

**BRITISH COLUMBIA UTILITIES COMMISSION**

**IN THE MATTER OF THE UTILITIES COMMISSION ACT  
R.S.B.C. 1996, CHAPTER 473**

**and**

**British Columbia Hydro and Power Authority -  
F2020-F2021 Revenue Requirements Application**

**Vancouver, B.C.  
January 23<sup>rd</sup> , 2020**

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**PROCEEDINGS**

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**BBEFORE:**

<b>D. Morton,</b>	<b>Panel Chair/Commission Chair</b>
<b>A. Fung, Q.C.,</b>	<b>Commissioner/Deputy Chair</b>
<b>R. Mason,</b>	<b>Commissioner</b>
<b>B. Lockhart</b>	<b>Commissioner</b>

**VOLUME 8B**

## APPEARANCES

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E. GJOSHE,	Self
P. WILLIS	Self
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**VANCOUVER, B.C.**  
**January 23<sup>rd</sup>, 2020**

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**(PROCEEDING RESUMED AT 2:25 P.M.)** **T58/59**

THE CHAIRPERSON: Please be seated.

Good afternoon, panel. Mr. Ghikas.

MR. GHIKAS: Thank you, Mr. Chairman. So here we have BC Hydro's third panel, the Load Forecast Cost of Energy and the Operations Business Group. We'll just launch right into it. I think everybody has a pretty good idea of what we're going to do here.

So perhaps we could just have the witnesses affirmed, and we'll launch in.

**BC HYDRO PANEL 3 - LOAD FORECAST AND COST OF ENERGY:**

**CHARLOTTE MITHA, Affirmed:**

**BRUCE CHOW, Affirmed:**

**HEATHER MATTHEWS, Affirmed:**

**BILL CLENDINNING, Affirmed:**

**JOHN RICH, Affirmed:**

**MAUREEN DASCHUK, Affirmed:**

**EXAMINATION IN CHIEF BY MR. GHIKAS:**

MR. GHIKAS: Q All right, let's start with you, Ms. Daschuk. You are the Senior Vice-President, Integrated Planning, correct?

MS. DASCHUK: A Yes, that's right.

MR. GHIKAS: Q And you've held that position for over

1 two years?

2 MS. DASCHUK: A Yes, since December 2017.

3 MR. GHIKAS: Q Can you describe your responsibilities  
4 in your current position?

5 MS. DASCHUK: A At the highest level, the integrated  
6 planning group is responsible for the planning for the  
7 power system. That starts with the group that's led  
8 by Energy Planning and Analytics, Mr. Clendinning and  
9 Mr. Rich. They look out into the future, a long ways  
10 out into the future. They are responsible for the  
11 integrated resource plan, for the load forecast and  
12 they give us a view of the longer term demand for  
13 energy and the peak capacity that we need on the  
14 system.

15 I also manage the asset planning groups.  
16 There are three. They are responsible for the  
17 generating stations, the lines, the dams, all the  
18 waterways.

19 I also have got responsibility for the  
20 engineering group because they provide a critical  
21 input into the type of system that we want to build,  
22 the standard to which are going to be building the  
23 system and how we interconnect new generators or new  
24 customers to our system.

25 MR. GHIKAS: Q And as you alluded to, Mr. Clendinning  
26 reports to you directly?

1 MS. DASCHUK: A Yes.

2 MR. GHIKAS: Q And Mr. Rich, in turn, reports to Mr.  
3 Clendinning?

4 MS. DASCHUK: A Yes, that's right.

5 MR. GHIKAS: Q You've been with BC Hydro for over ten  
6 years, correct?

7 MS. DASCHUK: A Yes.

8 MR. GHIKAS: Q You're pre-filed direct testimony  
9 outlines the various positions that you've held. Can  
10 you just elaborate briefly on the areas of the company  
11 that you've worked in during your time at BC Hydro.

12 MS. DASCHUK: A I started in the operations group with  
13 materials management and fleet. From there I moved  
14 into one of the first transformation initiatives and  
15 took on more of a strategic planning role in various  
16 activities, including the labour resource strategy  
17 that we needed to support the company.

18 I moved back into a combination of strategy  
19 and operations and working in the planning and  
20 delivery of the more routine work that BC Hydro  
21 delivers, not the big capital projects but the  
22 projects like wood pole replacements and the routine  
23 activities, and that led me into this current  
24 position.

25 MR. GHIKAS: Q Does your pre-filed evidence accurately  
26 describe the role you played in the development of the

1 materials filed by BC Hydro?

2 MS. DASCHUK: A Yes.

3 MR. GHIKAS: Q Are there any corrections that you need  
4 to make to that?

5 MS. DASCHUK: A No corrections.

6 MR. GHIKAS: Q What areas will you be speaking to on  
7 this panel general?

8 MS. DASCHUK: A This panel, I'll be speaking on the  
9 load forecast. I should also mention that I'm on the  
10 Panel 4 as well, and on Panel 4, that panel I'll  
11 actually be speaking about capital, maintenance and  
12 the operating costs associated with the integrated  
13 planning group. But this panel specifically is about  
14 load forecasting.

15 MR. GHIKAS: Q Do you adopt as your evidence in this  
16 proceeding your pre-filed direct testimony and the  
17 written materials filed by BC Hydro on the topics for  
18 which you are responsible?

19 MS. DASCHUK: A I do.

20 MR. GHIKAS: Q Thank you.

21 Mr. Clendinning, I'll jump to you. You are  
22 the director of the energy planning and analytics key  
23 business unit, correct?

24 MR. CLENDINNING: A That's correct.

25 MR. GHIKAS: Q And you've held your current position  
26 for almost two years?

1 MR. CLENDINNING: A Yes.

2 MR. GHIKAS: Q You've been at BC Hydro in various  
3 positions for approximately 12 years, correct?

4 MR. CLENDINNING: A I have.

5 MR. GHIKAS: Q And you're a professional engineer?

6 MR. CLENDINNING: A I am, in the province of British  
7 Columbia.

8 MR. GHIKAS: Q can you please describe the functions  
9 that you and your energy planning and analytics key  
10 business unit perform?

11 MR. CLENDINNING: A Surely. So Ms. Daschuk provided a  
12 higher level overview. My key business unit and its  
13 department are really a bookend to the integrated  
14 planning function characterized as Mr. Rich's  
15 department. It's sort of the leading edge with  
16 forecasting what is the future demand from our  
17 customers for our product, for electricity.

18 That then feeds into three other  
19 departments that are really focused on the integrated  
20 resource plan.

21 **Proceeding Time 2:30 p.m. T60**

22 And so we're looking forward to being able to put that  
23 in front of you in 2021.

24 And then that sets the power systems  
25 strategy for the company and that flows into our asset  
26 planning groups, as Ms. Daschuk mentioned, an aligned

1 generation, distribution, transmission. And to build  
2 out our response to demand for future electricity  
3 needs of our customers, what's our response to that  
4 going to be?

5 On the far end I have two departments that  
6 then take the proposals, the different risks, and a  
7 department brings those risks together and optimizes  
8 that in the development of the capital plan, and so  
9 joining Ms. Daschuk on the capital and maintenance  
10 plan is Ms. Pinksen who leads the department that has  
11 that function.

12 And then finally I have one last department  
13 that looks at the health of our assets in the system  
14 and is able to project, based on different  
15 expenditures, what might be the future state of our  
16 assets as we contemplate spending on different  
17 initiatives. So really, the front end of it, what is  
18 the power strategy, and then at the far end to  
19 optimize the capital plan and maintenance plans that  
20 responds to the needs of our customers and monitoring  
21 the state of our assets.

22 MR. GHIKAS: Q Does your pre-filed direct testimony  
23 accurately describe the role you played in the  
24 development of the materials?

25 MR. CLENDINNING: A It does.

26 MR. GHIKAS: Q And in general terms what areas will you

1 be speaking to.

2 MR. CLENDINNING: A In general terms, it would be  
3 Chapter 3 of the application, Appendix G, as well as  
4 Appendix G of the evidentiary update, Appendix O of  
5 the application, the 20-year load forecast from June  
6 2019 as well as the operation and maintenance in  
7 Chapter 5, section 5.58.4 from my KBU.

8 MR. GHIKAS: Q Thank you. Are there any corrections  
9 that you need to make to that evidence?

10 MR. CLENDINNING: A None.

11 MR. GHIKAS: Q Do you adopt as your evidence in this  
12 proceeding your pre-filed direct testimony and the  
13 written materials filed by BC Hydro on the topics for  
14 which you're responsible?

15 MR. CLENDINNING: A I do.

16 MR. GHIKAS: Q Coming back to you, Mr. Rich. You are  
17 the manager for the load forecasting team with the  
18 energy planning and analytics key business unit,  
19 correct?

20 MR. RICH: A I am.

21 MR. GHIKAS: Q And you have held your current position  
22 for approximately three and a half years?

23 MR. RICH: A Yes.

24 MR. GHIKAS: Q How long have you been with BC Hydro?

25 MR. RICH: A Approximately 25 years.

26 MR. GHIKAS: Q And approximately how much of that time



1           has been spent working in the areas of energy  
2           planning?

