MacLaren, Les MEM:EX

From: Cochrane, Marlene MEM:EX
Sent: August-01-13 4:28 PM
To: MacLaren, Les MEM:EX
Subject: FYI-BC Hydro Working Group Meetings

FYI – the dates for the meetings are below. I will send an invite to everyone once I have the boardroom number from BCH confirmed. Hydro knows the dates below as well. Thanks.

Marlene Cochrane
***Senior** Executive Assistant*
***Deputy** Minister's Office*
***Minister** of Energy and Mines*
***Phone** 250-952-0120*

From: Warren, Keira PREM:EX
Sent: Thursday, August 1, 2013 2:56 PM
To: Cochrane, Marlene MEM:EX
Cc: Freeman, Lisa FIN:EX
Subject: Re: BC Hydro Working Group Meetings

Perfect. Thank you!

Sent from my iPhone

On Aug 1, 2013, at 2:50 PM, "Cochrane, Marlene MEM:EX" <Marlene.Cochrane@gov.bc.ca> wrote:

> Hi Keira. I will book the following if the times work for you.
>
> August 23 - 10:00-1:00
> September 3 - 1:00-4:00
> September 12 - 1:00-4:00
> September 16 - 9:00-12:00
> September 17 - 9:00-12:00
> The meetings will take place at BCH: 333 Dunsmuir St. I will send an invitation with the floor number once the times are confirmed. Thanks very much.
>
> *Marlene Cochrane*
> ***Senior** Executive Assistant*
> ***Deputy** Minister's Office*
> ***Minister** of Energy and Mines*
> ***Phone** 250-952-0120*

MacLaren, Les MEM:EX

From:	MacLaren, Les MEM:EX
Sent:	August-07-13 8:51 AM
To:	Shepherd, Doug FIN:EX
Cc:	Wieringa, Paul MEM:EX
Subject:	FW: BC Hydro Working Group
Attachments:	workinggroupinformationsessionsFinalJuly31.docx

Hi Doug:

Here is the outline of the Working Group sessions. Session 2 on Capital is scheduled for Sept 3 from 1-4 pm at BC Hydro's offices. We should discuss whether you and/or Doug should join Peter at these sessions. If we are going to bring in an outside party, we might want them at the Sept 3 meeting as well.

Dates are:

August 23 - 10:00-1:00
September 3 - 1:00-4:00
September 12 - 1:00-4:00
September 16 - 9:00-12:00
September 17 - 9:00-12:00

The meetings will take place at BCH: 333 Dunsmuir St.

Les

From: MacLaren, Les MEM:EX
Sent: Wednesday, July 31, 2013 3:35 PM
To: Nikolejsin, Dave MEM:EX
Cc: Wieringa, Paul MEM:EX; Cochrane, Marlene MEM:EX
Subject: BC Hydro Working Group

Hi Dave:

Attached is a re-draft of the Working Group Process outline that incorporates comments from John D and the BCH Executive. Each BCH senior business process owner and in some cases Executives, are listed for each session. BCH has proposed that Charles and Cheryl be on the Working Group, which I think is OK. Let me know if you would like further changes.

We now have 5 sessions starting the week of August 19, with 2 sessions in each of the weeks of September 2 and 16. The week of September 9 BCH Board and Committee meetings. September 16 is UBCM week so earlier in that week is better (say Monday and Tuesday mornings), and we are trying to set up a session on LNG with the Clean Energy Association for the afternoon of the 16th as many DMs will be in Vancouver that week.

Intention is for BC Hydro to host at their Dunsmuir offices, which will allow easy access for the senior staff who will be available to hash things over with the Working Group.

Marlene, Dawn Teasdale in Charles Reid's office will coordinate scheduling on their side, so you can contact her to start setting aside dates.

Les

MacLaren, Les MEM:EX

From: Taylor, Annette <annette.taylor@bchydro.com> on behalf of Yaremko, Cheryl <Cheryl.Yaremko@bchydro.com>
Sent: August-16-13 3:30 PM
To: MacLaren, Les MEM:EX; Cochrane, Marlene MEM:EX; Nikolejsin, Dave MEM:EX
Subject: Rates Working Group, Session 1 documents for August 23
Attachments: Rates Working Group, Session 1, Information Notes.pdf

Please see attached the materials for the Working Group #1 session taking place on Friday August 23. Please forward to the government working group #1 attendees.
Thanks

Cheryl Yaremko
Exec. VP, Finance and Chief Financial Officer

BC Hydro
333 Dunsmuir, 18th Floor
Vancouver, B.C. V6B 5R3

Office: 604.623.4110
Fax: 604.623.4155
Email: cheryl.yaremko@bchydro.com

bchydro.com

BC Hydro Overview

For over 50 years BC Hydro has successfully planned, built and operated the electricity system that serves a large majority of British Columbians and helps drive B.C.'s economic prosperity. BC Hydro serves 1.9 million customers with clean, reliable hydroelectric power. Its generating assets in combination with the transmission and distribution systems are valuable, strategic, publicly-owned assets operated for the benefit of the province.

Much of the BC Hydro system was built during the 1960s, 1970s and 1980s. Like all electrical and mechanical systems, this one has reached the point where large investments are required to ensure it runs reliably and safely for both current customers and future generations of British Columbians.

The BC Hydro System

There are several key characteristics about the BC Hydro system that at once make it both highly valuable and challenging to operate. The majority of demand for electricity in B.C. is concentrated in the extreme southwest of the province, specifically the Lower Mainland, Fraser Valley and Vancouver Island. Yet a sizable majority of supply is generated in plants located in the Peace and Columbia River Basins. Interconnecting the supply from these regions to the demand (called "load") centre is one of the key operating challenges facing the company because reliable service depends upon a relatively small number of high voltage transmission corridors that must move energy across long distances while covering some of North America's most challenging terrain.

Planning the BC Hydro System

BC Hydro's long-term planning is strongly influenced by the direction provided by Government. Over the last decade, the Province has issued Energy Plans in 2002, 2007 and 2010 which have framed BC Hydro's planning options and constraints.

The company develops long term plans known today as the Integrated Resource Plan (IRP). The current IRP was filed with government on August 2, 2013 and is scheduled for public release later in August. In the IRP, BC Hydro proposes to meet future growth in electricity demand through energy conservation, clean electricity generation and careful management of current supply resources.

As part of the IRP process, BC Hydro carefully forecasts its long-term demand obligations, market prices, water availability and potential resources to determine what its customers require over a 20-year period. It then develops a view of how best to meet those needs after considering what resources are most suitable for the system given the policy framework.

While the timing of BC Hydro's energy and capacity deficit has some uncertainties associated with it, the long-term trend is clear – demand for electricity is growing. BC

Hydro's current forecast shows that the demand for electricity is expected to increase by approximately 45 per cent over the next 20 years.

Demand for Electricity in B.C.
BC Hydro's customers fall into three broad sectors – residential, commercial and industrial. Each sector makes up about one third of demand on the system.

The residential sector contains the majority of customers numerically. Residential electricity use is expected to increase by 50 per cent over the next 20 years, as B.C.'s population grows from approximately 4.4 million to 5.7 million and as people increase the use of technology within their homes.

The commercial sector covers small businesses, small industry, and large institutions such as universities, hospitals, and shopping malls. As B.C.'s economy grows, so too does this sector.

The industrial sector currently makes up the largest proportion of demand on the system (38 per cent) yet represents only a small number of customers. Historically B.C. has used low electricity rates to attract industrial investment to the province. Electricity is a key operating cost for these companies and they have an interest in maintaining both their low rate position among the three sectors and BC Hydro's standing as a low cost jurisdiction.

s.21 s.21

Economic growth and development potential are driving up demand from the industrial sector, especially in the North with LNG, shale gas and mining developments.

Investment in BC Hydro's System
BC Hydro is refurbishing its aging electricity system, while working to meet future load growth and investing in capacity. This is one of the largest expansions of electrical infrastructure in B.C.'s history.

After 40 to 50 years of operation, many of the major components on the system in generation, transmission and distribution have reached or are nearing end of life and must be replaced in order to maintain reliability for customers, as well as address safety and environmental concerns.

The province is also experiencing a potentially large increase in industrial growth that it has not seen in decades. As a result new growth-related enhancements are required to both strengthen the system and reach into unconnected areas. New high voltage transmission lines are now under construction, something not seen in over 20 years. There are also major generation projects underway such as John Hart on Vancouver Island, Mica in the Columbia Basin and the GM Shrum (Peace) and Ruskin (Lower Mainland) generating stations. As well, planning is underway for the Site C clean energy project, which would help meet British Columbia's energy and capacity needs well into the future.

Emerging innovations in technology are also changing the nature of the industry and how electricity is managed, as demonstrated by Smart Meters and grid modernization.

These and other upgrades all necessitate continued investment. Over the next two fiscal years, BC Hydro will continue to make significant investments in critical system upgrades. Many utilities are facing the same pressures to replace and modernize considerable portions of their systems with the accompanying cost pressures.

Cost of Energy
BC Hydro rates are among the lowest in North America, in part because of the legacy of the hydroelectric facilities that produce low cost power.

New sources of supply are now coming onto the system. Much of this supply was acquired in a series of call processes for power from the private sector. Projects that were awarded long term contracts to sell energy to BC Hydro will come on line in the next two years, largely, and impact rates at that point. This supply meets over 20 per cent of domestic load.

Electricity Rates and Regulation
The British Columbia Utilities Commission (BCUC) is BC Hydro's independent regulator. BC Hydro files a revenue requirement application with the BCUC to recover operating and capital costs so it can conduct business on behalf of its customers. The next filing is scheduled for February 2014 for recovery of rates in the F2015-F2016 period.

Of considerable concern for customers and the public over the next number of revenue requirement applications will be the size of the rate increases that are required to reinvest in the system. As a result of ongoing cost reduction efforts and of the 2011 Government Review, BC Hydro will achieve savings of over $390 million in operating costs during F2012-F2014. BC Hydro also rescheduled $800 million in capital expenditures to future periods to reduce rates in the same period.

Our current focus is to complete the recommendations of the Government Review and come in on plan for both operating costs and net income in F2014. This is proving to be very challenging as we work to offset numerous cost pressures. To deal with these challenges, we have undertaken another cost review and restraint program including additional organization structure adjustments (i.e. headcount), hiring and salary freezes, as per Government direction, and project reduction, deferral or eliminations.

As BC Hydro plans its F2015-F2016 period, we look forward to working collaboratively with our Shareholder to discuss the issues driving rate increases and to arrive at shared solutions across a range of options including government policy, capital risk and other costs which address the shifting electricity landscape.

BC Hydro Information Note

F15-F16 Rate Forecast and Drivers

This information note provides an outlook of the required rate increases for F15-F16, discusses the drivers of the rate increases and also provides a longer term rate outlook.

F15-F16 Rate Forecast

- BC Hydro's revenue requirement is projected to increase from approximately $3.8 billion in F14 to $4.8 billion in F16.

- The increase in the revenue requirement results in projected cumulative rate increases of 26.4% for the F15-F16 period (19.2% increase in F15 and 6.0% increase in F16).

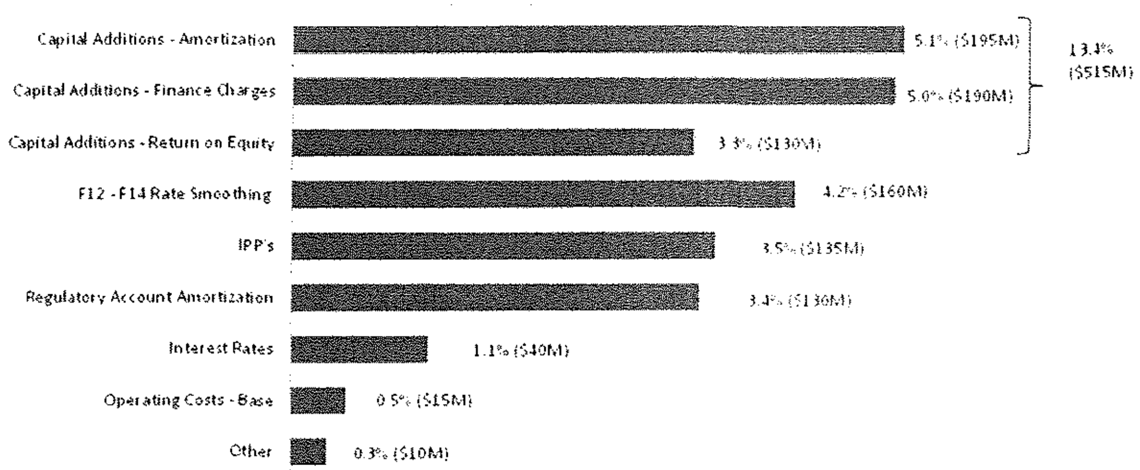
- Most of the cost increases in F15-F16 are fixed and committed and include increases related to capital additions, IPP commitments, rate smoothing from the F12-F14 Amended Revenue Requirements Application (ARRA), and financing costs on existing debt.

Rate Pressures

- Approximately 42% of the projected rate increase relates to growth related items (growth related capital expenditures and IPP purchases for load growth).

- The chart below shows the contribution of cost items to the forecast cumulative rate increase for the F15-F16 period. The amounts shown in brackets in the chart represent the cost increases from F14 to F16 for the related cost item.

Contribution to Projected Cumulative F15-F16 Rate Increase of 26.4%



Note: Other mainly includes changes in domestic load and surplus sales.

Capital Additions

- Capital additions refer to when the related asset is placed into service. Capital expenditures do not, on their own, impact BC Hydro's revenue requirements and rates because costs such as amortization, return on equity, and finance charges, are not recorded until the related asset is placed into service.

- Capital additions account for approximately 50 per cent of the rate increase forecast for F15-F16. Capital additions impact rate increases through increased amortization, finance charges, and ROE.

- Capital additions in F15-F16 are forecast to total $5.4 billion with approximately 60% of the additions relating to growth projects. Approximately $400 million in capital additions equates to a 1 per cent rate increase.

- In an effort to mitigate rate increases over the F12-F14 period, BC Hydro deferred approximately $800 million in capital additions. These additions will now come into service in the F15-F16 period, leading to an increase in related amortization, return on equity and finance charges.

- A majority of the projects coming into service in F15-F16 are already planned or underway.

- Each time an asset is put into service, it is added to the rate base which then increases ROE. That is, a $100 million capital addition would increase the allowed ROE (net income) by $3.5 million.

- The significant projects that will come into service during F15-F16, totalling $2.9 billion, include:

    - the Northwest Transmission Line (NTL - $746 million)
    - the Interior to Lower Mainland Project (ILM - $725 million)
    - Dawson Creek/Chetwynd Area Transmission (DCAT - $255 million)
    - Iskut Extension ($180 million)
    - Mica – Unit 5 and Unit 6 ($714 million)
    - GMS turbine rehabilitation ($272 million)

F12-F14 Rate Smoothing

- BC Hydro's original F12-F14 Revenue Requirements Application sought rate increases of 9.73 per cent per year. BC Hydro filed an Amended RRA after the 2011 Government Review, seeking rate increases of 8 per cent, 3.91 per cent, and 1.44 per cent for F12, F13 and F14 respectively.

- The reduction in revenue requirement to achieve the revised rate increases is outlined in the table below:

$millions	
Operating costs (note 1)	170
Reduction in interest rate forecasts	160
Increase in forecast of trade income	135
Increase in forecast misc. & intersegment revenue	65
Lower DSM expenditures	25
Lower forecast taxes & other	25
Reductions in capital additions	115
Impact to regulatory accounts:	
Change to DSM amortization period	100
Refund of credit balances	25
Total	820

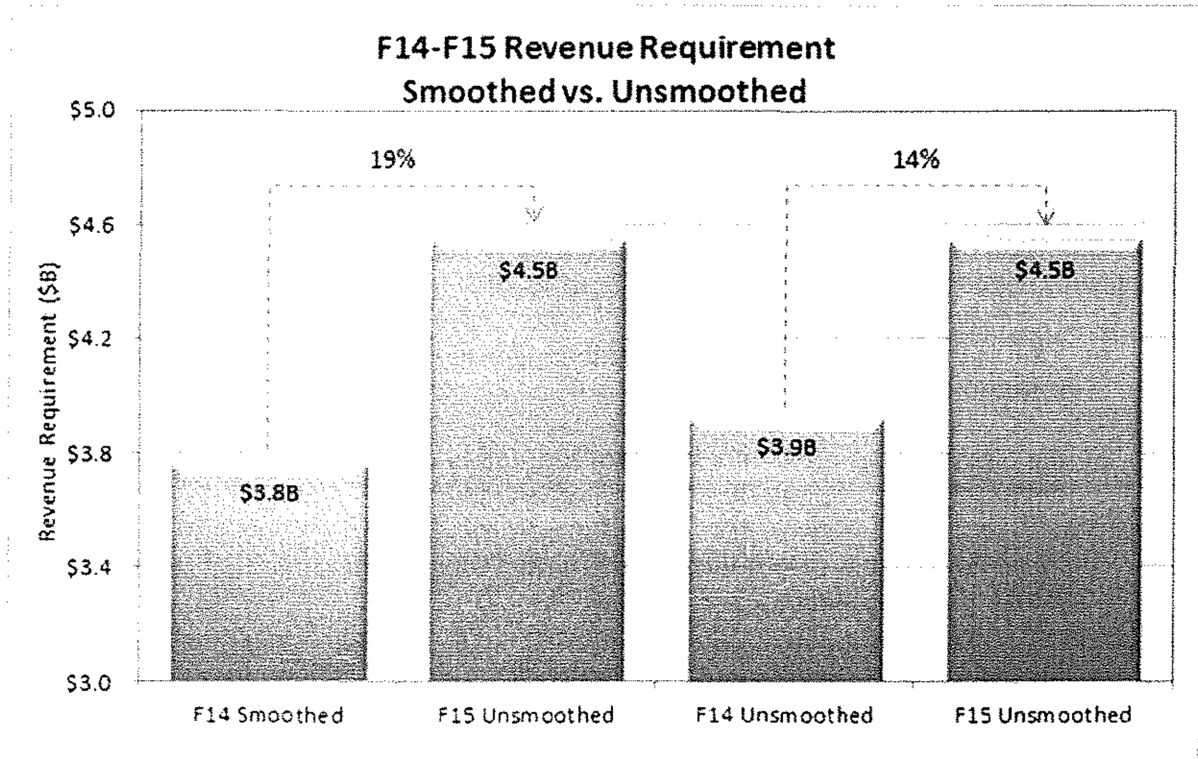
Note 1: $221 million of operating cost reductions were built into the original F12-F14 RRA, an incremental $170 million were identified through the Govt Review, for a total savings of $391 million

- The rate smoothing mechanisms lowered the revenue requirements in F12-F14 by deferring costs for recovery in future periods. As a result the revenue requirement in F14 was lower than it otherwise would have been in the absence of the rate smoothing. As the rate increase is determined by the year over year change in the revenue requirements, the lowering of the revenue requirement in F14 results in a higher rate increase in F15 as similar rate smoothing is not undertaken in F15.

- Also included in the rate smoothing amount is the deferral of the increase in net energy costs between BC Hydro's Amended RRA and its original application of approximately $50 million. In order to keep rates low in the F12-F14 period, the increase in net energy costs, due largely to increased load and revised generation outage schedules, was deferred for recovery in rates in future periods.

- The chart below shows that in the absence of the rate smoothing the F14 revenue requirement would have been approximately $160 million higher and the forecast rate increase for F15 would have be approximately 14% compared to the current forecast of 19%[1].

[1] This chart is provided for illustrative purposes to indicate the impact of rate smoothing on subsequent revenue requirement test periods. Actual impacts may vary depending on other factors.



IPP energy purchases

- Energy purchase agreements were entered into with IPPs to meet forecast demand. Energy deliveries from existing IPP contracts are forecast to reach approximately $1.3 billion on volumes of approximately 14,000 GWh in F16, an increase from $1.1 billion on volumes of 13,600 GWh forecast for F14 in the Amended RRA.

- IPP energy deliveries are expected to meet approximately 22 per cent of domestic load in F16 compared to 10 per cent in F07.

- There are approximately 130 existing IPP contracts with a significant portion already on-line or coming on-line by F17. There are no new significant power calls for IPP energy contemplated in the near term (new IPP contracts will be limited to Standing Offer Program and other small volume projects).

Regulatory Account Amortization

- BC Hydro defers certain costs and expenditures in regulatory accounts in order to match expenditures to customer benefits and to mitigate rate increases.

- Regulatory account amortization (recovery of previously deferred expenditures) makes up approximately 13 per cent of the rate increase forecast for F15-F16. Approximately $525 million recovered in the F15 revenue requirement will be applied against regulatory accounts.

- BC Hydro has prepared a draft Regulatory Account Report to be filed with its next RRA which proposes to continue to use a principle-based approach to recover these amounts, and to use a separate regulatory account, if required, to smooth rate increases.

- The recovery of $3.5 billion of regulatory account balances is already factored into current rates. However, the increase in regulatory account amortization in F15-F16 primarily relates to the start of recovery in rates of:

    - First Nation settlement and negotiation liabilities related to large settlements entered into in prior years

    - the Smart Metering & Infrastructure regulatory account, as the project will be substantially complete by F15

    - the recovery of a settlement payment relating to a contaminated property (Rock Bay Remediation)

    - the recovery of balances related to the mandatory transition to International Financial Reporting Standards

The recovery of these amounts is over various periods depending largely on benefit matching.

<u>Interest rates</u>

- BC Hydro uses forecast interest rates provided by Treasury Board Staff for forecasting purposes.

- Interest rates over the forecast period continue to be at historic low levels.

- It is estimated that a 1 per cent (100 basis point) change in short-term interest rates would change debt-related charges by approximately $60 million (1.5 per cent rate impact).

- BC Hydro's debt portfolio is currently composed of approximately 24 per cent variable rate debt and approximately 76 per cent fixed rate debt. BC Hydro will be considering a change to the mix of its debt portfolio to take advantage of the historic low interest rates on longer term debt.

Long-term Rate Forecast

BC Hydro's current long-term rate increase forecast for the F17 to F24 period together with forecast debt balances and contributions to the Government Fiscal Plan are shown on the table below. The long-term rate increase forecast excludes any rate mitigation decisions and is based on a set of assumptions that could change in the future. Therefore this information should be used for directional purposes only.

	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24
Rate Increase	19.2%	6.0%	8.4%	1.7%	2.8%	3.4%	2.1%	1.9%	7.7%	4.1%
Annual Capital Expenditure [1]	$ 2,800	$ 3,040	$ 3,520	$ 3,030	$ 3,060	$ 2,940	$ 2,600	$ 2,430	$ 1,800	$ 1,600
Capital Asset Amortization	$ 690	$ 760	$ 800	$ 940	$ 980	$ 1,020	$ 1,050	$ 1,070	$ 1,140	$ 1,240
Total Debt	$ 17,460	$ 19,060	$ 21,260	$ 22,460	$ 24,060	$ 25,400	$ 26,430	$ 27,400	$ 27,520	$ 27,390
Total Regulatory Accounts [2]	$ 4,770	$ 4,630	$ 4,530	$ 4,490	$ 4,510	$ 4,490	$ 4,460	$ 4,430	$ 4,340	$ 4,250
Contributions to Fiscal Plan										
Net Income	$ 610	$ 680	$ 730	$ 790	$ 850	$ 880	$ 910	$ 930	$ 1,040	$ 1,190
Water Rentals	$ 400	$ 400	$ 410	$ 430	$ 440	$ 450	$ 460	$ 480	$ 510	$ 530
Property Taxes	$ 210	$ 220	$ 230	$ 250	$ 260	$ 270	$ 280	$ 290	$ 300	$ 300
	$ 1,220	$ 1,300	$ 1,370	$ 1,470	$ 1,550	$ 1,600	$ 1,650	$ 1,700	$ 1,850	$ 2,020
Dividend (accrued)	$ 170	$ 280	$ 180	$ 500	$ 450	$ 550	$ 660	$ 690	$ 880	$ 1,010

Notes:

1. Includes Site C expenditures. Site C expected to be in service in F23.
2. By F24, $4 billion of regulatory account balances will be in 5 accounts that are benefit matching (DSM, Site C, SMI) or relate to transition to IFRS (IFRS PP&E and IFRS Pension).

- Rate increases appear to stabilize over the F18 to F22 period due mainly to the following:
  - Load continues to increase with annual increases averaging 1 per cent over this period (before expected LNG load).
  - The cost of sources of supply begins to flatten out as a significant portion of contracted IPP purchases come on-line by F17.
  - Capital additions remain stable over this period and average approximately $2 billion per year before the addition of Site C (projected to come in-service in F23).
  - The rate increase in F23 is largely due to the addition of Site C, which is forecast to come in-service that year.
  - Interest rates are assumed to remain at F17 levels throughout the forecast period.
  - The revenue requirement continues to increase, so that it takes approximately $40 million for a 1 per cent rate increase in F15, and approximately $75 million for a 1 per cent rate increase by F24.

BC Hydro Information Note

Revenue Requirements Application (RRA)

This information note provides an overview of the development of the RRA, its contents and how the rate increase is determined.

Overview

- BC Hydro's rates are set until the end of Fiscal 2014 (March 31, 2014). BC Hydro is required to file an RRA with the BCUC for the approval of the rates effective at the start of Fiscal 2015 (April 1, 2014).
- BC Hydro plans to file its F15-F16 RRA on February 21, 2014.
- BC Hydro's RRA is drafted on a forecast basis and is a request for approval to the BCUC for recovery in rates of the costs that are forecast for each of F15 and F16.
- BC Hydro is only able to charge its customers rates that have been approved by the BCUC.

Timing of the Filing and Review

- For F15 rates BC Hydro is required under BCUC guidelines to file an RRA with the BCUC a minimum of 30 days prior to the requested effective date of the new rates (in this case by March 1, 2014). BC Hydro is targeting a filing date of February 21, 2014.
- The RRA is likely to be reviewed through a public oral hearing process in the fall of 2014. It is then expected that the BCUC would issue its decision in early calendar year 2015.
- The development and drafting of the F15-F16 RRA has begun and the application is scheduled to be substantially drafted by the end of calendar 2013.

s.13, s.17

Determination of General Rates

- The attached pie chart (Figure 1) on page 4 shows the composition of the F16 revenue requirements and represents the costs totalling $4.8 billion that BC Hydro is requesting to recover in rates[1].

- The RRA forecast is based on BC Hydro's load forecast (see separate information note), which is used to develop a projection of BC Hydro's forecasted revenues.

- The forecasted costs are then compared to the revenues to be recovered at the existing rates based on the load forecast, and the difference between the two is the amount that is required to be funded by a rate increase.

- As the RRA revenues and costs are forecasts only, actual results will be different. Some of the forecasted differences (such as the cost of energy) are captured in regulatory accounts for later recovery from customers. Those differences not captured in regulatory accounts will be to the account of the shareholder in the form of a reduction or increase in the forecasted net income of BC Hydro.

<u>Components of the RRA</u>

- The components of the RRA are: forecasts of base operating costs (14%); amortization of capital assets (15%); finance charges (16%); contributions to Government (27%); and IPP purchases (27%). Contributions to Government are comprised of the allowed net income, water rentals and property taxes.

- The RRA provides information regarding BC Hydro's Regulatory Accounts and the amortization (recovery) of those accounts.

BC Hydro's Return on Equity (ROE)

- Payments to the province amount to 27% of the revenue requirement, and are composed primarily of the Return on Equity (ROE), water rentals and property taxes.

    - Water rentals and property taxes are set by Government and regional authorities.

    - The allowed ROE is set by way of a mechanism included in Heritage Special Direction No. HC2 (HC2)

- Under HC2, the annual ROE is equal to the pre-income tax annual rate of return allowed by the BCUC to the most comparable investor-owned low-risk utility regulated under the Utilities Commission Act (determined to be FortisBC Inc). The allowed ROE for F14 is 11.84%.

[1] The F2016 revenue requirements is illustrative of the total revenue requirements for the F15-F16 test period.

- In February 2012 the BCUC initiated a Generic Cost of Capital (GCOC) proceeding in order to review the setting of an appropriate rate of return for a benchmark low-risk utility. The BCUC issued its decision on the GCOC in May 2013 and determined that the annual rate of return for the benchmark low-risk utility should be reduced from 9.5% to 8.75%, which would result in a corresponding decrease in the allowed ROE for BC Hydro from 11.84% to 10.62%. Special Direction 3 directed the BCUC to require BC Hydro to defer the difference in F14 of BC Hydro's assumed ROE (11.84%) and the GCOC ROE decision (10.62%).

- Government has requested that BC Hydro continue to keep its ROE at 11.84% in order to contribute to ongoing balanced budgets. For F14 this will be accomplished through the issuing to the BCUC of a Direction from Government reversing the deferral in F14 and for F15 and F16 this will be accomplished through the issuing to the BCUC of a Direction from Government requiring that BC Hydro's ROE be set at the higher amount of 11.84% for both F15 and F16.

- BC Hydro's allowed net income is calculated by multiplying its allowed ROE per cent by its deemed equity (essentially 30% of its assets in service).

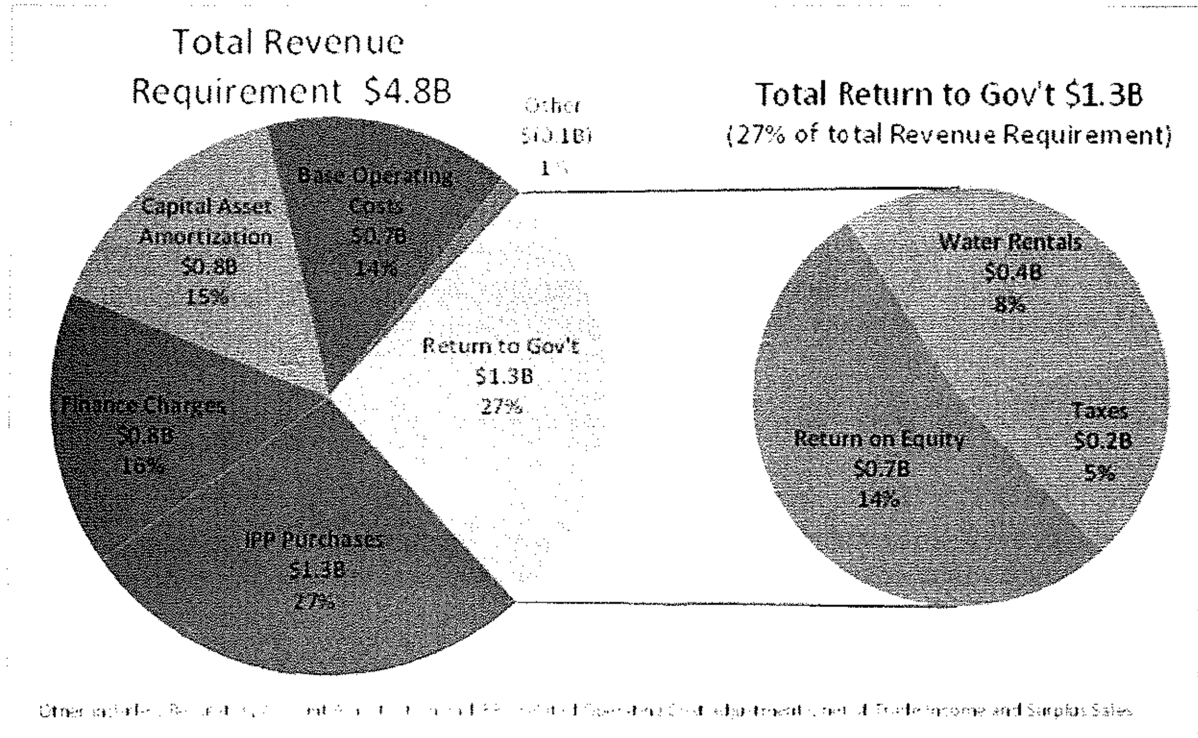
BC Hydro's Dividend

- Under Heritage Special Directive No. 1, BC Hydro is required to make an annual payment to the Province equal to 85% of the utility's net income for the most recent fiscal year.

- The dividend payment is reduced if the debt to equity ratio after deducting the dividend is greater than 80:20. In that case, the dividend would be the greatest amount that could be paid without causing the debt to equity ratio to exceed 80:20.

- The dividend paid for F13 was $215 million, which is less than 85% of BC Hydro's net income due to the 80:20 debt to equity cap.

Figure 1: Components of BC Hydro's F16 RRA.



BC Hydro Information Note

Role of the BCUC and Revenue Requirements Application Process

---

BC Hydro is regulated by the British Columbia Utilities Commission (BCUC) under the Utilities Commission Act.

BC Hydro plans to file its F15-F16 Revenue Requirements Application (RRA) on February 21, 2013. This note provides an overview of the process followed by the BCUC in reviewing the application, and the role of the BCUC.

Role of the BCUC

- Setting utility rates - BC Hydro is only able to charge rates that are approved by the BCUC.
- Cost Recovery - The BCUC reviews the costs forecasted by BC Hydro and determines which costs are prudent and permitted to be recovered in BC Hydro rates.
- Review of Regulatory Accounts - The BCUC has a role in establishing new regulatory accounts, closing existing ones, and determining amortization periods of the accounts that continue (subject to any applicable directions to the BCUC from Government).
- Review/direction regarding BC Hydro's forecasts - The BCUC reviews BC Hydro's forecasts including its load forecast, revenue forecasts, and interest rate forecasts and can direct BC Hydro on how the forecasting methodologies can be improved.
- Review of BC Hydro's priorities and methodologies - The BCUC provides its views on areas of concern, can direct BC Hydro to produce reports or studies on matters of interest to it, and can direct BC Hydro on the manner of providing service. In particular, the BCUC would likely review and consider the relative priorities that BC Hydro has placed on its various policy and strategic objectives, provide opinion on the resources being allocated to each, and could direct BC Hydro regarding to their relative allocation on a go-forward basis.

Process for Review of F15-F16 RRA

- The BCUC will determine the process to be followed in the public review of BC Hydro's RRA.
- The review of the upcoming RRA is likely to be through an oral hearing process in the fall of 2014, resulting in a decision in late winter 2015.
- The last oral hearing was in the fall of 2008 when the F09-F10 RRA was reviewed.

- If an oral hearing is ordered by the BCUC, the process to be undertaken will be as follows:
  - BC Hydro will file its application on February 21, 2014.
  - The BCUC will likely order two rounds of Information Requests (IRs) on the application. During this phase of the review, BC Hydro is required to answer IRs from BCUC staff and interveners regarding the application.
  - BC Hydro will file an evidentiary update in late June/early July 2014. The evidentiary update includes actual F14 results and updated energy and load forecasts.
  - A third round of IRs will take place on the evidentiary update.
  - In fall 2014 a public oral hearing will take place.

