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Subject: LCP Deck - Commercially Sensitive and Confidential
Date: Friday, August 14, 2015 4:35:14 PM
Attachments: [.png](#)
[August 2015.pptx](#)

Here is the draft. Have a look. Will make some additional changes tomorrow.

Ed



August 2015.pptx

Lower Churchill Phase 1

August 2015 Project Update

Boundless Energy



PROJECT BACKGROUND AND RATIONAL

Project Background and Rational

- Lower Churchill Phase 1, is comprised of Muskrat Falls, Labrador Island Link, Labrador Transmission Asset and Maritime Link (The Project).
- NL needs more power overall
- MF/LIL determined to be lowest cost option following extensive alternatives review
- Replaces Holyrood Thermal Generating Station > 45 years old
- Investment in an asset we own, returning value and cash flow in excess of \$30 billion to the people of the province
- Paying ourselves, as opposed to paying for oil to outside companies – we are “buying”, not “renting”

Project Background and Rational

- Benefits are inter-generational – 100+ year benefits – benefits future generations
- Clean power; power generation in our Province will be 98% GHG free, and avoid emerging future risk of costs of carbon (Obama)
- Significant construction benefits; jobs for NL's, and economic benefits for NL businesses
- Creates surplus power for NL needs and export – export revenue for people of province
- Both Labrador and the Island are connected 2 ways to North America markets for first time in history
- Significant improvement in system reliability as the island is now connected to neighbors

Project Background and Rational

- Interest rates locked in at historic lows
- Federal Loan Guarantee acquired in recognition of regional GHG reduction benefits from the project
 - will save > \$6 Billion over life of project financing, 35 years for MF and 40 years for LIL
- This project is a key investment in a long term revenue generating asset for current and future generations of Newfoundlanders and Labradorians, paid off in total within 35-40 years utilizing mortgage style debt retirement.
- Historic “New Dawn” agreement with Innu achieved
- Environmental approvals in place

Project Background and Rational

- 65-70% of Newfoundlander and Labradorians have consistently supported the Project
- This is a legacy Project, internationally recognized and an example of regional leadership and cooperation within Canada, addressing a key national initiative to address climate change across the country, and into our neighbors to the south, the United States, as well as laying the groundwork for future development of Newfoundland's energy warehouse.

Astaldi Performance has turned the corner

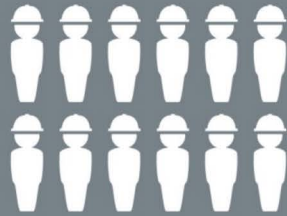
PROJECT NOW PROGRESSING ON ALL FRONTS

Muskrat Falls: Our Project, Our Benefits



> 13M hours
worked since start
of construction

Note: Update with June 2015 info



Approximately
4,200 people
working on the
project at peak

> 473 women
from NL



**3,578
NL residents**
working on
the project

84%
of project workforce

478 Aboriginal
NL residents



\$830M invested
in NL business since
start of project
construction

\$415M in wages
paid to NL residents
to date

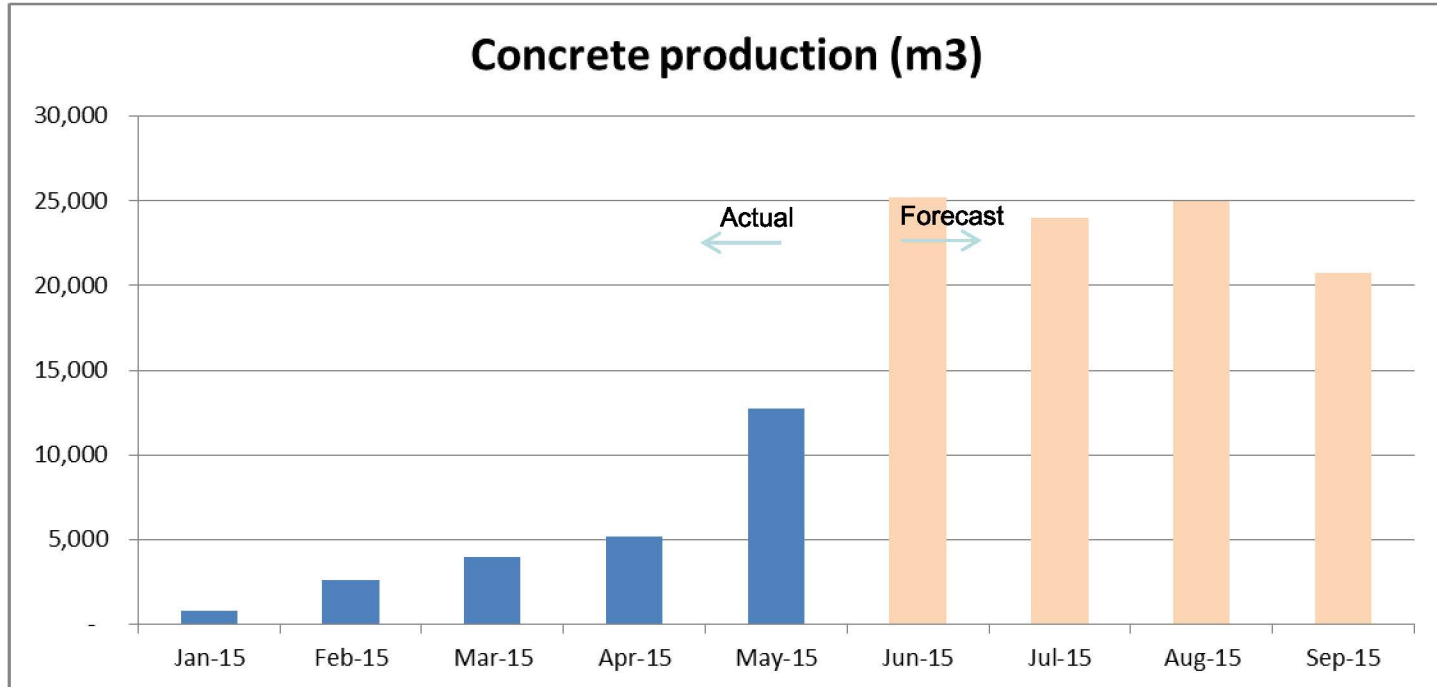
Project Now Progressing On All Fronts

- With recent Astaldi performance improvement, all aspects of the Project are now progressing effectively – LIL, LTA, SOBI, North Spur, North/South Dams, the Powerhouse, Maritime Link, and associated equipment and materials.
- Nalcor leadership has been critical in successfully addressing Astaldi performance issues, and Astaldi now delivering strong performance
- Safety, environmental, and quality performance remain on track, and performance is strong.

