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FortisBC Inc.

2009 Resource Plan

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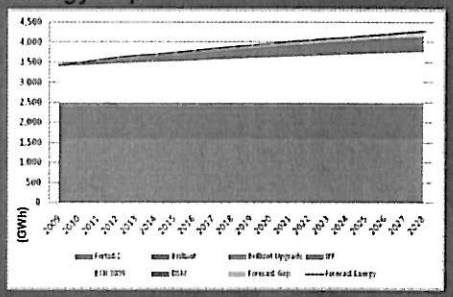
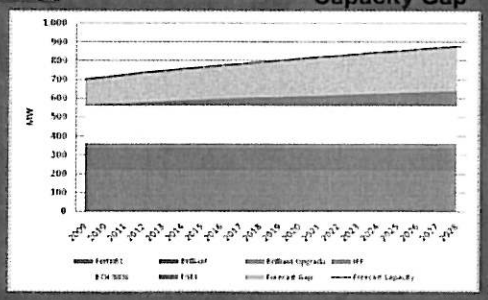
2009 Resource Plan

Energy Gap



Capacity Gap



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2009 Resource Plan

Recommended Planning Margin

	2009	2013	2018	2023	2027
A) Expected Load Forecast Annual Peak Demand (MW)	701	746	792	836	868
B) Forecast Peak Demand minus BCH 3808 Purchase (MW)	501	546	592	636	668
C) WECC Criteria (5% of Expected Load Forecast (B)) (MW)	25	27	30	32	33
D) Largest Generating Unit (Brilliant unit)	37	37	37	37	37
E) Total Recommended Planning Margin (MW) (sum C & D, above)	**62**	**65**	**67**	**69**	**71**
F) Recommended Planning Margin as Percent of A (E/A)	8.90%	8.66%	8.45%	8.27%	8.15%
G) Existing Operating Reserve (MW)	**18**	**18**	**18**	**18**	**18**
H) Additional Planning Margin Required (MW)	**45**	**47**	**49**	**51**	**53**
I) Additional Planning Margin Required as a Percent	6.36%	6.28%	6.20%	6.14%	6.10%

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2009 Resource Plan

Demand Side Management (DSM)

- DSM is the first resource solution that FortisBC applies to its existing and forecast energy and capacity gaps.
- FortisBC's existing DSM programs are expected to meet about 30% of annual growth
- Target is to meet 50% of incremental resource needs via DSM measures by 2020 – this meets the policy indicated by the BC Energy Plan.

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2009 Resource Plan

Assessment Criteria

1. After new resources are in place and after application of DSM, are the forecast capacity and energy gaps closed, and is there a Planning Margin?
2. What are the environmental impacts associated with each potential resource?
3. How well do the resources meet policy actions set out in the BC Energy Plan?
4. Are the resources economical?

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2009 Resource Plan

Portfolio 1 ("P1 – BC MARKETS")

This portfolio assumes that FortisBC will satisfy its existing and forecast capacity and energy gaps, and its need for a Planning Margin, pursuant to new power purchase agreements entered into with British Columbia-based power suppliers.

These suppliers could be any of BC Hydro, Columbia Power Corporation/Columbia Basin Trust, Teck and/or other Independent Power Producers.

New generation resources may have to be built to supply FortisBC's requirements, and it is the Company's expectation that it would have to pay market prices for the capacity and energy so supplied. This portfolio of generation resources is modeled to mimic the operational characteristics of those resources that may have to be built to supply FortisBC's load.

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2009 Resource Plan

Portfolio 2 ("P2 – GAS")

This portfolio assumes that FortisBC will satisfy its existing and forecast capacity and energy gaps, and its need for a Planning Margin, through construction of a series of Simple Cycle Gas Turbine units, the sizes and timing-of-acquisition of which are determined by the growing size of the Company's forecast capacity gap.

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2009 Resource Plan

Portfolio 3 – ("P3 – HYBRID")

This portfolio assumes that FortisBC will satisfy its existing and forecast capacity and energy gaps, and its need for a Planning Margin, through construction of a combination of clean, renewable resources with a gas-fueled peaking resource.

Small Hydro with Capacity and Pumped Storage Hydro facilities provide the peaking and storage capacity necessary to shape energy to meet FortisBC's requirements. Later in the planning period, a source of intermittent Clean energy (for modeling purposes, Wind) is added to the portfolio.

Simple Cycle Gas Turbine provides short term peaking capability pending the Pumped Storage Hydro's in-service date and then converts to a standby Planning Margin role.

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Rate Impact

Portfolio Cost Elements (NPV @8% in $2009 millions)

	A	B	C	D	E	F		
Portfolio	Cost for Market Purchases	Power Cost for New Resources	Surplus Energy Sales	Capital Related Cost	Planning Margin	Total	Average Annual Rate Impact	20 Year Cumulative Rate Impact
P1 - BC MARKETS	$7.6	$311.3	$0.0	$24.9	$12.8	$356.6	1.12%	24.65%
P2 - GAS	$7.5	$51.6	$0.0	$143.8	$9.0	$211.9	0.66%	13.54%
P3 - HYBRID	$7.8	$61.3	($31.8)	$272.7	$11.8	$321.9	1.18%	25.75%

Column A - cost of purchasing capacity and energy from the wholesale electricity market prior to new portfolio resources coming on-line.
Column B - represents the costs associated with power production, including variable O&M, fuel, and GHG-related costs. In P1 - BC MARKETS this includes both the cost of capacity and cost of energy, as discussed in Section 7.3.5.2.. For P3 - HYBRID this includes the refill costs associated with the PSH, as discussed in Section 7.3.1.
Column C - represents potential surplus sales revenues, based upon the forecast in Table 7.6.
Column D - represents all rate requirement capital-related costs associated with new capital investment.
Column E - represents the cost associated with the market-based interim Planning Margin product purchased prior to a portfolio having a physical Planning Margin in place.
Column F is the total of Columns A through E