3 MR. RICH:    A    Most of my career has been in energy  
4           planning.

5 MR. GHIKAS:  Q    And you are a professional engineer in  
6           B.C.?

7 MR. RICH:    A    Yes, I am.

8 MR. GHIKAS:  Q    How many people are in your load  
9           forecasting group?

10 MR. RICH:    A    There are seven professionals, including  
11           myself.

12 MR. GHIKAS:  Q    And can you briefly describe what your  
13           group does within the broader context of the energy  
14           planning and BC Hydro generally?

15 MR. RICH:    A    Well, on a day-to-day basis we are  
16           developing the next energy and peak demand forecasts  
17           and energy is our annual electricity demand measured  
18           in -- typically measured in gigawatt hours and peak  
19           demand is our maximum demand on the system in a single  
20           hours and that's typically measured in megawatts.

21                    Then we're also supporting the various  
22           business processes that are applying our current load  
23           forecasts, and so that includes system and capital  
24           planning, DSM planning, regulatory proceedings,  
25           revenue requirements such as this one, CPCNs, service  
26           plans and the like.

1 MR. GHIKAS: Q And how often does your team typically  
2 prepare load forecasts?

3 MR. RICH: A We try to complete a load forecast on an  
4 annual basis, although that may vary, subject to  
5 regulatory schedules, for example.

6 MR. GHIKAS: Q BC Hydro has filed two load forecasts in  
7 this proceeding, one dated October 2018 and one dated  
8 June 2019. Why was each of those prepared?

9 MR. RICH: A So the October 2018 load forecast was an  
10 energy forecast that was prepared in support of this  
11 application and it was also associated with the timing  
12 of when we normally develop an annual load forecast in  
13 support of BC Hydro's annual service plan.

14 The June 2019 20-year forecast was  
15 undertaken in response to a request from our planning  
16 groups because the most recent 20-year program was --  
17 or 20-year forecast was becoming somewhat dated and  
18 the June forecast also includes a peak demand  
19 component and that's what drives a lot of the capital  
20 growth planning aspect. And understand, the June  
21 forecast is also going to support the upcoming service  
22 plan.

23 **Proceeding Time 2:35 p.m. T61**

24 MR. GHIKAS: Q So, can you just explain briefly at a  
25 high level the similarities or differences in terms of  
26 how those two load forecasts were prepared? Not the

1 results, but how they were prepared.

2 MR. RICH: A Well, in general terms, other than  
3 applying a different electric vehicle load forecast  
4 that aligned with the *CleanBC* plan, the June forecast  
5 is essentially an extension of the October forecast.  
6 We did make a number of customer-specific changes in  
7 the first six years that were covered by the October  
8 forecast, and those were filed confidentially as part  
9 of Appendix A of exhibit B-15, and then we made a  
10 subsequent revised update to that in response to a  
11 BCUC IR.

12 And then other than that, we made  
13 relatively minor changes and other aspects of the load  
14 forecast.

15 MR. GHIKAS: Q Is the June 2019 forecast going to be  
16 the basis for the next integrated resource plan?

17 MR. RICH: A No, so we are actually in the middle of  
18 developing our next forecast, and that's the one  
19 that's going to be in the IRP. So I've got four load  
20 forecast vintages going through my head right now.

21 MR. GHIKAS: Q Does your pre-filed direct testimony  
22 accurately describe the role you played in the  
23 development of the materials?

24 MR. RICH: A It does.

25 MR. GHIKAS: Q And in general terms, what areas will  
26 you be speaking to?

1 MR. RICH: A Well, essentially everything that Mr.  
2 Clendinning said, which is Chapter 3 and Appendix O in  
3 the various appendices. Appendix G of the filing, as  
4 well as the evidentiary update of Appendix G. And I  
5 responded to a number of IR responses and prepared  
6 those aspects of the application.

7 MR. GHIKAS: Q And do you have any changes that you  
8 need to make to that evidence at this point?

9 MR. RICH: A No, I don't.

10 MR. GHIKAS: Q Do you adopt as your evidence in this  
11 proceeding your pre-filed direct testimony and the  
12 written materials filed by BC Hydro in the areas for  
13 which you have responsibility?

14 MR. RICH: A Yes I do.

15 MR. GHIKAS: Q Thank you. Ms. Mitha, we'll go all the  
16 way to you. You are the executive vice president of  
17 operations at BC Hydro?

18 MS. MITHA: A Yes, I am.

19 MR. GHIKAS: Q And can you elaborate on your current  
20 responsibilities please?

21 MS. MITHA: A Sure. So operations is responsible for  
22 operating a generation system, transmission  
23 distribution systems, and the telecom system across  
24 the province. And so we have the frontline staff in  
25 the 32 generating stations, the over 300 substations,  
26 60 district offices that have line resources and

1 designers. And we also have the two control centres.  
2 Responsibility and the non-integrated areas.

3 And so operations has all the powerline  
4 technicians for the lines work, the electricians and  
5 the protection control technologists who work in the  
6 stations along with other trades. The load desk  
7 operators and engineers who run the bulk electric  
8 system, and the engineers and hydrologists in  
9 generation system operations who manage, who optimize  
10 the generation system and manage the reservoirs. And  
11 we also have the designers who are responsible for a  
12 design on the distribution network and their customer  
13 connections, and we have plant operators. And that's  
14 dispersed across the province.

15 MR. GHIKAS: Q And Ms. Mitha, Ms. Matthews is one of  
16 the directors that reports to you, correct?

17 MS. MITHA: A Correct.

18 MR. GHIKAS: Q Now, your appointment to the executive  
19 team is relatively recent, correct?

20 MS. MITHA: A Correct, I was appointed in September of  
21 this year.

22 MR. GHIKAS: Q But you'd been with BC Hydro for  
23 approximately 15 years?

24 MS. MITHA: A Correct.

25 MR. GHIKAS: Q And where were you working -- were you  
26 working that whole time in the operations area?

1 MS. MITHA: A So, by and large, yes I have been working  
2 in operations for 14 of those 15 years. When I first  
3 came into Hydro I came in as a key account manager for  
4 about a year, year and a half. And then since then I  
5 have been areas that are now considered operations.

6 MR. GHIKAS: Q And immediately before you became  
7 executive vice president, you held two different  
8 director roles within the operations business group,  
9 correct?

10 MS. MITHA: A Correct.

11 MR. GHIKAS: Q And can you just describe very briefly  
12 what your responsibilities involved in your previous  
13 director roles?

14 MS. MITHA: A Sure, I was director of work management  
15 operations across operations. So looking at the new  
16 work management systems we were putting in, and the  
17 business improvements there. And before that I was  
18 director of distribution design and customer  
19 connections which have the 350 - 400 designers across  
20 the province who do the distribution design work, and  
21 do all the customer connections.

22 MR. GHIKAS: Q And you're a professional engineer as  
23 well, among your professional qualifications?

24 MS. MITHA: A Yes, I am.

25 MR. GHIKAS: Q Does your pre-filed direct testimony  
26 accurately describe the role that you played in the

1 development of the materials?

2 MS. MITHA: A It does.

3 MR. GHIKAS: Q. And in general terms, what topics will  
4 you be speaking to?

5 **Proceeding Time 2:40 p.m. T62**

6 MS. MITHA: A So I will be covering operating costs as  
7 they relate to the operations business group, and a  
8 cost of energy but the details on IPPs will be covered  
9 by Bruce Chow, Mr. Bruce Chow, and the details on cost  
10 of energy and system optimization will be covered by  
11 Ms. Matthews.

12 MR. GHIKAS: Q Are there any corrections that you need  
13 to make to your evidence?

14 MS. MITHA: A No, there's not.

15 MR. GHIKAS: Q Do you adopt as your evidence in this  
16 proceeding your pre-filed direct testimony and the  
17 written materials filed by BC Hydro on the areas for  
18 which are are responsible?

19 MS. MITHA: A I do.

20 MR. GHIKAS: Q Ms. Matthews, you are the Director of  
21 Generation System Operations Key Business Unit,  
22 correct?

23 MS. MATTHEWS: A Yes.

24 MR. GHIKAS: Q And you report to Ms. Mitha, obviously.

25 MS. MATTHEWS: A Yes.

26 MR. GHIKAS: Q You've held your current position for

1           approximately three and a half years?

2 MS. MATTHEWS:    A    Yes, that's correct.

3 MR. GHIKAS:     Q    And you've been at BC Hydro for  
4           approximately 20 years.

5 MS. MATTHEWS:    A    Yes.

6 MR. GHIKAS:     Q    You've held a number of positions which  
7           are reflected in your prefiled direct testimony. How  
8           much of your career at BC Hydro has been involved in  
9           system operations and planning?

10 MS. MATTHEWS:    A    Approximately 17 years. For six years  
11           I was in the energy planning group and then the last  
12           11 years I've been in the generation system operations  
13           group.

14 MR. GHIKAS:     Q    And you're a registered professional  
15           engineer as well?

16 MS. MATTHEWS:    A    Correct.

17 MR. GHIKAS:     Q    Does your pre-filed evidence accurately  
18           describe the role that you played in the development  
19           of the materials.

