From: emartin@nalcorenergy.com
To: Mullaley, Julia
Cc: Bown, Charles
Subject: Re: Transition Team Presentation
Date: Thursday, December 3, 2015 4:48:26 PM
Attachments: _.png
Transition Team Presentation Dec 4 2015.pptx

Julia,

Please use this version, 2 small changes, a date on one slide and a divider slide for rate section. Please let me know you have the revised one.

tks

Ed

Transition Team Presentation Dec 4 2015.pptx

Ed Martin---12/03/2015 04:38:39 PM---Julia, Here is the presentation,

From: Ed Martin/NLHydro

To: "Mullaley, Julia" <JMullaley@gov.nl.ca>, "Charles Bown" <cbown@gov.nl.ca>

Date: 12/03/2015 04:38 PM

Subject: Transition Team Presentation

Julia,

Here is the presentation,

Ed

[attachment "Transition Team Presentation Dec 4 2015.pptx" deleted by Ed Martin/NLHydro]

Presentation to Transition Team

December 4, 2015

Boundless Energy

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Introduction – Nalcor Energy

- Projections indicate unprecedented dividend potential from Nalcor
- The Province is at a key energy transition point
  - CF post 2041 becoming a current issue
  - MF/LIL/ML and connection to North America imminent
  - Oil and gas potential set for significant positive change

Opportunities Going Forward

- Slope and Deepwater exploration
- Bay du Nord development and much more
- Gull Island Project
- Additional hydro developments
- Wind
- Upper Churchill – time is rapidly approaching

Corporate Structure

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- NL Hydro
- Churchill Falls
- Oil & Gas
- Lower Churchill
- Bull Arm Fabrication
- Energy Marketing






Nalcor's vision is to build a strong economic future for successive generations of Newfoundlanders and Labradorians.

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Progress to Date

- Operating performance similar to other Canadian jurisdictions
- Significant growth projects under development
- Post 2018;
  - Very significant Net Income and Cash Flow
  - Very significant asset growth
  - Continued debt/equity stability

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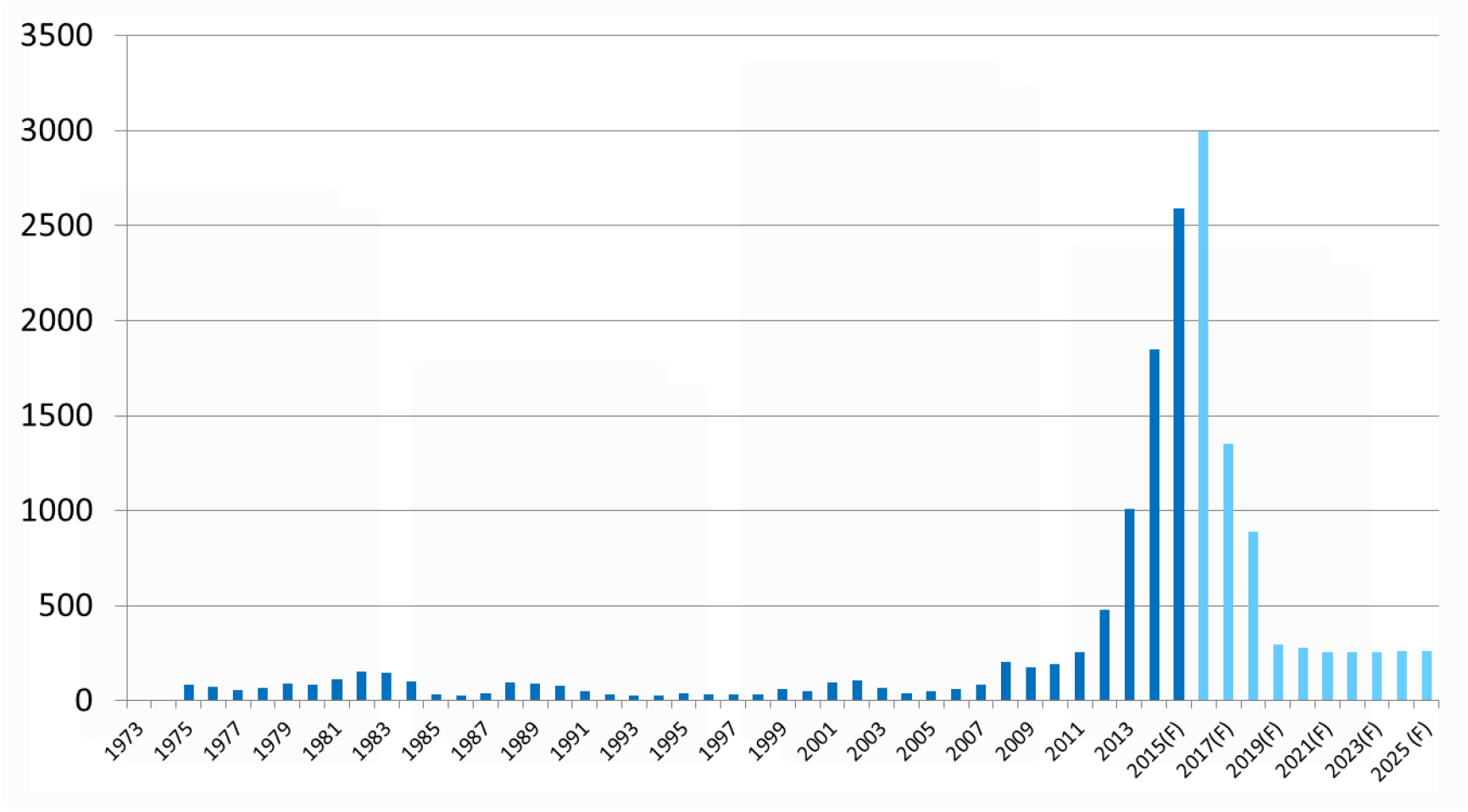
Capital Expenditures ($ millions)



