

***Nalcor Energy***

***Grant Thornton Review***

**DG3 Model Process Review**

**June 2018**

## ***Purpose***

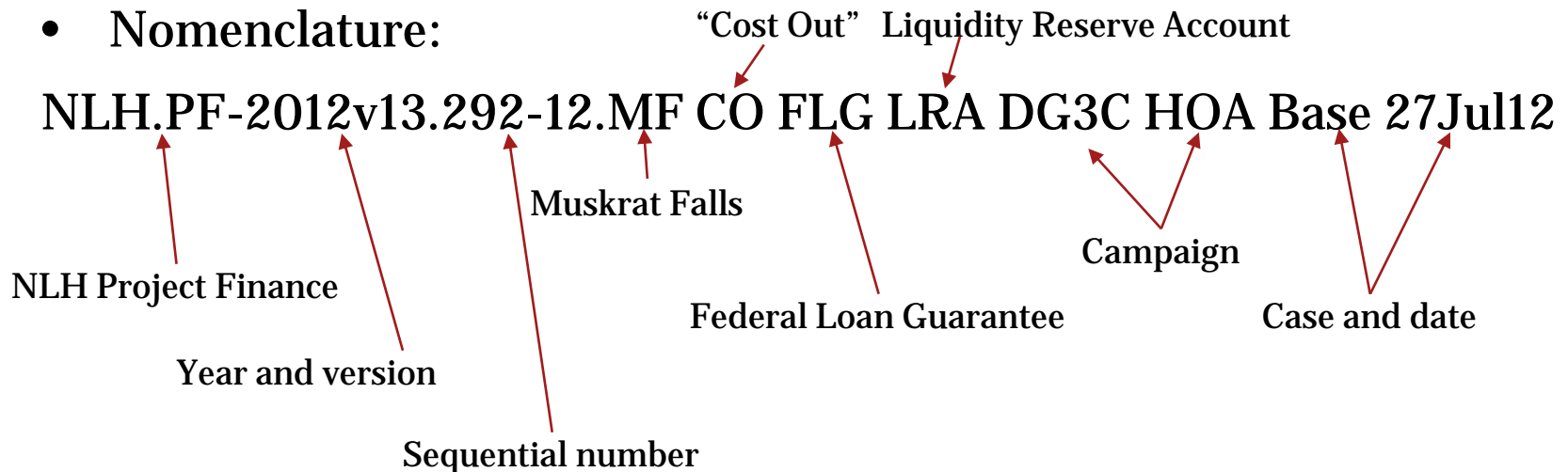
Grant Thornton are reviewing certain matters related to the Lower Churchill Project

The purpose of this discussion is to provide Grant Thornton with an overview of the Decision Gate 3 (“DG3”) financial modeling campaign

# Background

- DG3 models were the third of four generations of PwC Nalcor models over 7 ½ years
- As you can see, the modeling environment became increasingly complex as the business circumstances evolved; this gave rise to the 2013 generation which supported Financial Close
- The DG3 models are approximately 23 MB in size, contain numerous macros and do not run on all computers

- Nomenclature:



## ***Purpose of Modeling Campaign***

- Provide information in support of DG3, including Nalcor presentations to the House of Assembly (“HOA”)
- Calculate and present:
  - Rates and revenue required of NL ratepayers under various circumstances
  - The impact of:
    - Financial leverage;
    - The (at that time prospective) Federal Loan Guarantee (“FLG”);
    - Potential export revenues over and above the Base Block