20 MS. MATTHEWS:    A    Yes, it does.

21 MR. GHIKAS:     Q    Can you please describe what function  
22           your key business unit performs?

23 MS. MATTHEWS:    A    Yes, my function is to really make  
24           sure that we have enough generation on to meet our  
25           customers load at every hour of the day. So I'm  
26           accountable for doing this planning across the



1 operating time horizon, which is a three-year time  
2 horizon, and it's a continuous process. We look out  
3 three years. We look out a year. We look out the  
4 next couple of months. We look out the next week, the  
5 next day, and sometimes what we're doing in each of  
6 those period is slightly different. But it all ends  
7 up back at a shift office where the engineers -- it's  
8 like a control centre. So they're sitting in front of  
9 a bunch of screens and they can see what the load is,  
10 they can see where all the reservoirs are and as the  
11 peak is coming up on the evening, they're giving  
12 direction of what units to bring on line to meet that  
13 peak. And that's where it all comes together to make  
14 sure that we have enough generation on to meet  
15 customer demand.

16 I also actually as of September took on  
17 responsibility for the IPP portfolio. However for  
18 this proceeding Bruce will be answering most of the  
19 questions on that.

20 MR. GHIKAS: Q Thank you. So your area is notoriously  
21 complex, Ms. Matthews. So can I just ask you one  
22 follow-up question on that? How do you decide what  
23 resources to use at any given time to meet the  
24 requirements of customers?

25 MS. MATTHEWS: A Yes, so we make our decisions with the  
26 purpose of maximizing the overall value, and of

1 course, first having to meet our customers' load and  
2 then also meet all the other environmental and social  
3 constraints on the system. And so it starts with the  
4 energy studies, which is the set of models that we've  
5 modelled out over the three years and beyond period,  
6 and that gives us the plan at a high level of what the  
7 reservoir levels are, what the imports and exports  
8 might be.

9 And the other important thing that comes  
10 out of that is these price signals. And so we use  
11 these price signals of our big basins to decide first  
12 which of the Peace or the Columbia we are running  
13 first or second order. And then also it gives us a  
14 signal of what price BC Hydro is willing to either be  
15 importing at or for exporting.

16 And then on the smaller systems it's  
17 actually a lot more about the water management. So  
18 for example, today you may have noticed it's been  
19 raining quite a lot and so the shift office will be  
20 watching all those small rivers -- or the small basin.  
21 And actually Coquitlam this morning has come up to the  
22 flood level downstream, so they'll be -- they started  
23 backing off how much spill there is and they'll really  
24 be focussed on really water management and trying to  
25 prevent any flooding downstream.

26 So depending what is going on, what they



1 in that time, you know, on the long range we need to  
2 be self-sufficient with resources within British  
3 Columbia, and that's independent of imports and  
4 exports, and so that's our main driver. We're also  
5 looking at the financial concerns. We don't want to  
6 build assets that could be stranded.

7 And so those are the medium of what we're  
8 doing, and to Ms. Matthews's points, we're looking at  
9 when and how to procure additional resources. As we  
10 get closer in the timeframe that resource stack – if  
11 I'll call it that – gets fixed. And so how we then  
12 work with that fixed constraint on the system, that's  
13 really where the operational view takes over and I  
14 know Ms. Matthews can get into that more detailed  
15 world in a bit.

16 MR. GHIKAS: Q Thank you. Returning to you, Ms.  
17 Matthews, in general terms what areas will you be  
18 speaking to?

19 MS. MATTHEWS: A I'll be speaking to the heritage  
20 energy costs, the cost of market, imports and exports,  
21 and in general how the system is operated.

22 MR. GHIKAS: Q Are there any corrections you need to  
23 make to that evidence?

24 MS. MATTHEWS: A No.

25 MR. GHIKAS: Q Do you adopt as your evidence in this  
26 proceeding your pre-filed direct testimony and the

1 written materials filed by BC Hydro on the topics for  
2 which you're responsible?

3 MS. MATTHEWS: A Yes.

4 MR. GHIKAS: Q Thank you. And Mr. Chow, you are the  
5 manager of Independent Power Producer Portfolio  
6 Management at BC Hydro?

7 MR. CHOW: A Yes.

8 MR. GHIKAS: Q And you report to Ms. Matthews?

9 MR. CHOW: A I do.

10 MR. GHIKAS: Q You've held your current position for  
11 approximately six and a half years?

12 MR. CHOW: A That's correct.

13 MR. GHIKAS: Q. Can you describe what function your  
14 group performed on a day-to-day basis?

15 MR. CHOW: A Yes. So we manage BC Hydro's portfolio of  
16 contracts with independent power producers. It's  
17 about 130 contracts. So we monitor and manage the  
18 costs associated with those contracts. We verify and  
19 process the monthly invoices that are issued by the  
20 IPPs and we confirm that they're in compliance with  
21 their contracts with us.

22 In addition we forecast, on a monthly  
23 basis, deliveries from those individual contracts.  
24 And we develop programs, such as the biomass energy  
25 programs. And then we are also responsible for  
26 negotiating contracts. That would be, for example,

1 renewals of contracts that we've done recently, as  
2 well as new contracts for the biomass energy program.

3 MR. GHIKAS: Q Thank you. And you're a professional  
4 engineer and a chartered financial analyst?

5 MR. CHOW: A That's correct.

6 MR. GHIKAS: Q Does your pre-filed evidence describe  
7 the role you played in the development of the  
8 materials?

9 MR. CHOW: A Yes, it does.

10 MR. GHIKAS: Q And in general what areas will you be  
11 speaking to?

12 MR. CHOW: A I'll be speaking to the sections of  
13 Chapter 4 that deal with the independent power  
14 producers.

15 MR. GHIKAS: Q And are there any corrections you need  
16 to make to that evidence?

17 MR. CHOW: A No.

18 MR. GHIKAS: Q Do you adopt as your evidence in this  
19 proceeding your pre-filed direct testimony and the  
20 written materials filed by BC Hydro in the areas for  
21 which you're responsible?

22 MR. CHOW: A I do.

23 MR. GHIKAS: Q Thank you.

24 Mr. Chairman, the panel is available for  
25 cross-examination.

26 THE CHAIRPERSON: Thank you, Mr. Ghikas. And I would

1           just note that we've got a change of order of cross-  
2           examination for those of you that are listening at  
3           home and those of you in the room. We'll start with  
4           Mr. Ince.

5 MR. INCE:           Good morning, Mr. Chair, panel members, BC  
6           Hydro.

7 THE CHAIRPERSON:       Good morning.

8 MR. INCE:           I've got a small administrative item to  
9           bring up, is the schedule. So I previously gave Mr.  
10          Miller an estimate of 45 minutes.

11 THE CHAIRPERSON:       Yes.

12 MR. INCE:           And subsequent to that, since the other  
13          interveners knew that I was going to be up first on  
14          the load forecast, I've been handed some questions by  
15          the other interveners perhaps to --

16 THE CHAIRPERSON:       Wrong place at the wrong time, huh?

17 MR. INCE:           So I may have to -- Mr. Miller was very  
18          complementary in saying that I've been always on time  
19          in terms of my cross, but I may have to expand from 45  
20          minutes to one hour.

21 THE CHAIRPERSON:       No problem. Thank you for letting us  
22          know, but that's fine.

23 MR. INCE:           And in terms of compliments, the BC Hydro  
24          team offered me the compliment yesterday that I sound  
25          like lawyer and so --

26 MR. GHIKAS:          That is not a complement, sir, I'm sorry.

1 On the record.

2 MR. INCE: For the record I'm an engineer.

3 **CROSS-EXAMINATION BY MR. INCE:**

4 MR. INCE: Q. And Ms. Matthews, I am close to living  
5 down to -- downstream --

6 THE CHAIRPERSON: Sorry, Mr. Ince, just before you  
7 begin, given what you've just said, I'd like to aim  
8 for a break about 3:30-ish, and so it sounds like you  
9 may not be done by then, so if you could just let me  
10 know around 3:30 when is a good time for a break, that  
11 would be great. Thanks.

12 MR. INCE: Q Yeah. And, Ms. Matthews, thank you for  
13 the heads up. I live downstream of Coquitlam Dam, so  
14 -- but on that subject, in terms of administration, I  
15 have -- most of my questions are on the load forecast,  
16 but I have about half a dozen questions on the  
17 operations of the generation system and the  
18 constraints faced by BC Hydro.

19 So I'll turn your attention to Exhibit B-6,  
20 it's information request 1.7.5. Ms. Matthews, it has  
21 been described to me as the most important single  
22 concept in BC Hydro by one of your predecessors. It's  
23 also been described as the pinch curve.

24 **Proceeding Time 2:50 p.m. T64**

25 MS. MATTHEWS: A I have the IR.

26 MR. INCE: Q So, can we walk through this curve,



1           please. It is -- this is for 2018, I believe. I  
2           don't know if it's Fiscal '18 or 2018 calendar.

