

Alvarado
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File

Lower Churchill Project

Decision Review Criteria and Process

Boundless Energy



Two Decisions Under Consideration

*We need to
make a decision
now -*

- 1: What is the next generation source required to meet NL's domestic needs?
 - Part of normal Integrated Resource Planning for Newfoundland and Labrador
 - The decisions are driven by
 - Load growth
 - Holyrood replacement
 - Decision required within next 6 months
 - Annual report filed with PUB driving this timing

Two Decisions Under Consideration

- 2: What is the optimum configuration and sequence for sales of Lower Churchill power outside of the Province
 - Several options under consideration
 - Gull Island then Muskrat Falls?
 - Muskrat Falls then Gull Island?
 - Through PQ?
 - Maritime Route?
 - Maritime Route and through PQ?
 - Decision timing driven by readiness

These Two Decisions Are Related

- These decisions are obviously inter-related
 - Gull Island and Muskrat Falls are 2 potential separate options for Integrated Resource Planning
 - Both projects are also key potential components of sales outside the Province
- That being said, due to timing constraints, we now have to focus on decision 1:
 - *“What is the next generation source required to meet NL’s domestic needs?”*

What Is Our Decision Flow?

- Step 1
 - A “pure” Integrated Resource Planning decision (no sales outside of NL, excess water spilled);
 - Isolated Island (*Note: Natural Gas has to be addressed*) vs.
 - Muskrat Falls with Island Link, spill excess water vs.
 - Gull Island with Island Link, spill excess water vs.
 - Imports from mainland through PQ to Labrador to Island vs.
 - Imports from mainland through Maritime Link to Island

What Is Our Decision Flow?

- Step 1 (cont'd)
 - The decision criteria for this decision are a combination of the following items;
 - Economics and impact on the ratepayer (NPV, CPW, Cost and Schedule risk)
 - Reliability
 - Security of supply for NL (self reliance)
 - Long term NL goal of zero GHG emissions
 - Treasury benefits for NL
 - Long term strategic benefits – future generational benefits

What Is Our Decision Flow?

- Step 1 (cont'd)
 - For the purpose of this presentation today only, assume **(has to be verified, finalized and documented)** that the following scenario for “pure” Integrated Resource Planning (no sales outside of NL during the term of the analysis – i.e until 2041) is selected;

“Muskrat Falls with Island Link, spill excess water”

What Is Our Decision Flow?

- Step 2
 - Optimization, answering a series of questions;
 - How do we monetize the Muskrat Falls spill most effectively?
 - Sales to Maritimes?
 - Non-firm through PQ?
 - Both through Maritimes and non-firm through PQ?
 - How do we best meet future potential load growth?
 - How do we optimize reliability?

What Is Our Decision Flow?

- Step 2 (con't)
 - Optimization, answering a series of questions;
 - Could Gull Island spill be monetized in such a way that the risked economics are more favorable than the Muskrat Falls option selected?
 - Is doing Muskrat Falls or Gull Island first adversely impacting the other to an unacceptable extent?
 - How do we ensure the tunnel option is undertaken to aid in enabling Gull is future?

What Is Our Decision Flow?

- Step 2 (con't)
 - For the purpose of this presentation today, only assume the following **(to be verified and documented)**
 - Gull Island with spill less attractive than MF with spill
 - Gull with spill monetized (risked) is less attractive than MF with spill monetized (risked)
 - Impact on Gull of doing MF first is acceptable
 - MF is the best alternative
 - In this case, MF alternatives need to be rated and one selected
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What Is Our Decision Flow?

- Step 3
 - Rate and select the preferred MF alternative
 - Selection Criteria are as follows;
 - Reliability
 - Island Rate Impact
 - NPV
 - Flexibility
 - Strategic Value
 - Most Interest to Atlantic Canada
 - Capital Cost/Schedule Risk Exposure
 - CPW Exposure