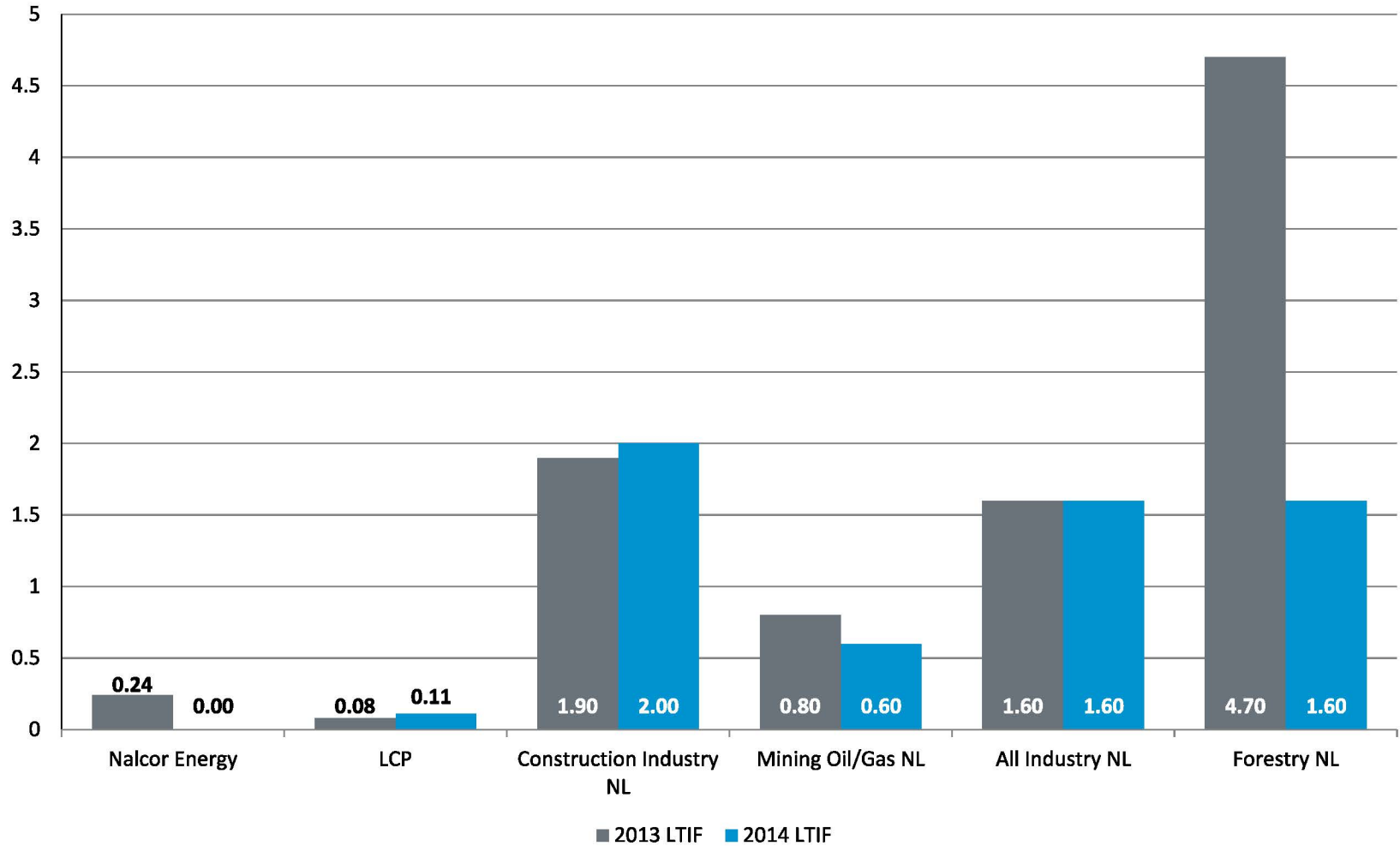
Nalcor Actions to Address Astaldi Issues

- Engagement at highest levels of Astaldi and Nalcor continuously over last 12-18 months
- Nalcor support and leadership in implementing performance improving initiatives and organizational improvements
- Nalcor provided key Construction Management personnel to Astaldi
- Nalcor Site Team augmented with senior Project Management personnel to provide on site decision making and support to Astaldi
- Current Status
 - Astaldi concrete production rate vastly improved and Construction management team fully functional.
 - Nalcor continues to provide support, guidance and leadership