# Model Control

Case Description	
DG3C HOA Base 27Jul12	
MF Market-In	
FLG	
65/35 DER	
LRA Step 12	
Apportionment	
Debt	79.73% <i>ApportionmentDebt</i>
Equity	20.27% <i>ApportionmentEquity</i>
Cost-Out Settings	
Input Price (in 2010\$)	66.650 <i>CostOutPrice</i>
Base Year	2010 <i>CostOutPriceBaseYear</i>
LRA Pre-Funding	29.94
Market-In Settings	
Island Price (in 2010\$)	65.380 <i>IslandMarketInPrice</i>
Base Year	2010 <i>IslandMarketInPriceBaseYear</i>
Export Realization	100% <i>MarketInExportRealization</i>
Water Rental (\$/MWh)	2.62 <i>WaterRentalRate</i>
Base Year	2012 <i>WaterRentalRateBaseYear</i>
Model Computation Settings	
Revenue Mode	Market-In <i>RevMode</i>
Debt Calculation Mode	2 <i>DebtCalcMode</i>
Use Bond Sinking Fund (1=Y, 0=N)	0 <i>BondSFToggle</i>
Levelize Island Sales	1 <i>LevelizeIslandToggle</i>

Out-Turn DER	
During Construction	
Debt	2,032.45 65.00%
Equity	1,094.50 35.00%

MinDSCR	
Monthly	1.65 2019-09-30

Based on Monthly Cashflows	
Equity IRR	9.671% 9.671%
Project IRR	
Discount Rate	7.0%
Base Date	2012-07-01
NPV of Revenues	4,145.56
NPV of Net CF to Equity	826.94
Discount Rate	12.0%

## ***MF and LTA***

- MF (Muskrat Falls) = the Muskrat Falls generation business, which pays both the water rental cost and the LTA (Labrador transmission Asset) required tariff
  - Capex in model: \$2.9 billion
- LTA (Labrador Transmission Assets) = a transmission facility connecting MF to Churchill Falls. In DG3, for regulatory reasons LTA was broken out as a revenue-earning business, the revenue for which is a cost to MF
  - Capex in model: \$0.7 billion

## ***“Cost Out” and “Market In”***

- Cost-Out (“CO”) mode:
  - Base block volume only assumed
  - Root cost per MWh manually goal-sought to achieve the specified Internal Rate of Return (“IRR”)
- Market-In (“MI”) mode:
  - Base Block root price is normally an input (but can be varied)
  - Export revenue is realized according to specified percentage
  - IRR is a fall-out result

## ***Liquidity Reserve Account (“LRA”)***

- Muskrat Falls (“MF”) and Labrador Transmission Assets (“LTA”) revenue rise over time because Base Block volumes grow according to Nalcor projections
- Low early year revenues can cause the debt service coverage ratio (“DSCR”) to be below Nalcor’s target of 1.40
- To address this, a LRA is put in place to provide a liquidity buffer for lenders’ benefit; the LRA is taken into account in the DSCR calculations



---

## ***Analytical Process***

- The analysis of a full set of assumptions involves multiple steps and multiple models in the DG3 environment
- The process is described in the following pages

## ***Process Steps 1 and 2***

<b>Step</b>	<b>Purpose</b>
<p>Set up Revenue Model (a separate model from the project finance model)</p>	<p>Calculate inputs for Revenues-MK tab of main model, and column D of Revenues-CO tab</p>
<b>Comments</b>	
<p>This campaign assumed no Maritime Link or access to markets in/via Eastern Canada</p> <p>Exports are via the existing recall booking with HQT</p>	

## ***Process Step 3***

<b>Step</b>	<b>Purpose</b>
Run 0-100 (that is, all equity) DER spill case (that is, all non-Island volume spilled), IRR 8.4%, LTA and MF, supply price fallout	Establish baseline supply price required in no-export case, if financed by equity at target Nalcor IRR

### **Comments**

Target IRR is a Nalcor administered value dating from ~2010

Two models:

- Step 3 LTA, the resulting tariff of which is an input to the MF model Revenue tabs; and
- Step 3 MF, which provides the overall ratepayer economics

## ***Process Step 4***

<b>Step</b>	<b>Purpose</b>
<p>Specifications for all leverage cases</p>	<p>Common assumption set (see below)</p> <p>No associated models</p>
<b>Comments</b>	
<ul style="list-style-type: none"> <li>• Financial Close October 1, 2013.</li> <li>• Tranched bond financing structure used. Takeouts each anniversary of Financial Close.</li> <li>• Bond amortization starts first semi-annual bond debt service period after January 1, 2019.</li> <li>• Spreads for FLG: short term Nalcor assumptions column C + 50 bps; long term Nalcor assumptions column I plus 115 bps.</li> <li>• Spreads for non-FLG: short term Nalcor assumptions column C + 110 bps (same as difference between provincially guaranteed NLH and Nalcor, columns C and D); long term Nalcor assumptions column I plus 350 bps.</li> </ul>	

