

# William J. Andrews

## Barrister & Solicitor

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August 30, 2017

British Columbia Utilities Commission  
Sixth Floor, 900 Howe Street, Box 250  
Vancouver, BC, V6Z 2N3  
Attn: Patrick Wruck, Commission Secretary

By email: [commission.secretary@bcuc.com](mailto:commission.secretary@bcuc.com)

Dear Sir:

Re: Site C Inquiry, Copy of “Key Findings – Load Forecast”

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I am writing on behalf of the interested party B.C. Sustainable Energy Association to provide, for posting on the inquiry website, a copy of the August 25, 2017 document titled “Key Findings – Load Forecast” issued by the Commission Panel in the proceeding regarding F2017 to F2019 Revenue Requirements Application (F2017-F2019 RRA or RRA). While BCSEA and other interveners in the RRA proceeding are aware of the “Key Findings – Load Forecast” document, it is my assumption that many parties interested in the Site C Inquiry may not be aware of it (although it is posted on the Commission’s RRA website.<sup>1</sup>)

**Background.** Order in Council 244/2017 requires the Commission to conduct the Site C Inquiry. It states in section 3(c) that in responding to the inquiry questions the Commission must use BC Hydro’s load forecasts submitted to the Commission in July 2016 in the F2017-F2019 RRA proceeding, with adjustments referred to in s.3(c)(i) and with sensitivity factors referred to in s.3(c)(ii). In the RRA proceeding, BC Hydro’s July 2016 load forecasts were the subject of numerous information requests by Commission staff and registered interveners. In the written final argument phase of the RRA, certain interveners argued that BC Hydro’s load forecasts are too high, and BC Hydro provided arguments in reply. While the Commission has not yet issued a final decision in the RRA proceeding, the RRA panel issued the “Key Findings – Load Forecast” document (attached). In the preface, the panel explains why it issued these findings ahead of the main decision on the RRA:

“In light of the requirement for the Commission to review additional details related to BC Hydro’s 2016 load forecast as part of the Site C Inquiry, the Panel considers it appropriate to provide its findings on the 2016 Load Forecast for the fiscal 2017 to fiscal 2019 test period (three-year test period) in advance of issuing its full decision on the remaining issues and determinations on approvals sought in the Application which is to be issued by the Commission in due course.”

My intention in providing the “Key Findings – Load Forecast” document is to bring it to the attention of parties interested in the Site C Inquiry. I am making no submissions at this time regarding how the inquiry panel should interpret or apply the document.

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<sup>1</sup> [http://www.bcuc.com/Documents/Proceedings/2017/DOC\\_49872\\_08-25-2017\\_BCH\\_RRA\\_Key-Findings-Load-Forecast.pdf](http://www.bcuc.com/Documents/Proceedings/2017/DOC_49872_08-25-2017_BCH_RRA_Key-Findings-Load-Forecast.pdf)

Yours truly,

William J. Andrews

A handwritten signature in black ink, appearing to read 'WJ Andrews', with a horizontal line extending from the end of the signature.

Barrister & Solicitor  
Encl.



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**Patrick Wruck**  
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August 25, 2017

Sent via eFile

Mr. Fred James  
Chief Regulatory Officer  
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British Columbia Hydro and Power Authority  
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Vancouver, BC V6B 5R3  
bhydroregulatorygroup@bchydro.com

**Re: British Columbia Hydro and Power Authority – F2017 to F2019 Revenue Requirements Application – Project No. 1598869 (3698869)**

Dear Mr. James:

Further to your July 28, 2016 application on the above noted matter, enclosed please find the Panel's key findings on the 2016 Load Forecast for the fiscal 2017 to fiscal 2019 test period.

Sincerely,

*Original signed by:*

Patrick Wruck  
Commission Secretary

HC/kbb



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# **British Columbia Hydro and Power Authority**

## **F2017 to F2019 Revenue Requirements Application**

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### **Key Findings – Load Forecast**

August 25, 2017

Before:

D. M. Morton, Panel Chair  
K. A. Keilty, Commissioner  
D. J. Enns, Commissioner

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**Key Findings – Load Forecast**

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## 1.0 Preface

On July 28, 2016, the British Columbia Hydro and Power Authority (BC Hydro, the authority) filed its Fiscal 2017 to Fiscal 2019 (F2017 to F2019) Revenue Requirements Application (Application) pursuant to sections 59 to 60 of the *Utilities Commission Act* (UCA) requesting, among other things:

- Final approval to increase rates by an average of 4.0 percent effective April 1, 2016, 3.5 percent effective April 1, 2017 and 3.0 percent effective April 1, 2018, which reflect the rate caps set out in Direction No. 7;
- Final approval of Open Access Transmission Tariff rates effective April 1, 2016, April 1, 2017 and April 1, 2018 as set out in the Application;
- Approval for changes and additions to certain regulatory and deferral accounts; and
- Acceptance of the demand-side measurements expenditure schedules under section 44.2 of the UCA.

On August 2, 2017, the Lieutenant Governor in Council, by Order in Council (OIC) No. 244, requested the British Columbia Utilities Commission (Commission), pursuant to section 5(1) of the UCA, to advise the Lieutenant Governor in Council respecting BC Hydro's Site C project in accordance with the terms of reference set out in section 3 of OIC No. 244 (Site C Inquiry). On August 8, 2017, in response to the OIC, the Commission initiated the Site C Inquiry.