Case Scenarios

824 mb / EXTRA 10 to 15
Top it up to 100
Recall

could be
900

- Case 1: Muskrat Falls non-firm / no Island Link
- Case 2: Muskrat Falls with Island Link, remaining energy product spilled
 - Case 2A: Muskrat Falls with 800MW conventional Island Link, remaining energy product spilled
 - Case 2B: Muskrat Falls with 900MW VSC Island Link, remaining energy product spilled
- Case 3: Muskrat Falls with Island Link, remaining product sold non-firm via HQTE
 - Case 2A: Muskrat Falls with 800MW conventional Island Link, remaining energy product spilled
 - Case 2B: Muskrat Falls with 900MW VSC Island Link, remaining energy product spilled
- Case 4: Muskrat Falls / Recall with 900MW VSC Island Link, 500MW VSC Maritime Link
 - Case 4A: Island needs are met first, and residual energy / capacity is sent via Maritime Link (assuming Maritime sales made at 15% below avoided cost). Island renewable resources built (max 1.2 TWh) to maintain reasonable sales volumes to Maritimes (end of period floor is 1.5 TWh).
 - Case 4B: Maritime Link is loaded to 3.5 TWh first, with Island capacity / energy requirements beyond the residual to come from Island resources (assuming Maritime sales made at 15% below avoided cost).
 - Case 4C: Maritime Link has a sales floor of 2.5 TWh with Island requirements beyond the residual to come from Island resources. (assuming Maritime sales made at 15% below avoided cost).

Summary Results

Note: Results not finalized – VSC Configuration and costs not finalized

	LCP Case # / Reference Case #							
	145 Case 1	180 Case 2A	180 Case 2B	187 Case 3A	187 Case 3B	196 Case 4A	178 Case 4B	188 Case 4C
Project Economics								
In-service capex	\$3,018	\$6,821	\$5,368	\$6,821	\$5,368	\$6,838	\$6,838	\$6,838
D/E ratio (generation and transmission)	0:100	41:59	32:68	41:59	32:68	41:59	41:59	41:59
Equity requirement	\$3,049	\$4,000	\$3,637	\$4,000	\$3,637	\$4,033	\$4,033	\$4,033
Dividends (50 years)	\$25,806	\$32,643	\$31,437	\$36,563	\$35,357	\$27,058	\$34,235	\$33,711
Dividends / Equity requirement	8.5	8.2	8.6	9.1	9.7	6.7	8.5	8.4
NPV - 12% - January 1, 2010	(\$578)	(\$806)	(\$806)	-\$201	(\$201)	(\$795)	(\$495)	(\$508)
NPV - 7.5% - January 1, 2010	\$884	\$622	\$622	\$1,778	\$1,778	\$204	\$993	\$950
Equity IRR (%), generation only**	9.3%	8.5%	8.5%	11.1%	11.1%	7.8%	9.6%	9.6%
Cost-out to Langan - @7.5%	na	na	na	na	na	\$105	\$98	\$105
Cost-out to Langan - @11%	na	na	na	na	na	\$125	\$124	\$129
Infeed Economics								
CPW - Isolated Island	na	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800	\$8,800
CPW - Infeed	na	\$7,500	\$6,800	\$7,500	\$6,800	\$6,800	\$7,500	\$7,000
"Bump" value (nominal \$)	na	\$721	\$155	\$721	\$155	\$155	\$155	\$155

** Note transmission assets earn their assigned cost of capital

Lead find us a solution where we are charging a higher rate to local ratepayers versus what we are selling for outside the province