- The oral hearing will take place as follows:
  - The BCUC will appoint a three person Commission Panel (the Panel) to review the application and write the BCUC's decision.
  - Senior BC Hydro representatives from each Business Group will be witnesses in the oral hearing. BC Hydro's witnesses are required to testify to their relevant evidence under oath and are subject to cross examination by BCUC staff and interveners. The oral hearing will likely take three to four weeks in October/November 2014.
  - A close of argument phase takes another eight to ten weeks after the oral hearing.
  - The Panel will issue its written decision approximately two months after the close of the hearing, which would be late February/early March 2015.

Benefits to a BCUC Hearing Process

- BCUC institutional knowledge
  - Institutional knowledge is a pre-condition to effective regulation. RRA hearings help develop and maintain BCUC knowledge on BC Hydro.
  - BC Hydro has not been subject to a full BCUC RRA review since 2008, so current understanding within the BCUC of BC Hydro's challenges and opportunities is likely low.
  - The F15-F16 RRA will likely be very thorough in terms of the number of IRs and enquiries. However, it will help set the stage for more regular and frequent RRA reviews in future years.

- Intervener Outlet - The RRA proceeding is a forum for interveners and customers to air grievances in front of BC Hydro's regulator.

- Opportunity for BC Hydro to socialize ideas - BC Hydro can use the RRA proceedings, including IRs and the oral hearing, to make the BCUC and interveners aware of new policies and initiatives and to garner their feedback.

BC Hydro Information Note

Comparison of Customer Bills

Overview

BC Hydro participates in the annual Hydro Quebec study "Comparison of Electricity Prices in Major North American Cities' and uses its ranking in three representative customer classes and usage levels to assess performance against the company's strategic objective of "maintain competitive rates." BC Hydro currently has a first quartile placement. The following identifies how much BC Hydro rates would have to increase to move from the first quartile to the second quartile assuming the bills of the other utilities do not change. It also considers the impact of Canadian US dollar exchange rates.

Hydro Quebec Study

- Hydro Quebec released its "Comparison of Electricity Prices in Major North American Cities" in early October 2012 for rates effective April 1, 2012.

- The study surveys 22 utilities across North America (12 Canadian and 10 US).

- Bills and prices are stated in Canadian dollars and include other adjustment clauses such as the rate riders or other charges based on changes in other variables. Exchange rates for April are used to convert US bills and prices to Canadian dollars.

- BC Hydro participates annually, providing bill calculations in the spring.

- The 2013 report is expected in the fall of 2013 for rates effective April 1, 2013.

- For the 2013 study, BC Hydro's rates will have increased 1.44% effective April 1, 2013 over the 2012 study. By comparison, Hydro Quebec increased rates 2.4% effective April 1, 2013 and Manitoba Hydro increased rates 3.5% effective May 1, 2013.

- BC Hydro uses its ranking from the Hydro Quebec study in three representative customer classes (residential, medium power and large power) and usage categories to determine its quartile placement, which is one metric to assess performance against the company's strategic objective of "maintain competitive rates" in its F13-15 Service Plan.

BC Hydro Moving from First to Second Quartile

- BC Hydro's monthly residential and large power bills would have to increase a total of 17% and 12% respectively to move into the second quartile, assuming the bills of other utilities stay the same.

- Monthly medium power bills would have to increase 3% to move from the first to second quartile.

- If the rates of other utilities stay the same, BC Hydro would likely exceed the first quartile threshold for the medium power category in the 2014 Hydro Quebec Report (rates in effect for April 1, 2014).

Quartile	Monthly Bill Ranking	Residential 1000 kWh		% higher than BC Hydro's bill	Quartile	Monthly Bill Ranking	Medium Power 400,000 kWh/ 1000 kW		% higher than BC Hydro's Bill	Quartile	Monthly Bill Ranking	Large Power 23,400 MWh/ 50,000 kW 120 kV		% higher than BC Hydro's Bill
1	4	BC Hydro (Vancouver, BC)	$ 88		1	4	BC Hydro (Vancouver, BC)	$ 28,302		1	4	BC Hydro (Vancouver, BC)	$ 1,525,576	
2	7	Pacific Power and Light (Portland, OR)	$ 103	17%	2	7	Pacific Power and Light (Portland, OR)	$ 29,207	3%	2	7	Seattle City Light (Seattle, WA)	$ 1,713,206	12%

Impact of Foreign Exchange on Bills in Hydro Quebec Study

- Electricity bills for the US utilities, when converted to Canadian dollars, appear lower due to the appreciation of the Canadian dollar to virtually parity with the US dollar in 2012.

- If the Canadian dollar falls below parity, this will have the opposite effect, working in BC Hydro's favor.

- For the large power segment, there are two US utilities ranked within the first quartile in 2012: Commonwealth Edison (Chicago), and CenterPoint Energy (Houston).

BC Hydro Information Note

Fully Allocated Cost of Service (FACOS) study

Purpose

- The FACOS study is used to allocate BC Hydro's revenue requirement among customer classes. The revenue requirement forms the basis for BC Hydro's rates. BC Hydro's rates are set to recover the costs of providing its service to customers plus a regulated rate of return.

- Each year BC Hydro files an update to its FACOS study with the BCUC. The most recent update, filed in January 2013, is based on F2012 financial information, customer revenues, load profiles, and sales. BC Hydro will prepare the next update to its FACOS study in the Fall of 2013, and will file it with the BCUC before the end of calendar 2013.

- The FACOS study determines how much of overall costs should be recovered from each customer class (i.e. Residential, General Service, Transmission)

A FACOS study follows three general steps:

1. **Functionalization**
   All costs in BC Hydro's revenue requirement are reviewed to determine the purpose for which the costs are incurred, and the costs are then functionalized as one of the following: a) Generation; b) Transmission; c) Distribution; or d) Customer Care.

2. **Classification**
   Costs in each of the above functionalized categories (a thru d) are then classified according to whether they are Energy Related, Demand Related, or Customer Related.

3. **Allocation**
   Each type of cost is then allocated to customer classes. For example, energy related generation costs are allocated according to a customer class's pro-rata share of total energy consumption. Customer related distribution costs are allocated using a pro-rata share of number of accounts.

Revenue-to-Cost Ratios and Rate Rebalancing

- The table below shows Revenue-to-Cost (R/C) ratios from the most recent FACOS study that was filed in January 2013. An R/C ratio is calculated by dividing revenues by costs.

- The ratio determines whether the revenues received from a particular customer class equal the costs that BC Hydro incurs to serve them.

- For example, the table below shows that BC Hydro is not collecting enough revenue from residential customers as their R/C ratio is less than one (100%) at 89.4%. It also shows that General Service customers are overpaying for electricity as their R/C ratios range from 105.8% (Large General Service) to 126.2% (Small General Service).

	Revenue-to-Cost Ratios
Rate Class	F2012 Actual (%)
Residential	89.4
Small General Service	126.2
Medium General Service	120.6
Large General Service	105.8
Irrigation	86.8
Street Lighting	111.4
Transmission	103.7
Total	**100.0**

- The residential R/C ratio has remained relatively stable in recent years:
  - F2009: 90.2%
  - F2010: 92.1%
  - F2011: 90.6%
  - F2012: 89.4%

- A customer class R/C ratio close to one is desirable. When R/C ratios diverge from one, rate rebalancing may be necessary.
  - Under rate rebalancing, the rates of customer classes with low R/C ratios are increased (in order to recover the cost of serving them) while the rates of customer classes with high R/C ratios are decreased (in order to avoid over-collecting).
  - BC Hydro still collects the same amount of total revenue across all customer classes as a result of rate rebalancing. However, some customer classes will pay more while others will pay less.

- Rate rebalancing is in addition to any general rate increases. For example, if BC Hydro rebalanced residential rates by 1 percentage point and if BC Hydro's general revenue requirement increase was 5%, the cumulative residential rate increase would exceed 6%. Note that in April 2008 the government amended the *Utility Commission Act* to cap any changes to Revenue-to-Cost ratios made after March 31, 2010 at no more than 2 percentage points per year.

BC Hydro Information Note

Electricity Load Forecast

Overview

- BC Hydro produces new load forecasts as required for its long-term planning processes, revenue forecasting and ratemaking processes. It produces a long-term load forecast yearly, and short-term updates for financial planning purposes as required.

- BC Hydro's base forecast is a mid-range, or P50, assessment of future loads. That is, the forecast is created with the expectation that realized electricity loads will be higher than the forecast 50% of the time, and lower 50% of the time. BC Hydro's system and facility planners then add reserve margins for capacity.

- BC Hydro's long term electricity load forecast is a key input to its Integrated Resource Plan (IRP). BC Hydro is basing its IRP on the most recent 20-year forecast from December 2012.

- According to this forecast, BC Hydro's demand for electricity could grow by about 45 per cent over the next 20 years before reflecting savings from demand-side management.

- BC Hydro's electricity load is split approximately evenly between the demands of residential, commercial and large industrial customers.

- Population growth is the key driver of residential customer growth. The residential sector is the most stable in terms of historic and expected future growth rates, although weather (space heating demand) results in significant short-term variations from the average.

- General economic activity is the key driver of commercial sector growth. Economic cycles and weather have an effect on the short-term demand in this sector.

- Industrial demand is the most volatile sector in terms of load variability and future forecast uncertainty. This sector is largely comprised of pulp and paper, and the oil & gas and mining sectors in northern BC. This sector is subject to largely external factors such as commodity demand and prices, economic cycles, major strikes and transformative events such as the pine beetle infestation. BC Hydro's load forecast shows the highest near-term growth in this sector due to expected activity in the oil & gas and mining sectors.

- New liquefied natural facilities (LNG) on the north coast potentially represent the single biggest additional demand on BC Hydro's system over the next 20 years. The IRP contains a forecast that LNG will add approximately 5% (an expected 3,000 gigawatt hours/year) to BC Hydro's load within the next 10 years, or three times the demand of its current single largest industrial customer. BC Hydro is closely tracking unfolding developments on 12 LNG projects. In the event that BC LNG development is either larger or faster than anticipated, BC Hydro is well positioned to advance plans to supply these additional loads.

- Uncertainty is inherent in every forecasting effort. In order to address the future uncertainty in how electricity demand may grow in the province, BC Hydro not only addresses the probable mid-range load forecast, but looks at what would happen if demand for electricity grew faster or slower than expected, and develops contingency plans based on those scenarios.

- BC Hydro's approach to load forecasting is consistent with industry best practices and its forecasts are periodically reviewed by the BCUC and ratepayer groups as part of regulatory applications. In 2011, the load forecasting process and results were reviewed as part of the Government Review of BC Hydro and noted to be "well planned" and "accurate, reliable forecasts".

BC Hydro Information Note

Optimization of BC Hydro Energy Production

BC Hydro optimizes the production of energy to meet domestic load and provide surplus capability to enable market trade activity by Powerex. The variable cost of generation produced or procured to meet the domestic load is the Cost of Energy. The net revenue from market trading supported by the BC Hydro generating system forms part of Trade Income.

Overview

- The BC Hydro generating system consists of hydro and thermal based Heritage assets, resources dispatched under the terms of the Canal Plant Agreement and the Keenleyside Entitlement Agreement, and resources contracted under Energy Purchase Agreements (EPAs).

- Tie lines to the US and Alberta enable electricity market sales and purchases.

- BC Hydro ensures that it has the energy resources available to meet the obligation to serve the daily, weekly, and annual load.

- When BC Hydro has energy surplus to its needs to meet domestic load, that surplus is sold to the market and the associated revenue is subtracted from the Cost of Energy.

- Operation of the generating system is optimized to maximize the net revenue from operations (system-backed Trade Income minus Cost of Energy) while ensuring that the obligation to serve the load is met.

System Flexibility

- The ability to dispatch generating units provides flexibility to respond to changing load and market environments (hourly to seasonal).

- Run-of-river hydro, wind, and other non-flexible generation provide the base resources around which flexible resources are dispatched.

- Some Heritage hydro resources have flexibility to shape production within a daily or weekly timeframe to meet variations in load within this period.

- In general, only the Peace (GM Shrum and Peace Canyon, supplied by Williston Reservoir) and the mainstem of the Columbia River (Mica and Revelstoke, supplied by Kinbasket Reservoir) have the dispatch flexibility to provide significant seasonal and annual energy production shaping for loads and markets.

Optimization

- BC Hydro uses proprietary forecast models to optimize the operation of the generating system.
- The optimization explicitly considers variability (uncertainty) in forecasts of market prices, inflows, and loads that are driven by weather and energy market/system conditions.
- These models dispatch the Peace and Columbia generating resources by storing and releasing water from Williston and Kinbasket Reservoirs to meet the load while maximizing market opportunities on a consolidated (BC Hydro plus Powerex) basis.
- The optimization maximizes net revenue from operations over a 5-year time horizon.
- Net revenue from operations is defined as:

  revenue from domestic customers + net revenue from coordination agreements + revenue from market electricity sales - cost of EPAs - cost of water rentals - cost of gas for thermal generation - cost of market electricity purchases.

- Only the two largest reservoirs (Williston and Kinbasket, which together comprise System Storage) have the flexibility to be re-operated to impact annual revenue requirements.
- Model forecasts show the annual range of variability in net revenue from operations (Cost of Energy + system-backed Trade Income) to be -250 to +450 $M (CAD) in each of F15 and F16.
- Impacts of volatility in single year revenue requirements are covered by Deferral Accounts, not by re-operating system storage sub-optimally to meet annual targets.
- Allocation of consolidated optimal market purchases/sales between BC Hydro (Cost of Energy) and Powerex (Trade Income) is forecast by applying of the terms of the Transfer Price Agreement.

Major Inputs, Assumptions and Constraints

- Load and EPA contract resource inputs are as per official forecast, with weather variability added in the optimization modeling.
- Inflow inputs for the current year are based on the water supply forecast (based on current snowpack); for subsequent years based on historic data.
- Market price inputs are based on the current forward curve, with weather and market variability added in the optimization modeling.

- The current maintenance and capital outage plan is used in the modeling when forecasting generating system capability; the new Mica units 5 and 6 are assumed to be in-service on schedule (Sept 2014 and Sept 2015 respectively).
- Current water rental and carbon tax regimes are assumed to continue; the USD/CAD exchange rate is based on the current forward curve, and the discount rate is 7%.
- The optimization is risk neutral - no additional penalty for spill or for risk of draft below Water Use Plan reservoir minimums.
- Operation of Kinbasket Reservoir is constrained by the provisions of the Columbia River Treaty with the current Non-Treaty Storage Agreement (NTSA).
- Operation of Williston Reservoir is constrained by 2150/2147 minimum operating level except under very low inflow conditions and by downstream ice restrictions.
- Impact of new Montana/Alberta line on BC-Alberta intertie is included, but no other changes in intertie transmission capability are assumed.
- Impact of Waneta Expansion Fortis transmission rights on trade is not modeled.
- Burrard Thermal is used only for system reliability; Island Cogen is dispatched in the model for reliability, but is typically out of the money for economic dispatch.

BC Hydro Information Note

IPP Cost of Energy

New sources of supply are now coming onto the BC Hydro system and will impact rates. Consistent with BC Hydro's mandate to provide British Columbians with clean, reliable, cost-effective electricity, BC Hydro must ensure its portfolio of IPP energy is a cost-effective one.

Overview

- BC Hydro has been purchasing power from Independent Power Producers (IPPs) since the late 1980s.
- IPPs now make up about 20% of BC Hydro's total domestic electricity supply, delivering electricity at an average cost of $79.7/MWh (F13).
- Over the last decade, Provincial energy policy has supported a strong, healthy IPP industry in B.C.
- BC Hydro has approximately 130 Electricity Purchase Agreements (EPAs) with IPPs that will provide over 15,000 GWh/year of energy supply to BC Hydro's system.

Influence of Energy Policy

- The 2002 Energy Plan indicated the private sector would build new electricity generation and BC Hydro would be restricted to improvements at existing plants.
- The 2007 BC Energy Plan added a strong focus on clean or renewable power, provided direction for the creation of a standing offer program and bioenergy calls, and introduced self-sufficiency as a goal.
- The 2010 BC *Clean Energy Act* (CEA) added explicit objectives to encourage economic development and to support First Nations and rural communities through clean or renewable energy development.

Energy Procurement

- Since 2002, calls for power have included the Green Power Generation Call (GPC)(2003); Open Call for Power (2006); Standing Offer Program (launched 2008); Phase 1 Bioenergy Call (2008); Clean Power Call (2010); Bioenergy Phase 2 Call (2010); Community-Based Biomass Power Call (2012); Integrated Power Offer (2013); and the Haida Gwaii Request For Expressions Of Interest (2012).
- BC Hydro also secured cost-effective energy via bilateral agreements as opportunities arose to acquire energy and capacity (e.g. Rio Tinto Alcan EPA renewal, Waneta Expansion EPA), as well as to address regional economic development objectives (e.g. Northwest Transmission Line and associated EPAs).

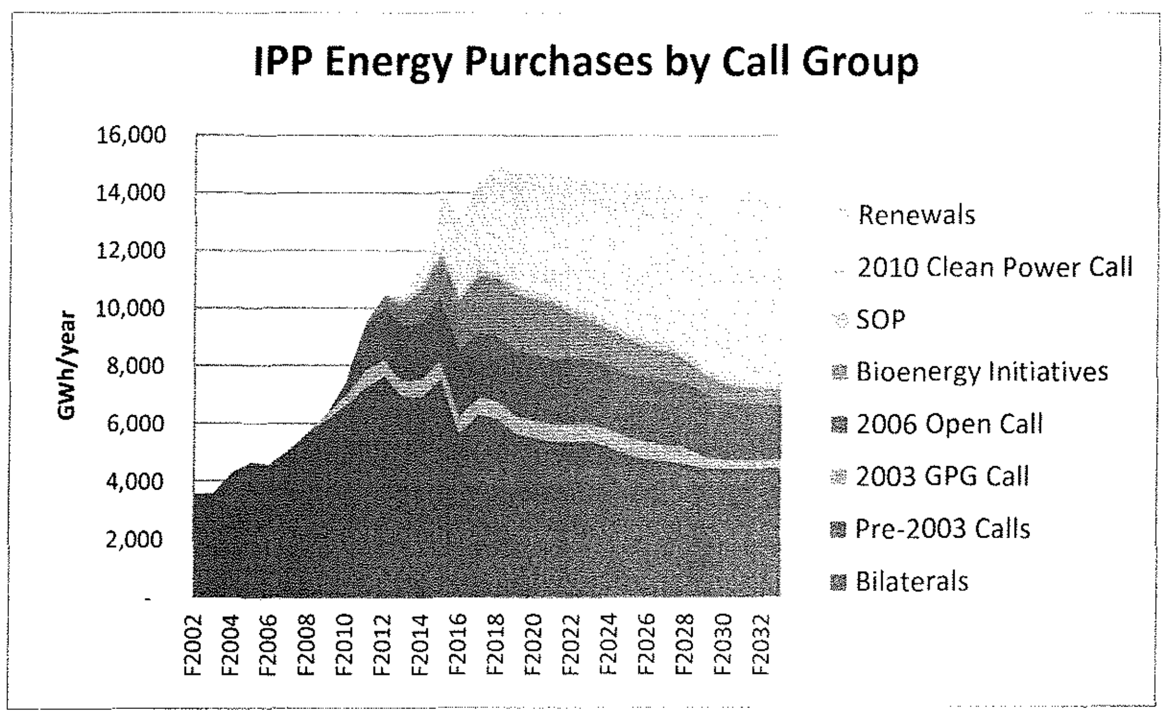
- As shown in the table below, BC Hydro spent about $850 million in F13 on energy from IPPs. BC Hydro forecasts it will spend $1.5 billion in F18 as a result of IPP projects that are currently under construction coming online at a higher average cost. These IPP purchase commitments are already made in EPAs that were signed as a result of the most recent calls for power.

- This increase in expenditure represents approximately 80% of the forecasted increase in BC Hydro's overall cost of energy for the same period, with increased market purchases and generating costs for non-integrated areas accounting for the balance.

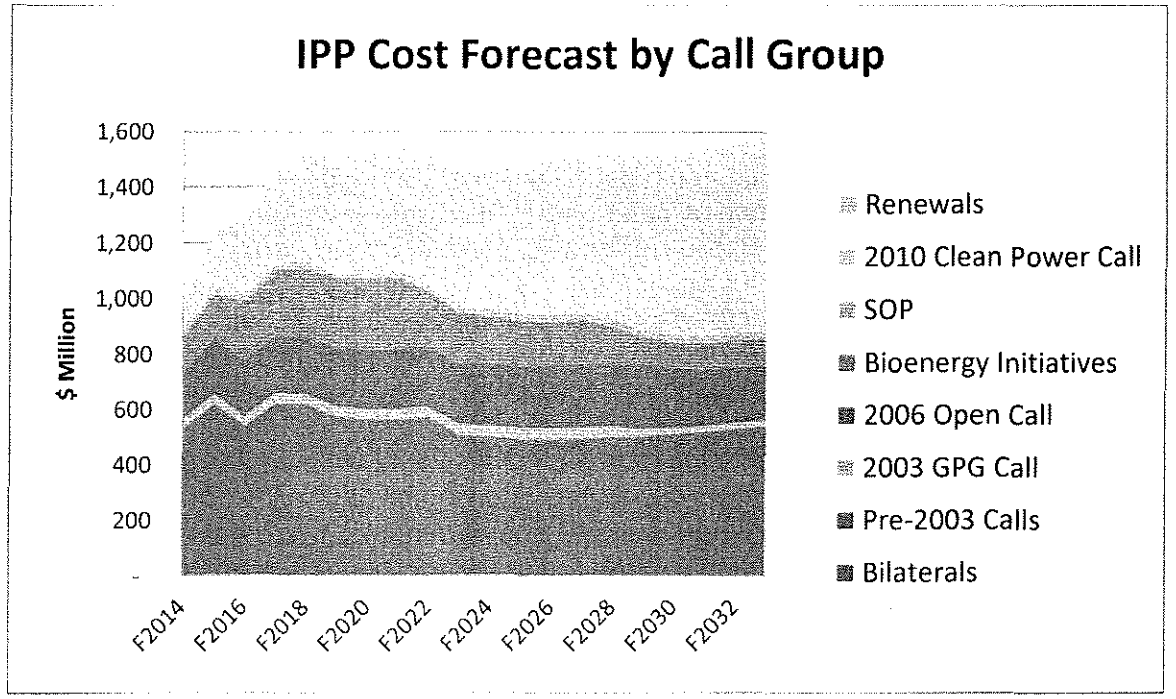
	F13 Actual	F14 Forecast	F15 Forecast	F16 Forecast	F17 Forecast	F18 Forecast
Total Energy (GWh)	10,827	12,056	14,164	13,526	15,076	15,331
Total Cost* ($ millions)	842	1,007	1,270	1,308	1,505	1,546
Unit Cost* ($ per MWh)	79.7	83.5	89.6	96.7	99.8	100.8

*Note: Reported IPP energy costs are typically $60-70 million lower in BC Hydro's annual reports due to capital lease adjustments for two EPAs; similarly, unit energy costs are lower (e.g., $71.2/MWh in F13).

- The graph following shows the historic (F02-F13) and forecast (F14-F32) IPP energy purchases by BC Hydro by call group.



- The graph following shows the forecast cost of IPP energy purchases by call group.



Recommendations for Energy Procurement Processes

- BC Hydro has sought to ensure its acquisition processes are in line with market conditions and industry best practices.

- In February 2011, Merrimack Energy Group, Inc. carried out an independent inquiry into the energy procurement practices of BC Hydro, with particular emphasis on the interactions with energy suppliers. Merrimack made a number of recommendations, such as: ensuring that energy procurement processes are linked to the Integrated Resource Plan (IRP); carrying out a financial analysis of the risk allocation related to certain EPA terms; and developing standards for evaluating and negotiating bilateral contracts.

- BC Hydro has responded to Merrimack's recommendations. For example, in 2012 Navigant Consulting completed a financial analysis of key terms in the BC Hydro template EPA. Navigant concluded that the identified terms do not introduce risk premiums in bidder pricing. Additionally, in September 2012, BC Hydro posted an "Overview of BC Hydro's Energy Procurement Practices" which provides a high-level summary of guiding principles and energy procurement procedures.

- For most of its major power calls, BC Hydro has compared its call results to the energy prices paid by utilities in other jurisdictions, such as Ontario Power Authority, Hydro Quebec, Portland General Electric and Puget Sound Energy. These comparisons confirmed that the EPAs awarded under BC Hydro calls have been cost-effective.

Current Activity: IPP Portfolio Management

- Consistent with BC Hydro's mandate to provide British Columbians with clean, reliable, cost-effective electricity, BC Hydro must ensure that its portfolio of IPP energy is cost-effective.

- In light of the current load-resource balance position, BC Hydro has been actively seeking opportunities to reduce or defer energy purchases where this can be done by mutual agreement between the IPP and BC Hydro. This involves:

  - Reviewing EPAs for projects not yet in commercial operation, with the aim of amending contracts to defer delivery of electricity, to downsize capacity or to terminate EPAs involving stalled projects, by mutual consent;

  - Renegotiating IPP contracts that begin to come up for renewal starting in 2013.

- To date, BC Hydro has terminated four EPAs and amended two others through mutual agreement. Four additional EPAs are in the process of being amended. If successful, this set of actions will reduce contracted energy by 1,800 GWh/year by F21, resulting in an average rate reduction of approximately 1% in F14 through F22, or a present value reduction of more than $1 billion.

- In addition, BC Hydro is seeking to minimize acquisitions of additional electricity supply, while honouring previous agreements to negotiate EPAs, such as those that have arisen through Impact Benefit Agreements (IBAs) with First Nations.

- In March 2013, BC Hydro updated the Standing Offer Program (SOP) rules to limit the participation of clustered projects that exceed 15 MW; introduced an option to extend commercial operation dates by up to two years; and extended the waiting period for projects with terminated EPAs from three to five years. BC Hydro anticipates moving forward with an additional change to the SOP dealing with the participation of high-efficiency cogeneration projects, given that such projects could add 500 GWh/year of energy.

Current Activity: Energy Acquisitions

- Current acquisitions activity is limited given BC Hydro's current electricity supply-demand position. In the IRP submitted to the Province on August 2, 2013, BC Hydro indicates that the need for additional energy resources from IPPs will be highly dependent on the development of the LNG sector. If LNG demand for energy from BC Hydro exceeds the expected volume of 3,000 GWh/year, then there may be a need for additional IPP energy during the 20-year planning horizon.

- BC Hydro currently has two active power procurement processes aimed at facilitating small-scale projects and local clean power solutions, consistent with policy direction from the 2002 and 2007 Energy Plans and the 2010 *Clean Energy Act.*

- SOP, launched in 2008, is designed for small, clean projects with a maximum size of 15 megawatts.
- Net Metering Program, launched in 2004, is for residential and commercial customers who wish to connect a clean generating facility of no more than 50 kilowatts to the distribution system.

- BC Hydro also continues to ensure that First Nations IBA commitments related to energy development are effectively managed. Currently, there are eight IBAs with some form of energy development commitment.

s.17

- As a follow up to Request for Expressions of Interest (RFEOI) for development of a clean energy project on Haida Gwaii completed in 2012, BC Hydro is undertaking consultation with the Council of the Haida Nation and is engaged with other Island groups to inform how BC Hydro proceeds.

BC Hydro Information Note

Comparison of Water Rental Rates with other utilities

BC Hydro pays water rental charges to the Province on the water used in its hydro-generation facilities. This information note provides an overview of the water rental charges, a comparison of these charges with other utilities, and financial impacts of changes in the rates.

Overview

- Water rental rates are composed of 3 tiers with the unit cost increasing for each tier based on hydro generation volumes. BC Hydro is the only utility to pay water rental rates as high as the Tier 3 level. Water rental payments are approximately $400 million per year, are paid to the Province, and go into general revenues of the Province.

- The 2011 Government Review recommended that the Province examine the water rental rates charged to BC Hydro with a view to balancing the needs of the Province and the utility.

Impact of changes to the water rental rates

- Based on current volumes, eliminating the Tier 3 water rental rates and replacing them with the Tier 2 rates would offset rate increases by approximately 1.2 per cent and impact the Province's Fiscal Plan by approximately $60 million per year.

- In addition, the Tier 2 water rental rates are almost two times greater than the water rental rates for Manitoba Hydro and Hydro Quebec. Water rental costs would be reduced by approximately $240 million in F2015 if the rates were comparable to Hydro Quebec.

	BC Hydro	Hydro Quebec	Manitoba Hydro
Average Water Rental Costs per Hydroelectric MWh	$7.8	$3.2	$3.5

Note: table above based on comparative review in F2013 using publicly available Annual Reports

MacLaren, Les MEM:EX

From:	Nikolejsin, Dave MEM:EX
Sent:	August-21-13 11:33 AM
To:	Dyble, John C PREM:EX; Milburn, Peter R FIN:EX; MacLaren, Les MEM:EX; Wieringa, Paul MEM:EX; Foster, Doug FIN:EX
Cc:	Feulgen, Sabine FIN:EX; XT:Reid, Charles FIN:IN; Cheryl.Yaremko@bchydro.com
Subject:	Materials for rates review meeting on Friday
Attachments:	Rates Working Group, Session 1, Information Notes.pdf; workinggroupinformationsessionsFinalJuly31.docx

Attached is a document prepared by Hydro re background and drivers of rates, etc.
I have also attached the process document that Les and Sabine worked on with Hydro staff.
See you Friday in Vancouver.

Dave Nikolejsin
Deputy Minister

Ministry of Energy and Mines
Province of British Columbia
250-952-0120
Dave.Nikolejsin@gov.bc.ca

Working Group Information Sessions
Draft Outline - 31 July 2013

Purpose of Sessions: The purpose of the working group sessions is to enable discussions between the Working Group and senior BC Hydro business process owners with regard to BC Hydro's revenue requirements, cost structure, and key drivers of future year rate increases with a goal to jointly problem solve and discuss opportunities to mitigate rate increases and determine acceptable rate increases in F15/F16 and beyond. The intention is that the sessions will allow for a two-way flow of information and ideas between the Working Group members and the senior business process owners.

Working Group Members:

Dave Nikolejsin, MEM
Les MacLaren, MEM
Paul Wieringa, MEM
Peter Milburn, Finance
Doug Foster, Finance
John Dyble, Office of the Premier
Charles Reid – BC Hydro President and CEO
Cheryl Yaremko – BC Hydro CFO

Summary of Sessions:

The following is a high-level summary and time-line of the planned half-day sessions. A more detailed description of the session contents is found in the sections following this summary.

Session 1: Week of August 19
- Revenue Requirements and Rate Forecast Drivers
- Cost of Energy and Load Forecast

Session 2: Week of September 2
- Capital projects

Session 3: Week of September 2
- Operating Costs and other expenses

Session 4: Week of September 16
- Regulatory Accounts, Rate Management

Session 5: Week of September 16
- Recap of Previous Sessions and Final Discussions/Decisions

Session 1 – Week of August 19

1. ***Revenue Requirements and Rate Forecast/Drivers (Janet Fraser and Cheryl Yaremko)***

   a. **Revenue Requirements overview – 1.0 hour**
   - Overview explanation of Revenue Requirements (show components of forecast F16 Revenue Requirement – Pie chart)
   - The foundation of the RRA, how built up, costs determined, rate increase determination
   - How is BC Hydro's allowed ROE (allowed net income) and dividend determined
   - BCUC role and RRA process
   - Difference between rate increase and bill impact (rate structure)
   - Cost of service, residential Revenue/Cost (R/C) ratios

   Discussions with regard to Revenue Requirements process, role of BCUC and Cost of Service and residential RC ratios.

   b. **F15 and F16 rate forecast and drivers overview – 1.0 hour**
   - Rate forecast (Long-term rate forecast – assumptions made, etc)
   - Discussion of rate drivers (including impacts of deferral of F12-14 costs)
   - Comparison of Customer Bills with other utilities
     - Show rate comparisons and what it would take for BC Hydro to fall out of 1st and 2nd Quartile.
   - Debt forecast
   - Contributions to Government

   Discussions with regard to rate forecast, rate drivers and customer bill comparisons.

2. ***Cost of Energy and Load Forecast – 2.0 hours (Chris O'Riley, David Ince, David Bonser, Rohan Soulsby)***

   a. **Load Forecast overview**
   - Review and discuss load forecast process and assumptions

   b. **Cost of Energy overview**
   - Forecast process (includes discussion of system optimization model, supply demand balance) and assumptions used
   - IPP forecast and management of IPP contracts
     - History of IPP's (reasons for calls)
     - IPP comparison with other utilities
   - Comparison with other utilities
     - Comparison of water rental rates with Hydro Quebec and Manitoba Hydro
     - Impact on rates and Fiscal Plan of replacing Tier 3 water rental rates with Tier 2
     - Impact on rates and Fiscal Plan of having water rental rates equivalent to Hydro Quebec and Manitoba Hydro

   Discussions on cost of energy, IPP contracts, water rental rates.

   End of Session: Summary of session, outcomes achieved/decisions made, follow-up items for further analysis/investigation.

Sessions 2 and 3: Week of September 2

Session 2:

3. ***Capital – 3.5 – 4.0 hours (Chris O'Riley, Greg Reimer, Bruce Barrett, Cam Matheson, Kirsten Peck, Al Leonard, Don Stuckert)***

a. **Overview**

- Asset management/asset planning process
- Capital project management:
  - Prioritization of capital projects
  - How are capital projects managed (approval process for budget, changes in scope)
  - How are estimates determined for projects
  - What is the approved amount and how can this be different than the estimate used in the capital forecast
  - BCH's track record of completing projects on time and on budget
- Capital expenditures vs. capital additions
- How is costing of capital projects undertaken and managed.
- Impact on rates: Capital additions, amortization, finance charges, ROE
- Discussion of 10-year capital plan
- Summary of major projects (growth, sustaining, committed) and projects coming into service in F15 and F16
- What will system look like after 10 years based on 10 year capital plan
- Rate impact sensitivities for capital additions

Discussion regarding capital asset management, planning, forecasts.

b. **T&D** (including SMI and infrastructure)
Overview of T&D specific projects and discussion.

c. **Generation** (including Site C)
Overview of Generation specific projects and discussion

d. **Technology &Security**
Overview of T&S specific projects and discussion

e. **Properties**
Overview of properties specific projects and discussion

<u>End of Session</u>: Summary of session, outcomes achieved/decisions made, follow-up items for further analysis/investigation.

Session 3:

4. ***Operating Costs & Other items – 2.5 hours (Cheryl Yaremko, Debbie Nagle, Wafi Kassam, Joanna Sofield, Carol Richards, Michael Wynne, James LeLievre, Diana Theman)***

a. Government Review process overview and summary

- BC Hydro's status with completion of recommendations
- Examples of cost reductions –headcount reductions, M&P salary freeze, T&D Transformation, etc _ and savings achieved. Components of the $391M in savings in response to Government Review.
- Recommendations for Government

Discussion regarding Government Review process

b. Overview of F15/F16 operating costs

- Budgeting process and improvements made from review
- Current forecast of F15/F16 cost pressures
- Breakdown of operating costs (labour, contractors, etc) – Pie Chart
- Trend analysis of operating costs from F07 – F14 to show normalized base operating costs have increased by inflation over this period in spite of continuing cost pressures
- Cost pressures: Ageing assets, fuel, supply costs and skilled labour costs increasing at rates higher than inflation, impact of continued customer growth, increasing IT sustainment costs, increasing compliance costs related to changing environmental and regulatory standards.
- Government support would be required to get additional operating cost savings
    - consolidation of contract spend
    - improvements in collective agreements
- Pension expense (discount rate).
- Ongoing productivity improvements and cost management processes

Discussion regarding cost pressures, budgeting process and cost management.

c. Workforce Plan

- Long term HR plan
- VMT process
- Headcount levels
- Employee vs. contractor

d. Finance Charges

- Forecast process and sources of assumptions used
- Debt management plan
- Pension solvency valuation

e. Powerex Income

f. Property taxes

<u>End of Session</u>: Summary of session, outcomes achieved/decisions made, follow-up items for further analysis/investigation.

Sessions 4 and 5: Week of September 16

Session 4:

Regulatory Accounts and Rate Management – 1.5 hours (Janet Fraser, Fred James, Wafi Kassam)

a. **Regulatory Accounts overview**

- Description of each class of regulatory account, establishment process, recovery plans
- Description of significant regulatory accounts, establishment process, recovery plans
- Summary of Regulatory Account Plan – principles used for regulatory accounts and recovery of them, use by other utilities
- Regulatory accounts recovered in rates vs the rate rider, explanation of the DARR (on bills, why set up, intent, what approved)
- Linkage between regulatory account balances, rate increases, and Gov't Fiscal Plan
- Impact of IFRS on regulatory account balances (IFRS PP&E and Non-Current Pension costs)

Discussion on regulatory accounts.

c. **Rate Management Overview**

- Rate Smoothing
  - Impact of F12-F14 rate smoothing on future rate increases (show visual of impact of rate smoothing)
    - Smoothing over 5 or 10 years (rate impacts and implications)

Discussion regarding next meeting – options/scenarios to be developed and modelled.

End of Session: Summary of session, outcomes achieved/decisions made, follow-up items for further analysis/investigation.

Session 5:

6. ***Final Discussion and Decisions – 4.0 hours (Attendees TBD.)***

Recap of previous sessions and discussions on the following:

- Parameters of acceptable rate increases
- Appetite of reductions to Fiscal Plan after current Fiscal Plan period
- Discussion of scenarios/options
  - Rate Mitigation – discussion of options and time frames (Water Rentals, allowed ROE, dividend)
  - Maintaining rate rider at 5%
    - Use excess rate rider to offset amortization of regulatory accounts collected in rates and any remainder to be used to reduce rate increases.
    - Different alternatives for use of DARR revenues.

- Potential Special Directions and statutory changes that are required
  - F14 ROE
  - First Nations Settlement Account Recovery
  - Rock Bay Settlement Account Recovery
  - Statutory Change for Expenditures for Export
  - Rate Smoothing
  - Powerex-California Settlement
- BCUC involvement and role of BCUC

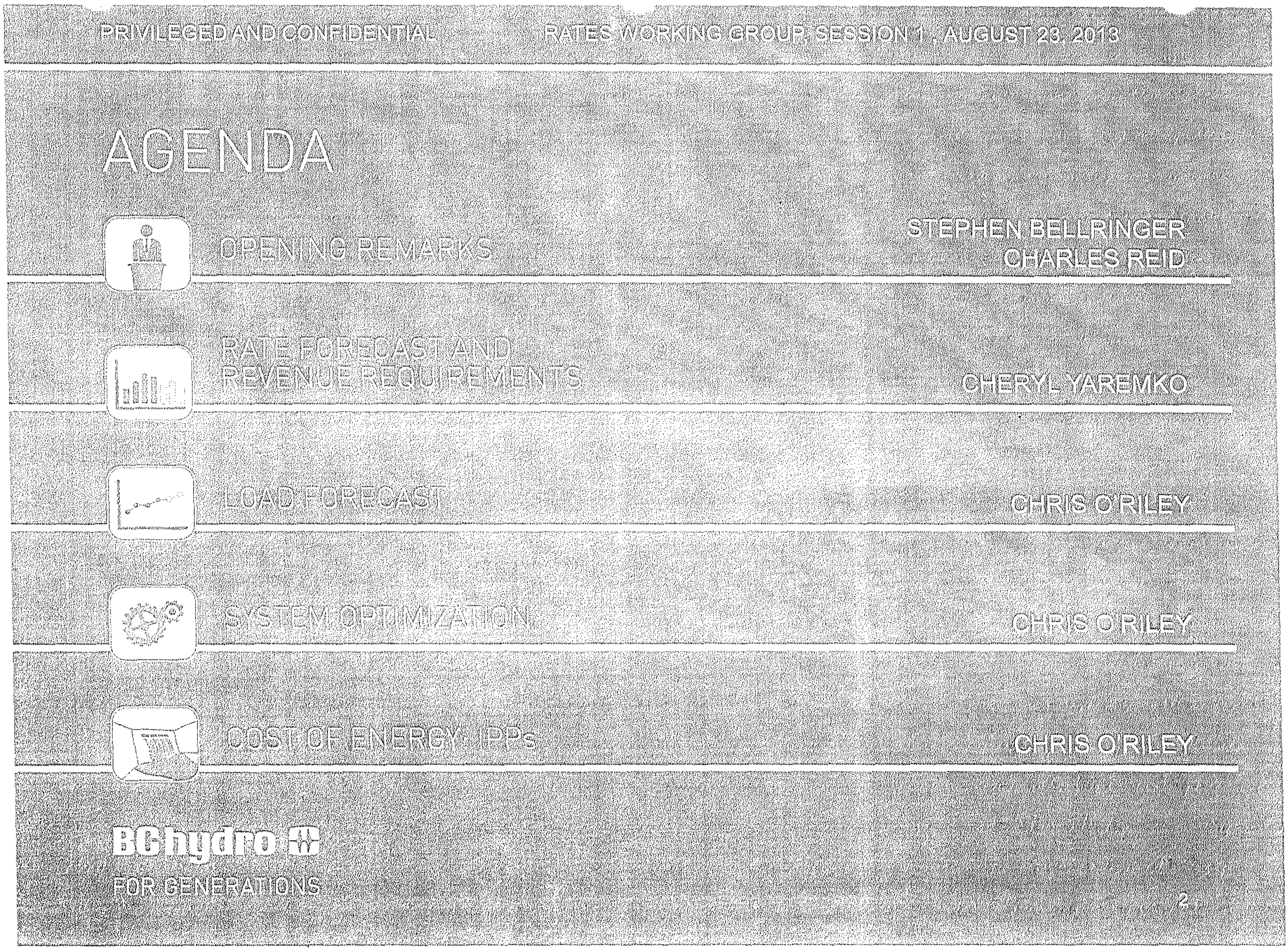
Decisions and discussion of Treasury Board Presentation

Review by Treasury Board and Issuance of Necessary Direction(s) – October TBD

RATES WORKING GROUP

BC hydro
FOR GENERATIONS

SESSION 1: AUGUST 23, 2013 PRIVILEGED AND CONFIDENTIAL



PRIVILEGED AND CONFIDENTIAL
RATES WORKING GROUP, SESSION 1, AUGUST 23, 2013
AGENDA
OPENING REMARKS
STEPHEN BELLRINGER
CHARLES REID
RATE FORECAST AND
REVENUE REQUIREMENTS
CHERYL YAREMKO
LOAD FORECAST
CHRIS O'RILEY
SYSTEM OPTIMIZATION
CHRIS O'RILEY
COST OF ENERGY: IPPs
CHRIS O'RILEY
BChydro
FOR GENERATIONS
2

OPENING REMARKS

BC hydro
FOR GENERATIONS

RATE FORECAST AND REVENUE REQUIREMENTS

BC hydro
FOR GENERATIONS

HISTORICAL RATE INCREASES

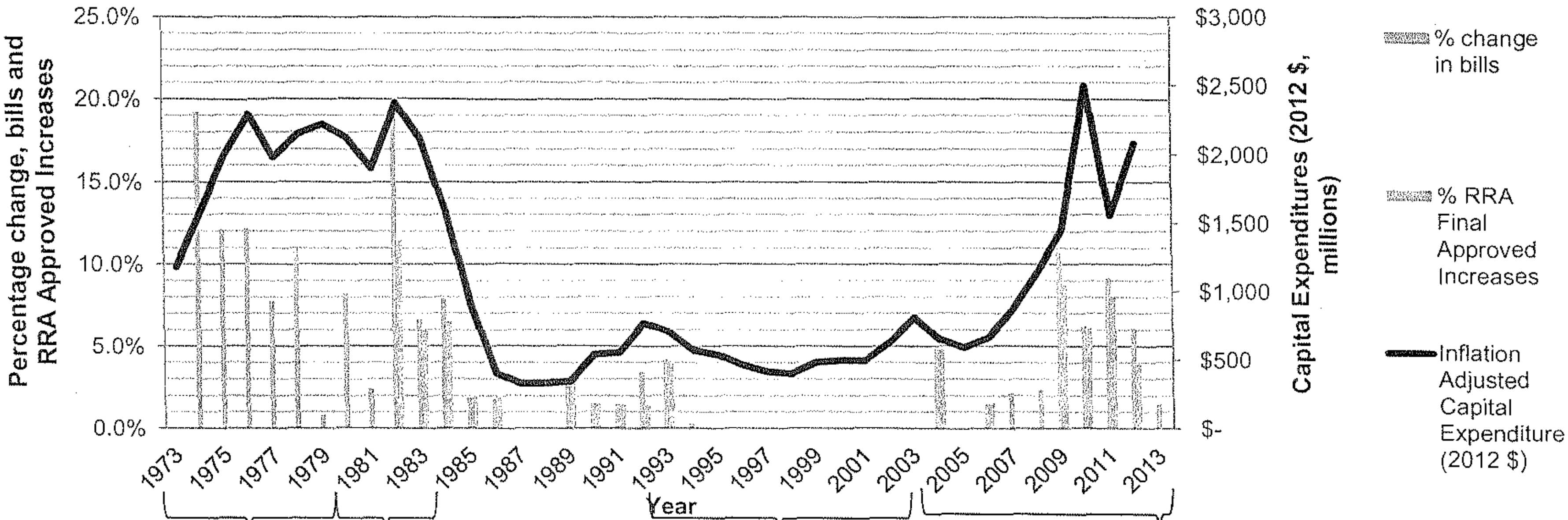
Closest Calendar Year	RRA Final Approved Increases
1993	3.90%
1994	0.00%
1995	0.00%
1996	0.00%
1997	0.00%
1998	0.00%
1999	0.00%
2000	0.00%
2001	0.00%
2002	0.00%
2003	0.00%

Closest Calendar Year	RRA Final Approved Increases
2004	4.85%
2005	0.00%
2006	1.54%
2007	0.10%
2008	2.34%
2009	8.74%
2010	6.11%
2011	8.00%
2012	3.91%
2013	1.44%

BC hydro

FOR GENERATIONS

INCREASES IN 1970S & 1980S REFLECTED GROWTH OF SYSTEM



Inflation, High Interest Rates & Oil Crises

- Construction on Mica, Peace River, Seven Mile, & Revelstoke & associated Transmission Lines
- 1970s oil crises lead to move away from hydrocarbon resources and forecasts of increased demand

BC Hydro Regulated, Canada in Recession

- BCUC created in 1980, first RRA in 1982
- High unemployment, value of Canadian dollar drops, oil prices fall
- BC Hydro future build plans scaled back due to lower electricity forecasts and surplus domestic electricity

Rate Freeze, Preparing for Deregulation & Market Restructuring

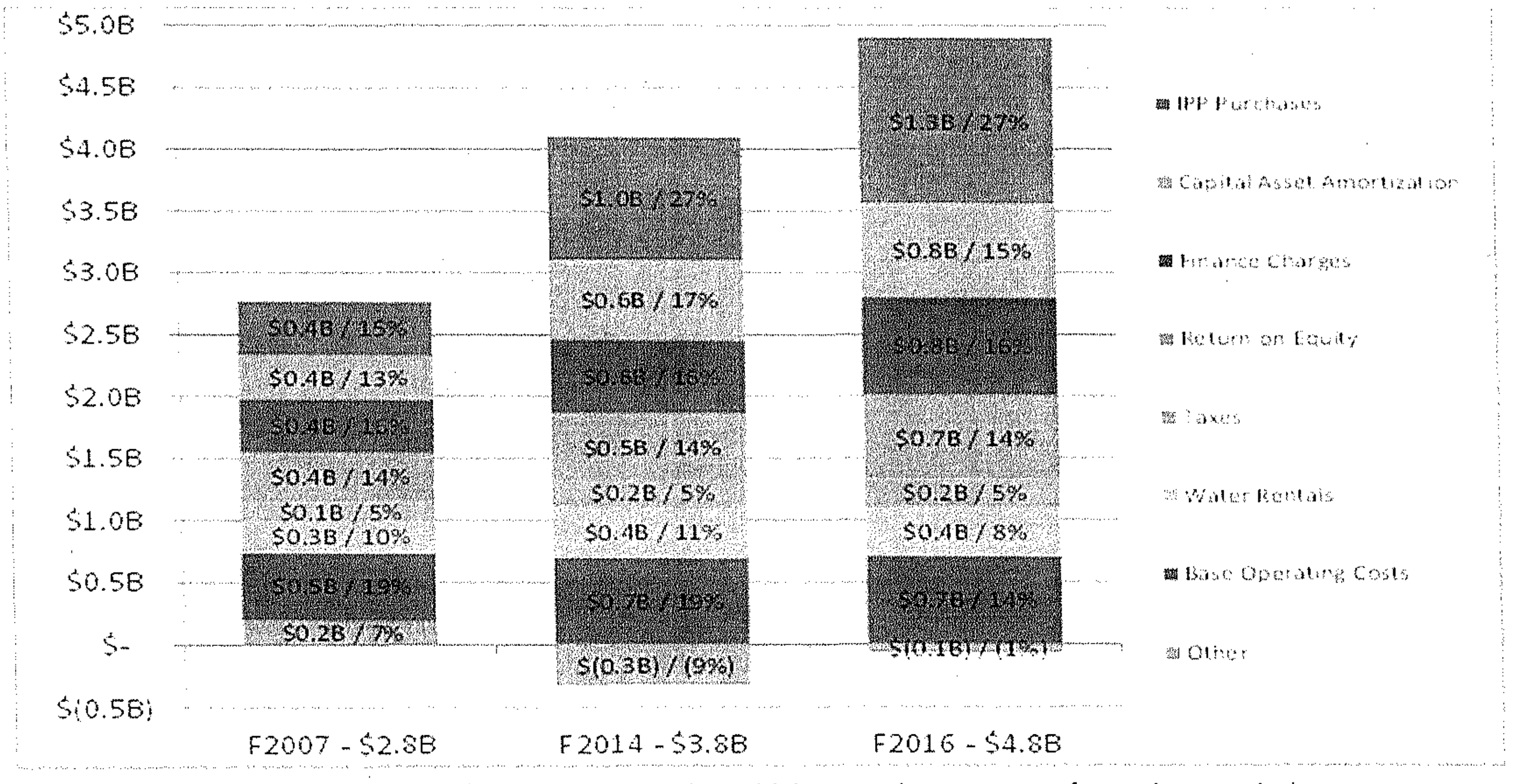
- US markets opening up & unbundling of electricity services
- Provincial government introduces rate freeze 1996, but effectively no increases for a decade, starting in 1993

Clean Renewable Resources

- 2002 Energy Plan focus on new supply from clean resources & 2007 Energy Plan self sufficiency by 2016
- Re-investment in existing heritage assets – Revelstoke 5, Aberfeldie
- Rate freeze over in 2004
- Purchase of 1/3 interest in Waneta in 2010 for $850M

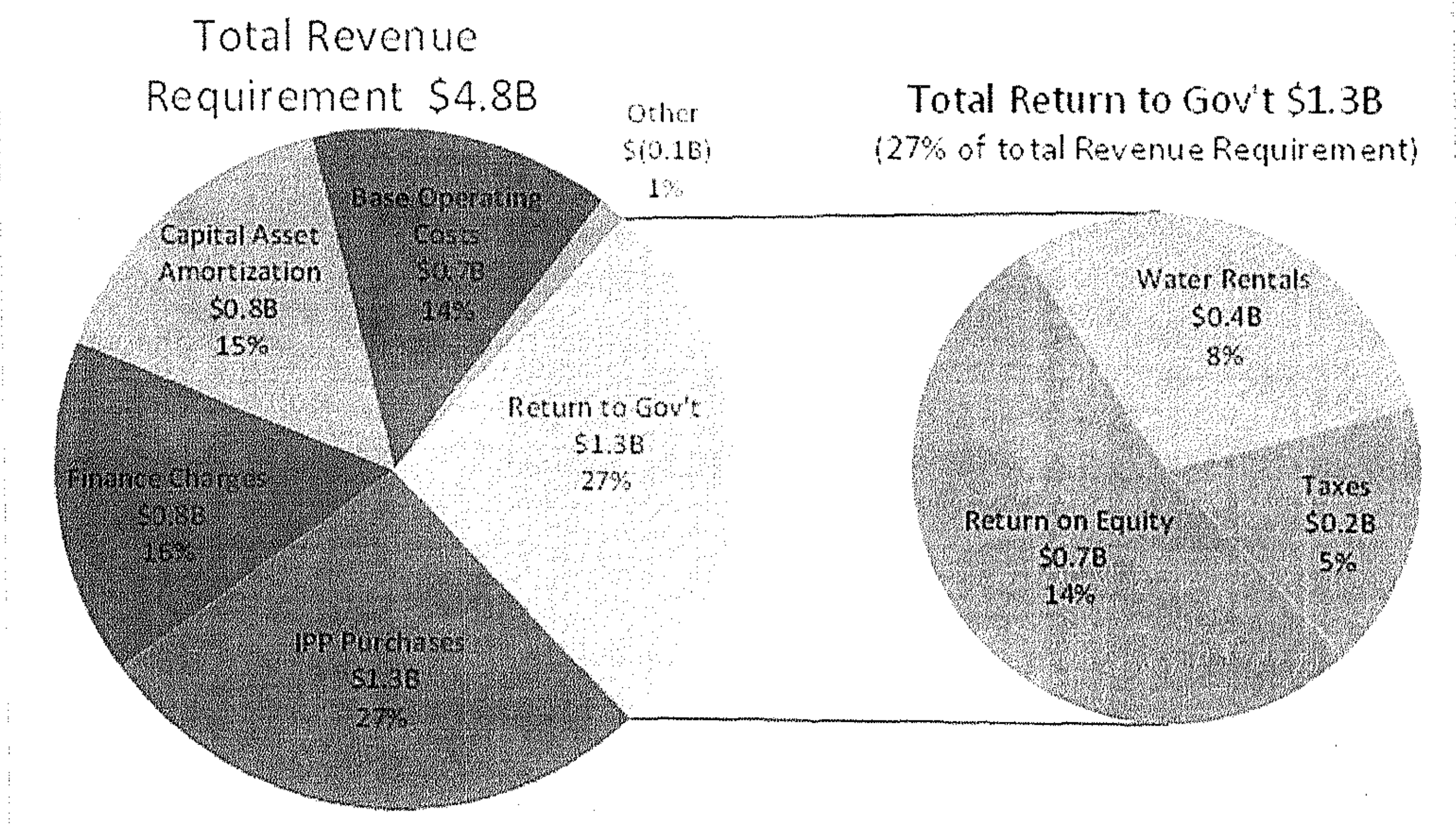
REVENUE REQUIREMENT

- Projected to increase from approximately $3.8 billion in F14 to $4.8 billion in F16, resulting in projected rate increases of 26.4% for the F15-F16 period (19.2% in F15 and 6.0% in F16).



Note: F07 has not been restated for BCTC integration which moved some costs formerly recorded as energy costs to operating costs.

COMPOSITION OF F16 REVENUE REQUIREMENT



Other includes: Regulatory Account Amortization and IFRS-related Operating Cost adjustments, net of Trade income and Surplus Sales

BChydro
FOR GENERATIONS

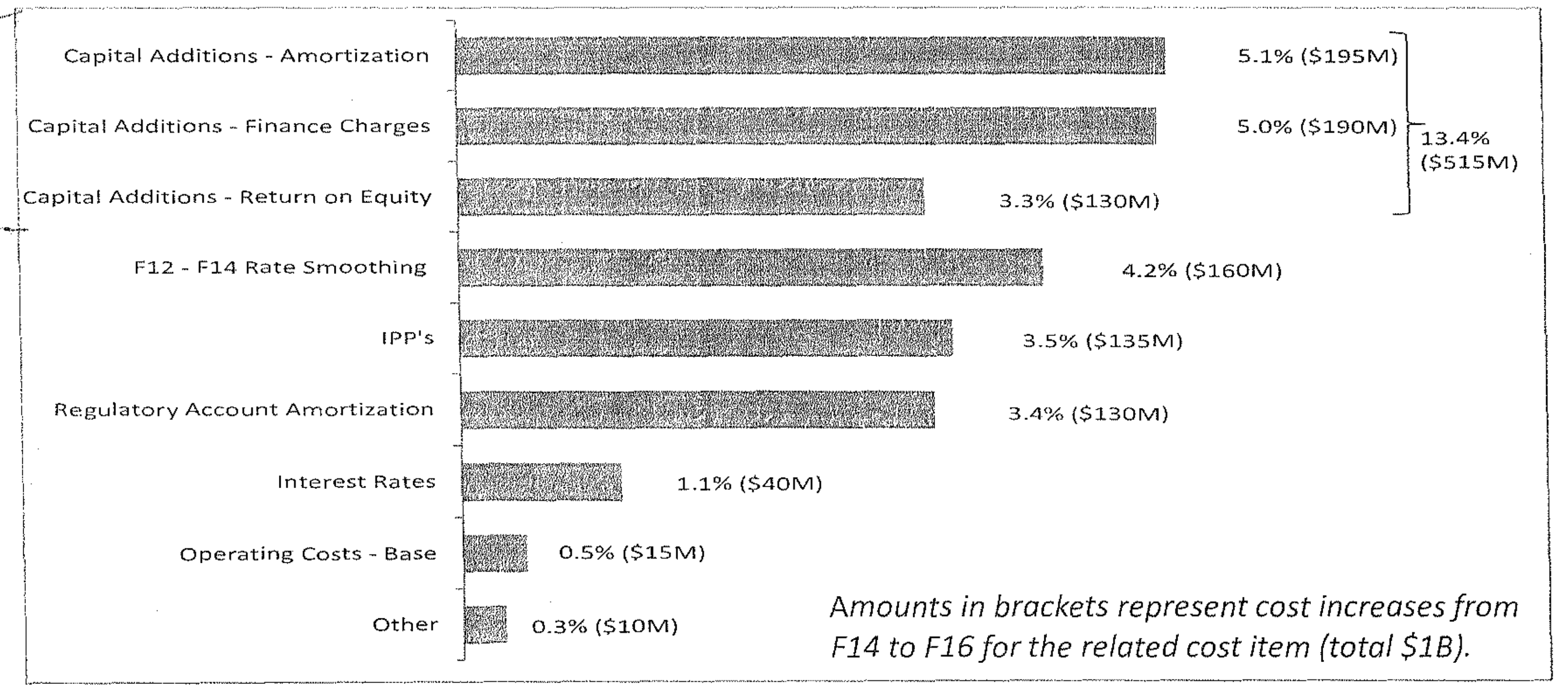
F15-F16 RATE FORECAST AND DRIVERS

Rate Increase %	F15	F16	F15-F16 Cumulative	F17
Current Forecast (unsmoothed)	19.2	6.0	26.4	8.4
Current Forecast (smoothed)	14.5	14.5	31.1	4.4

- Approximately 42% of the rate increase relates to growth (mainly growth capital additions and IPP purchases).
- Most of the cost increases in F15-F16 are fixed and committed:
  - Increases related to capital additions, IPP commitments (64%)
  - Rate smoothing from the F12-F14 ARRA (16%)
  - Regulatory account amortization, financing costs on existing debt (17%)
- Cumulative rate increases for F15-F16 are higher when smoothed because revenues collected are lower in F15 than required to fully cover costs in that year. Revenues collected in F16 must make up for the under collection in F15 as well as collect required revenues for F16.

F15-F16 CUMULATIVE RATE INCREASE (26.4%)

- Contribution of cost items to the forecast cumulative rate increase of 26.4% for F15-F16.



BC hydro

FOR GENERATIONS

RATES STABILIZE OVER F18-F22 PERIOD

	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24
Annual Rate Increase (%)	19.2	6.0	8.4	1.7	2.8	3.4	2.1	1.9	7.7	4.1

- Load increases by approx. 1% per year (before expected LNG load and after DSM)
- Cost of energy flattens out as most IPP purchases come on-line by F17
- Capital additions remain stable and average approx. $2 billion per year (excluding Site C)
- Interest rates are assumed to remain at F17 levels
- Revenue requirement continues to increase:
  - $40 million = 1% rate increase in F15
  - $75 million for 1% rate increase by F24

BC hydro

FOR GENERATIONS

COMPARISON WITH OTHER UTILITIES

- BC Hydro currently first quartile in each rate class in the 2012 Hydro Quebec Study.
- BC Hydro's monthly Residential and Large Power bills would have to increase 17% and 12% respectively to move into the 2nd quartile, assuming bills of other utilities stay the same.
- Monthly Medium Power bills would have to increase 3% to move from the first to the second quartile.

BC Hydro Customer Class	Quartile	Ranking within Quartile	Avg. Monthly Bill ($)	Example of 2nd Quartile Monthly Bill ($)	% Increase
Residential	1	4	88	103	17
Medium Power	1	4	28,302	29,207	3
Large Power	1	4	1,525,576	1,713,206	12

BC hydro
FOR GENERATIONS

RATE IMPACT ON CUSTOMERS

- BC Hydro's Revenue Requirement is allocated amongst customer classes based on a fully allocated cost of service study.
- Top 5 industrial customers account for approx s.17 of total sales volume and s.17 of total domestic tariff revenues.
- A 10% increase in customer rates increases total annual costs for these five customers by s.17
- For **Residential** customers, a 10% rate increase results in average annual bill increase of $105, and **Small Commercial** customers an average annual bill increase of $240.
- Rate increases are felt much more significantly by those customers on a fixed income.

Industrial Customers - F13	Annual Revenue to BC Hydro - $ millions	Sales - GWh

s.21

TOTAL		
Top 5 customers as % of Total Domestic Sales		

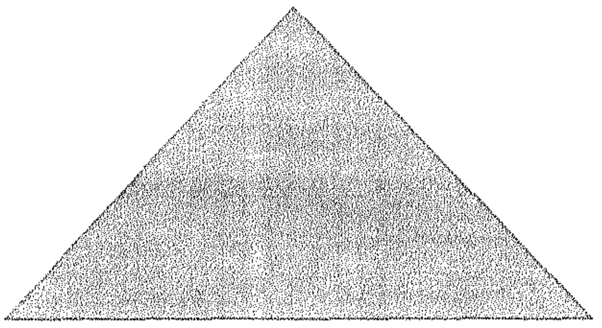
s.21

13

CHALLENGES AND CONSIDERATIONS

- There are three mechanisms to use when the revenue requirement increases:

Increase Rates



Lower Revenue Requirement (includes BCH costs and contributions to Gov't)

Increase Regulatory Accounts

BC hydro
FOR GENERATIONS

CHALLENGES AND CONSIDERATIONS

1. **F12-F14 rate mitigation by BC Hydro**
   - On track to reduce operating costs by over $390 million by next March
   - Delayed $800 million in capital additions
   - Eliminated approximately 800 roles, mainly in non-operational functions, while filling an additional 150 roles (operational "lights on")
2. **BC Hydro actions beyond Government Review**
   - IPP contract management
   - Capital plan review and reduction
   - Organizational structure review
3. **Options to mitigate F15-F16 rate increases are limited**
   - IPP contracts are committed
   - Large amount of capital is required and large projects are well underway
   - Recovery of F12-F14 rate smoothing
   - Government committed to amounts in current fiscal plan

CHALLENGES AND CONSIDERATIONS

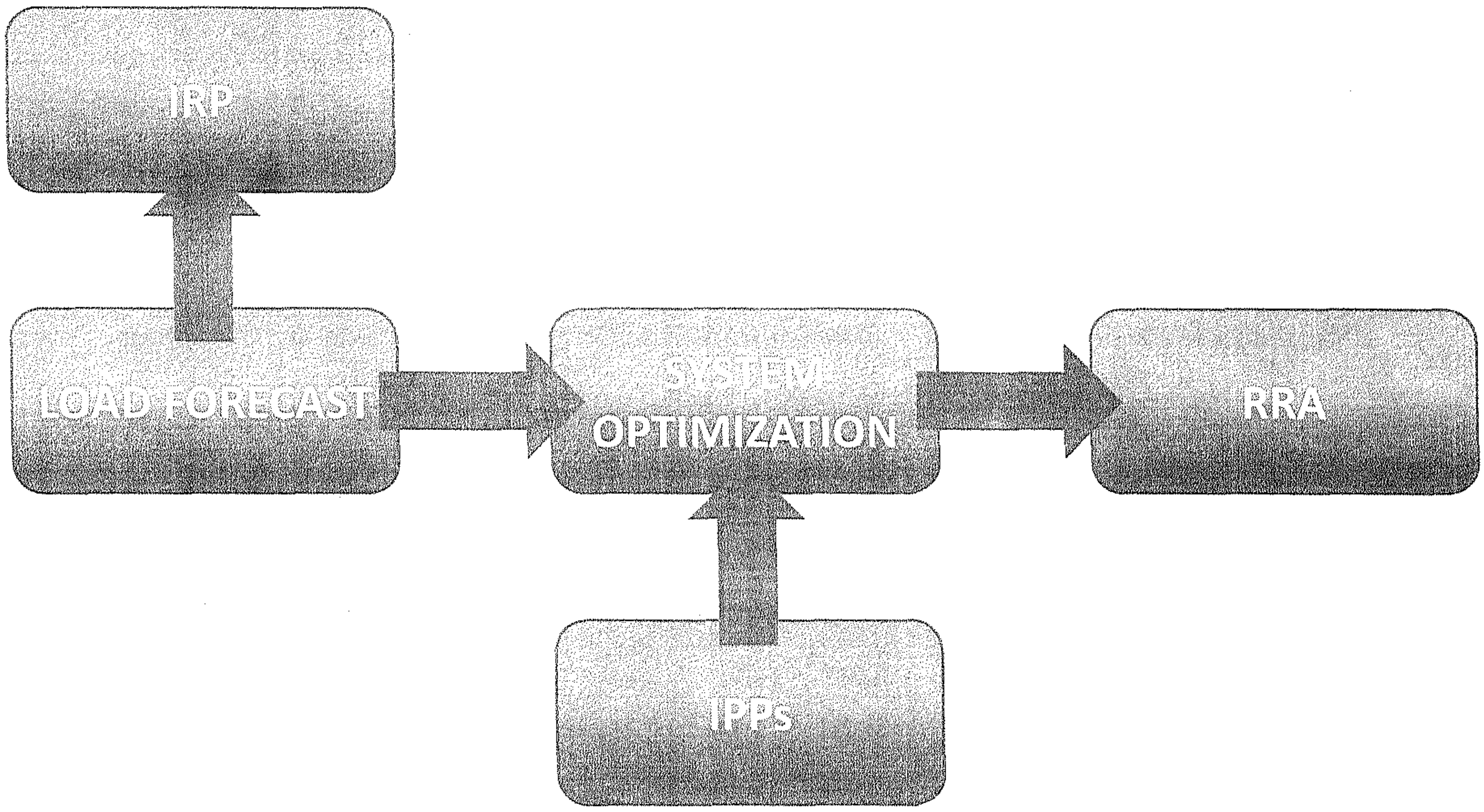
4. **Opportunities could be available starting in F17**
   - Delay capital and take on increased risk
   - Impact Government Fiscal Plan
   - Minimize operating cost impacts and continue to increase efficiency
5. **Considerations**
   - Operating cost pressures are exceeding inflation – assumption included in current forecast is half of inflation
   - Risk that interest rates may increase faster than forecast
   - Near term rate mitigation may only be possible by increasing regulatory accounts
   - Short term rate increase bubble - over longer term rate increases are smaller and stable
   - Gov't Review recommended BCH and Gov't determine collaboratively water rental rates and capital structure to support debt/equity ratio and dividend

REGULATORY PROCESS RISK

1. Leads to uncertainty on rates and Government Fiscal Plan
2. With the current rate forecast, the BCUC is likely to enforce rate mitigation mechanisms and/or disallow certain costs
   - IPP contracts
   - Regulatory Accounts for First Nations, Rock Bay, Home Purchase Option Plan
   - Rate stabilization regulatory account

LOAD FORECAST

BC hydro
FOR GENERATIONS



BC hydro
FOR GENERATIONS

HOW THE LOAD FORECAST IMPACTS RATES

- BC Hydro's forecast attempts to predict actual future loads as closely as possible.
- If a forecast is too low, there is potential for reliability issues, or the need to acquire resources on an expedited basis.
- If a forecast is too high, there is potential for the potential for excessive investments or stranded investments - resulting in rate increases.
- Therefore, the load forecast includes relatively certain loads and is guided by credible third-party expertise and inputs.
- The load forecast has to be credible and pass regulatory tests. The failure of a forecast in passing this test could result in regulatory cost disallowances, or the inability to get key projects approved.

HIGHLIGHTS

- 1.7% annual average growth in energy demand over next 20 years before LNG and before DSM savings (40% growth over that period)
  - Expected DSM savings reduce energy growth rate to 0.9% over the next 20 years
  - Expected LNG growth adds 5% to BC Hydro load – equivalent to 3 times the size of current largest industrial customer demand
- Electricity forecast reflects continued slower general economic growth post-recession. Most North American utilities have revised long-term economic and load growth rates downwards.
- The load forecast anticipates significant industrial (oil and gas, mining, LNG) demand growth within the next 10 years. Any rate impacts of these developments will be small in the near term.
- Accuracy of load forecasts
  - Gov't Review noted well-planned, accurate, reliable
  - Load forecasts have typically been within 2% of actual demands (RRA test period)
  - 2008-09 Recession - significant reduction in industrial demand -> reduction of long-term load projections

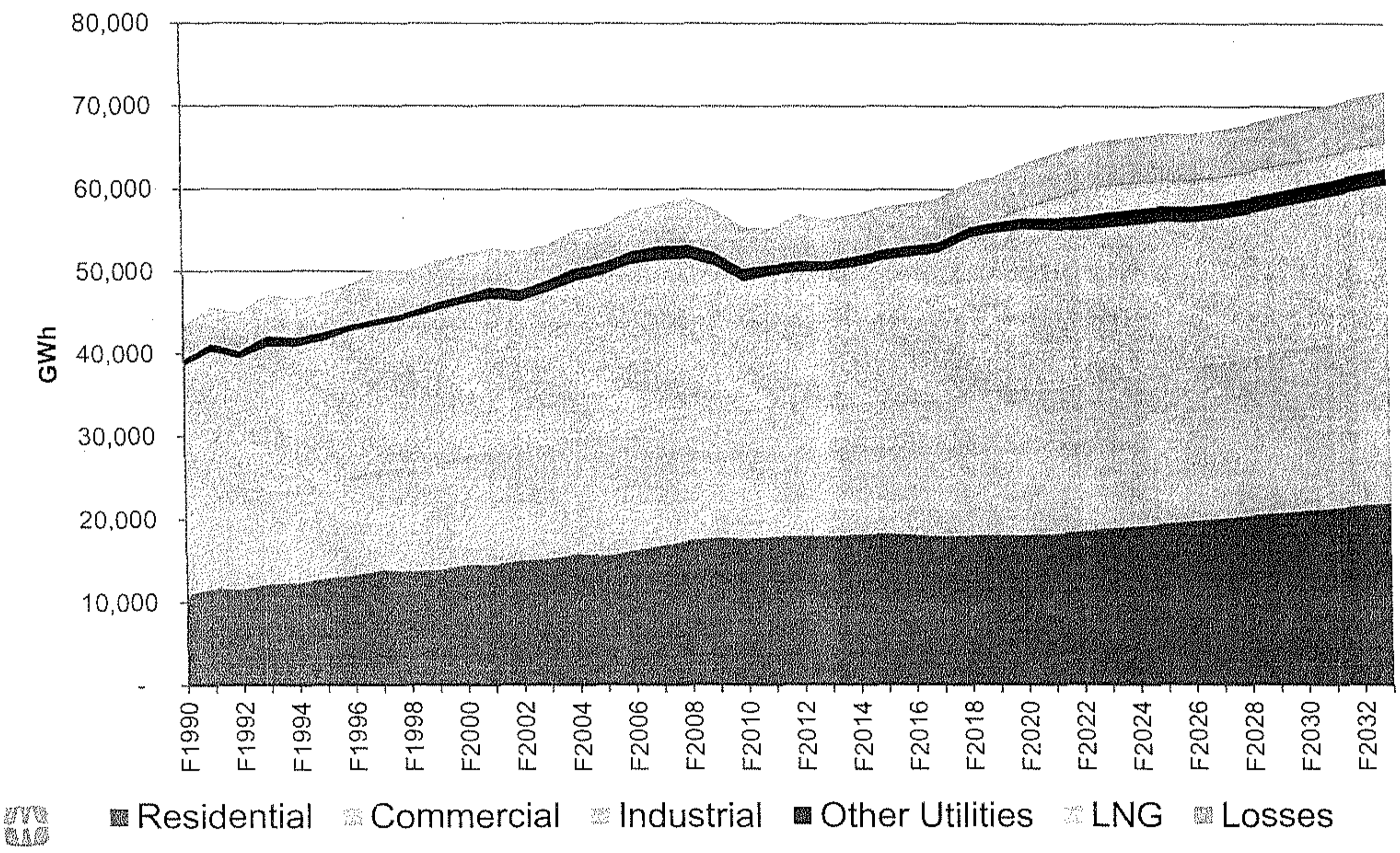
FORECASTING PRINCIPLES

- BC Hydro reference (mid) energy forecast represents the most likely (P50) outcome
- BC Hydro system and asset planners apply reserve margins to forecast to account for contingencies (weather, generation and transmission outages)
- Forecast is constructed using credible, independent third-party inputs
- “Evidence” principle – not speculative:
  - Add and subtract loads to the forecast based on concrete evidence
  - Forecasts are built using multiple credible sources of information
  - Defensible before the BCUC

PAST & FORECAST ENERGY DEMAND BY CUSTOMER GROUP

Including Expected LNG and after DSM

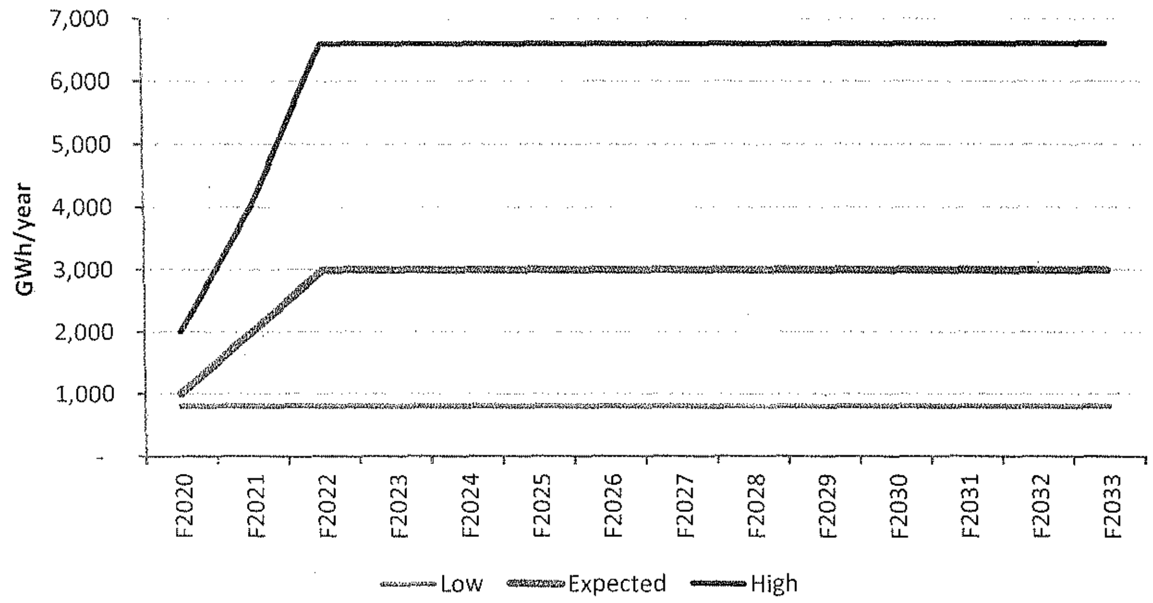
ENERGY:



BC hydro
FOR GENERATIONS

LNG RANGE

ENERGY: -5 plants - 82 mT



Beyond F2022:

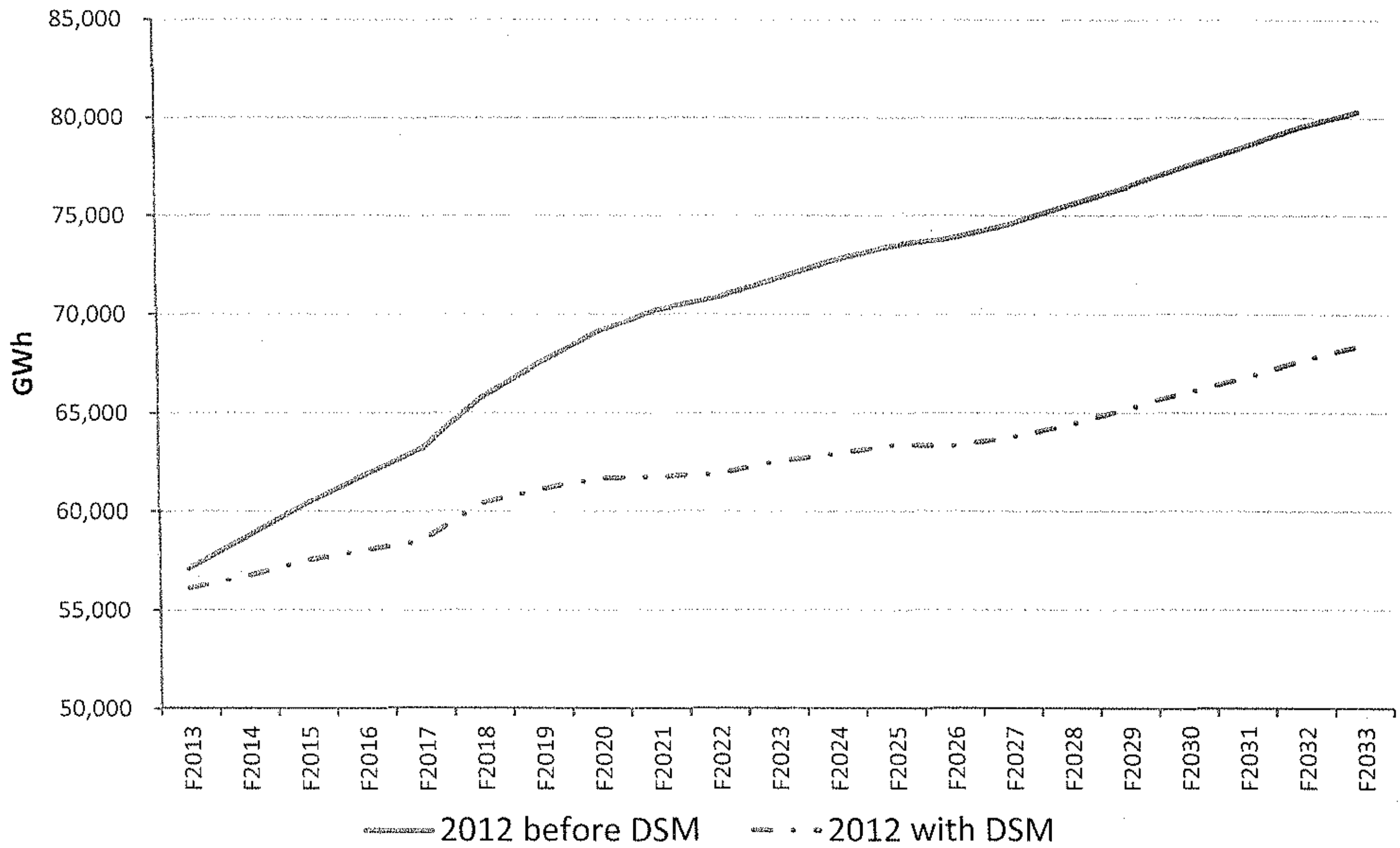
- High LNG scenario: 6,600 GWh/year
- Expected LNG: 3,000 GWh/year
- Low LNG scenario: 800 GWh/year

BC Hydro continues to work with the government and the LNG industry to understand the LNG requirements in the case that these demands are higher or come sooner than expected.

BC hydro
FOR GENERATIONS

IMPACT OF PLANNED DSM

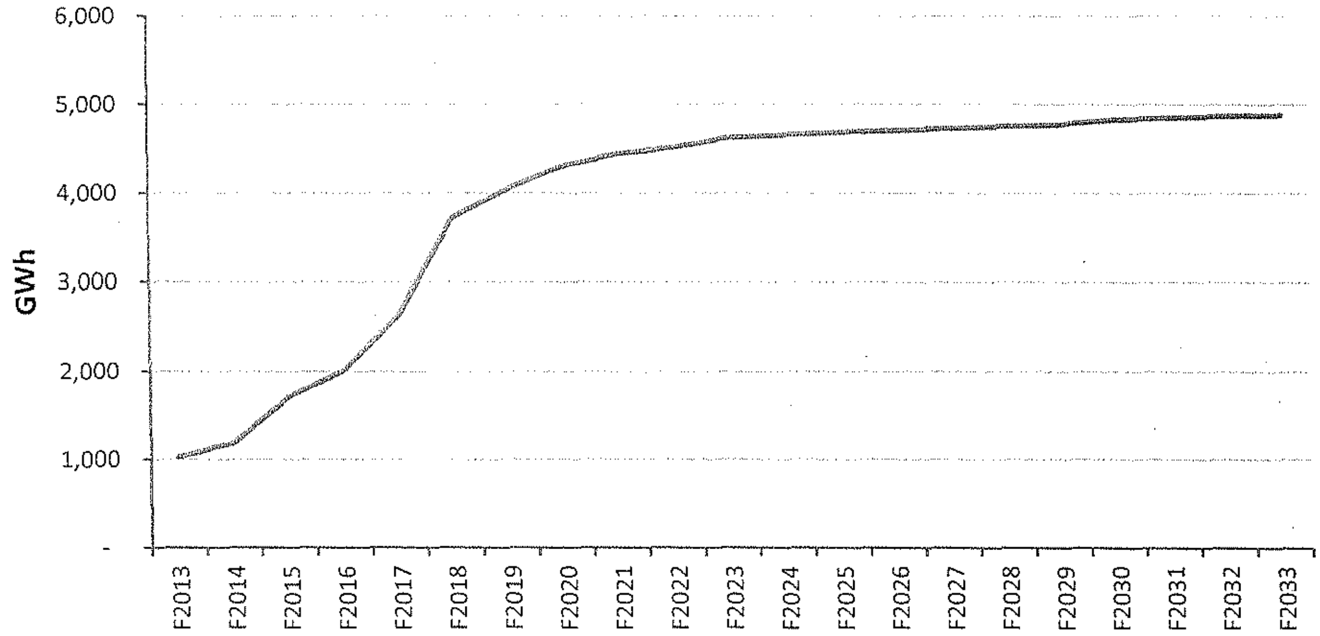
ENERGY:



BC hydro
FOR GENERATIONS

OIL AND GAS SUBSECTOR

ENERGY:
Before DSM



- The forecast anticipates substantial natural gas development potential, particularly in the Montney (Dawson Creek to Chetwynd) region.
- LNG is expected to foster this potential

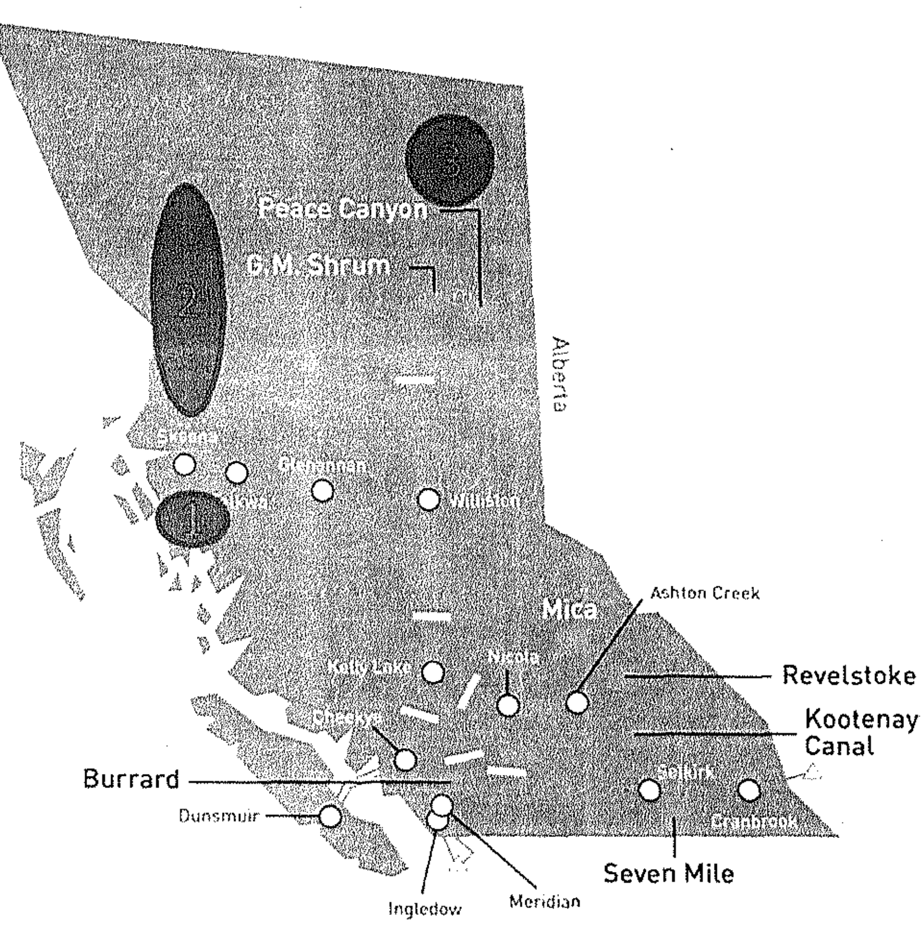
BC hydro
FOR GENERATIONS

MONITORING STRATEGIC LOAD GROWTH

- Unprecedented load growth potential in the North
- Driven by LNG, shale gas and mining developments

Legend

1. LNG facilities expected to be located in the Kitimat and Prince Rupert regions.
2. Mining expected to be interconnected to the Northwest Transmission Line and other potential mines in the North Coast region of B.C.
3. Integration of Fort Nelson & Electrification of Horn River Basin.



BC hydro

FOR GENERATIONS

SYSTEM OPTIMIZATION

BChydro
FOR GENERATIONS

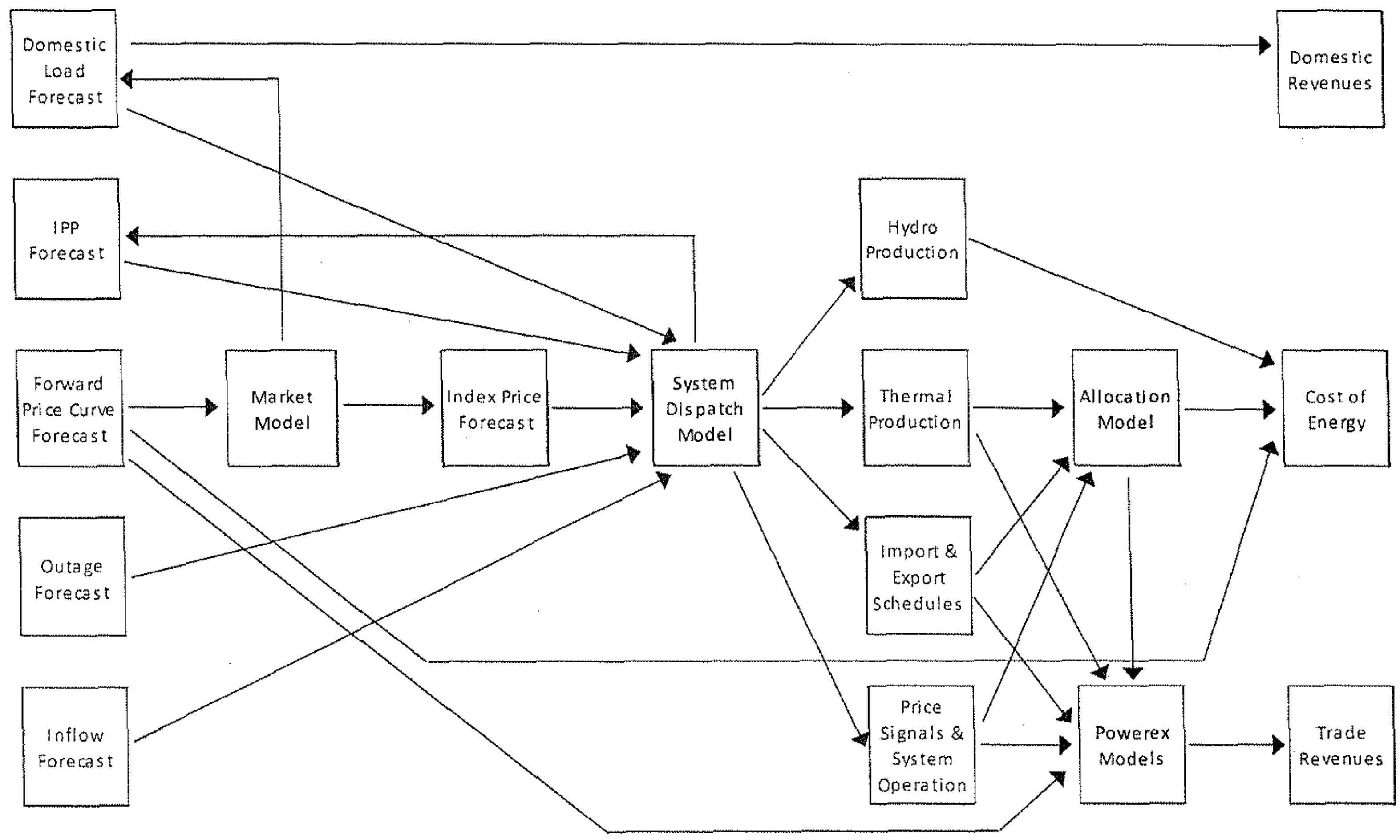
OPERATIONS PLANNING OVERVIEW

- System is optimized to maximize Net Revenue from Operations (Cost of Energy + System-Backed Trade Revenue)
- Forecast of Net Revenue from Operations is based on mean forecast and currently has + 400 / - 200 M CAD variability with 95% confidence interval
- Deferral Accounts are the regulatory vehicle to maintain optimal operations and limit customer rate volatility
- Operating for long term outcome, as opposed to annual target, does, over long term, create a benefit
- Operating to annual targets devalues multi-year storage, creates significant risk and given the large variability is not achievable under all situations

Note: Net Revenue from Operations =

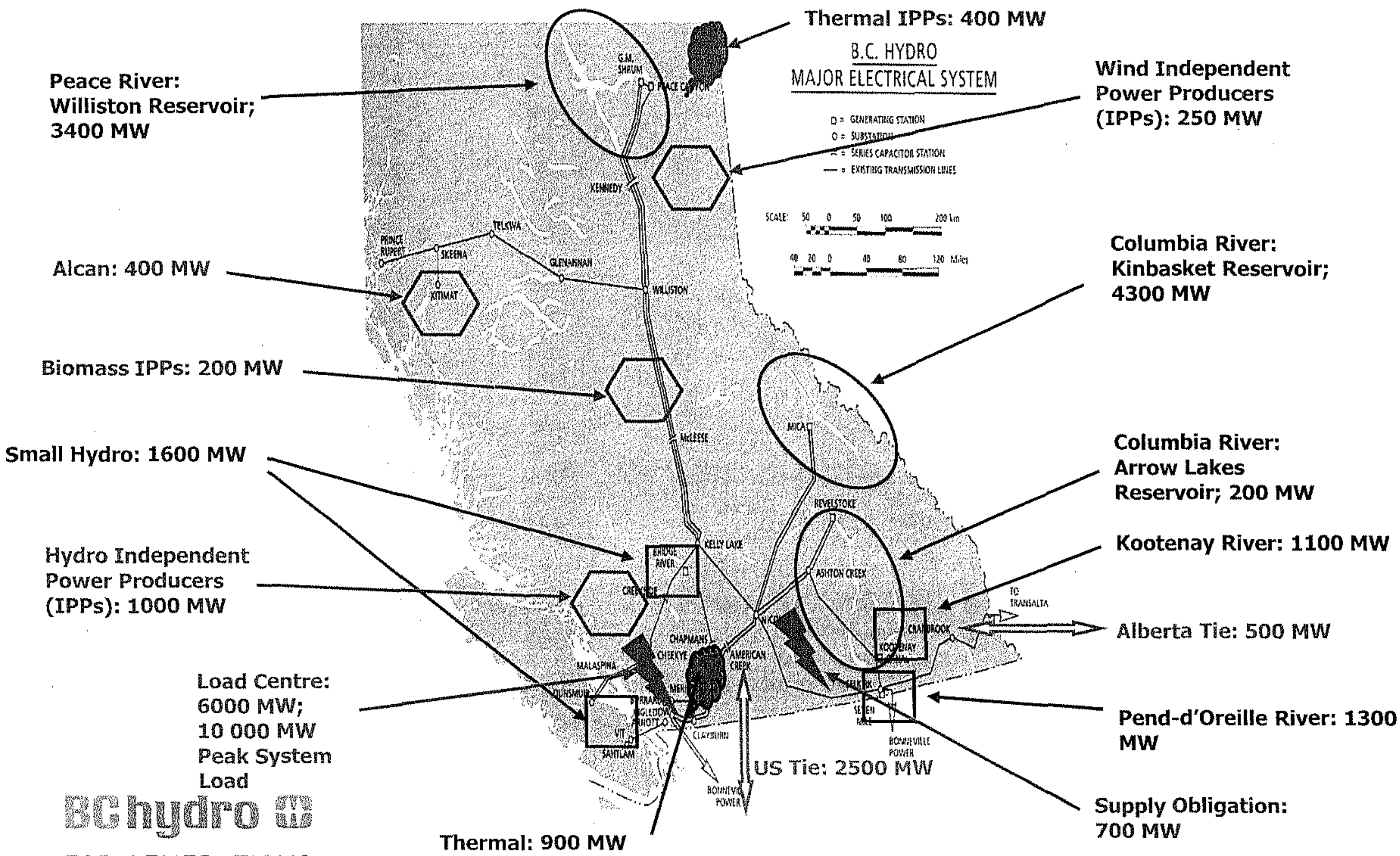
= revenue from billed sales + revenue from market electricity sales + net revenue from storage coordination agreements – cost of water rentals – cost of gas for thermal generation – cost of IPP EPA's – cost of market electricity purchases

OPERATIONS PLANNING PROCESS OVERVIEW



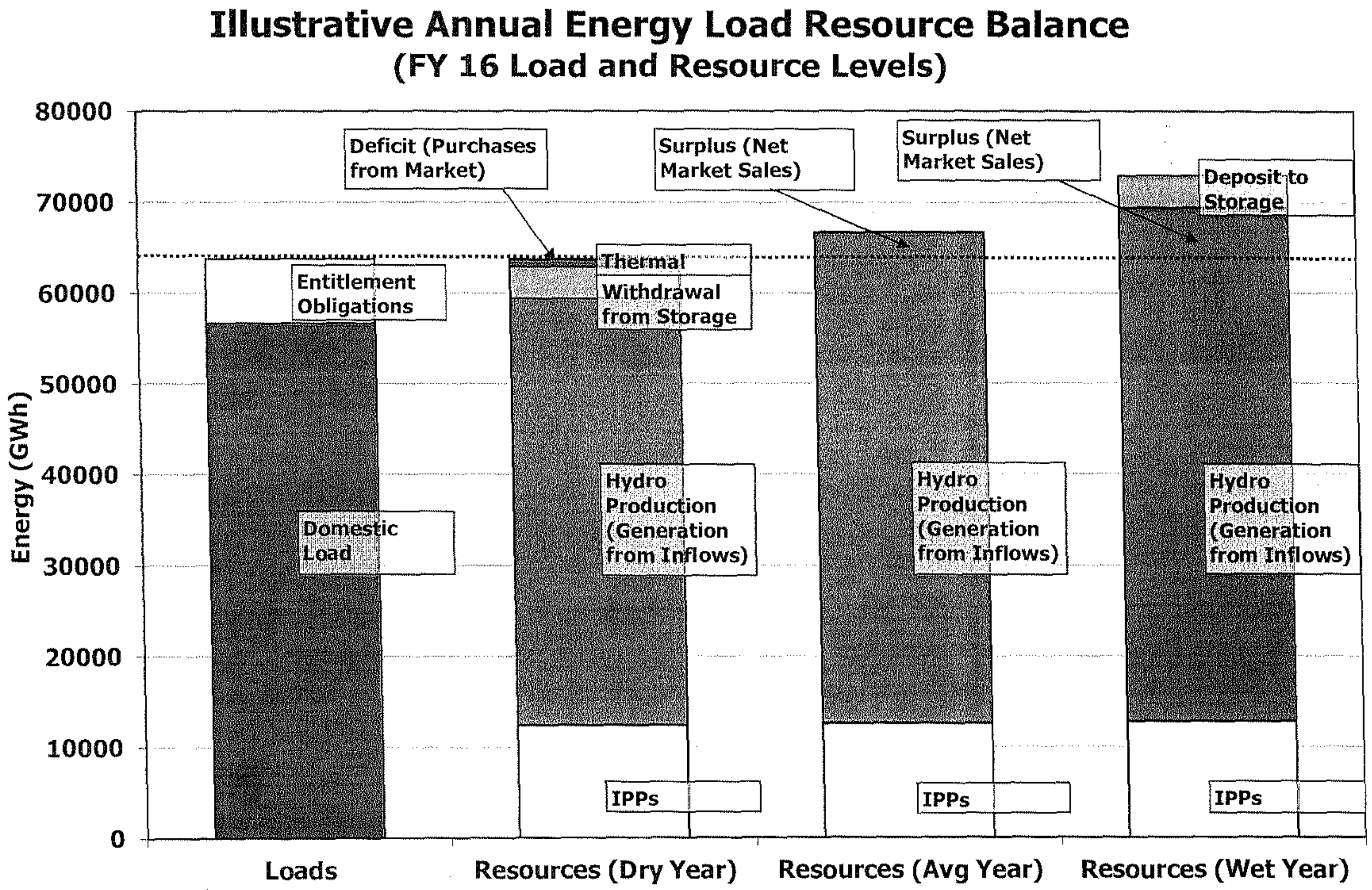
BC hydro
FOR GENERATIONS

OVERVIEW OF BC HYDRO SYSTEM



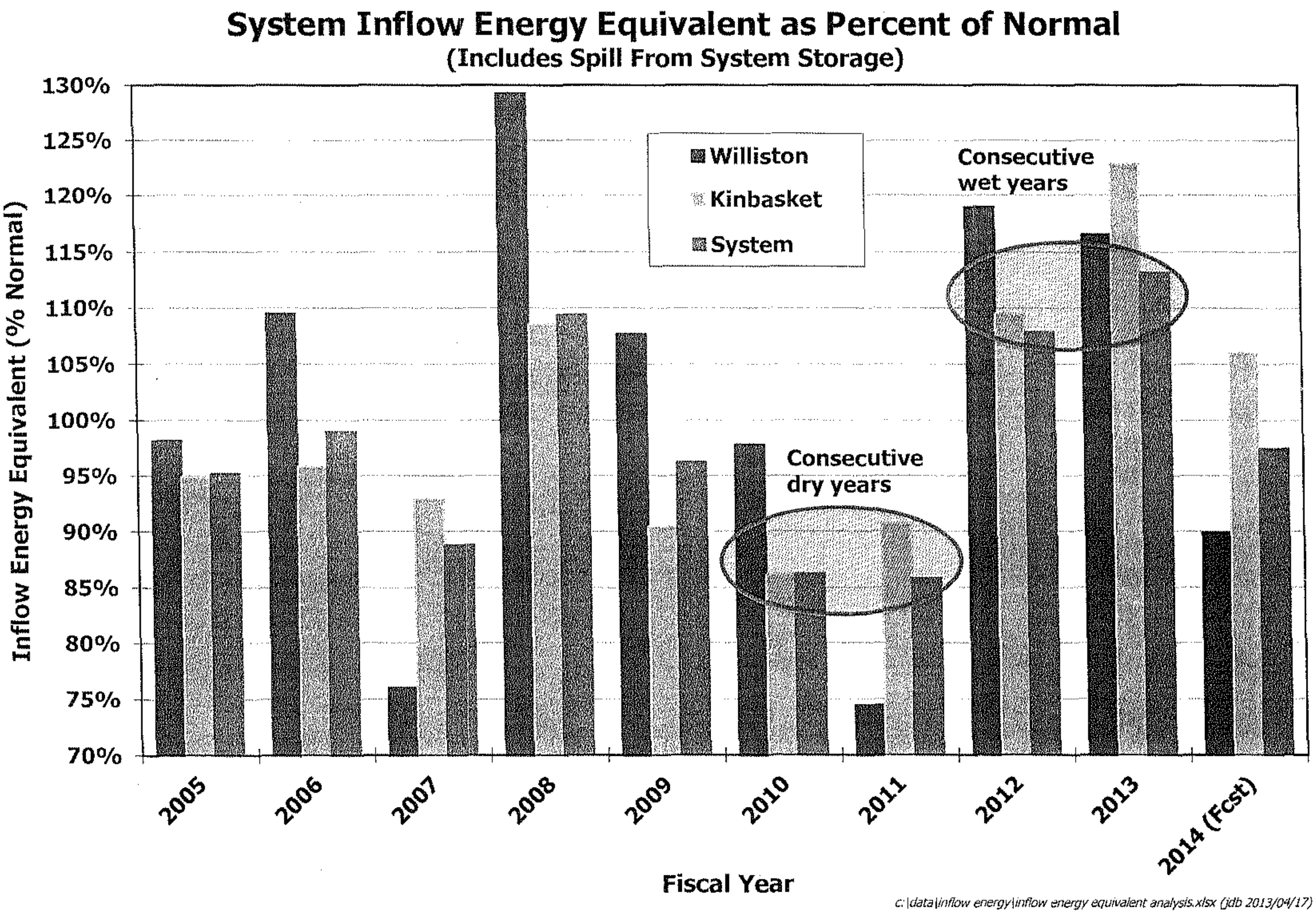
BC hydro
FOR GENERATIONS

SYSTEM LOAD-RESOURCE BALANCE



jdb\presentations\graphics\plots\lrb\LRB Picture.xlsx (J.D. Bonser 2013/08/13) 33

SYSTEM INFLOWS



CONSTRAINTS

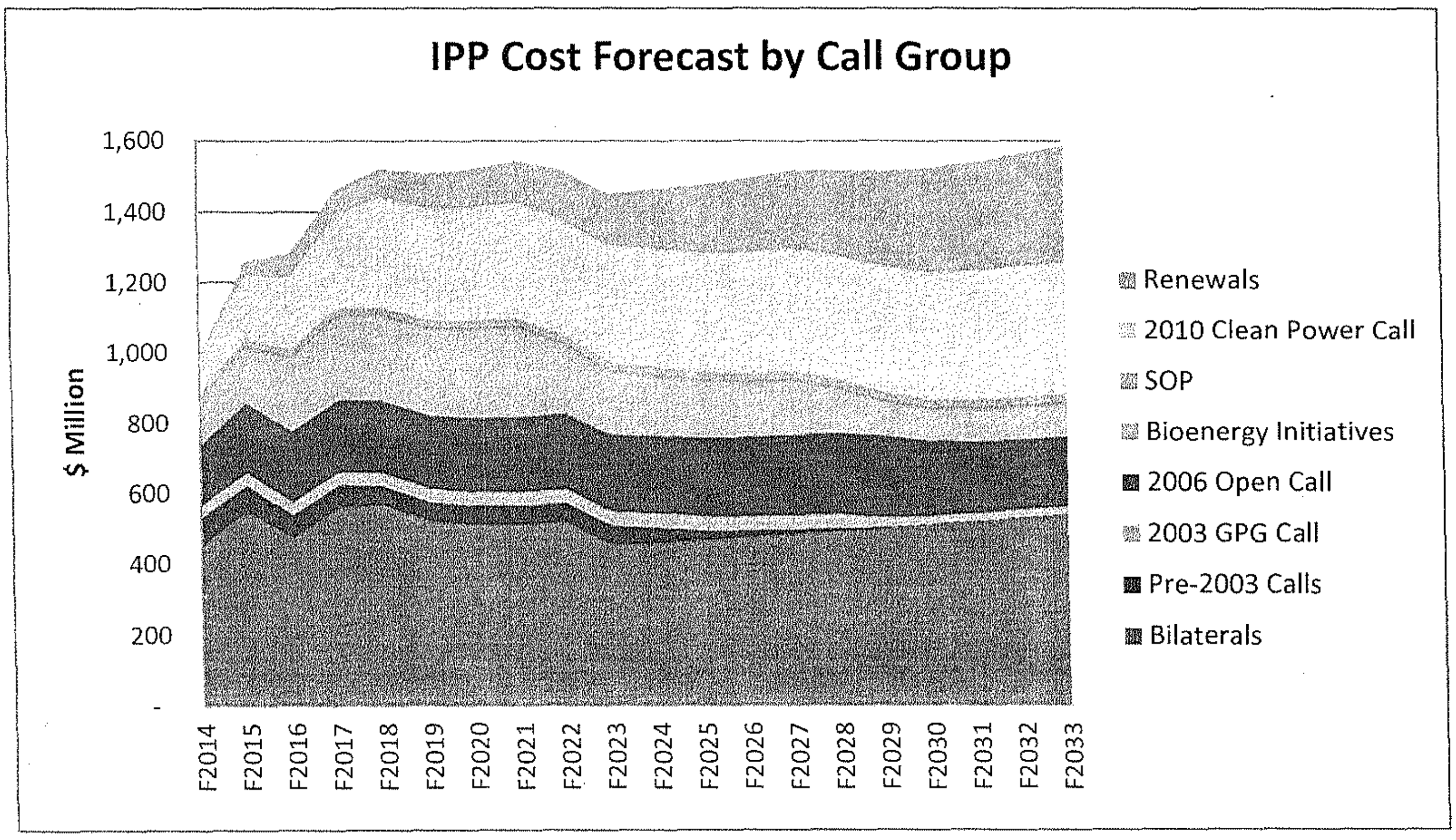
- Columbia River Treaty
- Water Use Plans
  - Williston Reservoir Minimum Levels (2150/47)
- Physical Limits including outage plans

BC hydro
FOR GENERATIONS

COST OF ENERGY: IPPs

BC hydro
FOR GENERATIONS

IPP ENERGY AND COSTS WILL CONTINUE TO INCREASE THROUGH F18



BC hydro
FOR GENERATIONS

PROFILE OF IPP PROJECTS

Status	# of Projects	Plant Capacity (MW)	Total Energy (GWh/y)
In-Service	81	3,498	15,217
Pre-COD Projects			
Under Construction	20	1,139	3,734
Deferred/Downsized	9	454	1,511
Potential for Deferral/Downsizing	6	202	1,095
Potential for Termination	4	38	157
Sub-Total Pre-COD	39	1,833	6,497
TOTAL	**120**	**5,331**	**21,714**
Terminated	**10**	**358**	**1,623**
TOTAL (incl. Terminated)	**130**	**5,690**	**23,337**

Note: Data for Terminations and Deferrals include projects where an Agreement in Principle is in place to terminate or defer COD. Total Energy amounts are before firming and attrition adjustments.

CONTRACT MANAGEMENT APPROACH

Existing EPAs represent a nominal commitment of $52B (attrition adjusted)

- **$32B** of that commitment relates to Pre-COD EPAs
- **$7B** of that commitment relates to projects that have been, or will be deferred, downsized or terminated by mutual consent
- Successful implementation would reduce commitments by about **$1B** present value

BC hydro
FOR GENERATIONS

CONTRACT MANAGEMENT APPROACH

Rates will be, on average, **1.2% lower**[1] than they otherwise would be in F2014 to F2022 , depending on how much of the contract commitments are actually fulfilled.

- Based on comparison of current expected contractual commitment versus expected commitment after implementation of plan
- Includes adjustment for resulting reduction in sales of surplus energy
- Largest benefit is expected in F2017 due to impact of deferrals

[1] This reduction is already included in the current rate forecast

BC hydro
FOR GENERATIONS

SESSION 2: CAPITAL, DRAFT AGENDA FOR DISCUSSION

ASSET MANAGEMENT AND PLANNING

PROJECT EXECUTION

OVERVIEW OF SPECIFIC PROJECTS

- Greater than $50 million

BChydro
FOR GENERATIONS

MacLaren, Les MEM:EX

From: Teasdale, Dawn <dawn.teasdale@bchydro.com>
Sent: September-03-13 1:12 PM
To: MacLaren, Les MEM:EX; Nikolejsin, Dave MEM:EX; Cochrane, Marlene MEM:EX
Cc: Teasdale, Dawn
Subject: Updated Electronic versions of session 2 materials
Attachments: Session 1 - Follow-Up.pdf; Rates Working Group Session 2 September 3 - FINAL2.pdf

Importance: High

Please find attached the electronic versions of session 2 materials.

Regards,

Melissa

Dawn Teasdale
Strategic Business Advisor

BC Hydro
333 Dunsmuir Street, 18th Floor
Vancouver, B.C. V6B 5R3

Office: 604.623.4410
Mobile: 604.617.2381
Fax: 604.623.4459
Email: dawn.teasdale@bchydro.com

bchydro.com

Government Working Group

Follow-up issues from Session No. 1

(Privileged and Confidential)

Issue/Question:

Provide details of the IPP projects under each of the "Status" references on the Profile of IPP Projects slides.

RESPONSE:

Attached is additional information on the differing IPP Projects under each status of Under Construction, Deferred/Downsized, Terminated, Potential for Deferral/Downsizing and Potential for Termination.

PROFILE OF IPP PROJECTS

Status	# of Projects	Plant Capacity (MW)	Total Energy (GWh/y)
In-Service	81	3,498	15,217
Pre-COD Projects			
Under Construction	20	1,139	3,734
Deferred/Downsized	9	454	1,511
Potential for Deferral/Downsizing	6	202	1,095
Potential for Termination	4	38	157
Sub-Total Pre-COD	39	1,833	6,497
TOTAL	**120**	**5,331**	**21,714**
Terminated	10	358	1,623
TOTAL **(incl. Terminated)**	**130**	**5,690**	**23,337**

Note: Data for Terminations and Deferrals include projects where an Agreement in Principle is in place to terminate or defer COD. Total Energy amounts are before firming and attrition adjustments.

BC hydro
FOR GENERATIONS

PROFILE OF IPP PROJECTS UNDER CONSTRUCTION

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BC hydro

FOR GENERATIONS

PROFILE OF IPP PROJECTS UNDER CONSTRUCTION

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BChydro
FOR GENERATIONS

PROFILE OF IPP PROJECTS UNDER CONSTRUCTION

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BC hydro
FOR GENERATIONS

PROFILE OF DEFERRED/DOWNSIZED IPP PROJECTS

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BC hydro
FOR GENERATIONS

Note: Data for Deferrals include projects where an Agreement in Principle is in place defer COD or downsize the project. Total Energy amounts are before firming and attrition adjustments.

PROFILE OF IPP TERMINATED PROJECTS

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BC hydro
FOR GENERATIONS

Note: Data for Terminations include projects where an Agreement in Principle is in place to terminate. Total Energy amounts are before firming and attrition adjustments.

PROFILE OF POTENTIAL DEFERRED/DOWNSIZED IPP PROJECTS

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BC hydro
FOR GENERATIONS

PROFILE OF IPP PROJECTS WITH POTENTIAL FOR TERMINATION

Name	Plant Capacity (MW)	Annual Production (GWh)	Comments

s.17, s.21

BC hydro
FOR GENERATIONS

Government Working Group

Follow-up issues from Session No. 1

(Privileged and Confidential)

Issue/Question:

Provide a table from the 2012 load forecast showing prospective new mines with in-service dates, mineral type, GWh load and probability of completion.

RESPONSE:

Please see the attached information.

Page 93 redacted for the following reason:
- - - - - - - - - - - - - - - - - - - -
s.17, s.21

Government Working Group

Follow-up issues from Session No. 1

(Privileged and Confidential)

Issue/Question:

How is residential utilization reflected in the load forecast? What assumptions are used? What is the trend in residential load? What is BC Hydro assuming for changing use per account for an existing, single-family house with gas heating on southern Vancouver Island?

RESPONSE:

The residential load forecast is included in the overall load forecast and is derived as the multiplication of a forecast of number of accounts times a use per account forecast. The forecast of the number of accounts is based on a projection of regional housing starts provided by a third party consultant. Demographic trends and immigration are the key drivers to the accounts forecast. With regard to predicting the use per account:

- **BC Hydro uses an end-use model that models residential consumption from the bottom-up. This is done by creating an inventory of important end-uses in the household (lighting, refrigeration, space heating, etc.) and predicting the penetration of these end-uses over time and the future efficiencies of these appliances. . The data used is derived from BC Hydro's own REUS (Residential End Use Study) and appliance efficiency and saturation level information from the US Energy Information Administration.**

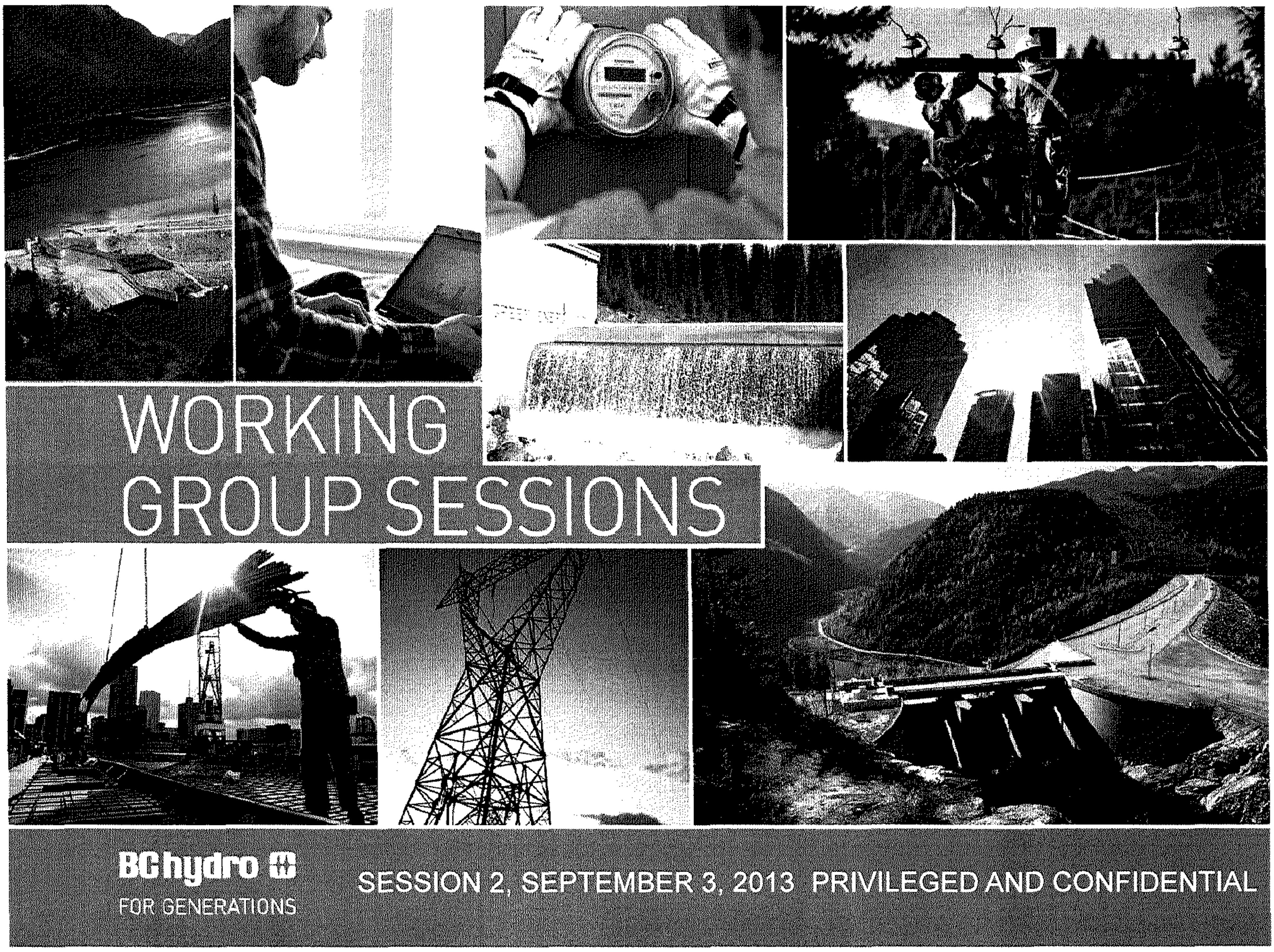
- **BC Hydro develops a use per account forecast from an aggregate model for each of its four major service regions specifically: the Lower Mainland, Vancouver Island, North and South. There is no specific projection developed for use per account by building type and heating type or below the four regions indicated above. Therefore BC Hydro has not developed a use rate forecast specifically for a single family house with gas heating on southern Vancouver Island.**

- **However, with regard to Vancouver Island, BC Hydro does forecast that the use per customer is expected to grow on average by 0.23% per annum over the 20 year forecast period. This is before DSM and other adjustments such as electric vehicles.**

- **Overall, BC Hydro assumes there is a slow reduction in percentage of electric space heating accounts (36.5% currently to 35.7% of accounts in 20 years - on a system level).**

- **According to BC Hydro's REUS, the saturation levels of all types of electric heating (i.e., furnace, secondary and heat pumps) increased in 2001 from 55.5% to 65.6% in 2012. This is specific to Vancouver Island, and is likely** due to the growth in multi-family residences, which are more likely to be electrically heated.

BC Hydro's residential customer load has been trending steady and future load growth overall is expected to be maintained at 1.8% per year before Demand Side Management, compounded over the next twenty years. Most of this growth is due to growth in the projected number of accounts.


WORKING
GROUP SESSIONS
BC hydro
FOR GENERATIONS
SESSION 2, SEPTEMBER 3, 2013 PRIVILEGED AND CONFIDENTIAL

AGENDA

FOLLOW UP FROM SESSION 1	CHARLES REID
INTEGRATED RESOURCE PLAN	CHRIS O'RILEY
ASSET MANAGEMENT	CHRIS O'RILEY GREG REIMER
PLANNING	CHRIS O'RILEY GREG REIMER
PROJECT EXECUTION	CHRIS O'RILEY GREG REIMER
OVERVIEW OF SPECIFIC PROJECTS	CHRIS O'RILEY GREG REIMER
SITE C	SUSAN YURKOVICH

BChydro
FOR GENERATIONS

FOLLOW UP FROM SESSION 1

BChydro
FOR GENERATIONS

FOLLOW UP FROM SESSION 1

- Profile of IPP Projects

s.17, s.21

- Residential utilization and load forecast
- Forecast demand in comparison to gas demand forecast (Session 3)
- Mining load forecast
- BC Hydro LNG load forecast compared to provincial LNG load forecast
- Rate design and residential inclining block (Session 5)
- Demand Side Management (Session 4)

BC hydro
FOR GENERATIONS

INTEGRATED RESOURCE PLAN

BC hydro
FOR GENERATIONS

ABOUT THE INTEGRATED RESOURCE PLAN

The IRP is a long-term plan to meet future growth in electricity demand, including from LNG industry.

- Includes energy conservation, clean energy generation, and management of current energy supply.
- Addresses provincial objectives (e.g., achieving self-sufficiency, reducing GHGs, supporting economic development and job creation).
- Upon approval of IRP, the BCUC must consider and be guided by the IRP.

PLANNING PROCESS

BC Hydro's long-term planning process is undertaken every 2-3 years.

- Process includes updating long-term load forecast and reviewing supply side options.
- Load forecast based on a number of factors (e.g., population, GDP, weather, technology, conservation programs, etc.).
- BC Hydro uses mid-load forecast (i.e., an equal probability that actual load could be higher or lower).
- BCUC has reviewed and accepted BC Hydro's load forecast methodology.

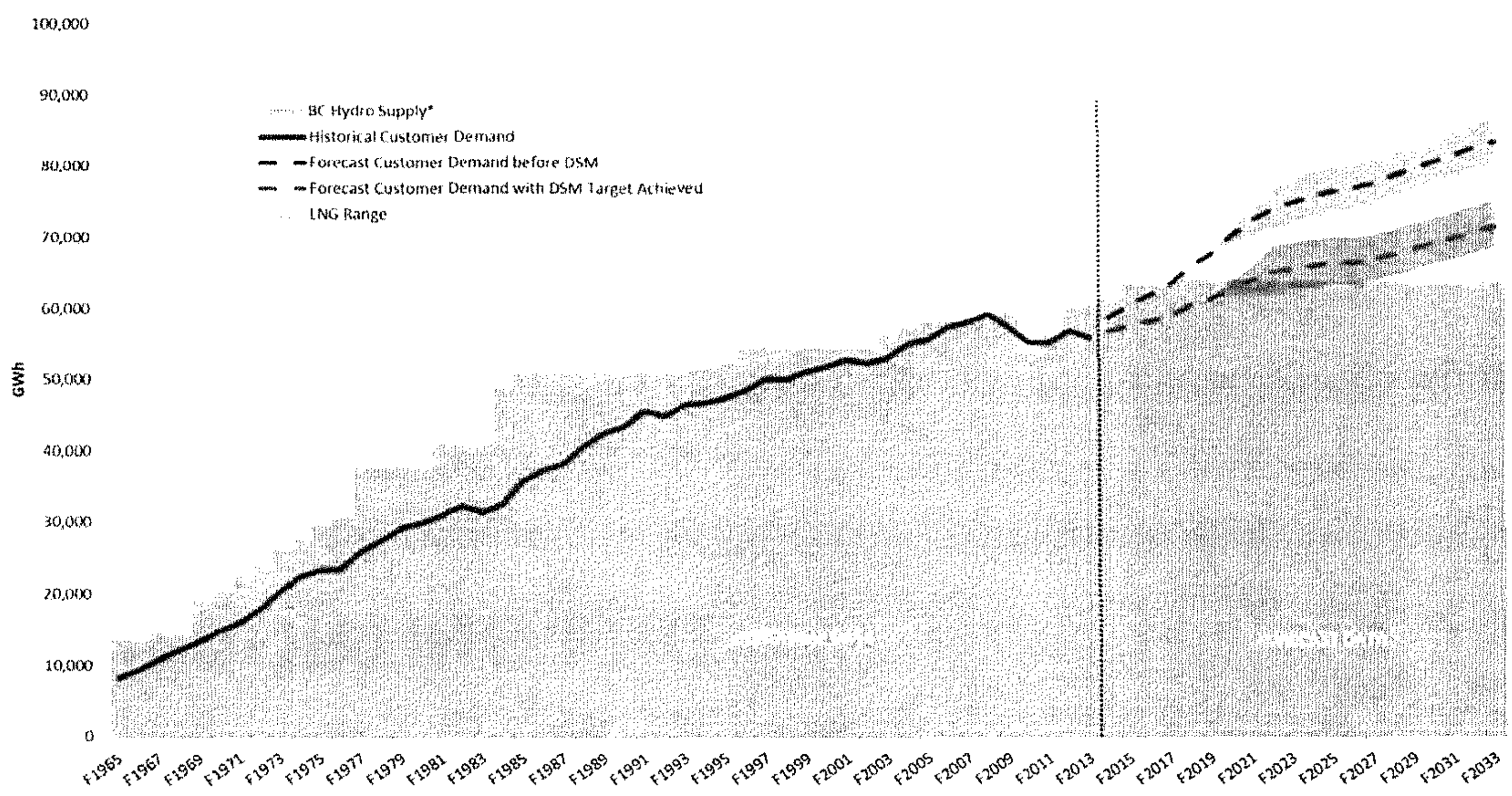
PUBLIC AND ABORIGINAL CONSULTATION

There was extensive consultation on the IRP throughout 2011 and 2012.

- BC Hydro held 27 regional multi-stakeholder meetings, 17 open houses, and provided comprehensive consultation guides to encourage on-line engagement.
- First Nations were also consulted through 17 workshops.
- A Technical Advisory Committee was engaged to provide more in-depth feedback from various special interests.
- BC Hydro is prepared to conduct further public consultation on the IRP as directed by the Province.

GROWING DEMAND

Demand for electricity is expected to increase by approximately 40% over the next 20 years. LNG will further increase this demand.



* The drop in BC Hydro supply in F2010 is a result of removing Burrard Thermal Generating Station from the planning stack pursuant to the October, 2009 Direction 2 to the BC Utilities Commission.

SUPPORTING LNG

As the LNG industry develops, BC Hydro will continue to support the needs of this sector.

- Approximately a dozen LNG projects proposed for Kitimat, Prince Rupert, north coast, Howe Sound and Vancouver Island.
- BC Hydro will be able to supply the initial 3,000 GWh/year of LNG load and will prepare to meet further requirements as they emerge.
- While most LNG producers will use natural gas to run the compression process, many are expected to use electricity for ancillary requirements (e.g., lighting, offices and control systems).
- Others may choose electricity for all their electricity needs.

RESOURCE GAP

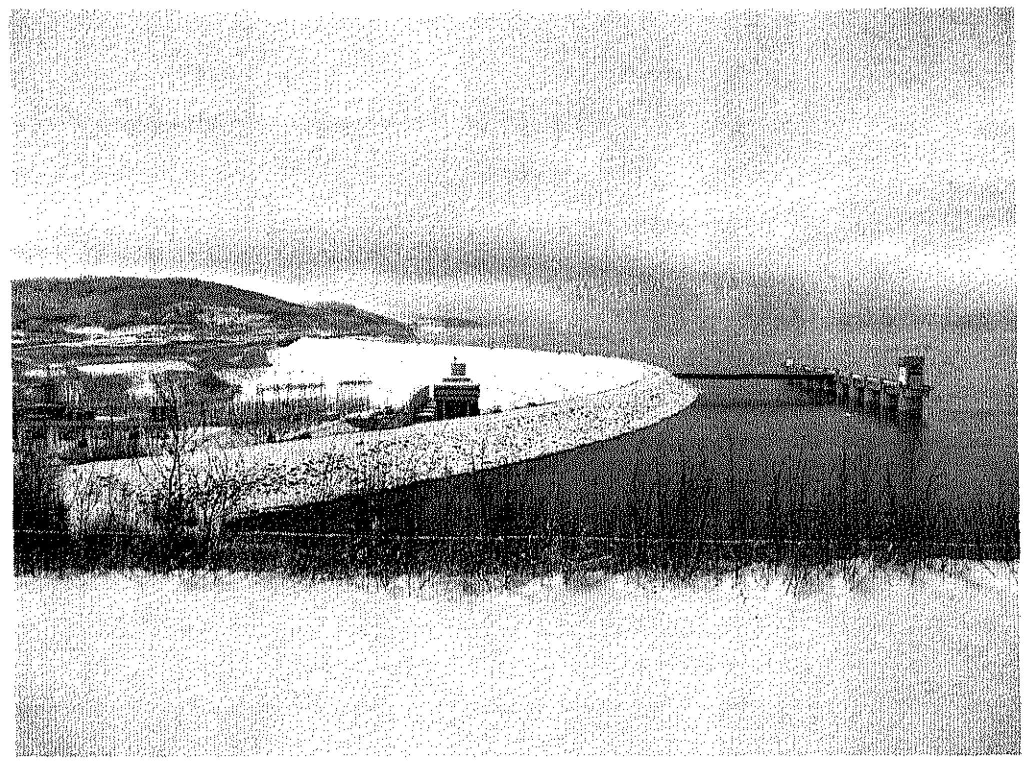
BC Hydro is forecasting a need for energy resources in F2018 and capacity resources in F2016, before conservation measures, and including LNG.

- Beginning in F2018, BC Hydro is forecasting energy deficits of:
  - 1,200 GWh (F2018)
  - 10,300 GWh (F2023)
  - 18,900 GWh (F2033)
- Beginning in F2016, BC Hydro is forecasting capacity deficits of:
  - 400 MW (F2016)
  - 2,100 MW (F2023)
  - 4,100 MW (F2033)
- BC Hydro is facing potentially large increases of industrial load on the North Coast and in the northeast.

CLOSING THE GAP

BC Hydro's IRP recommends energy conservation, clean electricity generation, and careful management of current energy supply resources.

- Conserving first
- Meeting future electricity needs
- Managing resources
- Planning for the unexpected
- Meeting LNG supply needs



BC hydro
FOR GENERATIONS

CONSERVING FIRST

Conservation is the first and best choice to meet future demand growth.

- BC Hydro plans to save 7,800 GWh per year through conservation and energy efficiency by F2021 – the equivalent of reducing new demand by approximately 75%.
- Recommended actions include:
  - Moderate current spending and maintain long-term target.
  - Implement a voluntary industrial load curtailment program.
  - Explore more codes and standards.

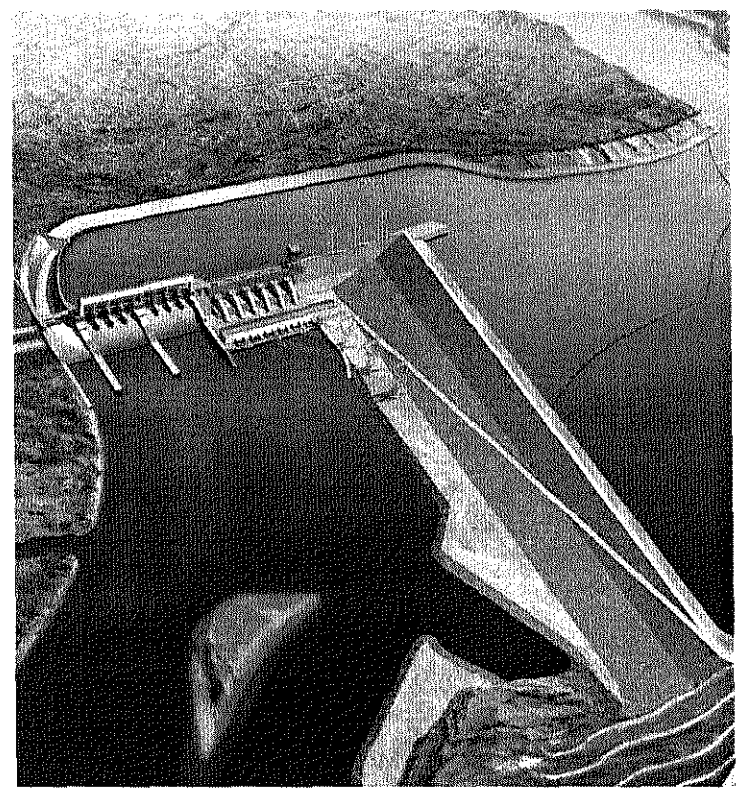
BC hydro

FOR GENERATIONS

MEETING FUTURE ELECTRICITY NEEDS

BC Hydro is planning to address long-term need for energy and capacity.

- Recommended actions include:
  - Continue to advance Site C for earliest in-service date of F2024.
  - Pursue bridging options for capacity (e.g., market purchases and power from the Columbia River Treaty).
  - Advance reinforcement along existing GM Shrum-Williston-Kelly Lake 500 kV transmission lines for F2024.
  - Reinforce South Peace Regional Transmission Network.

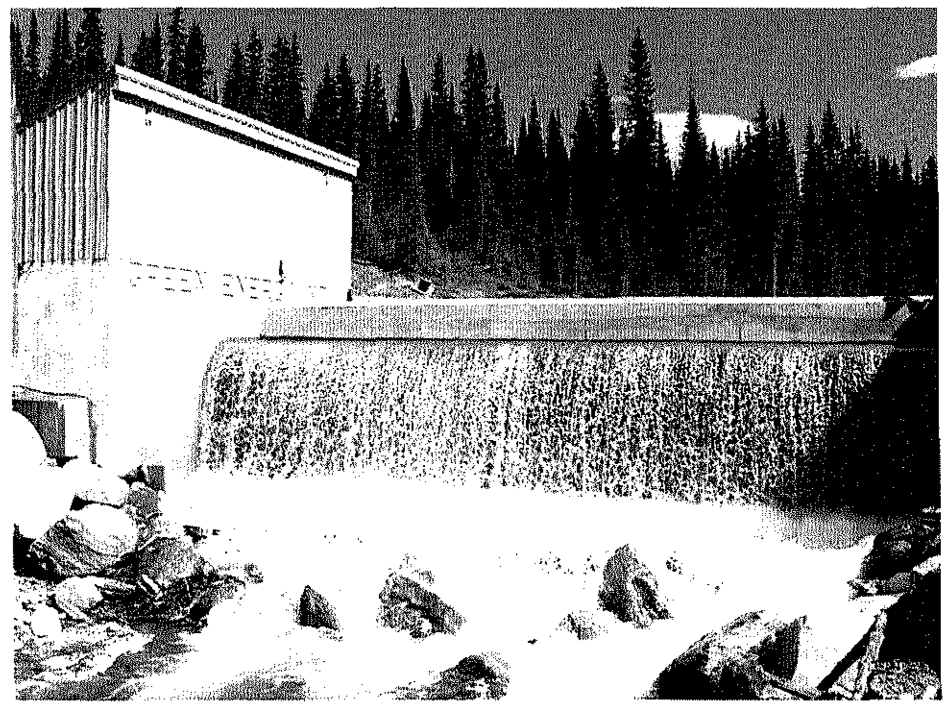


BC hydro
FOR GENERATIONS

MANAGING RESOURCES

BC Hydro is managing costs to keep rates among the lowest in North America.

- IPP power currently provides about 20% of customer electricity needs.
- Recommended actions include:
  - Optimize existing portfolio of IPP resources.
  - Investigate customer incentive mechanisms.

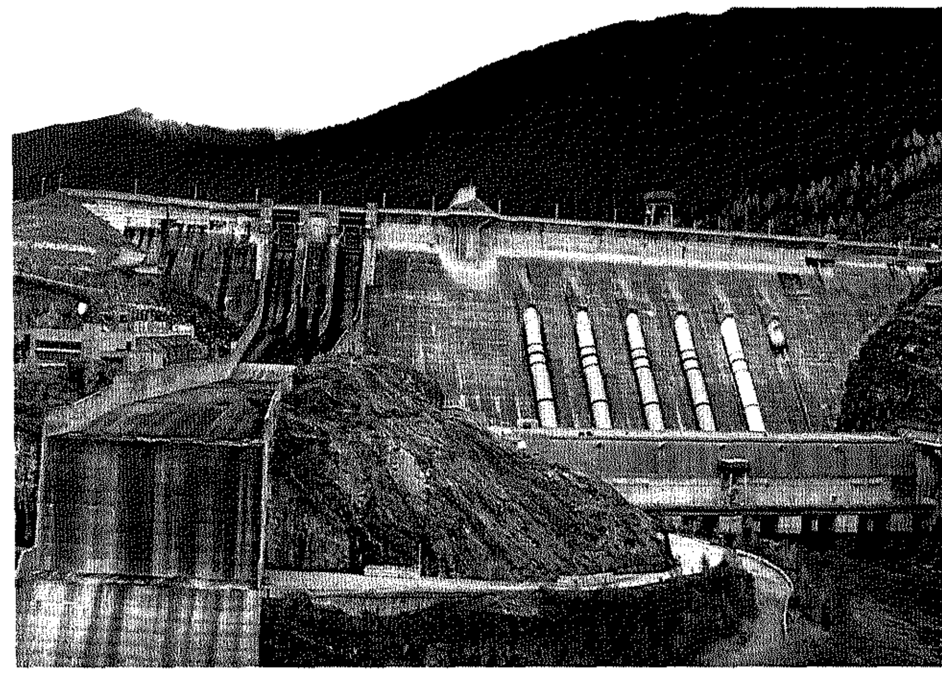


BC hydro
FOR GENERATIONS

PLANNING FOR THE UNEXPECTED

BC Hydro will continue to explore and advance capacity resource options for contingency purposes.

- Recommended actions include:
  - Advance Revelstoke 6 for F2021 to add 500 MW.
  - Advance GM Shrum upgrades for F2021 to add 220 MW.
  - Investigate natural gas generation for capacity.
  - Investigate Fort Nelson area supply options.



MEETING LNG SUPPLY NEEDS

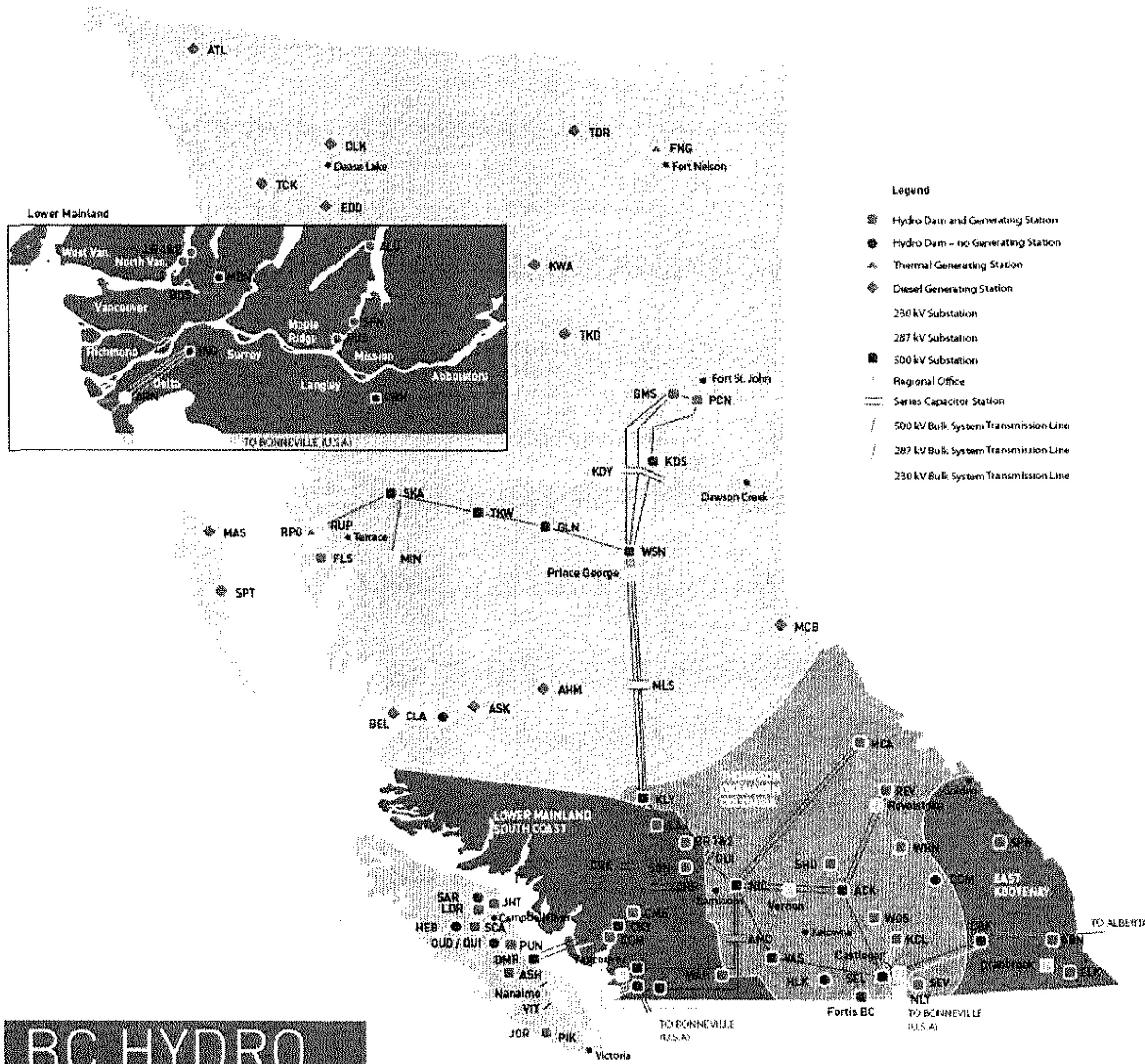
BC Hydro will continue to prepare to meet further load requirements for LNG as they emerge.

