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British Columbia Hydro and Power Authority

Waneta 2017 Transaction Application

Decision
and Order G-130-18

July 18, 2018

Before:
D. M. Morton, Commissioner / Panel Chair
A. K. Fung, QC, Commissioner
R. I. Mason, Commissioner

TABLE OF CONTENTS

Page no.

Executive summary

On October 30, 2017, the British Columbia Hydro and Power Authority (BC Hydro) filed an application for approval of BC Hydro's proposed purchase from Teck Metals Ltd. (Teck) of its two-thirds interest in the Waneta Dam along with Teck's Transmission Assets[1] (Waneta 2017 Transaction) requesting the following orders from the British Columbia Utilities Commission (BCUC):

1. Pursuant to section 44.2(3) of the *Utilities Commission Act* (UCA), acceptance of the expenditure schedule in regard to the Waneta 2017 Transaction as shown in the filing;
2. Pursuant to sections 58 to 61 of the UCA, approval of the Teck Wheeling Agreement (TWA) and Waneta Interconnection Agreement; and
3. Pursuant to section 49(a) of the UCA, approval of three adjustments to the Non-Heritage Deferral Account (NHDA) as described in the filing (Application);

On January 31, 2018, BC Hydro filed the following agreements on the record: the Waneta Transmission Agreement, TWA and Waneta Interconnection Agreement. Concurrently, BC Hydro withdrew its request for approval of the Waneta Interconnection Agreement on the basis that in accordance with its terms, the agreement does not require express BCUC approval;

A number of issues arose during the proceeding, including:

1. The appropriateness of the discount rate used by BC Hydro in the business case;
2. The need for energy after the end of the lease period;[2] and
3. The value of the energy produced by the dam, given the seasonal characteristics of the water flows.

After considering all the evidence and arguments made during the hearing, the Panel finds that approval of the Waneta 2017 Transaction is consistent with the *Clean Energy Act* objectives and environmental considerations and is, taken as the whole, in the public interest, and approves the Waneta 2017 Transaction as applied for.

Expenditure schedule

BC Hydro seeks a BCUC determination that the capital expenditures (Waneta assets at $1.203 billion, transaction costs at up to $50 million and Transmission Assets at $20 million) are in the public interest and an order accepting the Waneta 2017 Transaction expenditure schedule. The Panel assesses each item under the expenditure schedule separately to determine whether approvals are warranted.

Waneta 2017 Transaction - $1.203 billion capital expenditure

Based on a set of plausible scenarios for the future value of energy from Waneta, the range of net present values (NPV) of the Waneta 2017 Transaction is from -$31 million to $887 million. The Panel is satisfied that this

[1] Teck's Transmission Assets are all the items on the list from (a) to (m) in the Waneta Transmission Agreement in Exhibit B-12, Attachment 2, Schedule A.

[2] The lease period is defined as the 20-year period (extendable to 30 years at Teck's option) that the two-thirds interest in Waneta will be leased to Teck for in consideration of the lease payments from Teck to BC Hydro under the Waneta Lease Agreement. Defined in Exhibit B-1, Chapter 1, p. 1-3.

represents the reasonable range of transaction values. In addition, in the scenarios examined by the Panel, the ratepayer benefits are approximately $400 million higher than the NPV analysis.

The BCUC base case analysis investigated the sensitivity of the Waneta 2017 Transaction value to changes in several different variables. Of the variables considered, the market price of energy and the cost of future sustaining capital were the ones which had the most significant effect on the transaction value.

The Panel also assesses combinations of adverse scenarios unfolding, such as a slower growth in load, a sharp decrease in Long Run Marginal Cost for clean resources and a higher discount rate. An assessment using the BCUC's findings in the BCUC Inquiry Respecting Site C Final Report to the Government of BC regarding the load forecast and Mid-C prices confirms that the Waneta 2017 Transaction remains cost-effective. Even in a situation where no new generation is needed for the next 40 years and all the energy from Waneta is sold to market post-lease, the Waneta 2017 Transaction still has a positive impact on rates.

The most pessimistic scenario is that Teck defaults early in the life of the lease, BC Hydro has a surplus of energy and capacity, and the market price of energy is based on BC Hydro's Extrapolated Prices model. The Panel views the likelihood of this outcome to be low and although the NPV would be negative, the ratepayer impact is still likely to be positive.

Conversely, in the situation where BC Hydro has a deficit of energy and capacity at the end of the lease, BC Hydro's estimate of $48.25/MWh for the Waneta output represents a lower cost than the available alternatives.

The Panel therefore finds that the Waneta 2017 Transaction will yield positive ratepayer benefits (i.e. downward pressure on rates), and that this outcome holds across the plausible range of scenarios. Based on the analysis, the Panel finds that the capital expenditures of $1.203 billion applied for by BC Hydro warrants acceptance.

Transaction costs – up to $50 million capital expenditure

The Panel determines that given the capital expenditures of $1.203 billion for BC Hydro's purchase of the two-thirds interest in Waneta are accepted, the associated transaction costs should be accepted accordingly.

In the absence of any evidence in this proceeding that those costs are unwarranted, excessive or unreasonable, the Panel determines that up to $50 million in actually incurred transaction costs as applied for by BC Hydro warrants acceptance. Consistent with the terms of BC Hydro's Application, the Panel directs BC Hydro not to flow through into rates any amount of actually incurred transaction costs that exceed $50 million.

Transmission Assets - $20 million capital expenditure

Post-Lease, BC Hydro will need transmission capacity to move the Waneta output from Waneta to the BC Hydro system. The Panel agrees with BC Hydro that transmission rights to Teck's Line 71 will be needed, either through ownership or contract, to move the Waneta energy to the BC Hydro system.

In light of the risks related to access to transmission, cost certainty and regulatory risk, as well as the pros and cons of each option, the Panel also agrees with BC Hydro that buying the Transmission Assets in 20 years

(Scenario 1) is preferable to buying them now (Scenario 2) or getting rights to them in 20 years (Scenario 3). Scenario 1 has less regulatory risk than Scenario 2 and more upside than Scenario 3 in terms of additional transmission revenues. The net benefit to ratepayers of this additional revenue will be incremental to net benefit to ratepayers identified in the business case analysis discussed above.

The Panel therefore finds that the capital expenditure of $20 million for the Transmission Assets (at the time of purchase) warrants acceptance.

Teck Wheeling Agreement

BC Hydro seeks approval of the TWA, which provides for the provision of regulated services to Teck. Under the TWA, BC Hydro will provide transmission wheeling services to allow Teck to import power from the US, replacing the ability Teck currently has by virtue of its ownership of the Line 71 transmission line. The TWA also provides for the provision of ancillary services similar to the type of ancillary services that BC Hydro provides under its OATT.

After the lease period, Line 71 will be completely integrated into BC Hydro's system and will be subject to its OATT. However, the TWA differs from OATT in several important respects. The areas of non-compliance with OATT lie with the priority service offered to Teck as well as the wheeling charges, which are heavily discounted compared to the OATT tariff for firm reservation.

Given that BC Hydro makes its request under the rates sections of the UCA, the Panel makes its assessment based on the test that the rate not be unjust, unreasonable, unduly discriminatory or unduly preferential.

The Panel considers that, while there may be certain aspects of the TWA that discriminate among BC Hydro transmission service customers and offer preferential treatment to Teck, there are broader considerations.

First, given that the Panel approves the Waneta 2017 Transaction, it follows that for the associated benefits to be realized, the TWA would have to be approved since it is a condition precedent of the Waneta 2017 Transaction.

Second, the Panel agrees with BC Hydro that overall, the Waneta 2017 Transaction will result in advancing OATT principles for Line 71. The Panel recognizes that the increased intertie capacity resulting from the Waneta 2017 Transaction and the increased opportunity for OATT sales after the lease period could result in decreased OATT rates for all other BC Hydro's OATT customers. In the Panel's view, these are mitigating factors in support of the TWA.

The Panel therefore finds that the proposed rate is not unjust, unreasonable, unduly discriminatory or unduly preferential, and approves the TWA.

Non-Heritage Deferral Account (NHDA)

BC Hydro seeks an order approving three adjustments to the NHDA:

1. Deferral of its fiscal 2019 lease revenues arising from the Waneta 2017 Transaction.
2. Exclusion of the variance between forecast and actual water rentals arising from the Waneta 2017 Transaction.

3. Deferral of the revenue recognized by BC Hydro as a result of capital additions at Waneta made by Teck during the lease period.

The Panel finds that it is in the interest of BC Hydro's ratepayers for BC Hydro to:

- Defer its fiscal 2019 lease revenues arising from the Waneta 2017 Transaction as well as the revenue associated with capital expenditures made by Teck with respect to Teck's two-third interest in Waneta during the lease period to a regulatory account.
- Exclude the variance between forecast and actual water rentals in a given year arising from the Waneta 2017 Transaction from the water rental variances that are currently deferred to the NHDA during the lease period.

With respect to deferring the items proposed to the NHDA, the Panel agrees with BC Hydro that:

- It does not currently have another regulatory account that is suitable for the deferrals that it is proposing in the Application.
- The NHDA already has a recovery mechanism.
- By deferring to the NHDA it limits the number of new regulatory accounts.
- The amounts proposed for deferral each year are expected to be relatively small compared to BC Hydro's total annual revenue.

Although the Panel acknowledges that the recovery mechanism of the NHDA will not eliminate the intergenerational equity concern, it would reduce the concern compared to the alternative of not deferring the revenue at all. Alternatively, a new regulatory account could be established; however, the Panel is of the view that any recovery mechanism proposed for a new regulatory account will not completely eliminate the intergenerational equity concern due to the different characteristics of the various items that would be placed in the account.

The Panel therefore approves the accounting orders sought by BC Hydro in the Application as filed.

Reporting requirements

To monitor the effect of the Waneta 2017 Transaction on BC Hydro's ratepayers, the Panel directs BC Hydro to file compliance reports as further detailed in Order G-130-18.

1.0 Background and context

On October 30, 2017, the British Columbia Hydro and Power Authority (BC Hydro), which owns a one-third interest in the Waneta Dam, applied to the British Columbia Utilities Commission (BCUC) for approval of BC Hydro's proposed purchase from Teck Metals Ltd. (Teck) of its two-thirds interest in the Waneta Dam (Waneta Assets)[3] along with Teck's Transmission Assets[4] (Waneta 2017 Transaction).

1.1 Waneta facility overview

The Waneta Dam is a concrete hydroelectric dam located close to the Canada-US border, near the mouth of the Pend d'Oreille River just before it enters the Columbia River, near Trail, BC. The Waneta Dam was originally constructed in 1954 to generate power specifically for use at Teck's Trail smelter. Generating units at the dam have a capacity of approximately 490 Megawatts (MW) and they currently produce approximately 2,670 Gigawatt hours (GWh) per year.

Approximately one-third of the Waneta generation is currently being used by BC Hydro to serve its customers. The remaining two-thirds generation is used by Teck to serve its smelter load at Trail.[5]

Teck also owns transmission assets, including Line 71 between Waneta and the US border. The key elements of the Transmission Assets include Line 71 and Lines 14 to 17. These Transmission Assets have enabled Teck to serve its smelter load either from Waneta or through wholesale imports from the US, and sell surplus power from Waneta into wholesale markets in the US.[6]

1.2 BCUC prior approval of BC Hydro's one-third acquisition of Waneta in 2010

On July 6, 2009, BC Hydro filed an expenditure statement pursuant to section 44.2(1) of the *Utilities Commission Act* (UCA) in a filing called the Acquisition from Teck Metals Ltd. of an Undivided One-Third Interest in the Waneta Dam and Associated Assets (Filing). The Filing requested a determination from the BCUC that the expenditures associated with the acquisition of an undivided one-third interest in Waneta should be accepted by the BCUC on the basis that the expenditures are in the public interest pursuant to section 44.2(3)(a) of the UCA. The scheduled expenditures comprised a payment of $825 million for the Waneta Assets plus transaction costs then estimated at $25 million.

After consideration of the Filing, responses to information requests (IRs), and evidence and submissions of the parties, the BCUC found that the schedule of expenditures proposed in the Filing between BC Hydro and Teck was in the public interest. The schedule of expenditures was accordingly accepted in Order G-12-10.

As a result, BC Hydro acquired a one-third interest in Waneta for $825 million (Waneta 2010 Transaction). Teck remained the owner of the remaining two-thirds interest, and remains so to this day. As part of the Waneta

[3] Waneta Assets are all the items defined in the Waneta Purchase Agreement in Exhibit B-1, Appendix E, Section 1.1(hhhh), pp. 16–17.
[4] Teck's Transmission Assets are all the items on the list from (a) to (m) in the Waneta Transmission Agreement in Exhibit B-12, Attachment 2, Schedule A.
[5] Exhibit B-1, pp. 1-2–1-3.
[6] Exhibit B-1, p. 2-13.

2010 Transaction, a right of first offer (ROFO) was established in regard to the subsequent sale by either party of its interest in Waneta, which provided the non-selling party the first right to acquire the seller's interest.

1.3 Current proceeding

In May 2017, following a competitive sales process, Teck informed BC Hydro it had reached an agreement to sell its two-thirds interest in Waneta and related transmission assets to Fortis Inc. (Fortis) for $1.2 billion. On June 1, 2017, Teck delivered a Sale Notice[7] to BC Hydro which provided BC Hydro with the opportunity to match Fortis' offer and purchase Teck's two-thirds interest in Waneta under substantially similar terms. On August 1, 2017, BC Hydro delivered a Reply Notice[8] to Teck which, together with the Sale Notice, constituted BC Hydro's legally binding election to purchase Teck's two-thirds interest in the Waneta Dam and associated assets. Attached to the Reply Notice was an executed Waneta Purchase Agreement which set out the sale by Teck and purchase by BC Hydro of Teck's two-thirds interest in Waneta for $1.203 billion cash. The parties agreed that the closing of the Waneta 2017 Transaction must occur by August 1, 2018.

One of the key elements of the Waneta 2017 Transaction is that BC Hydro will purchase Teck's remaining two-thirds interest in Waneta for $1.203 billion. Further, the two-thirds interest in Waneta will be leased to Teck for a 20-year period (extendable to 30 years at Teck's option) in consideration of lease payments from Teck to BC Hydro.

Upon expiration or earlier termination of the lease, BC Hydro will purchase the Transmission Assets for $20 million. After the lease period has ended, and after BC Hydro has acquired the Transmission Assets, BC Hydro will provide a transmission wheeling service to Teck between the US border and Teck's smelter load, pursuant to the Teck Wheeling Agreement (TWA), as well as certain ancillary services, pursuant to the Waneta Interconnection Agreement.

1.4 Approvals sought

BC Hydro requests the following orders from the BCUC:

- Pursuant to section 44.2(3) of the UCA, acceptance of the expenditure schedule in regard to the Waneta 2017 Transaction as shown in the filing;
- Pursuant to sections 58 to 61 of the UCA, approval of the TWA and Waneta Interconnection Agreement; and
- Pursuant to section 49(a) of the UCA, approval of three adjustments to the NHDA as described in the Application.

On January 31, 2018, BC Hydro filed on the record the Waneta Transmission Agreement (WTA), TWA and Waneta Interconnection Agreement. Concurrently, BC Hydro withdrew its request for approval of the Waneta Interconnection Agreement on the basis that in accordance with its terms, the agreement does not require express BCUC approval.

[7] Teck delivered the notice contemplated by the ROFO to BC Hydro.
[8] Election by BC Hydro to purchase Teck's two-thirds interest.

1.5 Regulatory process and participants

On receipt of the Application, the BCUC conducted a public hearing process. The following parties registered as interveners in the proceeding:

1. FortisBC Inc. (FortisBC)
2. BC Sustainable Energy Association and Sierra Club BC (BCSEA-SCBC)
3. City of Trail
4. Commercial Energy Consumers Association of BC (CEC)
5. Movement of United Professionals (MoveUP)
6. Clean Energy Association of BC (CEABC)
7. Local 480, United Steelworkers
8. BC Old Age Pensioners' Organization, Council of Senior Citizens' Organizations of BC, and the Tenant Resource and Advisory Centre (BCOAPO)
9. Association of Major Power Customers of BC
10. Teck Resources Ltd.
11. FortisBC Energy Inc.
12. Regional District of Kootenay Boundary
13. Norm Gabana
14. Waneta Expansion Limited Partnership

By Orders G-169-17, G-199-17, G-15-18, G-42-18 and G-70-18, the BCUC established and subsequently amended a regulatory timetable with a written hearing process for the review of the Application, which included a community input session, two rounds of IRs to BC Hydro, intervener evidence and IRs on that evidence, Panel IRs, followed by oral and final arguments from all parties and a reply argument from BC Hydro.

The purpose of the January 13, 2018 community input session was to inform members of the public on how to participate in the BCUC's regulatory processes and provide an opportunity for parties to make submissions to the Panel appointed by the BCUC to consider their interests specific to this Application.

The BCUC also held two procedural conferences. The first was held on February 16, 2018 when the BCUC invited comments from interveners on the need for an oral hearing and suggested dates, the need for intervener evidence and each party's proposed regulatory timetable for the proceeding. The second was held on April 3, 2018, when the BCUC invited comments from interveners on the need for an oral hearing based on a proposed limited scope, each party's availability for an oral hearing and the proposed use of the concurrent evidence approach for cross-examination of witnesses at an oral hearing.

Before considering the merits of this Application, the Panel notes this is a somewhat unique acquisition which differs from the usual resource acquisition proposals that come for approval before the BCUC. BC Hydro already owns a one-third interest in Waneta which is currently used to serve load. It now proposes to buy the remaining two-thirds interest from Teck only to immediately lease back to Teck the output from that interest for guaranteed lease payments for a term of 20, up to 30, years. Only at the end of the lease term will the entire

output be available to BC Hydro to serve load and/or sell on the open market. In such circumstances, as we will explain in this decision, some unusual issues and considerations warrant careful exploration.

1.6 Legislative background

The BCUC is subject to the provisions of the UCA and in the case of regulation of BC Hydro, to special directives issued from time to time by the provincial government which are binding upon the BCUC.

1.6.1 *Utilities Commission Act*

In considering this Application, the Panel must consider the UCA, in addition to other relevant legislation and special directions issued by the Province of BC. Particularly relevant sections of the UCA are: section 44.2; and sections 58 to 61.

1.6.2 Direction No. 7

In addition to the UCA, Direction No. 7 to the British Columbia Utilities Commission (Direction No. 7) from the Province governs certain aspects of how the BCUC regulates BC Hydro.[9] The relevant provisions of Direction No. 7 are reproduced below.

Rate base

Direction No. 7 from the Province defines the term "rate base" as follows:

> **"rate base"** means, in relation to a fiscal year of the authority, the amount determined in accordance with the following equation and notes:
>
> $$RB = WCA + (A+B+C)/2 - (D + E + F)/2$$
>
> where
>
> RB = rate base;
>
> WCA = working capital amount of $250 million;
>
> A, B, D, E and F = the sum of an amount the authority forecasts will be listed as follows in the authority's audited financial statements at the end of the previous fiscal year and the amount the authority forecasts will be similarly listed at the end of the applicable fiscal year:
>
> A is the amount listed as property, plant and equipment in service, less accumulated amortization;
>
> B is the amount listed as intangible assets in service, less accumulated amortization;
>
> D is the amount listed as contributions in aid of construction;
>
> E is the amount listed as contributions arising from the Columbia River Treaty;
>
> F is the amount listed as leased assets included in A, less accumulated amortization;
>
> C = the sum of the balance the authority forecasts for DSM regulatory account at the beginning of the fiscal year and the balance the authority forecasts for the same account at the end of the fiscal year.

[9] Province of British Columbia, Lieutenant Governor in Council, Order in Council No. 97, Direction No. 7 to the British Columbia Utilities Commission (Direction No. 7), approved and ordered March 5, 2014.

Notes:

1 In determining rate base for a fiscal year, the amounts A, B and F must have subtracted from them any amount included in them that is an expenditure incurred by the authority on or after April 1, 2011, that the commission determines under the Act must not be recovered by the authority in rates.

2 In determining rate base for a fiscal year, the amount D must have subtracted from it any amount included in it that is related to an expenditure referred to in note 1;

Note 1 above states that any amounts the BCUC determines are not recoverable by BC Hydro in rates are deducted from the balance sheet, and hence are not part of rate base. By this mechanism, any section 44.2 capital expenditure requests which are rejected by the BCUC are not recoverable in rates, even if BC Hydro has recorded the applied-for capital expenditure in its balance sheet.

Return on equity

Direction No. 7 states that when setting rates for the authority, those rates must allow the authority to "achieve an annual rate of return on deemed equity, for F2019 and subsequent fiscal years, that would be necessary to yield a distributable surplus of $712 million."[10]

Income of subsidiaries

Pursuant to Section 6 of Direction No. 7, the BCUC must include the net income of BC Hydro's subsidiaries when setting rates for BC Hydro.

2.0 Overarching issues

Before reviewing the details of the proposed transaction, the Panel will first consider two issues that arose during the proceeding – whether a review under section 44.2 of the UCA is appropriate, and whether the BCUC should require BC Hydro to use a different, related entity to enter into the transaction.

2.1 Is section 44.2 the appropriate section of the *Utilities Commission Act*?

The Panel posed the following question for the oral argument phase:

> Should BCUC approve an expense under the *Utilities Commission Act* section 44.2 for an asset which is not used to provide a regulated service? If so, why? In particular, please discuss the appropriateness of ratepayers bearing the risks and receiving the benefits associated with the Waneta 2017 Transaction during the Lease period when the two-thirds interest in Waneta will not be used for regulated activities.[11]

BC Hydro submitted that section 44.2 of the UCA "exists for the purpose of allowing utilities to bring capital expenditure requests forward to the Commission that don't have direct load-serving connections." Although in BC Hydro's view, Waneta does have load serving obligations after the lease period, "section 44.2 would be more than adequate" for "purely financial transactions with no possibility of a load-serving obligation…" BC Hydro cited its Supply Chain System Applications Project Application as an example of the BCUC granting an order

[10] Province of British Columbia, Lieutenant Governor in Council, Order in Council No. 97, Direction No. 7, approved and ordered March 5, 2014, Section 4(d)(iii).
[11] Exhibit A-26, p. 1.

pursuant to section 44.2 of the UCA on an expenditure that is meant to generate financial benefits to BC Hydro's customers.[12]

All of the interveners agree with BC Hydro that it is appropriate to review the Waneta 2017 Transaction under section 44.2 of the UCA.

BCOAPO submitted that "BC Hydro is not prohibited from completing a transaction of this kind under the Act, and under this section." Further, since "there is a case for economic benefit to ratepayers, both in the initial 20 years and in the subsequent 20 [sic]…" that it agrees with BC Hydro that section 44.2(5)(e) is "specifically something that is contemplated by that section, and permitted by it."[13] BCOAPO submitted that it agrees with BC Hydro that "the economic and ratepayer benefits are the primary basis on which the transaction should be evaluated."[14]

BCSEA-SCBC submitted that ratepayers should "bear both the benefits and the costs of the transaction" both before and after the lease period because "ratepayers are receiving tangible benefits year by year from the lease payments during the lease period."[15] Further, BCSEA-SCBC submitted that section 44.2 is appropriate because "the asset will be used to provide a regulated service in the post-lease period."[16] BCSEA-SCBC stated that the "legislature intended that the Commission would be making a decision on whether this is an expenditure by BC Hydro that meets the tests that are set out in the Act [UCA]."[17] In BCSEA-SCBC's view, "it is appropriate to analyze the Transaction primarily on an investment basis, and secondarily on a planning basis."[18]

In CEABC's view, the BCUC could approve the Waneta 2017 Transaction under section 44.2, but by approving it, the BCUC would be saying that "the risks associated with Waneta are on the ratepayers, not the shareholder."[19]

Panel discussion

The Panel finds that a review under section 44.2 is appropriate and warranted in that it provides the opportunity for an open and transparent review of BC Hydro's business plan regarding the acquisition of the remaining two thirds interest in Waneta. No interveners challenged BC Hydro's assertion of the appropriateness of section 44.2 of the UCA for this purpose. Further, the Panel notes that section 44.2 makes no explicit reference to the nature of capital expenditures which may be applied for by a utility, but merely sets out the basis on which the BCUC should decide whether to accept or reject, in whole or in part, the application.

2.2 Entering into the transaction through other means

Two alternative scenarios for structuring the purchase of the transaction were discussed in the proceeding:

1. Entering into the Waneta 2017 Transaction through a non-regulated subsidiary; or
2. The Province of BC purchasing two-thirds interest in Waneta..

[12] Oral Hearing Transcript Volume 4, pp. 256–257.
[13] Oral Hearing Transcript Volume 4, p. 277.
[14] BCOAPO Final Argument, p. 8.
[15] Oral Hearing Transcript Volume 4, p. 297.
[16] Oral Hearing Transcript Volume 4, p. 298.
[17] Oral Hearing Transcript Volume 4, pp. 298–299.
[18] BCSEA-SCBC Final Argument, para. 15.
[19] Oral Hearing Transcript Volume 4, p. 330.

CEABC argues that:

> if the shareholder and BC Hydro thought that Waneta was such a great deal, they could have incorporated a subsidiary or a new company like Columbia Power, and use [sic] that vehicle to spend $1.2 billion….. That would be the vehicle to have the risk of Waneta on the shareholder, meaning the government of B.C. If, in 320 [sic] years, or 20 years, that asset was required to meet BC Hydro's load, then it could be sold, in which case then BC Hydro's ratepayers would have the risk of that project. Right now BC Hydro's ratepayers are taking that risk of that project 20 to 30 years in advance of any requirement for that project to meet their load.[20]

BC Hydro submits that with regard to the Province purchasing Teck's two-thirds interest in Waneta, it did not have the ROFO rights that BC Hydro has, and so could not have acquired Waneta on the basis of the Fortis transaction in the way BC Hydro did. In the case of an acquisition of Waneta through a BC Hydro subsidiary, BC Hydro confirmed that under Direction No. 7, its revenues, for revenue requirements purposes, include all revenues including those of its subsidiaries (and that there is no regulatory basis for allocating non-regulated revenues and costs to different entities).[21] As such, acquisition of Waneta through a BC Hydro subsidiary would have no meaningful effect on the economics of the transaction.[22]

BC Hydro submits that if the BCUC "were to grant the other orders requested, but declined to accept the expenditure schedule on the sole basis that the transaction is intended to serve B.C. Government interests rather than serve ratepayer interests…, then it is conceivable that BC Hydro would proceed" with the purchase of the Waneta Assets.[23]

MoveUP submits that the BCUC "has jurisdiction to dismiss the Application or to approve it without conditions, but not to direct BC Hydro's shareholder to create a non-utility entity to hold and operate the Waneta asset." Further, "the post-lease conversion of the facility's use does not appear to fall within the ambit of a CPCN application…"nor would it "call for an application under s. 44.2…."[24]

Panel discussion

The Panel has concerns with the suggestions that the Waneta 2017 Transaction instead be entered into by a subsidiary of BC Hydro. If an asset were purchased by BC Hydro itself, then the asset only goes into rate base if that transaction is approved by the BCUC. If the Application were to be rejected, then as a result the net total of the amortization, return and income related to the asset would not be recoverable in rates. The ratepayer would not be at risk for the investment, nor would they share in any of the benefits.

However, if the asset were to be purchased by a subsidiary of BC Hydro and the expenditure not approved by the BCUC, or if approval is not sought, then the costs and income would automatically flow to ratepayers by virtue of section 6 of Direction No. 7. In such case, the purchase would not be subject to the public interest test required by either section 44.2 of the UCA or section 45, whichever the case may be. In contrast, by purchasing the assets directly and applying to the BCUC for approval of an expenditure schedule, the BCUC can apply the public interest test, and ratepayers can be protected from the cost of assets that are not related to provision of utility services and that may present an unacceptable risk to ratepayers.

[20] Oral Argument Transcript Volume 4, pp. 229–230.
[21] Exhibit B-24, BCUC Panel IR 3.1.1.
[22] BC Hydro Final Argument, pp. 51–52.
[23] Exhibit B-24, Panel IR 3.1.
[24] MoveUP Final Argument, p. 2.

Further, in this particular circumstance, at the end of the lease period, or sooner in the case of a default, when the assets are repurposed to provide utility service to ratepayers, the subsidiary itself would become a public utility by virtue of the UCA. Therefore, BCUC approval would be required at that time.

The Panel also notes BC Hydro's submission that only BC Hydro has the ROFO, therefore, in the Panel's view, there is no option for any other entity to enter into the Waneta 2017 Transaction.

3.0 Review of the proposed expenditure schedule

Pursuant to section 44.2(3)(a) of the UCA, BC Hydro seeks a BCUC determination that the following capital expenditures are in the public interest and an order that the Waneta 2017 Transaction expenditure schedule is accepted. The expenditures related to the Waneta Assets and Transmission Assets are both derived from the purchase price in the Fortis transaction. The one-time $50 million transaction costs are an assumption made by BC Hydro for the purposes of the business case.

Table 1 – Expenditure Schedule for Waneta 2017 Transaction

Item	Expenditure
Waneta Assets	$1.203 billion
Transmission Assets	$20 million[35]
Transaction Costs	up to $50 million

After reviewing an expenditure schedule submitted, section 44.2(3) of the UCA requires the BCUC to:

a. accept the schedule, if the commission considers that making the expenditures referred to in the schedule would be in the public interest; or

b. reject the schedule.

In addition to considering the interests of persons in British Columbia who receive or may receive service from BC Hydro, the BCUC is required under section 44.2(5.1) to consider the following:

(a) British Columbia's energy objectives;

(b) an applicable integrated resource plan approved under section 4 of the *Clean Energy Act* (CEA);

(c) the extent to which the schedule is consistent with the requirements under section 19 of the CEA; and

(d) if the schedule includes expenditures on demand-side measures, the extent to which the demand-side measures are cost-effective within the meaning prescribed by regulation, if any.

BC Hydro states that the 2013 Integrated Resource Plan (IRP)[25] is the "applicable IRP" referred to in item (b) above, and that plan is in large measure the basis of the F2017-F2019 Load Resource Balance (LRB) forecasts that underpin BC Hydro's economic analysis of the Waneta 2017 Transaction after the Lease Term.

[25] British Columbia Hydro and Power Authority (BC Hydro) November 2013 Integrated Resource Plan dated November 15, 2013.

However, BC Hydro submits that, in the Waneta 2010 Transaction Decision, the BCUC concluded that the then-proposed acquisition of BC Hydro's one-third interest in Waneta "… did not form part of any long-term resource plan submitted by BCH and thus the provisions of [then] section 44.2(5)(b) [regarding BC Hydro's most recent long term resource plan (LTRP)] are not applicable to the consideration of the expenditure schedule by this Commission Panel."[26] Because the two-thirds interest in Waneta similarly does not currently figure in any of BC Hydro's LTRPs, BC Hydro submits that this requirement is similarly not applicable.[27]

In response to an IR, BC Hydro provided its view of the "public interest" test:

- When considering the public interest, it is appropriate for the BCUC to consider the entirety of the Waneta 2017 Transaction as there is only one transaction before the BCUC for consideration, and it is not severable or subject to modification.
- Broadly speaking, BC Hydro believes that the Waneta 2017 Transaction is in the public interest primarily because it is expected to yield positive financial benefits for BC Hydro's ratepayers without any material adverse impacts on the interests of any stakeholder.
- Finally, one can consider the public interest from the public policy perspective. Under democratic forms of government, it is self-evident that legislative assemblies act to advance the public interest. The UCA was enacted by the Legislature, thereby creating the BCUC and empowering it in certain areas and imposing on it certain obligations. Provided the BCUC faithfully exercises its powers and satisfies its obligations, it is serving the public interest. It follows that the issuance of orders that are justified in the context of those powers and obligations also serves the public interest.[28]

Panel discussion

In addition to considering the public interest, we will also consider the interests of BC Hydro's ratepayers.

Therefore, our review of the proposed expenditure schedule consists of the following:

a. An examination of the business case, including the net present value (NPV) of the various scenarios and the rate impact on BC Hydro's customers.

b. Whether it is appropriate that the Waneta Assets go into rate base, in particular since this is not a typical purchase of a utility asset.

c. Whether BC Hydro's consultation has been adequate.

d. Whether the transaction advances applicable BC energy objectives.

With regards to section 44.2(5.1), the Panel, in assessing whether the proposed expenditures are in the public interest, will consider item (a) and not items (b) through (d):

- Item (b): the Panel agrees with BC Hydro's assessment of the applicability of the 2013 LTRP as its most recent IRP.
- Item (c): section 19 of the CEA provides for the establishment of prescribed targets and prescribed guidelines for the purpose of achieving the provincial clean or renewable resource energy objective set

[26] BC Hydro Acquisition from Teck Metals Ltd. of an Undivided One-Third Interest in the Waneta Dam and Associated Assets (Waneta 2010 Transaction), Final Order G-12-10 dated February 3, 2010, p. 39.
[27] Exhibit B-1, Application, Section 4.9.3, pdf p. 117.
[28] Exhibit B-18, BCUC IR 109.1.

out in section 2(c) of the CEA. There are no prescribed targets or prescribed guidelines and so the requirement that the BCUC consider this section is not applicable.[29]

- Item (d): section 19 of the CEA is only applicable in regard to expenditure schedules that include "expenditures on demand-side measures." The expenditure schedule in Table 1 does not include expenditures on demand-side measures, and so this consideration is also not applicable.

3.1 Overview of BC Hydro's business case

BC Hydro developed a business case to inform its decision as to whether to act on its ROFO in the proposed sale and leaseback by Teck of its two-thirds interest in the Waneta Dam from a cost-effectiveness perspective.

The terms of the ROFO Sale Notice to BC Hydro included the following:

- Sale of the two-thirds interest for a purchase price of approximately $1.2 billion;
- Leaseback of the two-thirds interest to Teck for 20 years at a price of $40/MWh, escalating at 2 percent per year with Teck's option to further extend the lease for an additional 10 years at a price of $53/MWh, escalating at 2 percent per year (Lease);
- During the term of this lease:
  - Teck will receive the full entitlement energy and capacity from the facility; and
  - Teck will be responsible for all operating costs (including water rentals) and most capital costs (some major capital costs may be the responsibility of BC Hydro or shared);
- Following the 20–30 year period the Lease is in effect (Lease Term), BC Hydro will have unencumbered ownership of the two-thirds interest; and
- While transmission has been excluded from the ROFO, BC Hydro has assumed it will purchase Line 71 and other local transmission assets at the end of the Lease Term for $20 million (in 2018 dollars).

BC Hydro assessed the costs and benefits of the ROFO Sale Notice compared to the scenario where BC Hydro does not purchase Waneta, and considers scenarios where the smelter is served by BC Hydro following the Lease even if Waneta is purchased by Fortis. In order to assess the cost-effectiveness of the Waneta 2017 Transaction, BC Hydro utilized an NPV analysis consistent with the method used by BC Hydro for other capital projects, as well as a ratepayers' analysis to evaluate the ratepayers' benefits (through revenue requirements).

For the NPV analysis, BC Hydro constructed a discounted cash flow model to assess the NPV of the costs and benefits of the proposed Waneta 2017 Transaction. That model reviews the present value of free cash flows *before financing charges* and thus provides an investment view of the Waneta 2017 Transaction. Under the NPV analysis, BC Hydro did not use its expected actual cost of financing – which assumes the transaction is funded by debt only - but instead assumed a combination of debt and equity financing at its Weighted Average Cost of Capital (WACC). BC Hydro provides an in-depth explanation of the reasons for that choice and of why it undertook the NPV analysis in addition to the ratepayers' impact analysis.[30]

The benefits to ratepayers under the ratepayers' analysis are different from those identified under the investment view, as ratepayers will see the costs of the Waneta 2017 Transaction through revenue

[29] Exhibit B-1, Application, Section 4.9.4, pdf p. 118.
[30] Exhibit B-18, BCUC IR 90.3.1.

requirements rather than free cash flow.[31] BC Hydro highlights the difference between the free cash flows and the revenue requirement models in the treatment of initial capital and sustaining capital, operating and maintenance (O&M) and Lease revenues in Table 18 of the Business Case[32] and compared the two approaches in response to an IR.[33]

Where BC Hydro's financing rate is equivalent to the discount rate applied to the NPV analysis, the two analytical methods will have roughly the same results. This would have been the case prior to the development of the BC Hydro 10-Year Rates Plan[34] that changed the regulatory framework and resulted in a decoupling between BC Hydro's return on equity (ROE) and its asset base.

Before the 10-Year Rates Plan, invested capital was added to its asset base, a portion of which was "deemed" equity and earned a regulated rate of return. Currently, BC Hydro's ROE is fixed and no additional return is earned upon capital investment. As a result, the underlying cost of financing in the Rate Impact Model is equivalent to BC Hydro's cost of debt as there is no incremental return on equity.[35]

When the value of the Lease is removed, BC Hydro calculates that the unit cost of the energy and capacity provided following the 20-year Lease is $48.25/MWh (2018 dollars). In order to look at the post-Lease value of the Waneta 2017 Transaction under a range of potential load growth and market price scenarios, BC Hydro utilized five valuation indices for energy and capacity. These valuation indices were:

- **Long-Run Marginal Cost (LRMC) – Clean**: post-Lease energy and capacity is used by domestic customers and avoids the cost of new clean energy and capacity resources.
- **LRMC – Clean+Gas:** post-Lease energy and capacity is used by domestic customers and avoids the cost of new clean energy resources and new natural gas –fired capacity resources.
- **Industrial Tariff:** post-Lease energy and capacity will be used to serve the Teck smelter under BC Hydro's industrial tariff.
- **Market – ABB:** post-Lease energy and capacity exported to external markets at BC Hydro's forecast market prices.
- **Market – Extrapolated:** post-Lease energy and capacity exported to external markets at prices lower than BC Hydro's forecast market prices.

BC Hydro's base planning criteria uses the LRMC – Clean scenario which is the only one that BC Hydro states is fully consistent with the law, government policy and a robust forecasting methodology.[36] The additional scenarios were developed to take into account the inherent uncertainty around the valuation of the Waneta energy after the Lease Term.

Proceeding with the Waneta 2017 Transaction is expected to have a positive present net value under all considered valuation indices with the exception of the "Market Price – Extrapolated" scenario under which the value is approximately zero.[37]

[31] Exhibit B-1, Application, Business Case, pdf pp. 539–544, 559–562.
[32] Exhibit B-1, Application, Business Case, Table 18, pdf p. 561.
[33] Exhibit B-18, BCUC IR 90.3.1.
[34] Ministry of Energy and Mines, 10 Year Plan for BC Hydro (10-Year Rates Plan), dated November 26, 2013.
[35] Exhibit B-1, Application, Business Case, pdf p. 561; Exhibit B-18, BCUC IR 90.3.1.
[36] BCH Final Argument, p. 29.
[37] This scenario considers that BC Hydro is in a surplus position for the entire 40-year evaluation period, that export revenue will continue to be netted against revenue requirements and that the entire Waneta energy is sold directly into the market at low prices that

BC Hydro stated that the valuation is based on a set of conservative assumptions. It is of the view it may be able to extract additional value from the Waneta 2017 Transaction through: investment in the asset to extend the economic life; the ability to charge the Open Access Transmission Tariff (OATT) on Line 71 following the Lease Term; and marketing of Waneta energy and capacity to external markets at premium prices.[38]

BC Hydro also reviewed the risks associated with the Waneta 2017 Transaction. Key risks include: counterparty risk; extension option risk; facility risk; risk of amendments to other agreements; and valuation risk.

BC Hydro acknowledges the Waneta 2017 Transaction will result in incremental risks as a result of adding a physical asset with commensurate risks. However, it is of the view that the risks associated with Waneta are similar to the risks associated with BC Hydro's overall generation fleet. It therefore concludes that the transaction does not result in substantially new or different types of risks.[39]

BC Hydro concludes that, in order for the Waneta 2017 Transaction to not be cost-effective, more than one of the following unlikely scenarios would need to occur:

- Delay in load growth for greater than 10 years relative to current forecasts;
- Reductions in market prices below current forecasts;
- Large (>$100 million) additional capital investments required at Waneta beyond current forecasts; and
- Failure to realize any incremental value from the opportunities identified above.[40]

Based on this analysis in the Business Case,[41] BC Hydro recommended proceeding with the purchase of Teck's two-thirds interest in Waneta.

3.2 Range of Value Approach versus LRB Gap Approach

A key issue, which arose in the proceeding, is the approach the BCUC should take to assess the cost-effectiveness of the Waneta 2017 Transaction. One is the Range of Value Approach adopted by BC Hydro in the Business Case. An alternate approach is the assessment of the transaction from a more traditional resource acquisition approach, namely, whether the acquisition will serve to fill an identified gap in BC Hydro's future LRB (LRB Gap Approach).[42]

Position of the parties on the Range of Value Approach versus LRB Gap Approach

BC Hydro submits that if the BCUC were inclined to adopt the LRB Gap Approach to its assessment of the Waneta 2017 Transaction, it would also be required to take into account a number of other factors that have not been the subject of much, if any, consideration in this proceeding, mainly because BC Hydro has not sought to justify the transaction on a traditional resource-need basis.[43]

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constitute a low sensitivity analysis of the ABB market price forecast. BCH Final Argument, pp. 30–31.
[38] Exhibit B-1, Business Case, pdf p. 564.
[39] Exhibit B-1, Business Case, pdf p. 564 of 639.
[40] Exhibit B-1, Business Case, pdf p. 565.
[41] Exhibit B-1, Appendix N, Business Case.
[42] BCH Final Argument, p. 36.
[43] BCH Final Argument, p. 37.

BC Hydro submits the BCUC should not adopt the LRB Gap Approach because doing so:

a) "would be inconsistent with the evidence developed to support the transaction;

b) would require the Commission to choose which of the 500 or so scenarios is most likely to come to pass, an inherently speculative task;

c) would require the Commission to weigh each of the scenarios on the basis of the robustness of the assumptions that inform them (i.e. forecasts, sensitivity analyses, or guesses), itself a non-trivial task;

d) unnecessarily risks the transaction, because the Range of Value Approach adopted by BC Hydro allows for a reasoned decision by the Commission without the need to choose one of 500 possible future scenarios; and

e) would fail to recognize the Commission's own preference for regulatory mechanisms that eliminate the need to pick a specific future outcome."[44]

Based on the legislative and regulatory framework that BC Hydro references in its final argument, BC Hydro further submits that "if the Commission were to analyze the Waneta 2017 Transaction on the basis of an LRB Gap Approach, it would be obliged to define that gap in terms of BC Hydro's mid-level load forecast to lawfully account for BC Hydro's self-sufficiency obligations. Whether that load forecast is the one in the 2013 IRP, or the RRA [Revenue Requirements Application] Forecast based on the 2013 IRP, the need for Waneta would be made out."[45]

BC Hydro goes on to say that:

> [t]he Waneta 2017 Business Case does not attempt to justify the transaction on the basis of filling an LRB gap, and BC Hydro does not attempt to justify the transaction on that basis in this proceeding. It follows that the foregoing enactments are only relevant if the Commission rejects the Range of Value Approach adopted by BC Hydro and concludes that it must employ an LRB Gap Approach. As is apparent, the enactments referred to above and their requirement to use mid-level forecasts in consideration of BC Hydro's self-sufficiency obligations would seem to make that a self-fulfilling exercise.[46]

MoveUP submits that:

> [t]he Range of Value Approach reduces reliance on frail economic forecasts and situates the issue better in its real-world context, for the reasons articulated in BCH's Final Argument. While the Commission and participants in its processes must continue to engage in long term load growth projection exercises, we should not pretend that the results are dependable except, we can hope, in terms of the general direction and momentum of future trends. That is especially so at a time when the entire global energy sector is in an intense state of flux and transformation.[47]

While BCOAPO makes no submissions on the appropriateness of the "Range of Value Approach", its final argument and the conclusion it reaches are based on the "Range of Value Approach."

[44] BCH Final Argument, pp. 36–37.
[45] BCH Final Argument, paras. 92–97.
[46] BCH Final Argument, pp. 39–40.
[47] MoveUP Final Argument, p. 3.

In BCSEA-SCBC's submission, it views the Range of Value Approach as the appropriate basis for the BCUC's determination of whether the proposed expenditures (and related orders) are cost-effective and in the public interest.

BCSEA-SCBC also submits that "[b]y using these five different valuation indices (or scenarios), the Business Case accounts for the substantial uncertainty associated with predicting the LRB, market prices and the cost of new generation decades into the future. BCSEA-SCBC agrees with BC Hydro in paragraph 67 that the Business Case is not premised on identifying a specific future time when new generation resources will be required."[48]

CEC states that "[t]he range of values covered by the BC Hydro scenarios generally covers the low load forecast or small gap case and as such confirms BC Hydro's view that the business case is the best evidence on the record and […] and a load resource planning exercise would not be a particularly productive approach."[49] CEABC submits that "it is a totally fruitless task to devote a lot of time and effort to forecasting the countless possibilities."[50]

BCUC determination

The Panel finds the difference between the Range of Value Approach and the LRB Gap Approach to be less "black and white" than is suggested by the arguments of many of the parties.

BC Hydro developed its Business Case based on a Range of Value Approach, which attempts to stress-test the value of the Waneta 2017 Transaction through sensitivity analyses of the key factors influencing the transaction value: discount rate, LRB, LRMC, market prices and level of capital expenditures. In doing so, consideration is given to likely LRB scenarios so that the range of values does encompass those likely scenarios.

If BC Hydro had, instead, used the LRB Gap Approach, it would have developed one estimate based on its most plausible estimate of demand and other variables. However, the BCUC would expect that for a transaction of this magnitude, a utility would stress-test its estimates by examining the degree to which the analysis changed when the variables changed. Therefore, under the LRB Gap Approach, a utility could still be expected to provide a range of possible estimates of the value of a transaction.

Given the difficulty of forecasting demand or supply 20 years or more into the future, the Range of Value Approach is a practical approach. In our view, the Range of Value Approach is appropriate for the business case analysis of this proposed purchase as it eliminates the need to identify with precision the LRB, the LRMC of new resources, market prices, etc. in 20–30 years' time given the great uncertainty over such a long timeframe. **Therefore, for the purpose of evaluating the relative benefits of this proposed Waneta 2017 Transaction only, the Panel approves the Range of Value Approach as applied by BC Hydro as an appropriate departure from the more traditional LRB Gap Approach analysis normally applied to other resource acquisitions.**

[48] BCSEA-SCBC Final Argument, p. 14.
[49] CEC Final Argument, p. 24.
[50] CEABC Final Argument, p. 19.

3.3 Transaction value during the Lease Term

The Lease Term will last 20 or possibly 30 years of the 40-year assessment period; thus, the Waneta 2017 Transaction value during the Lease Term has a significant impact on the overall transaction value. If the Waneta 2017 Transaction proceeds, Teck will be making annual Lease payments to BC Hydro starting at approximately $74 million initially, escalating at 2 percent per year. If Teck extends the Lease to 30 years, the annual Lease payments will be re-set at year 21 at approximately $144 million per year, also escalating at 2 percent per year.[51]

The value of the initial 20-year Lease Term is substantial. The NPV of the Lease revenues less the administration and facility costs (i.e. those capital requirements that are BC Hydro's responsibility during the Lease Term to bring the asset up to Leading Utility Practice) amounts to **$792 million**, under the NPV analysis model.[52] This un-risked NPV assumes there is no early termination of the Lease due to default by Teck (Counterparty Default Risk) and there is no extension of the Lease Agreement by Teck, early termination and Lease extension being the most material risks to the Waneta 2017 Transaction. These risks will be discussed in Section 3.3.1 and Section 3.3.2 below.

Two other risks have been identified during the course of the proceeding that are potentially applicable during the Lease Term (but also post-Lease): (i) the possibility that interest rates turn out to be higher than what BC Hydro assumed in its Business Case; and (ii) a shorter amortization period through early retirement or obsolescence.[53] Since amortization and interest charges are only reflected in the revenue requirements model (and not in the free cash flows model), these risks would only affect the result of the ratepayers' impact analysis.[54] These risks will be discussed in Section 3.5.2 and Section 3.5.3.

Positions of the parties regarding the value of the transaction during the Lease Term

BC Hydro submits that the analysis performed demonstrates that the likelihood of the Waneta 2017 Transaction not providing a net benefit to BC Hydro's ratepayers during the Lease Term is very small. No credible scenarios have been proposed that indicate a different result.[55]

In response to the question: "Should ratepayers assume the risk of this transaction during the lease period?"[56] BC Hydro responded: "Well, because it's in their benefit, their net benefit. They'll ultimately get an asset that can be used to serve load. Between now and then they get a positive impact on their revenue requirement every single year."[57]

MoveUP submits that "the duration of the lease is the period of *lowest* risk and *most fully known and quantified benefit* to ratepayers, who will enjoy the net proceeds of the lease payments for the operation of a long-established and well-known facility."[58] MoveUP also submits that "unless there is a default by Teck, there is a very high level of certainty over costs and benefits in the coming 20 to 30 years, well beyond the horizon within

[51] BCH Final Argument, p. 24.
[52] Exhibit B-1-3, Errata 1 to Application, Business Case, pdf p. 9; Exhibit B-1, Application, Business Case, pdf p. 530.
[53] BCH Final Argument, p. 26.
[54] Exhibit B-1, Application, Business Case, Table 18, pdf p. 561.
[55] BCH Final Argument, pp. 24–27; Oral Argument Transcript Volume 4, pp. 204–205, lines 26–15.
[56] Exhibit A-26, Question 5.
[57] Oral Argument Transcript Volume 4, p. 255, lines 9–14.
[58] MoveUP Final Argument, pp. 2–3.

which dependable forecasts of conditions and system requirements can be made, especially in the context of rapidly-evolving energy policy and market dynamics."[59]

BCSEA-SCBC agrees with BC Hydro that the evidence supports a conclusion that the Waneta 2017 Transaction would provide ongoing value to ratepayers throughout the Lease Term.[60] This conclusion follows BCSEA-SCBC agreeing with BC Hydro's final argument.[61]

BCOAPO submits that since BC Hydro's LRB is likely to transition from surplus to deficit at some point during the 40-year evaluation period and this point is currently forecast to be towards the end of the 20-year Lease Term, BCOAPO would expect LRMC-based scenarios to be more representative of the net benefit accruing to BC Hydro ratepayers, indicating that the benefit to ratepayers will more likely be towards the higher end of the range presented than the lower one.[62]

For its part, CEC submits that "the initial lease payments can be considered as reasonably secure barring default by Teck."[63]

3.3.1 Counterparty Default Risk

Before dealing with the interest rate and amortization risks which affect the overall Waneta 2017 Transaction value pre and post-Lease Term (see Sections 3.5.2 and 3.5.3), the Panel must address the impact of the most significant risk to the Waneta 2017 Transaction value during the Lease Term. That is the Counterparty Default Risk. In such case, while Lease revenues would stop and costs would increase (i.e. water rentals, operating and capital costs); BC Hydro would become the sole unencumbered owner of Waneta sooner than it would otherwise. However, it would be able to use Waneta generation to serve domestic customers or for sales into external markets. Depending on when early termination occurs, and BC Hydro's LRB and market conditions at that time, early termination can either increase or decrease the ratepayer value of the Waneta 2017 Transaction.[64]

The costs and benefits that can occur as a result vary depending on when default occurs. BC Hydro states that one of the key uncertainties is the value of the energy and capacity BC Hydro can market upon default – while current market prices are low, under the ABB market forecast[65] they are expected to increase at a rate greater than inflation for the next several years. As a result, while default can have net negative consequences in early years, default may actually have net positive consequences in later years.

In order to determine the overall impact of Counterparty Default Risk, BC Hydro obtained Moody's assessment of the yearly probability of Teck Resources Limited (Teck's parent guarantor) defaulting over the next 10 years and extrapolated the default probabilities for the following period. In Table 6 of its Business Case, BC Hydro evaluated the cost or benefit of default in each year of the 20-year Lease Term, using four of the five valuation

[59] MoveUP Final Argument, p. 5.
[60] BCSEA-SCBC Final Argument, p. 13.
[61] BCSEA-SCBC Final Argument, pp. 11–12, paras. 49–51.
[62] BCOAPO Final Argument, p. 12.
[63] CEC Final Argument, pp. 11, 13.
[64] BCH Final Argument, p. 25.
[65] Report purchased by BC Hydro from the ABB Group for a forecast of long-term spot market prices, including at the mid-Columbia or "mid-C" electricity trading hub on the Washington-Oregon border. Exhibit B-1, Section 4.1.8, p. 4-5.

indices,[66] and calculated the sum of the probability-weighted value over this 20-year Lease Term, which yields the risk-adjusted value of the Waneta 2017 Transaction. Of the four valuation indices, the only scenario where the Counterparty Default Risk is expected to have a net negative impact is the extrapolated market pricing scenario (see Table 2 below).[67]

Table 2 – Impact of Counterparty Default Risk on Value of Waneta 2017 Transaction, 20-Year Lease (Present value to 2018, $ millions)

Basis for Post-Lease Value[4]	Value of Assets / Lease to BC Hydro		
	Un-risked	w/ Default Risk	Default Risk Impact
LRMC (Clean)	792	898	107
LRMC (Clean+Gas)	792	856	64
Market Prices (ABB)	792	792	1
Extrapolated Prices	792	738	(54)

Site C-related sensitivity analysis of Counterparty Default Risk around LRB Gap Approach and market prices

In the Business Case, Figure 5[68] shows the value of the Waneta 2017 Transaction under the LRMC - Clean, LRMC - Clean+Gas as well as the Market - ABB and Market - Extrapolated price curves,[69] depending on when a default occurs. Figure 5 has two underlying assumptions. The first is the use of BC Hydro's mid-range forecast from the 2016 load forecast.[70] The second is the use of the ABB market price curve to value the Waneta energy in surplus years under the LRMC scenarios. BC Hydro was asked to revise Figure 5 by using the "Panel Mid-C Price Forecast" from the BCUC Inquiry Respecting Site C Final Report to the Government of BC as an additional sensitivity test for the market prices, as well as testing the high and low range of the 2016 load forecast[71] (see discussion of "Panel Mid-C Price Forecast" in Section 3.4.3).

The three Revised Figure 5s that follow show the value of the Waneta 2017 Transaction under each of the Mid-Gap, Small Gap and High Gap energy surplus/deficit, using various valuation indices, including the "Panel Mid-C Price Forecast." In these figures, BC Hydro has added its LRB curve, the dotted purple line, which relates to the second Y axis on the right.

Note that BC Hydro's "gap" terminology refers to the difference between total supply of energy and total demand for energy, including demand-side management, which results in an energy surplus or deficit. A "small gap" refers to the low-load forecast, and the "high gap" refers to the high-load forecast.[72]

[66] BC Hydro views the likelihood of the smelter being served by BC Hydro following default to be low so the "BC Hydro Industrial Tariff" scenario has a very low probability of occurrence. Exhibit B-18, BCUC IR 76.3.
[67] Exhibit B-1, Application, Business Case, pdf pp. 541–542.
[68] Exhibit B-1, Application, Business Case, Appendix N-1, pdf p. 609.
[69] The market scenarios – both Market Prices (ABB) and Extrapolated Prices – remove consideration of BC Hydro's LRB position and assume the two-thirds interest will be exported to the Mid-C market whenever it is not provided to Teck under the Lease. Exhibit B-8, BCUC IR 6.4.
[70] BC Hydro's 2016 load forecast was the subject of the BC Hydro F2017-F2019 RRA, which was in turn based on the 2013 Integrated Resource Plan. BC Hydro Final Argument, pp. 28–29.
[71] Exhibit B-8, BCUC IR 6.3, 6.5; revised in Exhibit B-18, BCUC 76.6.
[72] For reference, see Exhibit B-8, BCUC IR 1.2, Attachment 1, lines 19, 19b, 20, 20b.

As each of the following Revised Figure 5s shows, the Panel Mid-C Price Forecast is already contained within the sensitivity analysis performed by BC Hydro and the Waneta 2017 Transaction value using the Extrapolated Market Price remains the lowest end of the transaction value.

Figure 1 – BC Hydro's Revised Figure 5a for Mid-Gap

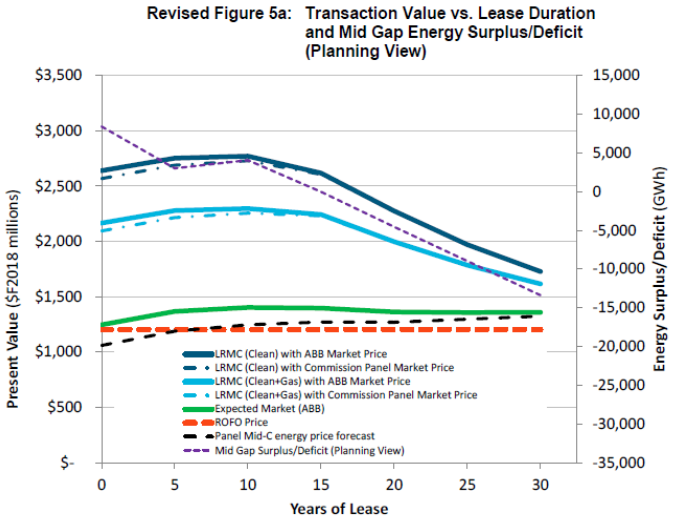
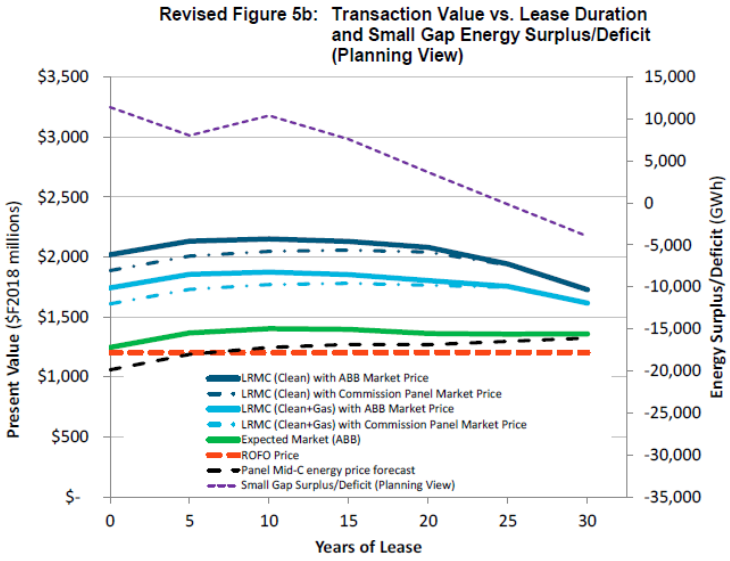
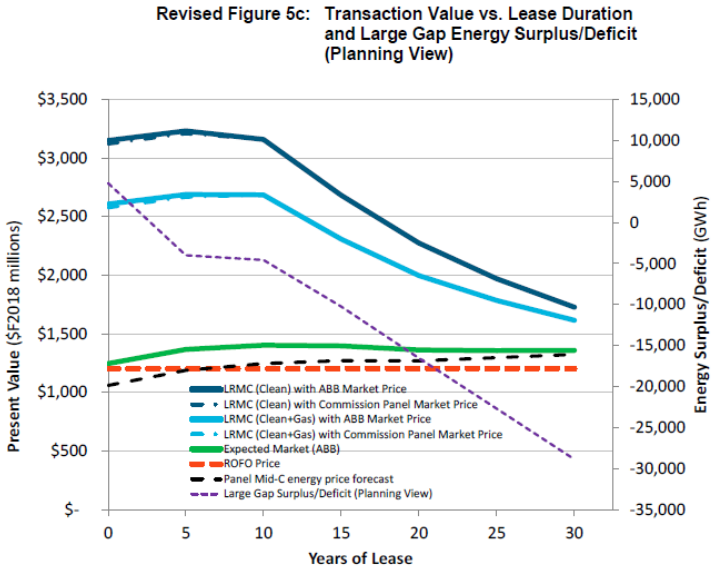


Figure 2 – BC Hydro's Revised Figure 5b for Small Gap



Going from the Mid-Gap to the Small Gap, BC Hydro goes from energy surplus to deficit later in the maximum 30-year period of the Lease Term, which translates in the NPV Waneta 2017 Transaction value curves being all lower than in the Mid-Gap but still higher than the ROFO price, therefore still providing benefits to BC Hydro's ratepayers. The Market Price scenarios are still the low bookend scenarios for the transaction value. Thus, the Small Gap scenario is already contained within the sensitivity analysis performed by BC Hydro.

Figure 3 – BC Hydro's Revised Figure 5c for Large Gap



Going from the Mid-Gap to the Large Gap, BC Hydro goes from energy surplus to deficit sooner in the 30-year period of the Lease Term, which translates in the NPV Waneta 2017 Transaction value curves being all higher than in the Mid-Gap, and now much higher than the ROFO price, providing more value to BC Hydro's ratepayers, in the event that a higher load forecast materializes as a result of other factors, such as low-carbon electrification in BC.

The following table presents the information contained in the Revised Figure 5a in table format. It shows the NPV of the Waneta 2017 Transaction value for various default scenarios compared to the NPV value for the full 20-year Lease Term.[73]

[73] Exhibit B-18, BCUC IR 76.1.

Table 3 – NPV of Transaction Value for Various Default Scenarios and 20-Year Lease Period

Revised Table — Net Present Value of Transaction for Various Default Scenarios and 20-Year Lease Period

(Present Value to 2018, $ millions)

Basis for Post-Lease Value	Scenarios #'s in Waneta Valuation Model	Teck Default after 5 years	Teck Default after 10 years	Teck Default after 15 years	20-Year Lease Period
LRMC – Clean only	7, 8, 9, 10	1,549	1,567	1,413	1,071
LRMC – Clean & Commission Panel Market Price	115, 116, 117, 118	1,485	1,525	1,402	1,071
LRMC – Clean + Gas	14, 15, 16, 17	1,075	1,093	1,039	794
LRMC – Clean + Gas & Commission Panel Market Price	122, 123, 124, 125	1,012	1,052	1,028	794
BCH Industrial Tariff	35, 36, 37, 38	405	315	239	175
Market Prices (ABB)	21, 22, 23, 24	164	199	194	159
Panel Mid-C Market Price	108, 109, 110, 111	(15)	43	68	66
Extrapolated Prices	28, 29, 30, 31	[redacted]	[redacted]	[redacted]	[redacted]

BC Hydro explains:

> As shown in the table, if Teck defaults after year 5, 10 or 15 it results in the following changes as compared to the value if Teck does not default before the end of the initial Lease Period:
>
> - A substantial increase in the value of the transaction under all LRMC scenarios;
> - A moderate increase in the value of the transaction under the Industrial Tariff scenario;[74]
> - A small increase in the value of the transaction in the ABB Market Price scenario, although this increase in the five-year default scenario is immaterial; and
> - For the Panel Mid-C Market Price scenario, either an immaterial increase in the 15-year default scenario or a small decrease in value under the five- and 10-year default scenarios.[75]

[74] BC Hydro's position continues to be that the likelihood of the smelter being served by BC Hydro following Teck default to be low, and thus the "BC Hydro Industrial Tariff" scenario has a very low probability of occurrence. Exhibit B-18, BCUC IR 76.3.
[75] Exhibit B-18, BCUC IR 76.1.

The Panel notes that the above redacted table does not show the results of the BC Hydro's analysis in respect of the Extrapolated Prices scenario. BC Hydro justifies the redaction in the following terms:

> The values in Figure 5 can be used to derive the extrapolated market price curve. The extrapolated market price curve is derived from electricity and natural gas forward fixed-price contracts that were extrapolated to the end of the Lease Period. The forward market prices used to develop the extrapolated forecast and price curve was provided by Powerex. The forward market prices are used by Powerex for trading decisions and are commercially sensitive. Public disclosure of these prices could negatively impact Powerex's trading operations and profits, which profits accrue to the benefit of BC Hydro ratepayers. As such, any negative impact to Powerex's profits results in harm to BC Hydro ratepayers.[76]

Despite this deficiency in the table, no intervener has challenged the basis for the redaction or the information set out in this table.

Position of the parties on Counterparty Default Risk

During the oral argument phase, BC Hydro summarized its assessment of Counterparty Default Risk as follows:

> [it] doesn't see there being very much risk at all during the lease period. You know, as much as can be known is known. Very few uncertainties are [sic] exist. The one big uncertainty is the possibility of default, and that can actually have a positive benefit on the transaction.[77]

Several interveners (MoveUP, BCOAPO, BCSEA-SCBC and CEC) agree with BC Hydro that while Counterpart Default Risk is the main or key risk during the Lease Term, it is nonetheless a modest risk that, should it materialize, is capable of mitigation through the corporate guarantee provided by Teck's parent, Teck Resources Limited, or through other means available to BC Hydro.[78]

Panel discussion

Based on the above evidence and submissions, the Panel is satisfied with BC Hydro's assessment of the Counterparty Default Risk.

BC Hydro has demonstrated that should the Market Prices (ABB) scenario come to pass, and Teck defaulted after five years, this would increase the value of the Waneta 2017 Transaction by $164 million. The Panel questions BC Hydro's assertion that figures exceeding $100 million are immaterial, even for a transaction of this size. Of more concern to the Panel is the redacted estimates of the effect on the Waneta 2017 Transaction value in the Extrapolated Prices scenario. The Panel does consider that these negative impacts on the transaction value are material.

However, BC Hydro estimates that the ratepayer impact of the Waneta 2017 Transaction is approximately $400 million more positive than the transaction value (see Table 18), and thus even in the worst case of the Extrapolated Prices scenario, the ratepayer impact is not negative.

Further, the risk of this scenario occurring is small: based on Moody's analysis, Teck Resources Limited's credit rating has improved from October 2016 to July 2017 as the company was able to take advantage of the strong

[76] Exhibit B-18, BCUC IR 76.1; Exhibit B-7, Attachment 1, p. 4.
[77] Oral Argument Transcript Volume 4, p. 254, lines 20–25.
[78] CEC Final Argument, pp. 43–44.

commodity prices to improve their financial situation, and the cumulative probability of default in the near term is lower than in the longer term.[79]

The Panel therefore agrees that the Counterparty Default Risk and any resulting adverse impacts are modest. Moreover, as the Business Case shows, if default does occur, it is likely to result in benefits to ratepayers in most, if not all, cases.

3.3.2 Extension option risk

A second significant risk to the Waneta 2017 Transaction value is the possibility that Teck exercises its Lease extension option (Extension Option Risk). Because Teck is assumed to exercise this option only if it would be more economical to extend the Lease than to purchase energy from the market, a Lease extension is assumed to only detract from the value of the Waneta 2017 Transaction.[80]

The Lease Agreement may be extended 10 years beyond the initial 20-year term at Teck's sole option. This extension is done at an effective price of $53/MWh (2018 dollars) rather than the $40/MWh (2018 dollars) for the initial Lease Term.

BC Hydro asked Powerex Corporation (Powerex) to value the extension option to determine the potential adjustment to overall Waneta 2017 Transaction value. Powerex valued the option as a 10-year European call option, with a one-time expiry on March 31, 2038. BC Hydro states that:

> [t]he Black-Scholes approach was used because it is the global standard approach for option pricing. One fundamental principle behind the Black-Scholes model is that you can perfectly hedge (assuming no costs) the option value by continually hedging the options [sic] exposure to movements in the underlying price. This hedge amount (expressed as a percentage of notional [sic]) is called the option's 'delta.' This delta is often interpreted as the probability of exercise of the option.[81]

BC Hydro calculated the value of the Lease extension option using a Black-Scholes model with the following assumptions:[82]

- ABB Forward Pricing Scenario;
- Arithmetic average of Heavy Load Hours Black-Scholes option Deltas;
- Years' 2038-2048 volumes were assumed to be Flat Heavy Load Hour volumes only; and
- The 10-year period between 2038 and 2048 was broken down into monthly option blocks to better capture changes in power price shape and volatility.

The following table shows the cost of the option granted to Teck under the various valuation indices:[83]

[79] Exhibit B-8-2, BCUC 5.1.
[80] BCH Final Argument, p. 26.
[81] Exhibit B-18, BCUC IR 92.2.
[82] Exhibit B-18-1, BCUC IR 92.1.
[83] Exhibit B-8, BCUC IR 17.5.

Table 4 – Cost of Teck's Lease Extension Option

Basis for Post-lease Value	Option Cost to BCHydro ($ million)
LRMC – Clean only	291
LRMC – Clean + Gas	196
Market Prices (ABB)	93
BCUC Panel Mid C energy price	56
BCH Industrial Tariff	45
Extrapolated Prices	6

BC Hydro assesses that there is a 58 percent probability of Teck exercising its extension option.[84]

Position of the parties on Extension Option Risk

In its final argument, BCSEA-SCBC paraphrases and concurs with BC Hydro's submission with respect to the Extension Option Risk.[85]

BCOAPO also concurs with BC Hydro that another key risk is whether or not Teck will exercise its option to renew the Lease for an additional 10 years.[86]

CEC submits that the Lease extension cost is not of overwhelming significance but should be included in the BCUC's assessment of the Business Case, as BC Hydro has properly included this evaluation in their assessment.[87]

Panel discussion

The Extension Option Risk and the Counterparty Default Risk are the most significant risks to the value of the Waneta 2017 Transaction. As with its analysis of the default risk, we are generally satisfied with the adequacy of BC Hydro's assessment of the Extension Option Risk.

The Panel agrees with CEC that the Lease extension cost to BC Hydro is not overwhelming but should be included in the overall assessment of the Waneta 2017 Transaction value given that a Lease extension is assumed to only detract from the value of the transaction. In Section 3.5.7 of this decision, the Panel will take the Extension Option Risk value into account, along with further determinations on the consolidated value of the Waneta 2017 Transaction, in the valuation of the transaction pre and post-Lease.

[84] Exhibit B-18, BCUC IR 92.1
[85] BCSEA-SCBC Final Argument, p. 12, paras. 53, 54.
[86] BCOAPO Final Argument, p. 11.
[87] CEC Final Argument, p. 23.

3.4 Transaction value after the Lease Term

After the Lease Term, BC Hydro will no longer be able to earn Lease payment revenues. At that point, Waneta will be fully available to BC Hydro as a load-serving public utility asset. As such, the value then will be determined by a number of factors such as BC Hydro's LRB (Section 3.4.1), market price for electricity and the LRMC for alternative resources (Section 3.5.3), the discount rate (Section 3.5.1) and Waneta's economic life and capital costs (Section 3.5.3 and 3.5.4).

The value of the Waneta 2017 Transaction in years 21 and beyond is subject to a higher level of risk than the Lease Term due to uncertainty around BC Hydro's load resource balance, market prices and the LRMC of new resources.[88]

Positions of the parties on the value of the transaction after the Lease Term

BC Hydro submits that "the vast majority of those analysis [sic] show [sic] that the transaction still has positive value. And so despite what we would say is a bias towards testing the lower bounds of the transaction of those 450, you still have a vast majority that are showing a positive transaction value."[89]

MoveUP submits that:

> BC Hydro's filed materials, information responses and oral and written submissions have significantly fortified MoveUP's confidence in the prudency of this transaction and we submit that it should be approved as applied-for. Even in the most adverse contemplated scenarios, the risk to ratepayers is slight, and the projected ratepayer upside under almost all scenarios is substantial. (See, for example, BC Hydro Final Argument, p. 32, Revised Figure 7, and p. 35 copy of Table 2.83.3.)[90]
>
> […] The Commission should feel satisfied that the output of the Waneta facility will be valuable to BC Hydro and its ratepayers well beyond the term of Teck's leaseback.
>
> With all respect, the scenarios and projections asserted by CEABC in this proceeding have been highly speculative. At times they resemble efforts to cherry-pick fragments of available information to justify a self-serving outcome – that the Commission should reject any strategy of utility-owned large-scale generation assets, and instead require BC Hydro to purchase energy and (largely hypothetical) capacity or storage from members of that Association.[91]
>
> […] We submit that the proposed transactions are in the public interest and that the Application should be approved.[92]

[88] Exhibit B-1, Application, Business Case, pdf p. 540.
[89] Oral Argument Transcript Volume 4, p. 263, lines 3–8.
[90] MoveUP Final Argument, p. 2.
[91] MoveUP Final Argument, pp. 3–4.
[92] MoveUP Final Argument, p. 5.

BCSEA-SCBC submits:

> BCSEA-SCBC agree with BCH in paragraph 79 [of BC Hydro's final argument] that the ratepayer impact of the transaction is positive through the 40-year evaluation period. This is a robust conclusion that holds up under the scrutiny of the sensitivity analyses.[93]
>
> […] In BCSEA-SCBC's view, the results of the financial analysis presented in Revised Figure 7 show that the proposed expenditures would be substantially beneficial to BCH ratepayers in a broad and reasonably representative range of future scenarios.[94]
>
> […] BCSEA-SCBC support Commission approval of the orders requested in this proceeding regarding BCH's Waneta 2017 Transaction.[95]

BCOAPO submits:

> BCOAPO notes that all of the scenarios BC Hydro generated using a variety of inputs show a positive benefit of this transaction to its ratepayers ranging from $29M to $1,071M. Having reviewed the evidence on the record, BCOAPO is of the view that the results are most likely to be at the upper end of the benefits range presented: a fact that is not determinative but is worth noting.[96]
>
> […] Based on BCH's sensitivity analyses, an unlikely combination of negative events would need to occur for the Transaction to not be cost-effective. Applying reasonable stress tests to the core valuation results still yields position benefits:
>
> - Assuming a 15% reduction in the LRMC-Clean, a Small LRB Gap and the Panel Mid-C market price forecast during periods of surplus yields a net benefit NPV of $421 M.[97]
> - Assuming a lower financing cost for Independent Power Producers (IPP), a 40% reduction in LRM-Clean, a small LRB gap and future market prices that are flat in real terms yields a net benefit NPV of $49 M.
>
> Overall, BCOAPO submits that the evidence indicates the Transaction should be considered as cost-effective from an economic investment perspective.[98]
>
> [and] BCOAPO has reviewed the evidence and, although there are some minimal risks to this transaction, those risks are minimal and the evidence overwhelming indicates that there is a far greater likelihood that it will yield some benefit to ratepayers. As a result, BCOAPO supports BC Hydro's application in all regards and asks that the Commission approve the Application as filed.

[93] BCSEA-SCBC Final Argument, p. 15.
[94] BCSEA-SCBC Final Argument, p. 15.
[95] BCSEA-SCBC Final Argument, p. 19.
[96] BCOAPO Final Argument, pp. 10–11.
[97] BCOAPO referenced an outdated IR response in quoting this figure, which BC Hydro revised to $386 M in BCUC IR 86.3.
[98] BCOAPO Final Argument, p. 20.

CEC submits:

> The CEC submits that the Commission should undertake to value the Waneta post-lease energy based primarily on a market prices. The CEC does not accept the BC Hydro Load Resource Balance load as providing an accurate picture as to the likely surplus/deficit position. The CEC submits that it is likely that BC Hydro will remain in surplus during the post lease period. The CEC considers that the Panel Mid C market price represents a reasonable middle ground for market prices.
>
> […] The CEC sees the ratepayer impacts as one of the most important pieces of evidence before the Commission and the CEC sees the evidence as very positive for ratepayers. The CEC recommends that the Commission weight this evidence heavily in its considerations.[99]
>
> […] The CEC submits that the BC Hydro ratepayer and those who may become future ratepayer of BC Hydro on balance will benefit significantly from this Transaction. The CEC submits that this Transaction will make energy marginally more affordable in BC for BC Hydro's customers. The CEC submits that the Waneta 2017 Transaction is demonstrably in the public interest. The CEC submits that rational judgment about the many risks, uncertainties and different evaluation methodology approaches when combined with a relatively strong base case on balance provides additional positive value to be weighted into the decision. The CEC recommends that the Commission approve the Transaction as filed and requested by BC Hydro.[100]

CEABC submits:

> When these $500 million reductions are combined with the ~$400 million reductions that result from using the proper pre-tax return on equity, and the consequential 7% discount rate, the original Table 8 Present Values for the first two scenarios (of $887 and $662 million) will be effectively eliminated. That is to say, the NPVs will be reduced to negative values, i.e. the previously alleged positive benefits no longer exist.[101]

In conclusion, CEABC submits it does not support BC Hydro's application for approval of the Waneta 2017 Transaction and urges the BCUC to reject it.

FBC submits:

> As a result of the Waneta 2017 Transaction, BC Hydro will realize financial benefits which will have a net positive impact on the rates of its customers, immediately through the lease payments from Teck Metals Ltd. (Teck), and after the expiration or termination of the Lease as the energy and capacity from the Waneta Plant become available to BC Hydro for load-serving and/or export... As a direct customer of BC Hydro, FBC, and its own ratepayers, will participate in these benefits.
>
> … For both of these reasons, FBC supports the completion of the Waneta 2017 Transaction and related agreements.[102]

[99] CEC Final Argument, p. 52.
[100] Ibid., p. 53.
[101] CEABC Final Argument, p. 10.
[102] FBC Final Argument, pp. 1–2.

3.4.1 Load forecasts and load resource balances

BC Hydro provides some background on its current LRB. The base case LRB underpinning the Waneta Business Case is the Mid-Gap forecast from the 2016 load forecast, which was submitted and updated in the F2017-F2019 Revenue Requirements Application (RRA). In turn, the 2016 load forecast is based on the approved 2013 IRP; both of which include the Site C energy and capacity scheduled to come online in F2024/2025. The Teck smelter load is not included in BC Hydro's current load forecast.[103]

In the Mid-Gap load forecast, there is a need for new energy and capacity resources in F2034 and F2029 respectively.[104] In the Small Gap, BC Hydro shows a need for new energy and capacity resources in F2044 and F2038 respectively.[105] In the Large Gap, BC Hydro shows a need for new energy and capacity resources in F2019 and F2022 respectively.[106] In all three scenarios, BC Hydro shows a need for new resources before the end of the 40-year term (in 2058) used to evaluate the Waneta 2017 Transaction.

Sensitivity analysis on load forecast and LRBs

In its Business Case, BC Hydro reviewed scenarios where the load grows quicker and slower than expected. The results are presented in Table 5 below.[107] In that table, the base case NPV refers to the Mid-Gap scenario where the LRMC is based on a portfolio of clean resources and the ABB Market Prices are used to value the energy during the surplus years. The values in the table are risk-adjusted for Counterparty Default Risk and Extension Option Risk. BC Hydro states that a 5-year delay in load growth is relatively small compared to the overall value and a delay of 10 years starts to show a more substantial effect, although it remains significantly positive. It is worth noting that the 10-year delay sensitivity corresponds roughly to the Small Gap scenario. Conversely, a 5-year acceleration to the load growth results in a small increase to the Waneta 2017 Transaction value. The Revised Figure 5s that are included in Section 3.3.1 visually show how a change in LRB gap affects the transaction value.

Table 5 – Sensitivity to Energy LRB Gap Growth – LRMC with Clean

(Present value net of purchase price)

LRB Gap Scenario	Year of change to Energy Deficit Position	Net Value of Transaction ($ millions)
5-year Accelerated Growth	2029	973
Base Case	2034	887
5-year Delayed Growth	2039	776
10-year Delayed Growth	2044	570

In the BCUC Inquiry Respecting Site C Final Report to the Government of BC (Site C Inquiry Final Report), the BCUC found: "Overall, the Panel finds BC Hydro's mid load forecast to be excessively optimistic and considers it more appropriate to use the low load forecast in making our applicable determinations as required by the OIC

[103] Exhibit B-1, Application, Business Case, pdf p. 531, Appendix A, pdf pp. 568–569.
[104] Ibid., pdf p. 531.
[105] Exhibit B-8, BCUC IR 1.2.1.
[106] Exhibit B-8, BCUC IR 1.2, Attachment 1.
[107] Exhibit B-1, Application, Business Case, pdf p. 545.

[order in council]. In addition, the Panel is of the view that there are risks that could result in demand being less than the low case."[108]

In light of this Site C finding, the BCUC asked BC Hydro to perform additional sensitivity analyses based on the Small Gap. Results will be shown in Table 19 and Table 20 of Section 3.5.7 of this decision.

In its response to a BCSEA-SCBC IR, BC Hydro discusses the Site C Inquiry Panel's statement in the Site C Inquiry Final Report on the mid-load forecast and the low load forecast. In particular, BC Hydro states:

> BC Hydro believes its current mid load forecast, as provided in its Fiscal 2017 to Fiscal 2019 Revenue Requirements Application and Site C Inquiry Submissions, represents an appropriate expectation of future load growth recognizing there are a number of uncertainties which could result in future load being higher or lower than the mid forecast. Given these load and other uncertainties, the Waneta 2017 Transaction was evaluated against a range of key sensitivities, including low load growth scenarios and scenarios where the full Waneta output was exported to external markets. We believe it is appropriate for the Commission to similarly assess the Waneta 2017 Transaction over this range of key sensitivities. [109]

BC Hydro also submitted that "while low-carbon electrification was not assumed in the development of the 2016 load forecast and uncertainty band, low-carbon electrification would certainly increase expected load growth towards the high-load forecast."[110]

Furthermore, BC Hydro made the following point regarding the unique nature of the Site C Inquiry:

> It's an issue [load over-forecasting] that the Commission had to deal with, but it wasn't an issue that was the subject of evidence by BC Hydro directly. It wasn't the subject of intervener evidence. It certainly wasn't the subject of cross-examination. The Site C enquiry I suggest was a somewhat unique affair, governed by a [sic] terms of reference that asked the Commission panel to look in specific questions. It was done in a very short timeframe, and it meant the Commission had to act largely in an inquisitorial fashion rather than hearing parties who have interest in the outcome of the debate come forward, put their evidence forward and test each other's evidence through cross examination.
>
> So the circumstances of that kind of conclusion, that implicit conclusion if we will, we say need not and should not be imported into this proceeding as a reason to undermine or toss out the load forecast. That was a very specific proceeding. The conclusions on that point came out of a specific fact circumstance and should not be brought into this world here, particularly whereas we say it's not actually necessary to land on a load resource balance that Hydro is going to face at the end of the lease period.[111]

[108] British Columbia Utilities Commission Inquiry Respecting Site C Final Report to the Government of British Columbia dated November 11, 2017, p. 77.
[109] Exhibit B-9, BCSEA-SCBC IR 48.1.
[110] Exhibit B-9, BCSEA-SCBC IR 48.3.
[111] Oral Argument Transcript Volume 4, pp. 239–240.

Position of the parties on load forecasts and LRBs

At the oral argument phase, BC Hydro submitted:

> We first suggest you start with the LRMC Clean scenario. That's the scenario remember at a post-lease period that is consistent with both the current legislative framework, the law, and is supported by what we would say is a robust, methodologically sound forecast, the 2016 load forecast. Yeah, and so, these, as I say, so the LRMC Clean 2016 load forecast, 6 percent discount rate, that starting point is methodologically robust, consistent with provincial law and policy regarding clean energy and consistent with the framework of BC Hydro's debt equity ratio under HC1 and consistent with the Commission's decision with respect to return on equity for FortisBC.[112]
>
> […] And then if you want to look seriously at what the regret bookend looks like, then you have to assume -- remember a red bookend means we don't need any new generation resources for 40 years. You maybe say, okay, maybe we need some resources in that 40 years but we still want to be extremely conservative. Then you look at LRMC Clean plus gas minus 40 percent, and you look at the low market prices, extrapolate or panel Site C, and these scenarios are in that IR that we talked about earlier. That is BCUC 2.83.3. And so we looked at the entire range of transaction values looking at the most conservative assumptions that you can reasonably come to. And the key there is as long as we need a resource, sometime in the next 40 years, then you can use some LRMC number and give some value to the transaction. And that's really the key. Like you have to have no market value and no need for generation resources before this is at zero. You need some generation at all in that 40-year period that gets deferred by Waneta and you get some positive value.[113]

In its final argument, BC Hydro confirms:

> The only scenarios where the transaction value tends toward zero are those in which the possibility that BCH will need any new generation resources for the next 40 years is taken out of the analysis (*i.e.,* ABB, Extrapolated and Panel Mid-C). Conversely, in any scenario in which BCH needs new resources sometime in the next 40 years the transaction has a positive NPV. BCH suggests that it is simply not credible that BCH will not need new resources for the next two generations.[114]

[112] FortisBC Inc. corrected this reference to be FortisBC Energy Inc. (FEI) rather than FBC. FBC Final Argument, p. 2.
[113] Oral Argument Transcript Volume 4, pp. 263, 265.
[114] BCH Final Argument, pp. 35–36.

BCOAPO submits:

> Apart from some small differences the load/resource balance used in the Waneta 2017 Transaction Application is the same as that submitted by BC Hydro in the recent Site C inquiry. However, the BCUC determined that for its analysis of Site C it would use BC Hydro's low load forecast. This difference in the approach to the load/resource balance is not a concern to BCOAPO though simply because the discussion in the preceding section cites evidence showing that the value of the Transaction is positive under the low load growth/small gap scenario. This is further illustrated in BC Hydro's response to BCUC 1.6.5.2.[115]
>
> […] As noted previously, BC Hydro's current load/resource balance indicates there will be an energy deficit by 2033 (F2034): at least four years prior to the end of the Lease This means that the export price-based scenarios actually *understate* the benefit of the Transaction during the post-Lease Period. On the other hand, the LRMC scenarios may overstate the value if load growth is slower than forecast and BC Hydro's load/resource balance is still in surplus when the Lease Period ends.[116]

BCSEA-SCBC states:

> BCSEA-SCBC agrees with BC Hydro that 'it is simply not credible that BC Hydro will not need new resources for the next two generations [i.e., the next 40 years].' It follows that the NPV financial analysis shows that the Waneta 2017 Transaction has a substantial positive value on an investment basis in all reasonable scenarios.[117]

CEC submits it "recommends that the Commission consider the Small Gap scenario as the appropriate LRB for use in the valuation of the Waneta Transaction."[118]

CEABC submits:

> The BCUC is not bound to use the "authority's mid-level forecasts of its energy requirements and peak load" because these forecasts do not extend to 2038 and beyond. The BCUC is free to make whatever determinations it judges to be appropriate with respect to energy and peak load requirements after 2038.
>
> In CEABC's view, there are many new loads that could possibly materialize over the next 20 to 30 years. In fact there are many new loads that should materialize, if B.C. is to meet our Provincial and Federal climate change policy commitments. […] However, even if these loads do materialize, they will still be largely irrelevant to the evaluation of this Transaction. The reason is quite simple. Any new loads that do materialize will already be better served by other resources.
>
> […] it is a totally fruitless task to devote a lot of time and effort to forecasting the countless possibilities. The vastly better solution will lie in developing a portfolio of flexible resources, which can be brought on line more quickly and located more appropriately, to respond to the needs that do arise.[119]

[115] BCOAPO Final Argument, p. 15.
[116] Ibid., pp. 10–11.
[117] BCSEA-SCBC Final Argument, p. 16.
[118] CEC Final Argument, p. 32.
[119] CEABC Final Argument, pp. 18–19.

Panel discussion

Given the range of possibilities, the Panel agrees with CEABC that it is fruitless to devote a lot of time and effort to forecast the countless possibilities of LRBs in the next 20 to 40 years. This is consistent with the Panel determination under Section 3.2 on the Range of Value Approach and will also be discussed more fully in the section on core valuation indices, under market prices in Section 3.4.3.

Nevertheless, the Panel notes that BC Hydro's base case analysis is based on its mid-load forecast whereas the BCUC had found, in the Site C Inquiry Final Report, "BC Hydro's mid-load forecast to be excessively optimistic and considers it more appropriate to use the low load forecast in making our applicable determinations as required by the OIC."[120]

Under the low load forecast (also referred to as Small Gap), BC Hydro shows a need for new energy and capacity resources in F2044 and F2038 respectively. The Panel recognizes that this energy shortage, while delayed to the end or after the Lease Term, would still materialize before the end of the 40-year evaluation term. At that point, the Waneta energy would be valued at the LRMC indices rather than the export market prices. The Panel agrees that this causes the value of the Waneta 2017 Transaction to remain significantly positive (see more on the consolidated transaction value in Section 3.5.7 of this decision).

The Site C Inquiry Panel also noted that it was "of the view that there are risks that could result in demand being less than the low case."[121]

This Panel recognizes that BC Hydro included in its Business Case analysis scenarios where the question of the LRB is entirely removed from the equation and where the entire two-thirds interest is valued at market prices, under the implied assumption that BC Hydro would not need new generation resources for the next 40 years. These market price scenarios remain the low bookend scenarios for the Waneta 2017 Transaction value. Thus, the Panel is satisfied that the Small Gap scenario, or scenarios where demand is less than the low case, are already contained within the sensitivity analysis already performed by BC Hydro.

The Panel also recognizes that other factors and technological disruptions may accelerate load growth and push the load forecast towards its higher bound, key among them being the low-carbon electrification that MoveUP, BCSEA-SCBC and CEABC all agree could push the load toward the higher band of the load forecast.

3.4.2 "Beer and foam" (unit energy costs and freshet energy)

BC Hydro states that under the Canal Plant Agreement, BC Hydro receives the actual generation output of Waneta (and the other CPA plants) and in return provides entitlement energy to Teck (and the other CPA parties). That entitlement energy is used by Teck to serve its smelter load, which is largely flat through the year.[122]

[120] British Columbia Utilities Commission Inquiry Respecting Site C Final Report to the Government of British Columbia dated November 11, 2017, Section 4.1.9, p. 77.
[121] Ibid.
[122] BCH Final Argument, pp. 6–7.

However, referring to Figure 4 below, CEABC submitted that "Waneta generation is heavily biased to the freshet period and there is minimal storage to mitigate or reshape the natural stream flows."[123] Further, Waneta's "…generation is dominated by the freshet season"[124] and "…does not contribute to the overall storage and shaping capability of BC Hydro's system, but rather it consumes that capability."[125] CEABC adds that "…no-cost storage and shaping [of Waneta] could represent a significant unacknowledged cost to BC Hydro."[126] In particular, CEABC points to the increased level of generation during the freshet period, when the market value of electricity is lower than during other periods throughout the year. With respect to BC Hydro's shaping resources, CEABC views Waneta as a net consumer, stating that "…to turn some of the foam into beer[127] it needs the assistance of BC Hydro's remaining storage assets."[128]

Figure 4 – Monthly Average MW for Waneta Facilities

Figure 2 Monthly Average MW for Waneta Facilities

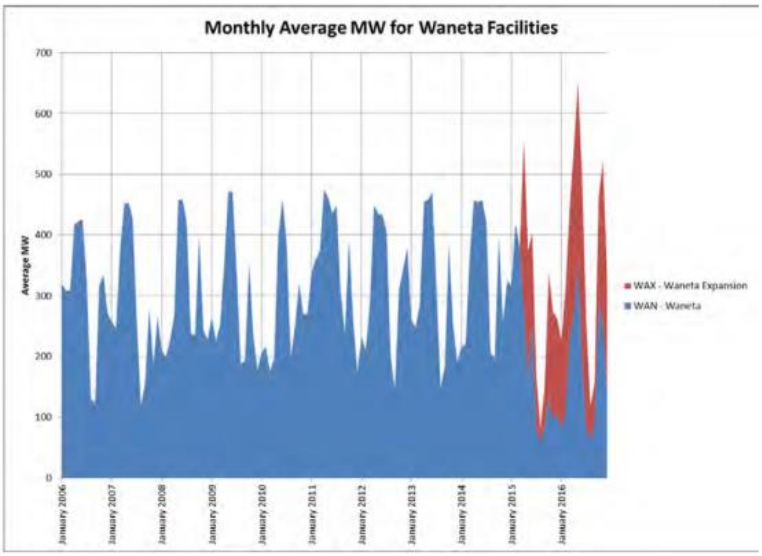


Figure 2 shows the average MW for the Waneta Facilities over each month. This chart shows the seasonality of the generation with a peak typically occurring in the spring and summer due to the spring runoff, and the lowest average generation occurring during the winter. The monthly average ranges from 119 aMW to 475 aMW. After the Waneta Expansion Project start-up the average range is lower from 59 aMW to 356 aMW.

In its reply argument, BC Hydro submits:

> …to assert as the CEABC does that after the Lease Period BC Hydro will be getting freshet energy that will need to be shaped ignores the reality of the CPA entitlement framework; Teck's current load profile; the fact that Teck's load is served by its 2/3 interest in Waneta during the Lease Period; and that BC Hydro will have that 2/3 interest for its purposes after the Lease Period.[129]

[123] CEABC Final Argument, Section III, p. 17.
[124] Oral Hearing Transcript Volume 4, p. 307.
[125] Ibid.
[126] CEABC Final Argument, Section I, p. 2.
[127] CEABC uses the term "beer" to refer to the portion of Waneta's generation that CEABC considers firm energy. CEABC uses the term "foam" to refer to the remaining portion of Waneta generation that CEABC considers to be less reliable and, therefore, to hold less value.
[128] Ibid., p. 308.
[129] BCH Final Argument, pp. 48.

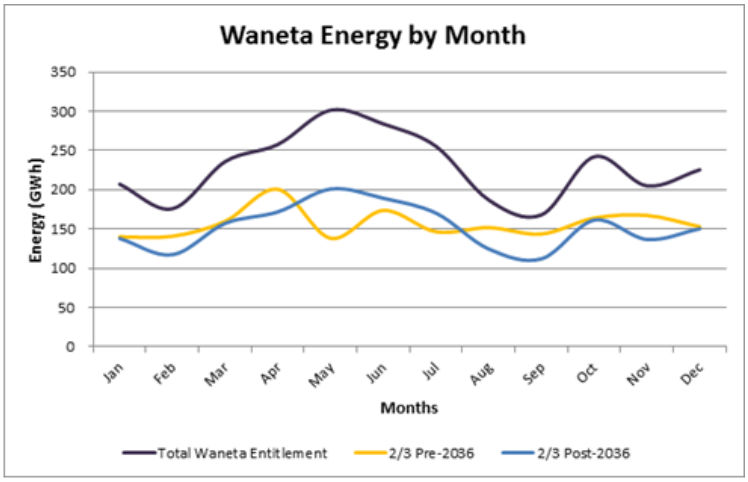
3.4.2.1 Canal Plant Agreement entitlements

The Canal Plant Agreement states that the entitlement energy and entitlement capacity for each of the plants based on the plant characteristics and available flow.

It further states that "for each plant and each month, the average energy is determined by averaging Monthly Energy Generation amounts for that plant and for that month over all 50 years of the Stream Flow Record Period."[130]

The figure below shows the Canal Plant energy entitlements for Waneta.[131]

Figure 5 – Canal Plant Energy Entitlements for Waneta



Energy shaping refers to the capability of a generating facility to store water for generation at later times when the resulting energy is most valuable. Coordination refers to the ability to instruct a generating facility in coordination with other facilities to meet load in the most cost-effective manner. During the Lease Term, the capacity associated with BC Hydro's Waneta electricity will continue to provide energy shaping flexibility to BC Hydro. BC Hydro plans and instructs the operation of the plants included in the CPA, including Waneta. The coordination of the CPA plants with the other plants in the BC Hydro 1 system provides coordination benefits stemming from the optimization of their joint operation.

During the Lease Term, and under the continuing arrangements contemplated in the Surplus Power Rights Agreement[132] and the Scheduling Agreement,[133] Teck's market activities are limited to importing to serve their load and exporting any surplus electricity. These agreements have the effect of reducing Teck's trade activity and providing schedule and load certainty for BC Hydro. BC Hydro's experience since the Waneta 2010 Transaction has shown greatly reduced Teck exports during heavy load periods (virtually all sold to BC Hydro) and reduced Teck imports during light load periods (as needed to serve their load and/or sell to BC Hydro). These reductions confirm the value associated with the highly predictable and stable smelter load. In aggregate, the energy shaping and coordination characteristics of Waneta are comparable with highly dispatchable

[130] Exhibit B-8-2, BCUC IR 45.5, Attachment 1, Appendix A, Section 4.3(b), pdf p. 506.
[131] Derived from Exhibit B-8-2, BCUC IR 45.5, Attachment 1, Appendix A, Table 9, pdf p. 522.
[132] The Surplus Power Rights Agreement is described in section 3.3.3 of Exhibit B-1.
[133] The Scheduling Agreement is described in section 2.5.6.3 of Exhibit B-1.

resources such as the Seven Mile facility, and are superior to most other resource options available to BC Hydro.[134]

Position of the parties on the Canal Plant Agreement entitlements

In its final argument, BC Hydro states that "…BC Hydro's acquisition of the remaining 2/3 interest in Waneta from Teck, if it proceeds, will reduce BC Hydro's entitlement obligation under the CPA after the Lease Period by an amount equal to the generation output of Waneta that would be available if it were operated solely for Teck's benefit."[135] BC Hydro also re-iterates its assertion from the Application, stating that "energy shaping and coordination benefits of Waneta 'are comparable with highly dispatchable resources such as the Seven Mile facility, and are superior to most other resource options available to BC Hydro.'"[136]

In its final argument, BCSEA-SCBC addressed CEABC's concern, referring to generation from the Waneta two-thirds interest as "…entitlement under the Canal Plant Agreement (CPA), which is mostly firm energy," and describing CEABC's position that the output from Waneta two-thirds interest is mostly unreliable as "not accurate."[137]

3.4.2.2 Analysis of the post-Lease energy value

As the Unit Energy Cost (UEC) is "…intended to illustrate what BC Hydro is paying for post-lease value…"[138] for example the unit cost of generation, it follows that the calculation of UEC can be applied to determine the revenue generated per unit of generation, or Unit Energy Revenue (UER), and indirectly validate the adequacy of pricing forecast. As such, BCUC staff applied the methodology and assumptions used in calculating UEC to calculate four UEC and UER scenarios based on BC Hydro's forecast market prices. The scenarios were created by including or excluding the following:

- *Monthly shaping factors*
  The calculation of the annual UEC and UER is based on the annual energy volume, annual lease payment and average annual energy prices, (i.e. there is no recognition of monthly energy volume or price variability throughout the year). A comparison of monthly and annual based calculations will determine to what extent monthly shaped volumes and prices will affect both UEC and UER.
- *Periods of significant generation*
  Waneta generation is higher in periods where the market price is lower, relative to other periods, and, therefore, holds less value (this is CEABC's concern). Therefore, BCUC staff evaluated generation by assuming zero production during the May and June periods.

Scenario 1 – UEC vs UER using annual entitlement volumes

This is the base scenario, as BC Hydro estimated the Waneta UEC using annual cost estimates and annual volumes. BC Hydro's financial analysis model's annual revenue estimates are used in this scenario. Due to the use of annual amounts, neither monthly shaping factors nor the removal of significant generation periods were applied.

[134] Exhibit B-1-1, pp. 4-28–4-29.
[135] BCH Final Argument, p. 49.
[136] Ibid., pp. 49–50.
[137] BCSEA-SCBC Final Argument, Section F, p. 18.
[138] Exhibit B-8, BCUC IR 15.2.

Scenario 2 – UEC vs UER using monthly entitlement volumes
This modifies Scenario 1 by applying monthly shaping factors. The removal of significant generation periods was not applied.

Scenario 3 – UEC vs UER using annual entitlement volumes minus May and June entitlement
This scenario assumes that no volumes are generated during May and June of each year. This is meant as a proxy for the market value of generation during this period being zero. This also results in an increase to the UEC as costs remain constant, but the energy volume declines. Due to the use of annual amounts, monthly shaping factors for energy and pricing were not applied.

Scenario 4 – UEC vs UER using monthly entitlement volumes excluding May and June entitlement
This modifies Scenario 3 by applying monthly shaping factors for energy volumes and pricing.

The results of the scenario analysis are summarized below:

Table 6 – Scenario Analysis Results

Scenario	Unit Energy Cost (F2018 $/MWh)	Unit Energy Revenue (F2018 $/MWh)
1 – Annual Basis and All Volumes	$48.25	$56.75
2 – Monthly Basis and All Volumes	47.50	57.25
3 – Annual Basis Excl. May and June	61.25	60.25
4 – Monthly Basis Excl. May and June	60.75	60.50

The detailed results underpinning the data in the table above are provided in Appendix A.

Panel discussion

The Panel has a number of concerns with the arguments of both BC Hydro and CEABC on this issue.

CEABC suggests that because Waneta has essentially a run-of-river output profile, the energy is of less value than assumed in the business plan. However, BC Hydro argues that under the CPA it has historically shaped the output of Waneta and will continue to do so. However, Table 6 above shows that based on long-term monthly averages, Waneta production is lowest in the months of November, January, December and February with the lowest production being in February. Therefore, the Panel finds that CEABC's assertion concerning the output profile is essentially correct.

The Panel acknowledges that BC Hydro currently provides shaping for Teck's entitlement. The evidence shows the shaping that BC Hydro currently provides for Teck results in a monthly energy entitlement that reflects the dam's long-term monthly average output profile. This allows BC Hydro to operate Waneta in coordination with other Canal Plant Agreement generating facilities to meet its own load along with Columbia River Treaty obligations in the most cost-effective manner.

Currently, Teck receives its monthly entitlement and is responsible for any further shaping to match its own load. BC Hydro states that Teck's load is essentially flat.[139] To shape the entitlement to actual load, Teck imports to serve its load and exporting any surplus electricity.

However, the Panel disagrees with BC Hydro's statement that "to assert as the CEABC does that after the Lease Period BC Hydro will be getting freshet energy that will need to be shaped ignores the reality of the CPA entitlement framework; Teck's current load profile; the fact that Teck's load is served by its 2/3 interest in Waneta during the Lease Period…."

According to BC Hydro's evidence, when the agreement with Teck terminates – either at the end of the Lease Term, the end of the extension, or, in the case of default, earlier – BC Hydro will no longer be obliged to provide the CPA entitlement to Teck, but instead will have access to the Waneta output to serve its domestic load – a load that is, at least at present, winter peaking. If, as and when the agreement with Teck terminates, the Waneta actual generation profile may require further shaping to meet that domestic load. Therefore, the issue is whether the cost of shaping after the Lease Term has been appropriately included in the business case.

The Business Case and all of the scenarios provided have been based on the average *annual* output of Waneta. In order to analyze the cost of shaping Waneta's actual output, *monthly* load resource balance information is required. BCUC staff asked BC Hydro to identify where on the record the monthly load resource balance information is located. BC Hydro indicated that this information is not located on the record and would take more than one month to provide.[140]

Given the lack of this information, BCUC staff developed a monthly analysis, described in Section 3.4.2.2 above, that assumed sales of Waneta energy at Mid-C, using pricing assumptions used in BC Hydro's scenarios. Based on this analysis, the Panel concludes that Scenario 2, which considers monthly Mid-C pricing show that over the post-Lease Term, sales of Waneta generation will cover its costs. Further, Scenario 4, which excludes any sales of volumes attributed to generation during the May and June periods, but does reflect costs, result in costs that are virtually identical to revenues.

While this analysis is not a proxy for an analysis of the cost of monthly shaping to serve domestic load, the Panel considers that it does at least attempt to value the energy given its monthly shape. Therefore, the Panel finds that the seasonal shape of energy, as well as expected seasonal pricing, is already reflected in the value of the Waneta Transaction in the post-Lease Term, as described by BC Hydro.

For these reasons, the Panel does not find CEABC's concerns to be supported by the evidence. The business case is still positive even when seasonality is considered.

[139] BCH Final Argument, Section D, p. 48.
[140] Exhibit A-27.

3.4.3 Core valuation indices

To address the uncertainty around the valuation of the Waneta energy after the Lease Term, BC Hydro developed five scenarios, which it describes as "core valuation indices" or "valuation indices." Those indices are described by name in the first column of Table 7 below. The second column sets out the assumptions behind each of the indices. The third column describes the key sensitivity analyses performed by BC Hydro using each of the five core valuation indices.

Table 7 – Core Valuation Indices and Sensitivity Analyses

Valuation Indices	Description of the Core Valuation Indices	Highlights of Sensitivity Analyses
LRMC – Clean	- Assumes that BC Hydro needs new resources after the Lease Term, consistent with BC Hydro 2016 load forecast (Mid-Gap) that was the subject of the F2017-F2019 RRA (RRA Forecast), itself based on the 2013 IRP. - Assumes the Waneta energy avoids the cost of acquiring these new resources. This basic logic was accepted by the BCUC in 2010 when it approved the Waneta 2010 Transaction. - Assumes that BC Hydro's load serving obligations can only be met by clean resources, consistent with current provincial policy and legal framework.[141]	- In the Business Case, BC Hydro tested scenarios with +/- 15% variability in the LRMC: 1) Clean+15% and 2) Clean+Gas - 15%; - Higher LRMC values increase the Waneta 2017 Transaction value and lower LRMC values decrease the Waneta 2017 Transaction value. - The Waneta 2017 Transaction remained significantly positive ($442 to $1,155 million NPV).[142] - BC Hydro was asked to model additional sensitivities of LRMC Clean to reflect rapidly decreasing wind costs and the recent Alberta awards. The lower LRMC tested is: LRMC Clean+Gas less 40%.[143] The value remained positive at $xx.
LRMC – Clean+Gas	- Assumes that BC Hydro can serve a portion of its load through natural gas-fired generation, which is inconsistent with current government policy. Otherwise same logic as above. - Valuation of the transaction using this index is lower than under the LRMC Clean scenario due to natural gas-fired generation being lower cost than clean alternatives.[144]	
Industrial Tariff	- Assumes that BC Hydro is either obliged or chooses to serve a new industrial load at the end of the Lease Term. - Valuation of the Waneta 2017 Transaction using this index is again lower than under the previous LRMC scenarios because it is assumed that Industrial Tariff rates will be lower than the cost of new resources.[145]	- BC Hydro was asked to test a low and high Industrial Tariff; since the High/Low values are contained within the range of the 5 core valuation indices, no additional sensitivity analysis was needed.[146] - BC Hydro was asked to value the entire 2/3 Waneta energy at the

[141] BCH Final Argument, pp. 28–29.
[142] Exhibit B-1, Application, Business Case, pdf pp. 545–546.
[143] Exhibit B-18, BCUC IR 83.3.
[144] Ibid., p. 29.
[145] BCH Final Argument, p. 29.
[146] Exhibit B-8, BCUC IR 8.5.

		Industrial Tariff to account for Teck's load forecast being higher than BC Hydro's forecast of Teck's load.[147]
ABB Market Price	- Assumes that BC Hydro is in a surplus position for the next 40 years. This scenario is not based on a forecast or even an assumption of zero-to-low load growth, but instead removes the question of resource-deferral value from the analysis to test the acquisition solely from a commercial perspective. This assumption is inconsistent with the RRA Forecast and the 2013 IRP. - Ratepayer value arises as BC Hydro sells electricity into export markets and consolidates the revenues from those sales into its revenue requirements to the credit (benefit) of ratepayers. This is consistent with the current regulatory framework, which credits trade income against the revenue requirement to the benefit of ratepayers. - This index is based on a forecast of wholesale market prices developed by the Third-party consultant ABB, which employs a robust forecasting methodology that analyzes all the current and planned generation resources in the Western Interconnection, factors in retirement dates, considers wholesale market prices and so on.[148] - Valuation using this index is again lower than under the Industrial Tariff.	- BC Hydro submits that "unlike the ABB Market Price forecast, the Extrapolated price curve is purely a sensitivity analysis and there is not methodological basis for the extrapolation."[149] - BC Hydro was asked to reassess the Waneta 2017 Transaction value using the "Panel Mid-C Price Forecast" from the Site C Inquiry Final Report.[150] - The Panel Mid-C Price Forecast is lower than the ABB Market Price forecast but higher than the Extrapolated Market Price that BC Hydro used to test the lowest end of the Waneta 2017 Transaction value.[151] Therefore, this market price index is already included in the range of sensitivity scenarios tested by BC Hydro in the Business Case.
Extrapolated Market Price	- This index is based on forward price curves developed by Powerex and then extrapolated to the end of the 40-year period. - Same logic as first two bullets in ABB price applies here. - Because the Extrapolated index is the lowest of all the indices considered, it results in the lowest ratepayer value of the five core scenarios.[152]	

[147] Exhibit B-18, BCUC IR 83.3.
[148] BCH Final Argument, p. 30.
[149] BCH Final Argument, Section C, p. 31.
[150] Exhibit B-8, BCUC IR 7.8.
[151] This can be inferred from BC Hydro's response to BCUC IR 6.3.1 in Exhibit B-8.
[152] BCH Final Argument. pp. 30–31.

Sensitivity analysis on core valuation indices

1) Long-Run Marginal Cost (LRMC)

BC Hydro tested the following LRMC sensitivities in the Business Case:[153]

Table 8 – Sensitivity to LRMC

(Present value net of purchase price)

LRMC Scenario	Energy + Capacity LRMC ($/MWh, $2018)	Net Value of Transaction ($ millions)
LRMC – Clean +15% premium	167	1,155
LRMC – Clean	145	887
LRMC – Clean + Gas	122	662
LRMC – Clean + Gas -15% decrease	104	442

The BCUC and interveners further explored BC Hydro's assumptions behind the energy LRMC - Clean and tested the robustness of the wind cost and data.[154]

- The LRMC - Clean index is based on wind resources for energy and pumped storage for capacity. The energy LRMC for wind is valued at **$106/MWh ($2018)** in the Business Case.[155] This is equivalent to $85/MWh at the point of interconnection.[156] BC Hydro provides the data sources and assumptions for the wind cost estimates.[157] In particular, this LRMC is based on IPP financing costs at 7 percent, which was used in the BC Hydro F2017-F2019 RRA proceeding but was subsequently reduced to 6.4 percent in the Site C Inquiry.[158]
- The energy LRMC would decrease to **$88/MWh ($2018)** if the wind capital and O&M cost estimates in the BCUC Illustrative Alternative Portfolio in the Site C Inquiry Final Report were used.[159] This LRMC is based on IPP financing costs at 6.4 percent to reflect reduction in interest rates since the RRA.
- BC Hydro was asked to use an energy LRMC of **$60/MWh ($2018)** to reflect the steep declines in wind costs, as shown by the recent Alberta projects.[160]
- BC Hydro was asked to calculate the percentage reduction from the blended (energy + capacity) LRMC - Clean value that can occur before the Waneta 2017 Transaction value becomes zero, based on 6 percent discount rate, Mid-Gap LRB, Leading Utility Practice for capital costs and 40-year economic life. BC Hydro calculated that the blended LRMC would have to be about **$50/MWh ($2018)**, which is a 66 percent reduction in the blended LRMC - Clean and a 59 percent reduction in the blended LRMC - Clean+Gas.[161]
- CEABC asked BC Hydro to further decrease the energy LRMC to **$45/MWh ($2018)** instead of $60/MWh and re-run the model to test for this sensitivity. BC Hydro noted that this value corresponds to a UEC at Point of Interconnection of $32/MWh, which is not a reasonable assumption for wind in BC as this is

[153] Exhibit B-1, Application, Business Case, pdf p. 546.
[154] Exhibit B-8, BCUC IR 10.0, 12.1; Exhibit B-18, BCUC IR 80.1, (errata B-18-2), BCUC IR 80.2, 85.5; Exhibit C6-7, CEABC-BCUC IR 1.1.
[155] Exhibit B-1, Application, Business Case, Table 3, pdf p. 530.
[156] Exhibit B-18, BCUC IR 80.1.
[157] Exhibit B-8, BCUC IR 10.1.
[158] Exhibit B-8, BCUC IR 10.2, 10.4.
[159] British Columbia Utilities Commission Inquiry Respecting Site C, Exhibit A-26-1.
[160] Exhibit B-18, BCUC IR 81.1.
[161] Exhibit B-18, BCUC IR 86.4.

very close to the lowest wind bid in the Alberta Renewable Electricity Program, which BC Hydro explains are not within reach in BC.[162]

The weighted average bid price in the first round of the Alberta Renewable Electricity Program is $37/MWh, which compares to BC Hydro's unit energy cost for wind at the point of interconnection of $85/MWh underlying the Business Case (or $106/MWh delivered to the Lower Mainland). Therefore, the Panel inquired whether the LRMC of clean electricity supply reflects the trend of rapidly decreasing costs for wind energy, especially in light of the recent Alberta awards. BC Hydro submitted that the Alberta average price cannot be reproduced in BC, for reasons including location and terrain, the presence of a wind service section, the size of the developer, Brownfield vs. Greenfield development, financing assumptions, terminal value and bidding strategy.

The BCUC also explored the capacity LRMC and the possibility of relying more on industrial curtailment and less on pumped storage for capacity. BC Hydro stated that based on its pilot program findings, it has concluded that about 85 MW of curtailment at roughly $75/kW-year can be relied upon for this purpose. Using such curtailment has a minor effect on long term planning as it only shifts the point at which additional capacity is required by less than a year.[163]

The revised table with updated energy and capacity LRMC value, along with updated IPP financing costs at 6.4 percent, is as follows:[164]

Table 9 – Updated Energy and Capacity LRMC Value

Marginal Resources	Period of Applicability	LRMC (2018 real dollars)					
		Clean + Gas (Requested)	Clean + Gas (6.4% Financing)	Clean + Gas (Business Case)	Clean Only (Requested)	Clean Only (6.4% Financing)	Clean Only (Business Case)
Energy: Greenfield IPPs	F2034 and beyond	$60/MWh	$105/MWh	$106/MWh	$60/MWh	$105/MWh	$106/MWh
Capacity Resources	F2029	$75/kW-year (Industrial Load Curtailment)	$75/kW-year (Industrial Load Curtailment)	$88/kW-year (SCGT)	$75/kW-year (Industrial Load Curtailment)	$75/kW-year (Industrial Load Curtailment)	$221/kW-year (pumped storage)
Capacity Resources	F2030 and beyond	$81/kW-year (SCGT)	$81/kW-year (SCGT)	$88/kW-year (SCGT)	$176/kW-year (pumped storage)	$207/kW-year (pumped storage)	$221/kW-year (pumped storage)
Combined Cost of Energy & Capacity	Effective for F2034 and beyond	$74/MWh	$119/MWh	$122/MWh	$91/MWh	$142/MWh	$145/MWh

The new low bound at $74/MWh ($2018) for the combined energy and capacity LRMC is included in the additional sensitivity analysis BC Hydro performed, where the low end of the sensitivity for LRMC is $73/MWh ($2018) and corresponds to LRMC - Clean+Gas less 40 percent.[165]

[162] Exhibit B-18-4, BCH-CEABC IR 28.3; Exhibit B-18, BCUC IR 80.1.
[163] Exhibit B-8, BCUC IR 11.3.1.
[164] Exhibit B-18, BCUC IR 81.1.
[165] Exhibit B-18, BCUC IR 83.3.

2) Industrial Tariff

BC Hydro was asked to perform two additional sensitivity analyses in respect of the Industrial Tariff.

The first sensitivity analysis tested a low Industrial Tariff to reflect the government's mandate letter to BC Hydro and a high Industrial Tariff to reflect the Site C Inquiry Panel view that there will be considerable pressure on rates for the remainder of the 2013 10-Year Rates Plan. Neither the mandate letter to BC Hydro or the Site C Inquiry Final Report specified a rate so BC Hydro modelled annual rate increases of 1 percent and 3 percent, respectively, for years beyond fiscal 2024. In comparison, the BC Hydro's core Industrial Tariff assumes annual rate increases from the 2013 10-Year Rates Plan to the end of fiscal 2024, followed by annual rate increases of 2 percent for years beyond 2024. Thus, BC Hydro modelled an arbitrary reduction of 1 percent for the low tariff scenario and an arbitrary 1 percent increase for the high tariff scenario for years beyond 2024. Since the high and low Industrial Tariff are contained within the range of the five core valuation indices, no additional sensitivity analysis was needed.[166]

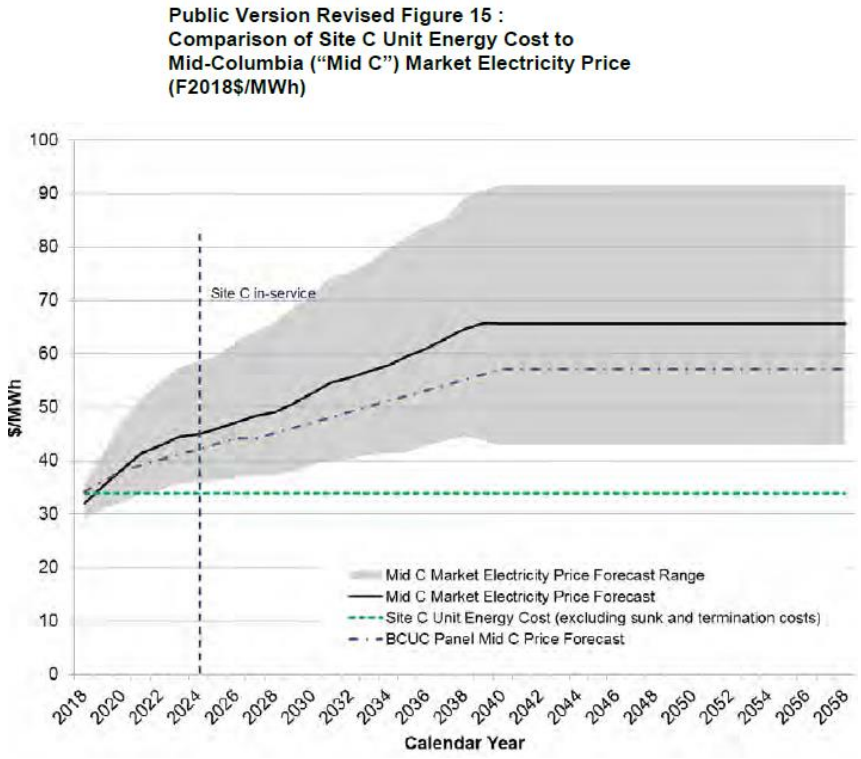
The second sensitivity analysis increased the load that was valued at the core Industrial Tariff from 1,783 GWh to 1,831 GWh because initially, BC Hydro had only valued 1,783 MWh at the Industrial Tariff, which was BC Hydro's forecast of Teck's load post-Lease, and had valued the 48 GWh difference between that load and the two-thirds Waneta output at ABB prices.[167] However, Teck's own load forecast post-Lease is 1,856 GWh, (i.e. higher than BC Hydro's forecast).[168] Since the Industrial Tariff index is higher than the ABB price index, BC Hydro was asked to revise this scenario to value the entire Waneta energy at the Industrial Tariff. This slightly increases the Waneta 2017 Transaction value but it remains between the LRMC and Market Prices scenarios.[169]

3) Panel Mid-C Price Forecast

In the Site C Inquiry Final Report, the BCUC found: "Accordingly, the Panel finds that for the purposes of this assessment the future market price for 2024 and beyond should be considered to be at a point mid-way between BC Hydro's proposed Mid C forecast and the low end of the ABB range."[170] The Panel Mid-C Price Forecast is shown in the figure below.

[166] Exhibit B-8, BCUC IR 8.5.
[167] Exhibit B-8, BCUC IR 16.4; Exhibit B-1-5, Errata to Chapter 2, pdf p. 4; Exhibit B-18, BCUC IR 73.4.
[168] Exhibit B-8-2, BCUC IR 5.5, Attachment 1.
[169] Exhibit B-18, BCUC IR 83.3.
[170] British Columbia Utilities Commission Inquiry Respecting Site C Final Report to the Government of British Columbia dated November 11, 2017, p. 95.

Figure 6 – Panel Mid-C Price Forecast



Thus, in this proceeding, BC Hydro was asked to re-run its model to add the Panel Mid-C Price Forecast as another market price sensitivity, in addition to the Extrapolated market price. As it turns out, the Panel Mid-C Price Forecast is between the ABB and the Extrapolated market prices and therefore was already included within the sensitivity analysis conducted by BC Hydro for its Business Case.

Position of the parties on core valuation indices

While BC Hydro believes its initial projection of wind energy is reasonable, it confirms that additional sensitivity analysis using a $60/MWh UEC for wind resources is appropriate.[171]

[171] Exhibit B-18, BCUC IR 80.1.

CEABC submits:

> The significant change to note in comparing this revised Table 8 to the original version, shown previously, is that this simple adjustment of the LRMC [using a $45 LRMC in place of the original $106 assumption), to bring it into alignment with current market prices and the forecast of future price trends, has reduced the apparent NPVs of the first two scenarios by $503 million and $524 million respectively.
>
> CEABC cautions that all of these analyses rely on forecasts of either loads or prices or both, that are so far in the future (2039 and beyond) that no-one, including CEABC, can have any degree of confidence in those predictions. However, the $45 Energy LRMC is more likely to be closer to reality than BC Hydro's original $106 value, since it is based on current market prices and currently observed price trends. Whereas the original $106 Energy LRMC was derived theoretically and had not been realigned with rapidly declining market prices.[172]

BC Hydro's rebuttal to CEABC's LRMC in the $44–$49 range includes the following key points:

- This narrow range is inconsistent with CEABC's argument in favour of the need to account for higher interest rates, which would push the LRMC for wind resources higher not lower.[173]
- This range is inconsistent with CEABC's own statement that "the CEABC accepts that the $60 price for wind … represents a more realistic proxy for the current LRMC."[174]
- Even if one were to conclude that an appropriate LRMC after the Lease Period was in this narrow range, that would still compare poorly to the $48/MWh that is the Waneta UEC after the Lease Period, when considering that Waneta exists and does not face the siting, construction, interconnection, financing, and permitting risks associated with any alternative.[175]
- From the "cost-effective" perspective that the BCUC has determined is the appropriate measure of alternatives, Waneta remains an attractive alternative to even the lowest-cost hypothetical alternatives.[176]
- The CEABC argument does not rely in any meaningful way on its own evidence, including CEABC's IR responses, to support an LRMC of $45/MWh.[177] BC Hydro submits that "it is uncertain at best whether the author of the CEABC's evidence is qualified to provide quantitative or analytical evidence generally, let alone admissible opinion evidence on the cost of future generation resources in BC. Submissions of counsel on the point clearly have no evidentiary value."[178]

[172] CEABC Final Argument, p. 10.
[173] BCH Final Argument, pp. 44–45.
[174] Ibid., p. 45.
[175] Ibid., p. 46.
[176] Ibid.
[177] BCH Reply Argument, p. 6.
[178] BCH Reply Argument, p. 6, footnote 10.

BC Hydro's explained its position on the Panel Mid-C Price Forecast:

> A forecast is a prediction or estimate of future events. Whenever possible, and to the extent important decisions are based on them, forecasts should have robust methodological underpinnings.
>
> The ABB Forecast described in section 4.1.8 of the Application is such a forecast. It is derived from a model of the Western Interconnection that includes known and planned generation resources to determine a market clearing price on an hourly time step basis. It explicitly considers natural gas prices, generation resource buildout, and hourly generation dispatch, among other factors, using an independent and robust methodology.
>
> The 'Panel Mid-C energy price forecast' referred to does not have a robust methodological underpinning. BC Hydro understands that it was calculated as the mid-point between BC Hydro's expected and low Mid-C price forecasts. (As such, it falls within the BC Hydro market price forecast uncertainty band shown in Figure 15 of BC Hydro's August 30 submission F1-1 of the Site C Inquiry, attached). In this regard it is very similar to the Extrapolated Forecast, also described in section 4.1.8 of the Application.
>
> Like the Extrapolated Forecast, 'Panel Mid-C energy price forecast' is a reasonable price curve to use for sensitivity analysis but is not by itself an appropriate basis for long-term resource planning or market price forecasts upon which significant decisions should be made.[179]

In its final argument, BCSEA-SCBC offers the following comments regarding the LRMC - Clean and LRMC - Clean+Gas:

(a) BCSEA-SCBC opposes the concept of new gas-fired generation. However, it recognizes that "LRMC Clean + Gas" is used strictly here as a valuation parameter and not as a planning option.

(b) BCSEA-SCBC is of the view that the dollar value BC Hydro currently uses for "LRMC Clean" is likely higher than it would be if it was updated using the most recent information. This is best dealt with using sensitivity analysis, rather than attempting to derive a new LRMC Clean value in the current proceeding. For example, at the BCUC's request BC Hydro ran scenarios using "LRMC minus 40%." This is appropriate.[180]

[179] Exhibit B-9, BCSEA-SCBC IR 47.1.
[180] BCSEA-SCBC Final Argument, p. 14.

BCOAPO submits:

> Furthermore, BC Hydro has indicated that the LRMC (energy and capacity combined) would need to fall to below approximately $50/MWh (2018$) before the un-risked value of the Transaction falls below zero. In contrast, BC Hydro suggested that, after allowing for optimistic technological improvements, the combined energy plus capacity LRMC for the post 2038 period is estimated to be $105/MWh for Clean+Gas and $126/MWh for 100% Clean (in 2018$).[181]
>
> […] There is considerable disagreement between CEABC and BCH as to the applicability of the Alberta REP results to BCH's service area, future trends in wind power costs and alternative costs for capacity. […] BCOAPO attaches little weight to the value of an RFP help in another province but in any case, the evidence indicates that the value of the transaction would remain positive even should CEABC's pricing scenario come to pass.[182]
>
> […] BCOAPO does not find either of these sensitivities [around market prices] particularly meaningful. They both use the export prices to value all of the additional generation available from Waneta after the Lease Period over the entire 40-year evaluation period.[183]

With respect to the Panel Mid-C Price Forecast, BCOAPO refers to Revised Figure 5a and 5b (see Section 3.3.1) to conclude that using that index yields a positive net benefit regardless of the duration of the Lease Term, under the Mid-Gap as well as the Small Gap.[184]

CEC submits:

> The CEC agrees with BC Hydro that it is unlikely that the price of wind would reach $45/MWh as a delivered LRMC price. The CEC also notes that to deliver wind energy requires capacity values to be added to the energy values.
>
> The CEC submits that the cost of wind could potentially decline below BC Hydro's $85/MWh but does not believe it would decline to $45/MWh.
>
> The CEC submits that a $60/MWh could be an appropriate point for the BCUC to consider the likely cost of wind energy in BC in the future for the evaluation period being considered here.
>
> The CEC submits that to the extent that the BCUC wishes to rely on the BC Hydro LRMC as an avoided cost of energy, there is a probability that BC Hydro may not be permitted to include natural gas in the future. The CEC submits it would be preferable to rely on the cost of the LRMC clean, using a cost of wind at $60/MWh and recommends that the BCUC weight this evidence significantly.
>
> The CEC also submits that even if one were to use the CEABC $45/MWh the net present values resulting do not favour wind energy over the Waneta 2017 Transaction values, particularly when judging all the related risks and uncertainties. The Waneta Heritage Asset would provide BC Hydro considerably more benefit for its ratepayers.[185]

[181] BCOAPO Final Argument, p. 13.
[182] BCOAPO Final Argument, p. 17.
[183] BCOAPO Final Argument, p. 13.
[184] BCOAPO Final Argument, pp. 15–16.
[185] CEC Final Argument, pp. 35–36.

On the Panel Mid-C Price Forecast, CEC submits "that the Panel Mid C market price has been thoroughly considered by the Commission and represents a reasonable starting point for valuing energy during the post-lease period."[186]

Panel discussion

Given that the Panel has previously approved the use of the Range of Value Approach to analyze the Waneta 2017 Transaction, the Panel also finds that BC Hydro's core valuation indices: LRMC - Clean; LRMC - Clean+Gas; Industrial Tariff; ABB Market Price; and Extrapolated Market Price, are the appropriate starting point scenarios to use, along with additional sensitivity analyses as discussed above.

In the BC Hydro Business Case, the range of values for the Waneta 2017 Transaction value is defined as follows:

- The value of the Waneta 2017 Transaction is the highest under the LRMC - Clean scenario ($887 million), which reflects the mid-range load forecast and where the Waneta energy is valued at ABB Market Price for "surplus" years and LRMC - Clean for "deficit" years; and
- The value of the Waneta 2017 Transaction is the lowest under the Extrapolated Market Price scenario (-$31 million), which reflects a future where BC Hydro would not need any new generation for the next 40 years (i.e. LRBs were taken out of the equation) and where the market prices of electricity remain low (and lower than the ABB forecasts).

Given the significant uncertainty related to load forecasts, LRMCs and market prices over a 40-year horizon, the Panel finds it is paramount to test the highest possible and lowest possible values for the Waneta 2017 Transaction. We will not focus on the Industrial Tariff scenario because the Industrial Tariff index is contained within the range of values; therefore, we do not consider the value of the Waneta 2017 Transaction under such a scenario to be determinative of the acceptance of the expenditure schedule.

The above exercise results in a blended LRMC - Clean that is reduced from $145/MWh to $91/MWh (a 37.2 percent reduction) while the LRMC - Clean+Gas is reduced from $122/MWh to $74/MWh (a 39.3 percent reduction).[187] The Panel is cognizant that at least 93 percent of electricity generation in BC is from clean or renewable resources[188] and therefore, we will focus our attention on the LRMC - Clean less 40 percent sensitivity test. Under that scenario, the value of the Waneta 2017 Transaction is still significantly positive at $373 million (See Table 17 in Section 3.5.7).

For the high end of the valuation range, when asked to re-run its valuation model using a wind energy LRMC of $60/MWh, BC Hydro stated that "additional sensitivity analysis using a $60/MWh ($2018) for wind resources is appropriate." The Panel also notes that CEABC, BCSEA-SCBC and CEC all believe the use of wind energy at $60/MWh is appropriate. For its part, BCOAPO notes that the value of the Waneta 2017 Transaction would still be positive for any blended LRMC higher than $50/MWh. The Panel is also satisfied that using $60/MWh for wind resources is appropriate.

For the low end of the valuation range, the Panel tested whether using the Panel Mid-C Price Forecast would reduce the Waneta 2017 Transaction value under "Extrapolated Market Price." The Panel is satisfied to see that

[186] CEC Final Argument, p. 38.
[187] Other changes account for this reduction, although not as much as the reduction in wind energy cost: relying on industrial curtailment for one year before using pumped storage and an IPP financing cost of 6.4% instead of 7%.
[188] *Clean Energy Act*, SBC 2010, Chapter 22, Part 1, section 2(c) of British Columbia's energy objectives.

the result using the Panel Mid-C Price Forecast falls within the two market price curves used by BC Hydro in its Business Case (ABB and Extrapolated) and was thus already included in the numerous sensitivity analyses performed by BC Hydro.

3.5 Consolidated value of the transaction

3.5.1 Discount rate

In BC Hydro's view, there is a need to evaluate the economic benefits using an investment analysis (NPV analysis) and the ratepayers benefits using a ratepayers' analysis (through revenue requirements). BC Hydro highlights the difference between the free cash flows and the revenue requirement model in the treatment of initial capital and sustaining capital, O&M and lease revenues in Table 18 of the Application and compares the two approaches in response to an IR.[189]

For the NPV analysis, BC Hydro uses a discount rate that is equal to an assumed WACC derived from the assumptions laid out below. Where BC Hydro's actual financing rate is equivalent to the discount rate applied to the NPV analysis, the two analytical methods will have roughly the same results. This would have been the case prior to the development of the 10-Year Rates Plan that changed the regulatory framework and resulted in a decoupling between BC Hydro's ROE and its asset base.

Before the 10-Year Rates Plan, invested capital was added to its asset base, a portion of which was "deemed" equity and earned a regulated rate of return. Currently, BC Hydro's ROE is fixed and no additional return is earned upon capital investment. As a result, the underlying cost of financing in the Rate Impact Model is equivalent to BC Hydro's cost of debt as there is no incremental return on equity.[190]

BC Hydro used a WACC of 6 percent for the NPV analysis. BC Hydro submits this WACC is based on conservative assumptions for: (i) the cost of debt at the time of issuance; (ii) the cost of equity; and (iii) the debt/equity ratio, which result in a higher WACC (discount rate) and lower NPV overall than if less conservative inputs were used. BC Hydro points out that this methodology has been employed since the BCUC's review of BC Hydro's Application for the Approval of the 2008 Long-Term Acquisition Plan.[191] BC Hydro's explanations as to why it believes its assumptions are conservative are summarized in the following Table 10.[192]

[189] Exhibit B-18, BCUC IR 90.3.1.
[190] Exhibit B-1, Application, Business Case, pdf p. 561; Exhibit B-18, BCUC IR 90.3.1.
[191] BC Hydro, Application for the Approval of the 2008 Long-Term Acquisition Plan, decision dated July 27, 2009.
[192] BCH Final Argument, pp. 33–34.

Table 10 – BC Hydro's Weighted Average Cost of Capital

Components of WACC	Value Used	Why it is Conservative
Cost of debt	4.01% (5-year average)	- higher than the 3.4% rate BC Hydro expects to issue debt at the time of Waneta purchase[193] - higher than the 3.18% cost of debt BC Hydro recently hedged and which is closely aligned with the expected closing date of Waneta. - the use of a lower cost of debt would yield a lower WACC and higher NPV benefits.
ROE	8.75% (FEI benchmark)	- BC Hydro's ROE would reasonably be expected to be lower than the benchmark ROE given its size and the fact is it a Crown corporation. - the use of a lower ROE would yield a lower WACC and higher NPV benefits.
Debt-equity ratio	60:40	- BC Hydro's current actual debt-equity ratio is about 80:20. Using this ratio would have given more weight to the lower debt rate of 4.01% relative to the ROE of 8.75%. - the use of 80:20 would yield a lower WACC and higher NPV benefits.

Sensitivity analysis on discount rate

The value of the Waneta 2017 Transaction is highly sensitive to discount rates because the transaction includes an up-front payment followed by benefits over an extended term. A change to how BC Hydro values these long-term benefits will materially affect the overall valuation (shown in Table 11 below).[194] In response to BCOAPO, BC Hydro explains that its Business Case evaluation standard practice uses sensitivity analysis at +/- 2 percent of the nominal base discount rate resulting in lower and upper discount rates of 4 percent and 8 percent for sensitivity purposes respectively.[195]

Table 11 – Sensitivity to Discount Rate – LRMC with Clean

(Present value net of purchase price, $ millions)

Valuation Index	Nominal Discount Rate		
	4%	6%	8%
LRMC – Clean only	2,263	887	86
LRMC – Clean + Gas	1,814	662	(12)
BCH Industrial Tariff	732	82	(312)
Market Prices (ABB)	750	114	(273)
Extrapolated Market Prices	504	(31)	(356)

[193] Exhibit B-1, pdf p. 96, footnote 113.
[194] Exhibit B-1, Business Case, pdf p. 544.
[195] Exhibit B-9, BCOAPO IR 17.1.

When asked to provide its calculated rate of return in F2017, BC Hydro states that its after-the-fact calculated rate of return in F2017 was 11.92 percent.[196] BC Hydro re-calculated a WACC based on this ROE, even though pursuant to Direction No. 7, as amended by OIC No. 590,[197] BC Hydro rates for the fiscal periods from F2017 are determined independently of its rate base. This WACC increases to 7.25 percent. BC Hydro notes that this WACC is within the sensitivity analysis already provided in Table 11 above.[198]

BC Hydro submits that using a WACC based on the benchmark ROE is appropriate as it reflects the risks of a comparable public utility that operates in a similar environment to BC Hydro. Such WACC is more reflective of actual market ROE. Using a higher ROE to calculate WACC would be inappropriate as it reflects above-market ROE and may result in BC Hydro rejecting a potentially economically beneficial project.[199]

BC Hydro was asked to run additional scenarios and to provide a sensitivity analysis on the value of the Waneta 2017 Transaction assuming the debt financing rate was 0.5 percent, 1 percent and 2 percent higher, and 0.5 percent lower. The results are provided in Table 12 below. The LRMC scenarios are premised on the Mid-Gap 2016 load forecast:[200]

Table 12 – Additional Sensitivity to Discount Rate

Change in financing cost	-0.5%	0%	+0.5%	+1.0%	+2.0%
Discount rate	5.50%	6.00%	6.25%	6.50%	7.00%
LRMC – Clean only	1,163	887	762	645	434
LRMC – Clean + Gas	894	662	558	460	282
BCH Industrial Tariff	263	131	70	13	(90)
Market Prices (ABB)	196	66	7	(49)	(150)
Extrapolated Prices	78	(31)	(80)	(127)	(212)

BC Hydro notes that changes to the cost of financing do not directly affect the investment analysis performed by BC Hydro. The cost of financing will have an effect on BC Hydro's WACC, and thus the discount rate used for the analysis. While discount rates have been changed to the nearest 25 basis points (bps) in this exercise, in practice, BC Hydro has a policy of rounding to the nearest 50 bps to give stability to the WACC and more predictability to the development and review of business cases. Thus, in reality, an increase of +0.5 percent in financing rate would not change the discount rate.[201]

[196] Exhibit B-18, BCUC IR 82.1.
[197] Province of British Columbia, Lieutenant Governor in Council, Order in Council No. 590, amending Direction No. 7, approved and ordered July 28, 2016.
[198] Exhibit B-18, BCUC IR 82.2.
[199] Exhibit B-8, BCUC IR 82.4.
[200] Exhibit B-8, BCUC IR 23.6.
[201] Exhibit B-8, BCUC IR 23.6.

Position of the parties on discount rate

CEABC submits that:

> [t]he use of a more appropriate Cost of Capital will cause a major reduction in the Present Values for all of the potential outcome scenarios calculated for the Transaction. […] Raising the return on equity to 11.84%, by itself will increase the WACC discount rate to 7%, which has a significant diminishing effect on the present values being calculated for the Transaction. […] Using the more appropriate pre-tax return on equity, the NPVs for first two scenarios (highlighted) have now declined by some $400 million each, and all the other scenarios are now negative (i.e. indicating a net loss, rather than a net benefit).[202]

CEABC cites the following response of BC Hydro to one of its IRs:

> … it is not the case that Government committed to contribute 40% of BC Hydro's capital expenditures in the form of equity. The Government… will receive a restricted, and then zero dividends from BC Hydro until it achieves a debt:equity ratio of 60:40. The lower dividends will result in an increase in BC Hydro's forecast equity (and available cash) over time.[203]

CEABC interprets this statement to means that "gradually over time, BC Hydro's capital structure will change to a 60/40 debt/equity proportion, which means that every project will be effectively financed at 60/40 in the long term. Regardless of whether it was initially financed by 100% debt, equity will gradually replace 40% of that debt."[204]

It further submits that "[i]n the same way as for the Present Value analysis, the use of the proper Cost of Capital (which includes target 40% portion of equity and the BCUC-determined reasonable return on that equity) will eliminate the illusory benefit to ratepayers produced by the assumption of perpetual 100% debt financing."[205]

BC Hydro submits that "CEABC offers no support, in argument or evidence, for the proposition that BC Hydro's tax status is relevant to the assumed cost of equity used for NPV analysis. Nor does the CEABC offer any basis in argument or evidence for the use of a cost of equity of 11.84%. BC Hydro submits that in this context the previous regulatory framework [which set BC Hydro's return at 11.84 percent] is no more relevant than a hypothetical future framework."[206]

BC Hydro further submits that if the 11.84 percent has relevance, then the 80:20 debt-equity ratio referred to in Heritage Special Direction No. HC1 at the same time as the 11.84 percent would have equal relevance.[207] An 80:20 debt-equity ratio, cost of debt at 4.01 percent and cost of equity at 11.84 percent yields an assumed cost of financing equal to 5.58 percent, and the use of an assumed cost of financing equal to 5.58 percent would yield a more favourable NPV than the 6 percent used by BC Hydro.

[202] CEABC Final Argument, pp. 3–4.
[203] Exhibit B-2, CEABC IR 23.6.
[204] CEABC Final Argument, p. 7.
[205] BCSEA-SCBC Final Argument, p. 7.
[206] BCH Final Argument, p. 43
[207] Ibid.

BC Hydro concludes that "the proposed 11.84% cost of equity paired with a 60:40 debt-equity capital composition, and consequential use of 7% cost of financing are self-serving guesses that should be ignored by the Commission in its consideration of the Application."[208]

BCOAPO submits:

> BC Hydro used a nominal discount rate of 6% in its investment analysis and the sensitivity analysis was performed using 4% and 8%. Higher discount rates obviously reduce the value of the Transaction so with an 8% discount rate only the LRMC-Clean scenario has a positive value. At 7% both of the LRMC-based scenarios BCOAPO thinks are most likely would have positive values. […] it is BCOAPO's view that, while the results show a material sensitivity to higher discount rates, the potential for increases in the discount rate do not present a major risk to the valuation of the Project.[209]

BCSEA-SCBC accepts BC Hydro's evidence that "6% is the appropriate WACC figure for use in the NPV analysis of the Waneta 2017 Transaction. This figure is conservative, for the reasons set out in paragraphs 83-86 of BCH's Final Argument. In BCSEA-SCBC's view, CEABC has not made a persuasive case for using 7% as the cost of financing the transaction for the NPV analysis. BCH's arguments in paragraphs 104-110 are reasonable."[210]

CEC submits:

> The CEC agrees that a 5-year average future cost of debt is appropriate in the calculation of the WACC. The CEC submits that it should be considered to be very conservative given BC Hydro's actual cost of debt discussed below.
>
> […] The CEC recommends that the Commission disregard CEABC's scenario of increased ROE or provide it very little weight in the discussion of discount rates. The CEC does not consider a benchmark rate for FortisBC to be an especially appropriate proxy for BC Hydro's cost of capital and agrees that an appropriate ROE for BC Hydro might be lower. The CEC therefore recommends that the Commission accept the 8.75% ROE as acceptable as a proxy for BC Hydro's ROE.
>
> […] The CEC submits that the actual cost of the financing could also potentially be used in order to reflect the actual costs that would accrue. This would result in a 4.01 discount rate (100% debt) and would place the Consolidated View of the project as being significantly more positive.
>
> The CEC recommends that the Commission heavily weight the conservative nature of the discount rate when conducting its analysis of the Transaction.[211]
>
> […] The CEC considers that 4% would not necessarily be inappropriate and notes the significant increase of $1,095 million that could be added to the NPV under this view. The CEC recommends that the Commission weigh this potential upside significantly in its analysis of the transaction as it represents the real expected ratepayer impact.[212]

[208] BCH Final Argument, p. 44.
[209] BCOAPO Final Argument, p. 14.
[210] BCSEA-SCBC Final Argument, p. 15.
[211] CEC Final Argument, pp. 20–21.
[212] CEC Final Argument, p. 41.

Both BCSEA-SCBC and CEC agree with BC Hydro that the 6 percent discount rate is conservative and that CEABC's case for a higher discount rate should be given very little weight. CEC goes further to say that an argument could be made to use the actual cost of financing as the discount rate. This would mean a 4 percent discount rate which makes the Waneta 2017 Transaction value significantly more positive than with 6 percent. For its part, BCOAPO submits that with a 7 percent discount rate, the Waneta 2017 Transaction value is still positive under the two core LRMC scenarios, which in the view of BCOAPO is the most likely.

BCUC determination

The Panel is satisfied that the discount rate, which is used by BC Hydro, is appropriate. We are not persuaded by the arguments of CEABC for a higher discount rate and agree with BC Hydro that CEABC's recommendation to use a higher ROE with the 60:40 debt-equity ratio is flawed and unsupported. To be internally consistent, one would have to use the higher ROE with the 80:20 debt-equity ratio that is referenced in the earlier and since amended version of Direction No. 7 pursuant to OIC No. 590. Rather, the Panel agrees with BC Hydro's explanations that each component of the WACC is conservative. Using a conservative discount rate means that the actual value of the Waneta 2017 Transaction is potentially understated if BC Hydro, as a Crown corporation, is able to actually realize lower borrowing costs as is expected.

CEABC argues that BC Hydro's debt-equity ratio will, at some point reach 60:40 and that at that time the BCUC will determine "reasonable return on that equity." It provides no evidence to suggest when that time may be and what a reasonable return on equity will be at that time. Further there is no certainty that BC Hydro would return to a full ROE at that time. Accordingly, the Panel has not considered this argument any further. For these reasons, **the Panel accepts the discount rate that BC Hydro has used.**

3.5.2 Finance charges

Incremental finance charges arise solely from incremental debt that BC Hydro will issue in consequence of the Waneta 2017 Transaction. BC Hydro submits that incremental debt financing charges are the only financing charges that will be reflected in future revenue requirements and are the only appropriate basis for considering ratepayers' impacts.[213]

In its ratepayer impact analysis, BC Hydro uses a 3.4 percent interest rate to determine its financing charges arising from the new debt it will be issuing. BC Hydro sets borrowing requirements on a portfolio basis and uses a mix of short and long-term debt, targeting 15 percent variable and 85 percent long-term. The 3.4 percent is based on forecast F2019 interest rates provided by the Ministry of Finance.[214]

Table 13 – Ministry of Finance F2019 Interest Rates

	Rate (Fiscal 2019 %)	Amount ($M)	Weighted Rate (%)
10-Year B.C. Government Bond	3.36	550	1.49
30-Year B.C. Government Bond	3.96	550	1.76
Commercial Paper	1.13	140	0.13
Total		1,240	3.38

[213] BCH Final Argument, p. 25.
[214] Exhibit B-8, BCUC IR 23.2.

To manage any interest rate related risk, BC Hydro notes that in anticipation of the Waneta 2017 Transaction, it hedged $1.25 billion of future long-term debt in September and October 2017 at a rate of 3.18 percent. The underlying debt would be borrowed in August 2018, approximately the time of the expected financial close of the Waneta 2017 Transaction, if approved. Though this debt would not be specifically allocated to Waneta, as BC Hydro does not do project-specific financing, it provides some mitigation to the risk of recent rising interest rates.[215]

Position of the parties on finance charges

BC Hydro submits that the financing risk is slight as it used 3.4 percent in its Business Case, which compares to the average 3.18 percent effective interest rate it secured through debt-hedging transactions it has entered into recently.[216] Also, given that the costs of incremental capital are only a component of an already small incremental cost of service arising from the Waneta 2017 Transaction; incremental finance charges due to higher interest rates would be similarly small. Finally, BC Hydro rejected a sensitivity analysis using a 6 percent financing rate as unreasonable given the current interest rates, BC Hydro's hedging activity and the fact that the Waneta 2017 Transaction, if approved, would close by August 2018.[217]

BCSEA-SCBC notes that it "agree[s] with BC Hydro in paragraph 56 [of BC Hydro's Final Argument] that incremental debt financing charges are the only financing charges that will be reflected in future revenue requirements and are the only appropriate basis for considering ratepayers impacts."[218]

While CEC submits that "the financing charges are appropriately costed and that 3.4% may be considered a relatively conservative estimate. Ultimately as far as ratepayer impacts are concerned BC Hydro's cost of capital for the Waneta 2017 Transaction will be in the 3.1% to 3.4% range. The CEC recommends that the Commission accept 3.4% as the appropriate figure for the determination of financing charges but recognize the conservative nature of the figure."[219]

Panel discussion

The Panel finds 3.4 percent to be an appropriate financing charge to use in the model. This is a conservative assumption given that BC Hydro secured through debt-hedging transactions it has entered into in September and October 2017, $1.25 billion of future long-term debt.

Given this hedge, the Panel also does not view the interest rate risk as significant. The Panel agrees with BC Hydro that this provides some mitigation to the risk of recent rising interest rates.

[215] Exhibit B-8, BCUC IR 23.3.
[216] BCH Final Argument, pp. 26–27.
[217] Exhibit B-18, BCUC IR 90.3.
[218] BCSEA-SCBC Final Argument, p. 11.
[219] CEC Final Argument, p. 17.

3.5.3 Economic life

As of June 2018, the Waneta Dam will be 64 years old (it was built in 1954) and while additional upgrades in the mid-1990s and 2000s increased maximum capacity to 490 MW,[220] the dam will be 104 years old at the end of the Waneta 2017 Transaction period. BC Hydro assumes a 40-year economic life in valuing the Waneta 2017 Transaction, which is both consistent with the economic life estimate used in the Waneta 2010 Transaction, when BC Hydro purchased one-third of the dam, and is conservative, as a longer assumed economic life would increase the NPV of the transaction.[221]

BC Hydro cautions against the use of a shorter economic life (i.e. 20 to 30 years) as doing so assumes the risk that Waneta generation would not be available beyond that period or would imply that sustaining capital beyond a 20–30 year period would be greater than the potential value.[222] Additionally, BC Hydro cautions against a 70-year economic life because of uncertainty in standards, technology and market conditions beyond that timeframe.[223]

Position of the parties on economic life

BC Hydro submits that its assumption of a 40-year economic life for Waneta is "conservative" due to the substantial level of capital investments made in the assets. As BC Hydro explained,[224] if it makes investments in Waneta that extend the asset life past 40 years (as it expects it will),[225] the result would be a decreasing effect on the amortization payments BC Hydro would be incurring during the Lease Term.[226]

CEC supports BC Hydro's position of a 40-year economic life, citing the following key points:[227]

- The 40-year term is consistent with the economic life used in the 2010 Waneta Transaction;
- "A substantial rehabilitation…at the end of the Lease period…or the 40 years evaluation period…will likely extend the life of the Waneta Assets past the assumed 40 years life."
- "The tail value for the [Waneta 2017] Transaction… are very substantial… in the 100s of millions to billions of 2018 present value dollars."

CEC also agrees with BC Hydro's use of a 40-year amortization period, stating that the amortization cost is "conservatively established."[228]

BCSEA-SCBC and CEC support BC Hydro's use of a 40-year economic life, arguing that "…implementation of Leading Utility Practice is likely to extend the economic life of the facility,"[229] and that Waneta holds considerable value beyond the 40-year period.[230] CEC states further that "…it would be appropriate for the Commission to weigh the upside of a longer [asset] life than a shorter economic life."[231]

[220] Exhibit B-1, Application, Section 2.1, pp. 2-ii–2-2.
[221] Exhibit B-1, Section 4.1.6, p. 4-4.
[222] Exhibit B-8, BCUC IR 22.2.
[223] Exhibit B-18, BCUC IR 71.1.
[224] In response to confidential CEC IR 1.4, filed publicly in Exhibit B-21-1.
[225] Exhibit B-1, pdf p. 96; Business Case, pdf p. 549.
[226] BCH Final Argument, p. 27.
[227] Ibid., p. 16.
[228] Ibid., p. 18.
[229] BCSEA-SCBC Final Argument, p. 7.
[230] CEC Final Argument, p. 6.
[231] Ibid., p. 42.

BCOAPO's position is that "…a significant increase in capital spending over what has been included in the business case is unlikely."[232] BCOAPO considers the sustaining capital budget since the Waneta 2010 Transaction as "reasonably predictable," as well as a 20 percent risk premium included by BC Hydro in all capital projects above $1 M.[233]

For its part, CEABC is concerned that BC Hydro's calculation understates total capital expenditures required in its evaluation of the Waneta 2017 Transaction:

- A potential shortfall of $216 M that BC Hydro would be required to pay to account for Teck's unwillingness to contribute more than $191 M;
- $200 M to protect against dam overtopping due to Probable Maximum Flood (PMF); and
- Costs of remediating toxic sediments.[234]

CEABC is also concerned with the accuracy of a 40-year time horizon, stating that "…a large stake of present dollars must be gambled, based on predictions of loads and prices 20 to 40 years in the future."[235]

Panel discussion

With respect to the use of a 40-year economic life, the Panel views it unlikely that the economic life of Waneta is less than 40 years. In particular, the application of a Leading Utility Practice capital expenditure schedule, where greater efforts are made to maintain and upkeep facilities, will likely lead to an economic life greater than 40 years.

3.5.4 Sustaining capital expenditures

Key risks to the value of the Waneta 2017 Transaction related to sustaining capital expenditures include: i) the estimated capital expenditure required to operate the Waneta Dam effectively over the 40-year transaction period; and ii) the risk of assuming an economic life shorter than the 40-year transaction period.

While BC Hydro states that "…it remains likely that the asset [Waneta] will continue to operate following this 40-year life however… the substantial large capital investments to keep Waneta operating are potentially larger on a present value basis than the benefits of the ongoing generation."[236] This statement creates uncertainty with respect to the impact on ratepayers following the 40-year economic life. Further, BC Hydro provided limited insights into potential future costs that could greatly affect ratepayers in the future.[237] CEC validates this by noting in its Final Argument that "…[Waneta] is already of considerable age and may require a significant replacement project at the end of the lease period…[that] could be considerably greater [in cost] than anticipated."[238]

[232] BCOAPO Final Argument, p. 14
[233] Ibid., p. 13.
[234] CEABC Final Argument, pp. 14-16
[235] CEABC Final Argument, p. 12.
[236] Exhibit B-20, CEABC IR 20.1.
[237] Exhibit B-20, CEABC IR, 19.2.
[238] CEC Final Argument, p. 7.

BC Hydro states it has adopted a Leading Utility Practice approach to future capital investments as this "…approach generally results in greater capital expenditures and lower risk."[239] BC Hydro's position is supported by BCSEA-SCBC, CEC and BCOAPO in each of their final arguments:

- BCSEA-SCBC states that "…by taking a Leading Utility Practice approach…the risk management approach is relatively conservative;"[240]
- CEC states that "BC Hydro has been privy to the operations of the asset [Waneta] since 2010 Transaction…it is likely that the sustaining capital has been managed appropriately and can be expected to continue;"[241] and
- BCOAPO considers the sustaining capital budget since the Waneta 2010 Transaction as "reasonably predictable."[242]

BC Hydro provided an Excel worksheet to quantify values from the Waneta Business Case, as reflected in Table 14 below.

Table 14 – Summary of Capital Expenditures by Scenario[243]

	Capital Expenditure (in $M, 2018 Dollars)			
Scenario	**Years 1-20**	**Years 21-40**	**Years 41-70**	**Aggregate**
Life Extension	$406	$238	$390	**$1,034**
Leading Utility Practice	352	89	-	**441**
Good Utility Practice	191	250	-	**441**

Conversely, CEABC is concerned that BC Hydro's calculation understates total capital expenditures required in its evaluation of the Waneta 2017 Transaction:

- Teck is most likely willing to contribute to capital expenditures that follow Good Utility Practice only, and would therefore not agree to contribute to any spending beyond this amount. Therefore, ~$216 M would be required to account for a "shortfall" during the lease period (years 1-20) between estimated costs under the Life Extension scenario ($406 M) and the Good Utility Practice scenario ($191 M).[244]
- An additional $200 M would be required to protect against dam overtopping in the event of a Probable Maximum Flood (PMF), and cites evidence from a report prepared by Klohn Crippen Berger in 2009, stating that " …Waneta Dam would just be stable under IDF [Inflow Design Flood] conditions, implying that the dam is not stable under PMF conditions. Should Waneta be raised to a Very High…or Extreme Consequence category, significant expenditures may be required to address issues with PMF."[245]

[239] BCH Final Argument, p. 13.
[240] BCSEA-SCBC Final Argument, p. 9.
[241] CEC Final Argument, p. 15.
[242] BCOAPO Final Argument, p. 13.
[243] Exhibit B-20, CEABC IR 19.1.
[244] CEABC Final Argument, pp. 14–16.
[245] CEABC Final Argument, pp. 14–16.

- Remediation costs associated with work on the dam, spillway or potential decommissioning would be triggered. CEABC cites BC Hydro's response to BCUC IR 48.1, which states that "[t]he overall site and surrounding area is contaminated with metals from over 100 years of major lead and zinc smelting at Trail…reports indicate that site contamination may also result from dam construction or railway loading…"[246] CEABC points further to BC Hydro's statement that "The Remediation Covenant does not cover contaminated sediment in the reservoir as it cannot be solely attributed to Teck."[247]

During final arguments, BC Hydro states that CEABC raised similar concerns during the Waneta 2010 Transaction, and little weight was given by the BCUC, as "…they are expressed as views in argument with little if any supporting evidence on the record."[248]

BC Hydro asserts that "…a PMF event is an extreme event" with extremely low risk and that the likelihood of a natural flood event exceeding spillway capacity is less than 1:10,000 per year. BC Hydro also references Canadian Dam Association, stating that "…guidelines speak to the ability to pass the PMF only in the context of Extreme Consequence Dam and Waneta is not an Extreme Consequence Dam." BC Hydro references provisions within the remediation covenant that commit Teck to continued responsibilities for obligations or liabilities. BC Hydro submits that there is no change in exposure to environmental liability between Teck and BC Hydro during the Lease Term. Further, BC Hydro asserts that risks associated with toxic sediment could only arise should Waneta be decommissioned.[249]

Panel discussion

The Panel views BC Hydro's estimated capital expenditures under a Leading Utility Practice scenario to be reasonable. BC Hydro's experience through participation on the Operating Committee gives credence to its estimate of capital expenditures under Leading Utility Practice, as well as to its estimate of Waneta's economic life.

3.5.5 Decommissioning costs

BC Hydro holds the view that its fleet of assets will operate indefinitely,[250] and therefore, an estimate of decommissioning for any assets, including Waneta, is evaluated on "a regular basis" and that an assessment of decommissioning costs would be considered if it were a viable option.[251] BC Hydro states that it has no expectations of having to decommission Waneta; in particular, it is less likely to decommission Waneta given that the dam shares the same forebay as the Waneta Expansion Project.[252]

BC Hydro elaborates on this position through an example: BC Hydro used hypothetical decommissioning costs of $600 M in year 40, which leads to a present value of ($124) million, a negative value. In contrast, however, the present value of the benefits of generation in this example in year 40 are $275 million, a positive value.[253]

[246] CEABC Final Argument, pp. 15–16.
[247] CEABC Final Argument, pp. 14–16.
[248] BC Hydro Waneta 2010 Transaction, Final Order G-12-10 dated February 3, 2010, p. 15.
[249] BCH Final Argument, pp. 47–48.
[250] Exhibit B-9, CEABC IR 8.6.
[251] Exhibit B-18, BCUC IR 72.2.
[252] Exhibit B-20, CEABC IR 20.2.
[253] Exhibit B-20, CEABC IR 20.2.

If the option to continue operating the dam resulted in a higher, but also negative NPV of the Waneta 2017 Transaction value, then BC Hydro would choose to continue operations, as that option would have a lower impact on ratepayers.[254]

BCSEA-SCBC agrees with BC Hydro's position that the likelihood of decommissioning Waneta is lower if the Application is approved, as "…any future loss of the smelter as a load is less influential on long-term Waneta economics…" if two-thirds interest is owned by a utility with an existing customer base. Further, BCSEA-SCBC asserts that the "Sale of Waneta…will result in the inclusion of other public interest considerations" and "…will become a heritage asset…"[255]

Both CEABC and CEC view decommissioning costs to be potentially higher in the future. While CEABC argues that BC Hydro would be accepting all liabilities associated with toxic sediments not solely attributable to Teck,[256] CEC recommends that the BCUC "…should consider the potential for a significant increase in rehabilitation costs when assessing the value of the Transaction."[257]

While BC Hydro provided a range of estimate of decommissioning costs of $400 M-$600 M, it stated that decommissioning studies to provide a more accurate answer would take months to complete.[258] Instead, the Panel approximated the Waneta decommissioning costs by calculating the costs to extend the life of the dam from 40 to 70 years. Since BC Hydro has stated that it would choose the cheaper of extending the life of the asset or decommissioning it, BC Hydro would not pay more to decommission the dam than it would to extend its life. Therefore, the cost of the 30-year extension becomes the upper-bound of the decommissioning costs.

The 30-year extension cost is the difference in estimated capital expenditures between the 70-year Life Extension scenario and the 40-year Leading Utility Practice scenario, as illustrated in Table 15 below:

Table 15 – Life Extension vs. Leading Utility Practice

	Capital Expenditure (in $M, 2018 Dollars)			
Scenario	**Years 1-20**	**Years 21-40**	**Years 41-70**	**Aggregate**
Life Extension	$406	$238	$390	**$1,034**
Leading Utility Practice	352	89	-	**441**
Difference	**$54**	**$149**	**$390**	**$593**

Therefore, the $593 M cost of the additional 30 years' capital expenditure establishes a maximum for the cost of decommissioning. As a reasonableness check, the value of $593 million is within the range of decommissioning costs estimated by BC Hydro. In this case, applying the proxy estimate of $593 M against the NPV of the BCUC base case analysis (see next section) of $592 M implies that the NPV of the Waneta 2017 Transaction, even factoring in potential decommissioning, is ($1 M), or effectively, zero.

[254] Exhibit B-20, CEABC IR 20.1.
[255] BCSEA-SCBC Final Argument, p. 8.
[256] CEABC Final Argument, p. 16.
[257] CEC Final Argument, p. 18.
[258] Exhibit B-20, CEABC IR 20.2.

Position of the parties on decommissioning

BC Hydro argues that there is no basis to assume that Waneta will be decommissioned, and that this assumption would be inconsistent with the assumption it makes about all its other dams.

Panel discussion

The Panel supports BC Hydro's position that it is unlikely that the Waneta dam will be decommissioned in the current planning horizon, given the sharing of assets with the Waneta expansion project. In addition, even should decommissioning be considered, the Panel agrees that it is likely to make more economic sense to invest in extending the dam's operating life.

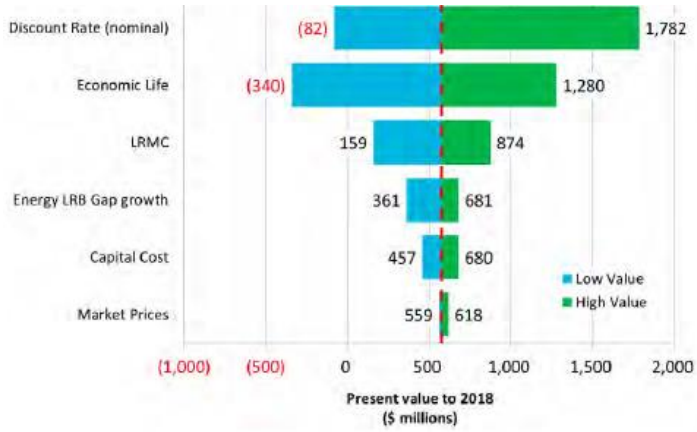
While the Panel considers that $600 million is a reasonable estimate for the decommissioning costs, we find that it is appropriate to exclude the decommissioning costs from the analysis of Waneta 2017 Transaction value.

3.5.6 BCUC base case analysis

The BCUC performed additional sensitivity analysis on the post-Lease value of the Waneta 2017 Transaction. As a starting point, BCUC staff created its own base case, which differs from BC Hydro's base case in using the Panel Mid-C Forecast prices from the Site C Inquiry Final Report instead of ABB prices, and using an LRMC reduced by 15 percent. As a result, the NPV of the Waneta 2017 Transaction in the BCUC base case analysis is $592 million.

The BCUC base case analysis applied sensitivity analysis on a variety of parameters. Table 16 and Figure 7 were provided to account for the lower IPP financing rate of 6.4 percent instead of 7 percent (base case parameters for each input variable are in the grey column).[259] They jointly describe and illustrate, respectively among other things, sensitivities to estimated capital expenditures and changes in economic life in the BCUC base case.

Figure 7 – BCUC Base Case Analysis – Tornado Chart



NOTE: Figure 7 is based on BCUC IR 24.1 and has not been updated as a result of the updates done in BCUC IR 86.2.1. While the low-high NPV values would need to be corrected, BCUC staff conclude that the overall shape of the tornado graph would remain the same, with the largest and smallest influences also remaining the same.

[259] Exhibit B-18, BCUC IR 86.2.1.

From Figure 7, the two biggest factors that contribute to the risk of the project are the discount rate and the economic life assumption. Regardless, the below analysis relates to the sensitivity of capital expenditures and economic life on the NPV of the Waneta 2017 Transaction.

Table 16 – BCUC Base Case – Scenario Results

Base Case Present Value Net of Purchase Price: 592 2018 $ millions

Input Variable	Low Value [A]	[A] less Base Case value	High Value [B]	[B] less Base Case value	Low Value	Base Case	High Value
Discount Rate (nominal)	(52)	(644)	1,687	1,095	8%	6%	4%
Energy LRB Gap growth	386	(206)	657	65	Small Gap Line 19 Table 3-8 RRA	Base RRA Line 18 Table 3-8 RRA	Large Gap Line 20 Table 3-8 RRA
LRMC	308	(284)	763	171	40% decrease in LRMC Clean)	15% decrease in LRMC (Clean)	LRMC (Clean)
Market Prices	545	(47)	604	12	Flat/Real	"Panel Mid-C" in Site C Report	ABB Market price
Capital Cost	443	(149)	666	74	Leading Utility Practice + 100% (AACE Class 5 estimate high point)	Leading Utility Practice	Leading Utility Practice – 50% (AACE Class 5 estimate low point)
Economic Life	(349)	(941)	1,207	615	20 years	40 years	70 years

Sensitivity analysis on capital expenditures

Total estimated capital expenditures under the BCUC base case equal $441 M, as per Table 15. As the following shows, holding all else equal, sensitivity analysis applied to capital expenditures results in a low NPV of $443 M if actual capital expenditures were 100 percent of estimate and a high NPV of $666 M if actual capital expenditures were 50 percent of estimate:

- NPV falls to $443 M if actual costs double to $882 M, or NPV will decrease $1 M for every $3 M spent above estimate; and
- NPV increases to $666 M if actual costs are 50 percent of estimate ($222 M), or NPV will increase $1 M for every $3 M spent below estimate.

Sensitivity analysis on economic life

Holding all else equal, sensitivity analysis applied to economic life results in a low NPV of ($349 M) if the economic life of Waneta Assets were reduced to 20 years and a high of $1,207 M if the economic life of Waneta Assets were increased to 70 years. As the following shows, in comparing the impact of increasing versus decreasing the economic life of Waneta, a decrease has a greater marginal impact than an increase:

- A reduction in economic life of 20 years results in a decrease in NPV of $941, or $47 M per year that the estimated economic life decreases; and

- An increase in economic life of 30 years results in an increase in NPV of $615 M, or $20.5 M per year that the estimated economic life increases.

Changing the economic life has a significant impact on NPV. In using an economic life less than 40 years, there is a shorter period of time to realize benefits relative to the cost of the transaction; conversely, the use of an economic life greater than 40 years provides a longer period of time against which benefits could be realized.

Panel Discussion

The Panel acknowledges CEABC's concerns related to variances in capital expenditures, however, sensitivity analysis performed as part of the BCUC base case analysis already captures any potential capital expenditure overages. As per Table 16 and Figure 7, NPV changes $1 M for every $3 M variance from estimate, holding all else equal. The Panel also refutes CEABC's concerns regarding a $216 M shortfall due to Teck's unwillingness to contribute more than $191 M towards total capital expenditures, as Section 9.1 of the Co-Possessors and Operating Agreement (COPOA) outlines capital expenditure obligations for each of BC Hydro and Teck. Further, as Sections 6.6 and 6.7 outline matters requiring majority and unanimous approvals of the Operating Committee, the Panel views that adequate checks and balances are in place to ensure accountabilities are assigned and notes that approvals from the Operating Committee are required for any estimated capital expenditures.

3.5.7 Summary of the consolidated value of the transaction

The following table shows the overall value of the Waneta 2017 Transaction in the core valuation scenarios (first five lines) as well as sensitivity scenarios around Teck's load (line 6), the LRMC valuation index (lines 7 to 9) and the Panel Mid-C Price Forecast discussed above (line 10). This table combines the Lease and post-Lease Terms along with the two main risk adjustments for counterparty default and the extension option. The LRMC scenarios are based on the Mid-Gap 2016 load forecast.[260]

[260] Exhibit B-18, BCUC IR 83.3.

Table 17 – Consolidated Value of the Transaction under Additional Sensitivity Scenarios

Basis for Post-Lease Value	Value of Assets / Lease to BC Hydro					
	Un-risked Lease Period	Default Risk Adj.	Post-Lease Value	Extension Option	Total Value	Value net of purchase
LRMC (Clean)	792	107	1,482	(291)	2,090	887
LRMC (Clean + Gas)	792	64	1,206	(196)	1,865	662
Industrial Tariff	792	n/a	586	(45)	1,334	131
Market Prices (ABB)	792	1	570	(93)	1,269	66
Extrapolated Prices	792	(54)	440	(6)	1,172	(31)
Industrial Tariff w/ higher load (BCUC IR 2.83.3)	792	n/a	626	(45)	1,373	170
LRMC (Clean) less 15% (BCUC IR 2.83.4.1)	792	84	1,237	(231)	1,882	679
LRMC (Clean) less 40% (BCUC IR 2.83.4.2)	792	33	829	(90)	1,576	373
LRMC (Clean+Gas) less 40% (BCUC IR 2.81.2)	792	19	663	(33)	1,441	238
Panel Mid-C Price Forecast (BCUC IR 2.83.4.3)	792	(17)	477	(56)	1,195	(8)

The above table shows that for the Industrial Tariff and Market Prices scenarios, most of the value of the Waneta 2017 Transaction stems from the Lease Term, even when adjusted for the default risk. Default risk adjustments would add to the consolidated value of the Waneta 2017 Transaction assuming that BC Hydro is under higher valuation index scenarios and detract from the value under lower priced scenarios such as the Panel Mid-C forecast and the Extrapolated price forecast.

BC Hydro offers the following observations in regard to the above table:[261]

(a) The Range of Value Approach (discussed in greater detail in Section 3.2) employed by BC Hydro in the Waneta 2017 Business Case yields a range of benefits of approximately zero to $900 million under the five main post-Lease scenarios.

(b) The additional scenarios include all the reasonable analysis scenarios suggested by interveners and BCUC staff during the IR process. Those additional scenarios have a similar but narrower range of potential benefits from approximately zero to $700 million.

(c) The only scenarios where the transaction value tends towards zero are those in which the possibility that BC Hydro will need any new generation resources for the next 40 years is taken out of the analysis (i.e. ABB, Extrapolated and Panel Mid-C). Conversely, in any scenario in which BC Hydro needs new resources, sometime in the next 40 years the Waneta 2017 Transaction has a positive NPV. BC Hydro suggests that it is simply not credible that BC Hydro will not need new resources for the next two generations.

[261] BCH Final Argument, pp. 35–36.

(d) The range of values shown would in all cases be greater by hundreds of millions of dollars if calculated on a ratepayer impact basis rather than an investment basis.

This latter point is supported by BC Hydro's comparison of the ratepayer benefit under both models:[262]

Table 18 – Ratepayer Benefit Present Value

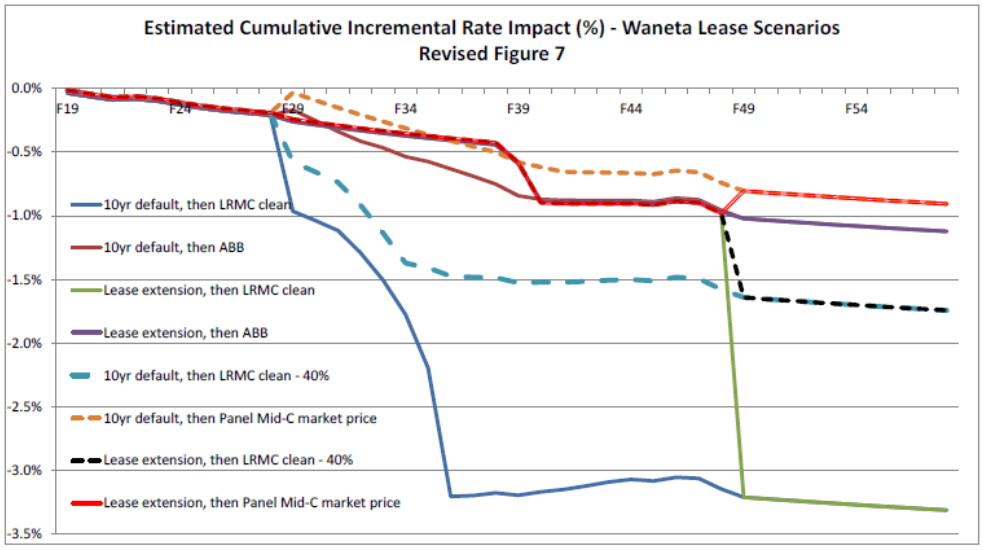
(Present value net of purchase price, $ millions)

Basis for Post-Lease Value	Free Cash Flow Un-risked (6% financing)	Ratepayer Benefits (3.4% financing)
LRMC – Clean only	1,071	1,502
LRMC – Clean + Gas	794	1,224
BCH Industrial Tariff	175	589
Market Prices (ABB)	159	570
Extrapolated Prices	29	436

(Note: in both cases costs/benefits are discounted at 6% nominal)

Figure 7 of the Business Case shows the ratepayer impact of the Waneta 2017 Transaction is positive through the entire 40-year evaluation period, even when default and extension risks are taken into account.[263] The Revised Figure 7 below shows the same downward pressure on rates through the entire 40-year period under both default and extension scenarios and on the basis on the Panel Mid-C Market Price and a 40 percent reduction in LRMC Clean.[264]

Figure 8 – BC Hydro's Revised Figure 7 based on Mid-Gap

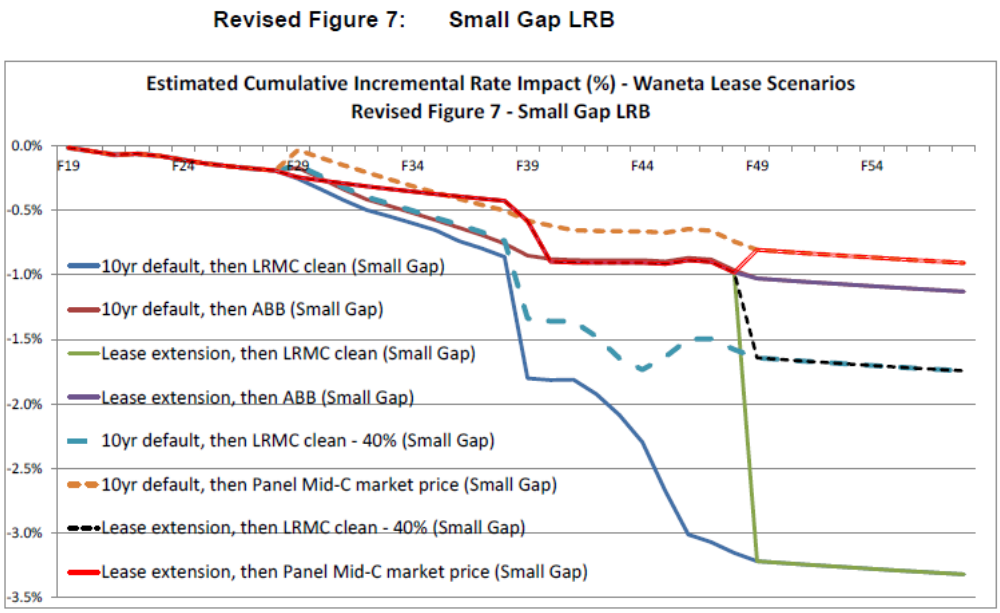


(Note: this figure is based on the Mid-Gap 2016 load forecast.)

BC Hydro also produced another Revised Figure 7 based on the Small Gap:

[262] Exhibit B-1, Application, Business Case, pdf p. 562.
[263] Exhibit B-1, Application, Business Case, pdf p. 560.
[264] Exhibit B-18, BCUC IR 91.5.

Figure 9 – BC Hydro's Revised Figure 7 based on Small Gap



These Revised Figure 7s present graphically the result of the free cash flow analysis, before financing charges; they do not represent the ratepayers' impact through the revenue requirements. This latter analysis would effectively add a few hundred millions in additional benefits to ratepayers because the revenue requirements are based on a 3.4 percent financing rate, while the implicit financing rate in the free cash flow methodology is equivalent to the discount rate (6 percent nominal). Ratepayers benefit from this lower cost of financing.[265]

The following table shows the sensitivity around the three LRB gaps (Small/Mid/Large), using the Panel Mid-C Price Forecast to value the energy in surplus years and the LRMC - Clean.[266]

Table 19 – Consolidated Value of the Transaction under Additional Sensitivity Scenarios

(Risked present value to 2018, $ millions)

	Value of Assets / Lease to BC Hydro					
	Un-risked Lease Period	Default Risk Adj.	Post-Lease Value	Extension option	Total Value	Value net of purchase
Panel Mid-C Prices from Site C Final Report & LRMC (Clean) - use Small Gap Surplus/Deficit in Line 19 Table 3-8 RRA	792	(8)	1,249	(291)	1,742	539
Panel Mid-C Prices from Site C Final Report & LRMC (Clean) - use Base RRA in Line 18 Table 3-8 RRA	792	94	1,482	(291)	2,077	874
Panel Mid-C Prices from Site C Final Report & LRMC (Clean) - use Large Gap Surplus/Deficit in Line 20 Table 3-8 RRA	792	194	1,482	(291)	2,177	974

[265] Exhibit B-1, Application, Business Case, pdf p. 562.
[266] Exhibit B-8, BCUC IR 18.2.

In the table below, BC Hydro was asked to re-run the model while changing up to three variables at once. The NPV value is positive in all but one scenario.[267] However, BC Hydro noted that the use of a higher discount rate is inconsistent with the use of lower LRMC values. A higher discount rate would be most likely driven by higher financing rates; but, lower financing rates are likely one of the drivers of the recent wind prices in Alberta.[268]

Table 20 – Consolidated Value of the Transaction under Additional Sensitivity Scenarios

Scenarios	Net Value of Transaction (million $2018)
Base Case (Table 1, BCUC IR 1.24.1)	606
Updated Based Case (per this IR)	592
Variants from the Base Case assumptions (Keep all other variables per Base Case)	
40% decrease in LRMC (Clean)	308
Small Gap + 40% decrease in LRMC (Clean)	241
Small Gap + 40% decrease in LRMC (Clean) + Flat/Real Market Prices	49
Discount Rate @ 7%	229
Discount Rate @ 7%, Small Gap	61
Discount Rate @ 7%, Small Gap, 40% decrease in LRMC (Clean)	(14)
Large Gap, 40% decrease in LRMC (Clean)	335
Large Gap, 40% decrease in LRMC (Clean), Flat/Real Market Prices	316

BCUC determination

Based on a set of plausible scenarios for the future value of energy from Waneta, the range of net present values of the Waneta 2017 Transaction is from ($31) million to $887 million, as presented earlier in Table 17. The Panel is satisfied that this represents the reasonable range of transaction values for consideration.

The BCUC base case analysis investigated the sensitivity of the Waneta 2017 Transaction value to changes in several different variables. Two of the variables, the discount rate and the economic life of the assets, are used solely for the purposes of evaluating this Application, and do not change subsequent to the transaction taking place. Therefore, they can be discarded when looking at how the value of the transaction may change over time.

Of the other variables considered, the ones which have a significant effect on the Waneta 2017 Transaction value are the market price of energy, and the cost of future sustaining capital (see Section 3.5.6). The effect of changing these two variables to their worst plausible values reduces the value of the Transaction by $47 million and $149 million respectively.

Even in the case where a combination of adverse scenarios unfolds, as compared to BC Hydro's base case, such as a slower growth in load (Small Gap), a sharp decrease in LRMC for clean resources and a higher discount rate of 7 percent, the NPV value for such scenario is -$14 million, which is effectively zero in relation to the size of the Waneta 2017 Transaction. The Panel notes that this scenario addresses CEABC's concerns regarding LRMC and discount rate and is even more conservative than the two tests performed by CEABC because it also layered the Small Gap in the scenario.

[267] Exhibit B-18, BCUC IR 86.3.
[268] Exhibit B-18, BCUC IR 85.5.

Additionally, using the BCUC's findings in the Site C Inquiry Final Report regarding the load forecast and Mid-C prices, the Waneta 2017 Transaction remains cost-effective, albeit reduced from an NPV of $887 million to $539 million in the LRMC - Clean analysis (see Table 19). And even in a situation where no new generation were needed for the next 40 years and all the energy from Waneta is sold to market post Lease, the Waneta 2017 Transaction has an NPV of -$8 million. The Panel views this as effectively zero considering the size of the proposed transaction.

The most pessimistic scenario is that Teck defaults early in the life of the lease, BC Hydro has a surplus of energy and capacity, and the market price of energy is based on BC Hydro's Extrapolated Prices model. The Panel views the likelihood of this outcome to be low and although the NPV would be negative, the ratepayer impact is still likely to be positive.

Conversely, in the situation where BC Hydro has a deficit of energy and capacity at the end of the lease, BC Hydro's estimate of $48.25/MWh for the Waneta output represents a lower cost than the available alternatives.

The Panel is mindful that the NPV results above are taken from an investment view, where the discount rate used was 6 percent, but that the actual ratepayer benefits should be calculated through the revenue requirements model as this more accurately reflects the ratepayer impact. As shown by BC Hydro when it compared the two methods' results, the ratepayer benefits will always be around $400 million higher than that calculated through the NPV analysis. Therefore, the Panel finds that the Waneta 2017 Transaction will yield positive ratepayer benefits, (i.e. downward pressure on rates) and that this outcome holds across the plausible range of scenarios.

For all the foregoing reasons, the Panel finds that the Waneta 2017 Transaction capital expenditures of $1.203 billion applied for under section 44.2 of the UCA warrant acceptance.

3.6 Transaction costs

As part of its determination on whether the capital expenditures requested in the expenditure schedule are in the public interest and ought to be accepted, the BCUC must also assess the reasonableness of the Waneta 2017 Transaction costs associated with the purchase of the Waneta Assets. BC Hydro seeks acceptance of up to $50 million in transaction costs. For the purposes of its Waneta 2017 Business Case, BC Hydro assumed those costs to be $50 million. A significant amount of this relates to property transfer tax. The balance relates to total financial, legal, consultation and regulatory costs. BC Hydro is not seeking the recovery of a specific amount as being in the public interest. Rather, as BC Hydro pointed out in its Application:

> The assumption [of $50 million] is generous and, because it is used in the financial analysis of the transaction, is also conservative, insofar as it tends to understate the net value of the transaction. **Only actual transaction costs will be capitalized and will flow through into rates**. Even if the $50 million transaction costs are incurred, the transaction still has a positive NPV.[269]

In short, to the extent that the actual transaction costs exceed the $50 million estimated in the Waneta 2017 Business Case and pursuant to BC Hydro's request for approval of actual transaction cost up to a maximum of

[269] Exhibit B-1, p. 4-5, emphasis added.

$50 million only, ratepayers are insulated from any risk associated with actual transaction costs that may exceed the $50 million maximum sought.

No intervener has raised any concern about the assumed transaction costs, which amount to some 4 percent of the total purchase price of the Waneta Assets. During oral arguments, counsel for BC Hydro confirmed that the Waneta 2017 Transaction costs do not include any part of the break fee payable by Teck to Fortis following BC Hydro's exercise of its ROFO in respect of the Waneta Assets and that obligation lies solely with Teck.[270]

BCUC determination

The Panel determines that given the capital expenditures of $1.203 billion for BC Hydro's purchase of the two-thirds interest in Waneta are accepted, the associated Waneta 2017 Transaction costs should be accepted accordingly.

In the absence of any evidence in this proceeding that those costs are unwarranted, excessive or unreasonable, **the Panel determines that up to $50 million in actually incurred Waneta 2017 Transaction costs as applied for by BC Hydro warrants acceptance.** Consistent with the terms of BC Hydro's Application, **the Panel directs BC Hydro not to flow through into rates any amount of actually incurred Waneta 2017 Transaction costs that exceed $50 million.**

3.7 Immediate inclusion of assets not used for regulated activities into rate base

Acceptance of a capital expenditure under section 44.2 of the UCA provides the applicant and its shareholders, barring any future determination of imprudence, with the ability to recover that expenditure from its ratepayers. These approved capital expenditures are recovered primarily through amortization and a return on invested capital. To recover amortization and earn a return, the asset must be included in a utility's rate base.

If the costs associated with the expenditure schedule were to be borne by the shareholder and not recovered from ratepayers, the BCUC would have no jurisdiction over the Waneta 2017 Transaction and acceptance of the related expenditure schedule would not be required.

At issue then is whether the Waneta assets qualify for rate base treatment, given that they are not intended to provide utility service to ratepayers, either directly or indirectly, for 20 to 30 years. If the Panel is not satisfied that they qualify for inclusion in rate base, then section 44.2 approval is not appropriate.

Position of the parties on including Waneta Assets into rate base

BC Hydro proposes to include the Waneta Assets into its rate base when the Waneta 2017 Transaction closes even though the assets will not be used for regulated activities during the Lease Term (up to 20 or 30 years). Currently, BC Hydro's rate base and its ROE are decoupled (i.e. BC Hydro's dividend is fixed regardless of the size of its rate base). However, it is possible for its rate base and ROE to be "recoupled" in the future, and thus its shareholders to start earning a return on the Waneta Assets. Additionally, ratepayers will be responsible for any risks or benefits resulting from the Waneta 2017 Transaction even during the Lease Term when they will not have access to the energy generated from the assets.

[270] Oral Hearing Transcript Volume 4, p. 227.

In this proceeding, BC Hydro was asked: "If the Commission were to direct the Waneta Assets to be 'ring-fenced' or otherwise segregated during the Lease period and brought into rate base once the lease has ended, in BC Hydro's view, what are the potential pros and cons of this approach?"

BC Hydro responded that if the BCUC were to direct the Waneta Assets to be "ring-fenced," "the financial consequences of the Waneta 2017 Transaction, then the net benefits (revenues less costs) would be to the benefit of the shareholder rather than BC Hydro's ratepayers." Since "BC Hydro is proposing to complete the transaction because it is expected to benefit its ratepayers," it "does not propose any 'ring-fencing.'"[271]

However, BC Hydro submits that "the question of whether or not BC Hydro's acquisition of the two-third interest in Waneta…should go into rate base is moot" because there's currently no return on deemed equity included in BC Hydro's revenue requirement and thus inclusion in rate base has "no financial impact from a ratepayer perspective."[272]

BC Hydro's justification to acquire the asset now when the power will not be available to BC Hydro customers for at least another 20 years includes:[273]

1) Immediate financial benefits through Teck's Lease payments which will have a net positive impact on the rates of BC Hydro's customers;
2) A low cost source of clean generation that would be used to serve its customer at the end of the Lease; and
3) The ability to acquire Teck's Transmission Assets at the end of the Lease.

BC Hydro submits that the Waneta 2017 Transaction cannot be viewed as purely a commercial transaction because the evidence shows that "some time in the 40 year period Waneta will be available to displace other alternatives," and "even in a circumstance where BC Hydro is in surplus, the Waneta Asset will be used and dispatched in an economic merit order consistent with all other BC Hydro resources."[274]

BC Hydro has confirmed that during the Lease Term, the output of the Waneta Assets would not be used to serve its customers' energy needs.[275] Furthermore, BC Hydro has stated that the Lease with Teck is an "economic transaction" and is not considered a "service" or a "rate" as defined in the UCA.[276] BC Hydro submitted that "none of [its] proposed purchase of the Waneta Assets, its obligations as a lessor pursuant to the Lease, nor its future purchase of the Transmission Assets would be regulated activities."[277] BC Hydro further submitted that the "lease is not an agreement in respect of a 'rate' for 'service' and the Lease payments BC Hydro will receive are not 'rates' for 'service', and so [UCA sections 58 to 61] are as a matter of law inapplicable. The Lease does not establish a service relationship between Teck and BC Hydro, but instead continues, for the term of the Lease, an existing proprietary relationship."[278] Teck's "leasehold interest is a property right, and not

[271] Exhibit B-18, BCUC IR 120.7.
[272] Oral Hearing Transcript Volume 4, p. 165.
[273] Exhibit B-1, Application, p. 1-9.
[274] Oral Hearing Transcript Volume 4, pp. 228–230.
[275] Exhibit B-18, BCUC IR 120.3.1.
[276] Exhibit B-1, Application, p. 4-1; Exhibit B-18, BCUC IR 120.1.
[277] Exhibit B-8, BCUC IR 60.1.
[278] Exhibit B-8, BCUC IR 50.1.

a right to be provided with electricity from or by BC Hydro under contract or tariff…the electricity generated at Waneta by Teck's leasehold share of the facility is Teck's electricity; it is not sold by BC Hydro to Teck…"[279]

BC Hydro submitted that if the Waneta 2017 Transaction completes, the:

> The Waneta Assets would be included in 'rate base' by operation of law. In particular, BC Hydro's 'rate base' is defined in Direction No. 7 as including 'property, plant and equipment in service' listed in 'the authority's audited financial statements.' BC Hydro expects that if the Waneta 2017 Transaction completes, the Waneta Assets will be listed in BC Hydro's audited financial statements, and would be 'in service' because they would be used in the manner intended by management (IFRS IAS 16). That is, the Waneta Assets would be 'in service' in an accounting sense.[280]

BC Hydro also explained that "if the Commission issues the requested orders, and the Waneta 2017 Transaction completes, then both the incremental costs and revenues of the transaction will be included in BC Hydro's revenue requirement…."[281] BC Hydro submitted that "the Lease revenues that will accrue to BC Hydro if it completes the Waneta 2017 Transaction would be for the benefit of its ratepayers regardless of any public interest determination by the Commission…" because all of its "revenues are included in its revenue requirements, regardless of how they are earned."[282] However, BC Hydro also pointed out that "in the 'highly unlikely scenarios' where the cost of service of the Waneta Assets is greater than the lease payments received from Teck, then the shortfall would be recovered from ratepayers."[283]

All of the interveners, with the exception of CEABC, are of the view that it is appropriate for ratepayers to bear the risks and receive the benefits of the Waneta Assets during the Lease Term.

CEC submitted that it is appropriate to match the costs with the Lease revenue, and that it does not have "a particular issue with the manner in which BC Hydro structured the transaction."[284] Further, CEC stated that it agrees with BC Hydro that the Lease with Teck is not a regulated service.[285] CEC submits that "overall, the proposed acquisition Transaction meets the tests outlined under Section 44.2 of the UCA."[286]

BCOAPO submitted that in its view, "BC Hydro is not prohibited from completing a transaction of this kind under the Act, and under this section."[287] Further, since "there is a case for economic benefit to ratepayers, both in the initial 20 years and in the subsequent 20…" that it agrees with BC Hydro that section 44.2(5)(e) is "specifically something that is contemplated by that section, and permitted by it."[288] BCOAPO submits it agrees with BC Hydro that "the economic and ratepayer benefits are the primary basis on which the transaction should be evaluated."[289]

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[279] Exhibit B-18, BCUC IR 120.1.
[280] Exhibit B-18, BCUC IR 120.5. International Financial Reporting Standards – International Accounting Standard 16 on Property, Plant and Equipment.
[281] Exhibit B-18, BCUC IR 120.3.
[282] Exhibit B-24, Panel IR 3.1.1.
[283] Exhibit B-18, BCUC IR 120.3.2.
[284] Oral Hearing Transcript Volume 4, p. 143.
[285] Oral Hearing Transcript Volume 4, pp. 144–145.
[286] CEC Final Argument, para. 30.
[287] Oral Hearing Transcript Volume 4, p. 277.
[288] Oral Hearing Transcript Volume 4, p. 277.
[289] BCOAPO Final Argument, p. 8.

BCSEA-SCBC submitted that ratepayers should "bear both the benefits and the costs of the transaction" both before and after the Lease Term because "ratepayers are receiving tangible benefits year by year from the lease payments during the lease period."[290] Further, BCSEA-SCBC submitted that section 44.2 is appropriate because "the asset will be used to provide a regulated service in the post-lease period."[291] BCSEA-SCBC stated that the "legislature intended that the Commission would be making a decision on whether this is an expenditure by BC Hydro that meets the tests that are set out in the Act."[292] In BCSEA-SCBC's view, "it is appropriate to analyze the Transaction primarily on an investment basis, and secondarily on a planning basis."[293]

MoveUP submits that the BCUC "has jurisdiction to dismiss the Application or to approve it without conditions, but not to direct BC Hydro's shareholder to create a non-utility entity to hold and operate the Waneta asset."[294] Further, "the post-lease conversion of the facility's use does not appear to fall within the ambit of a CPCN application…"nor would it "call for an application under s. 44.2…."[295]

On the other hand, in CEABC's view, ratepayers should not take the risk related with Waneta because "there's no particular advantage" from "taking on the risk of a twenty or thirty year prebuild."[296] However, in CEABC's view, the BCUC could approve the transaction under section 44.2, but by approving it, the BCUC would be saying that "the risks associated with Waneta are on the ratepayers, not the shareholder."[297]

Panel discussion

The Panel disagrees with BC Hydro's assessment that the question of whether the Waneta Assets go into rate base is moot because there's currently "no return on deemed equity that's included in BC Hydro's revenue requirements" and thus inclusion in rate base "has no financial impact from a ratepayer perspective."[298]

We agree that inclusion of the Waneta Assets in BC Hydro's rate base would not increase the return that its shareholders earn because BC Hydro's earned return is fixed annually at $712 million regardless of the amounts in rate base. However, if an asset is not included in rate base, the amortization cannot be recovered in rates. In addition, in this case, the Lease payments would not accrue to ratepayers.

Further, if an asset that is the subject of a capital expenditure schedule cannot be placed into rate base, the expenditure schedule would not warrant approval – the BCUC simply has no jurisdiction over assets that are purchased on the account of shareholders rather than ratepayers.

BC Hydro asserts that the Waneta Assets would be included in rate base by "operation of law." The Panel disagrees. The definition of rate base in Direction No. 7 does include "property, plant and equipment in service" listed in "the authority's audited financial statements." However, the same definition of rate base found in Direction No. 7 excludes from it "any amount…that the Commission determines under the Act not be recovered by the authority in rates."[299]

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[290] Oral Hearing Transcript Volume 4, p. 297.
[291] Oral Hearing Transcript Volume 4, p. 298.
[292] Oral Hearing Transcript Volume 4, pp. 298–299.
[293] BCSEA-SCBC Final Argument, para. 15.
[294] MoveUP Final Argument, p. 2.
[295] MoveUP Final Argument, p. 2.
[296] Oral Hearing Transcript Volume 4, p. 329.
[297] Oral Hearing Transcript Volume 4, p. 330.
[298] Oral Hearing Transcript Volume 4, p. 165.
[299] Province of British Columbia, Lieutenant Governor in Council, Order in Council No. 97, Direction No. 7, approved and ordered March 5,

Therefore, the Panel must determine whether the Waneta Assets can be placed into rate base, thereby allowing the associated costs to be recovered from ratepayers. In this instance, the asset is not intended be used to provide utility service to ratepayers for 20 to 30 years.

BC Hydro argues that the Waneta Assets "would be 'in service' because they would be used in the manner intended by management (IFRS IAS 16). That is, the Waneta Assets would be 'in service' in an accounting sense."[300] IAS 16 doesn't explicitly use the term "in service" although, it defines Property, Plant and Equipment as "tangible items that: (a) are held for use in the production or supply of goods or services, for rental to others, or for administrative purposes; and (b) are expected to be used during more than one period."[301] While we don't disagree that the assets will be in service from an accounting perspective, this is not the appropriate test for inclusion in rate base.

In determining whether assets should be included in rate base, the BCUC has historically applied the "Used and Useful" test, and will consider this test here. The principle underlying the Used and Useful test requires assets to be physically used and useful in utility service to current ratepayers before those ratepayers can be asked to pay the costs associated with them. Used and Useful is applied in the sense that the asset either directly or indirectly provides service to the customers of the utility.

There are exceptions to the Used and Useful principle – in particular for assets that are expected to become useful in the reasonably foreseeable future.

The Used and Useful test is typically applied to either an asset:

1. that while the need for it is perhaps not imminent, is expected to be used in the reasonably foreseeable future;[302] or
2. a portion of which is needed now, but a portion may not be needed for quite some time. This is the issue of so-called "lumpy capital." Generally speaking it is impossible to perfectly match capital acquisitions to need for them and therefore almost all asset acquisitions contain some initially unused portion.[303]

In the Panel's view, the present circumstance is distinguished from either of the above circumstances because here, there is no intention to use the assets for utility service for 20 or perhaps 30 years. Therefore the Panel will consider other aspects of the Waneta 2017 Transaction to consider whether it is in the interests of persons in British Columbia "who receive or may receive service from the authority" for the assets to be included in rate base.

In particular, the Panel considers the following factors to be persuasive that the assets should be included in rate base:

2014.

[300] Exhibit B-18, BCUC IR 120.5.

[301] https://www.ifrs.org/issued-standards/list-of-standards/ias-16-property-plant-and-equipment/.

[302] See for example Nsp Maritime Link Incorporated (Re), 2017 NSUARB 149 (CanLII); Alberta Power Limited v. Alberta Public Utilities Board, 1990 ABCA 33 (CanLII).

[303] See for example The Pig in the Python: Is Lumpy Capacity Investment Used and Useful?, William J. ~aumol* J. Gregoly Sidak, Energy Law Journal, Vol 23, pp. 383–398.

1. The assets align with BC Hydro's core business;
2. The assets have a long (at least 40 year) economic life and are intended to become used and useful significantly before the end of their expected lifespan;
3. The investment provides some degree of protection for the previously made one-third investment in the property, which is used and useful as it is currently being used to serve BC Hydro load; and
4. The business case shows that there are economic benefits to ratepayers in every scenario during the period that the assets will not be providing utility service.

Although not without risk – no investment ever is – the Panel views this as a unique opportunity to leverage the Province's low cost of borrowing to acquire assets that will be used to provide utility service to ratepayers upon expiration of the lease within the next 20 to 30 years and beyond.

Further, because the Province has decoupled rate base return from the quantum of assets in rate base, there is no incremental cost to ratepayers for return on deemed equity. This serves to reduce the economic risk faced by ratepayers.

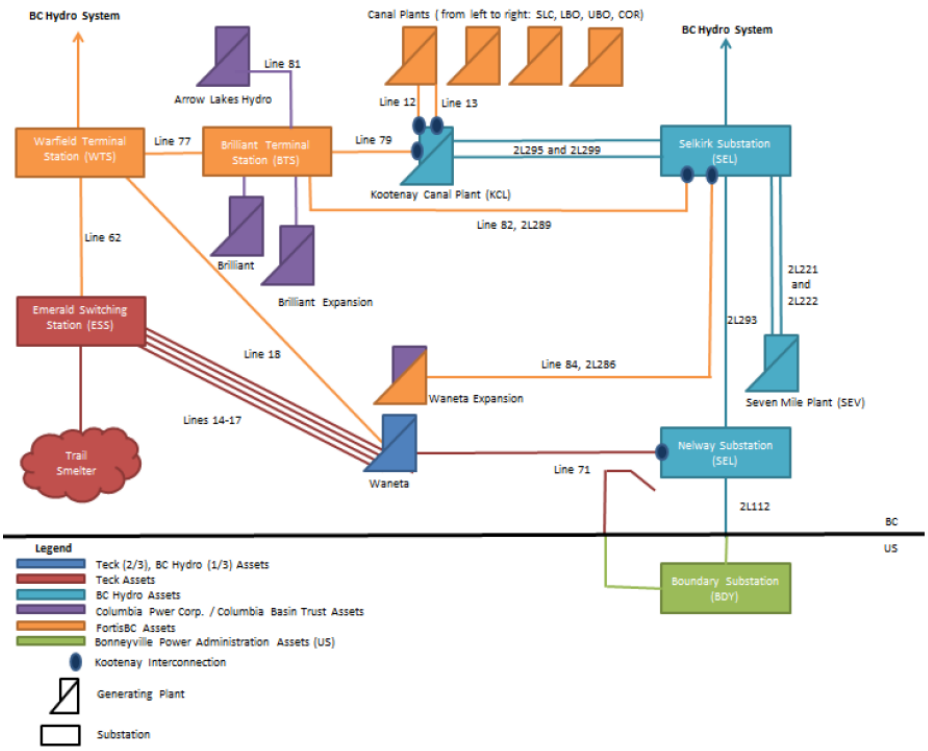
3.8 Purchase of Transmission Assets

In addition to the Waneta Assets, pursuant to the WTA, BC Hydro proposes to buy the Transmission Assets,[304] including Line 71, at the expiry or early termination of the Lease for $20 million (at the time of purchase of the Transmission Assets). Teck Transmission Assets are fully described in Schedule A to the WTA[305] and include among other items: Lines 14-17, the Line 71 Assets, the Waneta Hydro Station, the Emerald Switching Station and Teck Transmission Options.[306] For further discussion on the Teck Transmission Options, please refer to Section 3.8.1.

Figure 10 below provides an overview of the Transmission Assets in the region.

[304] Teck Transmission Assets are fully described in Schedule A to the Waneta Transmission Agreement (Exhibit B-12) and include among other items Lines 14-17, the Line 71 Assets, the Waneta Hydro Station, the Emerald Switching Station and Teck Transmission Options.
[305] Exhibit B-12, Attachment 2 (Waneta Transmission Agreement).
[306] The Teck Transmission Options refers to Teck's current option to purchase up to 150 MW of capacity rights (or an undivided interest) on Lines 62, 77 and 79, which are FortisBC assets, under the Transmission Facilities Agreement (TFA) between Teck and FBC.

Figure 10 – Regional Transmission Overview



Teck's Line 71 is a 25 km, 230 kilo Volt (kV) line that currently provides transmission capacity to Teck, BC Hydro, Powerex and FortisBC. The following entities own rights to Line 71 capacity:

- Under the 2010 Co-Ownership and Operating Agreement (COA) with Teck, BC Hydro currently has guaranteed scheduling rights to move BC Hydro's 1/3 share of Waneta output (up to 250 MW through 2035) over a portion of Line 71 capacity (370 MW) to the BC Hydro system and to the BC-US border.
- Under the 1987 letter agreement with Teck, FortisBC has import and export scheduling rights to and from the BC-US border using the residual Line 71 rights not used by Teck.

During the Lease Term, it is expected that the 2/3 Interest would serve the Teck smelter load and that Teck will require the Line 71 asset to periodically import to serve smelter load in the case of a Waneta outage, or to export a small volume of surplus Waneta electricity to market.

Post-Lease, the transmission capacity needed from Waneta to the BC Hydro system depends mainly on whether or not Teck is served by BC Hydro. If BC Hydro serves the smelter load, BC Hydro will only need approximately 250 MW of transmission capacity requirements on Line 71; however, up to 480 MW is needed if it does not serve the smelter load.

Table 21 below summarizes the three options that BC Hydro analyzed regarding the acquisition of Line 71 transmission rights to bring 370 MW of Waneta output to the BC Hydro system.

Table 21 – Ownership Scenarios[307]

	Scenario 1: Buy Tx Assets in 20 Years	Scenario 2: Buy Tx Assets Now	Scenario 3: Get Rights to Tx Assets in 20 Years
During-lease	Teck	BC Hydro	Teck
Post-lease ownership	BC Hydro	BC Hydro	Teck (or another purchaser)
Post-lease rights	Teck holds 300MW of import rights	Teck holds 300MW of import rights	BC Hydro holds sufficient rights for Waneta

(Note: Scenario 2 corresponds to the structure of the Fortis Inc. transaction)

Table 22 presents the discounted cash flow valuation model prepared by BC Hydro to evaluate the costs and revenues for these options.

Table 22 – Costs and Revenues[308]

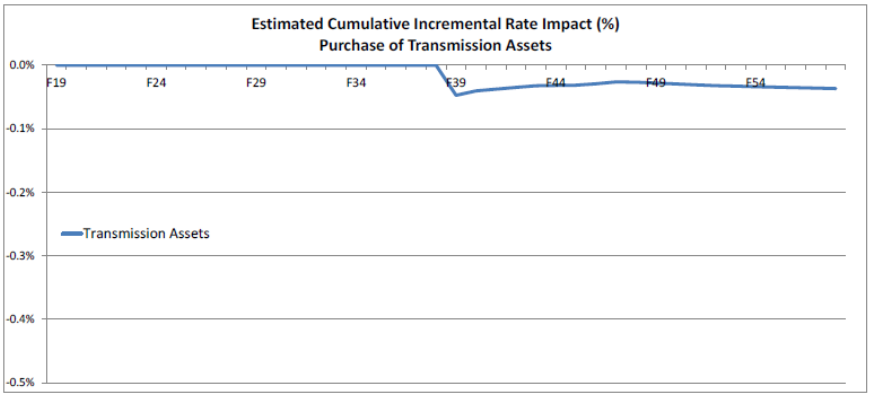
Option	Scenario 1: Buy Tx Assets in 20 Years	Scenario 2: Buy Tx Assets Now	Scenario 3: Get Rights to Tx Assets in 20 Years
During Lease:	None	Lease Revenue	None
Post Lease:	– OMA – Sustaining Capital – FBC Revenue	– OMA – Sustaining Capital – FBC Revenue	– Teck OMA – Teck Sustaining Capital
Net Present Value (2018$M)	(14.0)	(13.1)	(8.4)

On the revenues side, BC Hydro used a conservative assumption as it had assumed that revenues from FortisBC's use of Line 71 would continue under the un-amended 1987 Letter. However, the agreement between BC Hydro and FortisBC regarding Line 71 (the BC Hydro-FortisBC Letter)[309] eliminates the possibility of the 1987 Letter being in force in the post-Lease Term. BC Hydro estimated its ability to charge OATT tariffs post-Lease would add approximately $26 million to the present value of the Waneta 2017 Transaction.[310] These additional revenues make Scenarios 1 and 2 beneficial for ratepayers (~$12-13 million) while Scenario 3 would remain at -$8.4 million as BC Hydro would not own Line 71.

The result of BC Hydro's rate impact analysis for the purchase of the Transmission Assets in 20 years is shown in Figure 11 below.[311] There is a beneficial impact on rates for the remaining years of the evaluation period, as the estimated incremental transmission revenues more than offset the costs of purchasing and maintaining the Transmission Assets. BC Hydro confirmed that all anticipated costs and revenues associated with the Transmission Assets were included in both the ratepayer impact analysis and the NPV analysis.[312]

[307] Exhibit B-1, Application, Business Case, pdf p. 584.
[308] Exhibit B-1, Application, Business Case, pdf p. 586. The assumptions used to calculate the various streams of costs and revenues are found in Exhibits B-8 and B-8-2, BCUC IR 39.0.
[309] Exhibit B-17.
[310] Exhibit B-18, BCUC IR 123.1. BCH provides the assumptions used to calculate this additional revenue of $26 million in Exhibit B-10-1, BCUC IR 9.1.
[311] Exhibit B-18, BCUC IR 108.2. This figure reflects the rate impact analysis through the revenue requirements model, which results in an estimated present value of ratepayers benefits of approximately $14 million.
[312] BCH Final Argument, p. 54.

Figure 11 – Rate Impact Analysis of the Purchase of Transmission Assets



BC Hydro notes that the increased intertie capacity resulting from the Waneta 2017 Transaction and the increased opportunity for OATT sales after the Lease Term could also result in decreased OATT rates.[313]

BC Hydro analyzed the varying degrees of risk attached to each scenario, including the access to transmission, the cost certainty, regulatory risk, as well as the potential for counterparty objections, which has since been eliminated with the BC Hydro-FortisBC Letter. The pros and cons of each scenario are summarized in Table 23 below, based on the redacted version of BC Hydro's discussion and conclusions.

Table 23 – Pros and Cons of Ownership Scenarios

Scenarios	Pros	Cons
1. Buy Tx Assets in 20 years	- preserve the status quo on ownership during the Lease - secures the necessary Tx Assets when required at a potentially discounted price - potential for transmission tariff revenues post-Lease	- [redacted]
2. Buy Tx Assets now	- secures BC Hydro's interests in the Tx Assets now - potential for transmission tariff revenues post-Lease	- [redacted]
3. Get rights to Tx Assets in 20 years	- secures future contractual access to Tx Assets - preserves the regulatory status quo - lowest net present costs	- BC Hydro would be in the unusual position of owning and operating a generation asset that is not directly connected to the BC Hydro system, resulting in uncertainty - Teck may sell the Tx Assets to another entity after the Lease as it

[313] Exhibit B-18, BCUC IR 109.2.

		is not interested in owning those assets then - has no potential for transmission tariff revenues post-Lease

Based on this analysis, BC Hydro concludes that Scenario 1 is preferred: a structure where Teck retains the Transmission Assets for the Lease Term and BC Hydro only purchases the Transmission Assets at the end of the Lease Term (or in case of a Teck default) when BC Hydro requires the assets to deliver the Waneta generation to the BC Hydro system.[314] As noted earlier, BC Hydro will be able to generate additional transmission revenues post-Lease due to the BC Hydro-FortisBC Letter ($26 million) under Scenarios 1 and 2, but BC Hydro notes that Scenario 1 has substantially less risk than Scenario 2.[315]

Position of the parties on the purchase of Transmission Assets

BCOAPO submits:

> Overall, given that access to sufficient capacity on Line 71 is required to ensure the deliverability of the Waneta generation to the BC Hydro system after the Lease Period, BCOAPO views scenarios (i) and (ii) as being preferable to scenario (iii) despite the cost difference. There are times when the public and ratepayer interest are best served by spending more in the short term to reduce the risks going forward.
>
> In terms of BC Hydro's decision to prefer scenario (i) over scenario (ii), because of the redactions to Appendix C-Analysis of Waneta Transmission Options, BCOAPO is not in a position to offer an informed opinion.[316]

CEC is satisfied with the later purchase of the Transmission Assets. Estimating any additional costs for the Transmission Assets above the $20 million is speculative as it will depend on when any such options are exercised, which options are exercised and other factors. BC Hydro provided a range of costs should the Transmission Rights Option be exercised pursuant to the Transmission Facilities Agreement between Teck and FortisBC.[317] CEC considers that the cost of $20 million is relatively minor in the Waneta 2017 Transaction and submits that the Transmission Asset costs should be considered as relatively fixed.[318]

3.8.1 Teck Transmission Options

Line 71 has a capacity of only 370 MW so additional capacity would be needed to deliver the Waneta generation to the BC Hydro system if BC Hydro does not serve the smelter load.

Increased capacity can be achieved through:

- contractual transmission rights to Line 71 along with some potential rights on the FortisBC system;
- ownership rights to Line 71 along with some potential rights on the FortisBC system; or
- construction of additional transmission capacity from Waneta to the BC Hydro system.

[314] Exhibit B-1, Application, Business Case, pdf p. 590.
[315] Ibid.
[316] BCOAPO Final Argument, pp. 18–19.
[317] Exhibit B-8, BCUC IR 41.2.
[318] CEC Final Argument, p. 15.

The Teck Transmission Options refers to Teck's current option to purchase up to 150 MW of capacity rights (or an undivided interest) on Lines 62, 77 and 79, which are FortisBC assets, under the Transmission Facilities Agreement (TFA) between Teck and FBC (Teck Transmission Options). The Teck Transmission Assets, being purchased by BC Hydro for $20 million, include the Teck Transmission Options.[319]

As negotiated in the WTA, purchasing Teck's Transmission Options as part of the Teck Transmission Assets allows BC Hydro to request Teck to exercise any Teck Transmission Option during the Lease Term. However, as discussed below, if there is a cost to Teck to exercise the Teck Transmission Option at BC Hydro's request, then BC Hydro is responsible for the costs associated with exercising the option.[320]

Exercising Teck's Transmission Options would provide BC Hydro with an alternative path to move the Waneta output from Waneta to the BC Hydro system beyond the capacity of Line 71. The costs to do so would be borne by BC Hydro and would be in addition to the $20 million dollars BC Hydro proposes to pay for the Teck Transmission Assets.[321]

If a Teck Transmission Option is about to expire, under the WTA, BC Hydro can direct Teck to extend the time for exercising the option until at least 90 days after the end of the Lease Term. BC Hydro would be responsible for the costs associated with extending the Teck Transmission Option.[322]

In this Application, BC Hydro is not requesting approval for the additional costs associated with exercising or extending the Teck Transmission Options.

BCUC determination

Post-Lease, BC Hydro will need transmission capacity to move the Waneta output from Waneta to the BC Hydro system. Exactly how much transmission capacity will be needed depends on whether BC Hydro serves Teck after the Lease Term but BC Hydro states the capacity will be between 250 MW and 480 MW. The Panel agrees with BC Hydro that transmission rights to Line 71 will be needed, either through ownership or contract, to move the Waneta energy to the BC Hydro system.

In light of the risks related to access to transmission, cost certainty and regulatory risk, as well as the pros and cons of each option, the Panel also agrees with BC Hydro that Scenario 1 is preferable amongst the three considered as there is less regulatory risk than Scenario 2 and more upside than Scenario 3 in terms of additional transmission revenues of approximately $26 million post-Lease. This additional $26 million in net benefit to ratepayers would be incremental to all the NPV results reported previously under the sections dealing with the Waneta 2017 Transaction value during and after the Lease Term. In Section 3.5.7 of this decision, the following scenarios were singled out on the lower bookend values:

- All energy from Waneta is sold to market post-Lease at the Panel Mid-C Price Forecast: NPV -$8 M
- Small Gap, sharp decrease in LRMC - Clean (-40 percent) and a higher discount rate (7 percent): NPV -$14 M.

[319] Teck's Transmission Assets are all the items on the list from (a) to (m) in the Waneta Transmission Agreement in Exhibit B-12, Attachment 2, Schedule A.
[320] Exhibit B-12, Attachment 2 (Waneta Transmission Agreement), Section 3.4(b), p. 21.
[321] Exhibit B-12, Attachment 2, Schedule A, Section 3.4, p. 21.
[322] Ibid., Section 3.4(a), p. 21.

Therefore, purely from an NPV analysis perspective, the Panel notes that these scenarios would be less likely to result in net costs when the additional transmission revenues are taken into account.

The Panel notes that few of the interveners made submissions directly related to the purchase of the Transmission Assets, and those who did were either satisfied with the later purchase of the assets (CEC) or preferred Scenarios 1 and 2 over 3 despite the cost difference (BCOAPO).

Finally, BC Hydro confirms that Line 71 is part of the Transmission Assets that would be purchased by BC Hydro for $20 million at the end of the Lease Term, and that all anticipated costs and revenues associated with those assets were included in both the ratepayer impact analysis and the NPV analysis.[323] **Therefore, the Panel accepts that the capital expenditure of $20 million for the Transmission Assets (at the time of purchase) warrants acceptance pursuant to section 44.2(3)(a) of the UCA.**

3.9 Impact on others

3.9.1 Impact on FortisBC's ratepayers

Before moving on to other public interest considerations, the Panel notes that, as pointed out by its counsel during oral argumenta, FortisBC itself is a BC Hydro ratepayer which will benefit from the net present value impact of the Waneta 2017 Transaction on rates, which in turn will flow through to the benefit of FortisBC's ratepayers. That, coupled with the certainty and stability provided as a result of the February 2018 agreement between FortisBC and BC Hydro granting FortisBC continued access to Line 71 following its sale from Teck to BC Hydro, results in added benefit to FortisBC and its electricity ratepayers in the vicinity.[324]

3.9.2 Impact on the local community

In determining the public interest, the Panel has taken into account not only the interest of ratepayers but also that of the local community that may be affected by the Waneta 2017 Transaction. In a small community like Trail, Teck's smelter operations loom large. Teck has been operating in the area for 64 years since it first constructed the Waneta Dam for its own use in 1954. Not surprisingly, many in the area rely on Teck's continued operations in terms of prospects of employment, investment and prosperity. Hence, six interveners from the area participated in this proceeding. In addition, several local area residents and business leaders attended the community input session in Castlegar to provide their input to the Panel. The Panel appreciates the insights they provided.

Although some of the local area interveners express nervousness and trepidation at the idea of the Waneta 2017 Transaction as possibly suggesting the beginning of the end of Teck's involvement in the community, they recognize that as a business owner, Teck has the right to sell its assets to anyone at any time. From a community perspective, BC Hydro as a Crown corporation is probably as good as, if not better than, any other third-party purchaser in terms of providing a continued electricity supply at reasonable cost to Teck that would enable the Teck smelter to remain in operation for at least 20 to 30 years and possibly longer. On that basis, the local area interveners have not raised any appreciable objections to the Waneta 2017 Transaction that would prevent the

[323] Oral Hearing Transcript Volume 4, pp. 199, 205.
[324] Oral Hearing Transcript Volume 4, p. 268.

Panel from finding, as it does, that it is consistent with the local community interest to approve the Waneta 2017 Transaction.

3.9.3 First Nations impacts

Another group whose interests the Panel has taken into account in assessing the public interest are Indigenous groups. As BC Hydro acknowledges when it filed the Application on October 30, 2017:

> BC Hydro recognizes its responsibility to ensure that proceeding with the Waneta 2017 Transaction is consistent with the honour of the Crown. BC Hydro will only complete the Waneta 2017 Transaction if it is honourable to do so.[325]

Details of the BC Hydro's Aboriginal engagements efforts including steps taken to satisfy itself that proceeding with the transaction is honourable are set out in Chapter 5 of the Application.

BC Hydro summarizes its position in these terms in the Application:

> BC Hydro is dedicated to consulting with and, if appropriate, accommodating Aboriginal groups in a manner that meets the Crown's obligations having regard to the asserted Aboriginal rights and title and the extent of any adverse effects of BC Hydro's contemplated decisions on their claims. BC Hydro is also committed to meeting commitments made in its Statement of Indigenous Principles. Therefore, notwithstanding BC Hydro's view that this transaction does not trigger the legal duty to consult with the Okanagan, Secwepemc or Ktunxaxa Nations, or their individual member First Nations, BC Hydro has provided information to First Nations about the transaction, invited comments and questions, and will continue to consider and respond to such comments and issues as are raised in the engagement process described above and/or in the Commission's regulatory process.[326]

During oral arguments, counsel for BC Hydro highlighted the following:

> The legal obligation to consult hasn't arisen, but nevertheless BC Hydro has engaged with First Nations regarding this transaction and the First Nations that is has engaged with are those whose consultative boundaries include the Waneta facilities. Those engagement activities are described in Chapter 5 of the application and they were updated in Exhibit B-23, which was filed on March 8th. In summary, BC Hydro has provided information, including the application of cure, to all the First Nations who wanted it, and offered to meet with all who wanted to meet and met with some who didn't want to meet, and where we are today is that no First Nation has intervened in this proceeding and no intervener has challenged BC Hydro's position on this issue with respect to obligation to consult. In other words, nobody's raised any evidence or submissions on that point.[327]

No First Nations has intervened in this proceeding or notified the BCUC of any objections to this Waneta 2017 Transaction as a result of BC Hydro's engagement efforts. This is in stark contrast to the Waneta 2010 Transaction where a number of First Nations actively intervened in the proceeding. While silence may not necessarily signify assent, the fact that no First Nations has chosen to participate in this proceeding suggests to the Panel that it is reasonable to conclude that the current transaction poses no additional concern to First Nations insofar as it cements the transfer of the total ownership interest in Waneta from a current majority

[325] October 30, 2017 BC Hydro letter to BCUC, p. 6.
[326] Exhibit B-1, Chapter 5, section 5.6, p. 5-9, lines 3–13.
[327] Oral Hearing Transcript Volume 4, pp. 222–223.

owner (Teck) to a minority owner (BC Hydro). In such a scenario, it is hard to imagine there would be any additional adverse effects flowing to potentially affected First Nations that would trigger the need for consultation and accommodation in the legal sense. In these circumstances, the Panel agrees with BC Hydro that there is no evidence or submissions to the effect that proceeding with the Waneta 2017 Transaction would be inconsistent with the honour of the Crown or contrary to public interest.

3.10 British Columbia's energy objectives

Section 2 of the CEA sets out British Columbia's energy objectives, which are reproduced in Table 24 below along with a commentary from BC Hydro.[328] BC Hydro submits that the Waneta 2017 Transaction advances most of the British Columbia energy objectives (nine of 16) or is, at worst, neutral to them (seven of 16) and does not undermine or run counter to any of them.[329]

Table 24 – British Columbia's Energy Objectives

(a) to achieve electricity self-sufficiency	The acquisition of the two-thirds interest of Waneta that is at the heart of the transaction serves, or at worst is consistent with the self-sufficiency objective. The BCUC came to this same conclusion, under a substantially identical regulatory framework (on this issue) in its 2010 decision approving the acquisition by BC Hydro of a one-third interest in Waneta.
(b) to take demand-side measures and to conserve energy, including the objective of the authority reducing its expected increase in demand for electricity by the year 2020 by at least 66 percent	The Waneta 2017 Transaction neither serves nor impedes this objective. That is, the Waneta 2017 Transaction will have no effect on the relative priorities of resources, including demand-side measures, in BC Hydro's future resource planning.
(c) to generate at least 93 percent of the electricity in British Columbia, other than electricity to serve demand from facilities that liquefy natural gas for export by ship, from clean or renewable resources and to build the infrastructure necessary to transmit that electricity	The Waneta 2017 Transaction serves this objective insofar as it will ensure that Waneta and associated clean and renewable generation and transmission assets will remain available, indefinitely, to serve British Columbia loads. The BCUC came to the same conclusion in its 2010 Waneta Decision.
(d) to use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources	The Waneta 2017 Transaction neither serves nor impedes this objective.
(e) to ensure the authority's ratepayers receive the benefits of the heritage assets and to ensure the benefits of the heritage contract under the *BC Hydro Public Power Legacy and Heritage Contract Act* continue to accrue to the authority's ratepayers	The "heritage assets" include BC Hydro's interest in Waneta (section 1 of the *Clean Energy Act*) and so the Waneta 2017 Transaction serves this provincial energy objective.
(f) to ensure the authority's rates remain among the most competitive of rates charged by public utilities in North America	BC Hydro has entered into the Waneta 2017 Transaction primarily because of its economic value to ratepayers, and the fact that it will help maintain BC Hydro's low rates. Thus, this objective is also served by the transaction.
(g) to reduce BC greenhouse gas [GHG] emissions	Completion of the transaction will serve this objective insofar as it decreases the likelihood of Waneta being

[328] Exhibit B-1, Application, Section 4.9.2, pdf p. 113–117.
[329] BCH Final Argument, p. 60.

	decommissioned if and when it is no longer needed by Teck to serve the Trail smelter load and is thus available to displace more GHG-intense resources.
(h) to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia	The Waneta 2017 Transaction neither serves nor impedes this objective.
(i) to encourage communities to reduce greenhouse gas emissions and use energy efficiently	The Waneta 2017 Transaction neither serves nor impedes this objective.
(j) to reduce waste by encouraging the use of waste heat, biogas and biomass	The Waneta 2017 Transaction neither serves nor impedes this objective.
(k) encourage economic development and the creation and retention of jobs	The Waneta 2017 Transaction serves this objective insofar as it results in the full public ownership of a valuable resource that has made a meaningful contribution to the economic well-being of the West Kootenay region for decades.
(l) to foster the development of first nation and rural communities through the use and development of clean or renewable resources	The Waneta 2017 Transaction serves this objective for the same reason it serves objective (k) regarding economic development.
(m) to maximize the value, including the incremental value of the resources being clean or renewable resources, of British Columbia's generation and transmission assets for the benefit of British Columbia	Insofar as the CPA already results in the value of the resources to which it is applicable being maximized, including Waneta, this objective is neither served nor impeded by the Waneta 2017 Transaction.
(n) to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;	As noted, Waneta is a "clean or renewable resource" under the *Clean Energy Act*. The Waneta 2017 Transaction serves this provincial objective by putting Waneta into BC Hydro's hands for ultimate use as a resource that will either assist BC Hydro in meeting its domestic load-serving obligations or will generate incremental export revenues.
(o) to achieve British Columbia's energy objectives without the use of nuclear power	The Waneta 2017 Transaction serves this provincial energy objective by adding to BC Hydro's resource portfolio and load-serving ability through a non-nuclear resource.
(p) to ensure the commission, under the *Utilities Commission Act*, continues to regulate the authority with respect to domestic rates but not with respect to expenditures for export, except as provided by this Act.	The Waneta 2017 Transaction neither serves nor impedes this objective.

Panel discussion

The Panel finds that the proposed expenditure advances nine of sixteen energy objectives, and does not run counter to any of them.

4.0 Teck Wheeling Agreement rate order

BC Hydro seeks approval of the TWA, which provides for the provision of regulated services to Teck, under sections 58 to 61 of the UCA. All regulated service provisions, including the provision of ancillary services, are now contained in the TWA. Thus, separate BCUC approval of the Teck Interconnection Agreement is no longer

required.[330] The TWA provides for the provision of ancillary services similar to the type of ancillary services that BC Hydro provides under its OATT.

In addition to the TWA, BC Hydro had originally applied for BCUC approval of the Teck Interconnection Agreement (TIA). However, in subsequent negotiations with Teck all regulated service provisions of the TIA, including the provision of ancillary services, were moved to the TWA. Thus, separate BCUC approval of the TIA is no longer required, and BC Hydro withdrew its application for approval of the TIA.[331]

Teck built Line 71 over 50 years ago to access US wholesale electricity markets for its own merchant purpose, namely to import and export electricity when it was economical to do so. BC Hydro explains that Teck's construction, ownership and operation of Line 71 for its own commercial purposes and not for public utility purposes is the basis for its historical access to US wholesale power markets on an unregulated basis.[332] Teck is also a transmission service provider, insofar as it allows third parties to use its surplus capacity on Line 71. Teck's provision of transmission services is unregulated by virtue of its March 29, 1996 exemption order.[333]

4.1 Rates sections of the UCA

BC Hydro seeks BCUC approval of the TWA under sections 58 to 61 of the UCA, section 59 (Discrimination in rates) and section 60 (Setting of rates) are the most relevant to the order being sought by BC Hydro. The following sections lay out the tests that will be considered by the Panel in this section.

Discrimination in rates

59 (1) A public utility must not make, demand or receive

(a)an unjust, unreasonable, unduly discriminatory or unduly preferential rate for a service provided by it in British Columbia….

(2) A public utility must not

(a) as to rate or service, subject any person or locality, or a particular description of traffic, to an undue prejudice or disadvantage, or

(b) extend to any person a form of agreement, a rule or a facility or privilege, unless the agreement, rule, facility or privilege is regularly and uniformly extended to all persons under substantially similar circumstances and conditions for service of the same description……

(4) It is a question of fact, of which the commission is the sole judge,

(a) whether a rate is unjust or unreasonable,

(b) whether, in any case, there is undue discrimination, preference, prejudice or disadvantage in respect of a rate or service …

(5) In this section, a rate is "unjust" or "unreasonable" if the rate is

(a) more than a fair and reasonable charge for service of the nature and quality provided by the utility,

[330] Initially, BC Hydro had envisioned that the Teck Interconnection Agreement would include the ancillary services.
[331] Initially, BC Hydro had envisioned that the Teck Interconnection Agreement would include the ancillary services.
[332] Exhibit B-8-2, BCUC IR 53.1.
[333] Exhibit B-8-2, BCUC IR 53.5; the exemption order is attached to Exhibit B-8-2, BCUC IR 60.4.

(b) insufficient to yield a fair and reasonable compensation for the service provided by the utility, or a fair and reasonable return on the appraised value of its property, or

(c) unjust and unreasonable for any other reason.

Setting of Rates

60 (1) In setting a rate under this Act

(a) the commission must consider all matters that it considers proper and relevant affecting the rate,

(b) the commission must have due regard to the setting of a rate that

(i) is not unjust or unreasonable within the meaning of section 59,

(ii) provides to the public utility for which the rate is set a fair and reasonable return on any expenditure made by it to reduce energy demands, and

(iii) encourages public utilities to increase efficiency, reduce costs and enhance performance,

4.2 Teck Wheeling Agreement

The proposed TWA will have BC Hydro provide wheeling service to Teck for imports up to 300 MW of power to serve the smelter's load, at a rate of $1/month,[334] plus a share of eligible operating costs based on use, essentially grandfathering Teck's historical rights to self-supply ancillary services and access US markets.[335] The wheeling service to Teck will have a priority over the services BC Hydro provides under its OATT.[336]

These aspects of the TWA, which are further discussed below, make it an exception to BC Hydro's obligations under the OATT. This is acknowledged in Section 1.8 of the TWA:

> **1.8 Effect of this Agreement**. The Parties acknowledge that BC Hydro has obligations under the OATT to provide transparent non-discriminatory transmission service and that **the obligation of BC Hydro to provide the Wheeling Service under this Agreement represents an exception to its obligations under the OATT** that is justified because it serves the public interest as determined by the BCUC. Accordingly, the Parties acknowledge that BC Hydro will provide the Wheeling Service, but will attempt to do so in a manner that does not interfere with the rights of its customers to receive service under the OATT. The Parties also acknowledge that BC Hydro will publish (including in the system(s) BC Hydro uses to advise third parties of the amount of transmission capacity available for exports and imports of power) any business practices that it develops specific to the Wheeling Service to be provided pursuant to this Agreement. **For greater certainty, to the extent of any inconsistency between BC Hydro's obligations as a service provider under the OATT and business practices developed thereto, and its obligations to provide the Wheeling Service under this Agreement, BC Hydro's obligations under this Agreement will prevail.[337]**

The 300 MW of import rights was tabled by Teck as a condition of the sale for the Waneta Assets. Teck's current load is approximately 226 MW and BC Hydro assumes that 300 MW was chosen by Teck as a reasonable growth number and would allow other entities to use the remaining capacity up to the 370 MW of Line 71.[338]

[334] Exhibit B-12, pdf p. 97, section 3.1 of the attachment.
[335] Exhibit B-1, pdf p 32, lines 12–14, pdf p. 86, lines 14–15.
[336] BCH Final Argument, para. 141, p. 57.
[337] Exhibit B-12, Attachment 2, TWA Schedule B, Section 1.8, p. 85, emphasis added.
[338] Exhibit B-8-2, BCUC IR 38.1; Exhibit B-18, BCUC IR 106.1.

In response to an IR, BC Hydro stated that:

> Under the Waneta 2017 Transaction BC Hydro's access to U.S. wholesale power markets will be unchanged relative to the status quo until the end of the Lease Period. After the Lease Period Line 71 will be completely integrated into BC Hydro's system, and will be subject to its OATT in all respects but one, namely the Teck Wheeling Agreement, and the rights under the Teck Wheeling Agreement will be available to Teck solely to import electricity to serve its smelter load. In contrast, Teck currently has an unfettered right to use Line 71 for any purpose, including the provision of unregulated transmission services to third parties, including BC Hydro. In this sense, the Waneta 2017 Transaction will not maintain the status quo regarding the use of Line 71 generally, but rather regularize it within the larger OATT framework and BC Hydro's transmission service obligations after the Lease Period.[339]

BC Hydro noted that the increased intertie capacity resulting from the Waneta 2017 Transaction and the increased opportunity for OATT sales after the Lease Term could result in decreased OATT rates.[340]

Furthermore, "to the extent Teck nominates less than 300 MW, in accordance with the TWA, the transmission capacity not nominated by Teck would need to be made available by BC Hydro in accordance with the terms of its OATT."[341]

4.2.1 Wheeling charges

BC Hydro states it will offer wheeling services to Teck at no cost, other than a share of eligible operating costs based on use.[342] However, in Section 3.1 of the TWA, BC Hydro describes the wheeling charges as follows:

> 3.1 **Wheeling Charge.** The charge applicable to the Wheeling Service (the "**Wheeling Charge**") shall be equal to $1/month during the Wheeling Term plus Teck's O&M Share.

Section 3.2 of the TWA describes the Teck's O&M share and the method to calculate such share.

Under BC Hydro's OATT, Schedule 01 for Point-to-Point Transmission Service, provides the rate for long-term firm service:[343]

[339] Exhibit B-8-2, BCUC IR 63.5.
[340] Exhibit B-18, BCUC IR 109.2.
[341] Exhibit B-18, BCUC IR 109.4.
[342] Exhibit B-1, pdf p. 86.
[343] Accessed on July 6, 2018: https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/tariff-filings/open-access-transmission-tariff/schedule-01-oatt.pdf.

Schedule 01

Point-To-Point Transmission Service

Availability	For transmission of electricity on a firm and non-firm basis from one or more Point(s) of Receipt (POR) to one or more Point(s) of Delivery (POD).
Rate for Long-Term Firm Service	The Reserved Capacity Charge for the Long-Term Firm Service Rate will be up to a maximum price as set out below except where the POD is a point of interconnection between the Transmission System and the transmission system of FortisBC Inc., in which case the rate shall be zero ($0.00). The Maximum Reserved Capacity Charge is $70,555/MW of reserved capacity per year to be invoiced monthly. Reserved Capacity Billing Demand The Reserved Capacity Billing Demand is determined for each POR(s), POD(s) pair. The Reserved Capacity for each pair of POR(s) and POD(s) will be the maximum non-coincident sum of the designated POR(s) and POD(s) included in the pair.

In the Waneta Business Case, BC Hydro states that the BC Hydro OATT is approximately $8/MW/hr ($2017, with equivalent escalation to BC Hydro electricity rates) for firm transmission.[344] Based on there being 8,760 hours in a year, the cost under OATT for up to 300 MW of wheeling services as provided for under the TWA would be a maximum of $21 million per year ($8 * 8,760 *300 MW), equivalent to an average of $1.75 million per month.

BC Hydro was asked to quantify the cost of opportunity of providing 300 MW of import wheeling services to Teck at no cost. BC Hydro explained that, in the Business Case, no opportunity cost was allocated to the 300 MW import wheeling services as it was not an option to purchase the Transmission Assets unencumbered. Without this encumbrance, the upper bound of the opportunity cost would be approximately $98 million based on a long-term BC Hydro OATT firm reservation for 300 MW.[345] BCOAPO asked BC Hydro to clarify the basis on which the $98 million are being determined and BC Hydro confirmed that one of the assumptions was using a firm hourly wheeling reservation rate of $8.02/MW.[346]

Therefore, BC Hydro's provision of wheeling service to Teck for only $1/month or $12/year for up to 300 MW is not offered pursuant to the OATT rate.

However, the $98 million estimate did not take into consideration costs that Teck is obligated to pay to BC Hydro under the TWA and assumes BC Hydro's incremental costs of providing the wheeling service are zero.[347] Based on a Teck Nominated Demand of 300 MW over the entire 20 years of post-Lease Term, Teck's share of O&M costs would be approximately $4.5 million (calculated per Section 3.1 of the TWA). Taking into account these O&M payments by Teck, this upper bound limit would be reduced to $94 million.[348]

[344] Exhibit B-1, pdf p. 584.
[345] Exhibit B-8-2, BCUC IR 55.3.
[346] Exhibit B-20, BCOAPO IR 2.3.1.
[347] Exhibit B-8-2, BCUC IR 55.3.
[348] Exhibit B-18, BCUC IR 107.4.1.

In contrast, BC Hydro confirms that OATT customers do not pay a specific charge for the operation and maintenance costs related to transmission facilities; rather, these costs are incorporated into the OATT rate. Since the TWA includes specific charges for Teck to cover operations and maintenance costs, this represents another difference between the TWA and the OATT.[349]

4.2.2 Teck priority over other OATT customers[350]

As stated in the Application:[351]

- The schedule and curtailment priority for Teck's imports under the TWA will be equivalent to its (import) scheduling rights under the Line 71 Agreement at the end of the Lease Term; and
- The scheduling practices for Teck's imports under the TWA will also be equivalent to those applicable under the Line 71 Agreement at the end of the Lease Term.

Position of the parties on the Teck Wheeling Agreement

BC Hydro submits that under the Waneta 2017 Transaction, the status quo regarding Line 71 will continue during the Lease Term. After the Lease Term, and pursuant to the TWA, BC Hydro will own Line 71 and will provide a wheeling service to Teck that continues to have priority over the services BC Hydro provides under its OATT. However, relative to the status quo currently and during the Lease Term, there will be a significant reduction in the priority status afforded to Line 71 wheeling services:

(a) the priority service to Teck will only be for imports, and not for both imports and exports as is currently the case;

(b) the import priority service will only be available to Teck for the purpose of serving its load, unlike the current circumstances in which it is available to Teck for all uses; and

(c) the service will be restricted to no more than 300 MW, compared to as much as 370 MW as is currently the case.

It has been recognized across North America for over 20 years that it is generally preferable from a public interest perspective that wheeling services be provided under transparent and non-discriminatory tariffs. BC Hydro's OATT reflects those principles. Under the Waneta 2017 Transaction, these OATT principles are significantly advanced, relative to the *status quo*. In BC Hydro's submission, these public interest benefits of the Waneta 2017 Transaction should be expressly recognized in any reasons that accompany the requested orders (assuming they are forthcoming).[352]

BCOAPO submits that the TWA (for which BC Hydro is seeking rate order approval) is an integral part of the overall Waneta 2017 Transaction and it must be considered in that context.[353] BCOAPO agrees that the TWA involves the provision of regulated services and requires approval by the BCUC. Furthermore, should the expenditure schedule be accepted by the BCUC, BCOAPO supports the approval of the agreement.[354]

[349] Exhibit B-18, BCUC IR 107.5.
[350] BCH Final Argument, para. 141, p. 57.
[351] Exhibit B-1, pdf p. 86.
[352] BCH Final Argument, pp. 57–58.
[353] BCOAPO Final Argument, p. 8.
[354] BCOAPO Final Argument, p. 5.

Regarding the transmission and OATT issues, BCSEA-SCBC is satisfied that BC Hydro's requested remedies are appropriate, assuming the expenditure schedule is accepted.[355]

CEC submits:

> BC Hydro and Teck entered into a Wheeling Agreement which will establish BC Hydro's obligations to deliver electricity purchased by Teck in the US from the BC US border to Teck's industrial load in Trail consistent with Teck's Line 71 import scheduling rights and becomes effective at the expiry or termination of the Lease. The intention is to maintain Teck's long-standing right to import electricity to serve its Trail smelter load when economic to do so.
>
> The CEC submits that the Wheeling Agreement is acceptable.[356]

FBC submits:

> In February, 2018, FBC entered into separate letter agreements with Teck and BC Hydro concerning the continued use by FBC of the Line 71 transmission line between Waneta and the U.S. border (by which FBC has historically had access to US wholesale electricity markets). These letter agreements provide stability and certainty in terms of FBC's access to Line 71 during the term of the Lease, should the Waneta 2017 Transaction be completed.
>
> For both of these reasons,[357] FBC supports the completion of the Waneta 2017 Transaction and related agreements.[358]

BCUC determination

BC Hydro has acknowledged that, after the Lease Term, Line 71 will be completely integrated into BC Hydro's system and will be subject to its OATT. However, BC Hydro is requesting that the BCUC approve the TWA, which differs from OATT in several respects. The Panel understands that the areas of non-compliance with OATT lie with the priority service offered to Teck as well as the wheeling charges, which are heavily discounted compared to the OATT for firm reservation.

Since we are asked to approve the TWA as a rate under sections 58 to 61 of the UCA, we will first look at the test under those sections that the TWA must meet.

Section 59(1) states that "a public utility must not make, demand or receive (a) an unjust, unreasonable, unduly discriminatory or unduly preferential rate for a service provided by it in British Columbia" and section 59(2) states that "a public utility must not (a) as a rate or service, subject any person or locality, or a particular description of traffic, to an undue prejudice or disadvantage, or (b) extend to any person a form of agreement, a rule or a facility or privilege, …" Section 59(5) further states that a rate is unjust or unreasonable if it is:

> (a) more than a fair and reasonable charge for service of the nature and quality provided by the utility,

[355] BCSEA-SCBC Final Argument, p. 19.
[356] CEC Final Argument, p. 46.
[357] In its final argument, FortisBC submits the other reason is that BC Hydro will realize financial benefits which will have a net positive impact on the rates of its customers, immediately through the lease payments from Teck and after the Lease period as the energy and capacity from the Waneta plant becomes available to BC Hydro for load-serving and/or export.
[358] FBC Final Argument, pp. 1–2.

(b) insufficient to yield a fair and reasonable compensation for the service provided by the utility, or a fair and reasonable return on the appraised value of its property, or

(c) unjust and unreasonable for any other reason.

On its face, it appears that the TWA does in fact discriminate amongst BC Hydro's transmission service customers by offering a preferential treatment to Teck. However, is this sufficiently "unjust, unreasonable, unduly discriminatory or unduly preferential" as to offend the provisions of Section 59(1)? In that regard, the Panel considers that, while there may be certain aspects of the TWA that discriminate among BC Hydro transmission service customers and offers preferential treatment to Teck, there are broader considerations as to whether the proposed rate is "unjust, unreasonable, unduly discriminatory or unduly preferential." First, the Panel has previously found the purchase of the two-thirds Waneta interest to be in the public interest, and that it would most likely lead to downward pressure on rates and advance provincial energy policy objectives. Since the TWA is a condition precedent of the Waneta 2017 Transaction, it follows that for these benefits to be realized, the TWA would have to be approved.

Second, the Panel agrees with BC Hydro that overall, the Waneta 2017 Transaction will result in advancing OATT principles for Line 71 as a minimum of 70 MW of imports rights and 370 MW of export rights will be brought under OATT, which is more than under the status quo, where Line 71 is fully unregulated. The Panel recognizes that the increased intertie capacity resulting from the Waneta 2017 Transaction and the increased opportunity for OATT sales after the Lease Term could result in decreased OATT rates for all other BC Hydro's OATT customers. In the Panel's view, these are mitigating factors in support of the TWA.

Third, other than FortisBC's initial concerns that the Waneta 2017 Transaction might have upset the arrangements between FortisBC and Teck under the 1987 Letter to the detriment of FortisBC's ratepayers, concerns that have since subsided due to an agreement between BC Hydro and FortisBC and one between FortisBC and Teck, the Panel notes the broad Intervener support for the TWA approval: BCOAPO and BCSEA-SCBC both submit that if the BCUC accepts the expenditures schedules, they support the TWA; CEC also finds the TWA acceptable; and FortisBC supports the Waneta 2017 Transaction and the related agreements.

The Panel has previously noted the unique nature of the Waneta 2017 Transaction. Given the aforementioned benefits that the TWA brings to OATT and other BC Hydro customers, **the Panel finds that the proposed rate is not "unjust, unreasonable, unduly discriminatory or unduly preferential," particularly insofar as if effectively grandfathers Teck's historical rights associated with its original construction and operation of Line 71 for merchant purposes, and approves the TWA under sections 58 to 61 of the UCA.**

5.0 Accounting orders

BC Hydro seeks an order approving the following three adjustments to the Non-Heritage Deferral Account (NHDA):[359]

1. Deferral of its fiscal 2019 Lease revenues arising from the Waneta 2017 Transaction;
2. Exclusion of the variance between forecast and actual water rentals arising from the Waneta 2017 Transaction; and
3. Deferral of the revenue recognized by BC Hydro as a result of capital additions at Waneta made by Teck during the Lease Term.

Deferral of fiscal 2019 lease revenues

BC Hydro is seeking an order to allow it to defer its fiscal 2019 Lease revenues arising from the Waneta 2017 Transaction to the NHDA. BC Hydro submits that the F2017-F2019 RRA did not include the forecast Lease revenue from Teck for fiscal 2019 because "the Sale Notice to BC Hydro was not delivered until well after [the F2017-F2019 RRA was filed]."[360] The Waneta 2017 Transaction is anticipated to close by August 1, 2018, which will result in Teck beginning its Lease payment to BC Hydro in fiscal 2019, which is the final year of its current three-year revenue requirement (F2017-F2019).[361]

The fiscal 2019 forecast Lease revenue, operating expenses, finance charges and amortization expenses arising from the Waneta 2017 Transaction are not included in the F2019 revenue requirement. In the absence of a regulatory accounting order, the approximately $49 million in fiscal 2019 Lease revenue and the estimated $240,000 in operating expenses would be to the account of the shareholder, and the finance charges and amortization of capital assets would be deferred to the Total Finance Charges Regulatory Account and Amortization of Capital Additions Regulatory Account, respectively, for recovery in rates in the subsequent test period.[362] BC Hydro submitted that it is not requesting deferral treatment of the F2019 operating expenses, and thus it would be to the account of the shareholder.[363]

Exclusion of the variance between forecast and actual water rentals associated with Teck's interest in Waneta

BC Hydro is seeking an order, applicable during the Lease Term, to allow it to exclude the variance between forecast and actual water rentals in a given year arising from the Waneta 2017 Transaction from the water rental variances that are currently deferred to the NHDA.

The accounting for the Waneta Lease Agreement is within the scope of IFRS 15 "Revenue from Contracts with Customers." Under the terms of the COPOA, Teck is required to pay operating and sustaining capital costs to BC Hydro with respect to its two-thirds interest in Waneta.[364] Under IFRS 15, BC Hydro is required to recognize these payments as "revenue" and Teck's operating costs and sustaining capital costs associated with its two-thirds interest in Waneta as expenses and capital expenditures of BC Hydro, respectively.

[359] Exhibit B-1, pp. 1-17–1-20.
[360] Exhibit B-1, p. 1-18.
[361] BCH Reply Argument, para. 7.
[362] Exhibit B-1, p. 1-18; Exhibit B-8, BCUC IR 57.4, 57.4.3.
[363] Exhibit B-8, BCUC IR 57.4.
[364] Exhibit B-1, p. 1-18.

Teck's water rentals are classified as operating costs, which would be recognized by BC Hydro as revenue along with an offsetting and equal expense. However, the variance between BC Hydro's forecast and actual water rentals are already deferred to the NHDA, which would include the variance associated with Teck's two-third interest in Waneta.[365]

Deferral of the revenue resulting from capital additions made by Teck associated with Teck's interest in Waneta

BC Hydro is seeking an order, applicable during the Lease Term, to allow it to defer to the NHDA the revenue associated with capital expenditures made by Teck with respect to Teck's two-third interest in Waneta. BC Hydro submits that it "expects the annual incremental revenue and offsetting amortization will be relatively modest amounts – not more than a few million dollars in any given year compared to a revenue requirement in the order of $6 billion."[366]

Without the order, capital expenditures at Waneta made by Teck during the Lease Term would be recognized by BC Hydro as capital additions and revenue in the year of each addition.[367] However the amount expensed by BC Hydro each year would be the amortization of the capital additions. This would result in a timing difference between the recognition of the revenues and the recognition of the expenses, which would impact intergenerational equity. Furthermore, because the revenue variances would not be deferred, it would be to the account of the shareholder, but the capital additions variances would be deferred and to the account of ratepayers via the Amortization of Capital Additions Regulatory Account.

5.1 Adjustments to the Non-Heritage Deferral Account versus a new regulatory account

BC Hydro submitted that it considers the NHDA to be the preferred account for the proposed deferrals because the proposed deferrals are limited to revenue variances only, deferral to the NHDA is consistent with the treatment of other revenue related variances deferred to the NHDA, there are no other existing regulatory accounts that are suitable and it limits the number of regulatory accounts as the NHDA already exists and has an approved recovery mechanism.[368]

With respect to transparency, BC Hydro submits that "[t]he elements of the NHDA are reported in BC Hydro's Annual Deferral Accounts Report" filed with the BCUC, and "any changes to BC Hydro's regulatory accounts as a result of Commission orders in this proceeding would be reflected in these annual reports."[369]

Regarding the intergenerational equity concerns associated with BC Hydro's proposal to defer to the NHDA the revenue from Teck's capital expenditures at Waneta, BC Hydro recognizes that the amortization period of the deferred revenue and the capital expenditures will not be identical, and would therefore not fully mitigate the intergenerational equity concern, but it would reduce the concern compared to not deferring the revenue.[370]

[365] Exhibit B-1, p. 1-19.
[366] Exhibit B-1, p. 1-19.
[367] Exhibit B-8, BCUC IR 57.4.2.
[368] Exhibit B-8, BCUC IR 57.3; Exhibit B-18, BCUC IR 119.6.
[369] Exhibit B-18, BCUC IR 119.1.
[370] Exhibit B-20, CEC IR 51.1.

Further BC Hydro submitted that their proposed approach "may result in a shorter recovery period for revenues that BC Hydro will be required to recognize related to capital expenditures incurred by Teck."[371]

With respect to establishing a new regulatory account as an alternative to using the NHDA to capture only the deferrals proposed by BC Hydro, BC Hydro considers the main issue with this approach is determining an appropriate recovery mechanism.[372] For example, some variances may be appropriate to amortize over the next test period, while revenues related to Teck's capital expenditures may be appropriately amortized over the useful life of the related assets, and different assets may be added over different years and have different useful lives.[373] Furthermore, since the amounts proposed for deferral are limited to revenue variances, BC Hydro submit that deferral to a different regulatory account is not necessary because "these revenue variances can be tracked and reported separately."[374]

Position of the parties on the accounting orders

CEC and BCOAPO were the only interveners who addressed the proposed accounting orders in their final arguments, and did not raise any issues with BC Hydro's proposal.

CEC submits it is "satisfied that the issue of intergenerational inequity is not sufficiently significant to recommend modifications [to BC Hydro's proposed accounting orders]."[375]

BCOAPO agrees with BC Hydro's proposed accounting orders and submits that "[i]n BCOAPO's view, the objective of these accounting orders is to better match the timing of cost and benefits from the Transaction and to ensure that benefits intended to accrue to ratepayers actually do so," and it appreciates "BC Hydro making the effort to ensure the benefits accrue appropriately."[376]

BCUC determination

The Panel finds it is in the interest of BC Hydro's ratepayers for BC Hydro to:

- defer its fiscal 2019 Lease revenues arising from the Waneta 2017 Transaction and the revenue associated with capital expenditures made by Teck with respect to Teck's two-third interest in Waneta during the Lease Term to a regulatory account; and
- exclude the variance between forecast and actual water rentals in a given year arising from the Waneta 2017 Transaction from the water rental variances that are currently deferred to the NHDA during the Lease Term.

With respect to deferring the items proposed to the NHDA, the Panel agrees with BC Hydro on the following points:

- it does not currently have another regulatory account that is suitable for the deferrals that it is proposing in the Application;
- the NHDA already has a recovery mechanism;

[371] Exhibit B-9, CEC IR 6.3.
[372] Exhibit B-18, BCUC IR 119.6.
[373] Exhibit B-9, CEC IR 6.3.
[374] Exhibit B-8, BCUC IR 57.3.
[375] BCOAPO Final Argument, p. 6; CEC Final Argument, para. 310.
[376] BCOAPO Final Argument, p. 6.

- by deferring to the NHDA it limits the number of new regulatory accounts; and
- the amounts proposed for deferral each year are expected to be relatively small compared to BC Hydro's total annual revenue.

Although the Panel acknowledges that the recovery mechanism of the NHDA would not eliminate the intergenerational equity concern, it would reduce the concern compared to the alternative of not deferring the revenue at all. Alternatively, a new regulatory account could be established; however, the Panel is of the view that any recovery mechanism proposed for a new regulatory account would not completely eliminate the intergenerational equity concern due to the different characteristics of the various items that would be placed in the account. **Therefore, the accounting orders sought by BC Hydro in the Application are approved as filed.**

6.0 BCUC conclusions and recommendations

In the determinations set out above, the Panel has already made a number of determinations which, for brevity's sake, it will not repeat here. Rather, the Panel will focus its analysis here on those important public interest considerations which it must take into account pursuant to section 44.2(5.1) of the UCA in determining whether to accept the expenditure schedule filed by BC Hydro.

6.1 Impact on ratepayers

In assessing whether to accept the proposed expenditure schedule as being in the public interest under section 44.2(5.1) of the UCA, the first and important factor we must consider is the impact of the transaction on "persons in British Columbia who receive or may receive service from the authority" since they will ultimately bear the costs and risks of the transaction, if approved. As noted by counsel for CEC during the oral argument phase:[377]

> This is a significant application. A $1.2 billion acquisition that from a ratepayers' [sic] perspective, is a very serious matter. As I indicated during the procedural conference, and as the matter's been dealt with through this process, there is a fair bit of evidence on the record and 450 different scenarios. And at the end of the day, this is – it's going to be a judgment for this panel. And the test is going to be are you going to apply a reasonable judgment to considering the decision, and issuing a decision on the matter?

The Panel is of the view that a reasonable basis for assessing ratepayer impact is whether the transaction has an overall positive or negative effect on rates over the 40-year economic life of the assets.

In undertaking this assessment, the Panel notes that this is a somewhat unique transaction unlike the usual resource acquisitions by utilities. BC Hydro already owns one-third of the Waneta Assets. It proposes to buy the remainder of the Waneta Assets, only to immediately lease them back to the seller, Teck, for 20 years (and possibly 30 years) in return for guaranteed Lease payments. Only at the end of the Lease Term will the assets revert to BC Hydro to serve load or to sell the assets or their output on the market. On its face, therefore, the Waneta 2017 Transaction is essentially a financial transaction which costs BC Hydro $1.203 billion without any apparent load serving benefit to BC Hydro's ratepayers. One may question why BC Hydro's ratepayers should bear the risks of a transaction that does not serve ratepayer needs or interests. However, that question fails to take into account certain benefits to the ratepayer, the most obvious one being the guaranteed Lease payments.

[377] Oral Hearing Transcript Volume 4, p. 130, lines 9–14.

The guaranteed Lease payments payable to BC Hydro by Teck during the term of the Lease provide a significant portion of the overall value of the Waneta 2017 Transaction. Absent any default by Teck under the Lease, it remains in place for 20 (and up to 30) of the 40-year economic life of the Waneta Assets. During that Lease Term, the annual Lease payments (which are guaranteed by Teck's parent company, Teck Resources Limited) start at approximately $74 million, escalating at 2 percent per year. If Teck exercises its Lease extension option at the end of 20 years for another 10 years, the annual Lease payments will be reset at year 21 starting at approximately $144 million and escalate at 2 percent per year thereafter until the end of the Lease. The BC Hydro rate impact analysis shows that, for every year of the Lease Term (before and after the Lease extension), the Lease payments are expected to exceed the cost of the related amortization, finance charges and other incremental elements of BC Hydro's cost of service, thereby increasing BC Hydro's net revenues and reducing rates for ratepayers during the entire Lease Term.[378] These incremental net revenues would not be available to BC Hydro's ratepayers but for the Waneta 2017 Transaction. This is confirmed in the Business Case.[379] On an un-risked basis, the transaction value of $792 million derived from the Lease payments less associated costs is straightforward and undisputed. Figures 6 and 7 of the Waneta 2017 Business Case show the results of these calculations, on both a risked and un-risked basis. They show that the Waneta 2017 Transaction results in net positive impacts to ratepayers in all years under all scenarios.

While a default on Teck's part under the Lease poses a potential risk to the overall Waneta 2017 Transaction value in the near term when market prices are expected to remain low and lower than ABB, that risk is mitigated by the guarantee granted by Teck Resources Limited with respect to the Lease payments. Based on Moody's analysis, the credit rating of Teck Resources Limited has improved from October 2016 to July 2017 as it has been able to take advantage of strong commodity prices to improve its financial position. Furthermore, the analysis done by Moody's and BC Hydro using cumulative probabilities to calculate the sum of the probability weighted lease value shows that the risk of Teck default is actually lower in the near term than in the longer term when market prices are forecast to increase. According to BC Hydro, even if default occurs, ratepayers benefit in all instances except under lower market prices in the near term. Based on Moody's analysis, the risk of default is low. All interveners agree that the default risk is small and even if it materializes, its effects can be mitigated and are likely to benefit ratepayers in most, if not all, cases.

While there is some certainty of value during the Lease Term as a result of the guaranteed Lease payments, there is less certainty after the Lease Term. At that point, the Lease payments will end but the Waneta Assets will be available to BC Hydro to serve its general load. Their value at the time will be determined by such factors as BC Hydro's LRB, market price for electricity and the LRMC for alternative resources.

To assess the impact of these variables on the potential value of the Waneta Assets after the Lease Term, BC Hydro used the Range of Value Approach to develop five main scenarios and hundreds of additional scenarios to test sensitivities.

As discussed earlier in Section 3.2, the Range of Value Approach attempts to stress test the value of the Waneta 2017 Transaction through sensitivity analysis of the key variables influencing the transaction value: discount rate, LRB, LRMC, market prices and capital expenditures. The Panel has already determined earlier that for the purposes of this Waneta 2017 Transaction only, the Range of Value Approach is preferable over the more

[378] Exhibit B-1, Figure 6, p. 610.
[379] Exhibit B-1, Waneta 2017 Business Case, Appendix N, pp. 44–47.

traditional resource acquisition approach (namely, whether the acquisition will serve to fill an identified gap in BC Hydro's LRB). This is true because the assets will not be available to serve load until 20 or 30 years in the future. This long timeframe means that it would be practically impossible to pinpoint with any degree of precision the specific LRB, LRMC of new resources, market prices, etc. that would be required for conducting a traditional LRB Gap Analysis.

Instead, the Range of Value Approach shows that the asset value after the Lease Term is susceptible to a higher level of risk due to uncertainty around BC Hydro's load resource balance, market prices and the LRMC of new resources.[380] Nonetheless, even in the worst scenario (which assumes the entire Waneta output is surplus to BC Hydro's needs such that it must be sold on the market after the Lease Term), the analysis shows that even using the more conservative analysis scenarios suggested by the intervener and BCUC staff during the IR process, the range of potential ratepayer benefits in the post-Lease Term are between $0 and $700 million. That, coupled with the total ratepayer benefits flowing from the Lease payments in the Lease Term, means that the ratepayer impact remains positive through the assets' 40-year economic life, even when using the Panel's more conservative Mid-C Market Price from the Site C Inquiry.[381]

On the basis of this analysis, the Panel is satisfied that the overall consolidated Waneta 2017 Transaction value both pre and post-Lease results in a ratepayer benefit, even when risk adjusted for counterparty default and the Lease extension option. In short, the valuation, even on a risk adjusted basis, supports the finding that BC Hydro's ratepayers will benefit from the Waneta 2017 Transaction from a financial perspective, through downward pressure on rates and that this outcome holds across a wide range of adverse scenarios. In their argument, all interveners (with the exception of CEABC) support this finding.

6.2 Impact on others

As for the impact of the Waneta 2017 Transaction on others, the Panel has already canvassed earlier in Section 3.9 the effect of the Waneta 2017 Transaction on other stakeholders and confirms its determination that acceptance of the capital expenditures requested along with approval of the TWA and accounting orders sought is consistent with the public interest.

6.3 *Clean Energy Act* and environmental considerations

As the Panel noted earlier in Section 3.0 of this decision, section 44.2(5.1) of the UCA requires the BCUC to consider British Columbia's energy objectives in determining whether to accept an expenditure schedule filed by BC Hydro. Section 2 of the CEA sets out British Columbia's energy objectives. The Panel agrees with BC Hydro's submission (reproduced in Table 24 of this decision) that the Waneta 2017 Transaction advances most of the British Columbia energy objectives (nine out of 16) or is, at worst, neutral to them (seven of 16) and does not undermine or run counter to any of them.

[380] Exhibit B-1, Application, Business Case, pdf p. 540.
[381] BCH Final Argument, pp. 27–28, 31.

As BC Hydro rightly points out in its Application:

> There are no new environmental impacts created by the Waneta 2017 Transaction. Waneta is an existing facility and has all required environmental permits. It has been in existence for many years and BC Hydro believes that its impacts have been identified and acceptable operating standards have been successfully employed. Importantly, no material changes in operation have been identified during the Lease Period or subsequently. In the post-Lease Period, the Waneta 2017 Transaction potentially avoids the need for other resource alternatives that would invariably have some potential environmental impact.[382]

The Panel agrees with BC Hydro's submission during oral arguments to the following effect:

> …dealing with clean first, we would say that Waneta of course is as clean as any non-GHG resource. Clearly it's a non-GHG producing resource. And we would say further that's relevant regardless of whether BC Hydro is in surplus or deficit. The cleanness of Waneta is a factor in all circumstances because under the Clean Energy Act, Section 2(n), this is one of the B.C. energy objectives that the Commission is obliged to consider in assessing a 44.2 application.[383]

While other forms of energy may in the future be superior to hydro-electric power from a green or clean perspective, they would in all likelihood entail Greenfield construction of new plant facilities or connections with associated environmental and footprint impacts which would exceed any that arise from continued operation of the Waneta Dam.

6.4 Conclusions and compliance orders

For all these reasons, the Panel finds that approval of the Waneta 2017 Transaction is consistent with the CEA objectives and environmental considerations and is, taken as the whole, in the public interest, and hereby approves the Waneta 2017 Transaction as applied for.

The Panel is of the view that the BCUC should monitor the effect of the Waneta 2017 Transaction on BC Hydro's ratepayers, and therefore pursuant to section 43 of the UCA, directs BC Hydro to file with the BCUC:

a) **A report confirming the completion of the Waneta 2017 Transaction and providing the final actual Waneta 2017 Transaction costs, including a comparison with the estimated transaction costs, within 90 days of acquiring a two-third interest in the Waneta Assets.**

b) **A report confirming purchase of Teck's Transmission Assets and provide the final actual transmission purchase price, including a breakdown of the actual costs under section 10.5 of the WTA, within 90 days of acquiring Teck's Transmission Assets.**

c) **The NHDA balance that is related to the revenues approved for deferral in this Decision in its Annual Deferral Accounts Report (filed within the BC Hydro Annual Report).**

d) **The revenue arising from the Waneta 2017 Transaction as line item(s) separate from its revenue from rate regulated activities in its financial schedules contained in its revenue requirement applications during the Lease Term.**

e) **An annual Waneta 2017 Transaction report (Report) which must include the following:**

- **The operations, maintenance and capital expenditures including those major sustaining capital expenditures or operating and maintenance expenditures that BC Hydro was entitled to refer to a**

[382] Exhibit B-1, Application, Chapter 4, p. 4-27, lines 16–24.
[383] Oral Hearing Transcript Volume 4, pp. 242–243.

third-party referee and the related referee determinations as well as any significant non-sustaining capital expenditures that BC Hydro had the right to veto.

- **Annual cash flow comparison of actual expenditures versus estimated expenditures and an explanation for any variance greater than ten percent from the estimated expenditures;**
- **Organization chart showing the Operator and members of the Operating Committee;**
- **The monthly energy sale volumes and revenues; and the annual average energy selling price (in $/MWh);**
- **Summary of the Resource Physical Major Risks and mitigation measures employed;**
- **Statement of Delivery of Capacity and Energy to BC Hydro under the Waneta 2017 Transaction; and**
- **Statement of Entitlement Adjustments under the Canal Plant Agreement and amendments to the Canal Plant Agreement.**
- **Once BC Hydro has purchased Teck's Transmission Assets, the annual OATT revenues accrued from Line 71.**

f) The Report will be submitted as part of BC Hydro's annual report and as an appendix in its revenue requirements applications until 2058.

7.0 Summary of directives

This summary is provided for the convenience of readers. In the event of any difference between the Directions in this Summary and those in the body of the decision, the wording in the decision shall prevail.

