

D Barry Kirkham, QC⁺
 Duncan J Manson⁺
 Daniel W Burnett, QC⁺
 Ronald G Paton⁺
 Karen S Thompson⁺
 Harley J Harris⁺
 Paul A Brackstone⁺
 James W Zaitsoff⁺
 Jocelyn M Bellerud
 Katelyn A Gray^{**}

Robin C Macfarlane⁺
 Alan A Frydenlund, QC⁺
 Harvey S Delaney⁺
 Paul J Brown⁺
 Gary M Yaffe⁺
 Jonathan L Williams⁺
 Scott H Stephens⁺
 Pamela E Sheppard⁺
 Katharina R Spotzl
 Sarah M. Pélouquin^{**}

Josephine M Nadel, QC⁺
 Allison R Kuchta⁺
 James L Carpick⁺
 Patrick J Habert⁺
 Heather E Maconachie
 Michael F Robson⁺
 Zachary J Ansley⁺
 George J Roper
 Sameer Kamboj

James D Burns⁺
 Jeffrey B Lightfoot⁺
 Christopher P Weafer⁺
 Gregory J Tucker, QC⁺
 Terence W Yu⁺
 James H McBeath⁺
 Edith A Ryan⁺
 Daniel H Coles
 Patrick J O'Neill

OWEN BIRD

LAW CORPORATION

PO Box 49130
 Three Bentall Centre
 2900-595 Burrard Street
 Vancouver, BC
 Canada V7X 1J5

Carl J Pines, Associate Counsel⁺
 Rose-Mary L Basham, QC, Associate Counsel⁺
 Kari F Richardson, Associate Counsel⁺
 Hon Walter S Owen, OC, QC, LLD (1981)
 John I Bird, QC (2005)

⁺ Law Corporation
^{*} Also of the Yukon Bar
^{**} Also of the Ontario Bar

December 1, 2017

VIA ELECTRONIC FILING

British Columbia Utilities Commission
 6th Floor, 900 Howe Street
 Vancouver, B.C.
 V6Z 2N3

Telephone 604 688-0401
 Fax 604 688-2827
 Website www.owenbird.com

Direct Line: 604 691-7557
 Direct Fax: 604 632-4482
 E-mail: cweafer@owenbird.com
 Our File: 23841/0173

**Attention: Patrick Wruck, Commission Secretary and Manager,
 Regulatory Support**

Dear Sirs/Mesdames:

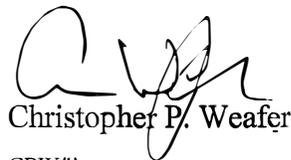
**Re: British Columbia Hydro and Power Authority – Open Access Transmission Tariff –
 Dynamic Scheduling Amendments Application Project No. 1598931**

We are counsel to the Commercial Energy Consumers Association of British Columbia (CEC). Attached please find the CEC's first set of Information Requests to BC Hydro with respect to the above.

If you have any questions regarding the foregoing, please do not hesitate to contact the undersigned.

Yours truly,

OWEN BIRD LAW CORPORATION



Christopher P. Weafer

CPW/jj
 cc: CEC
 cc: BC Hydro
 cc: Registered Interveners

**COMMERCIAL ENERGY CONSUMERS ASSOCIATION
OF BRITISH COLUMBIA**

**INTERVENER INFORMATION REQUEST NO. 1
TO BRITISH COLUMBIA HYDRO AND POWER AUTHORITY**

**British Columbia Hydro and Power Authority – Open Access Transmission Tariff –
Dynamic Scheduling Amendments Application Project No. 1598931**

December 1, 2017

1. Reference: Exhibit B-1, page 8 and page 10

In recognition of these industry requirements, BC Hydro adjusted its tariff and operating practices in 2013 to facilitate the implementation of FERC Order No. 764. BC Hydro's Open Access Transmission Tariff Amendments Application included intra-hour (15 minute) scheduling amendments to sections 13.8 and 14.6 of the OATT, and was approved by Commission Order No. G-180-13 on October 31, 2013. These amendments gave BC Hydro's transmission customer greater flexibility to import and export energy on a sub-hourly basis while ensuring that transmission reservations were still procured on an hourly basis. At that time, BC Hydro made no changes to the dynamic scheduling features of its OATT that had been put in place in 2005.

