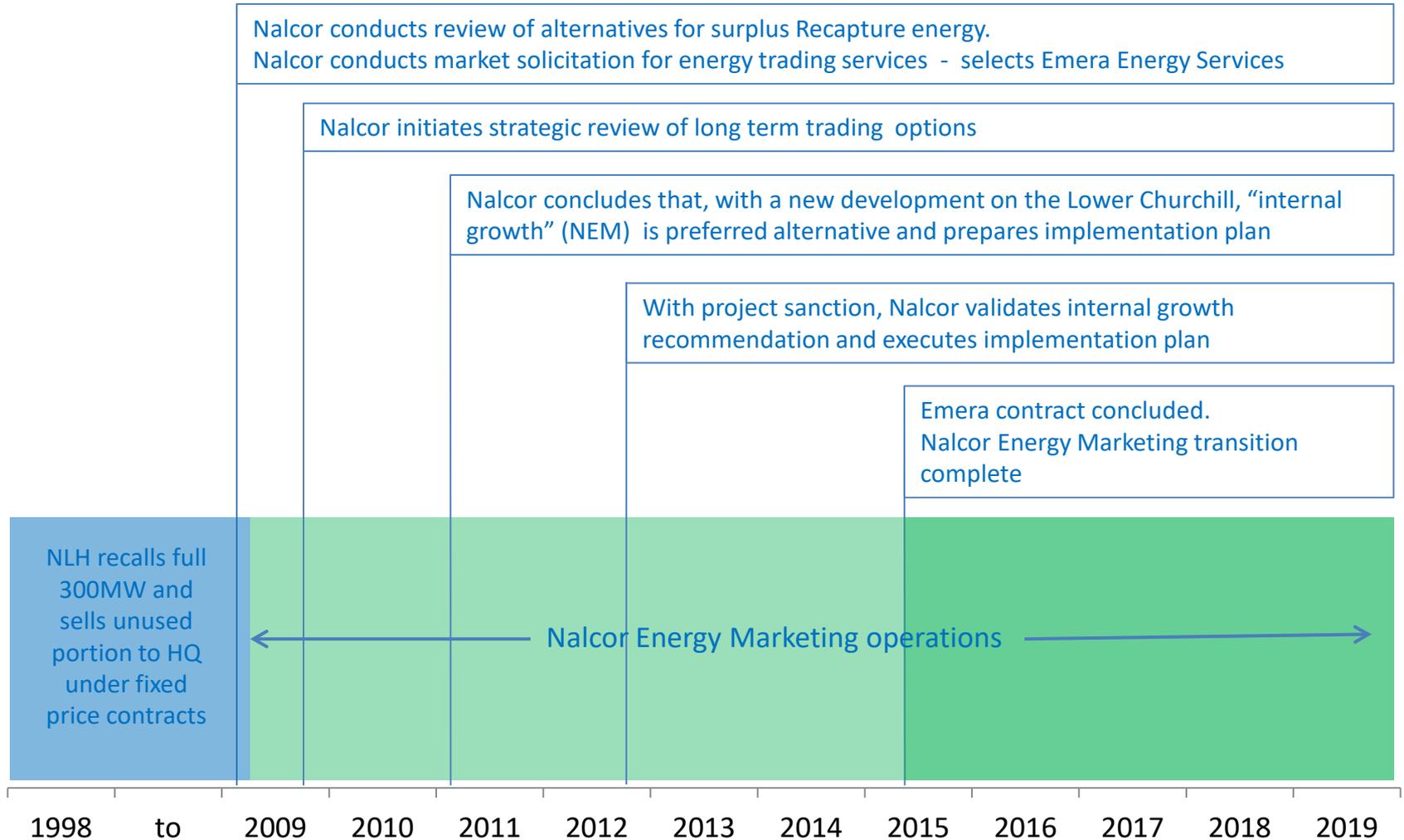
Presentation to the Board of Commissioners
of Public Utilities: Rate Mitigation Review

Outline

- Evolution of the Marketing Business
- Background and Assets Under Management
- Security of Supply and Asset Optimization
 - Framework for NLH-NEM Collaboration
- Summary

EVOLUTION OF THE MARKETING BUSINESS

Evolution Timeline



Strategic Review of Long Term Trading Options

- Alternatives considered:
 - Continuation of Emera contract
 - Agency
 - Joint Venture
 - Acquisition
 - Internal Growth (what has become NEM)
 - Cease marketing and trading activities
- Engaged experts in energy marketing, financial risk management, market access (both Canada and US), organizational structure and tax planning.