	Directive	**Page No.**
1.	Therefore, for the purpose of evaluating the relative benefits of this proposed transaction only, the Panel approves the Range of Value Approach as applied by BC Hydro as an appropriate departure from the more traditional LRB Gap Approach analysis normally applied to other resource acquisitions.	14
2.	the Panel accepts the discount rate that BC Hydro has used.	52
3.	For all the foregoing reasons, the Panel finds that the Waneta 2017 Transaction capital expenditures of $1.203 billion applied for under section 44.2 of the UCA warrant acceptance.	66
4.	the Panel determines that up to $50 million in actually incurred Waneta 2017 Transaction costs as applied for by BC Hydro warrants acceptance… the Panel directs BC Hydro not to flow through into rates any amount of actually incurred Transaction costs that exceed $50 million.	67
5.	Therefore, the Panel accepts that the capital expenditure of $20 million for the Transmission Assets (at the time of purchase) warrants acceptance pursuant to section 44.2(3)(a) of the UCA.	78

	Directive	Page No.
6.	the Panel finds that the proposed rate is not "unjust, unreasonable, unduly discriminatory or unduly preferential," particularly insofar as if effectively grandfathers Teck's historical rights associated with its original construction and operation of Line 71 for merchant purposes, and approves the TWA under sections 58 to 61 of the UCA.	88
7.	Therefore, the accounting orders sought by BC Hydro in the Application are approved as filed.	92
8.	For all these reasons, the Panel finds that approval of the Waneta 2017 Transaction is consistent with the CEA objectives and environmental considerations and is, taken as the whole, in the public interest, and hereby approves the Waneta 2017 Transaction as applied for. The Panel is of the view that the BCUC should monitor the effect of the Waneta 2017 Transaction on BC Hydro's ratepayers, and therefore pursuant to section 43 of the UCA, directs BC Hydro to file with the BCUC: a) A report confirming the completion of the Waneta 2017 Transaction and providing the final actual Waneta transaction costs, including a comparison with the estimated transaction costs, within 90 days of acquiring a two-third interest in the Waneta Assets. b) A report confirming purchase of Teck's Transmission Assets and provide the final actual transmission purchase price, including a breakdown of the actual costs under section 10.5 of the WTA, within 90 days of acquiring Teck's Transmission Assets. c) The NHDA balance that is related to the revenues approved for deferral in this Decision in its Annual Deferral Accounts Report (filed within the BC Hydro Annual Report). d) The revenue arising from the Waneta 2017 Transaction as line item(s) separate from its revenue from rate regulated activities in its financial schedules contained in its revenue requirement applications during the Lease Term. e) An annual Waneta 2017 Transaction report (Report) which must include the following: • The operations, maintenance and capital expenditures including those major sustaining capital expenditures or operating and maintenance expenditures that BC Hydro was entitled to refer to a third-party referee and the related referee determinations as well as any significant non-sustaining capital expenditures that BC Hydro had the right to veto. • Annual cash flow comparison of actual expenditures versus estimated expenditures and an explanation for any variance greater than ten percent from the estimated expenditures; • Organization chart showing the Operator and members of the Operating Committee; • The monthly energy sale volumes and revenues; and the annual	95–96

	Directive	Page No.
	average energy selling price (in $/MWh); • Summary of the Resource Physical Major Risks and mitigation measures employed; • Statement of Delivery of Capacity and Energy to BC Hydro under the Waneta 2017 Transaction; and • Statement of Entitlement Adjustments under the Canal Plant Agreement and amendments to the Canal Plant Agreement. • Once BC Hydro has purchased Teck's Transmission Assets, the annual OATT revenues accrued from Line 71. f) The Report will be submitted as part of BC Hydro's annual report and as an appendix in its revenue requirements applications until 2058.	

DATED at the City of Vancouver, in the Province of British Columbia, this 18th day of July 2018.

Original Signed By:

D. M. Morton
Panel Chair / Commissioner

Original Signed By:

A. K. Fung, QC
Commissioner

Original Signed By:

R. I. Mason
Commissioner

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ORDER NUMBER
G-130-18

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

British Columbia Hydro and Power Authority
Waneta 2017 Transaction Application

BEFORE:
D. M. Morton, Commissioner / Panel Chair
A. K. Fung, QC, Commissioner
R. I. Mason, Commissioner

on July 18, 2018

ORDER

WHEREAS:

A. On October 30, 2017, the British Columbia Hydro and Power Authority (BC Hydro) filed an application for approval of BC Hydro's proposed purchase from Teck Metals Ltd. (Teck) of its two-thirds interest in the Waneta Dam along with Teck's transmission assets (Waneta 2017 Transaction) requesting the following orders from the British Columbia Utilities Commission (BCUC):

    1. Pursuant to section 44.2(3) of the *Utilities Commission Act* (UCA), acceptance of the expenditure schedule in regard to the Waneta 2017 Transaction as shown in the filing;
    2. Pursuant to sections 58 to 61 of the UCA, approval of the Teck Wheeling Agreement and Waneta Interconnection Agreement; and
    3. Pursuant to section 49(a) of the UCA, approval of three adjustments to the Non-Heritage Deferral Account (NHDA) as described in the filing (Application);

B. Since 2010, BC Hydro has been the owner of an undivided one-third interest in the Waneta dam and associated assets which it purchased from Teck for $825 million (Waneta 2010 Transaction). Teck is the owner of the remaining two-thirds interest. The Waneta 2010 Transaction was approved by the BCUC pursuant to Order G-12-10 on February 23, 2010;

C. As part of the Waneta 2010 Transaction, a right of first offer (ROFO) was established in regard to the subsequent sale by either party of its interest in Waneta, which granted the non-selling party the first right to acquire the seller's interest;

D. In May 2017, following a competitive sales process, Teck informed BC Hydro that it had reached an agreement to sell its two-thirds interest in Waneta and related transmission assets to Fortis Inc. for $1.2 billion;

E. On June 1, 2017, Teck delivered a Sale Notice to BC Hydro which provided BC Hydro with the opportunity to match Fortis Inc.'s offer and purchase Teck's two-thirds interest in Waneta under substantially equivalent terms;

F. On August 1, 2017, BC Hydro delivered a Reply Notice to Teck which, together with the Sale Notice, constituted BC Hydro's legally binding election to purchase Teck's two-thirds interest in the Waneta Dam and associated assets;

G. Attached to the Reply Notice was an executed Waneta Purchase Agreement which sets out the sale by Teck and purchase by BC Hydro of Teck's two-thirds interest in Waneta for $1.203 billion cash. The parties agreed that closing of the Waneta 2017 Transaction must occur by August 1, 2018;

H. A key term of the Waneta 2017 Transaction is that the two-thirds interest in Waneta will be leased to Teck for a 20-year period (extendable to 30 years at Teck's option) in consideration of lease payments from Teck to BC Hydro;

I. Upon expiration or earlier termination of the lease, BC Hydro will purchase Teck's transmission assets, including Line 71 (collectively, the Transmission Assets), for $20 million;

J. After the lease period has ended, and after BC Hydro has acquired the Transmission Assets, BC Hydro will provide a transmission wheeling service to Teck between the US border and Teck's smelter load, pursuant to the Teck Wheeling Agreement, as well as certain ancillary services, pursuant to the Waneta Interconnection Agreement;

K. On January 31, 2018, BC Hydro filed the following agreements on the record: Waneta Transmission Agreement; Teck Wheeling Agreement; and Waneta Interconnection Agreement. Concurrently, BC Hydro withdrew its request for approval of the Waneta Interconnection Agreement on the basis that in accordance with its terms, the agreement does not require express BCUC approval;

L. On receipt of the Application, the BCUC established a public hearing process. By Orders G-169-17, G-199-17, G-15-18, G-42-18 and G-70-18, the BCUC established and subsequently amended a regulatory timetable with a written hearing process for the review of the Application, which included two rounds of information requests (IRs) to BC Hydro, intervener evidence and IRs on that evidence, Panel IRs, followed by oral and final arguments from all parties and a reply argument from BC Hydro;

M. BC Hydro and interveners provided oral arguments on April 19, 2018, followed by BC Hydro and intervener final arguments on May 3, 2018 and May 17, 2018 respectively. BC Hydro submitted its reply argument on May 24, 2018;

N. The BCUC has considered the Application, evidence and submissions of BC Hydro and all interveners and makes the following determinations.

NOW THEREFORE pursuant to the *Utilities Commission Act* and for the reasons set out in the decision issued concurrently with this order, the BCUC orders as follows:

1. Pursuant to section 44.2(3)(a) of the UCA, the expenditure schedule contained in the Application, consisting of a $1.203 billion payment to Teck to acquire a two-thirds interest in Waneta; a $20 million payment to Teck to acquire the Transmission Assets; and transaction costs up to $50 million, is in the public interest and is accepted.

2. Pursuant to sections 58 to 61 of the UCA, the Teck Wheeling Agreement is approved.

3. Pursuant to section 49(a) of the UCA, approval of three adjustments to the NHDA, all as more fully described in the Application, as follows:

    a) BC Hydro may defer its fiscal 2019 incremental lease revenues arising from the Waneta Transaction to the NHDA;

    b) BC Hydro may exclude the portion of year-to-year variances between forecast and actual water rentals arising from the Waneta Transaction from the water rental variances that are deferred to the NHDA; and

    c) BC Hydro may defer the revenue it will be required to recognize from time to time in consequence of Teck's capital expenditures at Waneta to the NHDA until the end of the Lease Period.

4. Pursuant to section 43 of the UCA, BC Hydro is directed to file with the BCUC:

    a) A report confirming the completion of the Waneta 2017 Transaction and providing the final actual Waneta 2017 Transaction costs, including a comparison with the estimated transaction costs, within 90 days of acquiring a two-third interest in the Waneta assets.

    b) A report confirming purchase of Teck's Transmission Assets and provide the final actual transmission purchase price, including a breakdown of the actual costs under section 10.5 of the Waneta Transmission Agreement, within 90 days of acquiring Teck's Transmission Assets.

    c) The NHDA balance that is related to the revenues approved for deferral in this decision in its Annual Deferral Accounts Report (filed within the BC Hydro Annual Report).

    d) The revenue arising from the Waneta 2017 Transaction as line item(s) separate from its revenue from rate regulated activities in its financial schedules contained in its revenue requirement applications during the Lease Term.

    e) An annual Waneta 2017 Transaction report (Report) which must include the following:

        - The operations, maintenance and capital expenditures including those major sustaining capital expenditures or operating and maintenance expenditures that BC Hydro was entitled to refer to a third party referee and the related referee determinations as well as any significant non-sustaining capital expenditures that BC Hydro had the right to veto;
        - Annual cash flow comparison of actual expenditures versus estimated expenditures and an explanation for any variance greater than ten percent from the estimated expenditures;
        - Organization chart showing the Operator and members of the Operating Committee;
        - The monthly energy sale volumes and revenues; and the annual average energy selling price (in $/MWh);
        - Summary of the Resource Physical Major Risks and mitigation measures employed;
        - Statement of Delivery of Capacity and Energy to BC Hydro under the Waneta 2017 Transaction;
        - Statement of Entitlement Adjustments under the Canal Plant Agreement and amendments to the Canal Plant Agreement; and
        - Once BC Hydro has purchased Teck's Transmission Assets, the annual OATT revenues accrued from Line 71.

f) The Report will be submitted as part of BC Hydro's annual report and as an appendix in its revenue requirements applications until 2058.

5. BC Hydro is directed to comply with all other directives in the decision accompanying this order.

DATED at the City of Vancouver, in the Province of British Columbia, this 18th day of July 2018.

BY ORDER

Original Signed By:

D. M. Morton
Commissioner

Analysis of the Post-Lease Energy Value

Background

British Columbia Hydro and Power Authority (BC Hydro) calculates Unit Energy Cost (UEC) to measure the costs of generation for Waneta over both the lease period and the post-lease period. The table below is taken from the Waneta Business Case, and identifies the post-lease UEC at $48.25/MWh.

Table 1 – Unit Energy Costs[384]

($/MWh, 2018 dollars)

Period	20-year Lease
Full term (years 1-40)	41.25
Post-Lease Term (years 21-40)	48.25

As the UEC is "…intended to illustrate what BC Hydro is paying for post-lease value…"[385] for example the unit cost of generation, it follows that the calculation of UEC can be applied to determine the revenue generated per unit of generation, or Unit Energy Revenue (UER), and indirectly validate the adequacy of pricing forecast. As such, BCUC staff applied the methodology and assumptions used in calculating UEC to calculate four UEC and UER scenarios based on BC Hydro's forecast market prices. The scenarios were created by including or excluding the following:

Monthly shaping factors

UEC and UER calculations over the post-lease period are based on annual values (volumes and prices). To determine the extent of price variability throughout the year, monthly shaping factors were applied in two of the scenarios to determine to what extent monthly shaped volumes and prices affected both UEC and UER.

Significant generation periods

BCUC staff considered the impact of surplus generation during periods where market prices were lower, relative to other periods, as the value of energy during those periods is lower. In these cases, BCUC staff evaluated generation by assuming zero production during the May and June periods.

Parameters and Assumptions

Volumes

Post-lease energy volumes were used to both validate UEC and calculate potential UER. These amounts are outlined in the Canal Plant Agreement,[386] and identify monthly generation volumes below:

[384] Exhibit B-1, Appendix N, section 4.2.1, p. 23, Table 4.
[385] Exhibit B-8, BCUC IR 15.2.
[386] Exhibit B-8-5, p. 88. See line 251 labeled Teck Share of Waneta.

Table I – Waneta Post-Lease Energy Allocations (in GWh)[387]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
138	117	157	172	201	189	170	125	112	162	137	150	1,830

Discount rate and inflation rate[388]

BCUC staff used a 6.0 percent nominal rate and a 2 percent annual inflation rate in validating UEC and calculating UER.

Scenario results

Scenario 1

This is the base scenario, as BC Hydro estimated the Waneta UEC using annual cost estimates and annual volumes. BC Hydro's financial analysis model's annual revenue estimates are used in this scenario. Due to the use of annual amounts, neither monthly shaping factors nor the removal of significant generation periods was applied.

Calculation of Unit Energy Cost		
Purchase Price	1,203,000	
NPV Cash Flows - Lease	791,565	
Residual Cost	411,435	
NPV Costs Post Lease	147,310	
Total Costs in $2018 Dollars	558,745	
Quantity Factor	11,606,655	MWh
Unit Energy Cost ($/MWh)	$48.14	/MWh
Rd. to Nearest Quarter	$48.25	/MWh

Calculation of Unit Energy Revenue		
NPV Revenues Post Lease	659,329	
Total Revenues in $2018 Dollars	659,329	
Quantity Factor	11,606,655	MWh
Unit Energy Revenue ($/MWh)	$56.81	/MWh
Rd. to Nearest Quarter	$56.75	/MWh

Scenario 2

This modifies Scenario 1 by applying monthly shaping factors for energy volumes and pricing. The removal of significant generation periods was not applied.

[387] These volumes are also available in Exhibit B-1, Appendix N – Business Case for Participation in Transaction for Teck Waneta Assets, p. 10.
[388] Exhibit B-1, Section 4.1, p. 4-3.

Calculation of Unit Energy Cost		
Purchase Price	1,203,000	
NPV Cash Flows - Lease	791,565	
Residual Cost	411,435	
NPV Costs Post Lease	151,318	
Total Costs in $2018 Dollars	562,753	
Quantity Factor	11,827,159	MWh
Unit Energy Cost ($/MWh)	$47.58	/MWh
Rd. to Nearest Quarter	$47.50	/MWh

Calculation of Unit Energy Revenue		
NPV Revenues Post Lease	676,984	
Total Revenues in $2018 Dollars	676,984	
Quantity Factor	11,827,159	MWh
Unit Energy Revenue ($/MWh)	$57.24	/MWh
Rd. to Nearest Quarter	$57.25	/MWh

Scenario 3

This scenario assumes that no volumes are generated during May and June of each year. This is meant as a proxy for the market value of generation during this period being zero. This also results in an increase to the UEC as costs remain constant, but the energy volume declines. Due to the use of annual amounts, monthly shaping factors for energy and pricing are not applied.

Calculation of Unit Energy Cost		
Purchase Price	1,203,000	
NPV Cash Flows - Lease	791,565	
Residual Cost	411,435	
NPV Costs Post Lease	147,310	
Total Costs in $2018 Dollars	558,745	
Quantity Factor	9,131,879	MWh
Unit Energy Cost ($/MWh)	$61.19	/MWh
Rd. to Nearest Quarter	$61.25	/MWh

Calculation of Unit Energy Revenue		
NPV Revenues Post Lease	549,557	
Total Revenues in $2018 Dollars	549,557	
Quantity Factor	9,131,879	MWh
Unit Energy Revenue ($/MWh)	$60.18	/MWh
Rd. to Nearest Quarter	$60.25	/MWh

Scenario 4

This modifies Scenario 3 by applying monthly shaping factors for energy volumes and pricing.

Calculation of Unit Energy Cost		
Purchase Price	1,203,000	
NPV Cash Flows - Lease	791,565	
Residual Cost	411,435	
NPV Costs Post Lease	151,318	
Total Costs in $2018 Dollars	562,753	
Quantity Factor	9,275,735	MWh
Unit Energy Cost ($/MWh)	$60.67	/MWh
Rd. to Nearest Quarter	$60.75	/MWh

Calculation of Unit Energy Revenue		
NPV Revenues Post Lease	562,018	
Total Revenues in $2018 Dollars	562,018	
Quantity Factor	9,275,735	MWh
Unit Energy Revenue ($/MWh)	$60.59	/MWh
Rd. to Nearest Quarter	$60.50	/MWh

British Columbia Hydro and Power Authority
Waneta 2017 Transaction Application

LIST OF ACRONYMS

Application	British Columbia Hydro and Power Authority's October 30, 2017 application for approval of BC Hydro's proposed purchase from Teck of its two-thirds interest in the Waneta Dam along with Teck's Transmission Assets requesting the following orders from the BCUC: 4. Acceptance of the expenditure schedule in regard to the Waneta 2017 Transaction as shown in the filing pursuant to section 44.2(3) of the *Utilities Commission Act* (UCA); 5. Approval of the Teck Wheeling Agreement and Waneta Interconnection Agreement Pursuant to sections 58 to 61 of the UCA; and 6. Approval of three adjustments to the Non-Heritage Deferral Account (NHDA) as described in the filing pursuant to section 49(a) of the UCA.
BC Hydro	British Columbia Hydro and Power Authority
BCOAPO	British Columbia Old Age Pensioners' Organization, Council of Senior Citizens' Organizations of BC, and the Tenant Resource and Advisory Centre
BCSEA-SCBC	BC Sustainable Energy Association and Sierra Club BC
BCUC	British Columbia Utilities Commission
bps	basis points
CEA	*Clean Energy Act*
CEABC	Clean Energy Association of BC
CEC	Commercial Energy Consumers Association of British Columbia
CPA	Canal Plant Agreement
COA	Co-Ownership and Operating Agreement
Counterparty Default Risk	The risk of early termination of the Lease due to a default by Teck
COPOA	Co-Possessors and Operating Agreement

Extension Option Risk	Teck's option to extend the Lease 10 years beyond the initial 20-year term
FEI	FortisBC Energy Inc.
Filing	On July 6, 2009, BC Hydro filed an expenditure statement in a filing called the Acquisition from Teck Metals Ltd. of an Undivided One-Third Interest in the Waneta Dam and Associated Assets. BCUC approved this filing now known as the Waneta 2010 Transaction.
FortisBC	FortisBC Inc.
Fortis	Fortis Inc.
GHG	greenhouse gas
GWh	gigawatt hour
IDF	Inflow Design Flood
IPP	Independent Power Producers
IR	information request(s)
IRP	integrated resource plan
km	kilometers
kV	kilo Volt
Lease	Leaseback of the two-thirds interest to Teck for 20 years at a price of $40/MWh, escalating at 2 percent per year with Teck's option to further extend the lease for an additional 10 years at a price of $53/MWh, escalating at 2 percent per year
Lease Term	The 20–30 year period the Lease is in effect
LRB	Load resource balance
LRB Gap Approach	A more traditional resource acquisition approach, namely, whether the acquisition will serve to fill an identified gap in BC Hydro's future LRB
LRMC	Long-Run Marginal Cost
MoveUP	Movement of United Professionals
MW	megawatt(s)
NHDA	Non-Heritage Deferral Account

NPV	net present value(s)
OATT	Open Access Transmission Tariff
OIC	Order in Council
O&M	operating and maintenance
PMF	Probable Maximum Flood
Powerex	Powerex Corporation
ROE	return on equity
ROFO	right of first offer
RRA	revenue requirements application
Site C Inquiry Report	BCUC Inquiry Respecting Site C Final Report to the Government of BC
Teck	Teck Metals Ltd.
TIA	Teck Interconnection Agreement
Transmission Assets	Teck-owned transmission assets, including Line 71 between Waneta and the US border
TWA	Teck Wheeling Agreement
UCA	*Utilities Commission Act*
UEC	Unit Energy Cost
UER	Unit Energy Revenue
WACC	weighted average cost of capital
Waneta 2010 Transaction	In 2010, BC Hydro purchased a one-third interest in Waneta for $825 million while Teck remained the owner of the remaining two-thirds interest; approved by the BCUC pursuant to Order G-12-10 on February 23, 2010.
Waneta 2017 Transaction	BC Hydro's proposed purchase from Teck of its two-thirds interest in the Waneta Dam along with Teck's Transmission Assets
Waneta Assets	Teck's remaining two-thirds interest in Waneta for $1.203 billion
WTA	Waneta Transmission Agreement

British Columbia Hydro and Power Authority
Waneta 2017 Transaction Application

LIST OF APPEARANCES

L. BUSSOLI	Commission Counsel
J. CHRISTIAN	British Columbia Hydro and Power Authority
C. P. WEAFER	Commercial Energy Consumers Association of BC
L. HERBST	FortisBC Energy Inc.
L. WORTH	British Columbia Old Age Pensioners' Organization, Active Support Against Poverty, Council of Senior Citizens' Organizations of BC, Disability Alliance BC Tenants Resource and Advisory Centre, and Together Against Poverty Society
W. A. ANDREWS	BC Sustainable Energy Association and Sierra Club BC
D. AUSTIN	Clean Energy Association of British Columbia
D. BOTH	Teck Resources Ltd.
A. BRADLEY	City of Trail
J. QUAIL	Movement of United Professionals

A. Anand Sanghera	Commission staff
N. Simon	
Allwest Reporting Ltd.	Court reporters

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

British Columbia Hydro and Power Authority
Waneta 2017 Transaction Application

EXHIBIT LIST

Exhibit No.	Description
COMMISSION DOCUMENTS	
A-1	Letter dated November 23, 2017 – Appointing the Panel for the review of the application
A-2	Letter dated November 24, 2017 – Commission Order G-169-17 establishing the regulatory timetable and public notice
A-3	Letter dated November 24, 2017 – Commission request for excel spreadsheets
A-4	Letter dated December 8, 2017 – Commission Information Request No. 1
A-4-1	**CONFIDENTIAL** Letter dated December 8, 2017 –Commission Information Request No. 1 Confidential
A-5	Letter dated December 14, 2017 – Commission response to extension request
A-6	Letter dated December 22, 2017 – Commission Order G-199-17 further regulatory timetable and Community Input Session
A-7	Letter dated December 27, 2017 – Amending the Panel for the review of the application
A-8	Letter dated January 4, 2018 – Commission to BCH and FBC regarding confidentiality
A-9	Letter dated January 12, 2018 – Commission requesting explanation of redactions
A-10	Letter dated January 19, 2018 – Commission Order G-15-18 establishing further regulatory timetable
A-11	Letter dated January 31, 2018 – Delay on filing of documents
A-12	Letter dated February 6, 2018 – Request for comments regarding BC Hydro's proposed amendments to regulatory timetable (Exhibit B-15)
A-13	Letter dated February 7, 2018 – Procedural Conference Information
A-14	Letter dated February 8, 2018 – Commission Order G-35-18 regarding confidentiality

A-15	Letter dated February 13, 2018 – Procedural Conference Information
A-16	Letter dated February 19, 2018 – Commission Order G-42-18 establishing the further regulatory timetable
A-17	Letter dated February 19, 2018 – Commission Information Request No. 2
A-17-1	**CONFIDENTIAL** Letter dated February 19, 2018 – Confidential Commission Information Request No. 2
A-18	Letter dated February 21, 2018 – Commission Information Request No. 2 Continued
A-18-1	**CONFIDENTIAL** Letter dated February 21, 2018 – Confidential Commission Information Request No. 2 Continued
A-19	Letter dated March 19, 2018 – Commission Information Request No. 1 to Clean Energy Association of BC on Intervener Evidence
A-20	Letter dated March 23, 2018 – Commission Response to Gabana letter and Request to BCH
A-21	Letter dated March 28, 2018 – Second Procedural Conference
A-22	Letter dated March 28, 2018 – Second Procedural Conference – Additional Dates
A-23	Letter dated April 5, 2018 – Commission Order G-70-18 Regulatory-Timetable
A-24	Letter dated April 9, 2018 – Panel Information Request No. 1 to BC Hydro
A-25	**CONFIDENTIAL** Letter dated April 9, 2018 – Confidential Panel Information Request No. 1 to BC Hydro
A-26	Letter dated April 12, 2018 – Oral Argument Information
A-27	Letter dated May 2, 2018 – Load Resource Balance Information

APPLICANT DOCUMENTS

B-1	**BRITISH COLUMBIA HYDRO AND POWER AUTHORITY (BCH)** – Submitting October 30, 2017 Waneta 2017 Transaction Application
B-1-1	**CONFIDENTIAL** Letter dated October 30, 2017 – BCH Submitting Confidential Waneta 2017 Transaction Application
B-1-2	Letter dated December 14, 2017 - BCH Submitting Confidential Spreadsheets Response to Exhibit A-3 – Web Cover letter only
B-1-3	Letter dated February 1, 2018 - BCH Submitting Errata No. 1 to the Application

B-1-4	**CONFIDENTIAL** Letter dated February 1, 2018 - BCH Submitting Confidential Errata No. 1 to the Application
B-1-5	Letter dated March 16, 2018 - BCH Submitting Errata to Chapter 2 and Appendix N
B-1-6	**CONFIDENTIAL** Letter dated March 16, 2018 - BCH Submitting Confidential Business Case
B-2	Letter dated December 6, 2017 - BCH Submitting Notice of Newspaper Publication and Distribution of Order
B-3	Letter dated December 12, 2017 - BCH Submitting Response to FBC Comments and Request for Extension
B-4	Letter dated December 12, 2017 - BCH Submitting Response regarding FortisBC Request for Confidential Information Disclosure
B-5	Letter dated December 28, 2017 – BCH Submitting Request for Regulatory Timetable Amendment
B-6	Letter dated January 9, 2018 – BCH Submitting Response Regarding Submissions Filed in Confidence
B-7	Letter dated January 18, 2018 – BCH Submitting Explanation of Redactions in Excel Working Models
B-8	Letter dated January 26, 2018 – BCH Submitting Response to BCUC IR No. 1
B-8-1	**CONFIDENTIAL** Letter dated January 26, 2018 – BCH Submitting Confidential Response to BCUC IR No. 1
B-8-2	Letter dated January 31, 2018 – BCH Submitting remaining responses to BCUC Information Requests No. 1
B-8-3	**CONFIDENTIAL** Letter dated January 31, 2018 – BCH Submitting Confidential remaining responses to BCUC Information Requests No. 1
B-8-4	Letter dated March 16, 2018 - BCH Submitting Revisions to BCUC IR No. 1
B-8-5	Letter dated March 26, 2018 – BCH Submitting Revision to BCUC IR No. 1
B-9	Letter dated January 26, 2018 – BCH Submitting Public Responses to Interveners IR No. 1
B-9-1	**CONFIDENTIAL** Letter dated January 26, 2018 – BCH Submitting Confidential Responses to Interveners IR No. 1
B-9-2	Letter dated January 31, 2018 – BCH Submitting remaining responses to Intervener Information Requests No. 1 – Replaced on February 1, 2018
B-9-3	**CONFIDENTIAL** Letter dated January 31, 2018 – BCH Submitting Confidential remaining responses to Intervener Information Requests No. 1

B-10	**CONFIDENTIAL** Letter dated January 26, 2018 – BCH Submitting Response to Confidential BCUC IR No. 1 (Exhibit A-4-1)
B-10-1	**CONFIDENTIAL** Letter dated January 31, 2018 – BCH Submitting remaining responses to BCUC Confidential Information Requests No. 1
B-10-2	**CONFIDENTIAL** Letter dated March 16, 2018 - BCH Submitting Revisions to BCUC Confidential IR No. 1
B-10-3	Letter dated March 16, 2018 - BCH Submitting Release of information Previously Considered Confidential - Round 1 Confidential BCUC IRs
B-11	**CONFIDENTIAL** Letter dated January 26, 2018 – BCH Submitting Confidential Waneta Valuation Model
B-11-1	**CONFIDENTIAL** Letter dated March 8, 2018 – BCH Submitting Updated Confidential Waneta Valuation Model
B-12	Letter dated January 31, 2018 – BCH Submitting Transmission Agreements
B-13	Letter dated January 31, 2018 – BCH Submitting Revised Draft Order
B-14	Letter dated February 2, 2018 – BCH Submitting Risk Register
B-14-1	**CONFIDENTIAL** Letter dated February 2, 2018 – BCH Submitting Confidential Risk Register
B-14-2	Letter dated March 16, 2018 - BCH Submitting Risk Register Errata Public Version
B-14-3	**CONFIDENTIAL** Letter dated March 16, 2018 - BCH Submitting Confidential Risk Register Errata
B-15	Letter dated February 5, 2018 – BCH Submitting Response to the Commission's letter dated January 31, 2018 (Exhibit A-11)
B-16	Letter dated February 9, 2018 – BCH Submitting Response to the Commission's letter dated February 6, 2018 (Exhibit A-12)
B-17	Letter dated February 16, 2018 – BCH Submitting Agreement between BC Hydro and FortisBC
B-18	Letter dated March 8, 2018 – BCH Submitting Responses to BCUC IR No. 2
B-18-1	**CONFIDENTIAL** Letter dated March 8, 2018 – BCH Submitting Confidential Responses to BCUC IR No. 2
B-18-2	Letter dated March 16, 2018 - BCH Submitting Revision to BCUC IR 2.80.1
B-18-3	Letter dated March 16, 2018 - BCH Submitting Response to outstanding BCUC IR 2.124.1
B-18-4	Letter dated April 6, 2018 - BCH Submitting Responses to CEABC IRs 2.28 series

B-18-5	**CONFIDENTIAL** Letter dated April 6, 2018 - BCH Submitting Confidential Responses to CEABC IRs 2.28 series
B-19	**CONFIDENTIAL** Letter dated March 8, 2018 – BCH Submitting Responses to Confidential BCUC IR No. 2
B-19-1	Letter dated March 16, 2018 - BCH Submitting Release of information Previously Considered Confidential - Round 2 Confidential BCUC IRs
B-20	Letter dated March 8, 2018 – BCH Submitting Responses to Interveners IR No. 2
B-20-1	**CONFIDENTIAL** Letter dated March 8, 2018 – BCH Submitting Confidential Responses to Interveners IR No. 2
B-20-2	Letter dated March 26, 2018 – BCH Submitting Supplemental Responses to Interveners IR No. 2
B-21	**CONFIDENTIAL** Letter dated March 8, 2018 – BCH Submitting Responses to Confidential CEC IR No. 2
B-21-1	Letter dated March 16, 2018 - BCH Submitting Release of information Previously Considered Confidential - Round 2 Confidential CEC IRs
B-22	Letter dated March 8, 2018 – BCH Submitting First Nations' Engagement Activities
B-23	Letter dated March 19, 2018 – BCH Submitting Information Request No. 1 to Clean Energy Association of BC on Intervener Evidence
B-24	Letter dated April 12, 2018 – BCH Submitting Information Response to Panel Information Request No. 1

C1-1	**FORTISBC INC. (FBC)** Letter dated December 8, 2017 - Request to Intervene by Diane Roy
C1-2	Letter dated December 7, 2017 – FBC Comments and Request for Extension
C1-3	Letter dated December 18, 2017 – FBC Response to BC Hydro Access to Redacted Information Exhibit B-3
C1-4	Letter dated January 3, 2018 - FBC Response to Proposed Timetable Amendment
C1-5	Letter dated January 5, 2018 – FBC Submitting IR No. 1 to BC Hydro
C1-6	Letter dated January 9, 2018 – FBC Submitting Response to Exhibit A-8 Regarding Confidentiality
C1-7	Letter dated January 22, 2018 – FBC Submitting Comments regarding Exhibit B-7 Explanation of Redactions
C1-8	Letter dated February 8, 2018 – FBC Submitting Comments on regulatory timetables
C1-9	Letter dated February 13, 2018 - FBC Submitting Declaration and Undertakings for Dan Egolf, Ludmila Herbst, Jamie King, Joyce Martin and Monic Pratch
C1-10	Letter dated February 16, 2018 - FBC Submitting FBC and Teck Agreement
C2-1	**BC SUSTAINABLE ENERGY ASSOCIATION AND SIERRA CLUB BC (BCSEA)** Letter dated December 5, 2017 - Request to Intervene by Thomas Hackney and William Andrews
C2-2	Letter dated January 5, 2018 – BCSEA Submitting IR No. 1 to BC Hydro
C2-3	Letter dated January 11, 2018 – BCSEA Submitting Confidentiality Declaration and Undertaking for Thomas Hackney
C2-4	Letter dated January 11, 2018 – BCSEA Submitting Confidentiality Declaration and Undertaking for William Andrews
C2-5	Letter dated February 7, 2018 – BCSEA Submitting Comments on regulatory timetables
C2-6	Letter dated February 22, 2018 – BCSEA Submitting IR No. 2 to BC Hydro
C2-7	Letter dated March 19, 2018 – BCSEA Information Request No. 1 to Clean Energy Association of BC on Intervener Evidence
C3-1	**CITY OF TRAIL (CITY OF TRAIL)** Letter dated December 5, 2017 - Request to Intervene by Alyssa Bradley
C4-1	**COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BC (CEC)** Letter dated December 6, 2017 - Request to Intervene by David Craig
C4-2	Letter dated January 2, 2018 – CEC Submitting Confidentiality Declaration and Undertaking for David Craig

C4-3	Letter dated January 5, 2018 – CEC's revised Information Request No. 1 to BC Hydro as requested (13.2.2 removed - duplication)
C4-4	Letter dated January 5, 2018 – CEC Submitting Confidentiality Declaration and Undertaking for Christopher Weafer
C4-5	Letter dated February 7, 2018 – CEC Submitting Comments on regulatory timetables
C4-6	Letter dated February 22, 2018 – CEC Submitting IR No. 2 to BC Hydro
C4-7	**CONFIDENTIAL** Letter dated February 22, 2018 – CEC Submitting IR No. 2 to BC Hydro Confidential
C4-8	Letter dated March 19, 2018 – CEC Information Request No. 1 to Clean Energy Association of BC on Intervener Evidence
C5-1	**MOVEMENT OF UNITED PROFESSIONALS (MOVEUP)** Letter dated December 7, 2017 - Request to Intervene by Rachel Roy
C5-2	Letter dated January 5, 2018 – MoveUp Submitting IR No. 1 to BC Hydro
C6-1	**CLEAN ENERGY ASSOCIATION OF BC (CEABC)** Letter dated December 8, 2017 - Request to Intervene by David Austin
C6-2	Letter dated January 5, 2018 – CEABC Submitting IR No. 1 to BC Hydro
C6-3	Letter dated January 22, 2018 – CEABC Submitting Comments regarding Exhibit B-7 Explanation of Redactions
C6-4	Letter dated February 8, 2018 – CEABC Submitting Comments on regulatory timetables
C6-5	Letter dated February 22, 2018 – CEABC Submitting IR No. 2 to BC Hydro
C6-6	Letter dated March 12, 2018 - CEABC Submitting Evidence
C6-7	Letter dated March 26, 2018 – CEABC Submitting Responses to IR No. 1 on Evidence
C6-8	Letter dated April 19, 2018 – CEABC Submitting Oral Argument Presentation
C7-1	**LOCAL 480, UNITED STEELWORKERS (UNITED STEELWORKERS)** Letter dated December 7, 2017 - Request to Intervene by Army DeMedeiros and Brian Onyschak
C8-1	**BRITISH COLUMBIA OLD AGE PENSIONERS' ORGANIZATION, COUNCIL OF SENIOR CITIZENS' ORGANIZATIONS OF BC, AND THE TENANT RESOURCE AND ADVISORY CENTRE (BCOAPO)** Letter dated December 8, 2017 - Request to Intervene by Sarah Khan
C8-2	Letter dated January 5, 2018 – BCOAPO Submitting IR No. 1 to BC Hydro
C8-3	Letter dated January 22, 2018 – BCOAPO Submitting Change of Counsel

C8-4	Letter dated February 8, 2018 – BCOAPO Submitting Comments on regulatory timetables
C8-5	Letter received February 23, 2018 – BCOAPO Submitting IR No. 2 to BC Hydro
C9-1	**ASSOCIATION OF MAJOR POWER CUSTOMERS OF BC (AMPC)** Letter dated December 8, 2017 - Request to Intervene by Matthew Keen
C9-2	Letter dated February 8, 2018 – AMPC Submitting Comments on regulatory timetables
C10-1	**TECK RESOURCES LTD. (TECK)** Letter dated December 14, 2017 - Request to Intervene by Nick Uzelac
C11-1	**FORTISBC ENERGY INC. (FEI)** Letter dated December 8, 2017 – Request to Intervene by Diane Roy
C12-1	**REGIONAL DISTRICT OF KOOTENAY BOUNDARY (RDKB)** Letter dated January 11, 2018 – Request to Intervene by Mark Andison
C12-2	Letter dated January 13, 2018 – Community Input Session Speaking Notes for Ali Grieve, Area 'A' Director, on behalf of the RDKB Board of Directors, to the Commission
C13-1	**GABANA, NORM (GABANA)** Letter dated January 16, 2018 – Request to Intervene by Norm Gabana
C13-2	Letter dated January 30, 2018 – Gabana Submitting Confidentiality Declaration and Undertaking Form
C13-3	Letter dated February 22, 2018 – Gabana Submitting IR No. 2 to BC Hydro
C13-4	Letter dated March 19, 2018 – Gabana Submitting Request for Clarification
C14-1	**WANETA EXPANSION LIMITED PARTNERSHIP (WELP)** Letter dated January 18, 2018 – Request to Intervene by Matthew D. Keen and Michael Manhas
C14-2	Letter dated February 8, 2018 – WELP Submitting Comments on regulatory timetables