3 MS. MATTHEWS:   A    It's calendar year.

4 MR. INCE:       Q    Calendar. So, can we walk through this.  
5           It looks like the load shape of BC Hydro is a smile.  
6           It is maximized in January and December and it's  
7           minimum in the summer. Is that correct?

8 MS. MATTHEWS:   A    Yeah, that's correct. On the graph,  
9           for those who don't have it in front of you, you can  
10          see it, and this is in energy so in the winter it's  
11          more like at around 6,000 gigawatt hours and then it  
12          goes down to a low in the spring of, eyeballing it,  
13          just under 5,000.

14 MR. INCE:       Q    So in contrast, the blue line is the total  
15          system inflows. So basically this is the energy, the  
16          potential energy available to BC Hydro. And that's  
17          the effect of, largely, freshet?

18 MS. MATTHEWS:   A    Yes, that's correct.

19 MR. INCE:       Q    And lower on the chart it's the red line,  
20          which is the EPAs, or I assume that's the independent  
21          power producers?

22 MS. MATTHEWS:   A    Yes, that's correct.

23 MR. INCE:       Q    And so subsequently, the green line -- so,  
24          because BC Hydro stores that excess energy that comes  
25          in during the freshet, BC Hydro realizes that dotted  
26          green line which is basically the minimum amount of

1 generation that it can produce as a result of the  
2 generation -- or the storage it has?

3 MS. MATTHEWS: A Yes, that's correct. And just to  
4 expand on the minimum generation, so that's the green  
5 line there. So, you'll see that it includes the red  
6 line, the EPAs, and, I mean, BC Hydro also has a  
7 number of facilities that don't have that much  
8 storage, so there's limited storage for what they can  
9 do. But then on other ones we have fish flows and  
10 minimum generation so it's -- you can't back off the  
11 generation at all the places down to zero, so that  
12 minimum generation represents all those constraints.

13 MR. INCE: Q So for example on minimum generation, it's  
14 largely fish and generation characteristics, the  
15 generation of the turbines?

16 MS. MATTHEWS: A Yeah, usually it's related to  
17 environmental fish flows.

18 MR. INCE: Q So this would seem to be a problem in  
19 terms of the May and June timeframe. It must be  
20 particularly difficult to operate the systems within  
21 those constraints?

22 MS. MATTHEWS: A Yeah, so what the graph is showing is  
23 that in May and June we get into a situation now where  
24 we have to be -- our minimum generation is over our  
25 load and so there has to be exports in that time  
26 period.

1 MR. INCE: Q So that's mandatory exports or potentially  
2 even spill?

3 MS. MATTHEWS: A Yes, correct.

4 MR. INCE: Q This chart is for 2018. Is there anything  
5 substantially different about 2019 or the current  
6 fiscal year that's substantially different from this?

7 MS. MATTHEWS: A No. I mean, the charts will change a  
8 bit as load changes or if there's different resources.  
9 I would say that when you actually get into the actual  
10 year, the amount of what we call the forced exports  
11 really depends on the year. It really depends on how  
12 the runoff comes off. So sometimes it's really warm  
13 for a couple weeks and it can come off altogether even  
14 if it's a low snowpack year. Whereas other times you  
15 might think you have a problem with a lot and it comes  
16 off more slowly, so you don't reach that level as  
17 much. So it's -- I mean, this is on an annual and a  
18 monthly basis, but it actually really depends on what  
19 happens in May and June in that specific year.

20 MR. INCE: Q Is this situation a deterioration from  
21 what would have occurred, let's say, ten years ago? I  
22 believe in the similar -- the same IR response that BC  
23 Hydro provided there's a chart from around 2008 that  
24 doesn't show as much of a pinch, shall we say.

25 MS. MATTHEWS: A Yes, no, that's correct. If you go  
26 back ten years -- I mean, we called it the pinch curve

1 because that part where the minimum generation was  
2 coming up to load was getting pinched and at that  
3 point it wasn't at that point, but now it is over in  
4 those months, so that ten years ago --

5 MR. INCE: Q Perhaps a new nomenclature for the pinch  
6 curve is warranted, it's an overlap curve. But  
7 getting back to May and June, that implies that in  
8 this period there were forced exports and presumably  
9 into the markets, either Alberta or the Pacific  
10 Northwest and that would have been at market prices  
11 during those periods.

12 **Proceeding Time 2:55 p.m. T65**

13 MS. MATTHEWS: A Yes. Now again, this actual curve is  
14 on a monthly basis, so I don't think you can actually  
15 make an assumption from that graph. But as it turned  
16 out in 2008 -- or '18, sorry, we did have forced  
17 exports and 2018 the calendar year was actually fairly  
18 dry across the springtime period, but we did still get  
19 into these situations where we've got forced exports.

20 MR. INCE: Q Fiscal '20 and fiscal '21, do you expect  
21 those to be worse than this situation? Similar?

22 MS. MATTHEWS: A I'd say similar. Again it's -- I mean  
23 overall our load resource balance is probably quite  
24 similar, but when it really comes down to it, it's  
25 going to depend on what actually happens with the  
26 weather in that year for how bad it is in any given

1 year.

2 MR. INCE: Q Now, if there are forced exports, this is  
3 into a market during the freshet. Can you indicate  
4 the makeup of the market in the Pacific Northwest in  
5 terms of largely where that power is going into, and I  
6 will refer to Exhibit B-12 Ince 2.21. I don't think  
7 it's necessary to reference that. But BC Hydro  
8 indicated that the BC Hydro system is that not  
9 dissimilar from the systems in the Pacific Northwest  
10 in terms of hydrology, and then when they have water,  
11 we have water. And when we have low prices, they have  
12 low prices. Is that a reasonable statement?

13 MS. MATTHEWS: A Yes. In that information response we  
14 gave, I think, what the generation mix was in the  
15 Pacific Northwest and there is a quite a lot of hydro,  
16 and there's a graph there of the Dells which is on the  
17 Columbia River and that's a good point for looking at  
18 how much flow it is and then hence how much water is  
19 going through the generators on the U.S. side and that  
20 definitely has a correlation with the price.

21 So again the timing of when the freshet  
22 happens and when the prices might go low, we actually  
23 see quite a large variability that's usually in the  
24 May, June as shown in the graph here. We have seen it  
25 earlier, we have seen it later as well. But when the  
26 water is all running off, I mean they're spilling it

1 down through all the units in the U.S. and the prices  
2 drop quite low, sometimes actually negative.

3 MR. INCE: Q I'd like to go to Exhibit B-6, Ince  
4 Information Request 1.7.10, and this is related to IPP  
5 values. I asked the question about what is the  
6 outstanding value of IPP contracts.

7 MR. CHOW: A Yes.

8 MR. INCE: Q And I believe the response was that BC  
9 Hydro on a nominal basis – so you take all of the  
10 contracts and value them at their nominal dollar  
11 value – is \$50 billion.

12 MR. CHOW: A Yes, that's correct.

13 MR. INCE: Q But I think a realistic assessment would  
14 be to apply a discount rate to that and the discounted  
15 value is \$20 billion. Is that reasonable?

16 MR. CHOW: A I believe that's the number.

17 MR. INCE: Q So given the situation with the hydrology  
18 and the markets, in terms of cost savings, are there  
19 possible cost savings within the IPP contracts over  
20 the test period, particular the hydro-based, the small  
21 hydro-based contracts?

22 MR. CHOW: A You're asking if there are cost savings  
23 possible over this period?

24 MR. INCE: Q In terms of buy-outs.

25 MR. CHOW: A In terms of buy-outs of contracts?

26 MR. INCE: Q Yes.

1 MR. CHOW: A I believe we responded to an IR on that.  
2 Sorry, I don't have the IR number, but BC  
3 Hydro doesn't have unilateral termination rights for  
4 its contracts with IPPs.

5 THE CHAIRPERSON: Sorry, doesn't have?

6 MR. CHOW: A Does not have.

7 MR. INCE: Q But given enough incentive presumably  
8 those contracts could be negotiated out of existence.

9 MR. CHOW: A That is something that we have not looked  
10 at.

11 MR. INCE: Q Let's say the contracts were either bought  
12 out or they were terminated in some way, and these  
13 IPPs were left to go to the market, potentially they  
14 were left to go free. Is it feasible that they could  
15 see domestically or export? So instead of the BC  
16 Hydro contract they had alternatives in terms of  
17 selling to domestic or export markets?

18 **Proceeding Time 3:00 p.m. T66**

19 MR. CHOW: A Again, so BC Hydro has these contracts,  
20 and BC Hydro intends to -- by its obligations under  
21 those contracts, in the absence of any termination  
22 right where the IPP would not be in compliance with  
23 its obligations under the contract, then BC Hydro  
24 wouldn't be in a position to terminate those  
25 contracts.

26 MR. INCE: Q So, I'd like to go into the load forecast.

1           So, perhaps congratulations for BC Hydro, but it seems  
2           to be in the press that it reached a new peak record  
3           all time. I see the number 10,302, although it may be  
4           that was exceeded on a subsequent date?

5 MR. CHOW:    A    Yes, that was on the Monday, last Monday,  
6           so the 13<sup>th</sup>, and on Tuesday we broke it again. So I  
7           think it is around 10,000, over 500. 577, something  
8           like that.