As discussed in section 2, BC Hydro's OATT currently limits dynamic scheduling to exports and requires Firm Service. To facilitate Powerex's participation in the EIM, Powerex has requested that BC Hydro evaluate the expanded use of dynamic scheduling on imports and on all transmission reservations, including Firm Service, Non-Firm Service and Network Economy Service. BC Hydro has considered

- 1.1 Please provide the rationale that was described in the 2013 application for requiring that the transmission reservations were still procured on an hourly basis.
- 1.2 Please provide the rationale that was originally used for limiting dynamic scheduling to exports.

2. Reference: Exhibit B-1, page 9 and <https://www.bpa.gov/Doing%20Business/TechnologyInnovation/TIPProjectBriefs/2017-TS-TIP-370.pdf>

In recent years, Bonneville Power Administration (BPA) has also recognized that enhanced use of dynamic transfer capability is needed to effectively deal with increased VEs penetration on its transmission system. BPA has recently initiated a project that will result in an increase in voltage control to allow for an increase of dynamic transfers.⁶ BPA's movement toward increasing dynamic scheduling capability will allow the region to more effectively manage VEs in a larger balancing footprint.

⁶ BPA Technology Innovation Project 370 available at: <https://www.bpa.gov/DoingBusiness/TechnologyInnovation/TIPProjectBriefs/2017-TS-TIP-370.pdf>.

Goals and Objectives - The goal of this project is to develop, simulate and validate a coordinated voltage control scheme for increasing Dynamic Transfer Capability on California – Oregon Intertie and Pacific HVDC Intertie. Objectives include:

- Develop Study Methodology for simulating Coordinated Controller
- Prototype and complete the simulation environment for Coordinate Controller
- Prototype and model the Controller algorithm
- Complete Controller validation studies

Deliverables Project deliverables include:

1. Report on simulation methodology to develop coordinated voltage control
2. Developed simulation environment for coordinated voltage control
3. Design of coordinated voltage control 4. Test and validation studies of coordinated voltage control

2.1 Would it be appropriate for BC Hydro to implement or participate in a similar project in the future? Please explain why or why not.

2.1.1 If yes, what would the likely costs be of implementing/participating in such a project.

3. Reference: Exhibit B-1, page 10 and 11

of dynamic scheduling. As a transmission provider, BC Hydro has considered the industry developments and concluded that it is reasonable and desirable to propose changes to its OATT to expand the use of dynamic scheduling. It is important that

BC Hydro keep up with industry developments where reasonable to support its customers, to reduce seam issues with interconnected BAAs⁹, and to encourage the efficient use of its transmission system.

⁹ "Seams issues" refers to inefficiencies that prevent the economic transfer of capacity and energy between neighboring markets or control areas, due to differences in market rules and designs, operating and scheduling protocols or other control area practices.

- 3.1 Please explain how dynamic scheduling results in 'efficient use of the transmission system'.
- 3.2 Please discuss any constraints that will be imposed on the transmission system as a result of Powerex or other customers participating in dynamic scheduling. Quantify and provide costs of managing such constraints where possible.

4. Reference: Exhibit B-1, page 11

Although Powerex is the only BC Hydro OATT customer that has formally expressed to BC Hydro an interest in expanded use of dynamic scheduling at this time, the amendments being proposed would be available to all eligible customers wishing to schedule dynamically. The amendments would be beneficial for all transmission customers who may want to dynamically import and export into or out of other regions and markets.

- 4.1 How does Powerex's participation in dynamic scheduling impact BC Hydro and its ratepayers, if at all? Please elaborate.
 - 4.1.1 Please provide quantification of any costs that will or could accrue to BC Hydro and/or its ratepayers.
 - 4.1.2 Please provide quantification of any benefits that will or could accrue to BC Hydro and/or its ratepayers.
- 4.2 Please confirm that Powerex's participation in dynamic scheduling is voluntary.
- 4.3 Does Powerex's participation in dynamic scheduling impose any obligations on BC Hydro or its ratepayers? Please explain.
- 4.4 Is BC Hydro aware of any other customers that would likely make use of dynamic scheduling either now or in the future?
 - 4.4.1 If yes, please briefly explain and provide details to the extent they are not confidential.
- 4.5 Please explain how participating in dynamic scheduling is beneficial to OATT customers, and provide quantification of any benefits where available.
- 4.6 Please confirm that the changes in the current application and the use of dynamic scheduling will not result in any direct costs to non OATT customers.
 - 4.6.1 If not confirmed, please explain and provide quantification of costs.