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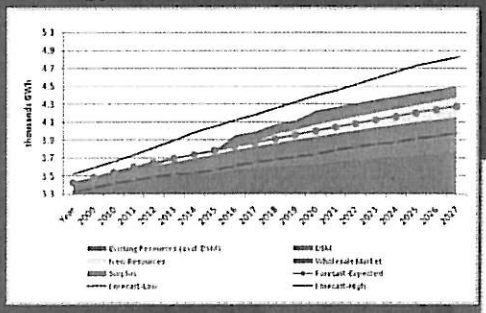
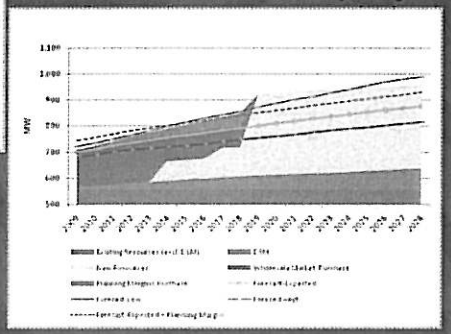
2009 Resource Plan

P3 – HYBRID - Preferred Resource Strategy

Energy



Capacity



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2009 Resource Plan

Status – Action Plan

Filed with the British Columbia Utilities Commission on May 29, 2009; awaiting regulatory process -

a) Requesting acceptance of its 2009 Resource Plan (including the P3 – HYBRID portfolio as the Company's preferred resource strategy).

b) FortisBC is also requesting the Commission to accept the following schedule of proposed expenditures.

- **Planning Margin:** expenditures of up to $150,000 in 2010 for the preparation and implementation of an RFP process that will result in the identification of a preferred planning margin (capacity product) resource for which FortisBC will seek approval from the Commission.
- **Simple Cycle Gas Turbine:** expenditures of up to $1.5 million required in 2010 and 2011 to complete pre-CPCN work necessary to prepare and file a thorough CPCN application in time to meet an in-service date of 2014.
- **Small Hydro:** expenditures of up to $500,000 required in 2010 to complete the pre-CPCN work necessary to prepare and file a thorough CPCN application in time to meet an in-service date of 2017.
- **Pumped Storage Hydro:** expenditures of up to $500,000 required in 2010 to complete the pre-CPCN work necessary to prepare and file a thorough CPCN application in time to meet a proposed in-service date of 2019.
- **Clean:** expenditures of up to $250,000 are required in 2012 for the investigation of the potential for a new Clean Energy resource(s) suitable for FortisBC.

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2009 Resource Plan

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FORTISBC

2009 Resource Plan

May 29, 2009

1 EXECUTIVE SUMMARY

FortisBC Inc. (the "**Company**" or "**FortisBC**") is an integrated regulated electric utility that generates, transmits and distributes electricity to customers in the southern interior of British Columbia. The Company serves over 157,000 customers directly and indirectly, focusing on the delivery of safe, reliable and cost effective electricity. FortisBC's customer base represents approximately 8% of British Columbia's electric utility customer total[1] and accounts for about 6%[2] of total provincial domestic sales.

The purpose of this 2009 Resource Plan is to guide FortisBC over the 20-year period from 2009 to 2028 in its acquisition and management of new generation resources to supplement the Company's current resource base.

This 2009 Resource Plan researches and analyzes the context (including regulatory, commercial and operational) within which FortisBC operates, its load and peak demand forecasts, its current resource capabilities and the potential generation resource options available to it to meet forecast needs during the 20-year planning period of this 2009 Resource Plan, all with a view to assisting the Company to achieve its goals of:

1. moving towards self-sufficiency through the acquisition of firm-capacity generation resources sufficient to ensure long-term, reliable power for FortisBC's customers;

2. mitigating the uncertainty and risks inherent in the Company's current market purchase strategy; and

3. balancing cost effectiveness with the BC Energy Plan's directions and Policy Actions.

This 2009 Resource Plan satisfies the applicable requirements of Section 44.1 of the Act and is in the interests of FortisBC's customers. The P3-HYBRID resource portfolio described in Section 8 of this 2009 Resource Plan as the Company's preferred resource strategy satisfies the applicable requirements of Section 64.01 of the Act.

FortisBC has prepared and is filing this 2009 Resource Plan with the British Columbia Utilities Commission (the "**Commission**") in accordance with the applicable requirements of the *Utilities Commission Act*, R.S.B.C. 1996 c.473, as amended (the "**Act**"), and in accordance with the Commission's "Resource Planning Guidelines".

[1] FortisBC / (BC Hydro + FortisBC) customers. BC Hydro customer count is from its 2008 Annual Report.

[2] FortisBC / (BC Hydro + FortisBC) domestic sales. BC Hydro sales information is from its 2008 Annual Report.

1.1 BC Energy Plan

FortisBC has had regard to the Government of British Columbia's BC Energy Plan[3] in its preparation of this 2009 Resource Plan. Table 3.5.2.1 below lists those Policy Actions set out in the BC Energy Plan which FortisBC believes have direct impact on the Company's resource planning process. Further details are set out in Section 3.5.2.

Table 3.5.2.1: BC Energy Plan Policies

Target Area	BC Energy Plan Policy Action
Energy Conservation and Efficiency	1. Set an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020. **(Policy Action 1)** 2. Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia. **(Policy Action 2)** 3. Encourage utilities to pursue cost effective and competitive demand side management opportunities. **(Policy Action 3)** 4. Explore with BC utilities new rate structures that encourage energy efficiency and conservation. **(Policy Action 4)**
Energy Security	1. Ensure self-sufficiency to meet electricity needs, including "insurance". **(Policy Action 10)**
Environment	1. All new electricity generation projects will have zero net greenhouse gas emissions. **(Policy Action 18)** 2. Zero net greenhouse gas emissions from existing thermal generation power plants by 2016. **(Policy Action 19)** 3. Require zero greenhouse gas emissions from any coal thermal electricity facilities. **(Policy Action 20)** 4. Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation. **(Policy Action 21)** 5. No nuclear power. **(Policy Action 23)**

1.2 Capacity and Supply / Demand Gaps

FortisBC owns four hydroelectric generating plants on the Kootenay River (the "**FortisBC Plants**"). The Company is also party to a long term power purchase agreement with each of British Columbia Hydro and Power Authority ("**BC Hydro**") and Brilliant Power Corporation. The FortisBC Plants and the power purchase agreements with BC Hydro and Brilliant Power Corporation together constitute the bulk of the Company's existing power supply resources, providing a total winter peak capacity of approximately 551 MW. In 2008 these resources served about 74% of FortisBC's December 2008 winter peak of 746 MW, resulting in a shortfall of 195 MW which was met through short term, market based contracts. In 2009,

[3] "The B.C. Energy Plan: A vision for clean energy leadership", published by the Government of British Columbia on February 27, 2007

FortisBC's load forecast predicts a capacity shortfall of about 145 MW. The peak capacity shortfall grows to approximately 239 MW in 2028 based on expected loads. Further, as described in Section 5.3, a peaking capacity shortfall is forecast for six months of the year in 2009, eight months of the year by 2013 and ten months of the year by 2026.