9 MR. INCE:    Q    Can you describe the conditions at the  
10           time, Mr. Rich, my apologies, I was in Hawaii, but the  
11           approximate time of day, the day of the week, and so  
12           on?

13 MR. RICH:    A    I think it was in the evening, so that  
14           would be typically when we would expect it. I mean, we  
15           are a winter peaking utility, so we are sensitive to  
16           colder temperatures. So that is when we would expect  
17           to reach a peak demand.

18                    It doesn't happen that often, actually. It  
19           is very difficult -- let me back up a bit. We try to  
20           normalize peak demand, and we do that by using a 30  
21           year rolling average of a cold day in the winter. And  
22           so I would describe the conditions as probably  
23           slightly colder than what we would call the design  
24           temperature, and so we would expect it to be slightly  
25           higher than what our normalized peak forecast demand  
26           would have been at the period -- at the time. But I



1 think the conditions were such that a cold day  
2 followed by another cold day, in the middle of a work  
3 day, probably exacerbates the demand.

4 MR. INCE: Q Approximately what months of the year are  
5 these peaks occurred? Like January? February? What  
6 is typically the peak month, and then the shoulders  
7 around that?

8 MR. RICH: A Well, typically December/January. But it  
9 can happen anywhere from November to February.

10 MR. INCE: Q Okay. And that's consistent with the  
11 pinch chart that we looked at earlier in terms of the  
12 smile shape, that BC Hydro's peak demand typically  
13 occurs in the winter. And why does it occur in the  
14 winter?

15 MR. RICH: A Well, yeah, I'm not sure about the smile  
16 chart, but --

17 MR. INCE: Q We were talking with Ms. Matthews about  
18 the curve that shows the BC Hydro peak electricity  
19 demands, the energy demands maximize in the winter.

20 MR. RICH: A Yes.

21 MR. INCE: Q So there is nothing unusual about this  
22 event in terms of the time of the year?

23 MR. RICH: A No, not at all.

24 MR. INCE: Q Some supertime, weekday?

25 MR. RICH: A Not at all. I mean a peak could happen in  
26 the morning as well, but typically in the evening

1           hours around supper time.

2 MR. INCE:    Q    Now, I'd like to refer to Exhibit B-13 and  
3           this is a response to Ince 2.29.  It's regarding the  
4           PowerSmart function.  And on day number 1, Mr. O'Riley  
5           talked about the recent reorganization at BC Hydro and  
6           the need to improve communications, reduce silos.  And  
7           he talked about integration of various departments.

8 COMMISSIONER MASON:       Mr. Ince, could you give me that  
9           IR reference again?

10 MR. INCE:        It is Exhibit B-13, 2.29, Ince.

11 COMMISSIONER MASON:       Thank you.

12 MR. INCE:    Q    So, the DSM group, the PowerSmart group  
13           necessarily produces a forecast of future DSM savings?

14 MS. DASCHUK:   A    Yes.

15 MR. INCE:    Q    And that is in effect, a load forecast?  
16           It might be negawatts, or a negative load forecast so  
17           to speak?

18 MR. RICH:    A    Yes, that's correct.

19 MR. INCE:    Q    And the BC Hydro load forecast has to be  
20           merged with the PowerSmart DSM savings forecast at the  
21           end of the day to get a after-DSM forecast?  You have  
22           to merge the two forecasts together?

23 MR. RICH:    A    That's correct.

24 MR. INCE:    Q    So the question I have is, it would be  
25           efficient in terms of merging the DSM planning  
26           function, and the integrated planning function as one



1 relationship that exists between the groups.  
2 MR. CLENDINNING: A I would like to take that  
3 opportunity. So, I meet with my counterpart, Mr.  
4 Steve Hobson, who's going to part of panel 5, on a  
5 regular basis, every two weeks is the usual frequency  
6 to have those meetings, but we'll meet *ad hoc* as  
7 needed. And it's not just Mr. Rich's team that  
8 interact with Mr. Hobson's group on the DSM portion,  
9 it makes an important part of the IRP as well, and so  
10 the relationships that we have, I think Mr. O'Riley  
11 spoke to earlier, in that we're trying to have the  
12 organization adapt and not thinking in lines of  
13 business and organizational structures and it's about  
14 relationship development.

15 And so what I can say is for those teams  
16 we're co-located with them in the same building and so  
17 that means we're always up and down at each other's  
18 desks to be able to do that. In addition to  
19 incorporating them into our project plans for the  
20 development of the load forecast, they're deeply  
21 embedded in our project plan for the IRP as well.

22 So, it's not as much a concern for me  
23 knowing that those relationships are intact.

24 MR. INCE: Q Is there a formal organization in terms of  
25 a cross-functional working groups or perhaps even an  
26 organizational approval necessary for the load

1 forecast? So, for example, there's a DSM forecast,  
2 there's a load forecast and each group has a stake in  
3 the accuracy of the other. Is there an official  
4 approval process where your group looks at the  
5 PowerSmart forecast and vice versa?

6 MS. DASCHUK: A Absolutely. The load forecast is  
7 actually reviewed and approved by the executive team  
8 and that includes Janet Fraser, who represents a  
9 number of key inputs into the load forecast. So we  
10 rely very heavily on the inputs from the key account  
11 managers and we also -- and obviously with the  
12 conservation and energy management group.

13 We also work very closely with Mr. Layton  
14 and Mr. Wong on the financial integration of the load  
15 forecast. So, ultimately the load forecast is  
16 reviewed and approved by the executive team and each  
17 member of the executive team can have a component of  
18 that.

19 The same holds true for the integrated  
20 resource plan, which we're currently working on, and  
21 there's a working group of leaders across the  
22 organization that are all part of that. It's not  
23 going to be Maureen Daschuk's integrated resource plan  
24 or Bill Clendinning's integrated resource plan, it's  
25 BC Hydro's integrated resource plan and we're all  
26 going to stand behind it irrespective of which part of

1 the business we're in.

2 MR. CLENDINNING: A I'll add to that that those  
3 discussions -- you know, there's usually one group  
4 who's accountable for the delivery and that's an  
5 important thing in any project. However, in  
6 presenting to whatever the approval body is, whether  
7 that's the executive team or the board, we have an  
8 obligation to present the often conflicting views  
9 within BC Hydro about how to handle different issues  
10 that we're facing and to present those to the decision  
11 makers with the tradeoffs that are associated with  
12 each one and to have those approvers make a decisions  
13 with the best information that's available to us. And  
14 so those do get vetted and in a very collegial way,  
15 I'd say, under this new plan, build, operate, support  
16 model.

17 MR. RICH: A Just at a working level, at my level and  
18 my team's level, there is actually a formal DSM load  
19 forecast working group that not only covers the  
20 conservation part of it, but in the last year expanded  
21 to include the low-carbon electrification component as  
22 well, so it's both conservation and electrification.

23 MR. INCE: Q Thank you. So, this is a document I  
24 recently found. This is the approval by the British  
25 Columbia Utility Commission of the 2017 to 2019  
26 revenue requirements application, and this is the

1 review of the 2016 load forecast.

2 So my understanding is the May, 2016 load  
3 forecast was the basis of the previous revenue  
4 requirements application. It was subsequently  
5 reviewed in a similar proceeding, I believe a  
6 negotiated settlement, and from a part of the previous  
7 revenue requirement process.

8 So there is a previous load forecast that  
9 was used in a previous rate filing and I see it was  
10 approved by the Commission, so I'll ask the point in  
11 question: Has there been substantive changes made to  
12 the May 2016 forecast which was approved in a previous  
13 application that perhaps approved the load forecast  
14 being approved by the Commission is too strong a  
15 return. But nonetheless there was a judgment rendered  
16 on it. Has there been substantive changes to the load  
17 forecast since that?

18 **Proceeding Time 3:11 p.m. T68**

19 MR. RICH: A Just for clarification, Mr. Ince, is it  
20 changes in the load or changes in methodology or both?

21 MR. INCE: Q Methodology and inputs.

22 MR. RICH: A So in terms of methodology, we did effect  
23 a number of changes and we highlight them in this  
24 application. So probably the most significant ones  
25 are implementing some of the recommendations that came  
26 out of the audit that happened in between the two

1 forecasts. So those included changing our assumed  
2 price elasticity of our customer response to  
3 electricity rate increases, included updating the  
4 economic elasticities that are in our residential and  
5 commercial models. We made some -- I think within the  
6 residential model we also changed the relationship  
7 between the economic driver, which is housing starts,  
8 or housing growth and account growth, because we used  
9 to assume a one-to-one relationship and we found in  
10 our data that that's not the case.

11 This is just off the top. I think there  
12 were a couple other methodological changes that were  
13 implemented in our view to continue along the path of  
14 continuous improvement, to continue to look at ways we  
15 can improve the accuracy of the load forecast.

16 In terms of the load itself, I don't think  
17 there's a big difference in the actual change in the  
18 load within the test period.