Section 3(c) of OIC No. 244 states that in making its applicable determinations, the Commission:

... must use the forecast of peak capacity demand and energy demand submitted in July 2016 as part of the authority's [BC Hydro's] Revenue Requirements Application, and must require the authority [BC Hydro] to report on

- (i) developments since that forecast was prepared that will impact demand in the short, medium and longer terms, and
- (ii) other factors that could reasonably be expected to influence demand from the expected case toward the high load or the low load case;

In light of the requirement for the Commission to review additional details related to BC Hydro's 2016 load forecast as part of the Site C Inquiry, the Panel considers it appropriate to provide its findings on the 2016 Load Forecast for the fiscal 2017 to fiscal 2019 test period (three-year test period) in advance of issuing its full decision on the remaining issues and determinations on approvals sought in the Application which is to be issued by the Commission in due course.

## 2.0 Introduction

In the Application, BC Hydro seeks, among other things, approval of rates for the three year test period.<sup>1</sup> BC Hydro states that the first three years of the May 2016 Load Forecast are key inputs for its Revenue Forecast and the Cost of Energy for the test period (fiscal 2017 to fiscal 2019). The Load Forecast is also a key input for BC Hydro's Load Resource Balances and its 10 Year Rates Plan.<sup>2</sup> However, it further stated that the longer term

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<sup>1</sup> Exhibit B-1-1, p. 1-1.

<sup>2</sup> Exhibit B-1-1, pp. 3-1 – 3-2.

forecast beyond fiscal 2019 is provided for context in this application and that BC Hydro will update its load forecast in the 2018 Integrated Resource Plan (IRP).<sup>3</sup>

BC Hydro also states that the load forecast provided in the Application is lower than the forecasts provided by BC Hydro in the 2013 IRP which were used as an input into the 2013 10 Year Rates Plan. BC Hydro indicates that developments in recent months have amplified this issue and illustrate the fact that load forecasting is inherently an uncertain undertaking.<sup>4</sup>

BC Hydro explained in response to BCUC IR 4.7 that the load forecast presented in the Application will also be used internally for many purposes such as load resource balance planning, monthly energy studies, long term transmission planning studies, and demand-side management planning.<sup>5</sup> BC Hydro stated that it:

... updates our load forecast annually and as circumstances dictate and would use the most current load forecast available. BC Hydro will consider any Commission determination and comments as we continue to update our load forecast. We will also consider new information that becomes available.<sup>6</sup>

BC Hydro indicated that a new load forecast will be completed in 2017 for input into the 2018 IRP.<sup>7</sup> BC Hydro also stated that the test period load forecast may be used to support the analysis of need and cost effectiveness of an Electricity Purchase Agreement (EPA) renewal.<sup>8</sup>

### 3.0 Legislative framework

The context for the Panel's review of the 2016 Load Forecast and associated revenue forecast is to find whether or not the forecasts are reasonable for use in the three-year test period in order to determine if the approvals sought comply with sections 59–60 of the UCA as well as the other elements of the legislative framework as summarized in Section 2.4 of the Application.

BC Hydro is exempt from section 44.1 of the UCA which addresses long-term resource planning by public utilities.<sup>9</sup> The *Clean Energy Act* (CEA) requires BC Hydro to submit its integrated resource plan to the minister for approval and identifies load forecasting as a key element of the integrated resource plan, thereby limiting the Commission's jurisdiction over BC Hydro's long-term load forecast. Section 3 of the CEA states that:

The authority must submit to the minister, in accordance with subsection (6), an integrated resource plan that is consistent with good utility practice and that includes all of the following:

- (a) a description of the authority's forecasts, over a defined period, of its energy and capacity requirements to achieve electricity self-sufficiency...
- (b) a description of the consultations carried out by the authority respecting the development of the integrated resource plan...

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<sup>3</sup> Exhibit B-14, BCUC IR 195.1.1.

<sup>4</sup> Exhibit B-1-1, p. 1-8.

<sup>5</sup> Exhibit B-9, BCUC IR 4.7.

<sup>6</sup> Exhibit B-14, BCUC IR 195.3.

<sup>7</sup> Exhibit B-14, BCUC IR 195.3.

<sup>8</sup> Exhibit B-14, BCUC IR 195.4.

<sup>9</sup> BC Hydro Reply Argument, p. 37.

Accordingly, the focus of the Panel’s review of the load forecast and associated revenue forecast is on the three-year test period since long-term planning is either governed by other legislative parameters or addressed in other processes.

With respect to actual variances from the revenue forecast in the test period, Direction No. 7 (7)(c)(i) to the Commission states:

When regulating and setting rates for the authority, the commission must, in regard to the non-heritage deferral account (NHDA), allow the authority to continue to defer to that account the variances between actual and forecast cost of energy arising from differences between actual and forecast domestic customer load.