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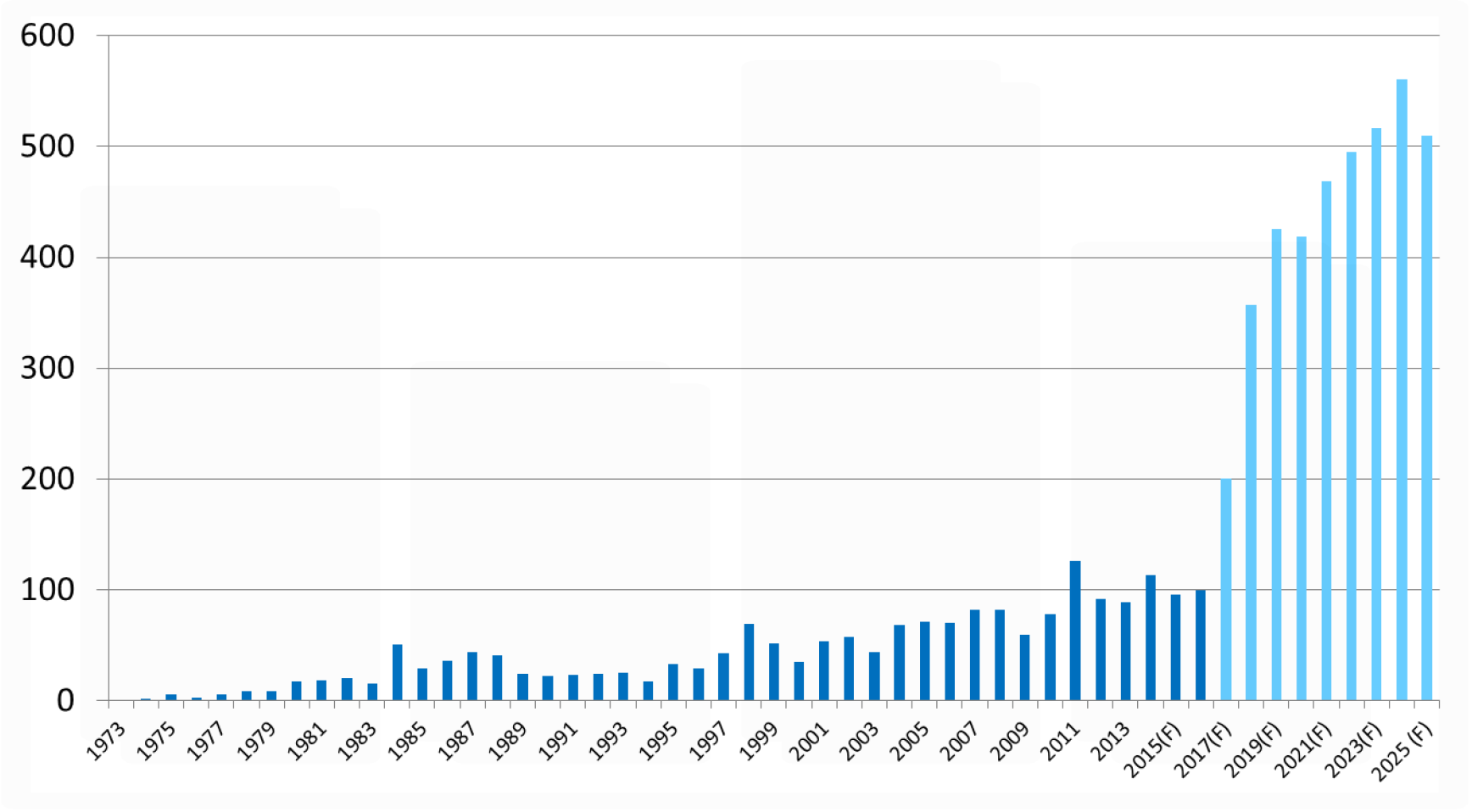
Net Income ($ millions)



Note: Excludes a $119 million write-off of historical LCP costs in 2003.

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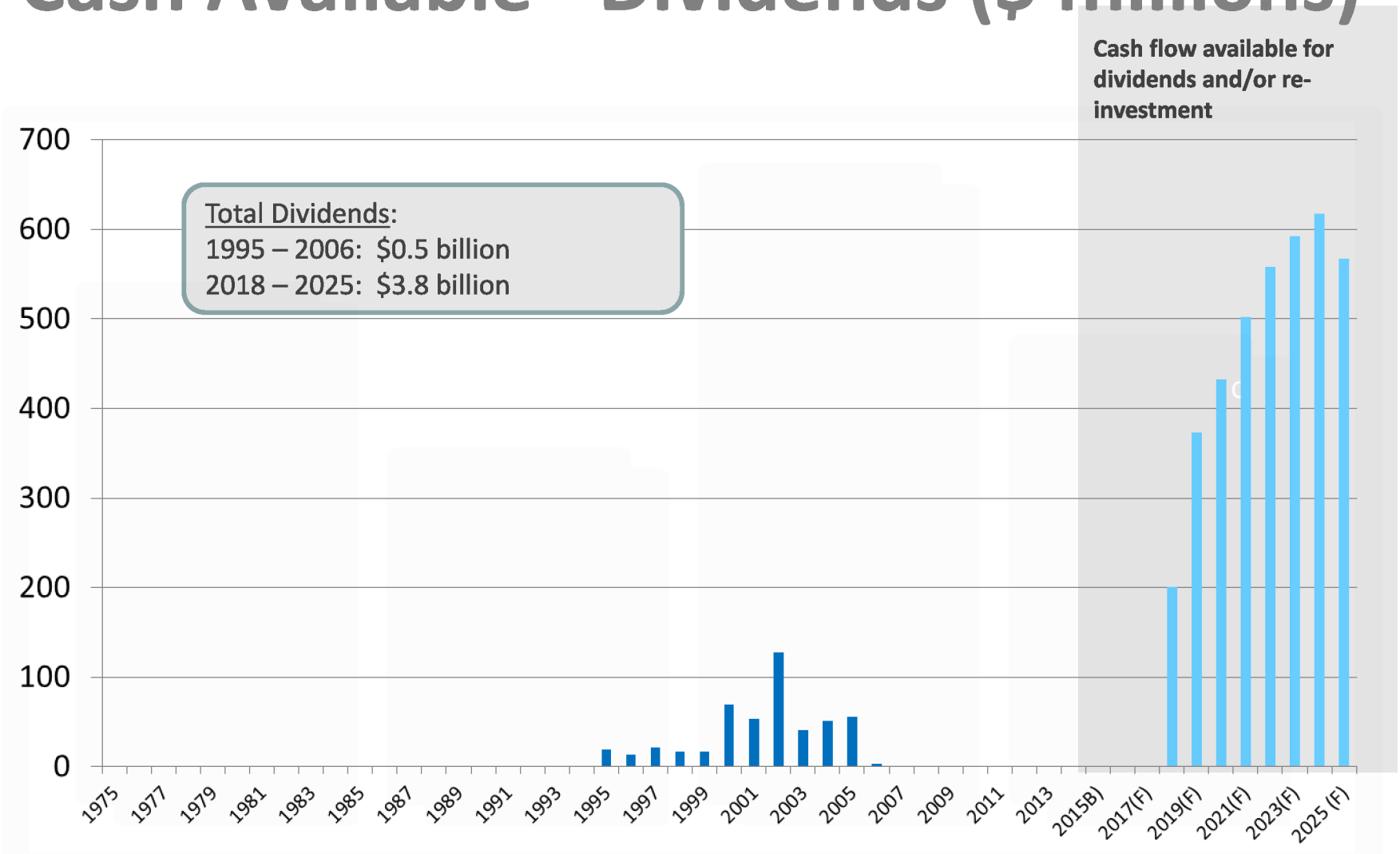
Cash Available - Dividends ($ millions)



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Summary

- Resource development can fundamentally change a society, e.g. Norway
- Much has been done; there is much more to do