19 THE CHAIRPERSON: You mentioned an audit, could you  
20 explain what that audit was?

21 MR. RICH: A Yes, it's filed in Appendix P, I believe.

22 THE CHAIRPERSON: Is this an internal audit?

23 MR. RICH: A An internal audit.

24 THE CHAIRPERSON: A financial audit or --

25 MR. RICH: A No, it was a load forecast audit.

26 THE CHAIRPERSON: Okay.



1 MR. RICH: A So it was a part of our corporate audit  
2 group and they retained a third party to review our  
3 load forecasting methods and processes.

4 MR. INCE: Q Was that GDS?

5 MR. RICH: A Yes.

6 MR. CLENDINNING: A If I can add to that, in terms of  
7 the priority that we put in deploying our people to  
8 work on the load forecast for this application, we  
9 really used three buckets to prioritize those. One  
10 was the observations made in the decision of the F17  
11 to '19 RRA. There's -- in Table 3-1 of Appendix O of  
12 the filing we list out specifically what the  
13 Commission said and what we did as result where we  
14 thought that there could be improvements made on that  
15 feedback. We also did that for this audit, and to be  
16 clear on the audit, BC Hydro's internal audit function  
17 selected the load forecast. They have a methodology  
18 for, I won't say randomly, but selectively picking  
19 groups for examination and realizing that they needed  
20 additional depth. They brought in GDS in order to  
21 conduct that audit and we've got their recommendations  
22 and findings as well.

23 And we also did look at the Site C decision  
24 for observations that were made through that  
25 proceeding and incorporated those. And Mr. Rich has  
26 listed some of them off, but they do tie directly what

1           we've heard from the Commission.

2   COMMISSIONER FUNG:       So if I can ask you, sir, how often  
3       does internal audit audit your load forecast  
4       methodology?

5   MR. RICH:    A    I may need Mr. Ince to help me with this.  
6       There was an audit, I think, done in 2007-2008 period  
7       and then another one prior to that.  So three times in  
8       fifteen years, ten years.

9   COMMISSIONER FUNG:       Thank you.

10  MR. AUSTIN:   Perhaps you can swear Mr. Ince in and pay  
11       him.

12  COMMISSIONER FUNG:       I'm sure Mr. Ince would like that.

13  MR. INCE:    Q    So I've got a question regarding the  
14       history of loads at BC Hydro.  This is Exhibit B-23-3,  
15       and it is Ince Information Request 4.5.0.

16  THE CHAIRPERSON:       4.3.0, sir?

17  MR. INCE:    4.5.0.

18  MR. INCE:    Q    So it shows a chart of total gross  
19       requirements for BC Hydro going back to the '60s.

20  MR. RICH:    A    I have it.

21  MR. INCE:    Q    So I want to explore some of the bumps on  
22       this chart and we can see -- can we identify some of  
23       the recessions, particularly I remember the '82 - '83  
24       recession where I had a house that was worth less than  
25       the mortgage and paying 19 percent on the mortgage.  
26       There's other events.  I think there was a '97

1 recession.

2 Can you describe the big one, though, the  
3 great recession of 2008-2009, what was the impact  
4 primarily by sector?

5 MR. RICH: A So this -- I guess this shows up in fiscal  
6 '07, '08, '09 period. That's when the -- what they  
7 call the great financial crises occurred that was  
8 followed by a recession globally as well as in Canada.  
9 So the real impact that chart shows is in our -- was  
10 in our forestry sector.

11 **Proceeding Time 3:16 p.m. T69**

12 So there were a number of mill closures,  
13 large pulp and paper mill closures. That explains  
14 probably about 70 percent of that drop, but there was  
15 also reductions in the residential and commercial  
16 sectors.

17 MR. INCE: Q And would you say that -- I hate to use a  
18 hackneyed phrase -- this is a new paradigm in terms of  
19 economic growth and load growth for BC Hydro?

20 MR. RICH: A Yeah, that's correct. And it's not just  
21 unique to BC Hydro and B.C., this is a North America  
22 phenomenon that shows a weakening of the relationships  
23 between the traditional economic drivers that drove  
24 load growth between what used to happen and today.

25 MR. INCE: Q I see a little drop off at the very end of  
26 that curve. Is that indicative of more to come?

1 MR. CLENDENNING: A Not necessarily. I think we do see  
2 in our traditional sectors, our traditional customer  
3 segments, you know, a moderating of growth, and so I  
4 think the forecast that we've put forward in the range  
5 of 0.5 to 1 percent. That said, I think as everyone  
6 in the room knows, there's the potential for  
7 electrification as we respond to the climate crisis.  
8 There are other industries that are evolving that  
9 could provide additional growth, and so sometimes the  
10 rearview mirror is a useful way to chart your --  
11 navigate your way forward, but it comes with risks.  
12 So I'd be hesitant to characterize it as one way or  
13 the other.

14 MR. INCE: Q Another potential driver of the flattening  
15 of the load is that -- this is referring to Exhibit B-  
16 3, Clean Energy B.C. 2.47.1. I don't think it's  
17 necessary to draw upon it, but in this response that  
18 Hydro provides, BC Hydro's revenue requirement has  
19 increased from 2.8 billion to 5.2 billion from fiscal  
20 2008 to 2018. So it's a substantial increase in the  
21 revenue requirement, which then would have flowed to  
22 rates, which then would have flowed to perhaps an  
23 elasticity effect.

24 Is that reasonable?

25 MS. DASCHUK: A We'd like just to take a moment to  
26 review the --

1 MR. INCE: Q Of course.

2 MS. DASCHUK: A Thank you.

3 MR. INCE: Q Well, I think the basic principle is that  
4 BC Hydro's revenue requirements has approximately  
5 doubled in that timeframe and that surely would have  
6 been passed through in terms of rates, which would  
7 have elicited a customer response in terms of  
8 elasticity. Is that a reasonable flow-through?

9 MS. DASCHUK: A Maybe if I can break it down. If there  
10 is a relationship between rates and customers' use,  
11 there is. And so I guess how you get there may be  
12 different, but you're right to say that as costs go up  
13 for customers, there is a tendency to reduce their  
14 usage.

15 MR. INCE: Q Affirmative. I'll be discussing  
16 elasticity later on.

17 MS. DASCHUK: A Okay.

18 MR. INCE: Q I think it's a sleeper issue in terms of  
19 importance as to the load forecast. And I appreciate  
20 BC Hydro making a revision to their elasticity from  
21 minus 0.05 to minus 0.1, I think it's an improvement,  
22 but perhaps we can talk more about that later.

23 MS. DASCHUK: A Okay.

24 MR. INCE: Q Can I ask about the -- just the basic  
25 make-up of the forecast. Well, let me ask a question  
26 to you, Mr. Rich, is that what do you aim for -- the

1 whole panel, in terms of forecast accuracy? So I used  
2 to work for a utility in which they had a forecast for  
3 a 1-in-10 event, a 1-in-10 winter event, but on the  
4 flip side there was no reserve requirement built into  
5 other planning criteria. So if there was a really  
6 cold day they had no reserves except to the extent  
7 that they padded the load forecast, so to speak.

8 So there's two ways you can plan for  
9 contingencies. You can bump up the forecast to plan  
10 for extreme events or you can put external planning  
11 criteria such as reserve requirements.

12 What's BC Hydro's philosophy in terms of  
13 how do they design their forecast?

14 **Proceeding Time 3:21 p.m. T70**

15 MR. CLENDINNING: A If I could start, and I'll let Mr.  
16 Rich pick up as I get into detail. The mid-forecast  
17 is obviously important, especially in the short term  
18 when we're setting rates over a one or two-year  
19 period. No doubt accuracy is important. But I think  
20 as we get into this period, as you described it,  
21 paradigm shift in load, and a lot of increasing  
22 uncertainty of where the past can't be used. I fall  
23 back to the confidence in our load forecast.

24 So, what are the high and low bands? And  
25 what are we trying to capture with those in terms of  
26 the risks that are facing us? And so, it's an easier

1           concept to understand what's your percentage accuracy  
2           versus the mid-forecast. Are you high or low, and to  
3           use words like over-forecasting and under-forecasting.

4                        But to answer your question about  
5           performance, you know, if we're saying the high and  
6           low bands represent an 80 percent confidence interval,  
7           over a 10 year period I'd expect the electricity  
8           demand from our customers to fall outside that band,  
9           and for me that would represent good performance. And  
10          I think we're shifting our mindset. Other utilities  
11          are as well, and I think intervenors and regulators  
12          are coming to terms with the increased uncertainty of  
13          this post-2016 political and post-2008 economic  
14          environment.

15                       So I really look to the confidence  
16          intervals in addition to forecast accuracy. And I  
17          encourage the team to compare their performance, not  
18          just against other load forecasts, which on a one,  
19          three, and six-year basis, we are performing better  
20          than -- for example our model supplier for residential  
21          is ITron. You know, performing much better than those  
22          customers.

23                       But against other economic forecasts, how  
24          are we doing relative to the province of British  
25          Columbia or private economic institutes forecasting  
26          GDP? That's an input to ours. So if they have

1 difficulty in forecasting GDP, you can imagine that  
2 that gets multiplied as it goes through. And we're in  
3 the range of -- the same range that we have for the  
4 load forecast, so sub-5 percent, sub-2 percent in some  
5 cases.