In addition to providing variance protection for the revenue forecast as noted above, Direction No. 7 (9) to the Commission also directed the Commission to establish the rate smoothing account to defer for recovery in rates in future years, those portions of the allowed revenue requirement in a particular fiscal year that were not, or are not to be recovered in rates in that particular year.<sup>10</sup> Direction No. 7(9) states:

- (1) When regulating and setting rates for the authority for F2017, F2018 and F2019, under sections 4, 5, 6, 7, 9 (2), 10 (3) and 11 of this direction, the commission must not allow the rates to increase by more than 4% in F2017, 3.5% in F2018 and 3% in F2019, on average, compared to the rates of the authority immediately before the increase.
- (2) If the base line rate change exceeds 4% in F2017, 3.5% in F2018 or 3% in F2019, the commission must order the authority to defer to the rate smoothing regulatory account the amount that is determined by subtracting the amount in paragraph (b) from the amount in paragraph (a)
  - (a) the forecast revenue that the authority would have earned under a base line rate change, and
  - (b) the forecast revenue that the authority is expected to earn under this direction.

#### 4.0 Key issues arising

BC Hydro submits the Commission should find that the Load Forecast and Revenue Forecast for the test period are reasonable.<sup>11</sup> In its reply argument, BC Hydro summarizes the views of interveners as follows:

Five interveners have commented on load forecasting in their submissions. Their views diverge. NIARG submits that the test period Load Forecast “appear[s] to be reasonable”. BCOAPO also generally accepts BC Hydro’s forecast for use in setting rates for the test period. AMPC advocates changes to the methodology prospectively, but does not recommend adjustments to the test period forecast. Only CEABC and CEC advocate adjusting the test period Load Forecast

...

CEABC argues the forecast is too low, while CEC argues it is too high.<sup>12</sup>

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<sup>10</sup> Exhibit B-1-1, p. 7-43.

<sup>11</sup> BC Hydro Final Argument, p. 26.

<sup>12</sup> BC Hydro Reply Argument, pp. 14– 15.

Based on its review of the evidence and considering the arguments of the parties, the Panel has identified the following key issues to be addressed in its findings on the reasonableness of the load forecast and associated revenue forecast for the three-year test period:

1. Scope and purpose;
2. Industrial elasticity; and
3. Load forecast methodology and variance treatment.

#### **4.1 Scope and purpose**

BC Hydro confirmed that the longer term forecast beyond fiscal 2019 is provided for context in the Application and states that BC Hydro will update its load forecast in the 2018 IRP.<sup>13</sup>

Some interveners in the proceeding argue that BC Hydro should use its updated load forecast to inform other issues. For example, the Non-Integrated Areas Ratepayers Group (NIARG) suggests that BC Hydro use “the best available information” for operational decisions and any EPA filings under section 71 of the UCA.<sup>14</sup> The Commercial Energy Consumers Association of British Columbia (CEC) submits that the 2016 Load forecast is high over the planning horizon and should be reforecast to avoid overspending on new energy resources that are not needed.<sup>15</sup> CEC further submits that an adjustment to the long-term forecast is required for appropriate Independent Power Producers (IPP) EPA planning.<sup>16</sup> The Association of Major Power Producers of British Columbia (AMPC) also has concern that extends beyond the test period as they are not convinced that the forecasts attributed to facilities under construction and yet to commence operations, should be considered reliable.<sup>17</sup>

#### *Panel discussion*

The Panel’s review of BC Hydro’s load forecast is focused on the F2017 to F2019 test period as inputs to calculating its revenue forecast and the cost of energy component of its proposed revenue requirement. The Panel makes no findings on any other purpose of the load forecast in this proceeding.

On January 27, 2017, the Commission issued Order G-7-17 and Reasons for Decision, which stated:

The review of this Application is focused on setting BC Hydro’s rates for F2017 though F2019.

...

BC Hydro has clarified that the load forecasts beyond the test period will be the subject of the 2018 Integrated Resource Plan. The Panel further recognizes that the Heritage Deferral Account (HDA) and the Non-Heritage Deferral Account (NHDA) are legislated to capture variances related to COE and revenue forecasts, which is impacted by the load forecast. In addition, there are further legislative parameters relating to the [Standing Offer Program] SOP and [Energy Purchase Agreements] EPAs.<sup>18</sup>

As noted above in the legislative framework section, section 3 of the CEA specifies that BC Hydro’s integrated resource plans are submitted to the minister and include a description of the authority’s forecasts, over a

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<sup>13</sup> Exhibit B-14, BCUC IR 195.1.1.

<sup>14</sup> NIARG Final Argument, p. 10.

<sup>15</sup> CEC Final Argument, p. 15.

<sup>16</sup> CEC Final Argument, p. 30.

<sup>17</sup> AMPC Final Argument, p. 6.

<sup>18</sup> Order G-7-17, Appendix B, p. 13.

defined period, of its energy and capacity requirements to achieve electricity self-sufficiency. The Panel concurs with BC Hydro that only the test period load forecast is within scope of the Application and the long-term resource planning is appropriately addressed in BC Hydro's IRP file with the minister. In the Panel's view, giving direction to BC Hydro on its long term resource planning is outside the scope of this Application and is beyond the Commission's jurisdiction.<sup>19</sup>

## 4.2 Industrial elasticity

BC Hydro stated that it uses a facility-by-facility assessment of viability given commodity market conditions and prices for large industrials, rather than attempt to undertake individual sector elasticity studies. BC Hydro explains:

The results of the analysis informs the probability weighting factors applied to all of the various electric intensive customers which make up the large industrial sector. Future rate increases impact future viability of these large industrial customers, but in general this is expected to be a secondary effect given the relative costs of electricity as a portion of total operating costs for some sectors.<sup>20</sup>