The energy shortfall associated with the peak capacity gap – currently at about 18 GWh of annual requirements – will grow to approximately 131 GWh by 2028 net of demand side management ("**DSM**") savings.

1.3 Demand Side Management

The Company has implemented plans to accelerate realization of energy savings from existing DSM programs, to expand energy savings program offerings, and to investigate and offer appropriate and effective Demand Reduction programs with the objective of achieving the target set out in Policy Action 1 of the BC Energy Plan (relating expressly to BC Hydro) of meeting 50% of incremental resource needs through DSM measures by 2020 (the "**Energy Plan DSM Target**"). Meeting the Energy Plan DSM Target will require FortisBC to reduce by 50% the 553 GWh/year increase that FortisBC forecasts will have occurred by 2020. (It should be noted that this forecast is inclusive of existing levels of DSM activity). FortisBC's target, in the context of the Energy Plan DSM Target is, therefore, to achieve 277 GWh/year of additional, cumulative DSM savings by 2020.

FortisBC expects to achieve this target without taking into account energy savings that may be attributed to government-mandated codes and standards, price elasticity response, rate design impacts or energy savings incidental to Demand Reduction measures.

FortisBC is a capacity constrained utility. Accordingly, this 2009 Resource Plan is to a large measure focused on meeting FortisBC's forecast capacity shortfalls. Although the DSM activities that have been described in this 2009 Resource Plan are largely energy-focused, there are nevertheless associated capacity reductions resulting from proposed DSM activities. In this 2009 Resource Plan, FortisBC has applied these Demand Reductions as the first resource solution, and the Company's preferred resource strategy described in Section 8 of this 2009 Resource Plan provides the balance of the required solution.

1.4 Market Reliance

FortisBC relies on the wholesale electricity market to meet an increasing proportion of its capacity and energy requirements. The Company feels its strategy of making market purchases to close the gap between its supply and demand has generally been successful. Nevertheless, in its 2005 Resource Plan the Company stated its intention to conduct a study of the wholesale electricity market in the Western Electricity Coordinating Council ("**WECC**") region (in which the FortisBC service territory is

located) in order to assess the continuing viability of its market purchase strategy. In the Action Plan set out in FortisBC's 2005 Resource Plan, therefore, the Company undertook to complete such a study.

The Company engaged Willis Energy Services Ltd. to complete a wholesale electricity market analysis. That analysis (the "**Willis Market Analysis**") was completed in August 2007. Section 4 of this 2009 Resource Plan summarizes the results of the Willis Market Analysis, and a complete copy of the Willis Market Analysis is contained in Appendix E.

WECC's 2008 Power Supply Assessment (the "**2008 WECC PSA**") is an assessment of generation resource capacity in the WECC region, with projections to 2017. The 2008 WECC PSA also includes an assessment of generation resource capacity margins for the various WECC sub-regions.

Specific to the "Canada" sub-region summer capacity is expected to be sufficient until 2015, at which time current and currently planned resources will no longer provide sufficient capacity. The shortfall at that time is projected to be about 336 MW. Winter capacity in Canada is expected to be in deficit in 2009. By 2017, it is forecast that Canadian winter capacity will be in deficit by about 4,550 MW.

The 2008 WECC PSA includes the following caveats[4]:

Transmission Constraints:

- "This assessment is based on the physical ability of the interconnection to supply all loads regardless of contractual obligations. This means that the model uses economic relationships to calculate transfers between zones within the assigned limits. In reality, the ideal solutions may be difficult to duplicate in the operational environment. System operation for contract obligations and other conditions could adversely affect the availability of resources, and could impact the amount and timing of power supply deficiencies in specific zones".

Capacity Constraints:

- "Surplus generation in the Pacific Northwest zone was often stranded due to transmission limitations... However, neither the summer nor the winter analysis for the Northwest sub-region captures the limitations on the ability of the hydro system to sustain output levels beyond a single hour. Because of this limitation, the reported surpluses, both for Northwest sub-region's load and for potential export to other sub-regions of the West, may be unrealistically high."

Section 3.7 of this 2009 Resource Plan examines the market supply / demand forecast within the WECC region, and Section 4 provides further analysis.

[4] WECC 2008 Power Supply Assessment (Appendix D-2) page 50

FortisBC acknowledges that the market environment has changed substantially since the publication of the 2008 WECC PSA . Specifically, FortisBC understands that the short term forecast gap between regional loads and resources has been reduced. The May 2009 forecast of the Energy Information Administration (US Department of Energy)[5] notes that although energy consumption is expected to be reduced in 2009, it is expected to return to a more normal growth rate in 2010. Given that the planning period of this 2009 Resource Plan is twenty years, and that it contemplates new resources that require extended implementation timeframes, FortisBC believes it is still prudent to continue to use WECC's long term assessment of the wholesale electricity market. On this basis, over the longer term, an overall tight supply is forecast in the WECC region.

As demonstrated in Section 4.1.1.1, electricity prices from the wholesale market are volatile. Since 2003 the Mid-Columbia Light Load Hour price per MWh has varied between $0 and $150+, while Heavy Load Hour price per MWh has swung between $0 and $400+.[6] Alberta Power Pool price volatility was even greater.

FortisBC's continued reliance upon the wholesale electricity market to meet current and future needs is not a prudent strategy. The market is volatile and the cost of purchases is expected to trend upward. Availability of capacity products, as well as transmission capability necessary to move the power to FortisBC's market, is in question. Finally, the Act requires each public utility, in its resource planning, to consider the government's goal that British Columbia be self-sufficient by 2016.

1.5 Planning Margin

WECC requires utilities in the WECC region to have positive Operating Reserve Margins (hourly margins) in place at all times. WECC recommends (but does not require) that utilities also plan for positive margins on a long-term basis (called "**Planning Margin**"). A Planning Margin protects against the possibility of loss of supply owing to unplanned generating unit outage, transmission outage or unexpectedly high loads.