Strategic Review of Long Term Trading Options (cont'd)

- Decision criteria included considerations such as:
 - Experience under the then current Emera marketing contract
 - Ability to maximize portfolio value
 - Ability to expand market access
 - Risk management efficiency
 - Ability to manage/support portfolio expansion
 - Availability of key resources
 - Cost effectiveness
- The internal growth model was chosen because, on whole, it presented the greatest overall strategic value to Nalcor
- The internal growth model offered approximately 25% lower overhead costs as compared to continuing with a contracted model
- The decision to move forward with the Internal Growth model was linked to a significant expansion of the portfolio and that occurred with the sanction of the Muskrat Falls project.

Risk Management

- A key requirement of any trading organization is a comprehensive risk management toolset to guide and monitor trading activities.
- The Energy Marketing Risk Manual establishes an effective framework for the management of risks inherent to NEM and is founded in industry best practices and Nalcor's Enterprise Risk Management Framework that is overseen by Nalcor's Board of Directors.
- NEM's day-to-day trading activities and compliance with established risk parameters are overseen and reported on by Nalcor's Treasury and Risk Management department

Risk Management (cont'd)

- Following are some of the topics included in the Risk Manual:
 - Oversight Framework and Structure
 - Risk Management Roles and Responsibilities
 - Approved Transaction Types and Delegation of Authority
 - Financial Risk Management Program (including commodity, foreign exchange, credit, and transmission congestion risks)
 - Operational Risk Management Program (including trading and scheduling risk, production risk, information and systems risk, confirmation and settlement, dispute resolution processes and human risk)
 - Regulatory Risk Management Program (including the compliance framework)
 - Portfolio Management and Expansion
 - Performance Reporting; and
 - Management of Change

BACKGROUND AND ASSETS UNDER MANAGEMENT

Energy Marketing 101

- Energy
 - Traded in MWh or MW per 1 hour (\$/MWh)
- Capacity
 - Generation and Transmission
 - Traded in MW quantities (\$/MW-month)
- Ancillary Services
 - Voltage and Frequency Support, Operating Reserves, etc.
- Others
 - Renewable Energy Certificates, GHG Credits, etc.

Types of Electricity Markets

- Clearing (“spot”) Markets
 - Day-ahead and real-time energy markets
 - Price is set each hour through a reverse auction where generator offers are cleared against load bids
 - Lowest offers cleared first
 - NYISO, ISO-NE, and IESO
- Contract Markets
 - Price determined through a mutually agreed bilateral contract
 - Can also have bilateral contracts in Clearing Markets
 - QC, NB, NS, PEI

Electricity Market Participation

Canada*

- Newfoundland and Labrador
- Quebec
- Ontario
- New Brunswick
- Nova Scotia

Other significant permits

- NEB Export Permit
- DOE Export Permit
- FERC Market Based Rate Authority (MBR)

United States*

- New York
- New England (all 6 states)