Astaldi Concrete Production



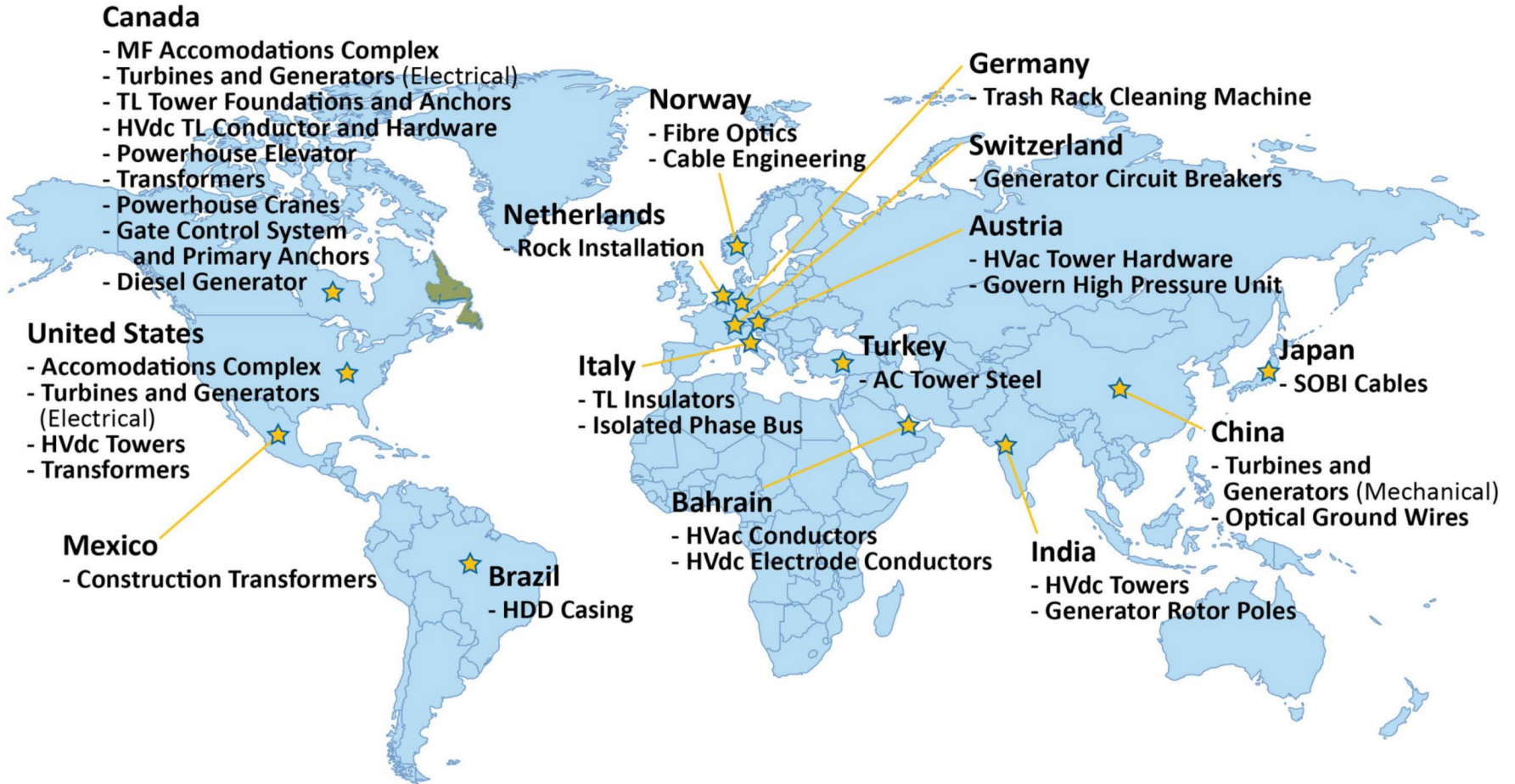
LTIF Comparison – Lower Churchill



- INSERT ENVIRONMENTAL AND QUALITY COMAPRISONS

PROJECT PROGRESS

Lower Churchill Project Global Reach

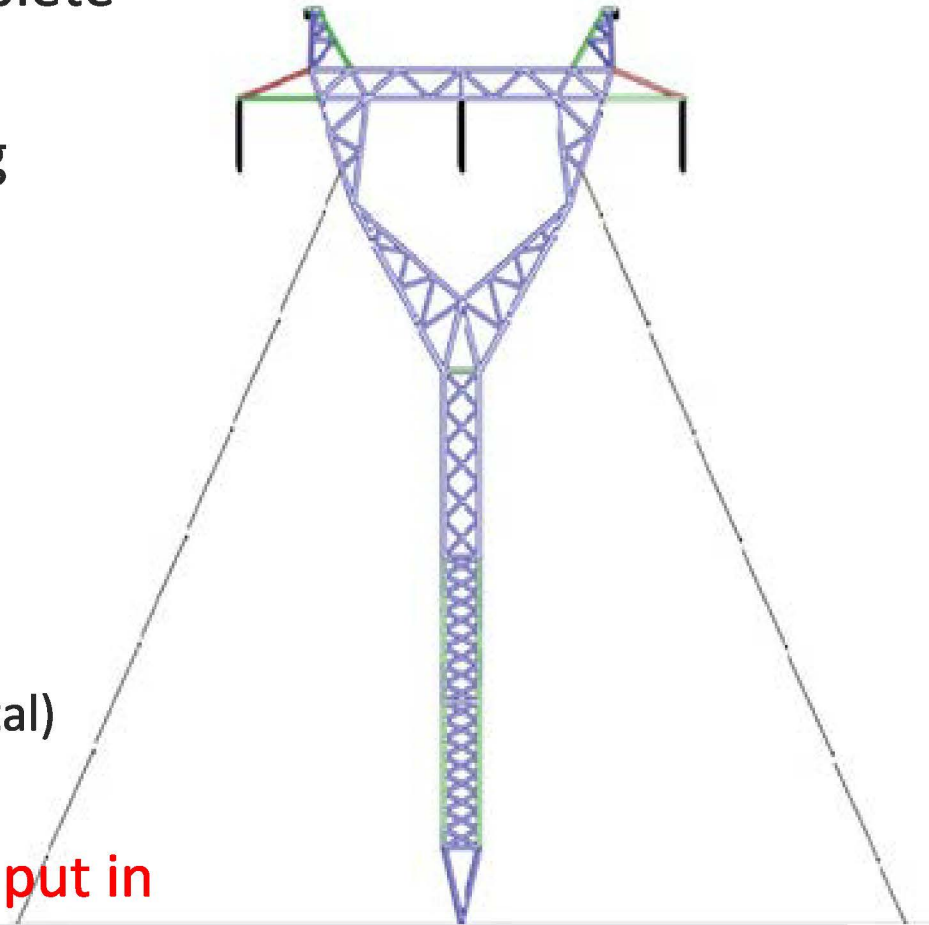


Overall Progress

- Construction underway on all components: generation, transmission and associated infrastructure
- 100 work fronts across province and around globe
- Majority of work fronts progressing as planned
- Work being performed safely, in an environmentally-responsible manner to a high quality
- Tremendous benefits to the province:
 - >XXX NL residents working on the project, XX% of workforce
 - \$XXX million in wages to NL workers
 - \$XXX million to NL businesses
 - **(Note: waiting for June 2015 info)**

AC Transmission: Muskrat to Churchill Falls

- Clearing for right-of-way complete
 - 2,450 hectares
- Towers and foundations being assembled and erected
 - Approx. 54% of towers erected
 - 72% of towers assembled
 - 92% of foundations installed
- Conductor stringing ongoing
 - Approx. 32% complete
 - 78 km completed (of 490 km total)
- Work will be substantially complete in 2015 **and may be put in service (TBC JK or PH)**

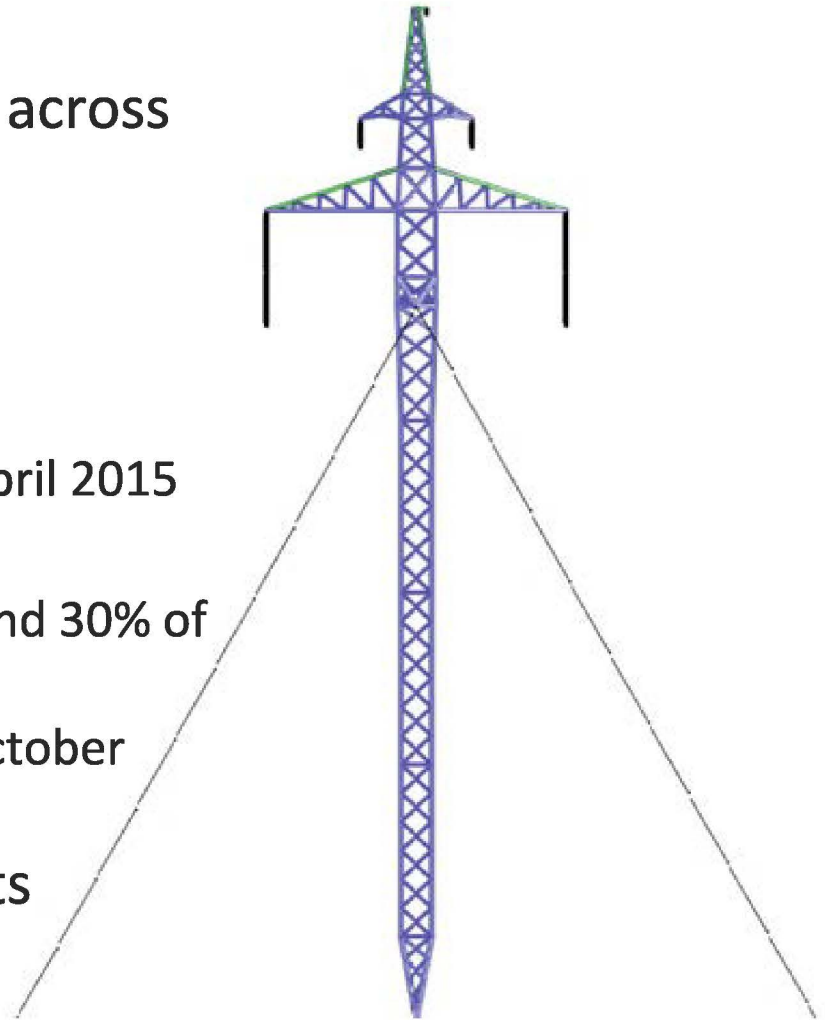






DC Transmission: Labrador-Island Link

- Clearing for right-of-way ongoing across province
 - Approx. 67% cleared in Labrador
 - 32% cleared on the island
- Towers and foundations
 - First tower erected in Labrador in April 2015
 - 79 towers erected in Labrador
 - Approx. 35% of towers assembled and 30% of foundations installed in Labrador
 - Start tower assembly on island in October 2015
- Remaining ROW clearing contracts under evaluation









HVdc Specialties

- Civil construction works underway for Synchronous Condenser facility at Soldiers Pond, HVdc Converter Stations at Soldiers Pond and Muskrat Falls, and ac Substations at Soldiers Pond, Muskrat Falls and Churchill Falls
- Construction of grounding sites at Dowden's Point and L'Anse au Diable well advanced with breakwater construction scheduled for completion in 2015
- Manufacturing of all power transformers (7 units for Churchill Falls, 4 units for Soldiers Pond, and 2 units for Muskrat Falls) complete. All units scheduled for delivery in September/October 2015