- Recommended actions include:
  - Explore natural gas supply options on the north coast
  - Explore clean energy solutions, should the LNG industry's needs exceed existing and committed supply.
  - Advance reinforcement of 500 kV transmission line from Prince George to Terrace.
  - Explore options for Horn River Basin and northeast gas industry

ASSET MANAGEMENT

BC hydro
FOR GENERATIONS

BC HYDRO SYSTEM



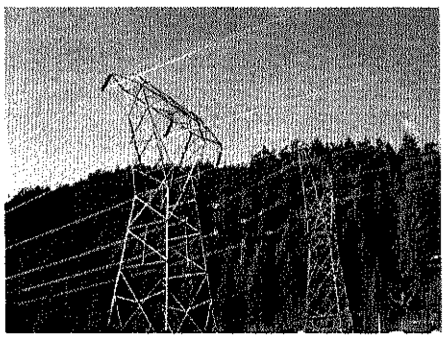
BC HYDRO SYSTEM MAP

- 30 hydro-electric + 3 thermal generation stations
- 89 generating units
- 75+ dams and civil structures
- Over 18,500km of transmission lines
- Over 55,000km of distribution lines
- Approx. 300 substations
- Approx. 900,000 utility poles
- Approx. 325,000 individual transformers
- Interconnections with Alberta and US

REINVESTMENT IN THE SYSTEM

- BC Hydro "Big Build" Era was in the 1960s, 70s and 80s. Rate increases in the 1970s and 1980s reflected this growth in the system.
- After the "Big Build" there were a number of years with little investment. There were also no rate increases for a decade, starting in 1993.
- Today, BC Hydro's facilities are aging:
  - For example, the turbines at GM Shrum were originally installed in 1968. The units provide 23% of BC Hydro's generation.
- B.C.'s population and economy are growing
  - The population is expected to grow by nearly 30% in 20 years, to about 5.7 million
  - Residential electricity use expected to increase by 50%
  - Unprecedented load growth potential in the North driven by LNG, shale gas, and mining developments

DRIVERS AND CONSIDERATIONS



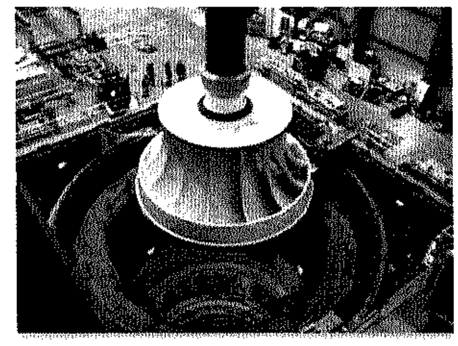
Dam Safety & Seismic Resiliency

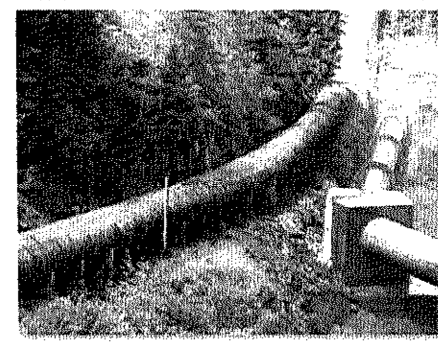
Load Growth

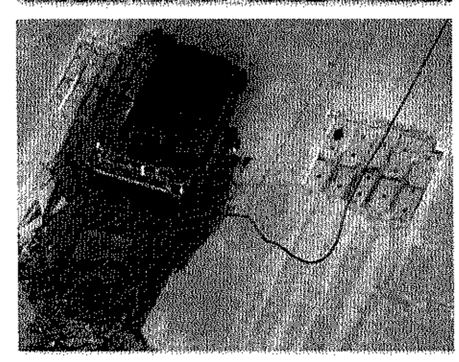
Aging Assets/ Asset Condition

Financial & Rates

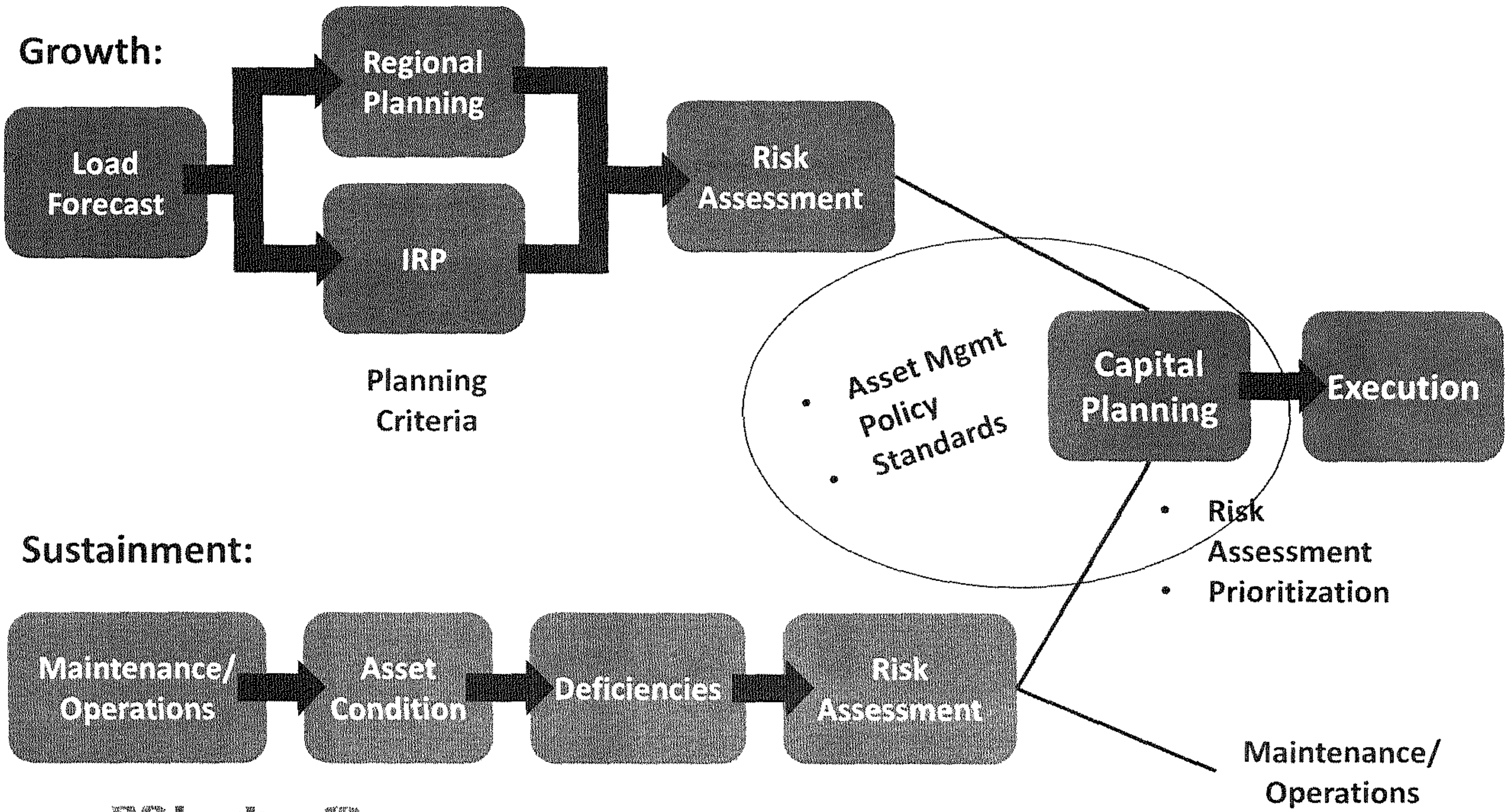
Capacity of BC Hydro





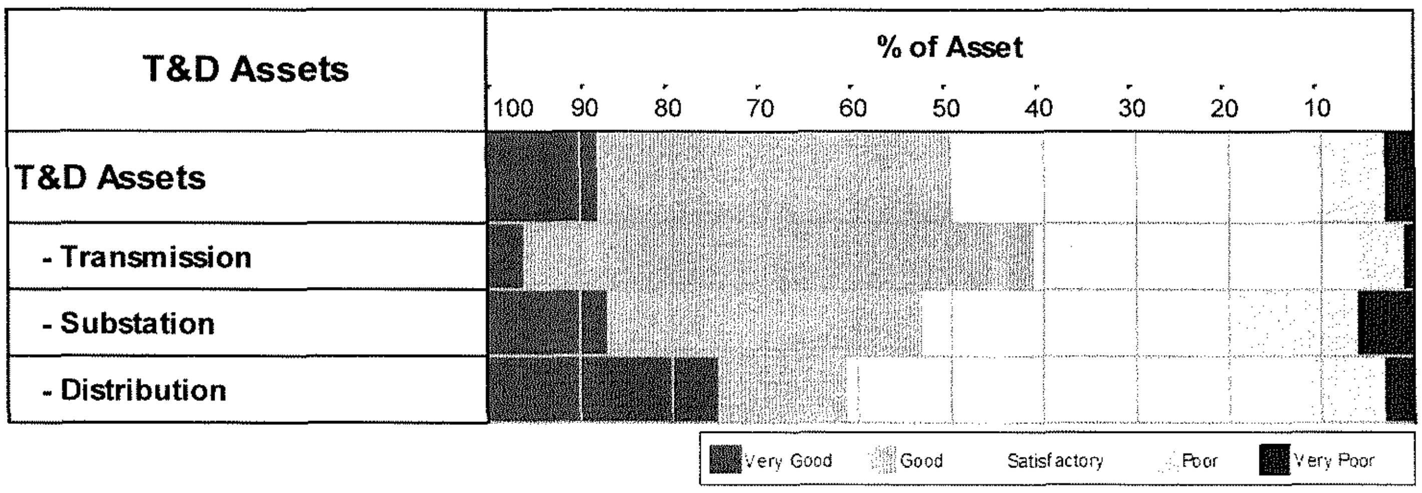


ASSET MANAGEMENT FRAMEWORK



BC hydro
FOR GENERATIONS

TRANSMISSION AND DISTRIBUTION



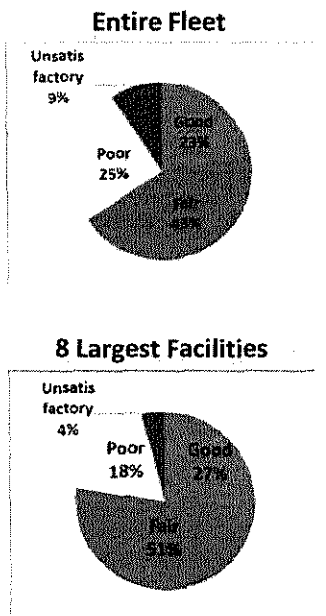
Transmission Capital Plan

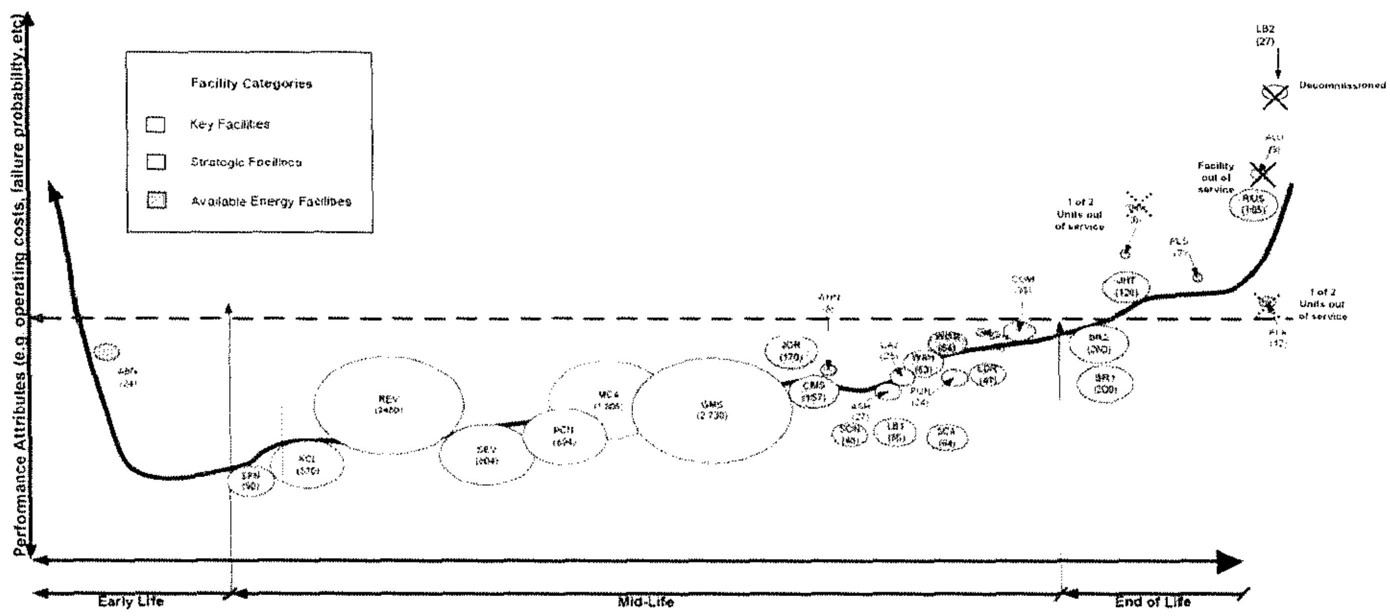
- Serve new load growth
- Interconnect new generation and transmission customers
- Address deteriorating asset condition and performance
- Address safety, environmental, extreme weather, fire, security risks

Distribution Capital Plan

- Serve new load growth
- Interconnect new generation and distribution customers
- Address deteriorating asset condition and performance
- Address safety and environmental risk

GENERATION

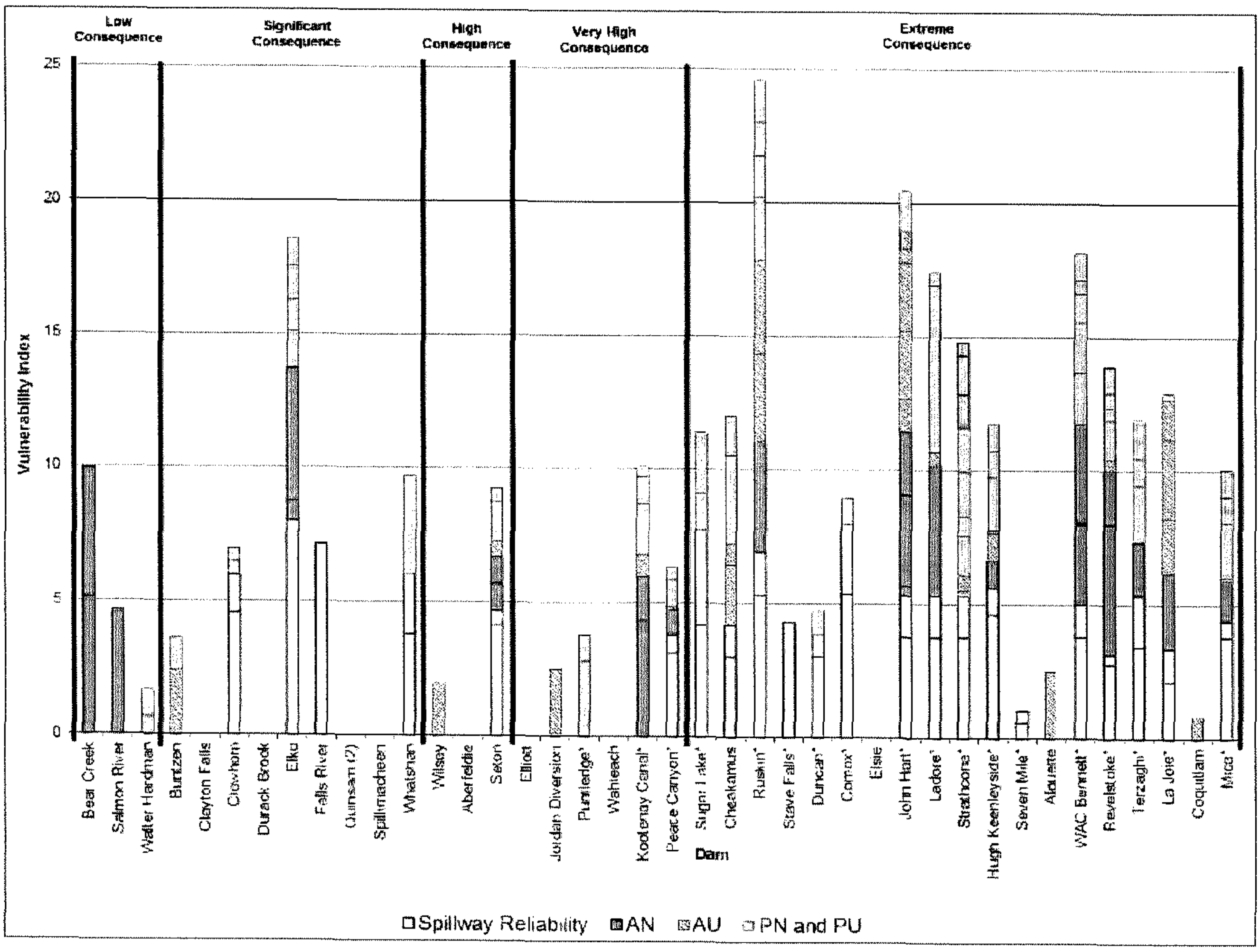




Generation Capital Plan

- Generation capacity growth
- Dam Safety risks (flood, seismic and asset condition)
- Deteriorating condition and performance of major equipment
- Entire facilities approaching or exceeding the end of life
- Mitigating water passage risks (including penstocks)

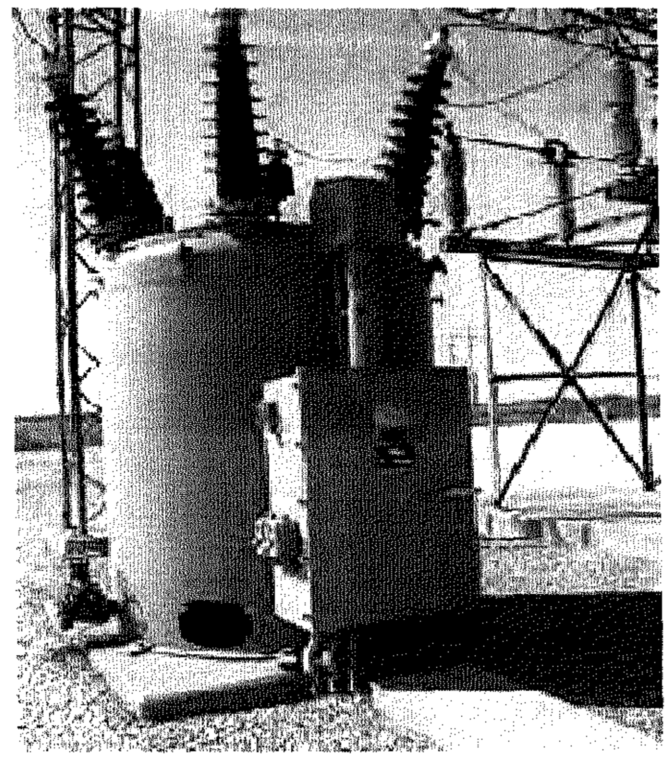
BC HYDRO DAM SAFETY RISK, F14 Q1

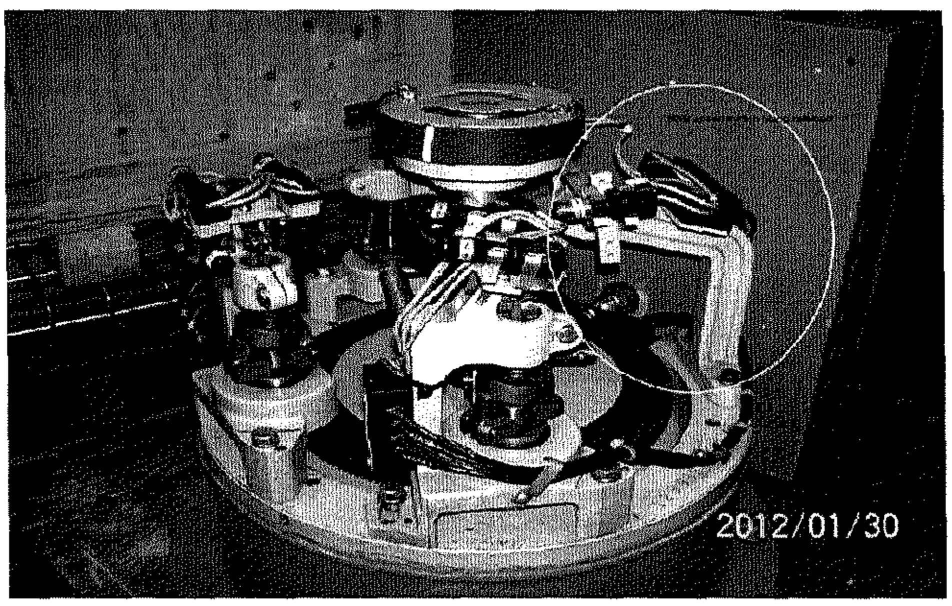


25

GENERATION: MAINTENANCE VS. CAPITAL

- Kootenay Canal - Replace Units 1 to 4 Speed Switches
- Jordan River - Replace Unit Circuit Breakers
- Strathcona – Replace Units 1 and 2 Cooling Water Valves





GROWTH AND SUSTAINMENT PROJECTS

10 YEAR CAPITAL PLAN	T&D	GENERATION
GROWTH	$4.4 B	$0.2 B
SUSTAINMENT	$4.8 B	$5.4 B

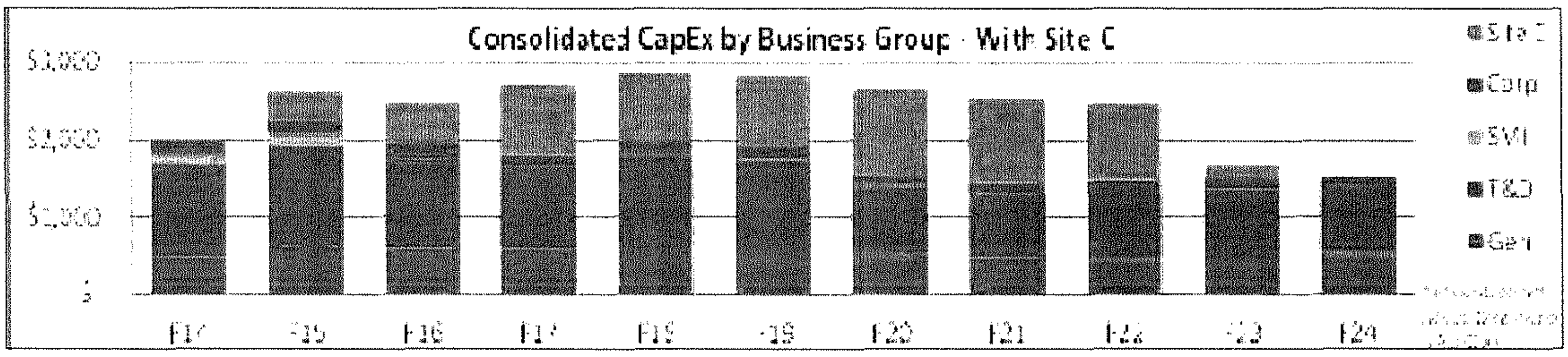
BC hydro
FOR GENERATIONS

PLANNING

BChydro
FOR GENERATIONS

10 YEAR CAPITAL PLAN OVERVIEW

- BC Hydro prepared a 10 Year Capital plan in F12 and updates it annually. Board will review this year's plan in November 2013.
- BC Hydro committed to provide the BCUC a 10 year forecast of capital needs by the time of the submission of F15-F16 RRA.
- The first two years of the 2013 10 Year Capital Plan (F15 and F16) will inform the capital expenditures in the F15-F16 RRA.
- BC Hydro is forecasting capital expenditures, on average, of $1.7 B/Yr. excluding Site C, over the next 10 years ($2.4 B/Yr. including Site C),
- 2013 Plan is reduced by approx. $2.5B from 2012 10 Year Plan over F14-F22.
- Of the approximately $5B in capital additions in F15-F16, there is approximately $2.4B going into service in F15 and $2.6B going into service in F16.



CORPORATE RISK MATRIX

BC Hydro CAPITAL ALLOCATION Risk Matrix

FREQUENCY (YEARLY)	FREQUENCY OF CONSEQUENCE		S1	S1.5	S2	S2.5	S3	S3.5	S4	S4.5	S5	S6	S7
f ≥ 100	At least 100 times every year	L9	10		12		12		13		14	15	16
10 ≤ f < 100	At least 10 times every year	L8			10		11		12		13	14	15
1 ≤ f < 10	At least once every year	L7					10		11		12	13	14
1/3 ≤ f < 1	At least once every 3 years	L6.5							10.5	11.0	11	12	13
1/10 ≤ f < 1/3	At least once every 10 years	L6							10.0	10.5			
1/30 ≤ f < 1/10	At least once every 30 years	L5.5									10	11	12
1/100 ≤ f < 1/30	At least once every 100 years	L5											
1/300 ≤ f < 1/100	At least once every 300 years	L4.5									9	10	11
1/1K ≤ f < 1/300	At least once every 1,000 years	L4											
1/3K ≤ f < 1/1K	At least once every 3,000 years	L3.5										9	10
1/10K ≤ f < 1/3K	At least once every 10,000 years	L3											
1/100K ≤ f < 1/10K	At least once every 100,000 years	L2										8	9
1/1M ≤ f < 1/100K	At least once every 1,000,000 years	L1											8

CONSEQUENCE TYPE		CONSEQUENCE SEVERITY S1	S1.5	S2	S2.5	S3	S3.5	S4	S4.5	S5	S6	S7
Safety	Worker	First Aid		Treatment by Medical Professional		Temporary Disability		Permanent Disability		Fatality	Multiple Fatalities	
	Public	Near Miss		First Aid		Treatment by Medical Professional		Temporary Disability		Permanent Disability	Fatality	Multiple Fatalities
Environmental *		Low impact		Moderate impact		Moderate to High impact		High impact		Very high impact	Extreme impact	
Financial Loss		$10K to $30K	$30K to $100K	$100K to $300K	$300K to $1M	$1M to $3M	$3M to $10M	$10M to $30M	$30M to $100M	$100M to $1B	$1B to $10B	> $10B
Reputational *		Limited complaints to company or shareholder		Negative local profile		Small but vocal minority of customers critical		Many customers critical		Loss of trust- strategic change imposed by regulator and/or shareholder	Loss of consent to operate	
Reliability	Supply	N/A		N/A		Require voluntary load reduction		Localized load shedding		Significant load shedding required	BC load shedding spreads to WECC	
	Customer (hours lost per event)	< 1.5K	1.5K to 5K	5K to 15K	15K to 50K	50K to 150K	150K to 500K	500K to 1.5M	1.5M to 5M	5M to 50M	50M to 500M	> 500M

Risk Zone	Risk Communication Guidelines
	Detailed analysis and discussion within business group at EVP or SVP level. Input from Executive Team generally should be sought.
	Analysis and discussion within business unit, with decision making at Senior Manager level. Consider seeking input from EVP or SVP.
	Risk generally analysed and discussed within business group, with decision making at Manager level.

Purpose of the Risk Matrix

1. To provide a standard representation of the results of risk analyses for use in the evaluation and communication of risks.

2. As a risk governance tool, The Risk Zone relates to the level of management discussion to aid in decision-making.

3. Not used to describe risk tolerance.

4. A comparison of differing risks may also be conducted based on the Risk Levels.

To use the Risk Matrix

1. Select the Consequence Type.

2. Select the highest appropriate Consequence Severity.

3. Select the Frequency level of the Consequence Type and Severity.

4. Plot the Consequence severity and Frequency level pair to determine the Risk Level and associated Risk Zone.

5. Based on the Risk Zone, review Risk Communication Guidelines to determine action.

NOTE: The rigour of analysis in analyzing consequence and frequency should be commensurate with the Risk Zone. This may be an iterative process.

ASSESSMENT OF RISK

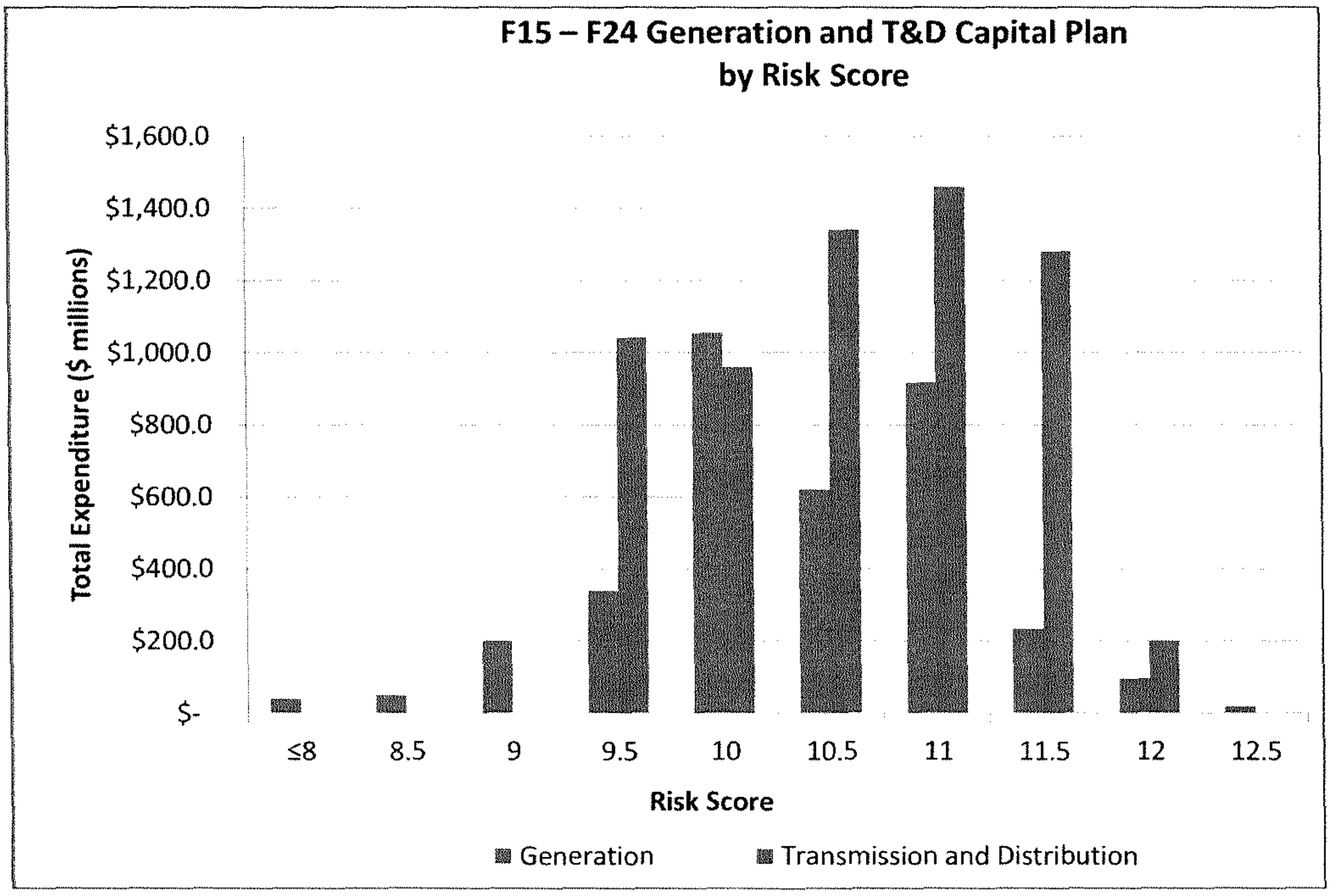
Application of Prioritization Framework to calculate risk scores and provide a consistent representation of risk across the organization

- Each investment is assigned a risk score associated with postponing the investment by three years from the current timing
- Comparison of similar investments
- Comparison of investments with the same risk score
- Verification and challenging of the proposed investments, including timing

BC hydro
FOR GENERATIONS

ASSESSMENT OF RISK

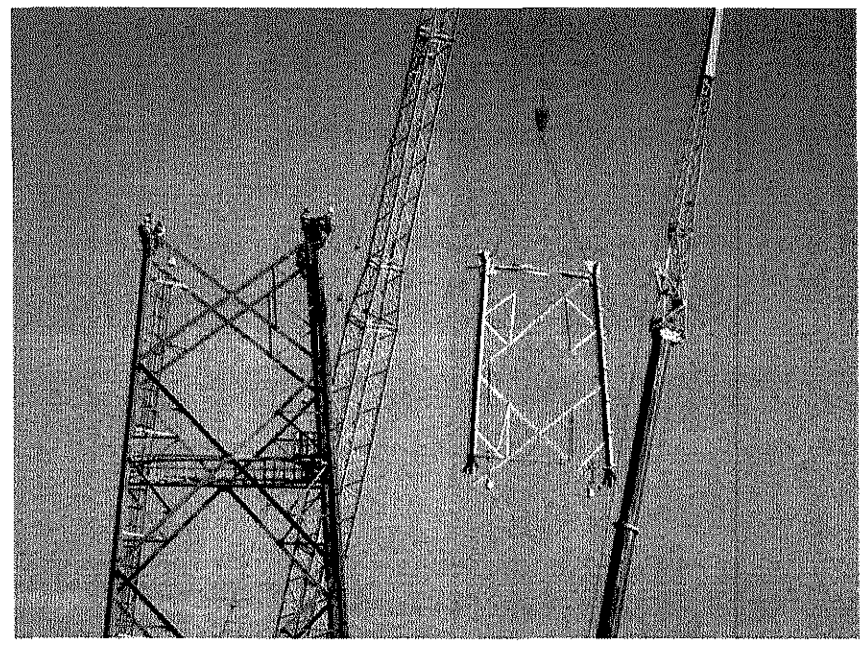
The total F15 to F24 expenditures associated with each risk score are shown below.