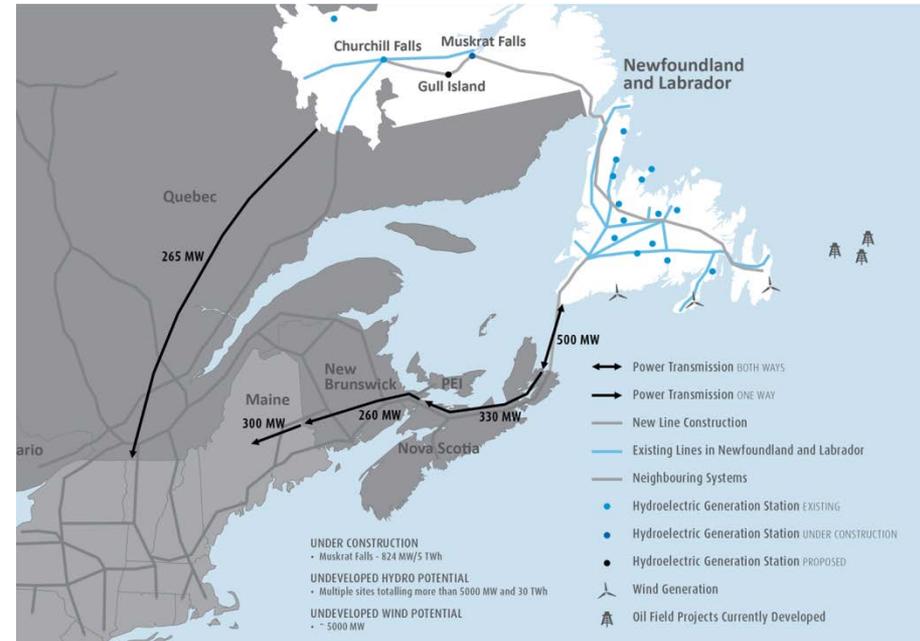
Trading Agreements

- Many enabling agreements with various counterparties

* Markets in which Nalcor Energy Marketing has authorizations/permits to participate

Electricity Assets for Extra-Provincial Trade

- Capacity and Energy
 - Surplus NLH energy, including Recapture
 - Muskrat Falls residual energy
 - ~ 3.5 TWh annually on average
 - Capacity subject to outcome of Hydro's Reliability and Resource Adequacy study, filed at the PUB.
- Firm Transmission
 - Quebec – 265 MW
 - Maritime Link – 500 MW
 - Nova Scotia – 330 MW
 - New Brunswick – 260 MW (7 months)
 - New England – 300 MW
- Bayside capacity call – 250 MW
- NL hydroelectric reservoir capability
- Renewable attributes/GHG credits
- Future??



Where do we Rank?

- From a total export volume perspective (based on 2018 NEB statistics):
 - Following the completion of Muskrat (and excluding contracted commitments to HQ and Emera), Nalcor will sit as the 5th largest Canadian electricity exporter out of a field of more than 50 exporters.
 - With a Gull development, it would sit as #2 (only after HQ)
 - Following 2041, Nalcor will be the largest Canadian exporter, by far!

SECURITY OF SUPPLY AND ASSET OPTIMIZATION

NLH and NEM Collaboration

- This section provides a summary of how Newfoundland and Labrador Hydro (Hydro) and Nalcor Energy Marketing (NEM) are, and will be:
 - ensuring that security of supply for domestic load (i.e. reliability) remains paramount in all decisions, and
 - working together to maximize value creation opportunities that arise due to the connection of the island system with the broader North American grid.

Guiding Principles for Collaboration

1. Security of Domestic Supply

- The following excerpts from the NEM-NLH Interim PPA highlight the current (and future) obligations to ensure security of domestic supply:
 - *"NLH Commitments" means the amounts of Electricity required by NLH from time to time to satisfy NL Native Load.*
 - *"NEM and NLH agree that the operations of the NLH Facilities and imports from external markets shall be coordinated and that those generation facilities shall be dispatched in a manner that ensures ... that NLH Commitments and any other obligations of NLH are satisfied and paramount"*
 - *"NLH and NEM shall coordinate ... the management of NLH's Facilities and imports to meet the NLH Commitments"*

Guiding Principles for Collaboration

(cont'd)

2. Resource Optimization

- In addition to ensuring security of domestic supply, another goal in the design of operations is to return maximum value to the province from the operation of the electricity assets.
- Optimizing the short to medium term operation occurs by controlling the amount of hydro generation to:
 - Minimize spill;
 - Minimize thermal production;
 - Maximize export volumes at times of higher prices; and
 - Maximize the value of storage through ponding activities.
- Combining, or “pooling”, generating sources and reservoirs provides the best opportunity to maximize the value of resources that are currently held in different legal entities.

Reliability Trumps

- From the NLH-NEM Interim PPA:

“(c) Performance of Production Planning — NEM shall at all times perform Production Planning in a manner that satisfies NLH's forecasted Energy, Capacity and system requirements.

(d) Planning Guidelines - NLH shall provide the technical rules that will govern Production Planning to ensure that the security of supply for purposes of serving NL Native Load is at all times maintained at acceptable levels in accordance with Good Utility Practice (the "Production Planning Guidelines"). The Production Planning Guidelines may be revised from time to time by NLH.