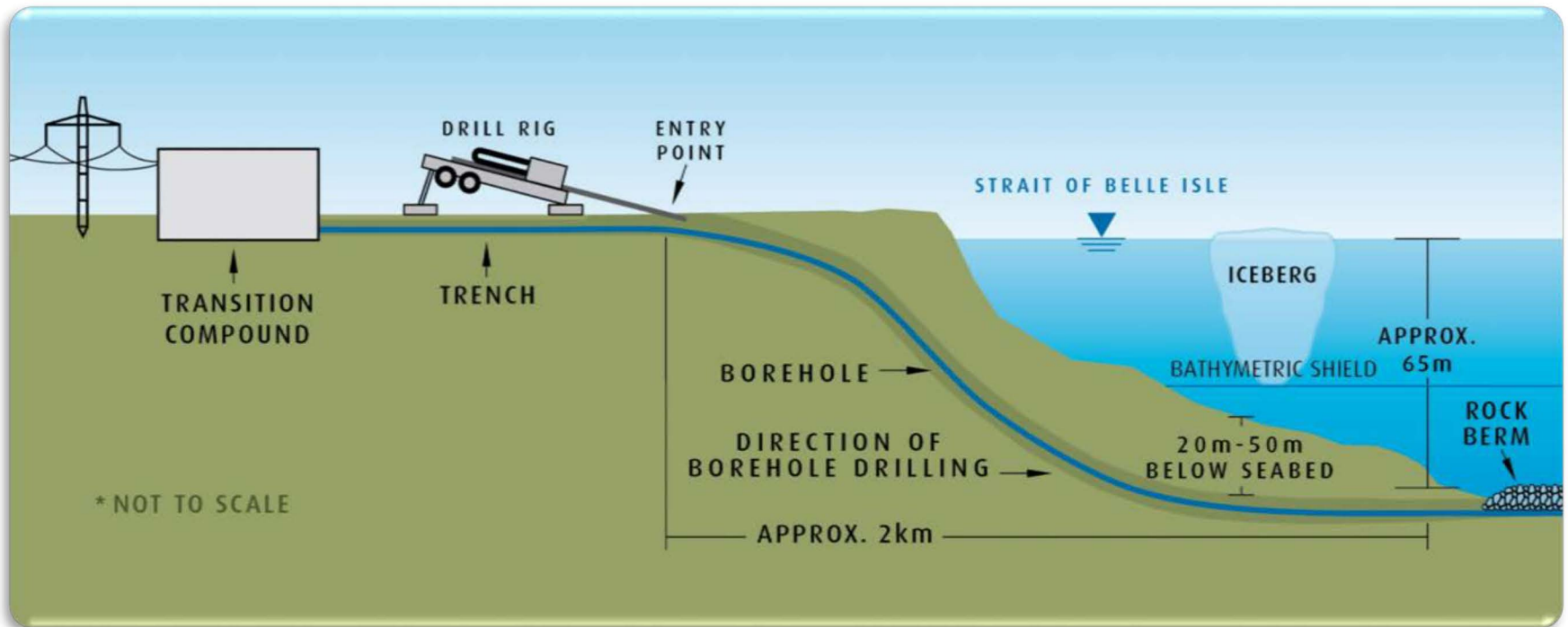


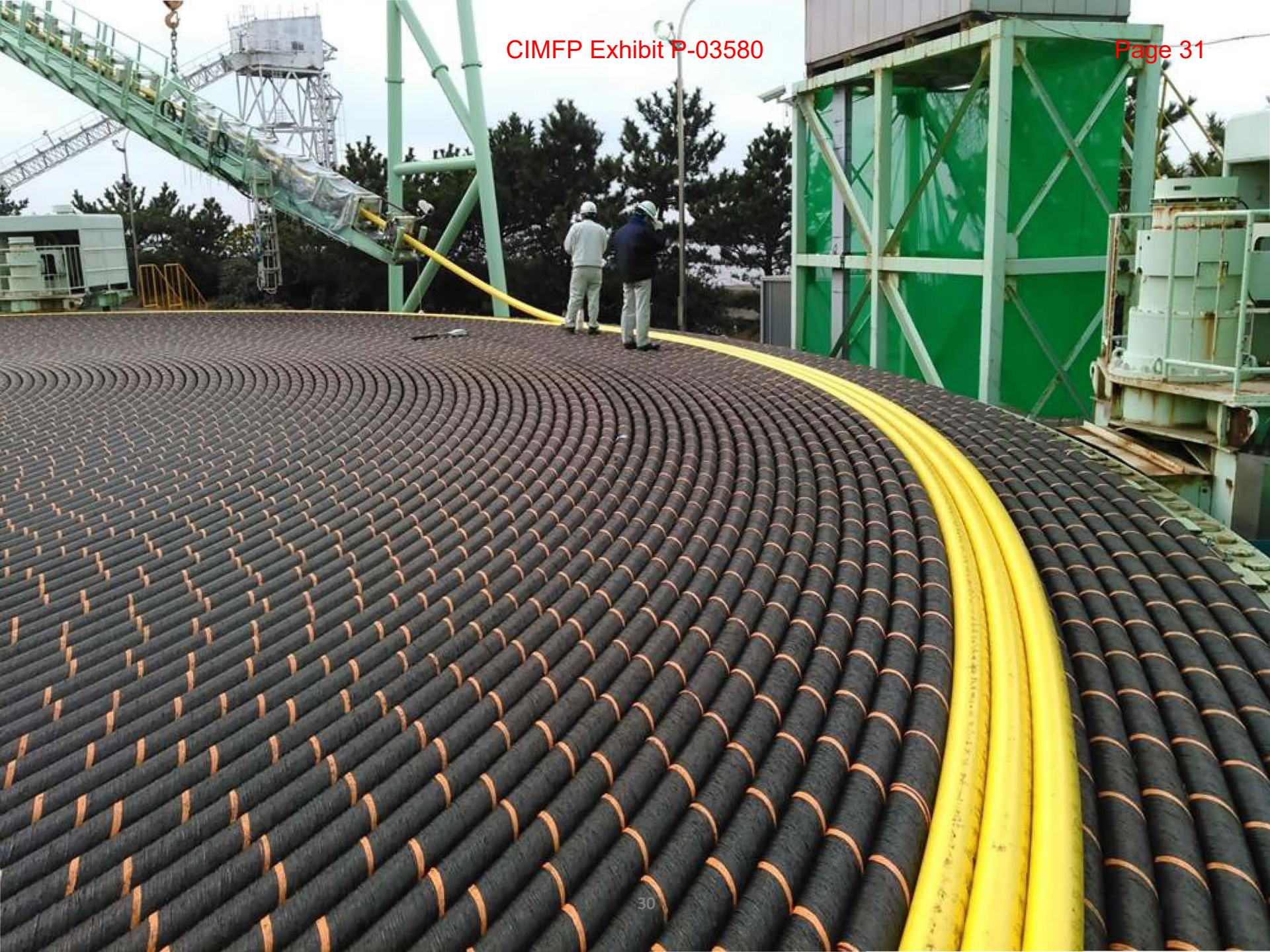


Strait of Belle Isle Marine Cable Crossing

- First land cables will be installed in September
- Marine cable manufacturing underway in Japan; last of three cables expected in September each 30 kms in length
- Successfully completed horizontal directional drilling (HDD) program; longest landfall application in world
- On track for marine cable installation across the Strait next year

Horizontal Directional Drilling





Muskrat Falls Generating Facility

- Stabilization work progressing well at North Spur; geotechnical conditions as expected
- Concrete for spillway piers and slabs nearing completion, moving toward starting installation of gate guides & gates this fall
- River diversion thru spillway on track for 2016
- Concrete placement in powerhouse tripled since May 2015
 - 24,000 m³ in July - Best rates in Canada
- Turbines and generators as well as gates being manufactured in China, equipment being delivered to Muskrat Falls
- Reservoir clearing advanced ahead of schedule with opportunity for contractor and workers to be utilized on transmission right-of-way



















COST UPDATE

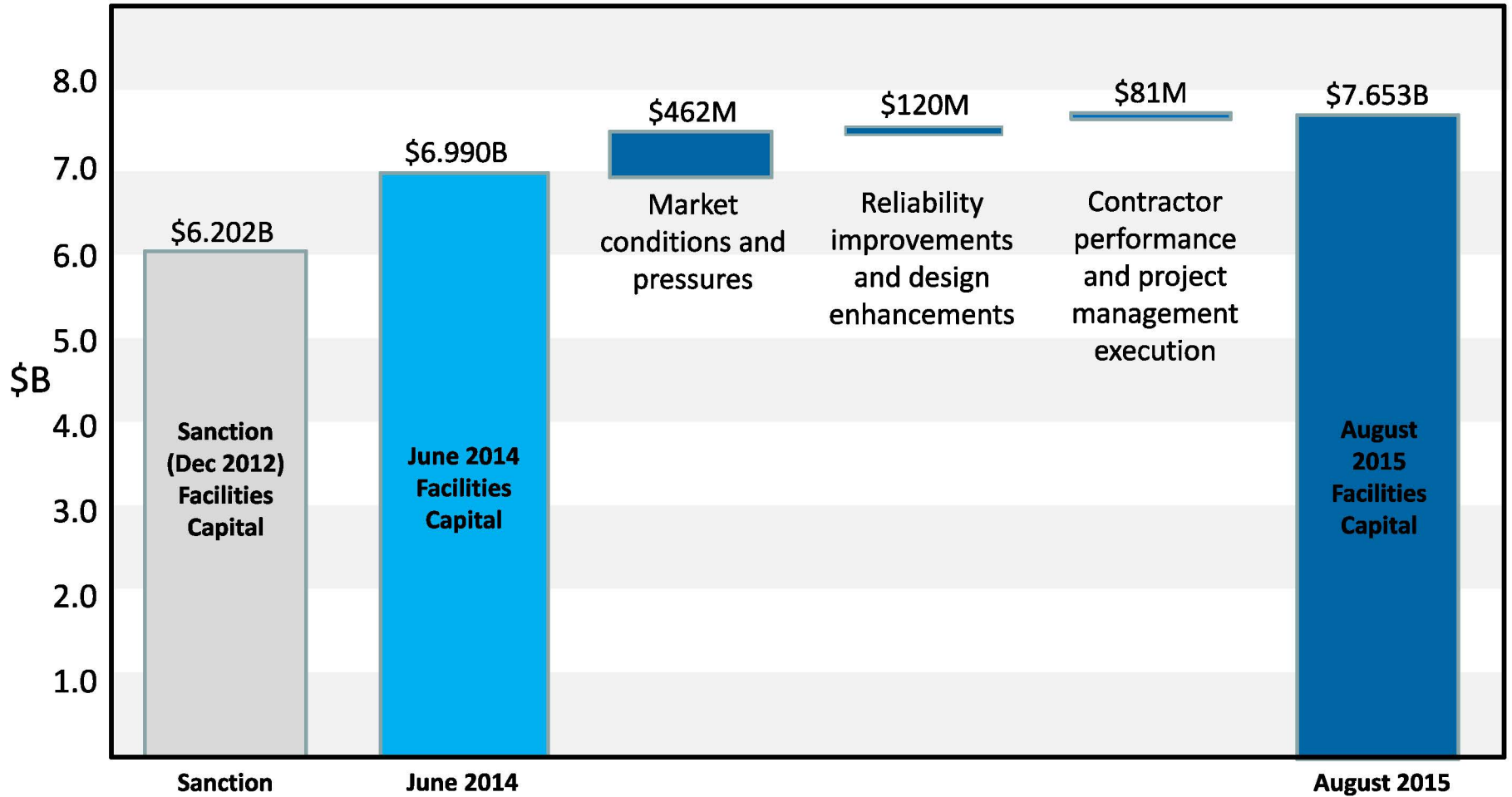
Key Messages (cont'd)