6 So, I really couch the accuracy piece,  
7 which I know has been a focus for many years, with the  
8 performance of the uncertainty band as well.

9 MR. INCE: Q Thank you, and I also want to get into the  
10 potential for bias. So, I want to explore the concept  
11 of a P50 forecast, that Mr. Rich, when I cross-examine  
12 you 10 years from now on the 2020 forecast, it's your  
13 intention that 50 percent of the time this 2020  
14 forecast will be too low, and 50 percent too high. Is  
15 your intention to make the forecast right down the  
16 middle with no inherent bias?

17 MR. CLENDINNING: A That's the intention. I think  
18 there are two types of bias that can come into a  
19 forecast. One is systemic bias, that we can identify  
20 over time by looking more closely at the performance  
21 of the load forecast, asking the hard questions about  
22 why we miss things. Seeking input from forums like  
23 this, and from experts and from those reviews to make  
24 those changes. And I think that is -- I liken it to a  
25 software development cycle, and you've identified what  
26 are the big bugs you know that you can do something



1           about and you nail them off.

2                       There are non-systemic biases and just the  
3           nature of, you could use the technical term  
4           "stochastic" or noisy things that go into it. And so  
5           that's why I feel it is important to balance the  
6           accuracy performance of a load forecast with the  
7           uncertainty band, how many times out of ten. You  
8           know, if we're doing an 80 percent confluence and did  
9           we get it right, and so the answer to your question  
10          is, I want us to aim for a P50 half the time were  
11          we're higher than the forecast, than actuals, and half  
12          the time were lower.

13   MR. INCE:    Q    Okay.

14   MR. RICH:    A    If I just want to add to clarify too, our  
15          mid-forecast is actually not a P50 forecast, it's a  
16          deterministic forecast. So we are aiming in an  
17          unbiased, objective way to get it right, and so the  
18          uncertainty band is a probabilistic method of creating  
19          a confidence interval around that. But technically  
20          speaking it is not a P50, per se.

21   MR. INCE:    Q    And that's generated with a Monte Carlo  
22          model? Hopefully no gambling involved?

23   MR. CLENDINNING:  A    Correct.

24   MR. INCE:    Q    But on that point, there is three main  
25          classes of models, am I correct in this? There is the  
26          bottom-up models, there is the top-down models, and

1           there is the external Monte Carlo model. So can you  
2           describe what are -- what is the top-down approach? I  
3           assume that applies to the residential and commercial  
4           sectors?

5           MR. CLENDINNING:     A     I'll start, and again I can hand  
6           off to Mr. Rich. So, we use at the highest level, and  
7           in lay terms, what I call an algebraic, or an A-plus-  
8           B-equals-C approach to develop the mid-forecasts. So,  
9           we look at specific forecasts, individual numbers, and  
10          we add those up for the different sectors using a  
11          variety of different methodologies that Mr. Rich can  
12          get into. Then we add a probabilistic approach on top  
13          of that, and that is where we get into the confidence  
14          interval piece. And so Mr. Rich is correct that our  
15          mid-forecast is not the P50, it's an add up of what we  
16          have.

17                                 Then we use the Monte Carlo model. That is  
18          basically like taking a number of the different input  
19          variables and simulating changes in them thousands and  
20          thousands of time to see what could come up. And a  
21          good example that we've included in some of our  
22          responses to information requests is about recessions.  
23          I know that has been a topic of discussion previously.  
24          And in those simulations we did an analysis, I'm --

25   **Proceeding Time 3:26 p.m. T71**

26          I don't have the IR in front of me. Where we looked

1 at how many times in those scenarios did we have  
2 recessions included. So that when you look at the low  
3 band of the forecast, potentially it could include  
4 recessions and we found that 13 percent of the time it  
5 did include that.

6 I'm throwing those numbers at you to tell  
7 you that the benefit of doing that Monte Carlo  
8 analysis is to really try to see the unforeseen events  
9 that we're not going to get in the  $A + B = C$  process,  
10 and combined, we feel that they make a robust way in  
11 order to do forecasting over the short and the longer  
12 term and there's a solid basis for ratemaking.

13 MR. INCE: So Mr. Chair, I'm looking at the time. You  
14 asked for a reminder at 3:30. I have one more  
15 question.

16 MR. INCE: Q So would you say that the load forecast,  
17 the high band and the low band, there's a ten percent  
18 probability of exceedance of going above the high band  
19 and a ten percent probability of going below that.  
20 That's your objective, is that correct?

21 MR. RICH: A Yes.

22 MR. INCE: Q How many times have you gone above and  
23 below those within recent memory?

24 MR. RICH: A I don't have that. I don't think the  
25 performance has been balanced on both sides.

26 MR. INCE: Q I would suspect just after the recession

1           in 2008–2009 it would have been a unique event.

2 MR. RICH:    A    As you said, I think it was a paradigm  
3           shift that's forced us to move to this approach of  
4           really relying on the uncertainty band and to look at  
5           supplementing some of or approaches. Like the use of  
6           a statistical end use model for residential. And so  
7           that relies on history as predictor of future and a  
8           number of utilities and utility forecasting modelling  
9           suppliers have struggled with that.

10                   And so, for example, to try and get  
11           underneath that, to complement that approach we're  
12           looking at what's called a stock and flow methodology  
13           that I'm sure you're familiar with. Rather than  
14           saying what's happened recently we look at what's the  
15           entire stock of devices that use electricity in  
16           British Columbia. We set that out, and then we go,  
17           "What could happen to that stock?" They can reach end  
18           of life and be replaced with new devices that have  
19           different characteristics or that population could  
20           grow. And so that gives you a basis using forward  
21           looking indicators about the characteristics of those  
22           devices as opposed to at the highest level trying to  
23           figure it out. We feel that those two can complement  
24           each other, that you can't jump from one to the other,  
25           and so we're in the early stages of doing that for our  
26           residential forecast, but it has potential use in the

1 commercial sector.

2 And John can elaborate on our use in terms  
3 of energy efficiency. It's a methodology that we use  
4 for estimating the change in efficiency of devices  
5 that are out there, so.

6 I think, to get back to your question, the  
7 performance hasn't been, as we described, balanced in  
8 the past, but I think through the audit, through what  
9 we've heard through Site C, the past revenue  
10 requirements applications, what we're seeing out in  
11 industry we're being responsive to try and get  
12 underneath that issue.

13 MS. DASCHUK: A I'd just like to maybe clarify or add  
14 on. I would say if you looked back historically what  
15 Mr. Clendinning is saying is true. However if you  
16 look at the last three years, I would actually say  
17 that we've done an exceptional job in terms of  
18 forecasting. And two of the three years we under  
19 forecast and one of the three years we over forecast,  
20 but in each of those three years it was less than 1  
21 percent variance.

22 So I guess what I'm saying is I would  
23 rather look to more recent performance and suggest  
24 that there's been some significant improvements that  
25 have been put in place by the team and that we are  
26 committed to improving the accuracy of the load

1 forecasts.

2 THE CHAIRPERSON: So is it fair to say then, and I think  
3 you're saying this, is that those last three year  
4 forecasts, they've come after the changes that you've  
5 implemented as a result of the audit and the Site C  
6 report and various other things.

7 MS. DASCHUK: A Absolutely.

8 THE CHAIRPERSON: So that's had a good consequence then?

9 MS. DASCHUK: A Absolutely. We believe we've learned a  
10 lot, and you know, we've built on the strengths of  
11 previous load forecasting and I'm not in any way  
12 trying to suggest that the previous load forecasters  
13 were not doing their best. What I am saying is that  
14 we have, I believe, made some really significant  
15 improvements and the results show that.

16 THE CHAIRPERSON: I just have a question about this  
17 probabilistic band that you were talking about, the  
18 probability of being ten percent over, ten percent  
19 under the --

20 MR. CLENDINNING: A If I could clarify one point from  
21 Ms. Daschuk and then take that question if that's all  
22 right.

23 THE CHAIRPERSON: Sure. Go ahead.

24 MR. CLENDINNING: A So the forecast performance that  
25 Ms. Daschuk was talking about is on the May 2016  
26 forecast and so that was the early days and Mr. Ince

1 was involved in that, in making those improvements.  
2 The specific ones that I listed were inputs into our  
3 current forecast and so we don't yet have the  
4 performance of those yet. So I just wanted to clarify  
5 on those two points. Thank you for allowing me that  
6 time.

7 THE CHAIRPERSON: So just a question about this  
8 probabilistic band that you're talking about.  
9 Presumably the quantity, the ten percent, that changes  
10 the further forward the forecast looks, correct?

11 MR. CLENDINNING: A The temporal effects. You know,  
12 you can see the fan that opens up.

13 THE CHAIRPERSON: Exactly. So where is the ten percent?  
14 Is that for the next year? For the first year? I  
15 just -- like where?