Muskrat Falls Project Update

December 4, 2015

Boundless Energy

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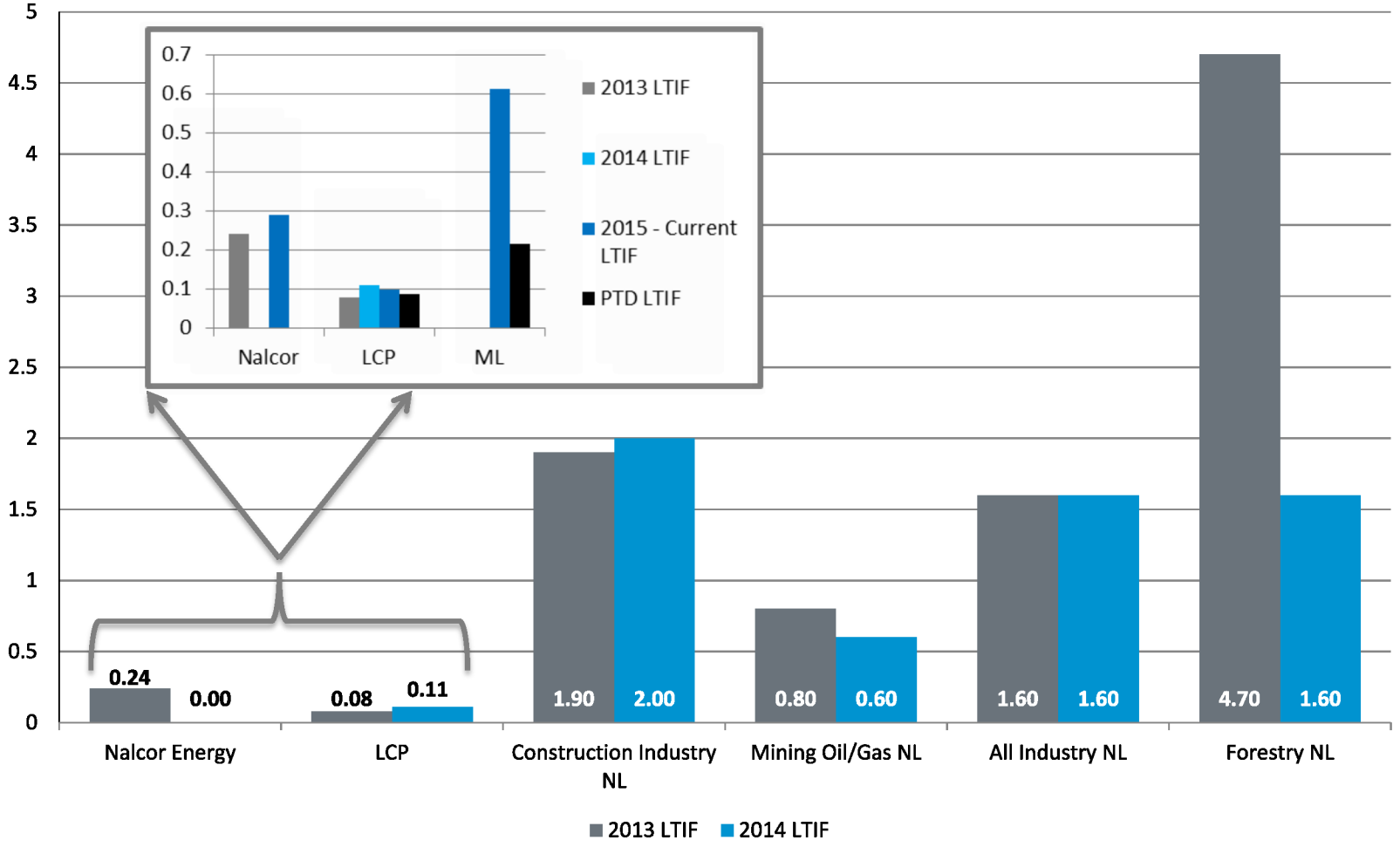
LTIF Comparison – Lower Churchill



Project Background and Rationale

- NL needs more power
- MF/LIL determined to be lowest cost option following extensive alternatives review
- Replaces Holyrood Thermal Generating Station > 40 years old
- Investment in an asset we own, returning value and cash flow in excess of $60 billion to the people of the province
- Paying ourselves, as opposed to paying for oil to outside companies – we are “buying”, not “renting”
- 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
- Significant construction benefits; jobs for NL’s, and economic benefits for NL businesses

Project Background and Rationale (continued)

- 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
- 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
- Historic “New Dawn” agreement with Innu achieved
- Environmental approvals in place

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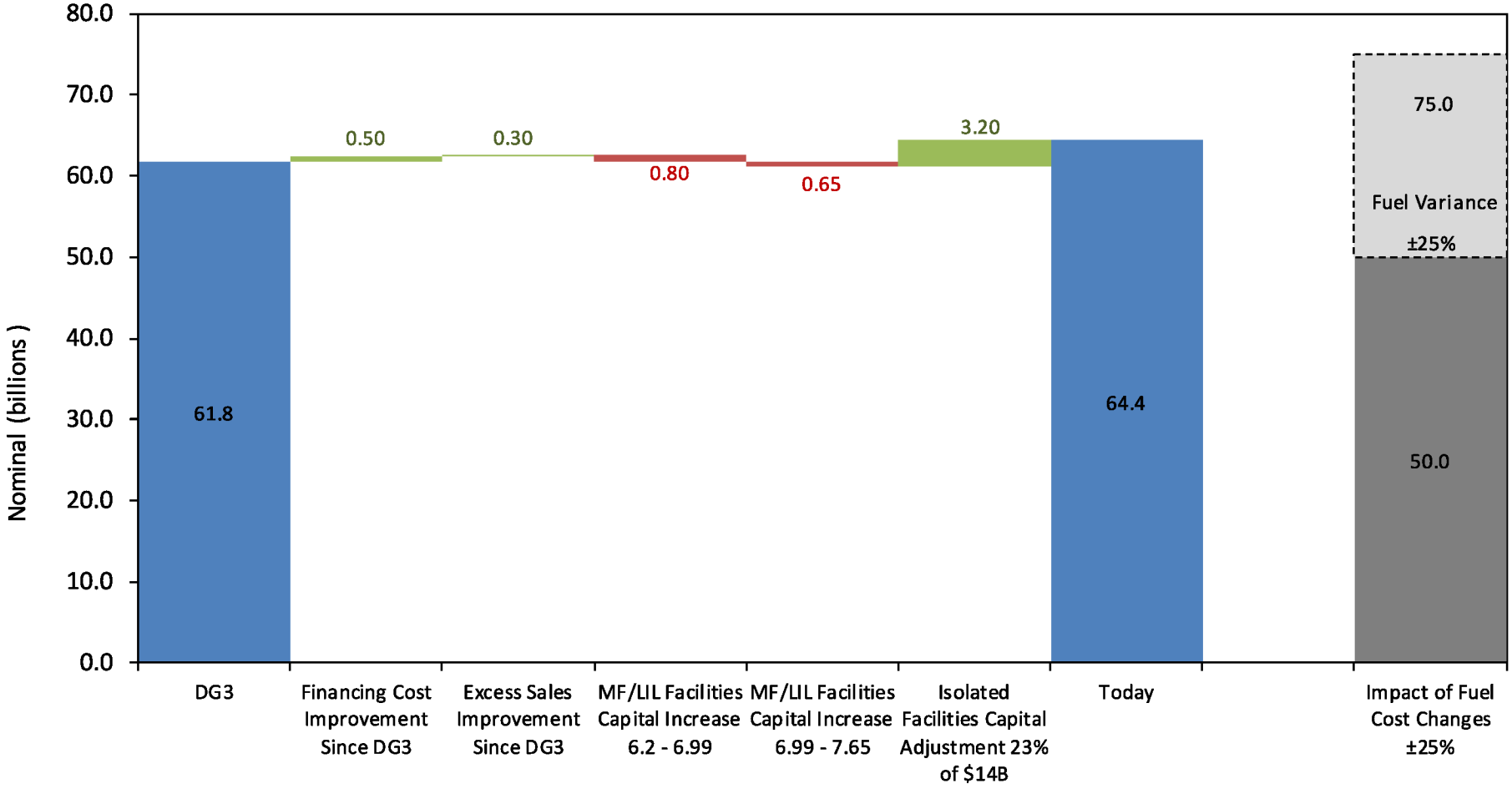
Net Benefits to NL at DG3