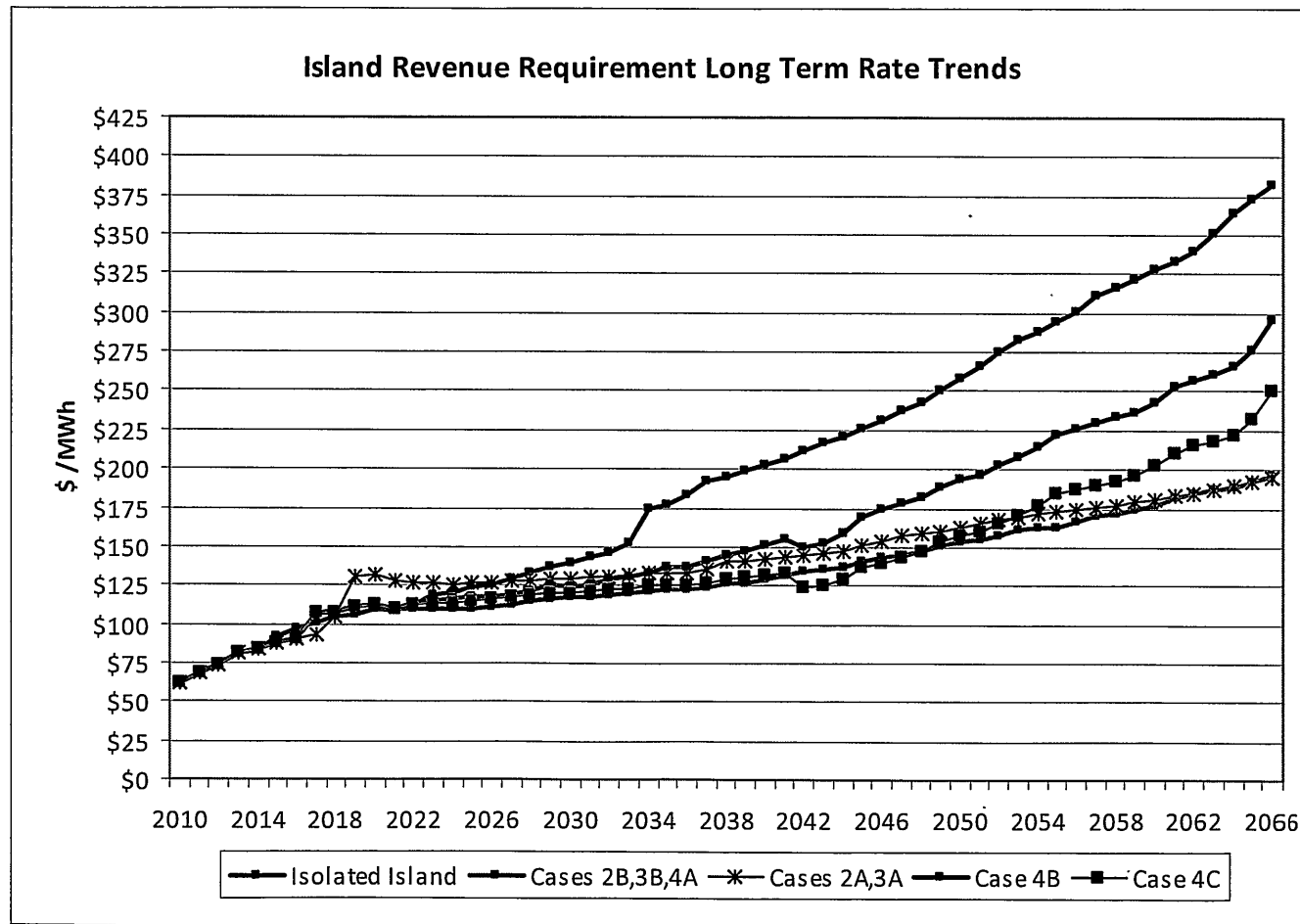
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MF – Decision Review Criteria Summary

<u>Evaluation Criteria</u>	<u>% Weight</u>	<u>Case 1</u>	<u>Case 2A</u>	<u>Case 2B</u>	<u>Case 3A</u>	<u>Case 3B</u>	<u>Case 4A</u>	<u>Case 4B</u>	<u>Case 4C</u>
Reliability	25%								
Island Rate Impact	20%								
NPV	15%								
Flexibility	10%								
Strategic Value	10%								
Most Interest to AC	10%								
Capital Cost Exposure	5%								
CPW Exposure	5%								
Total	100%								
Average Score									
Weighted Ranking									
Ranking									