RISKS: EQUIPMENT FAILURES

Downtown Vancouver Outage (July 2008)

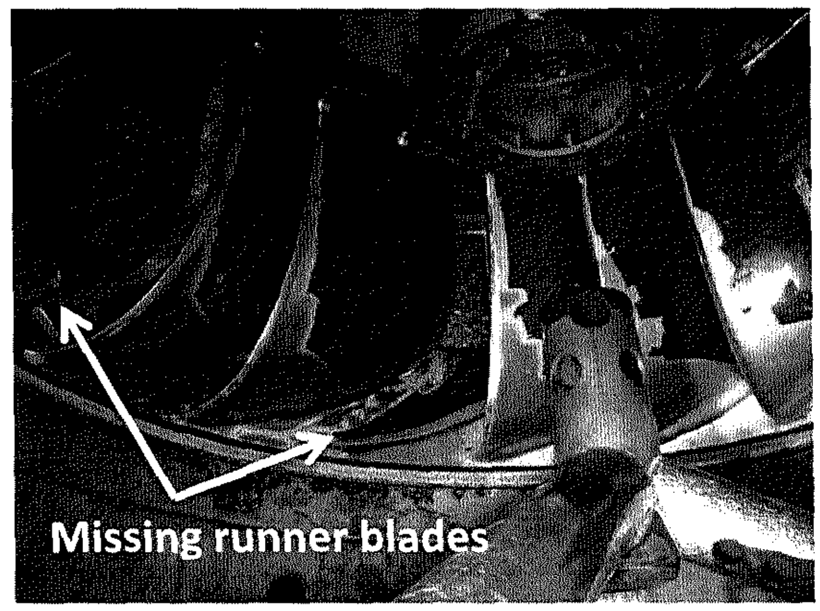
- Caused by overheated connector in a manhole that caused a chain reaction fire and explosion that led to the failure of 13 other circuits in the manhole
- BC Hydro crews removed and replaced nearly 4 km of underground cable to restore power
- Some customers out of power from July 14 8:54am to July 17 at 6:00pm



Fraser Tower Failure (July 2011)

- Catastrophic loss of 230 kv tower structure
- Damage to neighbouring 500 kv tower foundation
- Emergency repairs: $28 M
- Operating costs: $8 M

RISKS: EQUIPMENT FAILURES



Mica Unit 4 Exciter Failure and Fire
- Fortunately, no one injured
- Unit (450 MW) forced out of service for 3 months

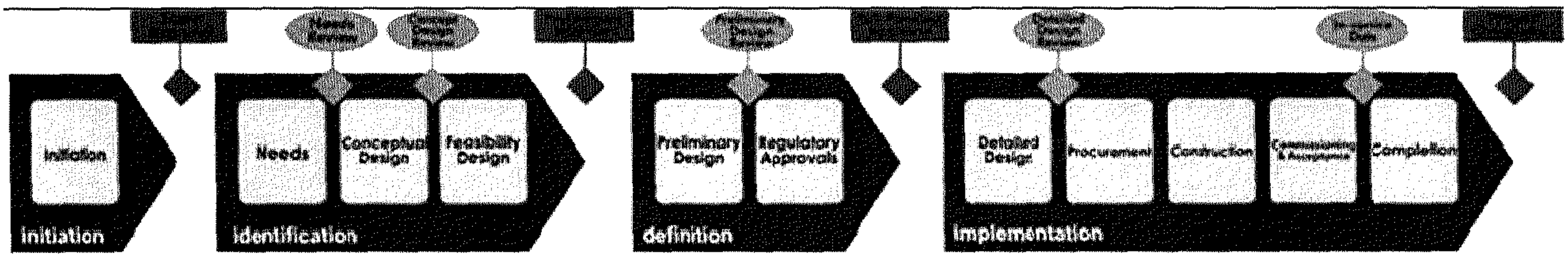
GM Shrum Unit 3 Turbine Failure
- Catastrophic failure of turbine runner in March 2008
- Damage to runner and other parts of turbine (seals, wicket gates)
- Unit forced out of service for 13 months
- Cost of repairs (excluding opportunity costs) was $27 million

BC hydro
FOR GENERATIONS

PROJECT EXECUTION

BC hydro
FOR GENERATIONS

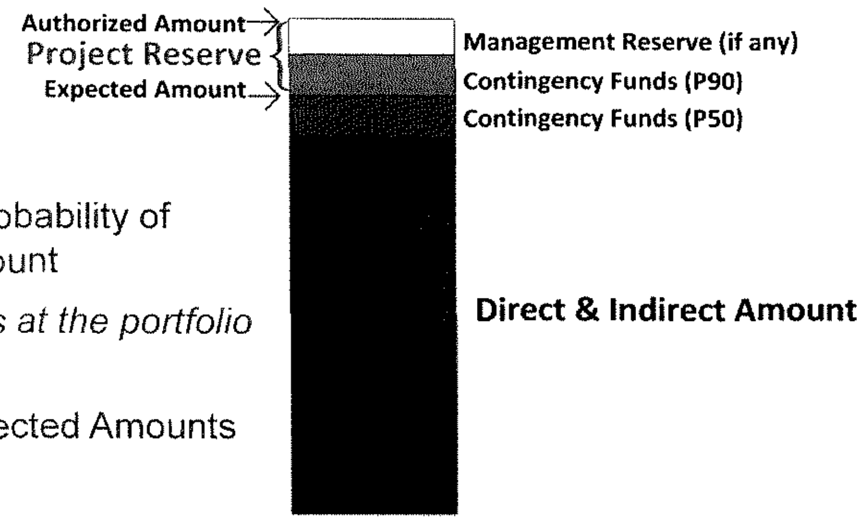
PROJECT MANAGEMENT FRAMEWORK



- Well-established standard Project Lifecycle and practices
- Clear decision gates with extensive senior management and Board involvement
- Incorporates all Capital Project and Planning recommendations from 2011 Government review

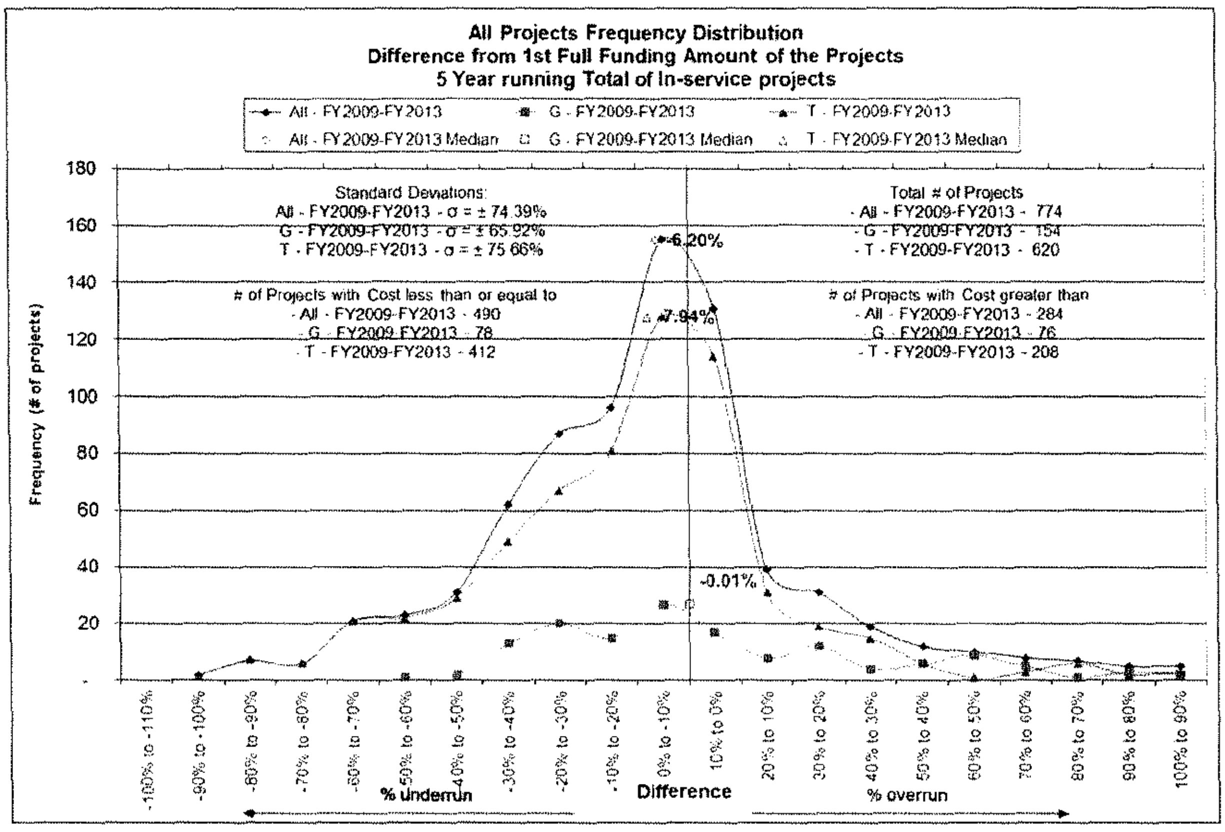
PROJECT BUDGETING

- Probabilistic estimating approach applies industry best practices
- Project budgets approved at two levels:
  - **Expected Amount**
    - Budget available to Project Manager
    - Includes contingency funding to provide 50% probability of completing project at or below the specified amount
    - *Set to provide lean budgets and lower variances at the portfolio level*
    - Annual Capital Plans are built up based on Expected Amounts
  - **Authorized Amount**
    - Budget including Project Reserve that must be released by Board committee or senior management
    - Provides 90% probability of completing project at or below the specified amount
    - May include management reserve for specific risks or events
- Change control and reporting process in place for all contingency draws



BC hydro
FOR GENERATIONS

BUDGET PERFORMANCE



Across all 774 projects >$1 million completed in last five years

- Total cost of $9 million less than the original budget of $3.30 billion (99.74%)
- 63% of projects completed below Expected Amount
- Median project was 6.2% below Expected Amount

GOVERNANCE

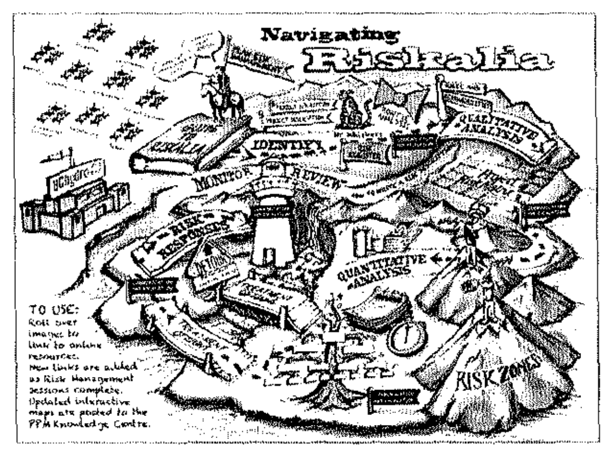
- Business decisions on project need, scope, budget, schedule are made by senior management, separate from persons responsible for delivering project

Project Authorized Amount	Approval Required
> $3 million	Executive Vice-President
> $6 million	Chief Financial Officer
> $20 million	Chief Executive Officer
> $50 million	Board of Directors

- Generation and Transmission projects above $100 million require BCUC approval unless exempted under *Clean Energy Act*
  - CPCN approvals typically require quarterly or twice-yearly reports to the BCUC
- Monthly review of project status and risks with Project Manager, Executive and/or senior management
- Quarterly review of projects over $20 million with Board capital committee

SYSTEMS

- Well-documented practices available online for employees and external partners
  - ~ 1 million page views
- SAP costing and Primavera P6 scheduling tools
  - Includes resource-loaded forecasts in dollars and hours
- SharePoint-based project sites allow for internal and external collaboration
  - Integrated Change Control and Lessons Learned processes to share knowledge between projects
- Risk management systems in accordance with mixture of Project Management Institute and ISO 31000 standards
  - All projects have comprehensive risk register updated at least monthly



REGULATORY AND FIRST NATIONS

- Practices include comprehensive Safety, Environmental, Regulatory, Stakeholder and Aboriginal Relations practices
- Very few projects are significantly negatively impacted by such issues

First Nations

- MOU between Province and BC Hydro on First Nations consultation provides clear processes and facilitates permitting while upholding honour of the Crown
  - Coordinated consultation raises awareness early in project lifecycle, reduces duplication and minimizes risk of inadequate consultation
- BC Hydro costs for First Nations consultation and accommodation in line with Canadian utility standards
- BC Hydro continues to strengthen relationships with First Nations
  - $144 million in strategic procurement opportunities negotiated in F2013

PROCUREMENT

- New Standard Form Construction Contract documents developed collaboratively with the Independent Contractor's Business Association and other groups
- Continued progress on Supplier Engagement Review initiatives and engagement
  - Timely payment of invoices was a common point of frustration. In F2013 BC Hydro paid 95% of invoices on time, compared to 66% the year before
- Long-term capital plans shared with key supplier groups to allow them to be better prepared and to enhance competitive interest in BC Hydro projects

PROCUREMENT

- BC Hydro Owner's Engineer model being implemented to ensure effectiveness of increasing use of external engineering resources while remaining a Knowledgeable Owner.
- A number of successful smaller B.C. and Canadian contractors working successfully with BC Hydro, e.g. Dent, FMI, HMI, Westpac.
- Increasing interest from and participation by international construction firms, e.g. Peter Kiewit International, Fleur, Barnard, Dragados.
- In F2013 and F2014, BC Hydro has received an average of just over 5 submissions for each of the construction RFx's, a number that industry research has concluded delivers competitive pricing.

DELIVERY MODELS

BC Hydro uses a range of delivery models to work with the design, equipment and construction contractor community

Model	Example	Benefits
Design-Build-Finance-Rehabilitate (P3)	• John Hart Replacement	• Performance specifications allow innovation • Increased cost and schedule certainty
Design-Build	• North West Transmission • Interior to Lower Mainland Transmission • Spillway Gates Program	• Access specialized design and construction knowledge • Transfer of performance and productivity risk
Design-Bid-Build	• Columbia Valley Transmission • Ruskin Dam and Powerhouse Redevelopment • Mica Units 5&6	• Minimize cost impacts of as-found and ground conditions during construction on brownfield site • Effective integration between civil and powertrain contractors and BC Hydro operations

PROCUREMENT STRATEGIES

Within high-level delivery strategies, different procurement strategies are integrated to address specific challenges and opportunities

Model	Example	Benefits
Partnerships	• SNC and AMEC Long Term Agreements • Spillway Gates Program	• Knowledge of BC Hydro standards and processes built over multiple projects • Open, transparent processes for managing costs reduce construction contract risks
Pre-Qualification & Blanket Contracting	• Strathcona Intake Tower Seismic Upgrade • Line Contractor • Design Services	• Confirm technical ability to successfully construct complex and tight tolerance work • Allow efficient procurement of design and construction resources across multiple projects and maintenance work
Select Award	• Wahleach Rock Trap Access	• Allow targeted procurement through First Nations businesses
Work Bundling & Optional Pricing	• Transformers, Circuit Breaker, Governors, Exciters • Distribution Pole Replacement Program	• Minimizes procurement and bid costs for BC Hydro and contract community • Increases competitive interest through volume of work
Early Contractor Involvement	• John Hart North Earthfill Dam Repair • Ruskin Right Abutment Seismic Upgrade	• Allow development of standards, specifications and cost estimates based on recent industry experience

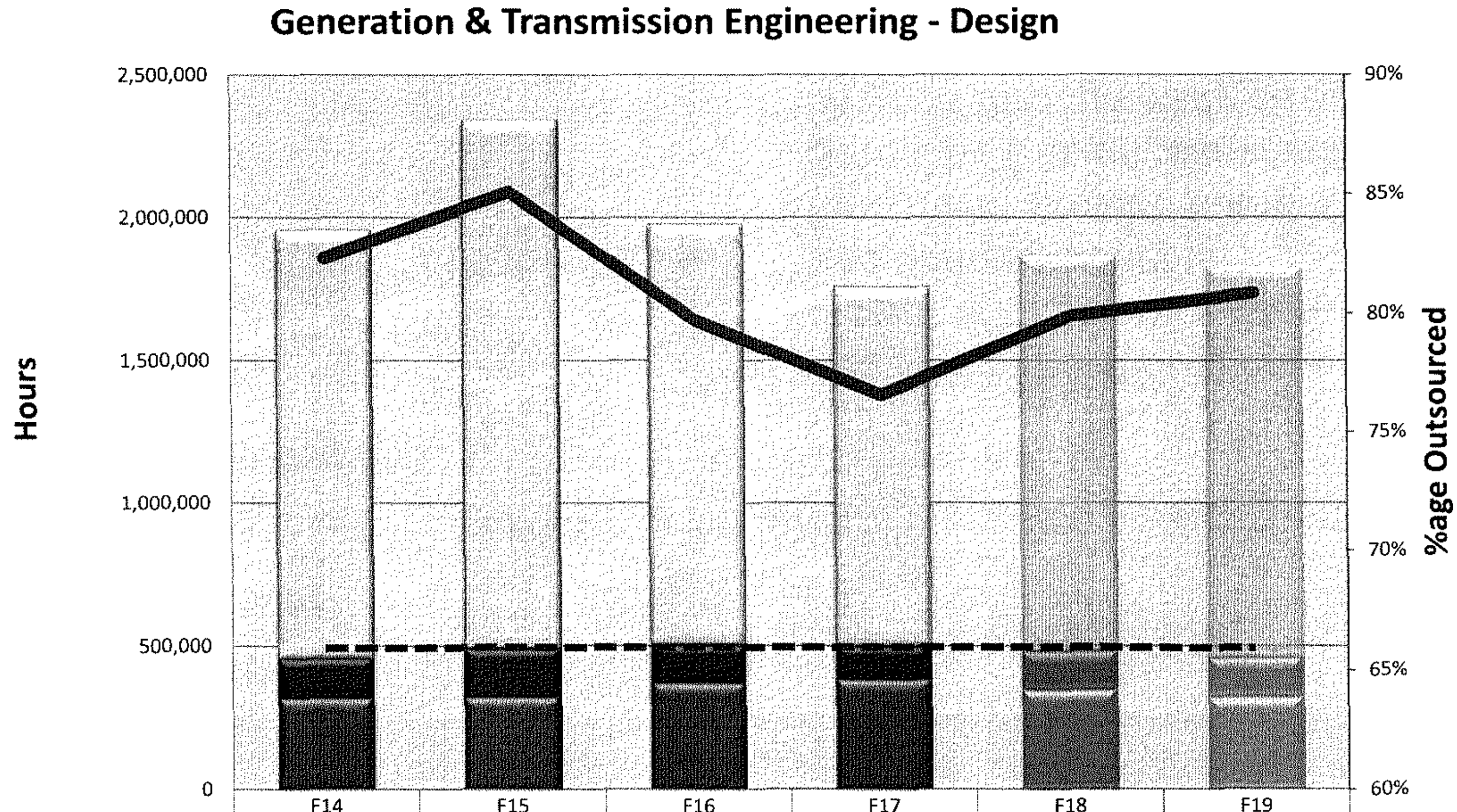
PORTFOLIO: SUPPLY AND CONSTRUCTION

- Virtually all of our capital Supply and Construction is done by market competition and private sector suppliers.

BC hydro

FOR GENERATIONS

WORKLOAD, CAPACITY AND OVERSIGHT

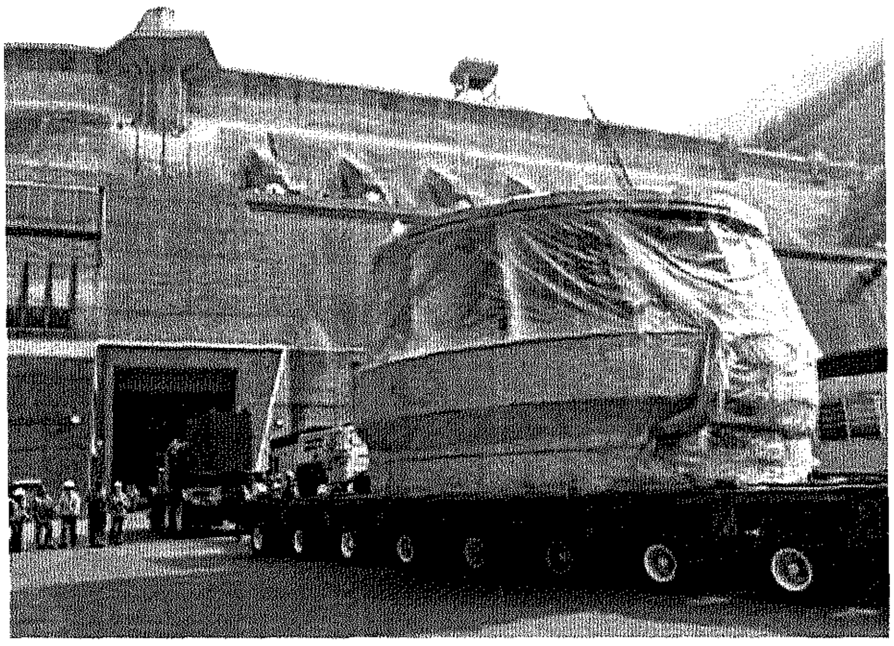


	F14	F15	F16	F17	F18	F19
Demand - External	1,498,882	1,847,834	1,471,581	1,260,002	1,385,822	1,369,449
Demand - Owner's Engineer	137,855	170,042	132,807	116,683	136,100	139,313
Demand - Internal Design	322,671	324,558	374,993	386,114	350,246	325,110
Internal Capacity	491,530	494,530	494,530	494,530	494,530	491,530
%age of Work outsourced	82%	85%	80%	77%	80%	81%

PROJECT RESULTS: REVELSTOKE 5

	Planned	Actual
Expected Amount	$280.0M	$244.5M
Authorized Amount	$320.0M	
In-Service Date	Oct 2010 – Oct 2011	Dec 22, 2010

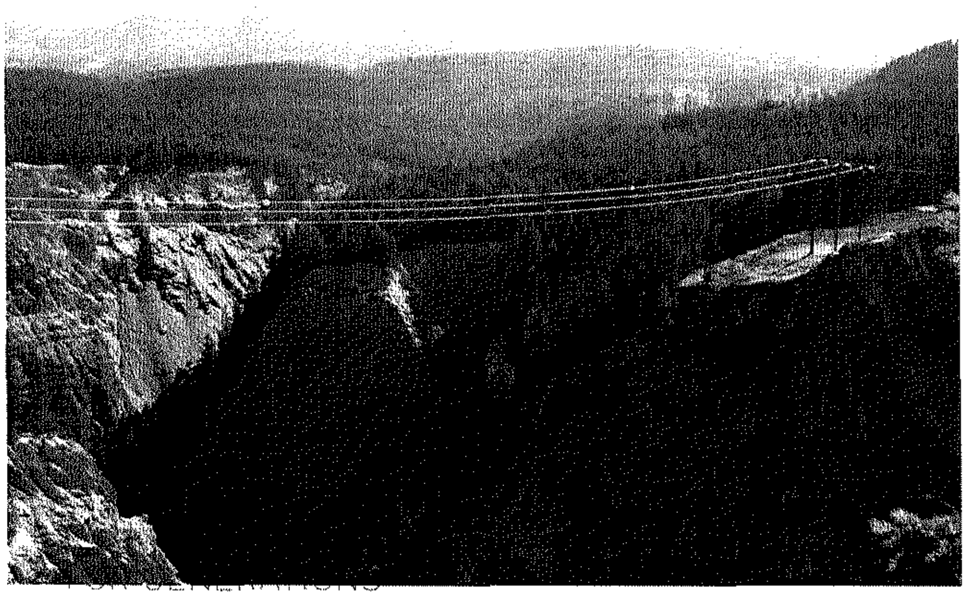
Procurement Model: DBB



- 495 MW of additional capacity; project will achieve system energy and shaping benefits
- First major project to implement Safety by Design, eliminating hazards through early design treatment
- No significant safety or environmental incidents
- 260 person-years employment

PROJECT RESULTS: COLUMBIA VALLEY TRANSMISSION

	Planned	Actual
Expected Amount	$154.1M	$115.3M
Authorized Amount	$170.5M	
In-Service Date	October 2012	October 2012
Procurement Model: DBB		

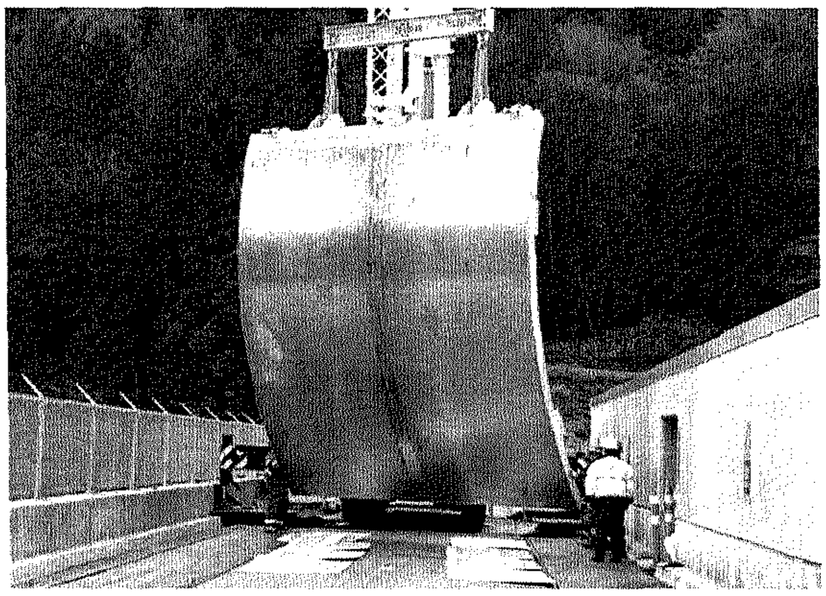


- 112km of new 230kV transmission line.
- New 230/69kV substation and expansion of three existing substations.
- 3km of new 69kV transmission line.
- No significant safety or environmental incidents.
- 150 person-years employment.

PROJECT RESULTS: STAVE FALLS SPILLWAY GATES UPGRADE

	Planned	Actual
Expected Amount	$61.2M	$49.2M
Authorized Amount	$65.6M	
In-Service Date	March 2013	March 2013

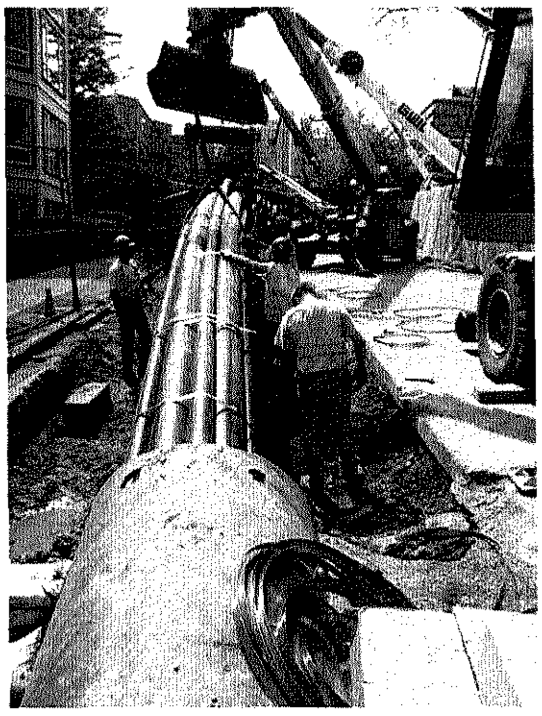
Procurement Model: DB Partnership



- Replacement of obsolete 1910 era equipment with modern designs, providing substantial reliability improvements;
- Early Contractor involvement implemented within Partnership Agreement;
- Successful completion of Design-build contract. Work Changes amounted to less than 2% of the contract value.

PROJECT RESULTS: VANCOUVER CITY CENTRAL TRANSMISSION UPGRADE

	Planned	Forecast
Expected Amount	$200.9M	$168.6M
Authorized Amount	$200.9M	
In-Service Date	May 2013	March 2014
Procurement Model: DBB		



- 8.3km of new 230kV underground transmission cable including direction drilling under False Creek.
- New 230/25kV indoor substation in urban location.
- No significant safety or environmental incidents
- 216 person-years employment

OVERVIEW OF SPECIFIC PROJECTS

BC hydro
FOR GENERATIONS

GENERATION PROJECTS

Project Title	Category	Targeted In-Service Date	Forecast Capital Expenditure $ million	Forecast Capital Expenditure Net of CIA and/or Gov't Funding $ million
MCA - Replace Mica SF6 Gas Insulated Switchgear	Sustaining - Equipment	F2015	196	196
GMS - Rehabilitate GM Shrum Units 1 to 5 Turbines	Sustaining - Equipment	F2016	195	195
MCA - Install Mica Units 5 and 6	Growth	F2016	627	627
HLK - Upgrade Hugh Keenleyside Dam Spillway Gates	Dam Seismic	F2017	116	116
CMS - Replace Cheakamus Units 1 and 2 Generators	Sustaining - Equipment	F2018	51	51
GMS - Upgrade GM Shrum WAC Bennett Dam Rip Rap	Safety	F2018	92	92
RUS - Redevelop Ruskin Dam and Powerhouse	Re-development	F2018	588	588
BR2 - Upgrade Bridge River #2 Units 5 and 6	Sustaining - Equipment	F2019	67	67
JHT - Replace John Hart Powerhouse	Re-development	F2019	1014	1014
LDR - Upgrade Ladore Dam Spillway Gates (Stage 2)	Dam Seismic	F2020	77	77
BR2 - Upgrade Bridge River #2 Units 7 and 8	Sustaining - Equipment	F2021	76	76
SCA - Upgrade Strathcona Spillway Gates (Stage 2)	Dam Seismic	F2021	79	79
GMS - Replace GM Shrum Units 1 to 10 Control Systems	Sustaining - Equipment	F2023	56	56
JHT - Seismically Upgrade John Hart Dam (incl Spillway Gates)	Dam Seismic	F2023	300	300
REV - Rewind Revelstoke Units 3 and 4 Stators	Sustaining - Equipment	F2024	53	53
SCA - Upgrade Strathcona Low Level Outlets, Tunnel and Hollow Cone Valve	Dam Seismic	F2024	189	189
ELK - Upgrade Elko Dam Main Civil Structures	Sustaining - Civil	F2025	101	101
PCN - Seismically Upgrade Peace Canyon Dam	Dam Seismic	F2028	150	150

T&D PROJECTS

Description	Category	In-Service Date	Forecast Capital Cost $ million	Forecast Capital Cost net of CIAC and Government Contribution $ million
Vancouver City Central Transmission (VCCT)	Area Reinforcement	F2014	170	170
Northwest Transmission Line (NTL)	Area Reinforcement	F2015	736	511
Interior to Lower Mainland Project (ILM)	Bulk System Reinforcements	F2015	690	690
Merritt Area Transmission Project (MAT)	Area Reinforcement	F2015	56	56
Dawson Creek Area Reinforcement (DCAT)	Area Reinforcement	F2016	220	220
Long Beach Area Transmission Project	Area Reinforcement	F2016	51	51
Surrey Area Substation (SAS) Project	Area Reinforcement	F2016	76	76
Iskut Extension	Area Reinforcement	F2016	167	127
Big Bend Substation	Station Expansion & Modifications	F2016	51	51
2L99/2L103 (Skeena – Minette – Kitimat) Transmission Line Replacement	OH Lines Life Extension	F2017	90	90
Horne Payne Substation Expansion	Area Reinforcement	F2017	54	53
Prince George to Terrace Capacitors (PGTC) Project	Bulk System Reinforcements	F2019	111	0
Metro North System Supply Reinforcement	Area Reinforcement	F2019	185	185
Peace Region Electric Supply	Area Reinforcement	F2019	289	289
Downtown Vancouver Redevelopment	Area Reinforcement	F2020	400	400
Peace Region to Kelly Lake 500kV Transmission Reinforcement	Bulk System Reinforcements	F2023	268	268

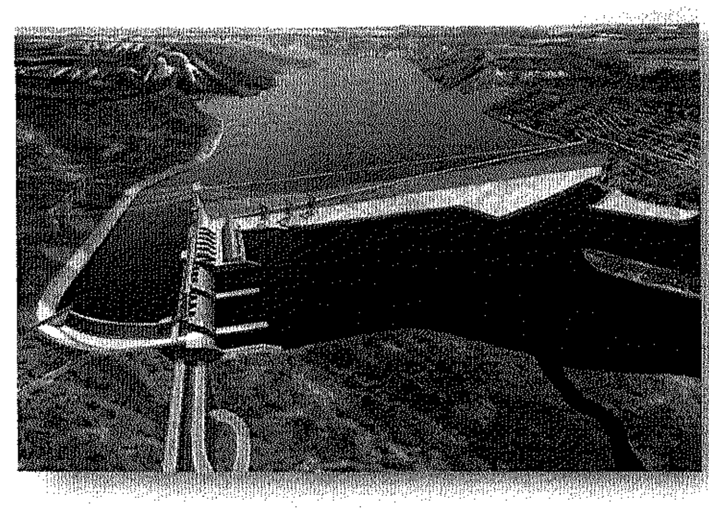
P50 AND P90 ESTIMATES

Project	In-Service Date	P50 Estimate $ million	P90 Estimate $ million	Forecast Capital Cost $ million
Northwest Transmission Line	F2015	736	746	736
Interior to Lower Mainland Project	F2015	690	725	690
Mica – Replace Mica SF6 Gas Insulated Switchgear	F2015	200.2	200.2	196
GMS – Rehabilitate GM Shrum Units 1 to 5 Turbines	F2016	198.6	273.6	195
MCA – Install Mica Units 5 and 6	F2016	627	714.5	627
HLK – Upgrade Hugh Keenleyside Spillway Gates Reliability	F2017	116.9	124.1	116
RUS – Redevelop Ruskin Dam and Powerhouse	F2018	636.3	758	588
JHT – John Hart Powerhouse Replacement	F2019	1014	1149	1014

SITE C

BC hydro
FOR GENERATIONS

SITE C PROJECT COMPONENTS



- Earthfill dam and generating station
  - 5,100 gWh/year
  - 1,100 MW
- 83-km-long reservoir
- Realignment of up to 30 km of Highway 29
- Shoreline protection at Hudson's Hope
- Two new 500 kilovolt AC transmission lines
- Access roads and a temporary construction access bridge
- Two approx. 10 m diameter tunnels and associated cofferdams
- Worker accommodation

BC hydro
FOR GENERATIONS

PROJECT BACKGROUND

- Government direction to proceed with the project in April 2010, subject to achieving environmental certification and fulfilling Crown's duty to consult First Nations

s.12, s.13

- Cost estimate reviewed in 2013; tracking of changes confirms project on track to be delivered within budget
- Unit energy cost of Site C is $83 per megawatt hour
- Currently undergoing a 3-year cooperative federal-provincial environmental assessment

BC hydro

FOR GENERATIONS

REGULATORY STATUS

- Filed Environmental Impact Statement (EIS) with regulatory agencies on Jan. 25, 2013
  - Five-volumes, more than 15,000 pages
  - Includes project rationale, identifies potential effects and proposes measures to avoid or mitigate adverse effects
  - Describes key benefits for customers, Aboriginal groups, northern communities and the province
- Comment period followed (Feb-April)
- Responded to 4,100 information requests
- Amended EIS submitted July 19; 4,500 additional pages of evidence
- EIS deemed satisfactory by BC EAO and CEA Agency on August 1
- Joint Review Panel established August 2013; public hearings anticipated in fall 2013

BC hydro
FOR GENERATIONS

KEY ACTIVITIES

- Definition design complete and reviewed by Technical Advisory Board
- Competitive Model Test underway for turbines and generators
- Procurement strategy and plan developed and approved by Executive Project Board and BC Hydro Board
- Early procurement planning underway for worker accommodation, early works and main civil
- Community Benefits Agreement reached with Peace River Regional District
- Three Impact Benefits Agreements tabled with First Nations, one term sheet signed
- Acquisition of properties through Passive Land Acquisition Program
- Construction planning underway including a project labour strategy

SITE C ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT TIMELINE

Pre-Panel Review
24 months

- Agreement on cooperative federal-provincial EA process
- Advisory Working Group
- Environmental Impact Statement (EIS) Guidelines
- EIS (Application)
- Working Group Review of EIS Guidelines and EIS
- Public comment periods

☆

Joint Review Panel and Report
8 months

- Panel's sufficiency review of EIS
- Submissions (including from Aboriginal groups)
- Public hearings
- Panel report

Review of Panel Report and Decision
6 months

- Draft Referral Package Preparation (EAO)
- Steering Committee Review (EAO, CEA Agency)
- Decision by Ministers/ Cabinet

ABORIGINAL CONSULTATION AND ACCOMMODATION DISCUSSIONS

☆ we are here

BC hydro
FOR GENERATIONS

MacLaren, Les MEM:EX

From: Teasdale, Dawn <dawn.teasdale@bchydro.com>
Sent: September-09-13 11:42 AM
To: Nikolejsin, Dave MEM:EX; MacLaren, Les MEM:EX; Cochrane, Marlene MEM:EX
Cc: Vanagas, Steve
Subject: Working Group #3 Materials
Attachments: Working Group Session 3 Information Notes.pdf

Good morning Dave, Les and Marlene,

Please find attached the materials for Working Group Session #3 taking place on Thursday, September 12, 1:00 – 4:00 pm.