4.7 Please explain the how the use of dynamic scheduling will impact the transmission system and provide quantification of any direct or indirect costs that may accrue in the short or long term to core or any other customers as a result of these impacts.

4.8 Please explain how BC Hydro OATT customer participation in dynamic scheduling will reflect on BC Hydro as an entity, if at all.

5. Reference: Exhibit B-1, page 13

- Due the limitations on the availability of dynamic scheduling, dynamic scheduling was always subject to technical limitations and feasibility. BC Hydro's proposed amendments to section 4 of Attachment Q-1 clarify the process required for customers to use dynamic scheduling given these limitations. Proposed section 4 clarifies that BC Hydro may limit the volume of dynamic scheduling requests that can be accepted based on its reasonable assessment of the availability and limitations of dynamic scheduling between and through specific BAAs. For instance, BC Hydro must have arrangements in place with other BAAs in order to accommodate dynamic scheduling, and dynamic scheduling may be limited by reliability constraints.

5.1 Please elaborate on the types of arrangements that BC Hydro must have in place with other BAAs, and whether BC Hydro would be required to put these arrangements in place, or if they are already established.

5.1.1 If BC Hydro would be required to put the arrangements in place, what if any, are the activities associated with doing so.

5.1.2 If BC Hydro would be required to put the arrangements in place, what would be the costs of doing so?

5.2 Please elaborate on the 'reliability constraints' that BC Hydro is referring to in the cited paragraph.

5.3 Please confirm that BC Hydro would not expect to adjust any material aspects of its generation, transmission, distribution or other systems in order to provide additional reliability or accommodate dynamic scheduling in any other manner.

5.3.1 If not confirmed, please comment on the adjustments that BC Hydro would make as a result of dynamic scheduling.

5.3.2 Please provide quantification of any costs associated with providing reliability or accommodating dynamic scheduling.

6. Reference: Exhibit B-1, page 21

While no amendments to the OATT are required to implement, BC Hydro will be adjusting the way the utilization rate is calculated per section 5 of Attachment Q-2 – Network Economy Service. BC Hydro needs to adjust the way it is calculating the utilization rate in order to accommodate intra-hour scheduling and dynamic scheduling of imports, neither of which were available at the time BC Hydro originally implemented the network utilization test.

- 6.1 Please provide the costs associated with adjusting the way the utilization rate is calculated and identify which customers will bear these costs.

7. Reference: Exhibit B-1, page 21

In 2006, certain Alberta transmission customers and BC Hydro entered into a Negotiated Settlement Agreement (**NSA**), which was approved by the Commission under Order No. G-127-06. The NSA established specific tests and reporting obligations on the use of Network Economy Service. Important elements of that settlement included an economic test (to ensure the service's high reservation priority would apply only when imports economically displace domestic generation); a utilization test (to ensure that Network Economy Service reservations were being used and were not simply being reserved to block third party access); and various reporting obligations (to ensure transparency). Network Economy Service reservations have a higher priority than Non-Firm Service reservations provided the economic test and utilization test criteria are passed.

- 7.1 Please provide a brief description of Network Economy Service.
- 7.2 Please explain why Network Economy Service had a higher priority than Non-firm Service reservations.
- 7.3 Please describe the high reservation system and the issues regarding the economic displacement of domestic generation.
- 7.4 Please describe the issues regarding the use of the Network Economy Service reservations and the potential for blocking third party access.
- 7.5 Please discuss the importance of transparency in dynamic scheduling, and identify the areas in which it could be an issue.

8. Reference: Exhibit B-1, page 21 and 22

Since neither intra-hour scheduling nor dynamic scheduling was available for use on Network Economy Service at the time the NSA was completed, BC Hydro needs to adjust how it is implementing the utilization test to accurately account for this new use of Network Economy Service.

The utilization test required by the NSA compares the volume of Network Economy Service reservations to the volume of energy scheduled on those reservations. For ease of implementation, BC Hydro has been calculating the utilization of Network Economy Service by comparing the volume of transmission reservations to the average scheduled energy in a given hour. This implementation approach to the

utilization test does not accurately measure utilization where there are intra-hour or dynamic schedules.