$000	Isolated		Interconnected		Net	
	Nominal	PV	Nominal	PV	Nominal	PV
CPW	74,221,796	10,778,339	46,916,599	8,365,997	27,305,197	2,412,342
CPW Induced	22,266,539	3,233,502	14,074,980	2,509,799	8,191,559	723,703
Income (Direct, Indirect and Induced)	7,744,518	1,352,918	5,777,301	2,307,718	(1,967,217)	954,800
Dividends	4,473,138	512,337	22,181,019	1,489,981	17,707,881	977,644
Treasury (Direct, Indirect and Induced)	1,095,016	189,118	862,797	347,562	(232,219)	158,444
Export			3,016,812	746,318	3,016,812	746,318
Water rentals			1,236,980	192,412	1,236,980	192,412
Carbon	(4,868,605)	(629,233)	(33,166)	(2,232)	4,835,439	627,001
Carbon Induced	(1,460,581)	(188,770)	(9,950)	(670)	1,450,631	188,100
Innu dividends			303,146	58,991	303,146	58,991
Total					**61,848,209**	**7,039,755**

Adjustments to Net Benefits to NL to 2067 Since DG3



Phase 1 – Muskrat Falls

Labrador-Island Transmission Link and Maritime Link

LABRADOR
Muskrat Falls
Churchill Falls
Gull Island
QUEBEC
NEWFOUNDLAND
St. John's
Soldiers Pond
Bottom Brook
Cape Ray
Atlantic Ocean
Cape Breton
P.E.I.
NEW BRUNSWICK
NOVA SCOTIA
Halifax
ME
ONTARIO
VT
NH
NY

Labrador – Island Transmission Link
Maritime Transmission Link
Existing AC Transmission Lines
AC Transmission — Muskrat Falls to Churchill Falls
Potential NS-NB Interconnect Upgrade
Subsea Component of Link

Muskrat Falls: Our Project, Our Benefits

> 14M hours
worked since start of construction

Approximately 5,400 people
working on the project at peak

589 women
from NL

4,552 NL residents
working on the project

85%
of project workforce

496 Aboriginal
NL residents

$975M invested
in NL business since start of project construction

$735M in estimated wages
to NL residents

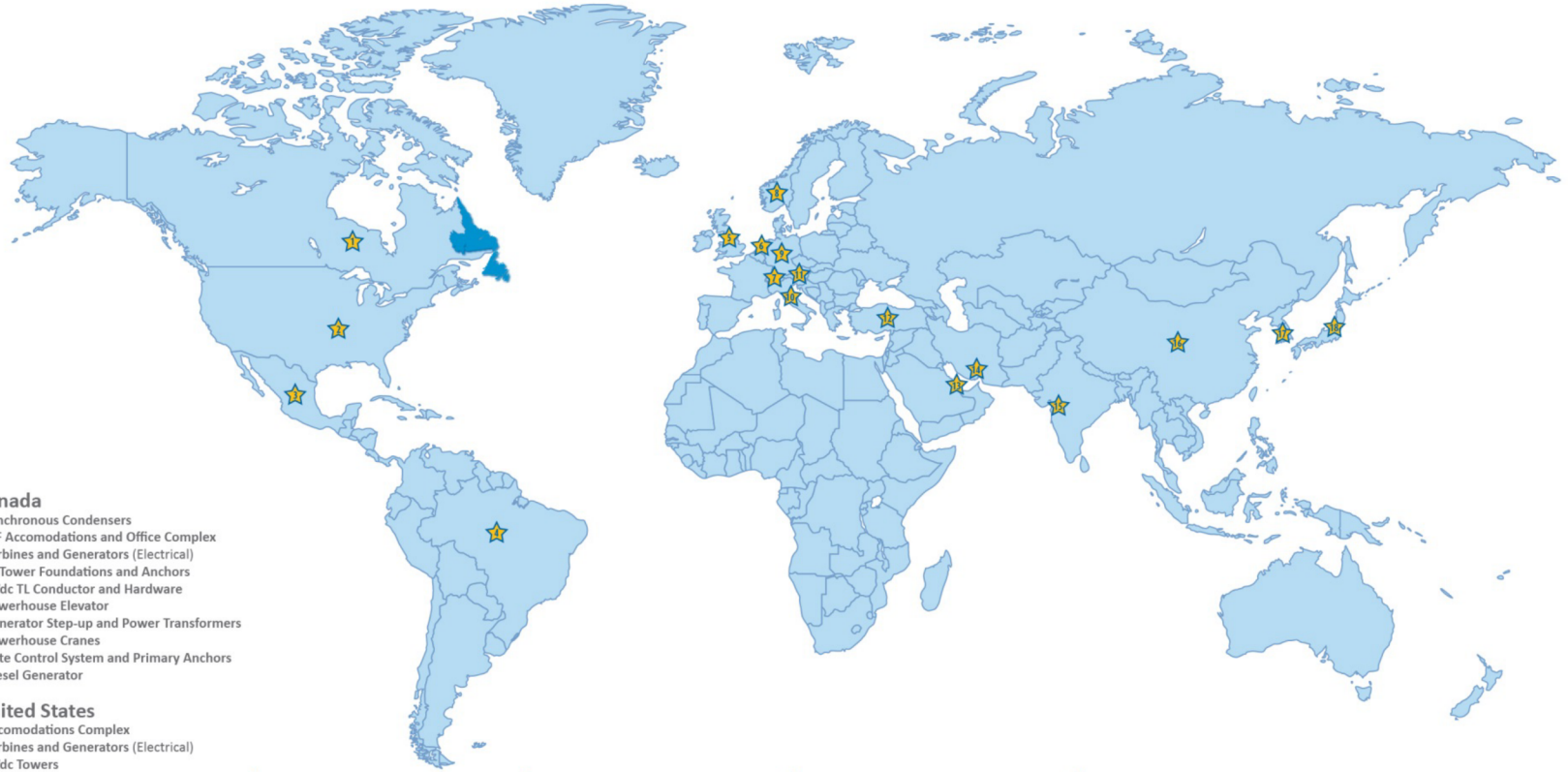
* *Figures above for September 2015 and project to date*