# Process Step 5A

Step	Purpose
<p>LTA Cost-Out (i.e., required tariff):</p> <ul style="list-style-type: none"> <li>• No FLG (federal loan guarantee)</li> <li>• DSCR 1.30</li> <li>• IRR 8.4%</li> <li>• LRA – none</li> <li>• DER (debt:equity ratio) fallout</li> <li>• Supply price fallout</li> </ul>	<p>Initial leveraged run of LTA</p> <p>Provide input for associated MF model (Step 6)</p>
Comments	
<p>DER was 47:53 – less than target leverage to meet DSCR</p>	

# Process Step 5B

Step	Purpose
<p>LTA Cost-Out (i.e., required tariff):</p> <ul style="list-style-type: none"> <li>• No FLG</li> <li>• DSCR 1.40</li> <li>• IRR 8.4%</li> <li>• LRA – yes, optimized to DSCR</li> <li>• DER 60:40</li> <li>• Supply price fallout</li> </ul>	<p>Introduce LRA, improve leverage</p> <p>Provide input for associated MF model (Step 7)</p>
Comments	
<p>LRA enables higher leverage while maintaining DSCR</p>	

# Process Step 6

Step	Purpose
MF Cost-Out: <ul style="list-style-type: none"> <li>• No FLG</li> <li>• DSCR 1.40</li> <li>• IRR 8.4%</li> <li>• LRA – none</li> <li>• DER fallout</li> <li>• Supply price fallout</li> </ul>	Initial leveraged run of MF
Comments	
DER was 43:57 – less than target leverage to meet DSCR  Supply price per mWh: \$78.90	

# Process Step 7

Step	Purpose
<p>MF Cost-Out:</p> <ul style="list-style-type: none"> <li>• No FLG</li> <li>• DSCR 1.40</li> <li>• IRR 8.4%</li> <li>• LRA – yes, optimized to DSCR</li> <li>• DER 60:40</li> <li>• Supply price fallout</li> </ul>	<p>Introduce LRA, improve leverage</p>
Comments	
<p>LRA enables higher leverage while maintaining DSCR</p> <p>Supply price \$78.00, a slight improvement (\$0.90) from Step 6</p>	



# Process Step 8

Step	Purpose
MF Export Case: <ul style="list-style-type: none"> <li>• No FLG</li> <li>• DSCR fallout</li> <li>• IRR fallout</li> <li>• LRA same as Step 7</li> <li>• DER 60:40</li> <li>• Supply price same as Step 7</li> </ul>	Show impact of exports on IRR and DSCR
Comments	
IRR 8.40% => 9.67%  DSCR 1.40 => 1.68	

# Process Step 9

Step	Purpose
LTA Cost-out <ul style="list-style-type: none"> <li>• FLG</li> <li>• DSCR 1.40</li> <li>• IRR 8.4%</li> <li>• LRA optimize to DSCR</li> <li>• DER 65:35</li> <li>• Supply price fallout</li> </ul>	Provide LTA tariff input to MF Steps 10 - 12
Comments	
Higher leverage enabled by FLG	

# Process Step 10

Step	Purpose
<p>MF Cost-out</p> <ul style="list-style-type: none"> <li>• FLG</li> <li>• DSCR 1.40</li> <li>• IRR 8.4%</li> <li>• LRA optimize to DSCR</li> <li>• DER 65:35</li> <li>• Supply price fallout</li> </ul>	<p>Baseline MF FLG case with no exports</p>
<h2>Comments</h2>	
<p>Higher leverage enabled by FLG</p> <p>Supply price \$66.65, a significant improvement on equivalent non-FLG case (\$11.35 or \$612 million in NPV of ratepayer cost)</p>	