FortisBC currently complies with WECC's hourly Operating Reserves requirements which provide for an immediate, short term power supply reserve. However, FortisBC does not currently incorporate a Planning Margin. The risk associated with the lack of a physical Planning Margin is two-fold. First, if a single generating unit or portion of the transmission system goes out of service, FortisBC must make potentially expensive market purchases for as long as required to source a replacement supply. Second, given that power supply requirement forecasts are based on "normal" weather patterns (as described in Section 5.3), if the service territory were to experience extremes of weather (extended hot or cold periods) beyond those contemplated by the forecast, there is potential for insufficient power

[5] Energy Information Administration *Short-Term Outlook*, May 12, 2009

[6] Light Load Hours are 0100-0600 and 2300-2400 hours. Heavy Load Hours are 0700-2200 hours.

supply (that is to say that the resources planned to meet the expected forecast may prove insufficient). Accordingly, FortisBC believes it consistent with good utility practice to consider as well the additional load implied by a Planning Margin.

The Company commissioned two studies, the first by Willis Energy Services Ltd. and the second by Manitoba Hydro's HVDC Research Center, to help analyze the situation. Both reports, completed in late 2007, are attached as Appendices H-1 and H-2, respectively.

As a result of reviewing standard utility practice and following review of the two Planning Margin studies that it had commissioned, FortisBC concludes that it is prudent and necessary to acquire and maintain a Planning Margin resource in excess of forecast / load gaps. Accounting for the nature of FortisBC's resource stack, the Company recommends the implementation of a Planning Margin requirement of 45 MW to 55 MW[7] (see Table 6.3) – which is the sum of FortisBC's single largest generating unit at the Brilliant hydro facility, plus 5% of load responsibility. The recommended Planning Margin range equates to approximately 9% of FortisBC's capacity.[8]

However, the Company recognizes that an immediate implementation of the recommended Planning Margin would create a significant rate impact. Therefore, the preferred resource strategy described in Section 8 envisions the gradual, phased-in acquisition of a market based planning margin initially which will be replaced by a physical Planning Margin, effective in 2019.

Section 6.3 provides further details.

1.6 Transmission

From a transmission planning perspective, FortisBC's service territory consists of two distinct regions: the Okanagan region and the West Kootenay region. The West Kootenay region can be considered as a "generation-surplus" region with no requirement for reliability or capacity driven reinforcement within the planning period of this 2009 Resource Plan. By contrast, the Okanagan region faces both reliability and capacity constraints within the planning period of this 2009 Resource Plan. In normal operations (all transmission elements in service) the Okanagan system is forecast to accommodate load growth until 2020. Prior to 2020, the Okanagan transmission system will no longer meet N-1 reliability when the combined Kelowna/Penticton area demand exceeds approximately 615 MW. This load level is currently forecast to be reached in about 2015. A localized N-1 capacity violation occurs in the Kelowna area in approximately 2011/2012 as a result of insufficient transformation capacity. Finally, an N-1 violation occurs in approximately 2016 as a result of insufficient transformation capacity at the Vaseux Lake Terminal Station. By 2020 new supply solutions will require new transmission infrastructure, and there are a number of potential solutions to this issue – as set out in Table 3.9.2.2.4 – with costs ranging from

[7] The Planning Margin requirement is a "range" that grows with projected load growth over the planning period.

[8] For comparison, BC Hydro's reserve Planning Margin is 14%.

$70 million to $500 million+. There are also reliability-related, and local area (Kelowna) load reinforcements required. These forecast reinforcements are summarized as follows:

Table 3.9.3: Transmission Timing/Cost Summary

Type	In-Service	Capital Cost ($2009)
Kelowna Transformer	2011	$8 million
150 MVar static var compensator (SVC)	2013	$35 million
Vaseux Transformer	2016	$8 million
New Supply	2020+	$70 million - $500 million+

While, due to the time required to place new generation resources, the Kelowna-area transformer cannot be avoided, Kelowna-area new generation resource would provide potential to defer or eliminate the installation of the Vaseux transformer and the SVC, in addition to its inherent contribution to a solution for new supply requirements.

FortisBC's Preferred Resource Strategy envisions locating power generation in the Company's North Okanagan service territory, thereby potentially avoiding the last three items on the Table 3.9.3 list: the SVC, the Vaseux transformer, and new supply infrastructure.

1.7 Stakeholder Consultation

FortisBC considered it important to try to determine its customers' priorities with respect to what type of resourcing strategy those customers might support. As one would expect, there are many and varied opinions on the subject and it is difficult to draw definitive conclusions. The different consultation techniques FortisBC employed included the following:

1. presentations to 15 local government bodies;
2. 3 workshops; and
3. a broadly based telephone survey.

Despite the expected varied reactions, the following themes were prevalent:

- conservation should be considered first;
- environmentally sound solutions are important;

- transmission impacts are of concern;
- incremental cost is a concern; and
- lessening dependence on external, especially United States markets is favoured.

Subsequent to filing, FortisBC intends to present this 2009 Resource Plan to interested customers through a series of open houses within its service territory. Notification of the open houses will be published in area newspapers and a stakeholder consultation report summarizing the meetings will be filed as part of the regulatory process.

FortisBC will continue to ensure that this 2009 Resource Plan reflects its customers' input.

The stakeholder consultation process is summarized in Section 3.7 and additional detail is provided in Appendix C.

1.8 Resource Portfolios

FortisBC developed four criteria for its assessment of resource options portfolios. Those criteria are:

1. Does the portfolio, after new resources are in place and after application of DSM, close the forecast capacity and energy gaps, and provide a Planning Margin?
2. Does the portfolio minimize environment impacts?
3. How well does the portfolio meet the relevant Policy Actions set out in the BC Energy Plan (see Table 3.5.2.1)?
4. Is the portfolio economical?

The Company examined the relative merits of three portfolios of resource options, as described below:

Resource Option Portfolio 1 ("P1 – BC MARKETS")

This portfolio assumes that FortisBC will satisfy its existing and forecast capacity and energy gaps, and its need for a Planning Margin, pursuant to new power purchase agreements entered into with British Columbia-based power suppliers. These suppliers could be any of BC Hydro, Columbia Power Corporation/Columbia Basin Trust, Teck and/or other Independent Power Producers. New generation resources may have to be built to supply FortisBC's requirements, and it is the Company's expectation that it would have to pay market prices for the capacity and energy so supplied. This portfolio of generation resources is modeled to mimic the operational characteristics of those resources that may have to be built to supply FortisBC's load.

Resource Option Portfolio 2 ("P2 – GAS")

This portfolio assumes that FortisBC will satisfy its existing and forecast capacity and energy gaps, and its need for a Planning Margin, through construction of a series of Simple Cycle Gas Turbine units, the sizes and timing-of-acquisition of which are determined by the growing size of the Company's forecast capacity gap.

Resource Option Portfolio 3 – ("P3 – HYBRID")

This portfolio assumes that FortisBC will satisfy its existing and forecast capacity and energy gaps, and its need for a Planning Margin, through construction of a combination of clean, renewable resources with a gas-fueled peaking resource. Small Hydro with Capacity and Pumped Storage Hydro facilities provide the peaking and storage capacity necessary to shape energy to meet FortisBC's requirements. Later in the planning period, a source of intermittent Clean energy (for modeling purposes, Wind) is added to the portfolio. A Simple Cycle Gas Turbine provides short term peaking capability pending the Pumped Storage Hydro's in-service date and then converts to a standby Planning Margin role.

The portfolios are listed below in Table 7.3.1. The complete portfolio review process is detailed in Section 7.3.

Table 7.3.1: Portfolio Summary

Portfolio	Description	Installed Capacity (MW)	Dependable Capacity (MW)	Firm Energy Generated (GWh/yr)	Project Life (yrs)	Capital Cost (C$2009 millions)
P1 - BC Markets	Could include any of BC Hydro, Teck, Columbia Power Corp, and/or other BC-based Independent Power Producers	334	326	N/A	N/A	N/A
	Avoidable Transmission:					
	- SVC, Kelowna in **2013**					$35
	- Vaseux Transformer in **2016**					$8
	Total:	**334**	**326**	**N/A**		**$43**
P2 - Gas	- 2 x 42 MW Simple Cycle Gas Turbines (SCGT), and 2x 103 MW SCGT in **2014**	290	272	Only as required	30	230
	- 1 x 42 MW SCGT in **2020**	42	38	Only as required	30	$44
	Total:	**332**	**310**	**N/A**		**$274**
P3 - Hybrid	- 2 x 42 MW SCGTs in **2014**	84	76	Only as required	30	$88
	- Small Hydro with Capacity in **2017**	40	37	154	40+	$149
	- Pumped Storage Hydro (PSH) in **2019**	200	200	Only as required	50+	$510
	- Clean (Wind) in **2021**	30	8	66	20	$62
	Total:	**354**	**321**	**220**		**$809**

Table 7.4.4.4 below sets out the cost elements that make up the total cost, on a net present value basis (at 8% in $2009), of the three portfolios. A detailed explanation of the cost elements shown in Table 7.4.4.4 can be found in Section 7.4.4.4.

Table 7.4.4.4: Portfolio Cost Summary

Portfolio Cost Elements (NPV @8% in $2009 millions)	A	B	C	D	E	F		
Portfolio	Cost for Market Purchases	Power Cost for New Resources	Surplus Energy Sales	Capital Related Cost	Planning Margin	Total	Average Annual Rate Impact	20 Year Cumulative Rate Impact
P1 - BC MARKETS	$7.6	$311.3	$0.0	$24.9	$12.8	**$356.6**	1.12%	24.65%
P2 - GAS	$7.5	$51.6	$0.0	$143.8	$9.0	**$211.9**	0.66%	13.54%
P3 - HYBRID	$7.8	$61.3	($31.8)	$272.7	$11.8	**$321.9**	1.18%	25.75%

Column A - cost of purchasing capacity and energy from the wholesale electricity market prior to new portfolio resources coming on-line.
Column B - represents the costs associated with power production, including variable O&M, fuel, and GHG-related costs. In P1 - BC MARKETS this includes both the cost of capacity and cost of energy, as discussed in Section 7.3.5.2.. For P3 - HYBRID this includes the refill costs associated with the PSH, as discussed in Section 7.3.1.
Column C - represents potential surplus sales revenues, based upon the forecast in Table 7.6.
Column D - represents all rate requirement capital-related costs associated with new capital investment.
Column E - represents the cost associated with the market-based interim Planning Margin product purchased prior to a portfolio having a physical Planning Margin in place.
Column F is the total of Columns A through E

Table 7.4.4.4 also includes the average annual and total 20 year cumulative rate impacts for all three portfolios.

The portfolios were compared via a Decision Matrix exercise (Section 7.4) – the objective of which was to assist in identifying the solution which optimally balanced all four criteria. Table 7.4.6 below shows the relative performance of the three portfolios.

Table 7.4.6: Portfolio Performance v. Selection Criteria

Criteria	Portfolio		
Possible Total 4 - 24. "4" is Best; "24" is Worst	P1 - BC MARKETS	P2 - GAS	P3 - HYBRID
A) Gap Closure + Planning Margin	3.0	1.0	2.0
B) Environment	5.0	5.0	2.0
C) BC Energy Plan	1.0	2.0	1.0
D) Economics	4.0	1.0	2.0
Total of A + B + C + D =	13.0	9.0	7.0

Decision Matrix Legend

First =	
Second =	
Last =	

Complete details on criteria, weightings and portfolio scores in the Decision Matrix can be found in Section 7.4.6.

1.9 Preferred Resource Strategy

The P3 – HYBRID portfolio is, in FortisBC's opinion, a balanced solution to the Company's forecast capacity and energy gaps. It represents the resource portfolio that, through implementation of a blend of available technologies, provides the best solution in terms of environmental protection, operating flexibility and long term generation capacity sustainability. **Consequently, the P3 – HYBRID is FortisBC's Preferred Resource Strategy**.

The P3 – HYBRID portfolio contemplates the acquisition of resources as follows:

- 2014 - 2 x 42 MW Simple Cycle Gas Turbines to provide peak capacity support and to provide transmission support to the North Okanagan region. When no longer needed in the peak capacity support role (after the Pumped Storage Hydro comes on line) these facilities would be placed on standby in the Planning Margin role while continuing to provide transmission support.

- 2017 - 40 MW Small Hydro with Capacity.

- 2019 - 200 MW Pumped Storage Hydro facility to take over the peaking role from the Simple Cycle Gas Turbines and allow for storage to support both customer-owned and other system intermittent renewables such as Wind.

- 2021 - 30 MW of Clean Resource. Such a resource might be Wind (which FortisBC has used for modeling purposes) but could include other forms of clean power.

The Pumped Storage Hydro facility would be a net user of energy, requiring approximately 1.3 GWh in refilling energy for every 1.0 GWh of energy production. As the Pumped Storage Hydro facility would produce energy during Heavy Load Hours to match FortisBC's peak demands, refilling would take place during non-peak Light Load Hours. The refill energy would come primarily from FortisBC's existing and new clean renewable resources during those Light Load Hours.

1.9.1 Preferred Resource Strategy Load / Resource Balance

Figures 8.2.3-A and 8.2.3-B below following provide graphical representations of the P3-HYBRID portfolio's ability to meet both energy and capacity growth for high, expected and low forecasts over the planning period of this 2009 Resource Plan.

Figure 8.2.3-A: Preferred Resource Strategy – Energy Load / Resource Balance

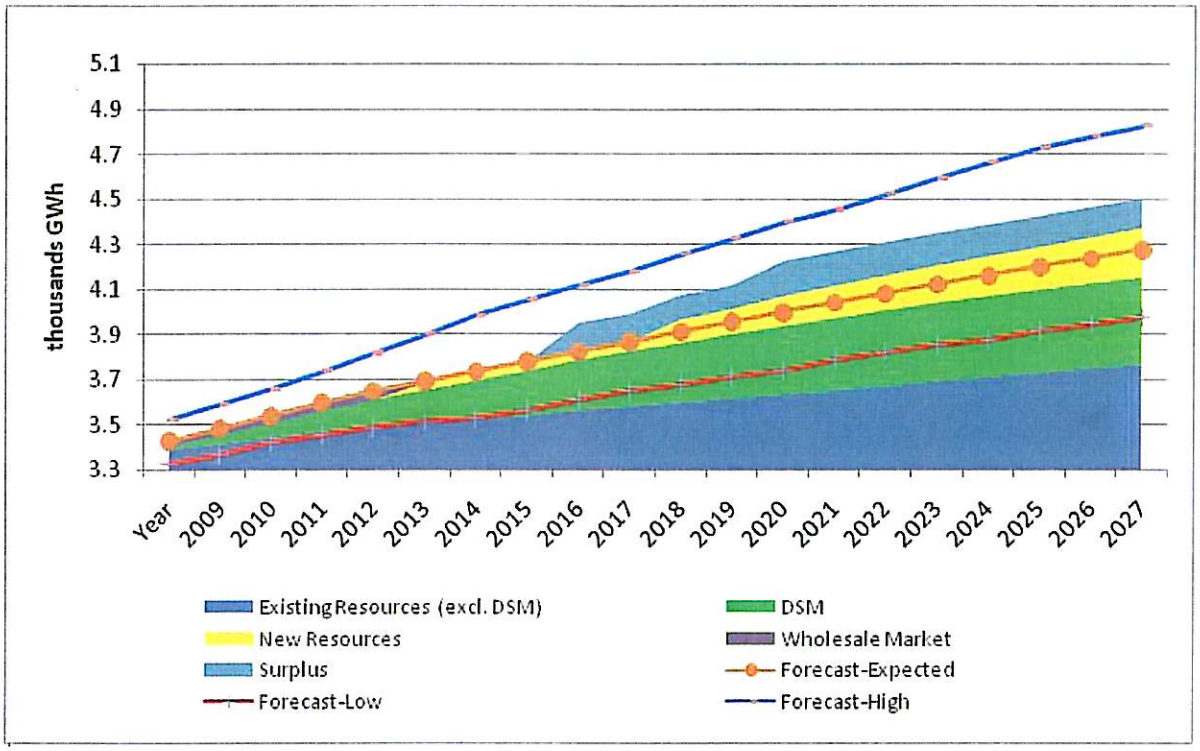
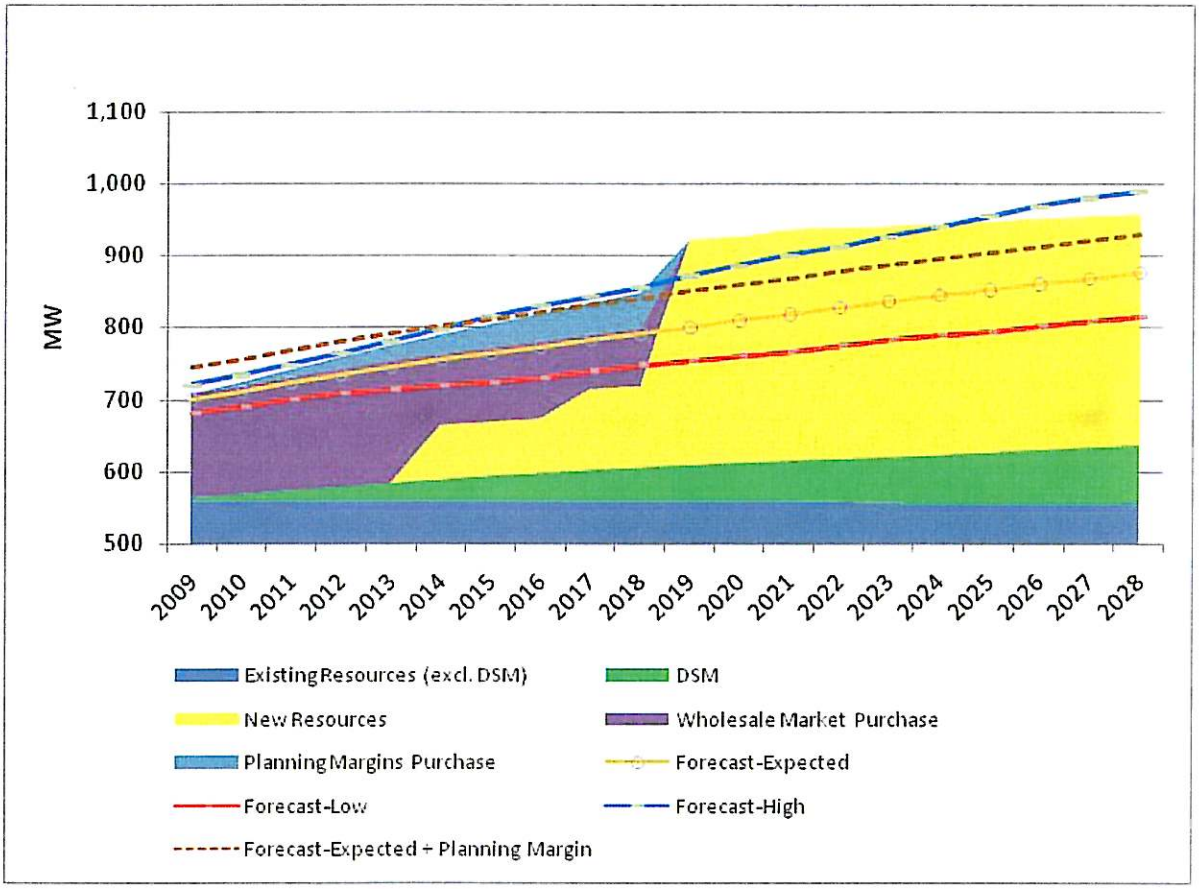


Figure 8.2.3-A above demonstrates that, after satisfying the forecast load, a portion of new resource energy goes to refill the Pumped Storage Hydro reservoir, with the balance becoming surplus.