Project Success Factors Addressed

- Clear scope definition
- Front End Loading
- Integrated team
- Solid project plan
- Optimal delivery/contracting strategy including early de-risking and risk allocation
- Application of proven technology
- Strong owner team that includes functional expertise and offers continuity over the project
- Strong and effective project control during execution

Lower Churchill Project Global Reach

Locations around the world where components for the Muskrat Falls Project are being manufactured and fabricated



Canada
- Synchronous Condensers
- MF Accomodations and Office Complex
- Turbines and Generators (Electrical)
- TL Tower Foundations and Anchors
- HVdc TL Conductor and Hardware
- Powerhouse Elevator
- Generator Step-up and Power Transformers
- Powerhouse Cranes
- Gate Control System and Primary Anchors
- Diesel Generator

United States
- Accomodations Complex
- Turbines and Generators (Electrical)
- HVdc Towers
- Power Transformers

Mexico
- Construction Transformers

Brazil
- HDD Casing
- HVdc Converter Transformers

England
- Gas Insulated Switchgear
- HVdc Converter Transformers
- HVdc Thyristor Valves

Netherlands
- Rock Installation

Switzerland
- Generator Circuit Breakers

Norway
- Fibre Optics
- Cable Engineering

Germany
- Trash Rack Cleaning Machine

Italy
- TL Insulators
- Isolated Phase Bus

Austria
- HVac Tower Hardware
- Govern High Pressure Unit

Turkey
- HVac Towers

Bahrain
- HVac Conductors
- HVdc Electrode Conductors

United Arab Emirates (Dubai)
- HVdc Towers

India
- HVdc Towers
- Generator Rotor Poles

China
- Turbines and Generators (Mechanical)
- Optical Ground Wires
- Gates (major structural components)

Korea
- Synchronous Condenser (Flywheel/Shaft) Forging and Machining

Japan
- Marine Cables

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LOWER CHURCHILL PROJECT

2015 Progress and 2016 Look Ahead - Muskrat Falls Generation Site

Muskrat Falls Site

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Spillway Progress

November 2014
The spillway concrete works were at the stage when the base slabs were poured and the concrete piers were being started

November 2015
The spillway concrete works, transition dams and separation wall are complete. Astaldi have handed over to Andritz for the installation of the guides and gates

Separation Wall

November 2014
The separation wall had not been started

November 2015
The separation wall is complete

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Centre Transition Dam

November 2014
The centre transition dam base slab was poured and formwork was being erected

November 2015
The centre transition dam is complete

Powerhouse and Intakes

November 2014
The powerhouse and intake concrete works were just started Unit 1 and 2

November 2015
The powerhouse and intake base slabs are poured, the scroll case formwork is erected and concrete works proceeding on all units

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North Spur

November 2014
The North Spur stabilization contract not yet awarded and no work had started on stabilization

November 2015
The contract was awarded Q2 2015. The contractor has made good progress with the upstream cut-off wall complete and upstream slope stabilization well advanced; downstream slope stabilization is also well advanced

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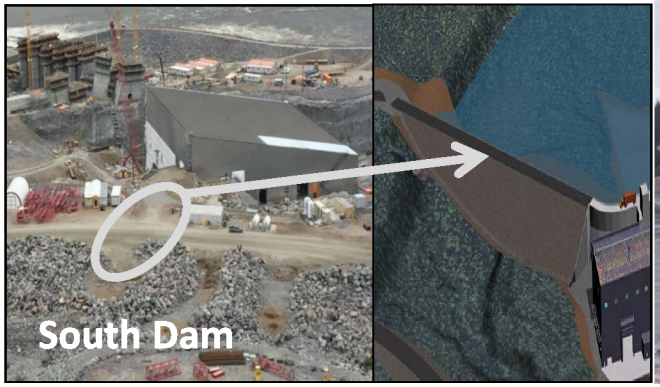
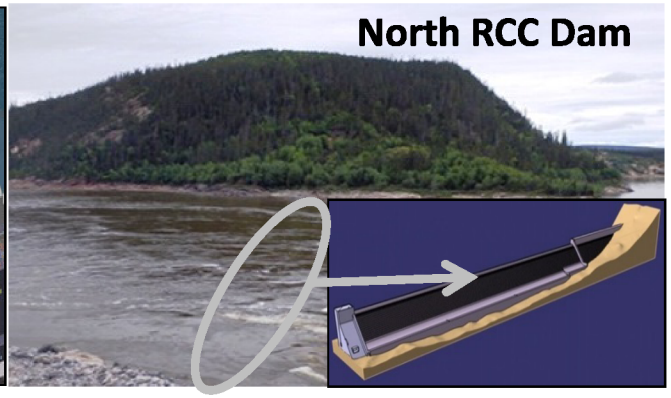
North and South Dams





November 2014
The basic design was complete. Contracts were out for bid but not awarded

November 2015
The contract for north and south dams was awarded Q3 2015, the cofferdam that will close and divert the river in 2016 has started and the cofferdam to protect the powerhouse intakes is also well advanced

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2016 Look Ahead

- Key targets
  - Substantial completion of spillway gates, guides and hoists to meet river diversion mid year
  - Close upstream cofferdam and river diversion mid 2016
  - Completion of North Spur stabilization work to allow impoundment to 25m by November
  - Impound reservoir to 25m
  - Powerhouse and intake concrete works on all units

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2016 Progress and 2016 Look Ahead - Transmission

Overview of Transmission Progress

Status as of November 2014

- 37% of 8859 hectares of right-of-way (ROW) cleared
- 14% of 4493 access roads installed
- 300 of 4493 foundations installed
- 355 of 4493 towers assembled
- 50 of 4493 towers erected
- 0 of 4493 structures strung

Status as of November 2015

- 70% of 8859 hectares ROW cleared
- 65% of tower access roads installed
- 1859 of 4493 foundations installed
- 2030 of 4493 towers assembled
- 1202 of 4493 towers erected
- 756 of 4493 structures strung