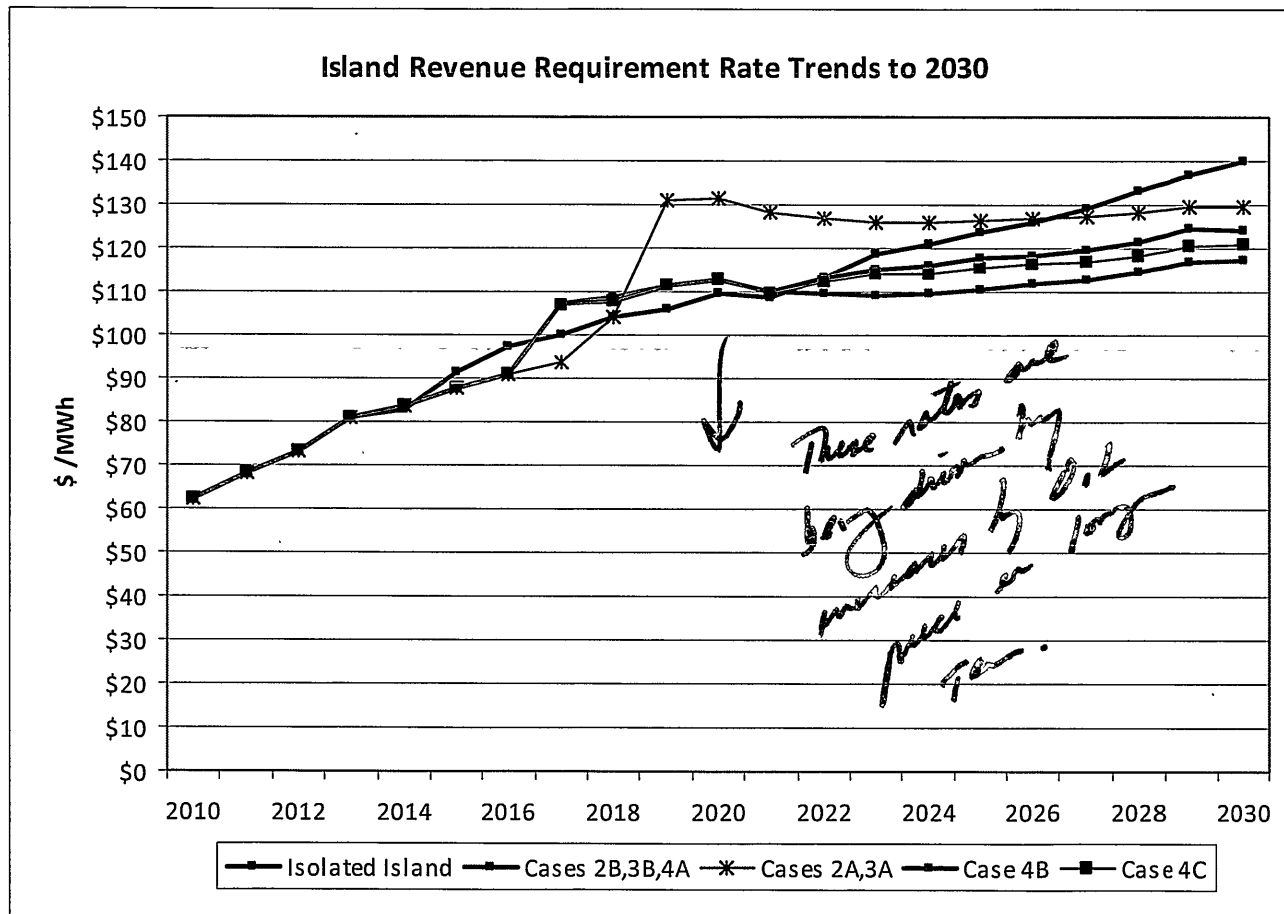
Island Rates Analysis (2010 - 2067)

Note: Results not finalized – VSC Configuration and costs not finalized



Island Rates Analysis (2010 - 2030)

Note: Results not finalized – VSC Configuration and costs not finalized.



900mw
 bit people informed on
 lost revenue
 must not use
 Hollywood

Communications Issues

- Rate increases to accommodate MF
 - MF is the most economic solution over time
 - Thermal generation would be a big part of our long term solution without MF
 - Rates would go much higher than MF over time with a thermal solution
 - This is the best solution for future generations
 - Provides a 99% GHG free solution for NL

Communications Issues

- Sales prices to Maritimes and through Quebec are lower than cost to NL consumers
 - MF is the most cost effective solution for NL needs over the long term, even without any outside sales
 - Any surplus energy sales will be based on available market prices elsewhere, and over time, market prices elsewhere are expected to exceed NL cost.

Communications Issues

- Sales prices to Maritimes and through Quebec are lower than cost to NL consumers (Con't)
 - Even if shorter term sales prices elsewhere are lower than NL cost, we are still better to sell the energy, rather than spill the water, and get zero value

Key Milestones for May 2011 MF Start