- Facilities capital costs are currently projected to grow by an additional 10.6%, (total since sanction including this 10.6% is 23%)
 - due to a combination of project enhancements plus market forces (market forces also being experienced by other NL and North American projects).
 - the 10.6% includes a contingency allowance of 5%, representing 7% of remaining expenditures.
 - \$6,990M + \$XXXM + \$XXXM Contingency = \$7,650M
 - These increases are partially offset since sanction by the following changes equating to 8% (15% nominal) of facilities capital;
 - 5% (8% nominal) - lower than budgeted financing costs,
 - 2% (5% nominal) higher than budgeted revenue from excess electricity sales, and
 - 1% (1-2% nominal) - Holyrood displacement potential during construction
 - \$300M (\$500M nominal) + \$100M (\$300M nominal) + \$100M
-

Key Messages (cont'd)

- Procurement of material and supplies, and selected NL execution work (such as SOBI drilling) comprising >50% (\$3.2B) of total facilities capital are overall within 2.5% of budgeted amounts
- Increase of 23% in facilities capital since sanction (excluding offsets) are primarily related to execution of work in Newfoundland and Labrador, comprised of 3 main categories;
 - 12% - increases resulting from considered decisions
 - 5% to enhance the design and long term quality and operating performance of the Project
 - 7% to address productivity and cost/schedule containment opportunities during construction
 - 9% - market forces driving higher than budgeted bids
 - 2% - actual impact on LIL productivity due to severe weather plus unknown geotechnical conditions

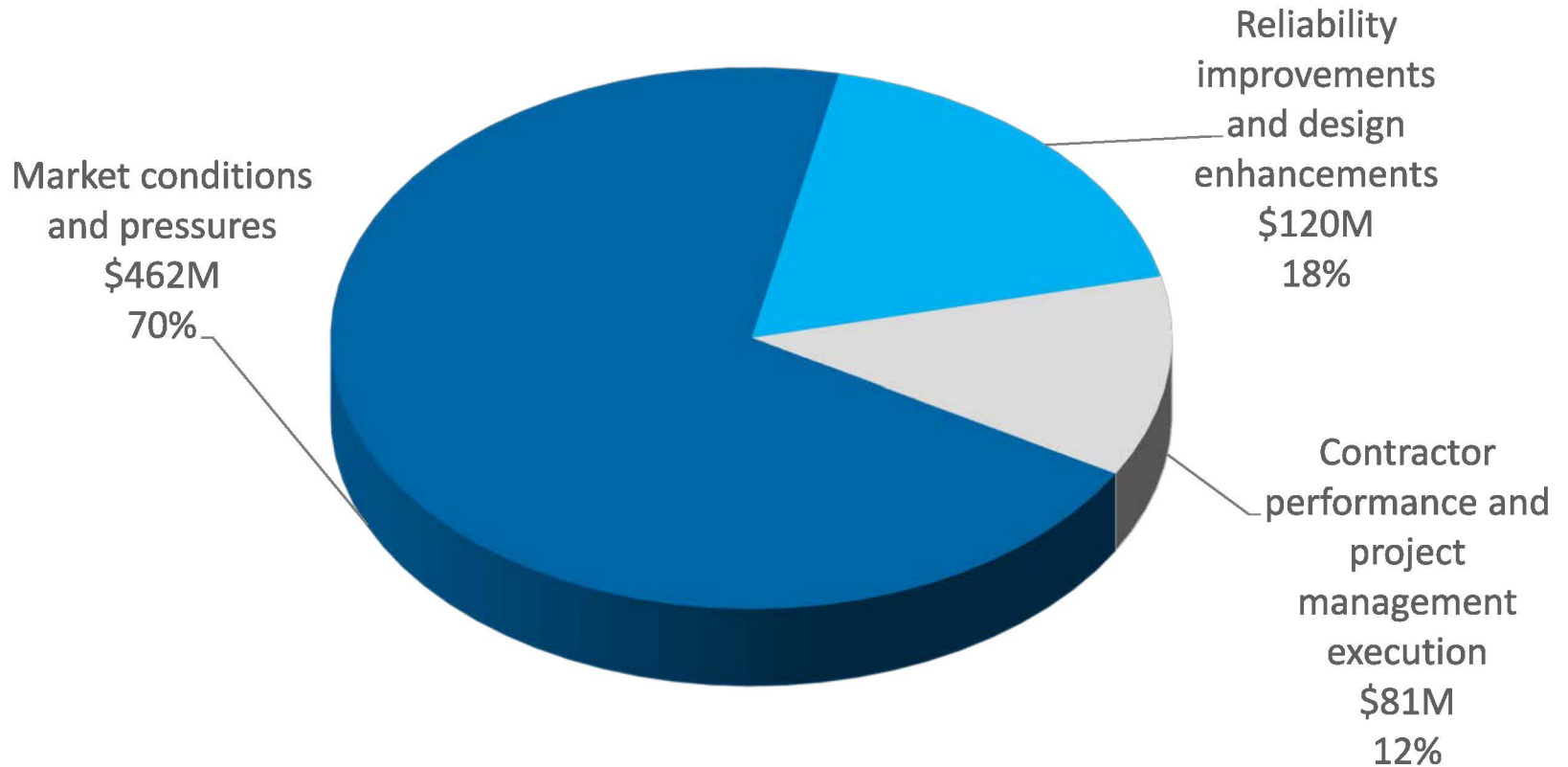
Cost growth contributors since sanction



Changes from DG3, June 2014 and August 2015

Project Component	DG3 Cost Estimate	June 2014 Cost Estimate	August 2015 Cost Estimate
Muskrat Falls Generating Facility	\$2,901	\$3,372	\$3,686
Labrador Transmission Assets	\$691	\$832	\$878
Labrador-Island Transmission Link	\$2,610	\$2,786	\$3,089
TOTAL	\$6,202	\$6,990	\$7,653

Facilities Capital Changes (since June 2014)