Figure 8.2.3-B below demonstrates how the P3 - HYBRID portfolio deals with the capacity supply / demand gap over the planning period of this 2009 Resource Plan. The Low, Expected and High peak capacity forecasts are displayed by the red, orange, and blue lines, respectively. Until new resources start to come on line in 2014, the capacity supply / demand gap is covered by DSM and market purchases (green and purple areas). From 2014 until 2019, as new resources are introduced (the yellow area) the peak capacity gap is reduced and then finally eliminated. The blue area represents the market-based interim Planning Margin until it is replaced by conversion of the Simple Cycle Gas Turbines to the Planning Margin role in 2019. Finally, the brown dotted line represents the sum of the Expected peak capacity requirements, plus Planning Margin.

Figure 8.2.3-B: Preferred Resource Strategy – Capacity Load / Resource Balance



1.9.2 Transmission Considerations

FortisBC's ability to locate new generation in the Kelowna area is a key determinant of impacts associated with transmission infrastructure. The key to successful amelioration of potential transmission impacts (environmental and economic) is to defer or eliminate the need to construct transmission infrastructure. As discussed in Section 3.9 above, FortisBC has assumed that additional transmission infrastructure will be required to support the Okanagan load center. The P3 - HYBRID portfolio assumes that the Simple Cycle Gas Turbines will be located in the North Okanagan, although the viability of such a location needs to be the subject of further study. As a result the P3 - HYBRID portfolio may defer or eliminate the need to construct the additional transmission infrastructure necessary to move new generation to the Kelowna load – estimated to cost in the range $70 million to $500 million+.

1.9.3 Environmental Considerations

The P3 - HYBRID portfolio requires the construction of Simple Cycle Gas Turbines which will produce some greenhouse gas emissions. However, the emissions are limited, and by 2019, in normal

operations, would cease. Those emissions will be minimized by running the Simple Cycle Gas Turbines primarily as a peaking facility for the period 2014 to 2018 until the Pumped Storage Hydro facility takes over peaking operations. Peaking operations equate to less than 1% average effective capacity of the Simple Cycle Gas Turbines, with the peak year being 5.9% in 2016. From 2019 the Simple Cycle Gas Turbines are placed on standby in the Planning Margin role. Total greenhouse gas emissions will be approximately 115 thousand tonnes over the planning period of this 2009 Resource Plan – which equates to approximately 25% of the greenhouse gas emissions that would be produced by continuing to rely upon the wholesale electricity market. Running the Simple Cycle Gas Turbines in excess of peaking requirements could occur if electricity market economics indicate that surplus sales would benefit FortisBC's ratepayers. Run time in excess of planned peaking operations would produce additional greenhouse gas emissions at the rate of approximately ½ tonne per MWh.

FortisBC's environmental performance will be improved by the P3 – HYBRID portfolio's green resources of the Pumped Storage Hydro facility, Small Hydro, and Clean energy facilities when they come on line, and enhanced by the use of new and existing clean and renewable resources to provide the energy necessary to refill the Pumped Storage Hydro facility during Light Load Hours.

The storage and energy shaping capabilities provided by both the Small Hydro and Pumped Storage Hydro facilities would enable FortisBC to incorporate more intermittent clean resources to its system as required in the future. These attributes of the P3 – HYBRID portfolio's storage resources are necessary enablers for FortisBC's customers to pursue, on a larger scale, distributed generation sources such as backyard wind turbines, and rooftop solar systems. Further, these storage attributes could provide FortisBC with an opportunity to support clean and renewable resources outside the Company's service territory.

Therefore, when the entire portfolio is considered, the overall environmental benefits of the P3 – HYBRID portfolio are, in the Company's opinion, considered favourable.

1.9.4 BC Energy Plan

The P3 – HYBRID portfolio meets the objectives of all of the BC Energy Plan Policy Actions enumerated in Table 3.5.2.1 above, including Policy Action 20 (zero greenhouse gas emissions from coal), 18 (zero net greenhouse gas emissions) and 19 (zero net greenhouse gas emissions from existing thermal by 2016).[9] 100% of dependable capacity is from clean energy sources[10]. This meets the Policy Action 21 goal of 90%. Further, the P3 – HYBRID portfolio contributes to provincial self-sufficiency goals (Policy Action 10).

[9] FortisBC has included the costs of greenhouse gas – related offsets applicable to its planned operations of the Simple Cycle Gas Turbine in its economic analysis, as noted in Section 7.2.2.3

[10] Inclusive of existing power purchase agreements, and excluding the Planning Margin.

1.9.5 Capital Costs and Rate Requirements

1.9.5.1 Capital Expenditures

The capital expenditures for the PRS are noted in Table 8.6.1-A below:

Table 8.6.1-A: Preferred Resource Strategy Capital Expenditure

Preferred Resource Strategy	Year in Service	Capital Cost (C$2009 million)
Simple Cycle Gas Turbine (SCGT)	2014	$88.0
Small Hydro with Capacity	2017	$148.0
Pumped Storage Hydro (PSH)	2019	$510.0
Wind	2021	$63.0
Total		**$809.0**

1.9.5.2 NPV Calculations and Associated Rate Requirements

Table 8.6.2 below repeats the cost elements that make up the total cost, on a net present value basis (at 8% in $2009) of the Preferred Resource Strategy. Table 8.6.2 also includes the average annual and total 20 year cumulative rate impacts.