Marlene, could I please ask you to forward this material to the government Working Group Session #3 attendees for me?

Feel free to contact me if you have any questions.

Thanks,
Dawn

Dawn Teasdale
Strategic Business Advisor, Office of the President and CEO

BC Hydro
333 Dunsmuir Street, 18th Floor
Vancouver, B.C. V6B 5R3

Office: 604.623.4410
Mobile: 604.617.2381
Fax: 604.623.4459
Email: dawn.teasdale@bchydro.com

bchydro.com

BC Hydro Information Note

Powerex Overview

Background

Powerex, a wholly owned subsidiary of BC Hydro, is an industry leading energy marketing and trading company, with 25 years of history and experience. Today, Powerex is one of the largest participants in the western physical electric markets. Powerex trading and marketing activities include: procurement and selling of BC Hydro's shortfalls/surpluses; marketing of the Canadian entitlement on behalf of the provincial government; trading and marketing activities which utilize BC Hydro's residual storage capabilities; and a wide range of complementary trading and marketing activities. Powerex's trading activity includes wholesale energy and ancillary service products, renewable energy products, natural gas and carbon-related products. Largely, Powerex's activity is in the short term western physical energy markets, with some transactions up to 10 years in duration as opportunities arise. Powerex's income contributes directly to lowering BC Hydro electricity rates.

Powerex Financial Contributions (Millions of $Cdn)	F2013	F2012	F2011	F2010	F2009	F2008	F2007	F2006	F2005	F2004	F2003	Total
Powerex Audited Net Income	101	145	74	12	222	83	259	179	256	158	138	$1.6 Billion
Entitlement Payment to Province	89	110	131	167	229	245	223	320	248	223	97	$2.1 Billion
Transmission Payment to BCH	20	28	21	33	37	34	32	29	24	39		
Net Sales of BCH surplus	66	-	-	-	-	-	-	-	-	-	-	

*Last three items are not included in Powerex net income, but are reported here for information purposes as activity that financially benefits either BC Hydro or the province directly

In the F2012 to F2014 BCH Revenue Requirements Application (RRA) Powerex income was planned at $130 million for F2012 and $113 million for F2013 and F2014. The RRA amounts were based on Powerex's 5 year average annual income. Powerex income varies considerably from year to year depending on natural gas and power prices, weather conditions, generation unit outages in key markets, market design and accounting policies. Powerex's five year average annual income for F2009 to F2013 is $111 million.

s.17, s.21

Pages 159 through 162 redacted for the following reasons:
- -
s.17, s.21

BC Hydro Information Note

Government Review Process Overview and Summary

The 2011 Government Review of BC Hydro identified 56 recommendations to reduce operating and capital costs at BC Hydro, in order to minimize the proposed rate increases for F2012 to F2014. Of the 50 recommendations directed to BC Hydro, BC Hydro has completed 44 and expects to complete the remaining recommendations in F2014. BC Hydro continues to provide support to Government with respect to the remaining 5 recommendations directed to Government.

Overview

- In April 2011, the Province of B.C. appointed a panel of senior government officials to review BC Hydro's operations in order to identify potential actions for minimizing the proposed cumulative rate increase of 32 per cent that had been filed with the BCUC for the three-year period of F2012 to F2014.

- The panel's report was released in August 2011 and provided 56 recommendations: 50 directed to BC Hydro, and 6 directed to Government. The recommendations mainly related to alleviating cost pressures for the operating and capital requirements for the company.

- Many of the specific recommendations identified initiatives that were already underway at BC Hydro to improve operational efficiency, and which could be accelerated.

Progress on Review Recommendations

- As of June, 30, 2013, BC Hydro has completed 44 of the 50 recommendations directed to BC Hydro and is on track to have all 50 recommendations completed by the end of F2014.

- Of the 6 recommendations directed to Government, the recommendation related to self-sufficiency has been addressed. s.12 s.12 s.12 BC Hydro continues to provide support to Government regarding the recommendations yet to be addressed.

Key results achieved to date include:

Overall Savings Achieved and Planned

- Cumulative operating cost savings of $391 million were planned for F2012 to F2014. BC Hydro is on track to deliver its planned cost savings over the three-year rate filing period. BC Hydro achieved its targets for F2012 and F2013, and the F2014 budget has been set to achieve the required savings.

- New outsourcing agreements with Telus, SNC Lavalin, Accenture, and other service providers have delivered some of these savings.

Workforce Restructuring and Reductions

- Since the integration of BCTC, BC Hydro has realized a gross total of approximately 800 position reductions.

- Over the last three years, there have been a net total of 650 headcount reductions, comprising the 800 gross reductions less the 150 new roles that have been added to support safety, operational excellence, the Long Term Sourcing Strategy, and capital project delivery.

- BC Hydro is on track to meet F2014 staffing levels as indicated in the Amended RRA.

Reduced Expenses and Discretionary Spending

- Discretionary spending on travel, advertising, consultants, materials and supplies, and dues and fees will be reduced by $60 million over the three-year period. This is one of the areas of savings and operational improvement that was accelerated in response to the Government Review.

- An updated internal policy has been published with respect to the procurement of management consulting services with a plan in place to track and report these services.

Demand Side Management Program Efficiencies

- Forecast Demand Side Management costs were reduced by $56 million in the Amended F2012-F2014 RRA. These reductions are being achieved through productivity improvements involving improved program forecasting and planning, as well as better coordination and management of previously separate initiatives.

Procurement Improvements and Cost Savings

- BC Hydro has fully leveraged all areas of the province's BC Bid e-bidding functionality so that vendors can now respond electronically to opportunities to provide services to BC Hydro.

- BC Hydro has worked with 18 contractor industry groups on improving supplier relationships and addressing supplier concerns (e.g. vendor complaint review process, supplier interaction guidelines, and timely payments).

- BC Hydro staff have worked with the construction industry to develop new standardized construction contract language to ensure risks are more appropriately allocated between the parties, and to make it easier for construction companies to compete for and deliver on BC Hydro contracts.

Innovative Approaches and Partnerships for Capital Projects

- BC Hydro has expanded our partnership approaches to capital projects and has introduced new Design-Build procurement models for our major transmission, distribution and generation projects.

- Improvements have been made to the risk management practices for capital projects through enhancements to project IT systems, contract documents, work practices, and BC Hydro's risk matrix.

Next Steps

- BC Hydro continues to make good progress in implementing the Government Review recommendations and is working toward completing the remaining recommendations by the end of F2014.

- BC Hydro will continue to provide support to Government for its recommendations.

BC Hydro Information Note

F15/F16 Operating Costs

This issue note provides an overview of BC Hydro's operating costs, summary of cost reductions to date, cost pressures facing the company including its preliminary outlook of its F15/F16 forecast, its ongoing productivity improvements and cost management processes, and an overview of its planning and budget process.

Overview

- Net Operating costs of $699 million represent approximately 18% of the F14 Revenue Requirement and is required to safely and reliably operate and maintain BC Hydro's system.

- Operating costs include the costs for the operations and maintenance of BC Hydro's generation, transmission and distribution systems along with seven regional offices and numerous field facilities located in over 100 communities across the province.

- As BC Hydro's customer base and electricity system continue to grow, so does the amount of work required to continue to deliver electricity safely and reliably. BC Hydro's capital additions have totalled close to $9 billion since F2009 and includes the addition of more than 2,000 km of transmission and distribution lines, 13 new substations and large generation projects including Revelstoke 5.

- As can be seen from the breakdown of operating costs in Appendix 1, approximately 75% of costs relate directly to the maintenance and operations of the generation, transmission and distribution system along with customer care operations. The remainder of the costs relate to supporting functions such as information technology and security, property services as well as business support costs.

- Total maintenance costs in F2013 were approximately 12% of total capital expenditures.

Savings achieved in F2012 to F2014

- Subsequent to the 2011 Government Review, BC Hydro filed its Amended Revenue Requirement filing (ARRA) committing to find cumulative savings totalling $391 million over the F2012 to F2014 period. Some of these cost savings were included in the original RRA. These savings were used to offset priority funding requirements and to lower rate increases.

- As shown below, operating costs for F2014, in the absence of the savings, would have been $865 million instead of the $699 million.

Operating Costs ($ millions)

	F2012	F2013	F2014	Total savings
Original Plan	800	829	865	
Cost savings	(47)	(72)	(95)	(215)
Original RRA	753	757	770	
Government Review savings	(53)	(52)	(71)	(176)
Amended RRA (ARRA)	700	705	699	(391)

- The savings forecast to be achieved are shown below and are in excess of the $391 million included in the ARRA. This is largely due to some one-time savings in F2012 that were used to further lower rates in F2012 to F2014 period as per Special Direction No. 3 which was issued subsequent to the ARRA filing.

Cost Savings / Reductions	F12-F14 Total Savings
BCTC Integration Savings	77
Workforce	63
Consultant/Contractors	36
Outsourcing Contracts	25
IT Project & Service Efficiencies	21
OCIO Service Efficiencies	15
Travel	12
Materials & Supplies	8
Compensation / Total Rewards	7
Dues & Fees	4
Procurement Processes	3
Advertising	2
Maintenance and program delivery efficiencies, efficiencies in labour and vehicle utilization	82
F12 One-Time Savings	21
Other Miscellaneous	35
Total reductions/savings	**412**

- The savings achieved has enabled BC Hydro to show a decrease of approximately $65 million in total operating costs (from $765 million in F2010 to the total of $699 million in F2014) despite significant continuing cost pressures including:
  - Increased maintenance of aging infrastructure
  - Growth in the BC Hydro system; BC Hydro has added $4.5 billion in growth capital over the last 5 years which results in more assets to maintain and operate.
  - Inflation has increased by an average of 1.2%/yr from F2010

- Materials, supplies, and fuel costs are increasing at rates higher than inflation.
- Customer care costs associated with customer growth (growth has averaged 1.1%/yr since F2010 with the addition of approximately 76,000 customers)
- Contractor/consultant rates are increasing for specific skills
- Increasing technology sustainment costs as new projects and transformation initiatives are undertaken
- Increasing compliance costs to meet environmental and regulatory standards
- Current service pension cost increases due to decreases in the discount rate. (a 1% decrease in the discount rate increases current service pension costs by approximately $25 million. The discount rate has decreased from 7.35% in F2010 to 4.0% in F2014).
- Wage increases to obtain settlements with unionized staff and attract and retain skilled employees based on comparable public-sector settlements/mandates.

- BC Hydro met its operating cost targets in F2012 and F2013 as set out in its ARRA and expects to meet its target for F2014.

Progress on Government Review recommendations

- BC Hydro has completed 44 of the 50 recommendations directed to it as part of the Government review and is on track to complete the remainder in F2014. The actions taken to complete the recommendations related to operating cost savings include:
  - Compensation and total rewards changes:
    - M&P salaries have been frozen 3 of the past 4 years. Union wages have been frozen 2 of the past 4 years.
    - M&P variable pay is in the process of being eliminated as per the transition plan approved by government. Executive offer has already been transitioned as per the plan approved by government.
    - Changed M&P overtime rate to Employment Standards Act requirements.
    - Reduced M&P vacation pay policy (AV differential) to Employment Standards Act minimums
    - Eliminated M&P honorarium program and placed tighter controls on recognition programs.
    - Eliminated M&P computer purchase plan.
    - Eliminated 2% of salary premium for M&P employees who cashed in their flex days instead of using as time off.
    - Eliminated early retirement subsidies for terminating employees for service accrued after Jan 1, 2013.

  - Changed rate of interest credited on employee pension contributions from the fund rate of return to 5 year bank rate.
  - Changed methodology for determining indexing credited on pensions in payment to a long term sustainable focus.

- Apprentice costs and overtime have been reduced over the past three years

- Workforce reductions - combined BCTC and BC Hydro workforce on track to be reduced by approximately 800 Headcount Equivalent (net 650) by end of F2014

- Accelerated the completion of the BCTC integration and collaboration between departments

- Strengthened controls and reduced spend in travel, contractor costs, dues, advertising, materials and supplies

- New outsourcing agreements with Telus, SNC Lavalin, Accenture and other service providers have delivered some of these savings

- Streamlined and consolidated the procurement of common goods and services

- Focused on obtaining efficiencies in delivery of IT services, and bundling work to obtain efficiencies in maintenance and program delivery.

Current forecast of F15/F16 operating costs

- BC Hydro's Service Plan assumed base operating cost increases of ½ of inflation in each of F15 and F16 respectively. This amounted to increases of $7 million and $14 million from the F14 budget amount of $699 million.

Cost Pressures:

- BC Hydro is in the middle of its budget process for F15/F16 and has identified cost pressures in excess of the $7 million and $14 million increases for F15 and 16 respectively.

- It will be difficult to stay within this increase given our current challenges of meeting our F2014 budget as well new cost pressures associated with the operationalization of the SMI program and continuing pressures related to our aging assets, discount rate impacts on current service pension costs, inflationary and customer growth impacts, and collective bargaining mandates.

Continuing F2012 to F2014 pressures:

- While BC Hydro will meet its cumulative savings target of the $391 million identified in the ARRA it has had to find savings in other areas to make up the shortfall in:

- Compensation changes. The ARRA assumed an across the board salary and wage freeze for F12 to F14 period but BC Hydro provided salary increases for union employees for F2013 and F2014 in order to gain a fair settlement.
    - Union staff have had a wage freeze for 2 of the past 4 years and M&P have had a salary freeze for 3 of the past 4 years.
    - The salary and wage increases have had an unplanned cost increase of $13 million in F2014 and is expected to have a $16 million operating cost impact in F2015 and F2016 as some of the wage increases are effective October 1, 2013.

- Outsourcing arrangements. The outsourcing contract negotiations were not finalized at the time of filing the ARRA and s.17

  s.17

    - This has an annual impact of $9 million of cost pressures in F2014 and future years.

- Procurement savings. Changes in scope and mix changes between operating cost and capital savings have resulted in lower operating cost savings.
    - This has an annual impact of $4 million in F2014 and future years.

<u>Cost pressures related to aging assets, inflation and growth:</u>

- The cost pressures BC Hydro has identified to date for F15 and F16 include:
    - Civil infrastructure and other plant and equipment maintenance related to aging infrastructure ($15m)
    - Increase in fuel costs, PST impacts, and other inflationary pressures ($5m)
    - Sustainment costs related to new IT projects going into service and contractual increases for outsourced contracts ($5m). Legacy IT systems were not being sustained in advance of being replaced.
    - Shift in labour costs from deferred to operating due to changes in the nature of expenditures ($5m)

<u>Operationalization of SMI:</u>

- The operationalization of the SMI program will increase operating costs ($15m) as some of the incremental costs were being deferred while the project was underway. The incremental costs relate to IT and telecom costs and costs to manage energy diversions. These are partly offset by a reduction in manual meter reading costs.

- The benefits from SMI are mostly in increased revenues, so there is some offset to these operating costs in other parts of the income statement.

- While the NPV of net benefits of SMI are still expected to be positive there will be small net costs in the first few years of operation (excluding the impact of recovering in rates previously deferred costs). In earlier forecasts, this impact had continued to be deferred.

Current Service Pension costs:
- Current service pension costs are increasing due to lower discount rates ($10m). The discount rates used for forecast purposes are provided by BC Hydro's actuaries and have decreased to 4.0% from the 4.6% used in in the F2014 budget assumptions. This also has an impact on F2014 and BC Hydro has to find offsets in other areas in order to meet its operating cost plan for F2014.

Salary increases:
- The identified cost pressures above do not include any provision for salary or wage increases in F2015 or F2016. Non-Union staff have not received within range salary adjustments for three out of the past four years and the union contracts expire at the end of F14. s.17

s.17

Ongoing productivity improvements and cost management processes
- BC Hydro continues to be sensitive to the impact of increases in operating costs but is also mindful of the need to prudently incur costs in areas that reduce risk to its operations and business.

- BC Hydro has several activities underway to manage operating costs:

s.17

  - Transmission and Distribution transformation project
  - Lease consolidation and densification in the Lower Mainland
  - Management of discretionary travel and conferences
  - Cost-effective use of management contractor/consultants
  - Reduce number of computers and mobile devices in use

- Other areas BC Hydro is investigating for potential operating cost savings include the following (some of these will require government support)

  - Retiring the Burrard Generating station

- Consolidation of contract spend

s.17

Budget process and improvements made from budget process review

- The 2011 Government Review of BC Hydro recommended that BC Hydro improve its budgeting and forecasting processes by periodically undertaking a zero-based budgeting exercise to obtain a better understanding of their incremental costs and improve overall cost effectiveness.

- BC Hydro's budget process was reviewed by an external consulting firm in June/July 2012.

  - The Review included short-term and long-term recommendations for improvement. The majority of the short-term recommendations were implemented for the F2014 budget process (conducted during F2013).

  - The Review examined the applicability of zero based budgeting and concluded that while useful for some components of the business it is not effective in all circumstances. The Review concluded that a driver based budgeting approach is best practice and a better approach.

  - The longer-term recommendations from the external review, including the recommendation for a more formal use of driver based budgeting, are further being investigated to determine cost effectiveness and the appropriate timing for implementing changes to the current process. For example, the T&D Transformation project is reviewing all aspects of the T&D business model that will identify core requirements, including work delivery methods, resourcing of work, technology enablers, as well as required support functions. Budgets in F15 will be established based on the results of this work.

- BCH uses a top-down/bottom-up budget process.

  - As part of the bottom-up process each Business Group (BG) develops initial budgets that are subjected to detailed review within the BG leadership team for total cost, consistency with work and staffing plans, and alignment with BCH and BG priorities. This process also includes a discussion as to whether all current operating activities need to continue.

  - The top-down process includes Executive Team review of the BG operating plans and involves an iterative process of weighing requested increases and savings developed from the bottom-up process to the consolidated review.

Appendix 1

	F14 $M	Outsourced Contracts $M[2]		
Maintenance	237			
Generation Operations	126		Compensation Mitigation ($8M),	s.21
Transmission & Distribution Operations	287	s.21		
Customer Care Operations	75		s.21	
Maintenance & Operations	**725**	**65**		
Information Technology & Security	121	46	IT (Fujitsu, Telus)	
Property Costs	33		Rent ($11M)	s.21
Business Support [1]	80	s.21		
Human Resources & Training	20		s.21	
	978	156		
Capital Overhead	(279)	(18)		
Net Operating Costs	**699**	**138**		

Note:

1. Includes Finance, Legal, Communications, Safety Health & Environment, Procurement and Insurance
2. The outsourced contract costs are included in the total operating costs of $699 million.

Pages 174 through 177 redacted for the following reasons:
- -
s.13, s.17

BC Hydro Information Note

Finance Charges

BC Hydro's debt is forecasted to rise over the next several years to fund required investments in capital assets. In addition, interest rates are expected to rise putting additional pressure on finance charges.

The purpose of this information note is to provide a brief summary of BC Hydro's debt management practices.

	F2014	F2015	F2016	F2017
Debt net of sinking funds and temporary investments ($M)[1]	$15,463	$17,289	$18,489	$19,897
Finance Charges ($M)[2]	$597	$661	$788	$894
Weighted average cost of debt (Finance Charge / Debt)	3.86%	3.82%	4.26%	4.49%
ST Interest rate forecast[3]	1.39%	2.10%	2.98%	3.98%
LT Interest rate forecast[3]	3.26%	4.08%	5.08%	6.08%

1. *Based on the Updated Service Plan June 2013 and excludes capital expenditures for Site C*
2. *Includes finance charges related to IPP capital leases*
3. *October 2012 rates from Treasury Board*

Debt

- With the exception of $10 million of provincially guaranteed debt held by the Canadian Pension Plan, all of BC Hydro's debt is "off-lent" by the Province and as a result BC Hydro enjoys borrowing costs similar to that of the Province.
- BC Hydro Treasury works with the Debt Management Branch of the Province to coordinate strategy and borrowing requirements and other debt related activities.
- Interest costs related to assets under construction are included in capital costs and netted against finance charges.
- Debt is effectively repaid as capital costs are recovered in rates over the useful life of the asset (on average 40 years) through amortization expense.
- In periods of relatively low capital investment the cash collected through the amortization expense is used to pay down debt. In periods of relatively high capital investment it is used to fund new capital projects.

Finance Charges

- BC Hydro forecasts its finance charges using interest rate forecasts provided by Treasury Board.
- BC Hydro finances its debt through a mix of short term and long term Canadian dollar debt.
- Over the last three years, during this low interest rate environment, BC Hydro has been reducing the variable rate debt exposure (debt subject to reset within one year) and increasing the duration of its debt portfolio thereby locking in its debt costs at current low rates over a long term so as to help mitigate the interest rate risk associated with growing debt.
- Currently the amount of variable rate debt is approximately 27% and the duration of the portfolio is 9 years. For several years prior to 2010 the variable rate exposure averaged 36% and the duration averaged 6.5 years.
- Management has discussed a strategy of making further reductions in its variable rate debt target. If implemented, this will reduce BC Hydro's interest rate risk but increase the finance charges forecast for F2015 and F2016.
- Variances in finance charges from the forecast used to set rates are captured in the finance charge regulatory account. The account balance at March 31, 2013 was in a $1.2 million asset position meaning finance charges were essentially on forecast.

BC Hydro Information Note

Property Tax Payments (School Taxes and Grants-in-Lieu)

- The *Hydro and Power Authority Act* (1964) exempts the property of BC Hydro from all property taxes other than school taxes levied by the Province; for example, BC Hydro is exempt from paying hospital, general municipal, regional district and local improvement taxes. However, BC Hydro is authorized by the Province to pay grants-in-lieu of taxes as set out in Orders In Council 1218/65, 268/11 and 021/13.

- Annual payments of school taxes provide the Province with funding for general revenues. Annual payments of grants-in-lieu of taxes to municipalities, regional districts and the Province provide funding support for local infrastructure, operations and community programs.

- In F13, BC Hydro paid total property taxes of $191.7M comprised of $118.3M for school taxes and $73.4M for grants-in-lieu. The total payments are $33.2M more than they were 5 years ago (a 21% increase since F08) and $50.1M more than they were 10 years ago (a 35% increase since F03).

- BC Hydro pays school taxes on all of its assessable land, buildings and electric-system facilities such as generating stations, transmission circuits, distribution lines and substations. The only exception is for power generation facilities located on the Peace, Columbia and Pend-d'Oreille Rivers, which are exempt from taxation by Order-In-Council 2091/82.

- BC Hydro is authorized to pay three types of grants-in-lieu of taxes:

  - **Lands & Buildings** - A "general" grant that is equivalent to the previous year's tax levy for general municipal, rural area, local improvement and regional district purposes; it is essentially an amount equivalent to local area property taxes for fee-owned land and for buildings such as offices, warehouses, linerooms, etc. (this grant is paid directly to municipalities and to the Province for rural areas).

  - **1%-of-Revenue** – A grant from electric sales in the previous fiscal year from customers within the boundaries of a municipality or rural area (this grant is paid directly to municipalities and to the Province for rural areas).

  - **Generation Facilities** - A grant that is paid directly to municipalities and regional districts impacted by BC Hydro generating facilities such as dams, reservoirs and powerhouses.

- BC Hydro prepares a separate financial forecast for school taxes and each of the three grant-in-lieu components above and summed together to determine the total property taxes over the F14 – 16 forecast period shown in the table below.

  - **School Taxes** – The forecast is based on annual increases to account for anticipated increases to assessed values for land, buildings and electric system assets. Consideration was given to new capital projects such as the ILM and NTL transmission circuits. Also annual increases are forecasted to account for inflationary pressure on the Province to collect additional school tax revenues to fund their operations and infrastructure.

  - **Grant: Land & Buildings** - The forecast is based on annual increases to account for anticipated increases to assessed values for land and buildings, and also increased every year to account for inflationary pressure on municipalities to collect additional local tax revenues to fund their operations and infrastructure.

  - **Grant: 1%-of-Revenue** - The forecast is based on the domestic-revenues forecast.

  - **Grant: Generation Facilities** - the grants are indexed annually to forecast total municipal tax revenue increases throughout the province, as prescribed by Order In Council 268/11 and 021/13. Consideration was given to the installation of two new 500-MW units at Mica (scheduled for F2015 and F2016).

- There are currently no risks that BC Hydro is aware of that would have a significant impact on the F14 to F16 property tax forecast. However, it must be noted that a large portion of BC Hydro's property tax payments are based upon property valuations determined by BC Assessment. BC Hydro is not aware of any pending initiatives by BC Assessment to review our facilities or electric-system assets during the forecast period. Also, although the *Hydro and Power Authority Act* was recently amended to allow the Province to authorize BC Hydro to pay grants in lieu to taxing treaty First Nations, BC Hydro anticipates that the financial impact will be minimal. BC Hydro is not aware of any other proposed legislative changes by the Province that would impact school taxes or grants in lieu.

Forecast Property Tax Payments	
Fiscal Year	**($ millions)**
F13 (actual)	$191.7
F14	$200.5
F15	$209.0
F16	$216.2

BC Hydro Information Note

Current Workforce and Long-Term HR Plan

BC Hydro's success through the years in delivering electricity to customers can largely be attributed to the experience and skill of its workforce. BC Hydro continues to develop targeted workforce strategies to attract and retain employees with the utility-specific skills required to maintain and operate the province's electricity system and deliver the necessary capital improvements to ensure safety and reliability.

Current Workforce Overview

- BC Hydro's F2014 labour budget is based on a workforce plan of approximately 5,650 positions in the core company, representing the following union and non-union distribution:
  - (37%) Management & Professionals (M&P)
  - (29%) Canadian Office & Professional Employees Union (COPE)
  - (34%) International Brotherhood of Electrical Workers (IBEW)

- Employees are deployed in over 100 locations across B.C., with 60 per cent of the workforce located in the Lower Mainland.

- The majority of BC Hydro's employees work in operational (technical and trades) roles involved in the generation, transmission and distribution of electricity. The remaining employees work in roles that support the operation and maintenance of the utility business such as safety, customer care, First Nations, capital work, demand side management functions, financial, HR and regulatory compliance.

- 450 additional employees work at BC Hydro's subsidiary companies, Powerex and Powertech, as well as special project teams for Site C and Smart Metering Infrastructure.

- BC Hydro's workforce has undergone several shifts in the past 3 years:

  - Workforce downsizing

  - Overtime reductions, salary freezes, and compensation and benefit reductions for professionals, managers, and executives.

  - BCTC integration

  - Significant capital and maintenance program investments due to system growth and aging assets

  - Significant organizational focus on improving worker safety and operational performance

- In conjunction with these changes, the company has focused on reducing non-operational roles, selectively repurposing some vacancies to operational and/or safety-sensitive roles and has rebalanced existing outsourcing agreements and developed new strategic partnerships to support daily operations and major capital projects.

Workforce Trends & Risks

- Between F2014 and F2020, it is estimated over 1,100 employees will retire. If employees "eligible to retire" elected to do so, this number would increase to approximately 1,625. The highest levels of retirements are expected in critical operational roles, including Power Line Technicians (PLTs), Cable Splicers, Communication Protection Control Techs and Engineers. Resignations tripled in F2012 and retirements increased by approximately 25%, and 35% in Fiscal 2013.

- In the past two fiscal years (F2012 & F2013), voluntary attrition levels significantly increased.

- The highest levels of attrition are being experienced with employees with less than 5 years of service with BC Hydro (including mid-career hires). The most common reasons cited in exit interviews include higher compensation offers and better career opportunities being offered by competitors.

- Occupations where attrition created the most serious shortfalls were in operational, utility-specific occupations, that are not readily available in the labour market and which require an average of 4-5 years to grow through on-the-job apprenticeships and work experience. Unlike contractors or certain resource companies which can sustain higher turnover levels, our objective is to retain people for a longer duration than most other companies, because it takes us longer to build fully qualified employees through the apprentice or Engineer-in-Training program and it generally requires a longer time to understand the complexities of BC Hydro's power grid system and the policy/regulatory environment.

- BC Hydro has also experienced targeted poaching efforts for key specialists, including Real-Time System Operators, Communication Protection Control Technologists and System Planning Engineers. BC Hydro employees who are of Aboriginal descent are also being actively recruited by pipeline, oil and gas and resource companies.

Labour Market Dynamics and Wage Pressures

- The majority of BC Hydro's critical workforce positions are unique to electric utilities. For these roles, BC Hydro competes primarily with B.C. contractors and western Canadian electric utilities.

- According to a Conference Board of Canada report, $350B in capital investment is planned for Canada's electric infrastructure over the next 20 years, which is a 50%

increase in recent spending. This means there will be greater competition for skilled trades, technologists and engineers in Western Canada due to strong energy and resource sectors and associated capital investment. A recent Engineers Canada study forecasts that B.C. will have the tightest engineering labour market in Canada between now and 2020.

- The remote nature of many of BC Hydro's capital assets and the challenges associated with living in these communities add to attraction and retention challenges, particularly when private-sector competitors are offering significantly higher compensation.

- Increased competition has also led to steady incremental wage growth within the electric utility sector. In 2011, Mercer completed a total rewards review of BC Hydro's offer which included s.13, s.17

s.13, s.17

Key Workforce Strategies to Address People Risks
In response to these challenges, BC Hydro has implemented a multi-pronged approach to manage work planning and risks:

- Managing headcount to ensure "best-and-highest use" of labour budget and allocating vacancies on the basis of operational criticality and safety sensitivity to manage headcount responsibly – CEO approves or denies all external hires requests.

- Since 2010 we proactively increased management of employee performance issues which consequently resulted in an increase of involuntary employee terminations.

- In 2012, BC Hydro opened a Trades and Technical Training Centre to strengthen the pool of apprentices and provide continuous skills upgrading for existing operational trades and technical staff.

- Developed targeted strategies - labour strategy working groups have been established for key "at-risk" occupations, including PLTs, Cable Splicers, Communication Protection Control Technologists, Frontline Operations Managers, Engineers, and Project Managers. These groups are developing specific recruitment and retention interventions to address skills shortages. Actions include increasing pre-apprentice programs/pool of apprentices, negotiating retention measures with the IBEW s.13, s.17

s.13, s.17

- Strengthening new employee orientation and succession planning programs.

Long Term Human Resources Plan
BC Hydro has the following longer-term staffing strategies over the next 10 years:

- The total workforce for F15 & F16, and beyond (assuming existing business landscape), will average s.17 (down from approximately 6250 in F2011) and will continue to shift to more operational roles.
- Ongoing utilization of an efficient mix of employees (contingent, contractors, consultants and strategic partners) to perform our work.
- Continuous review of our organizational structure to identify further efficiency opportunities such as centralization of functions, business process and/or technology improvements, reduced management layers and outsourcing.

BC Hydro Information Note

Headcount and Vacancy Management

Overview

- BC Hydro's labour budget for F2014 is based on a workforce plan of 5650 positions.
- Since the integration of British Columbia Transmission Corporation (BCTC) in 2010, BC Hydro has eliminated approximately 800 non-operational positions and added approximately 150 critical operational frontline and safety-focused support positions, the Long Term Sourcing Strategy and capital project delivery.

s.13, s.17

Headcount and Vacancy Management

- Since 2009, BC Hydro recruitment approvals have been managed by a cross-company Vacancy Management Team (VMT) that works with BC Hydro leaders to reduce and reallocate headcount. Headcount reductions are primarily achieved through proactive management of attrition, outsourcing, business process redesign, restructuring, utilizing technology and eliminating lower value non-operational roles.
- VMT prioritizes and recommends internal and external headcount be awarded primarily to safety, core operations, and reputation of the organization while still balancing the needs and priorities of all business groups including non-operational groups.
- VMT Recommendations for external hiring are reviewed and either approved or denied by the CEO to ensure compliance with BC Hydro requirements as well as government mandates related to headcount management.
- VMT also proactively monitors and manages monthly attrition and recruitment levels, coordinates company-wide resource management for large-scale projects, governs the size and duration of BC Hydro's temporary and seasonal workforce, and manages headcount impacts related to the annual hiring of apprentices, co-op students and other trainees, such as Engineers-in-Training.