(e) Distribution of Production Plans - NEM shall provide each Production Plan to NLH upon the completion of same. In a timely manner, NLH shall approve or reject such plan based on compliance with the Production Planning Guidelines. If NLH rejects such plan, NLH will specify in detail how the plan violates the Production Planning Guidelines.”

Designed for Optimal Results

- From an energy demand/supply perspective, the primary focus of Nalcor's electricity operations entities are:
 - Hydro (Resource and Production Planning department) is primarily focused on ensuring Hydro fulfills its mandate of reliable service, consistent with least-cost operations.
 - It has a view to meeting customer requirements, both short and long term
 - It responds to the demands that are placed on its generating assets
 - It is aware of all aspects of the operation, including generation and transmission outages
 - CF(L)Co and Musktrat are primarily concerned with plant operations and maintenance and meeting their contractual commitments
 - Responds to the demands that are placed on their generating assets
 - NEM is Nalcor's face to extra-provincial markets and is primarily concerned with managing water resources in compliance with established reliability criterion, and then value creation
 - Responds to market signals in both domestic and extra-provincial markets
- Each of these entities have a clear focus on driving excellence in their respective businesses

Water Management and Production Scheduling

- To be effective in its role, Water Management and Production Scheduling must
 - Have an intimate knowledge and understanding of the factors that place demands on all of the production assets (domestic load, weather, unit maintenance, operating reserves, etc.), and
 - An intimate knowledge and understanding of all factors that influence external markets
 - *This is a given, regardless of organizational design*
- Operational integration is at the core of our success in optimizing the production assets

Framework for Collaboration

- As asset owners, Hydro, CF and MF maintain full control and accountability over each of their assets
- Hydro and the NLSO maintain full accountability for ensuring security of supply to domestic customers
- To meet these requirements in light of increasing market activity due to new interconnections and increasing surpluses, market strategies are designed to ensure that asset integrity and security of domestic supply remain paramount in all decisions.

Framework for Collaboration

(cont'd)

- NEM is charged with optimizing the operation and maximizing the value of provincial surpluses while at all times operating within the Production Planning Guidelines
 - NEM is the group within Nalcor that has a view to “discretionary” purchases and sales that drive value from extra-provincial market activity
 - Following completion of the Muskrat Falls and associated transmission facilities, during an average water year, it is forecast that as much as 1/3 of available provincial renewable production will go to serve extra-provincial markets**
- In practice, Hydro’s oversight of NEM’s activities is largely achieved through weekly water management meetings between Hydro and NEM in which production plans for the upcoming week are discussed and approved and operating instructions are then issued to the NLSO and NEM front office

** Excludes contracted commitments (HQ and NSPI) and Labrador industrial.

SUMMARY

Summary

- The decision to proceed with the Internal Growth model (NEM) is founded on a comprehensive strategic and cost analysis
 - The internal growth model offers 25% lower overhead costs as compared to a contracted solution
- Nalcor/NEM have more than 10 years trading experience and following Muskrat's completion will be one of the larger Canadian electricity exporters (top 10 percentile)
- NEM operates under a comprehensive risk management and oversight framework that is modelled on industry best practices
- Hydro and NEM are working together collaboratively to create maximum value from external market activities while always ensuring security of domestic supply
 - Operate under a framework for collaboration that provides clear lines for decision-making and accountability oversight
 - Have already returned significant value to Hydro and its customers, and to Nalcor
- NEM has the market knowledge to support future initiatives

Bio

Greg Jones, Director, Nalcor Energy Marketing

Greg Jones is responsible for the execution of Nalcor's Energy Marketing line of business which includes maximizing the value of existing assets that are surplus to provincial needs and growing the business.

Greg began his career with NL Hydro in 1986. He has held a variety of positions throughout the corporation including, Distribution Planning Engineer, Generation Planning Engineer, Manager Business Development and has been leading the Energy Marketing line of business since its inception in 2009.

Greg is a two time graduate of Memorial University of Newfoundland and holds a Bachelor's degree in Electrical Engineering and a Master's degree in Business Administration. Greg is a member of the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL)