From:	MacLaren, Les EMPR:EX
To:	Wieringa, Paul EMPR:EX; Rowe, Katherine EMPR:EX; Sopinka, Amy EMPR:EX
Subject:	FW: For Chris"s review
Date:	Saturday, December 2, 2017 9:53:09 AM
Attachments:	Site C Responses 1 Dec 2017 v2.docx ATT00001.htm

Info

From: O'Riley, Christopher [mailto:Chris.Oriley@bchydro.com]
Sent: Saturday, December 2, 2017 9:29 AM
To: Nikolejsin, Dave MNGD:EX; MacLaren, Les EMPR:EX
Subject: Fwd: For Chris's review
Termination rate increase put in terms of customer bills.

Sent from my iPhone

Begin forwarded message:

> **From:** "Clarke, Gareth" <Gareth.Clarke@bchydro.com>
> **Date:** December 2, 2017 at 9:15:46 AM PST
> **To:** "O'Riley, Christopher" <Chris.Oriley@bchydro.com>
> **Subject: Fwd: For Chris's review**
>
> Sorry, should be there now?
>
> Sent from my iPhone.
>
> Begin forwarded message:
>
> > **From:** "Magre, Leela" <Leela.Magre@bchydro.com>
> > **Date:** December 1, 2017 at 14:29:38 PST
> > **To:** "Clarke, Gareth" <Gareth.Clarke@bchydro.com>
> > **Subject: For Chris's review**
> >
> > Hi Gareth,
> > We've been asked to pull together some info on Site C for Gov. Could you have Chris review before the end of the day? Sorry, I know I'm not giving much time.
> > This has been approved by the relevant business groups.
> > Thanks,
> > Leela
> >
> > ---
> > **Leela Magre** | Manager, Policy & Research
> > **BC Hydro**
> > 333 Dunsmuir St, 15th floor
> > Vancouver, BC V6B 5R3
> > **P** 604 623 4008
> > **M** 236 993 0338
> > **E** leela.magre@bchydro.com
> > bchydro.com
> > **Smart about power in all we do.**

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Site C Responses

1. **Examples of the impact of a 12% rate hike in terms of a typical household - ideally by region and household type.**

- If Site C is terminated and costs are recovered over 10 years, a rate impact of 12.1% means the typical residential household would pay about $1000 over the 10-year period.

    - Lower Mainland
        - A customer that lives in a single family home and has electric heat would pay $194 more in 2019.
        - A customer that lives in a townhome and has electric heat would pay $128 more in 2019.
        - A customer that lives in an apartment and has electric heat would pay $55 more in 2019.

    - Vancouver Island
        - A customer that lives in a single family home and has electric heat would pay $200 more in 2019.
        - A customer that lives in a townhome and has electric heat would pay $139 more in 2019.
        - A customer that lives in an apartment and has electric heat would pay $57 more in 2019.

    - Southern Interior
        - A customer that lives in a single family home and has electric heat would pay $193 more in 2019.
        - A customer that lives in a townhome and has electric heat would pay $116 more in 2019.
        - A customer that lives in an apartment and has electric heat would pay $73 more in 2019.

    - Northern Interior
        - A customer that lives in a single family home and has electric heat would pay $187 more in 2019.
        - A customer that lives in a townhome and has electric heat would pay $168 more in 2019.
        - A customer that lives in an apartment and has electric heat would pay $61 more in 2019.

[Supporting data follows]

			Illustrative Bill Difference with 12.1% Increase	
Region	Housing Type	Heating Type	Annual Bill	Average Monthly Bill
Lower Mainland	Single Family Dwelling	Electric Heat	$ 194	$ 16
		Non Electric Heat	$ 100	$ 8
	Townhome	Electric Heat	$ 128	$ 11
		Non Electric Heat	$ 69	$ 6
	Apartment	Electric Heat	$ 55	$ 5
		Non Electric Heat	$ 37	$ 3
Vancouver Island	Single Family Dwelling	Electric Heat	$ 200	$ 17
		Non Electric Heat	$ 104	$ 9
	Townhome	Electric Heat	$ 139	$ 12
		Non Electric Heat	$ 63	$ 5
	Apartment	Electric Heat	$ 57	$ 5
		Non Electric Heat	$ 37	$ 3
Southern Interior	Single Family Dwelling	Electric Heat	$ 193	$ 16
		Non Electric Heat	$ 103	$ 9
	Townhome	Electric Heat	$ 116	$ 10
		Non Electric Heat	$ 79	$ 7
	Apartment	Electric Heat	$ 73	$ 6
		Non Electric Heat	$ 48	$ 4
Northern Interior	Single Family Dwelling	Electric Heat	$ 187	$ 16
		Non Electric Heat	$ 98	$ 8
	Townhome	Electric Heat	$ 168	$ 14
		Non Electric Heat	$ 77	$ 6
	Apartment	Electric Heat	$ 61	$ 5
		Non Electric Heat	$ 45	$ 4

Data Source: 2014 REUS and F2015 Billing Data, as cited in 2015 RDA, BC Hydro's response to BCOAPO IR 1.59.6

Illustrative consumption is the Median Consumption of each segment

2. What would an alternative portfolio look like in a terminate scenario (renewables, capacity, transmission)? To meet 30% GHG reductions by 2030, and 80% by 2050.

- If we don't build Site C by 2030 we would need about 600 MW of wind and 1,000 MW of pumped storage by 2030 in addition to higher levels of conservation.

- 1,100 hectares of land impacts to accommodate about 200 wind turbines and one large pumped storage facility (equivalent to 3 times the size of Stanley Park).

- Meeting 2030 and 2050 GHG emission reduction targets would require more resources:

  - In 2030 with Site C – we need about 4,300 MW of wind, 5,000 MW of pumped storage capacity and three new high-voltage transmission lines:
    - 12,000 hectares of land impacts (equivalent to 30 times the size of Stanley Park covered with wind turbines and pumped storage facilities) to accommodate about 1,400 wind turbines and five large pumped storage facilities
    - 700 km of transmission corridors

  - In 2030 without Site C – we need an additional 1,600 MW of wind and 1,000 MW of pumped storage for a total of 5,900MW of wind and 6,000MW of pumped storage:
    - 9,000 total hectares of land impacts to accommodate a total of 2,000 wind turbines and six large pumped storage facilities (equivalent to 21 times the size of Stanley Park)
    - 700km of transmission corridors for three new high-voltage transmission lines (same as with Site C)

  - By 2050 (with or without Site C) – we would need an additional 9,600 MW of wind and 7,000 MW of pumped storage capacity and seven more new high-voltage transmission lines (over and above what is required in 2030):
    - 13,000 hectares of land impacts beyond the impacts above to accommodate about 3,200 more wind turbines and seven more large pumped storage facilities (equivalent to an additional 33 times the size of Stanley Park).
    - 1,700 km of transmission corridors beyond the 700 km above.

Important notes:

- The land impacts identified above are "direct" impacts only.
  - For wind, this consists of the turbine base, roads and transmission to the point of interconnection. The actual permitted size of the wind farm will be substantially larger as there is spacing among the wind turbines. Some land use (such as agriculture) can continue in this permitted but not directly impacted land.

- Our best assessment today is that wind projects will average approximately 3MW per turbine. The actual turbine size for a project would be determined after investigative and design studies, and may vary from this amount. As a result, the number of turbines and the amount of land required will vary from our estimates.

- We have made approximations for the land impact of transmission and roads required for the wind and pumped storage projects. The actual transmission and road impact would be determined after investigative and design studies, and may vary from this amount.

- This is an approximate impact that assumes wind and pumped storage continue to be the most cost effective resources.