- 8.1 Please provide any relevant information not described in response to CEC 1.7.4 regarding the use and importance of the utilization test.

9. Reference: Exhibit B-1, page 21

The utilization test required by the NSA compares the volume of Network Economy Service reservations to the volume of energy scheduled on those reservations. For ease of implementation, BC Hydro has been calculating the utilization of Network Economy Service by comparing the volume of transmission reservations to the average scheduled energy in a given hour. This implementation approach to the

utilization test does not accurately measure utilization where there are intra-hour or dynamic schedules.

- 9.1 Does BC Hydro use the utilization test measurement information internally, or is this only used to satisfy the NSA requirements?
- 9.2 If BC Hydro uses the information for purposes other than satisfying the NSA requirements, please elaborate on how the information is used.

10. Reference: Exhibit B-1, page 22

Since the transmission reservation is only available in minimum one hour blocks, BC Hydro will calculate utilization for all transmission reservations (including Network Economy Service reservations consistent with the NSA) to accurately measure utilization as follows:

- 10.1 Would it be useful for BC Hydro to facilitate smaller transmission reservation blocks? Please explain why or why not.
- 10.2 If yes, how could BC Hydro do so?

11. Reference: Exhibit B-1, page 22

- 1. For static schedules (i.e., non-dynamic schedules), BC Hydro will compare the volume of a reservation to the peak energy volume scheduled over an hour. This will accurately account for both hourly schedules where the amount scheduled will not change, and intra-hour energy schedules, where it may change within the hour; and

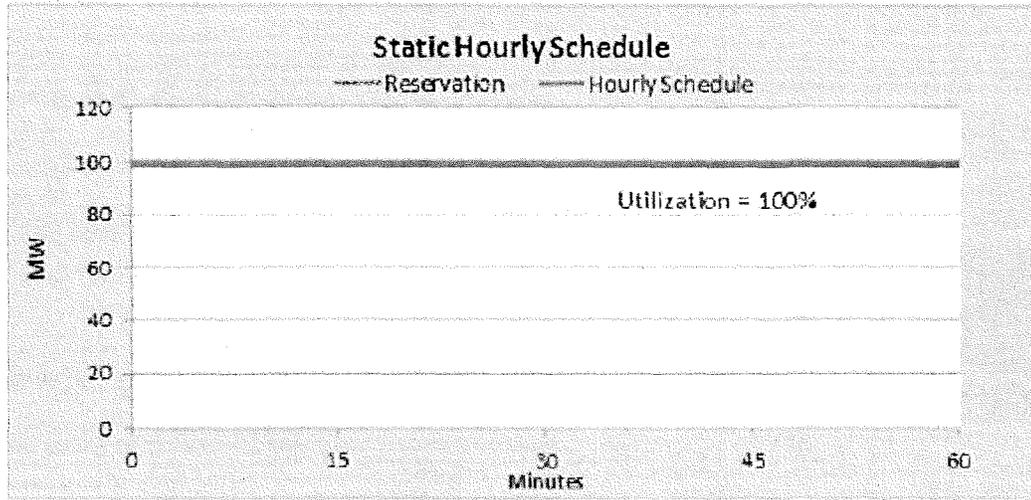
- 11.1 Please confirm or otherwise explain that, for static schedules, BC Hydro is proposing to change the calculation of utilization from average energy scheduled to peak energy scheduled, but that the circumstances will not have changed for the static schedules.
 - 11.1.1 If the circumstances for static schedules has not changed, and BC Hydro is planning to change the calculation of the utilization test, please explain why.
- 11.2 Please elaborate on how comparing the peak energy volume scheduled over an hour 'accurately' accounts for both unchanging hourly schedules and intra-hour schedules.