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2016 Look Ahead

- Muskrat Falls to Churchill Falls transmission lines complete
- Muskrat Falls to Forteau line substantially complete
- Shoal Cove to Soldiers Pond ROW cleared and access roads installed
- Shoal Cove to Soldiers Pond tower erection and line stringing over 30% complete

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2015 Progress and 2016 Look Ahead - SOBI

Cables in Japan and Labrador Sites


Cable factory in Japan


Final Sub sea cable manufactured


Land cable terminations at Forteau


Quarry and Quay near Forteau

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Overview of SOBI Progress

Status as of November 2014

- Horizontal Directional Drilling - 100%
- Cable type testing and manufacturing 53%
- Civil works 85%
- Land cable installation 0%
- Rock supply and Quay 47%

Status as of November 2015

- Horizontal Directional Drilling - 100%
- Cable type testing and manufacturing 100%
- Civil works 95%
- Land cable installation 83%
- Rock supply and Quay 100%

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2016 Look Ahead

- Transport cable to SOBI
- Install three sub sea cables
- Terminate and test installed cables
- Sub sea rock protection complete
- SOBI scope substantially complete

2015 Progress and 2016 Look Ahead - Switchyards and HVdc Facilities

Overview of Switchyards and HVdc Facilities

Status as of November 2014

- EPC contracts for switchyards, converters and synchronous condensers in progress
- Power transformer manufacturing started
- Site preparation complete at Muskrat Falls, Churchill Falls and Soldiers Pond, Forteau and Shoal Cove sites, civil works not started
- Grounding sites contract for island and Labrador not yet awarded

Status as of November 2015

- EPC contracts progressing with focus on civil design and major equipment manufacturing underway
- Power transformers received at Muskrat Falls(2) Churchill Falls (7) and Soldiers Pond (4)
- Civil works and building construction well advanced at Muskrat Falls, Churchill Falls and Soldiers Pond
- Work for grounding sites substantially complete for island and Labrador

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Switchyards and HVdc facilities

2014
Site preparation work was nearing completion at all sites

November 2015
Civil works well advanced at all sites and grounding stations substantially complete

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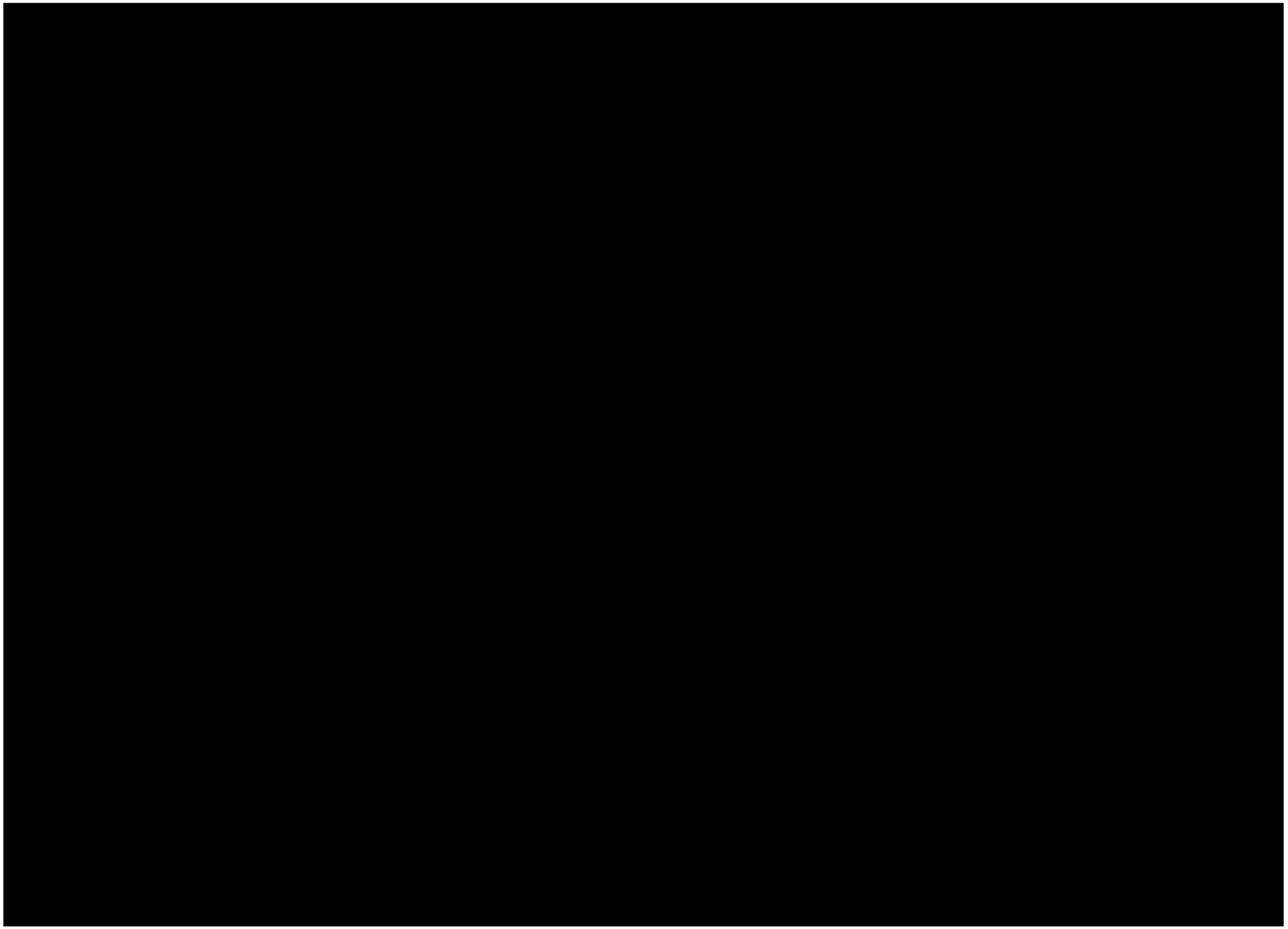
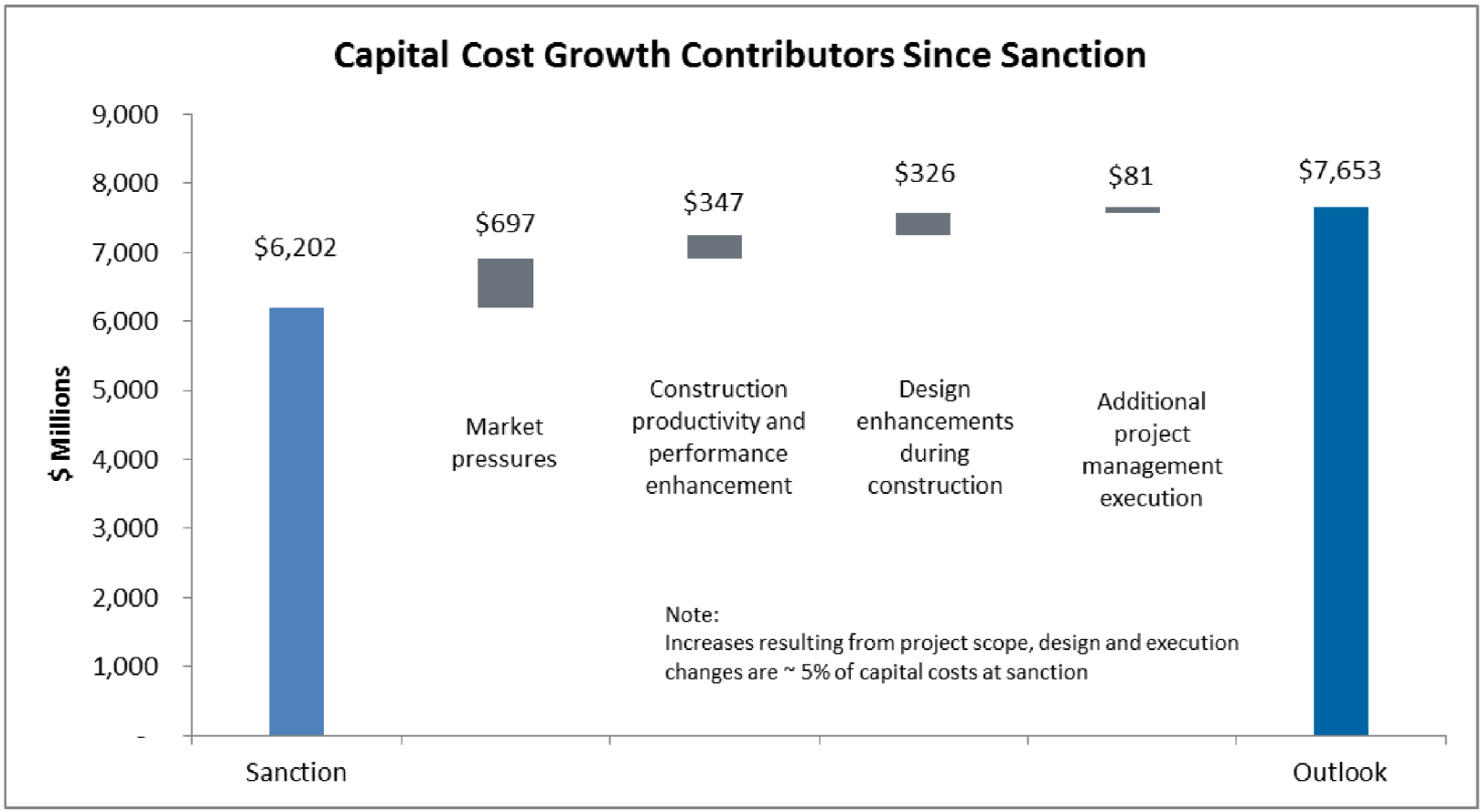
2016 Look Ahead