According to BC Hydro, light industrial loads consist of forestry, oil and gas, coal mines and other industrial customers connected at distribution voltage BC Hydro states:

The forecast of sales to forestry, coal, and the oil and gas portion of the light industrial distribution sector is developed using production forecasts and information gathered from BC Hydro's key account managers for specific loads such as distribution coal mines or gas producers. The other industrial distribution loads are developed from a regression model, where the driver of the sales is real GDP for B.C. as this variable has a strong relationship to other industrial distribution loads.<sup>21</sup>

BC Hydro further explains that "the elasticity of -0.05 is applied to estimate the rate impact on BC Hydro's sales forecast. This calculation was applied uniformly across the sectors. It has not been applied for specific income level, end uses of electricity, season, electricity rate level, customer rate classes, location on the system, or duration of the forecast period."<sup>22</sup> BC Hydro stated it applies the common elasticity factor of -0.05 to all customer classes and explains that its assumption of -0.05 is based on the direct testimony of Dr. Ren Orans as contained in its 2008 Long Term Acquisition Plan (LTAP) Application to the Commission.<sup>23</sup>

In contrast, AMPC stated that "the remedy for the industrial revenue calculation following a rate increase is the use of an industrial price elasticity figure larger than -0.05, and a more detailed revenue calculation (as distinct to a load forecast) by individual industrial facilities that includes a 'feedback' step."<sup>24</sup> AMPC also stated that BC Hydro's most recent analysis in its F2010 Demand-Side Management Milestone Evaluation Summary Report indicates a -0.16 price elasticity for industrial customers.<sup>25</sup>

In its final argument, AMPC recommends that the Commission direct BC Hydro to recognize the risk of increasing rates to industrial customers by replacing the universal price elasticity factor of -0.05 applied to industrial customers in favour of a higher price elasticity factor that more realistically captures the effect of cumulative

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<sup>19</sup> BC Hydro Reply Argument, p. 37.

<sup>20</sup> Exhibit B-10, AMPC IR 1.3.2.

<sup>21</sup> Exhibit B-1-1, p. 3-8.

<sup>22</sup> Exhibit B-10, AMPC IR 1.3.2.

<sup>23</sup> Exhibit B-20, p. 18; Exhibit B-22, CEABC IR 3.46.1.

<sup>24</sup> Exhibit C9-9, BCSEA IR 2.2.

<sup>25</sup> Exhibit C9-9, BCESA IR 2.2.

rate impacts on more price sensitive energy intensive and trade-exposed industrial customers, and introduce conservatism to the load forecasting methodology by building in a transparent “iterative step” or price feedback mechanism to the facility based industrial load forecast, explicitly considering the production shifting risk of the rate increase(s) proposed for the test period.<sup>26</sup>

BC Hydro explained that the methodology it uses to forecast industrial load accounts for elasticity and the “stepwise nature” of industrial demand.<sup>27</sup> BC Hydro states it assesses the future viability of their customers and their loads by undertaking a facility-by-facility assessment considering a number of factors, including cost issues. BC Hydro argues that a facility-by-facility assessment addresses the same load impacts due to cost pressures, but is a more granular and timely assessment than applying a further class average elasticity response.<sup>28</sup>

With respect to AMPC’s comments on BC Hydro’s forecasting methodology as it relates to price elasticity, BC Hydro submits there is no need to use a class specific elasticity factor since the impact of prices is already reflected in its customer-specific assessment.<sup>29</sup>

### *Panel discussion*

The Panel acknowledges the concerns of AMPC regarding the price elasticity used for industrial customers and notes that it does not suggest adjustments for the test period but rather argues for changes going forward. The Panel also acknowledges BC Hydro’s observation that using a higher elasticity factor (such as the -0.16 cited by AMPC), without recognizing that the impact of prices is already reflected in the customer-specific assessment, would therefore lead to double-counting.<sup>30</sup>

Notwithstanding, the Panel observes that the capped rate increases for 2017, 2018 and 2019 have been prescribed by Direction No.7 at 4.0 percent, 3.5 percent and 3.0 percent, respectively. The Panel accepts these increases were known to industrial customers when BC Hydro’s key account managers conducted their forecast surveys. Accordingly, the Panel is satisfied that the issue of price elasticity for future, unknown price increases is not an issue in the test period.

## **4.3 Load forecast methodology and variance treatment**

BC Hydro states that previous Commission “reviews of the Load Forecast, such as the review undertaken for BC Hydro’s 2008 Long Term Acquisition Plan (LTAP) proceeding, concluded that BC Hydro’s Load Forecast was acceptable. The Government’s review of BC Hydro in 2011 indicated its forecasting process is well planned, and produces reliable results.”<sup>31</sup> In response to BCUC IR 2.2, BC Hydro provided a comparison of its current methodology with the methodology reviewed in the BC Government Review in 2011 and BCUC Review of 2008 LTAP, and provides justification for any change.

BC Hydro explained that there have been no major changes in the current large industrial forecast methodology compared to the methodology in the BC Government’s review in 2011 and the BCUC’s review of BC Hydro’s 2008 LTAP.<sup>32</sup> There have been changes to the methodology to enhance the accuracy of the chemical sector sales forecast. The prior methods used regression analysis and a forecast of provincial GDP growth to estimate sales for the last 10 years of forecast.<sup>33</sup> Liquefied natural gas (LNG) loads were based on a probability weighting of

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<sup>26</sup> AMPC Final Argument, p. 2.