12. Reference: Exhibit B-1, pages 23 and 24

Figure 5-1 shows three examples of how BC Hydro would calculate utilization of a transmission reservation:

- 1. The top graph depicts an hourly transmission reservation with a static hourly schedule. In this example the peak schedule matches the transmission reservation for the hour so the utilization is 100 per cent. This example shows how transmission reservations and schedules were matched historically, and still are in most instances despite more intra-hour and dynamic scheduling;

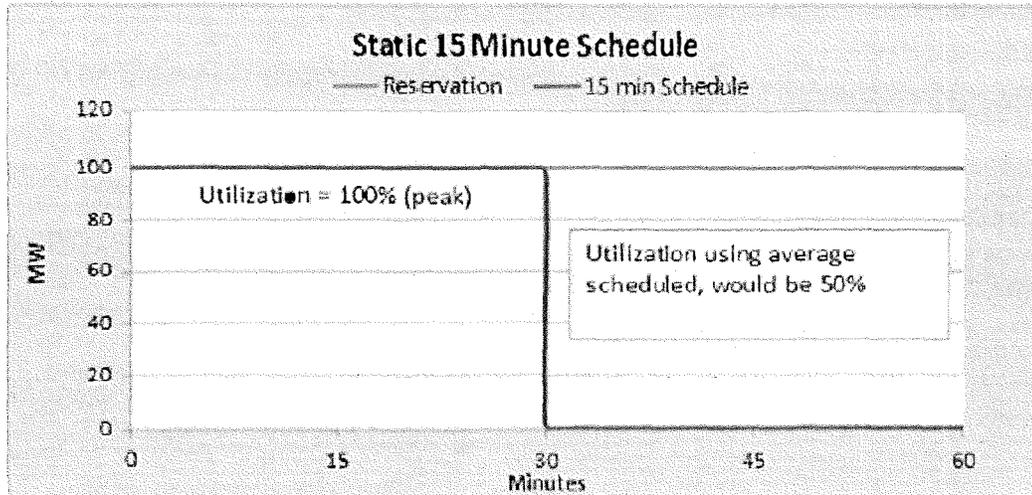
Figure 5-1 Three Examples of 100 per cent Utilization of Hourly Reservation



12.1 Does the peak schedule normally match the reservation, such that the utilization is 100%, or is this frequently not the case? Please explain.

13. Reference: Exhibit B-1, page 23 and 24

2. The middle depicts an hourly transmission reservation with static intra-hour schedules. In this example the schedule comprises two 15-minute increments equal to the transmission reservation followed by two 15-minute increments with zero scheduled. In this example the peak schedule matches the transmission reservation for the hour so the utilization is 100 per cent despite the average schedule being only 50 per cent of the peak. This example could reflect a reservation by a VER customer whose generation falls off during the hour; and



- 13.1 To the extent that BC Hydro is proposing to utilize a peak value instead of an average value, it would appear that the utilization rates would increase relative to the current methodology for the same situation. Please confirm or otherwise explain.
- 13.2 If confirmed, what are the implications to the customer of having a higher utilization rates? Please explain and provide quantification of any costs or benefits.
- 13.3 If confirmed, what are the implications to BC Hydro of having a higher utilization rate for the same situation? Please explain and provide quantification of any costs or benefits.
- 13.4 What are the implications to the other parties involved with calculating a higher utilization rate for the same situation. Please explain and provide quantification of any costs or benefits.

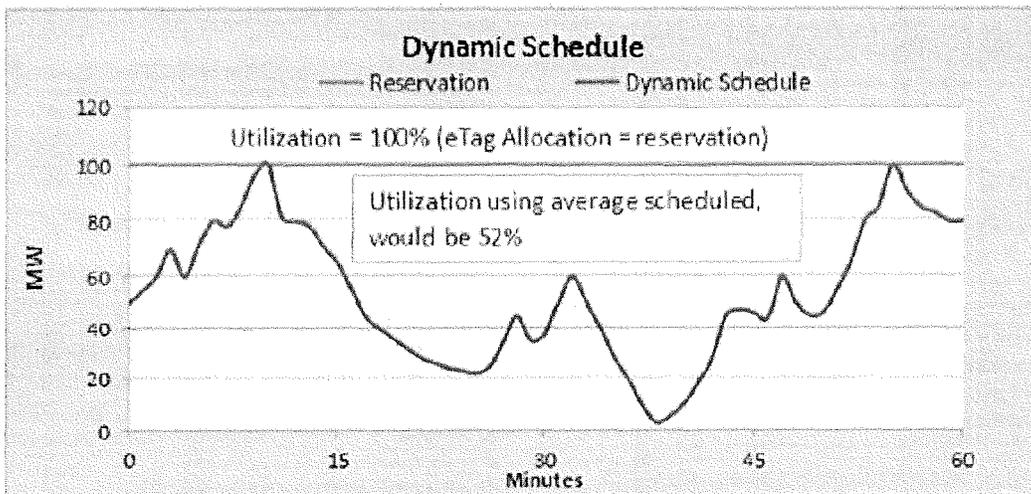
14. Reference: Exhibit B-1, page 22, 23 and 24