- Civil works and buildings nearing completion at all sites
- Synchronous condensers delivered
- Gas insulated switchgear, converter transformers and station equipment delivered to sites
- Equipment installation underway at all sites
- Factory Acceptance Testing of protection and control systems well advanced
- Substation completion of Soldiers Pond switchyard



Cost Growth Contributors Since Sanction



Project Cost Updates by Scope

Hebron In-Province Construction (Gross $MCAD)	Total Sanction Estimate (including contingency and allowances)	Hebron (Exxon) Forecast inc. Contingency Nov-15	Hebron (Exxon) % Over AFE with Contingency Inc.	Nalcor Forecast w/Contingency Nov-15	Nalcor Estimate % Over AFE inc. contingency
Modules/GBS	4207	5826	38%	5876	40%

Hebron Korean Topsides Construction (Gross $MCAD)	Total Sanction Estimate (including contingency and allowances)	Hebron (Exxon) Forecast inc. Contingency Nov-15	Hebron (Exxon) % Over AFE with Contingency Inc.	Nalcor Forecast w/Contingency Nov-15	Nalcor Estimate % Over AFE inc. contingency
UPM (incl bulks)	569	751	32%	759	33%
DES	41	86	110%	92	124%

Hebron Total Project Costs (Gross $MCAD)	Total Sanction Estimate (including contingency and allowances)	Hebron (Exxon) Forecast inc. Contingency Nov-15	Hebron (Exxon) % Over AFE with Contingency Inc.	Nalcor Forecast w/Contingency Nov-15	Nalcor Estimate % Over AFE inc. contingency
Total	10,624	12,774	20%	13,173	24%

White Rose Wellhead Platform Argentia (Gross $MCAD)	Total Sanction Estimate (including contingency and allowances)	Husky Forecast inc. Contingency May-15	Husky % Over AFE with Contingency Inc.	Nalcor Forecast w/Contingency Nov-15	Nalcor Estimate % Over AFE inc. contingency
Graving Dock Construction	71	101	42%	101	42%

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Remaining Key Project Risks

- With all key PO and Contract costs contracted there will be limited further Market Risk
- Risk exposure narrows and shift primarily to execution:
  - Labour Productivity of Time and Material type contracts
  - Key Contractor continued engagement
  - Key Contractor performance
  - Potential Claims
  - Union unrest – specifically RDTC
  - Aboriginal unrest
  - Remaining geotechnical risk - North Dam construction and HVdc line
  - 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
AC Line ~ $.4 B (MF-CF) • Clearing • Tower steel • Hardware • Construction DC Line~$1.4 B(MF-SP) • Clearing • Tower steel • Hardware • Construction SOBI – Subsea ~ $.3B • Subsea cable • Land drilling • Cable protection	Converter ~ $.5 B • Muskrat • Soldiers Switch yards ~$.4 B • Muskrat • Soldiers • Churchill Syncronous condenser ~$.2 B • Sync @ Soldiers • Electrodes • Telecoms	• EA • IBA • Engineer • Legal • Owners • Community • Etc.	Civil ~ $.8 B (10%) • Reservoir • North Spur • Bulk Excavation • Dams Electro Mechanical~ $.6B (8%) • Turbines & Generators • Gates • BOP Site Infrastructure & Services ~$.5 B (7%) • Camp and catering • Roads Astaldi • Mob, site ~ $.2 B (3%) • Spillway/transition dams ~ $.2 B (3%) • Powerhouse– non-labour~ $.2 B (3%) Astaldi • Powerhouse labour ~$.5 B (6+%)

RATE IMPACTS AND MITIGATION

Domestic Retail Rates and Bills Forecast (DG3 vs Current)

Domestic Rate (¢ per kWh)	2019	2022	2025
DG3 Rates	16.1	16.1	16.2
Domestic impact of LCP cost change (2014 vs DG3)	1.2	1.0	1.0
Domestic impact of LCP cost change (2015 vs 2014)	0.5	0.4	0.4
Restated Domestic Rates (LCP changes only)	17.8	17.5	17.6
Impact of Other Non-LCP changes	(0.9)	0.3	0.7
Sub-total	16.9	17.8	18.3
Tax changes since DG3 *	1.8	2.0	1.8
Current forecast rates	18.7	19.8	20.1