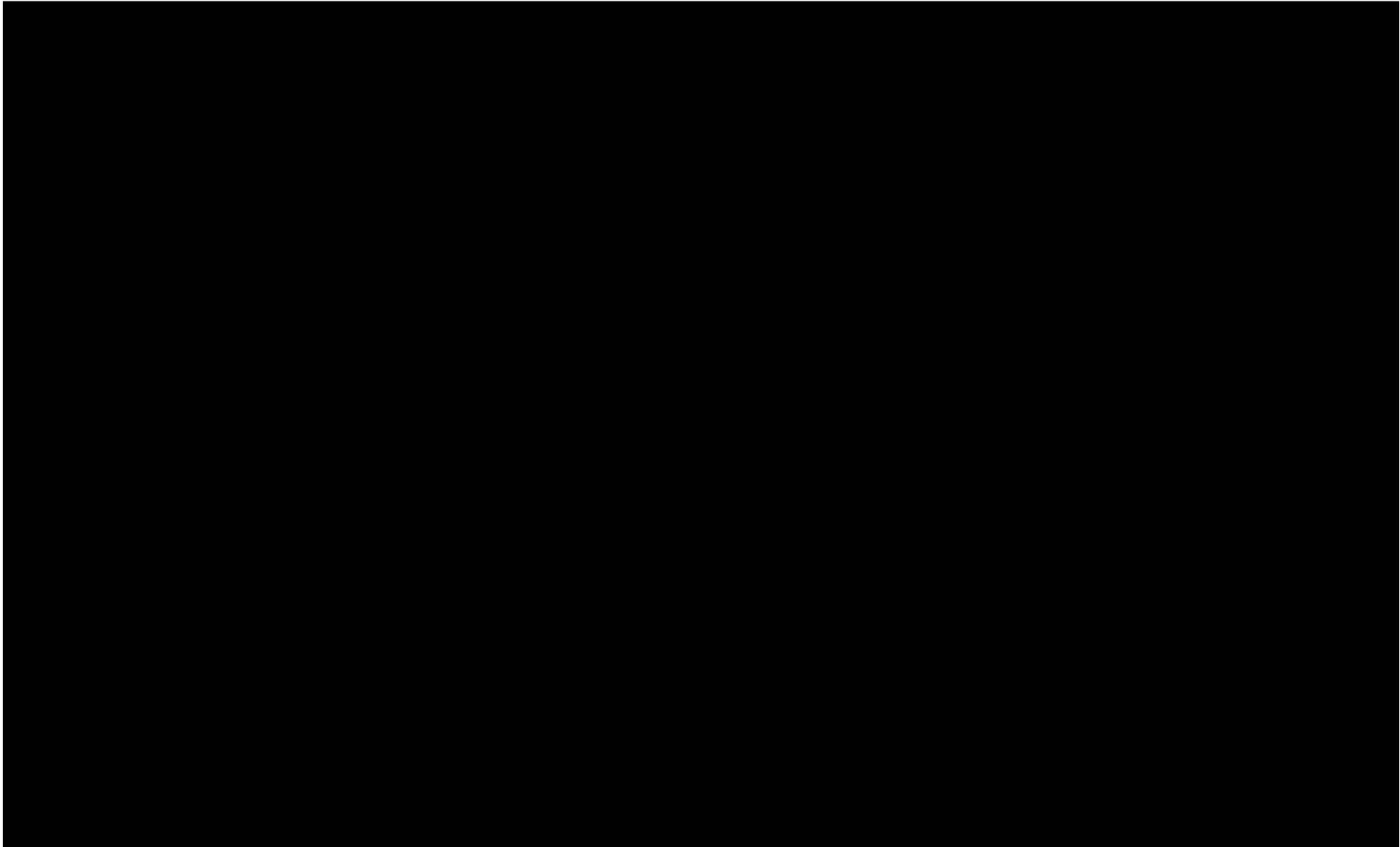


Marketplace Conditions

- Extremely active construction industry, highly competitive labour market. LCP is not unique – we are facing labour and productivity challenges
- Contractors are adding labour risk premiums into their bids – this is driving up costs
- Cost pressures reflected in latest contracts: North Spur, North and South Dams, Mechanical and Electrical Auxiliaries, some transmission line work
- Market pressures increasing capital costs, pricing, contracts for the project
- Decreasing value of Canadian dollar, foreign exchange rates
 - We have avoided the majority of this but still have an impact

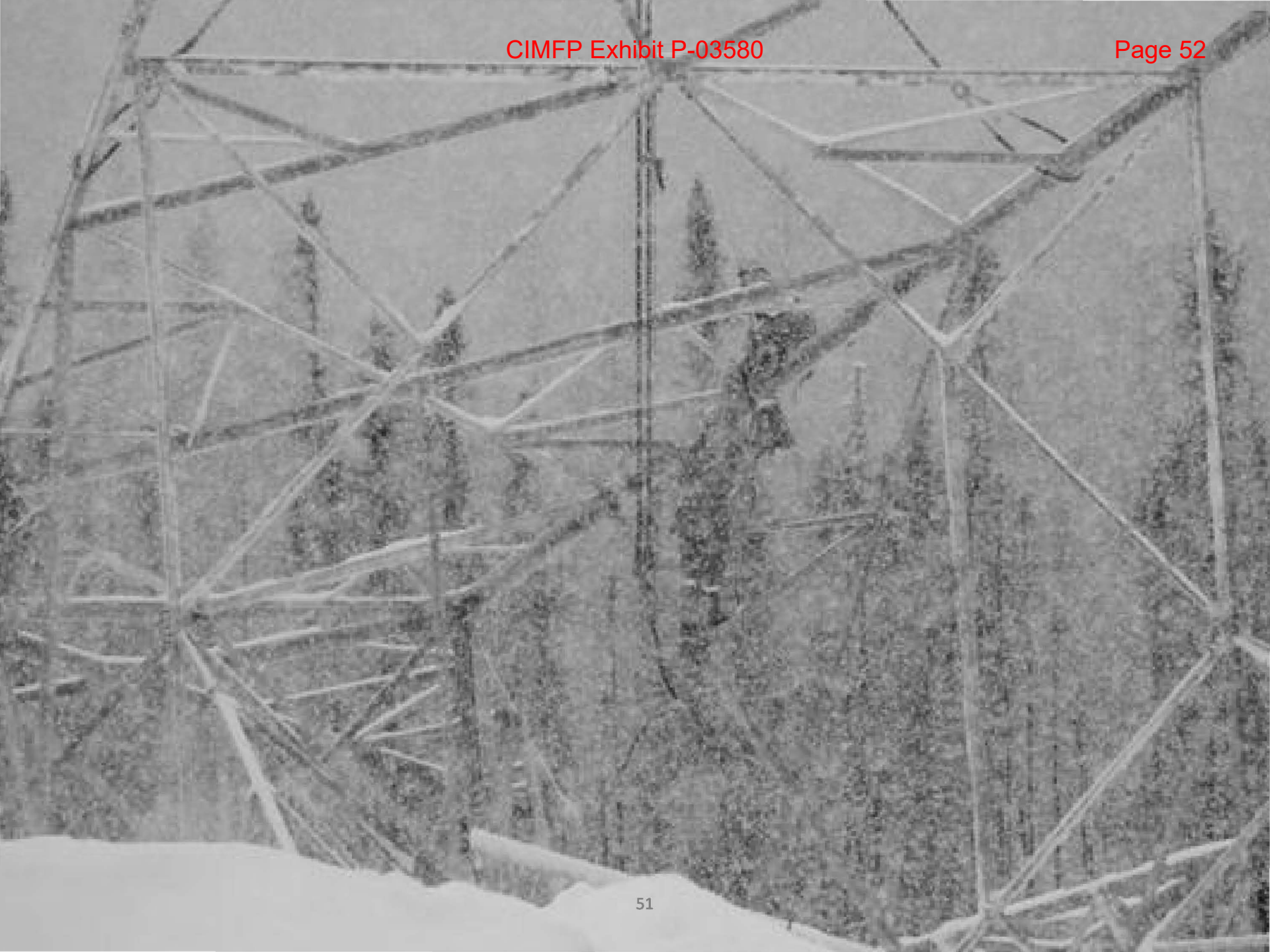
Marketplace Conditions

- INSERT CONSTRUCTION INDUSTRY DATA RE HIGH ACTIVITY LEVELS DRIVING COSTS



Severe Weather and LIL Geotechnical Productivity

- Difficult and unknown topography considerations shifted risk to Owner to prevent over budget of contingency in contractor's bid and contract
- Very severe weather conditions last winter impacting worker productivity, driving need for more workers/hours
- Winter roads added in addition to all season roads to more effectively advance clearing work fronts and installing bridges
- Geotechnical constraints more than planned in some areas, particularly in the interior of Labrador



Design Enhancements to Improve Quality & System Reliability

- Strategic investments to enhance system reliability, increase project productivity and improve safety
- Long-term value and reliability, but additional costs upfront
- Examples:
 - Construct permanent transmission infrastructure in challenging terrain and remote areas – bridges, roads, access for maintenance
 - Will enable safe, efficient access during operation
 - Design enhanced for some tower anchors, weight and type of foundations required for geotechnical conditions identified during construction



Construction Productivity & Performance Enhancement Measures

- 200+ contracts managed by the LCP project team
- Majority of contracts tracking on schedule, cost
- More project management required by LCP on some contracts - additional costs but positive outcomes:
 - Concrete placement tripled from 8,000 m³/mo. to 24,000 m³/mo. since May 2015
 - Additional oversight for transmission construction
- LCP hands-on with contractors for productivity, safety, environment, general project management – ultimately benefits outcome

SCHEDULE UPDATE

Key Messages

- The ability to transfer electricity to the island remains on track for 2017, and Churchill Falls recall power and market purchase of power are available to displace Holyrood in 2017 and beyond.
- LIL, LTA, SOBI, North and South dams, North Spur, transition dams, Spillway and river diversion, and material and equipment deliveries remain on schedule.
- The Powerhouse is behind due to Astaldi slow start, and first power from Muskrat Falls will be delayed from 2017, with the revised timeframe under review.
- Additional costs and potential cost offsets and reductions associated with the powerhouse delay are also under review.