# ***Process Step 11***

<b>Step</b>	<b>Purpose</b>
MF export case <ul style="list-style-type: none"> <li>• FLG</li> <li>• DSCR fallout</li> <li>• IRR fallout</li> <li>• LRA same as Step 10</li> <li>• DER 65:35</li> <li>• Supply price same as Step 10</li> </ul>	Baseline MF FLG case with exports
<b>Comments</b>	
IRR 9.86%  DSCR 1.68	

# Process Step 12

Step	Purpose
<p>MF export case</p> <ul style="list-style-type: none"> <li>• FLG</li> <li>• DSCR fallout</li> <li>• IRR same as Step 8</li> <li>• LRA same as Step 10</li> <li>• DER 65:35</li> <li>• Supply price reduced to conform IRR to that in Step 8 (9.67%)</li> </ul>	<p>“Fully subsidized” case where the FLG benefit to export profitability is directed to a reduction of Island supply price</p>
Comments	
<p>Supply price \$65.38, a reduction of \$1.27 or \$69 million in NPV of ratepayer cost</p>	

# Summary

Model	DG3C HOA Base 27Jul12 LTA Cost-Out 100% Equity Step 3	DG3C HOA Base 27Jul12 MF Cost-Out 100% Equity Step 3	DG3C HOA Base 27Jul12 LTA Cost-Out No FLG Step 5A no LRA	DG3C HOA Base 27Jul12 LTA Cost-Out No FLG Step 5B with LRA	DG3C HOA Base 27Jul12 MF Cost-Out No FLG Step 6
IRR	8.40%	8.40%	8.40%	8.40%	8.40%
Apportionment	0.00%/100.00%	0.00%/100.00%	58.85%/41.45%	76.16%/23.84%	52.45%/47.55%
Out-Turn DER	0.00%/100.00%	0.00%/100.00%	47.39%/52.61%	60.00%/40.00%	42.65%/57.35%
LRA	-	-	-	8.28	-
DSCR	-	-	1.30	1.40	1.40
Supply Price (2010 \$)	15.702	82.073	14.754	14.524	78.903
NPV of Island Revenues (MF)					
LTA Revenues (LTA)	846.81	4,419.31	795.69	783.27	4,255.26
Equity	691.58	2,796.39	399.08	317.80	1,773.06
Debt	-	-	359.43	476.70	1,318.45

Model	DG3C HOA Base 27Jul12 MF Cost-Out No FLG 60/40 DER LRA Step 7	DG3C HOA Base 27Jul12 MF Market-In No FLG 60/40 DER LRA Step 8	DG3C HOA Base 27Jul12 LTA Cost-Out FLG Step 9	DG3C HOA Base 27Jul12 MF Cost-Out FLG 65/35 DER LRA Step 10	DG3C HOA Base 27Jul12 MF Market-In FLG 65/35 DER LRA Step11	DG3C HOA Base 27Jul12 MF Market-In FLG 65/35 DER LRA Step 12
IRR	8.40%	9.671%	8.40%	8.40%	9.86%	9.67%
Apportionment	73.01%/26.99%	73.22%/26.78%	81.07%/18.93%	79.51%/20.49%	79.75%/20.25%	79.73%/20.27%
Out-Turn DER	60.00%/40.00%	60.00%/40.00%	65.00%/35.00%	65.00%/35.00%	65.00%/35.00%	65.00%/35.00%
LRA	41.39	41.39	5.92	29.94	29.94	29.94
DSCR	1.40	1.68	1.40	1.40	1.68	1.65
Supply Price (2010 \$)	78.002	78.002	12.17	66.65	66.65	65.38
NPV of Island Revenues (MF)						
LTA Revenues (LTA)	4,206.68	4,206.67	656.32	3,594.45	3,594.45	3,525.96
Equity	1,297.30	1,280.05	266.98	1,108.22	1,093.17	1,094.50
Debt	1,946.34	1,920.10	495.72	2,058.32	2,029.74	2,032.45
					<b>PPA</b>	<b>Fully subsidized</b>
					612.21	680.71
	<b>FLG benefit, HOA It1 LTA-LRA, newCBCint</b>					