Table 8.6.2: Preferred Resource Strategy Net Present Value Cost Elements

	Portfolio Cost Elements (NPV @8% in $2009 millions)							
	A	B	C	D	E	F		
Portfolio	Cost for Market Purchases	Power Cost for New Resources	Surplus Energy Sales	Capital Related Cost	Planning Margin	Total	Average Annual Rate Impact	20 Year Cumulative Rate Impact
Preferred Resource Strategy	$7.8	$61.3	($31.8)	$272.7	$11.8	**$321.9**	1.18%	25.75%

Column A - cost of purchasing capacity and energy from the wholesale electricity market prior to new portfolio resources coming on-line.
Column B - represents the costs associated with power production, including variable O&M, fuel, and GHG-related costs. For the Preferred Resource Strategy this includes the refill costs associated with the PSH, as discussed in Section 7.3.1.
Column C - represents potential surplus sales revenues, based upon the forecast in Table 7.6.
Column D - represents all rate requirement capital-related costs associated with new capital investment.
Column E - represents the cost associated with the market-based interim Planning Margin product purchased prior to a portfolio having a physical Planning Margin in place.
Column F is the total of Columns A through E

The P3 – HYBRID portfolio will, (for the "expected" load, the net present value of Revenue Requirements @ 8% discount rate in 2009 dollars, over the planning period of this 2009 Resource Plan) cost approximately $322 million, including $12 million for the interim market-based Planning Margin, and approximately $32 million in surplus sales.

In order to manage and minimize both rate implications and reliability risk related to the Planning Margin, FortisBC has chosen to phase-in the acquisition of the market-based, interim Planning Margin pending the Simple Cycle Gas Turbines conversion to the Planning Margin role in 2019.

FortisBC has investigated the potential economic benefit of running the Simple Cycle Gas Turbines to take advantage of market opportunities. Even though there appear to be few predictable opportunities to engage in profitable off-system sales, the Company would be well positioned to take advantage of short term market excursions and this could generate economic benefits to offset the rate impact of the P3 – HYBRID portfolio. Of course, this would also require the acquisition of the required environmental offsets.

The Pumped Storage Hydro facility provides FortisBC with similar opportunities to take advantage of short term market price excursions to generate economic benefits to offset the rate impact of the P3 – HYBRID portfolio. Additionally, the storage attributes of the Pumped Storage Hydro facility are considered to have economic potential in the sale of related ancillary services to shape and firm otherwise intermittent power from other renewable resources. The as-yet-unformed market for these services could include both British Columbia as it continues to develop renewable sources of electricity and the United States as it seeks capacity to support its Renewable Portfolio Standards.

The rate impact for the P3 – HYBRID portfolio, without consideration for potential revenue streams as discussed above, equates to an annual average of 1.18%. The twenty year cumulative rate impact is 25.75%.

Full details of the preferred resource strategy can be found in Section 8.

1.10 Action Plan

To implement the Preferred Resource Strategy, FortisBC proposes the following Action Plan:

1. The Company will implement its preferred resource strategy, as outlined in Section 8, pursuant to the following:

    (a) FortisBC requests that the Commission accept this 2009 Resource Plan (including, without limitation, the P3 – HYBRID portfolio described in Section 8 of this 2009 Resource Plan as the Company's preferred resource strategy), and determine that carrying out this 2009 Resource Plan would be in the public interest, all pursuant to Section 44.1(6)(a) of the Act; and

    (b) FortisBC requests that the Commission accept the following schedule of proposed expenditures, and determine that making the expenditures would be in the public interest, all pursuant to Section 44.2(3)(a) of the Act:

(i) **Planning Margin:** expenditures of up to **$150,000 required in 2010**. These funds are for the preparation and implementation of an RFP process that will result in the identification of a preferred planning margin (capacity product) resource for which FortisBC will file with the Commission an application pursuant to Section 71 of the Act. The interim Planning Margin is required as a medium term, bridging resource until the acquisition of the Pumped Storage Hydro facility as noted below.

(ii) **Simple Cycle Gas Turbine:** expenditures of up to **$1.5 million required in 2010 and 2011**. These funds are to complete pre-CPCN work necessary to prepare and file a CPCN application in time to meet an in-service date of 2014. This pre-CPCN work will include (a) site evaluations and acquisition, (b) environmental assessment, and (c) pre-engineering cost assessment work. The pre-engineering cost assessment work will develop the detailed cost assessments required to identify the funds necessary to develop a CPCN application for a Simple Cycle Gas Turbine plant. The pre-engineering cost assessments, an update on the status of the environmental assessment, as well as a request for CPCN development funds will be filed with the Commission by the end of 2010. A full CPCN application will be filed in 2011.

(iii) **Small Hydro:** expenditures of up to **$500,000 required in 2010**. These funds are to complete the pre-CPCN work necessary to prepare and file a CPCN application in time to meet an in-service date of 2017. This work will include (a) site evaluations and acquisition, and (b) pre-engineering cost assessment work. The pre-engineering cost assessment work will develop the detailed cost assessments required to identify the funds necessary to develop a CPCN application for a Small Hydro with Capacity facility. The pre-engineering cost assessments, as well as a request for CPCN development and environmental assessment funds will be filed with the Commission by the end of 2010. A full CPCN application will be filed in 2012.

(iv) **Pumped Storage Hydro:** expenditures of up to **$500,000 required in 2010** are in the public interest. These funds are to complete the pre-CPCN work necessary to prepare and file a CPCN application in time to meet a proposed in-service date of 2019. The pre-CPCN work will include (a) site evaluations, selection and acquisition work, and (b) pre-engineering cost assessments. The pre-engineering cost assessment work will develop the detailed cost assessments required to identify the funds necessary to develop a CPCN application for a Pumped Storage Hydro facility. The pre-engineering cost

assessments, as well as a request for CPCN development and environmental assessment funds will be filed with the Commission by the end of 2010. A full CPCN application will be filed in 2012.

(v) **Clean:** expenditures of up to **$250,000 required in 2012**. These funds are required for the investigation of the potential for a new Clean Energy resource(s) suitable for FortisBC are in the public interest. It is anticipated that this investigation may take the form of a Clean Call for Power, however, further study is required. A report on this investigation, as well as timetable for development necessary to bring this resource into service by 2021 will be filed with the Commission in 2014.

2. In accordance with Section 44.1(2) of the Act, the Company proposes to update this Resource Plan in two years (that is, by 2011), or sooner, if circumstances materially change prior to that time or at such other time as the Commission requires.