Looking Ahead

- SOBI marine cables installed in 2016
- On track for power from Churchill Falls to the island on new transmission lines in 2017
- First time island connected to North American grid in 2017
- Begin commissioning and startup facilities in 2017
- Conduct start up and performance testing of integrated systems; teams now in place planning to bring units online
- Gradually bring power from Labrador to island customers in 2017 with Muskrat Falls units in 2018
- Maritime Link planned to be ready, working with Emera to integrate into our system

HOW WE MANAGE RATES IS A CRITICAL SUCCESS FACTOR

Rate Mitigation

- *“With much of the country’s electricity infrastructure nearing the end of its life expectancy, investing in grid renewal and modernization today will be essential to ensuring a reliable, cost-effective and sustainable power supply tomorrow. The costs of doing so will be high—at least \$350 billion in capital investments over the next 20 years—but will be necessary to address the deteriorating condition of utility assets.”*
- *“Fortunately, the investments being made by utilities across Canada are providing a much needed short-term boost to the economy through economic stimulus and job creation.”*

Canadian Electricity Association, 2015 Report

ELECTRIC UTILITY INNOVATION - TOWARD VISION 2050

Rate Smoothing in Other Jurisdictions

- It is common in some other Canadian and US jurisdictions that specific actions are taken by regulators to smooth the rate impacts from large capital investments:
 - cost of a major asset is sometimes collected in rates prior to the asset being in service in order to smooth the known upcoming rate increase
 - Smoothing is normally achieved by allowing some of the construction financing costs to flow through to the revenue requirement prior to the in-service of the new facilities
 - Also decoupling rates and costs does occur in other jurisdictions under performance-based rate making, for example, rates can be tied to an escalation factor or number of customers

Manitoba Example

- Manitoba Hydro is spending about \$20 billion over the next decade. The most significant projects include Bipole III, at a cost of \$4.6 billion, the Keeyask generating station at \$6.5 billion, maintenance and upgrading of existing facilities at \$5.9 billion, and energy efficiency programs at \$0.7 billion
- Recently Manitoba's Public Utilities Board approved a rate increase, a portion of which will be held in a deferral account to offset future rate increases from Bipole III, a major transmission project scheduled to come in service in 2018, to account for collection of revenues prior to the project coming in service

Ontario Example

- In a 2010 report on the regulatory treatment of infrastructure investment the OEB states the including Construction Work in Progress (CWIP) in rate base provides two principal benefits:
 - First, it provides a smoothing, or phased-in, effect on rates and thereby mitigates the rate impact that might otherwise take place when large new plant is placed into service
 - Second, it can reduce borrowing costs. Permitting a utility to recover CWIP funding can also reduce a project's total net present value cost
 - The Board will allow utilities to apply to include up to 100 percent of prudently incurred CWIP costs in rate base.
 - This approach allows utilities to recover the interest costs on debt and a return on equity (i.e., the weighted cost of capital) during the construction period.
 - The depreciation or return of the investment will continue to be recovered once the project goes into service.
 - The Board may also consider: a) applying a cap on the CWIP amount allowed or b) allowing the CWIP amount into rate base on a staged basis as construction proceeds.

U.S. Jurisdictions Treatment of CWIP

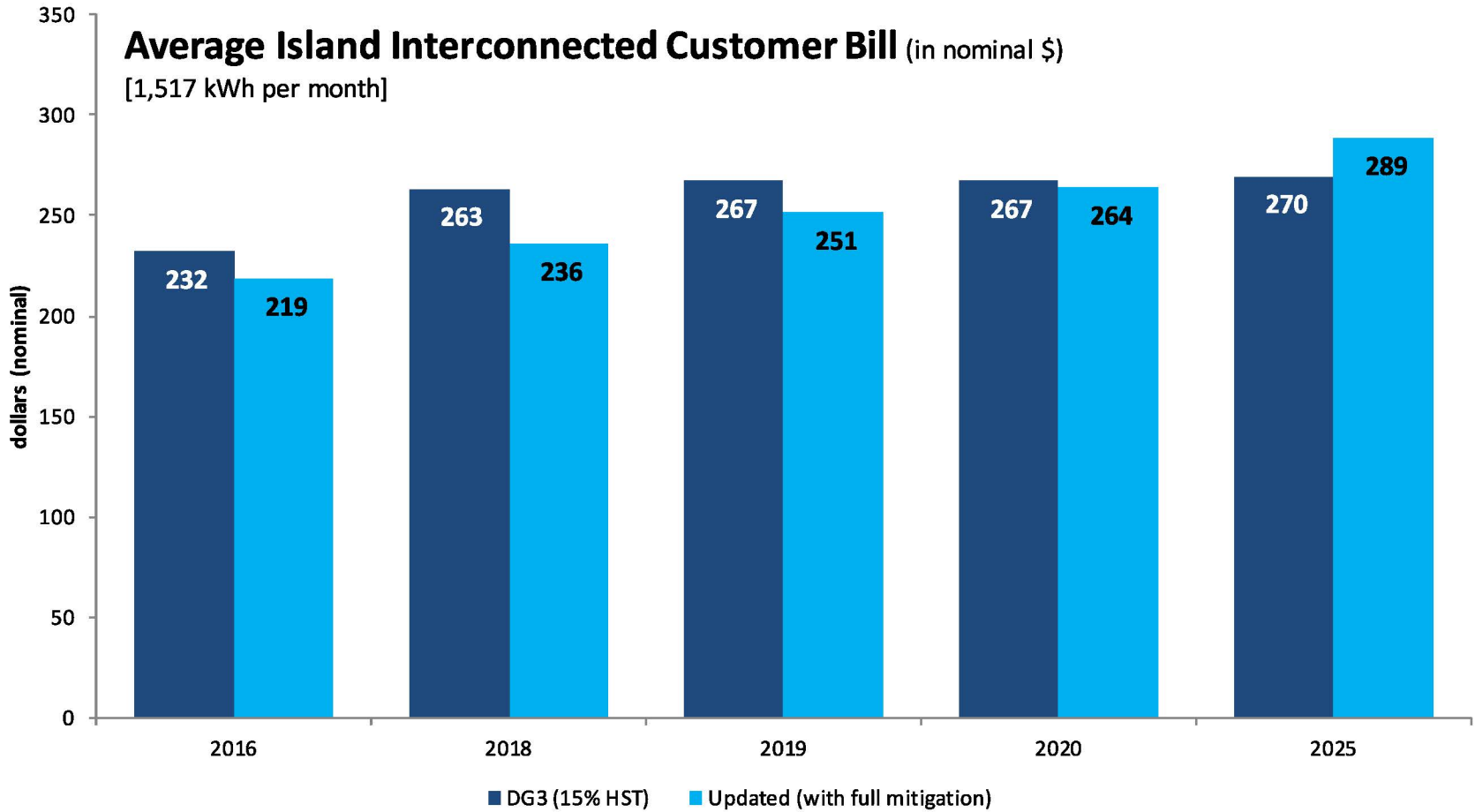
State	Project Specific or Blanket?	Supporting Legislation and Regulations?	CWIP Recovered in Rates	Notes
Florida	Nuclear	Both	CWIP financing costs Pre-construction costs Plant-related transmission	June 2006 and June 2008 legislation, Feb. 2007 regulations
Georgia	Nuclear	Legislation	CWIP financing costs	April 2009 legislation
Kansas	Nuclear	Legislation	CWIP financing costs Pre-construction costs Construction costs	May 2008 legislation
Louisiana	Nuclear	Regulations	CWIP financing costs	Adopted May 2007
Mississippi	Nuclear	Legislation	CWIP financing costs Pre-construction costs	May 2008 legislation
Michigan	Large Capital Investments	Legislation	CWIP financing costs	October 2008 legislation
North Carolina	Coal and Nuclear	Legislation	CWIP financing costs Pre-construction costs	August 2007 legislation
South Carolina	Coal and Nuclear	Legislation	CWIP financing costs	May 2007 legislation
Virginia	Nuclear	Legislation	CWIP financing with ROE	April 2007 legislation

Rate Mitigation

- Impact on NL Customer rates can be mitigated by utilizing available funds from
 - excess electricity sales, an amount that was never included in the economics
 - return on MF/LIL/LTA equity cash flow, and
 - other Nalcor cash flow, based on principle of investing an appropriate portion of current non-renewable revenue into renewable infrastructure for future generations
- Approximate total available funds from Nalcor from now until 2042 estimated at \$15 billion, of which assuming \$3-4 Billion equity injection into Nalcor, yields a remaining \$11-\$12 Billion during this time frame
- These amounts do not consider the significant additional, growing revenue post 2012 from MF ROE, Upper Churchill or Oil and Gas