Average Monthly Island Interconnected Customer Bills (nominal $; 1517 kWh per month)	2019	2022	2025
DG3 Rates	244	244	246
Domestic impact of LCP cost change (2014 vs DG3)	19	16	15
Domestic impact of LCP cost change (2015 vs 2014)	8	7	6
Restated Domestic Bill (LCP changes only)	271	266	267
Impact of Other Non-LCP changes	(13)	5	10
Sub-total	258	271	277
Tax changes since DG3 *	26	29	28
Current forecast bills	284	300	305

*The Tax changes since DG3 include the elimination of the 8% Provincial Rebate effective July 1, 2015 and the proposed increase in HST from 13% to 15% effective January 1, 2016

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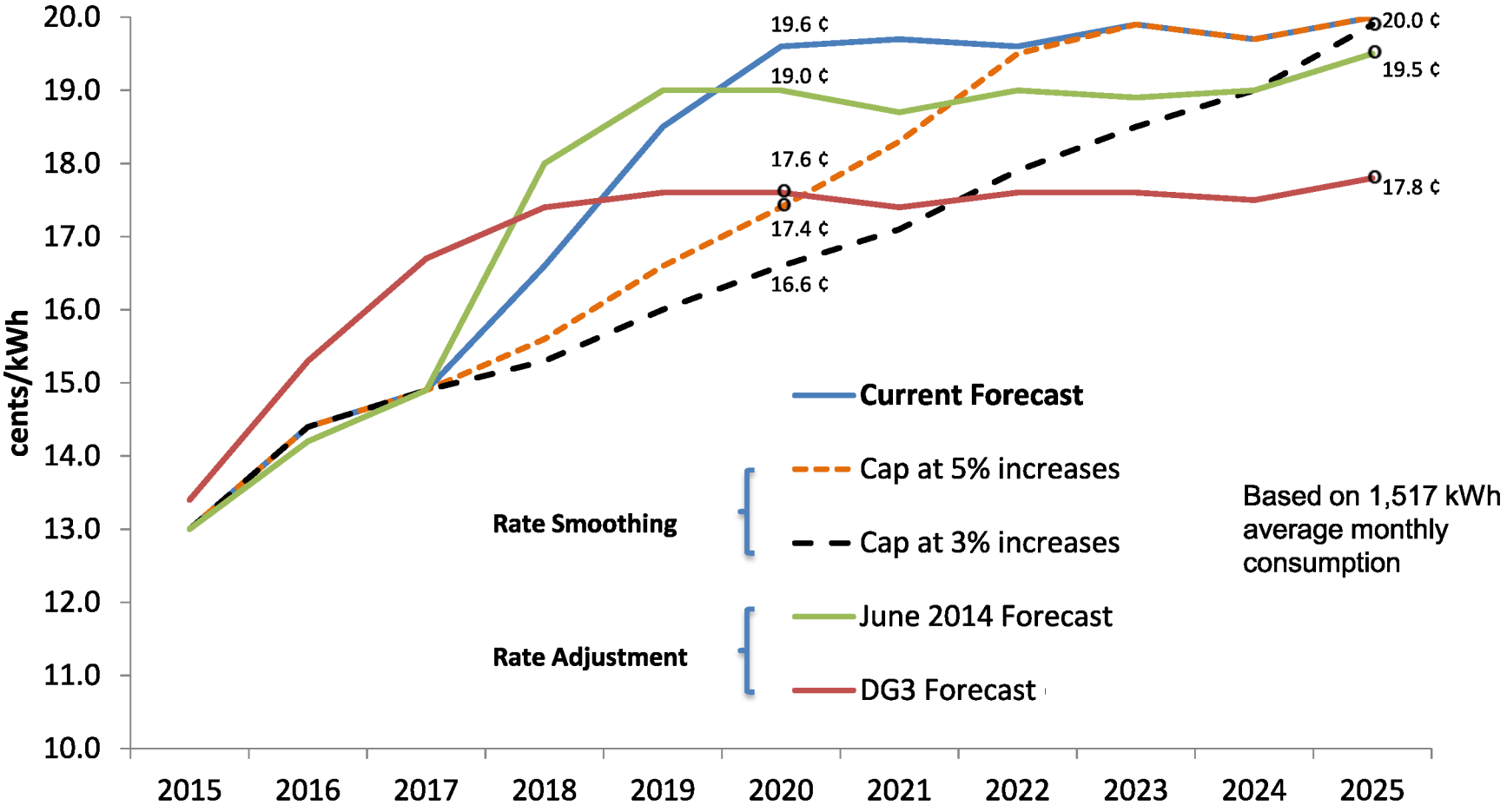
Rate Mitigation

- Rate Mitigation has two distinct elements, rate "smoothing" from now until in-service and rate "reduction" over the longer term.
- With over $60 billion in nominal benefits accruing from the project there is more than sufficient mitigation for a rate implementation plan
- There are a number of options available to implement rates with varying degrees of funding required from ratepayers and taxpayers
- Absent any rate mitigation measures, based on current projections, at in-service LCP will have a significant impact in 2018 and 2019 on rates (due to recent significant decrease in oil costs and increased capital)
- However, once upfront capital cost is incorporated into rate base, rates stabilize and actually decline on a "real" (adjusted for inflation) basis
- Other jurisdictions are experiencing the same type of infrastructure demands and have implemented rate mitigation programs – this has occurred in the past as well, including NL during 1977-83 period
- **A detailed regulatory plan would be required once the preferred rate implementation is developed and finalized**

Rate Subsidy

- Consider four options for a rate subsidy based on using future dividends projected to be available from Nalcor (there are other options)
  - Option 1: Cap retail rate increases at 5% per year until 2022.
  - Option 2: Cap retail rate increases at 3% per year until 2025.
  - Option 3: Set rate increases to equal those previously announced at DG3 in 2012.
  - Option 4: Set rate increases to equal those forecast in June 2014.
- Options 1&2 are rate smoothing (time limited) which provide for a transition period to reach projected MF rates. Options 3&4 are rate adjustments (project life) where rates are kept artificially low for the project life.
- Note, rate smoothing will mitigate risk of oil price volatility during as we move towards in-service

Rate Subsidy Examples - Impact



Sources of funding

- There are substantial sources of funding available, including:
  - Government's return on equity investment
  - Muskrat Falls export sales.
  - Upper Churchill recall export sales.
  - Muskrat Falls water power rental fees.
  - NL Hydro regulated dividends.
  - Upper Churchill water power rental royalty.
  - Upper Churchill preferred dividends.
  - Other non-electricity Nalcor free cash flow
- Rate smoothing may be preferred to rate adjustment as it is time and cost limited
- A rate subsidy will reduce planned future revenue to Government from Nalcor

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