<sup>27</sup> Exhibit B-20, p. 17.

<sup>28</sup> Exhibit B-20, p. 18.

<sup>29</sup> BC Hydro Reply Argument, p. 43.

<sup>30</sup> BC Hydro Reply Argument, pp. 43 – 44.

<sup>31</sup> Exhibit B-1-1, p. 3-3.

<sup>32</sup> Exhibit B-9, BCUC IR 2.2.

<sup>33</sup> Exhibit B-9, BCUC IR 2.2.

load requests from LNG proponents. In the current methodology, LNG plant loads are based on public information announced by LNG proponents and for which BC Hydro has received service requests.<sup>34</sup>

BC Hydro states it delayed filing the Application to allow BC Hydro to update the Load Forecast and the Load Resource Balances to reflect the current outlook of certain sectors, including more recent developments in mining and LNG plant loads. BC Hydro states that the updated load forecast, while continuing to predict long-term load growth across all three customer sectors, yielded a lower growth rate compared to the 2013 IRP.<sup>35</sup>

BC Hydro presented the Domestic Sales Variance Average for Seven and Eight Years:

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<sup>34</sup> Exhibit B-9, BCUC IR 2.2.

<sup>35</sup> Exhibit B-1-1, Application, p. 3-1.

Table 1 – Total Domestic Sales Variance for Averages of Seven and Eight Years <sup>36</sup>

Sector	A	B	Forecast Vintage	C=A-B	D=(A-B)/B
Fiscal 2016	F2016 Actual (GWh)	F2016 RRA (GWh)	Oct-13	Difference (GWh)	Per Cent Difference %
1 Residential	17,331	18,743		(1,412)	-7.5%
2 Light Industrial and Commercial	18,421	18,346		75	0.4%
3 Large Industrial	13,669	15,032		(1,363)	-9.1%
4 Other	1,602	1,639		(37)	-2.3%
5 Total Mid Domestic Sales	51,023	53,760		(2,738)	-5.1%
Fiscal 2015	F2015 Actual (GWh)	F2015 RRA (GWh)	Oct-13	Difference (GWh)	Per Cent Difference %
6 Residential	17,047	18,805		(1,758)	-9.3%
7 Light Industrial and Commercial	18,564	18,277		287	1.6%
8 Large Industrial	14,020	14,444		(423)	-2.9%
9 Other	1,567	1,604		(37)	-2.3%
10 Total Mid Domestic Sales	51,199	53,130		(1,932)	-3.6%
Fiscal 2014	F2014 Actual (GWh)	F2014 RRA (GWh)	Mar-11	Difference (GWh)	Per Cent Difference %
11 Residential	17,965	18,057		(91)	-0.5%
12 Light Industrial and Commercial	18,501	17,681		821	4.6%
13 Large Industrial	13,994	16,519		(2,526)	-15.3%
14 Other	1,550	2,099		(549)	-26.2%
15 Total Mid Domestic Sales	52,010	54,356		(2,346)	-4.3%
Fiscal 2013	F2013 Actual (GWh)	F2013 RRA (GWh)	Mar-11	Difference (GWh)	Per Cent Difference %
16 Residential	17,703	18,210		(507)	-2.8%
17 Light Industrial and Commercial	18,384	17,930		455	2.5%
18 Large Industrial	13,508	15,315		(1,807)	-11.8%
19 Other	1,397	2,072		(676)	-32.6%
20 Total Mid Domestic Sales	50,992	53,527		(2,535)	-4.7%
Fiscal 2012	F2012 Actual (GWh)	F2012 RRA (GWh)	Mar-11	Difference (GWh)	Per Cent Difference %
21 Residential	18,395	18,213		182	1.0%
22 Light Industrial and Commercial	18,005	18,209		(204)	-1.1%
23 Large Industrial	13,522	14,451		(929)	-6.4%
24 Other	1,565	2,045		(480)	-23.5%
25 Total Mid Domestic Sales	51,487	52,919		(1,431)	-2.7%
Fiscal 2011	F2011 Actual (GWh)	F2011 RRA (GWh)	Jul-09	Difference (GWh)	Per Cent Difference %
26 Residential	17,797	17,365		432	2.5%
27 Light Industrial and Commercial	18,052	18,247		(195)	-1.1%
28 Large Industrial	13,164	14,153		(989)	-7.0%
29 Other	1,594	2,029		(435)	-21.4%
30 Total Mid Domestic Sales	50,607	51,794		(1,187)	-2.3%
Fiscal 2010	F2010 Actual (GWh)	F2010 RRA (GWh)	Oct-08	Difference (GWh)	Per Cent Difference %
31 Residential	17,593	16,967		626	3.7%
32 Light Industrial and Commercial	17,811	18,586		(775)	-4.2%
33 Large Industrial	13,020	15,240		(2,220)	-14.6%
34 Other	1,809	1,829		(20)	-1.1%
35 Total Mid Domestic Sales	50,233	52,622		(2,389)	-4.5%
Fiscal 2009	F2009 Actual (GWh)	F2009 RRA (GWh)	Oct-08	Difference (GWh)	Per Cent Difference %
36 Residential	17,861	17,264		597	3.5%
37 Light Industrial and Commercial	18,265	18,445		(180)	-1.0%
38 Large Industrial	14,303	15,228		(926)	-6.1%
39 Other	1,887	1,765		122	6.9%
40 Total Mid Domestic Sales	52,316	52,702		(386)	-0.7%
Average last seven years					
41 Residential	17,690	18,051		(361)	-1.9%
42 Light Industrial and Commercial	18,248	18,182		66	0.4%
43 Large Industrial	13,557	15,022		(1,465)	-9.6%
44 Other	1,583	1,902		(319)	-15.6%
45 Total Mid Domestic Sales Average last seven years	51,079	53,158		(2,080)	-3.9%
Average last eight years					
46 Residential	17,713	17,916		(203)	-1.0%
47 Light Industrial and Commercial	18,231	18,256		(25)	-0.1%
48 Large Industrial	13,670	15,010		(1,339)	-8.8%
49 Other	1,653	1,859		(205)	-10.0%
50 Total Mid Domestic Sales Average last eight years	51,268	53,040		(1,773)	-3.3%