2. For dynamic schedules, BC Hydro will compare the volume of a transmission reservation to the transmission allocation (the portion of the transmission reservation that is allocated for the dynamic schedule) indicated on the eTag(s). This will accurately account for EIM and other dynamic interchange transfers, which require transmission capacity to be made available for the scheduling hour for use, as required.

- 14.1 Please explain what an 'eTag' is, and how it is used.
- 14.2 How are OATT customers charged for transmission capacity that is made available for the scheduling hour for use? Please explain.
- 14.3 Please confirm that the costs for the transmission capacity that is made available for the scheduling hour for use are borne exclusively by the OATT customers.
- 14.4 If not confirmed, please explain why not and provide quantification of any costs that are not recovered from the OATT customers.

15. Reference: Exhibit B-2, page 22, 23 and 24

2. For dynamic schedules, BC Hydro will compare the volume of a transmission reservation to the transmission allocation (the portion of the transmission reservation that is allocated for the dynamic schedule) indicated on the eTag(s). This will accurately account for EIM and other dynamic interchange transfers, which require transmission capacity to be made available for the scheduling hour for use, as required.
3. The third example shows a dynamic schedule. In this example, the hourly capacity reservation must be made available for the full hour and must be dynamically scheduled by T=xx:40. In this example the Transmission Allocation indicated on the eTag is equal to the transmission reservation and the utilization is therefore 100 per cent, despite the average schedule being only 52 per cent of the reservation.



15.1 Please explain what T=xx:40 means.

16. Reference: Exhibit B-1, page 24

BC Hydro will implement this change to the utilization test through its operating processes. No amendments to the OATT are required.

16.1 Does BC Hydro need to seek approval for the change with the other parties involved in the Negotiated Settlement Agreement? Please explain.

16.2 If yes, how and when will BC Hydro seek these approvals?

17. Reference: Exhibit B-1, page 25

In the Consultation Notice BC Hydro also sought comments on a possible new Attachment Q-6 that would provide a new zero priority scheduling option for customers participating in the EIM. Under Attachment Q-6, a transmission customer could use the residual capacity on its transmission reservations for EIM purposes, at the lowest transmission curtailment priority (first to be curtailed) and at no additional cost to the customer. These schedules would not decrement available transfer capability (**ATC**) that is offered for higher priority transmission services (i.e., they would have no impact to ATC). This scheduling option would be available on Point-To-Point Service Agreements and Network Integration Transmission Service Agreements.

Attachment Q-6 did not result in any comments from transmission customers and would cost approximately \$250,000 to implement. As the amendments to Attachment Q-1 are sufficient to facilitate participation in the EIM and other markets requiring dynamic scheduling, BC Hydro has decided not to seek approval of Attachment Q-6 at this time. Should developments arise that would make

Attachment Q-6 necessary or desirable in the future, BC Hydro would reconsider seeking approval from the Commission at that time.

- 17.1 Please briefly elaborate on the zero-priority scheduling option.
- 17.2 Please confirm that any costs associated with Attachment Q-6 would be born exclusively by OATT customers.

18. Reference: Exhibit B-1, page 26

It is important that BC Hydro keep up with industry developments where reasonable to support its customers, to reduce seam issues with interconnected BAAs, and to encourage the efficient use of its transmission system. BC Hydro proposed amendments to the OATT are in alignment with evolving markets and practices in the Western Interconnection, and will give all OATT customers the service they need

to participate in markets that require an expanded use of dynamic scheduling. As discussed in section 1.2, BC Hydro respectfully requests approval of its proposed amendments to Attachment Q-1 on or before January 31, 2018 to facilitate the participation in the CAISO EIM by Powerex.

- 18.1 Please discuss BC Hydro's expectations for how the market and practices in the Western Interconnection will continue to evolve over the next decade.