Suggested Rate Mitigation Program

- Goal is to limit customer rates to within 5% or less of an increase (not including HST change made by Government) as compared to DG3 projections up to a point to where the curves intersect.
- Suggested methodology is a combination of the following, as necessary;
 - assume \$650 million of equity already injected into LIL by the Province is structured as a Contribution In Aid of Construction (CIAC), not requiring a “return of” or “return on” equity
 - remainder of required funds to come from a portion of the excess sales
- To the extent the Shareholder financed this injection, the remainder of the \$15 Billion over time could be used to cover financing costs – it would be a small fraction of the available total



Impact of Mitigation

Assuming \$655M portion of the equity the shareholder will have injected into the LIL asset for increased facilities capital is structured to not attract a return of or return on equity, however all remaining equity ("original" and "additional", except for the \$655M) will attract a return of and return on equity, then the following is the outcome:

- a) Even after excluding the \$655M, the Province will receive more dividends overall than shown in the recent budget documents - due to higher equity being injected for increased facilities costs being recovered and earning ROE

Impact of Mitigation

- b) The additional higher dividends above help cover the \$655M reduction in recovered facilities capital costs so that the net dividends to the Province will be cumulatively the same as presented in the recent budget documents

- c) If the government chooses to factor in their cost of financing the \$655M, the net dividends will be reduced approximately by the \$500M-\$1 billion however the impact will look negligible over time in the context of \$15 billion in Nalcor returns

RISK ASSESSMENT GOING FORWARD

Many Key Things Are Behind Us

- Environmental Approvals
- Innu “New Dawn” and the IBA arrangements
- Federal Loan Guarantee in place
- Debt Financing locked in at low rates with \$5B borrowed cash on deposit
- Emera and Nova Scotia arrangements
- Engineering
- Camp and catering in place and operating
- MF site roads, site power and laydown areas
- Bulk excavation of the Powerhouse and Spillway

Many Key Things Are Behind Us

- Completion of Spillway civil works this fall, on track for river diversion next year
- Turbines and Generators Unit 1 and 2 on track to ship this fall
- Subsea drilling SOBI complete
- SOBI subsea cables - 2 manufactured, 1 in final stages
- SOBI land cables manufactured and en route to NL
- Tower steel, conductor and hardware
- Significant reservoir and transmission line clearing
- LTA Transmission from MF to CF significant progress, expected completion this year

Many Key Things Are Behind Us

- LIL Transmission commenced, expected to be out of Labrador by year end
- Significant progress on North Spur
- Significant site work preparation for transition infrastructure (switchyards, converters, electrodes)
- All major contracts now awarded or bids received

Key Remaining Risks

- With all PO and Contract costs contracted there will be limited further Market Risk
- Risk exposure will be narrower and will shift to execution:
 - Labour Productivity of Time and Material type contracts
 - Key Contractor performance
 - Potential Claims
 - Union unrest – specifically RDTC
 - Aboriginal unrest
 - Geotechnical risk of N Spur and North Dam construction
 - Commissioning and Startup
- There are risk mitigation plans in place and being actioned

Current Project Summary

Transmission ~ 30% \$2.2 B	DC ~ 15% \$1.2 B	Other ~ 15% \$1.2 B	Muskrat Falls ~ 40% \$3.0 B
<p>AC Line ~ \$.4 B (MF-CF)</p> <ul style="list-style-type: none"> • Clearing • Tower steel • Hardware • Construction 	<p>Converter ~ \$.5 B</p> <ul style="list-style-type: none"> • Muskrat • Soldiers 	<ul style="list-style-type: none"> • EA • IBA • Engineer • Legal • Owners • Community • Etc. 	<p>Civil ~ \$.8 B (10%)</p> <ul style="list-style-type: none"> • Reservoir • North Spur • Bulk Excavation • Dams
<p>DC Line ~ \$1.4 B (MF-SP)</p> <ul style="list-style-type: none"> • Clearing • Tower steel • Hardware • Construction 	<p>Switch yards ~ \$.4 B</p> <ul style="list-style-type: none"> • Muskrat • Soldiers • Churchill 		<p>Electro Mechanical ~ \$.6B (8%)</p> <ul style="list-style-type: none"> • Turbines & Generators • Gates • BOP
<p>SOBI – Subsea ~ \$.3B</p> <ul style="list-style-type: none"> • Subsea cable • Land drilling • Cable protection 	<p>Synchronous condenser ~ \$.2 B</p> <ul style="list-style-type: none"> • Sync @ Soldiers • Electrodes • Telecoms 		<p>Site Infrastructure & Services ~ \$.5 B (7%)</p> <ul style="list-style-type: none"> • Camp and catering • Roads
			<p>Astaldi</p> <ul style="list-style-type: none"> • Mob, site ~ \$.2 B (3%) • Spillway/transition dams ~ \$.2 B (3%) • Powerhouse– non-labour ~ \$.2 B (3%) <p>Astaldi</p> <ul style="list-style-type: none"> • Powerhouse labour ~ \$.5 B (6+%)

LOOKING AHEAD

Our Project, Our Benefits

- Muskrat Falls remains the best option to meet NL electricity needs
- Hydro developments are long-term investments, risk/capital intensive up front
- 100+ year asset will generate clean, renewable energy – ahead of future carbon capture requirements
- Enhanced reliability and stable rates for electricity customers
- Provide significant value and cash flows to NL – approx. \$35B in nominal value over life of project
- GHG cost impacts and nominal value not included in project economics
- Manage our own energy and economic future
- We have the right team to make it happen





To secure a strong economic future
for successive generations of
Newfoundlanders and Labradorians

CONTRACTOR INTERFACE CONSIDERATIONS

Contractor and Commercial Interface

- We have to be extremely sensitive and highly coordinated on publically available information to prevent unnecessary significant value loss
- Contractors will seek any available information and/or inconsistency in messaging to attempt to make a claim case
- All interactions should be through single point of contact within the Project Team

BACK UP SLIDES

Things That Impact Rates

DG3 Rate Projection

Debt Interest \$4.5 – 5B

Return on Equity
\$25 – 30B

Facilities Capital
\$6.2B

Not Currently In Rate Proj.

- + Greater debt financing savings than planned - \$0.5B (\$0.3B NPV)
- + Value of excess sales >\$3B
- + Holyrood displacement value potential re early LIL (TBD)
- + Use of portion of MF/LIL ROE as CIAC
 - + COREA
 - + Other
- + Non-renewable to renewable CIAC (oil dividends)

TOTAL AVAILABLE

> \$15 - 20B

- Facilities Capital cost increases \$6.2 to \$6.99 to \$7.35 + 0.30 Cont = \$7.65
- Potential delay costs

- + Direct and induced business and employment income (>\$5B)
- + Direct and induced provincial treasury benefits (\$2B)
- + Own vs Renting an asset
 - + Pay ourselves to own the asset forever, as opposed to paying outside entities for thermal fuel
- + Reliability Improvements
- + GHG reduction
 - + 98% GHG electricity production in NL
- + Connection to North America for 1st time

Key Messages (cont'd)

- Increase of 23% in facilities capital cost since sanction are comprised of 2 main categories;
 - 12% - increases resulting from considered decisions
 - 5% to enhance the design and long term quality and operating performance of the Project
 - 7% to address productivity and cost containment opportunities during construction
 - 11% - market forces, as well as impact due to severe weather and productivity related to unknown geotechnical conditions on LIL
- Offsets to these increases since sanction equating to 8% (15% nominal) of facilities capital comprised of ;
 - 5% (8% nominal) - lower than budgeted financing costs,
 - 2% (5% nominal) higher than budgeted revenue from excess electricity sales, and
 - 1% (1-2% nominal) - Holyrood displacement potential during construction

Market Forces

- Although Nalcor's budget and expected productivity estimates were solid, and in several cases supported/supplemented by assessments from independent sources, bids on many key contracts for work in NL came in significantly higher than budgeted
- Key reasons for this;
 - Similar experience to other construction jobs in NL, Canada, and internationally, driven by extremely active construction industry which in turn causes prices to increase in a "seller's market"
 - In addition, bidders increased their bids in response to their perception that labor productivity would be impacted by perceived difficulty in working with the unions, apparently basing their perception on activities at other NL projects, Vale, Hebron and Astaldi slow start
 - In context of North Spur, perceived geotechnical risk (more than reasonable allowance driven in no small part by the public discourse/focus re North Spur