<sup>36</sup> Exhibit B-9, BCUC IR 4.3.

BC Hydro stated that the data on the variance for each sector shows that, on average, the total domestic sales forecast exceeded actuals by 3.9 percent over the last seven years and by 3.3 percent over the last eight years. The average variance in the residential sector and light industrial and commercial sector actuals were lower than the forecast by only about 1 percent and 0.1 percent, respectively.<sup>37</sup>

BC Hydro states that the total domestic sales variance is primarily due to the large industrial sector, which accounts for about 75 percent of the average domestic sales variance over the last eight years. Further examination of the large industrial class indicates the variance is attributed to large discrete customer load attrition events and other external factors that could not have been reasonably foreseen. Other external factors include fluctuations in global commodity demand and prices which vary from those reflected in the mid load forecast projections. The outcomes of these external factors are delayed requests for electricity service from large industrial customers and temporary shutdowns.<sup>38</sup>

Despite the results shown in the table above, BC Hydro believes that its approach to forecasting large industrial load remains appropriate and that past variances have resulted from unforeseen circumstances that would have been difficult, if not impossible, to predict. BC Hydro further states that in terms of the recent cycle of lower than forecast large industry loads, the length of the down-cycle was unforeseen and there were plant closures for other reasons like water availability that compounded the situation. BC Hydro expects that, as is currently being seen, commodity prices will recover and associated load growth is expected to occur.<sup>39</sup>

### *Intervener arguments*

While several interveners provided various submissions on BC Hydro's load forecast, most do not suggest an adjustment to the forecast presented for the test period. The exceptions are as follows:

- The CEC advocates for an overall downward adjust to the load forecast: a reduction in load forecast of 1 % for 2017, 2% for 2018 and 3% for 2019, reducing revenue forecast by \$43 million in 2017 and by \$86 million in 2018 and by \$132 million in 2019. The CEC believes that this would be a step toward having BC Hydro achieve a better balance between over and under forecasting to establish an improvement to the base for appropriate rate setting.<sup>40</sup> The CEC also submit that because the variances from forecast are captured in the NHDA, it would be appropriate for BC Hydro to achieve a better balance.<sup>41</sup>
- The Clean Energy Association of BC (CEABC) submits that the pace of raw gas production in the Montney is greatly exceeding BC Hydro's forecast, and recommends that the Commission direct BC Hydro to immediately revise its Montney raw gas production forecast to reflect the reality of increasing production and investment.<sup>42</sup>

### *Panel discussion*

As noted in the legislative framework section above, the Panel's review of the 2016 Load Forecast and associated revenue forecast is to find whether or not the forecasts are reasonable for use as key input in the three-year test period in order to determine if the approvals sought comply with sections 59–60 of the UCA as well as the other elements of the legislative framework as summarized in Section 2.4 of the Application. While a specific approval for the three-year test period load forecast is not required, the Panel recognizes that it is a key input into its cost of energy forecast and its calculation of the domestic revenue forecast for each year of the

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<sup>37</sup> Exhibit B-9, BCUC IR 4.3.

<sup>38</sup> Exhibit B-9, BCUC IR 4.3.

<sup>39</sup> Exhibit B-14, BCUC IR 200.2.

<sup>40</sup> CEC Final Argument, p. 6.

<sup>41</sup> CEC Final Argument, p. 74.

<sup>42</sup> CEABC Final Argument, p. 20.

test period. BC Hydro’s Non-Heritage Deferral Account (NHDA) captures many variances, and as illustrated in the table below, with the largest impact attributed to the domestic load forecast variances:

**Table 2 – Non-Heritage Deferral Account Annual Summary<sup>43</sup>**

Non-Heritage Deferral Account Annual Summary																		
Year	Reported Opening Balance	Cost of Energy	Commodity Risk	Notional Water Rental	FX Gains & Losses on Powerex Trade	Domestic Revenue Variance (2009)	ABSU Founding Partner Benefits	Deferred Operating Costs in NHDA	RRA Adjustments	PTP and NITS Variance	Capital Lease Adjustment	Burrard Costs	Other	Total Changes	Rounding	Amortization	Interest	Ending Balance
F2005	0.0	154.5	-5.3	-10.7	-10.6									127.9			3.0	130.9
F2006	130.9	44.7	19.8	0.2	-3.9		-0.6	7.3	-2.9					64.6	0.1		9.0	204.6
F2007	204.6	35.5	3.3	-4.9	4.9		-0.6	-2.7						35.5		-45.3	14.0	208.8
F2008	208.8	-54.3	-3.0	2.9	-18.6		-0.5		-33.7					-107.2	0.1	-58.9	8.8	51.6
F2009	51.6	-51.5	9.7	-0.7	9.7	20.4	-0.5		43.2					30.3		-14.9	7.4	74.4
F2010	74.4	-22.8	-0.4	-9.3	-4.5	82.5	-0.6							44.9		-6.6	6.8	119.5
F2011	119.5	-44.5	-12.1	-1.6	-4.0	42.4	-0.2		262.9	16.0				258.9		-23.5	7.3	362.2
F2012	362.2	-147.0	12.9	18.9	2.4	62.8	0.6	11.2	65.9	0.3				28.0	-0.3	-39.8	16.9	367.0
F2013	367.0	-166.6		5.1	-3.9	176.1	0.4		103.2	-12.2			62.2	164.3	-0.1	-84.0	20.3	467.5
F2014	467.5	-195.5	15.2	-14.9		137.7		-0.9	49.8	5.3				-3.3	0.0	-120.3	17.7	361.6
F2015	361.6	50.7	-4.8	-5.1		207.3				8.8	-22.8	4.1		238.2	0.1	-90.6	14.8	524.1
F2016	524.1	235.4	-0.5	1.9		268.9				-0.7	-31.0	9.0		483.0	-0.1	-117.7	27.5	916.8
Cumulative Total		-161.4	34.8	-18.2	-28.5	998.1	-2.0	14.9	488.4	17.5	-53.8	13.1	62.2	1,365.1	-0.2	-601.6	153.5	

The Panel observes that all of the other balances in the NHDA have been both positive and negative in the past, thereby capturing the intent and purpose behind a variance account treatment. The exception is the domestic revenue variance, which has held a consistent and growing negative variance. Because BC Hydro’s actual load has been less than its forecast since F2009, there have been significant additions to the NHDA every year. The Panel observes that the annual variance related to domestic revenues has steadily increased from \$20 million in F2009 to \$269 million in F2016 for total additions of \$998 million in 8 years. On average the variance has been \$125 million per year over the fiscal 2009 to fiscal 2016 period and the average annual addition has been \$171 million over the last five-year (i.e., fiscal 2012 to fiscal 2016) period.<sup>44</sup>

In reviewing the fiscal 2017 to fiscal 2019 domestic energy sales forecast, the Panel uses BC Hydro’s Table 3-4 on page 3-20 of the Application and includes the highlighted columns comparing the F2017 Plan as provided for in the interim application (February 2017) and the F2017 Actual filed in the eventual Application (July 2017):

**Table 3 – Fiscal 2017 to Fiscal 2019 Domestic Energy Sales Forecast Less Demand-Side Management – Plan**

(GWh)	F2015	F2015	F2016	F2016	F2017	F2017	F2017	F2018	F2019	
	RRA	Actual	RRA	Actual	Plan (interim Rates)	Plan	Actual	Plan	Plan	
	A	B	C	D	E	F	G	H	I	
Residential	18,805	17,047	18,743	17,331	n/a	18,039	17,989	18,112	18,250	
Light Industrial and Commercial	18,277	18,564	18,346	18,421	n/a	18,832	18,847	18,785	18,899	
Large Industrial	14,444	14,020	15,032	13,669	n/a	13,380	13,235	13,323	13,882	
Other	1,604	1,567	1,638	1,602	n/a	1,611	1,682	1,618	1,634	
Total	53,130	51,199	53,759	51,023	53,352 *	51,860	51,753	51,838	52,664	
	* Exhibit B-1, Appendix B, Schedule 4, L16						-0.21%	(G/F)-1		
							-3.00%	(G/E)-1		

<sup>43</sup> Exhibit B-9, BCUC IR 126.1.

<sup>44</sup> Exhibit B-9, BCUC IR 1.124.7.

The Panel observes that even though the F2017 actuals are in line with BC Hydro's current forecast (a 0.21% variance)(Column G compared to Column F), the F2017 actual is a negative 3 percent variance from the forecast originally filed in the interim application (Column G compared to Column E).

As stated by BC Hydro, the large portion of the historical load variance is related to the industrial sector, which includes three major resource-based subsectors that make up the most of the large industrial load: oil and gas, mining, and forestry.<sup>45</sup> The Panel recognizes that there are inherent uncertainties and external factors such as political and social-economic factors that may have impact these industrial subsectors. Notwithstanding, BC Hydro suggests that there have been offsetting changes in industrial load which include positive developments and project restarts which will have an upward influence on the load forecast in the test period.<sup>46</sup>

In consideration of the above discussion, the Panel notes the following observations with respect to BC Hydro's 2016 Load Forecast:

- Since the 10 Year Rate Plan was first prepared in 2013, forecast revenues have declined by \$3.5 billion, comprised mainly of reductions in forecast revenues from large industrial customers, reductions in the forecast growth of large industrial load, reductions in forecast revenues from LNG as a result in a shift of timing of this load, and reductions in revenues in fiscal 2015 and fiscal 2016 mainly due to warm winter weather, which reduced sales to residential customers.<sup>47</sup> BC Hydro does not believe the variance is a result of statistical bias in its load forecasting models, methodology or process.<sup>48</sup> BC Hydro states the total domestic sales variance is primarily due to the large industrial sector, and that past variances in large industrial load have resulted from unforeseen circumstances that would have been difficult, if not impossible, to predict.<sup>49</sup>
- Even though it identifies these challenges in forecasting revenues and states that variances are due to variables that are beyond its control, BC Hydro continues to forecast improvements in the industrial load forecast. The Panel notes that with regard to the test period, there is only a need to accurately predict the next three years. However, the historical variances in Table 1 indicate that there have been significant variances even one or two years into a forecast – for example in fiscal 2015, the variance of the residential class from the 2013 forecast amount was -9.5% and the fiscal 2012 industrial class variance was -11.8% from the 2011 forecast. The Panel takes some comfort in the fact that the first year of the test period has passed and the actuals for that year have tracked the forecast fairly closely. However, this result is not an indicator that the next two years will track accurately. The Panel further notes that other utilities such as Pacific Northern Gas Ltd., FortisBC Energy Inc., and FortisBC Inc. use a different load forecast methodology for their short term forecast for setting rates as compared to its long term forecast for resource planning.
- Notwithstanding the concern expressed above, we note that the forecast for the remaining two years of the test period do not reflect a significant upward trend. Further, the average of the forecast load for the next two years, 52,251 GWh, is virtually identical to the average of the actual load of 52,173 GWh for the past five years. The Panel is of the view that the forecast for the remaining two years of the test period appears reasonable given the current economic circumstances.<sup>50</sup>

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<sup>45</sup> Exhibit B-9, BCUC IR 4.3; Exhibit B-14, BCUC IR 197.3.

<sup>46</sup> Exhibit B-14, BCUC IR 197.3.

<sup>47</sup> Exhibit B-10, BCOAPO IR 1.3.1.

<sup>48</sup> Exhibit B-9, BCUC IR 4.3.

<sup>49</sup> Exhibit B-9, BCUC 4.3; B-14, BCUC IR 200.2.

<sup>50</sup> Average of 2013–2017 actuals (53,130; 51,199; 53,759; 51,023; 51,753) = 52,173; Average of 2018 and 2019 forecast (51,838; 52,664) = 52,251. All figures are from Table 3.

The Panel notes the majority of interveners have not made a case for adjusting the load forecast in the test period. The Panel observes that, in the absence of a rate cap, a lower load forecast would result in a higher rate increase, and it is likely interveners are supportive of keeping actual rate increases lower than necessary.

- The use of the NHDA has inherent intergenerational equity concerns in that current period under-recoveries are shifted into the future. This can be seen by examining Table 2 above. There is almost one billion dollars that has accumulated in this account due to forecast variances over the past 8 years.
- The historical revenue variances related to the industrial sector also produces inter-class subsidization concerns. These revenue variances are recorded in the NHDA, and are recovered from ratepayers through the Deferral Account Rate Rider (DARR) which is then applied to all customers' bills.
- Any adjustments to BC Hydro's load forecast may impact the variances accruing into the NHDA. However under section 9 of Direction No. 7 to the Commission, the Panel's interpretation is that any variances related to BC Hydro's base line rate change above the rate caps established for each year of the test period will be deferred to BC Hydro's rate smoothing regulatory account. Accordingly, adjustments to the load forecast result in a shifting of variances from the NHDA regulatory account to the rate smoothing regulatory account. We have previously commented on the intergenerational inequity concerns associated with the NHDA; similar concerns arise with the use of the rate smoothing regulatory account.

Considering the discussion above, the Panel finds the 2016 Load Forecast reasonable for use in the F2017 to F2019 test period and declines to make any adjustments to the load forecast presented in the Application.

In the Panel's view, CEC's recommendations for an overall downward adjustment to the load forecast of 1 percent, 2 percent and 3 percent for the test period appear arbitrary, notwithstanding the attempts to "achieve a better balance."<sup>51</sup>

The Panel acknowledges BC Hydro's legislative framework and the requirement under Direction No. 7 for the Commission to continue to allow BC Hydro to defer its domestic revenue variances to the NHDA, and to allow BC Hydro base line rate change above the rate caps for each year of the test period to be deferred to BC Hydro's rate smoothing regulatory account.

As discussed above, given the rate caps, any adjustment to the load forecast in the test period would result in a shift from one regulatory account to another, thereby affecting only the timing of the recovery of the amount. The Panel notes amounts added to the NHDA in excess of \$500,000 are recovered by the DARR mechanism. Given that the recovery mechanism for the rate smoothing regulatory account has not yet be established, in the Panel's view it is not possible to quantify the difference in these recovery mechanisms at this time. Both accounts may result in intergenerational inequity concerns if the recovery period is prolonged.

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<sup>51</sup> CEC Final Argument, p. 74.

**DATED** at the City of Vancouver, in the Province of British Columbia, this 25<sup>th</sup> day of August 2017.

*Original signed by:*

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D. M. Morton  
Panel Chair / Commissioner

*Original signed by:*

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K. A. Keilty  
Commissioner

*Original signed by:*

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D. J. Enns  
Commissioner