16 MR. RICH: A So what's in the current application, if  
17 you look at the mid, low and high for fiscal '20 it's  
18 about a plus or minus 2 percent band and the next year  
19 it's a plus or minus 4 percent band and so --

20 THE CHAIRPERSON: Ten percent in about three or four  
21 years. Yeah, okay. Thanks.

22 MR. INCE: Break time?

23 THE CHAIRPERSON: All right, we'll come back at quarter  
24 to then. Thank you.

25 **(PROCEEDINGS ADJOURNED AT 3:32 P.M.)**

26 **(PROCEEDINGS RESUMED AT 3:43 P.M.)**

**T72/73**

1 THE CHAIRPERSON: Please be seated.

2 Please proceed, Mr. Ince.

3 MR. INCE: Q Costs to do with the load forecasting  
4 methodology, and what I'm trying to get at here is  
5 that BC Hydro has one forecast methodology that  
6 continues from now until the 20 or 30-year horizon. I  
7 just wanted to get assurances that there isn't a two-  
8 year forecast and a substantially different 18-year  
9 forecast, 20-year forecast. Is that the case?

10 MR. RICH: A You're asking in terms of methodology?

11 MR. INCE: Q Methodology.

12 MR. RICH: A No, there isn't, it's the same  
13 methodology.

14 MR. INCE: Q Thank you. And I'd like to talk about the  
15 differences, again, between the May 2016 and the  
16 October 2018 forecasts specific to LNG or liquified  
17 natural gas. I see the methodology change. This is  
18 referred to in Exhibit B-1, the load forecast chapter,  
19 that there's been a new approach in terms of LNG. And  
20 in the forecast, in the May 2016, I believe there was  
21 a probabilistic approach where you took each of these  
22 large lumpy industrial loads and applied them a  
23 probability of them being realized. Whereas it  
24 appears that there's a new methodology where it's a  
25 binary approach, zero or a one, they're in or they're  
26 out. Can you describe that, please?



1 MR. RICH: A Yeah, I'll clarify that a little bit.  
2 Actually, in the May 2016 it was they were all in, to  
3 put it that way. So all the LNG projects that had  
4 requested service of BC Hydro, the idea then was in a,  
5 to be transparent about it, recognizing that there as  
6 uncertainty to put all the proposed LNG projects in.  
7 The difference between that May 2016 and what's in our  
8 application, the October 2018, is in fact to apply a  
9 probabilistic based approach to it. With the  
10 exception -- and we did that to be consistent with the  
11 large industrial sector methodology, generally.

12 The exception is that in the first three  
13 years of the forecast, and this applies to all large  
14 industrial sector projects, is that we do apply that  
15 binary all in or all out. So it's not unique to LNG  
16 but we apply that to all of the large industrial  
17 sector.

18 MR. INCE: Q Has that made a substantial change in the  
19 test years?

20 MR. RICH: A It does not for LNG because all the LNG  
21 projects are outside the test years. It did make a  
22 difference in the forestry sector and way we treated a  
23 couple of the -- well, one particular facility.

24 MR. INCE: Q Other industrial customers, mining  
25 customers for example, could you tell me those are  
26 being treated on a probabilistic basis?

**Proceeding Time 3:48 p.m. T74**

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25  
26

MR. RICH: A Yeah, the entire large industrial sector is treated on a probabilistic basis.

MR. INCE: Q So perhaps an example is worthwhile, that there is a Mine X, and it's expected to start up in Fiscal '24 and it has a 10 percent probability being realized, and perhaps as that project develops, that probability increases, or perhaps decreases to zero. Is that an accurate assessment?

MR. RICH: A So I'll explain the probability based approach, and then I will just then clarify what that means in terms of the binary approach. So, you're right on the probabilistic approach, these are projects -- typically new customers, or existing facilities that face a closure risk, but we assess them with using a bunch of different information, both from a macro-economic view as well as from a customer view.

But I will pick an example actually in the oil and gas sector, because that's an interesting one, because they do have the ability to self-supply their requirements. So not only do we apply a probabilistic assessment is this project going to go given the market conditions for natural gas production, and if it does, what is the likelihood they'll take service from BC Hydro? So there was a second probability

1 assessment. And combining those two, we come up with  
2 a weighted forecast of energy related to that project.

3 What we do in the binary view in the first  
4 test years is that we actually make a call. So, in  
5 the case of, we'll stick with oil and gas, if we  
6 believe that project is going to go, say it's a 75  
7 percent probability, and the basis of that 75 percent  
8 probability is that it really is going to move  
9 forward, but it may be delayed by a year. So we will  
10 make a binary call to delay the in-service date by  
11 what the customer has told us, to what we think will  
12 really happen. So we apply that in that way.

13 In the case of the forestry sector, and  
14 this is a call we made during the test period, as you  
15 know the forestry sector is facing some structural  
16 challenges, and we think there is going to be a  
17 continued shake-out of that, so we have a probability  
18 assessment of pulp and paper mills, what's the  
19 likelihood of closure?

20 And so in the test period, we made a call  
21 on a particular facility that said instead of saying  
22 it is a 40 percent chance of probability, or 60  
23 percent chance of probability, and translating that  
24 into a gigawatt hours, because that plant is either  
25 going to be operating or it is not going to be  
26 operating. So instead of applying a probabilistic

1 gigawatt hour into the load, we assigned it either  
2 that mill is either going to be there or not going to  
3 be there.

4 Did I explain myself?

5 THE CHAIRPERSON: I think so. And I'd just like to  
6 clarify that when you use the terminology include a  
7 probabilistic load, what you mean is let's say the  
8 load is 100 gigawatt hours and there is a 60 percent  
9 probability you would include 60 gigawatt hours.

10 That's what you mean by that term?

11 MR. RICH: A That's correct, yes.

12 THE CHAIRPERSON: Thank you.

13 MS. DASCHUK: A But if the probability was only 10  
14 percent, we would have included nothing in the first  
15 test period, because we could have then put in a 10--

16 THE CHAIRPERSON: And that's the binary approach.

17 MS. DASCHUK: A That's the binary approach for the test  
18 period as opposed to the probabilistic approach for  
19 the longer term.

20 THE CHAIRPERSON: Right, understood. Thank you.

21 MR. INCE: Q So for example, in mining, there must be  
22 many mines in your load forecast, although my  
23 experience with the mining sector is that hope springs  
24 eternal, you have to be a real optimist to be a miner.  
25 Approximately how many mines are you looking at in  
26 terms of the load forecast?

1 MR. RICH: A I don't know off the top of my head, but  
2 it's no more than a handful.

3 MR. INCE: Q Okay.

4 MR. RICH: A In terms of mines that are in development.

5 MR. INCE: Q And what would be approximately the  
6 weighted average percentage of those mines proceeding?

7 MR. RICH: A I don't know off the top of my head. I  
8 will say that I will use -- I don't like to use the  
9 word "conservative". Cautious objectivity I would  
10 say. But I would not put a mine in the forecast that  
11 has a 10 percent probability, regardless of the  
12 timeframe.

13 MR. INCE: Q Can you get for me the probability  
14 weighting, the average probability weighting for the  
15 industrial customers going forward for the test years?

16 MR. RICH: A For the test years?

17 MS. DASCHUK: A There is no probability weighting for  
18 the test years, it was binary.

19 MR. RICH: A That's correct.

20 THE CHAIRPERSON: It's a binary, that's right.

21 MR. RICH: A So there are no new mines in the test  
22 period.

23 MR. INCE: Q Okay. So let's go on to the oil and gas  
24 loads. I see the forecast, it's a significant  
25 component of load growth going forward. It has been a  
26 significant component of load growth in previous

1 generations of load forecasts.

2 **Proceeding Time 3:53 p.m. T75**

3 Those growth, that growth has not been realized  
4 according to the time lines expected in the previous  
5 generations of forecast. Things have been delayed.  
6 Why the general delay in terms of the development in  
7 the Peace region and the Montney in terms of gas  
8 production loads?

9 MR. RICH: A I guess at a high level it's just --  
10 projects are delayed in starting. So I think the  
11 market is growing, it's continuing to grow. It's just  
12 not at the pace of what was expected in previous  
13 forecast years.

14 MR. INCE: Q Is it perhaps low gas prices, commodity  
15 prices, regulatory uncertainty?

16 MR. RICH: A I don't know. I guess it could be a  
17 combination of those things I mean I think the  
18 general description of the northeast B.C., the Montney  
19 shale basin is that it's a low cost producer in North  
20 American. It's considered a very cost competitive  
21 natural gas play. And so part of the improvements is  
22 we hired an external consultant for this load forecast  
23 vintage to help us understand the market better and  
24 the view is that despite low natural gas prices, that  
25 that sector is considered, you know, a lot cost  
26 producer in North American terms. It's very

1 competitive.

2 We're seeing -- it's interesting, this is a  
3 bit of a new phenomena for this year, but this is the  
4 first time where a couple of the producers, the shale  
5 gas producers saying, "We are temporarily reducing  
6 production because of prices." So we'll monitor that,  
7 but overall there will be a ramp up to support LNG  
8 Canada for example.

9 One of the reasons it is a very competitive  
10 play is because it's liquids rich, so not only natural  
11 gas comes out of the ground but the liquids component.  
12 And so there's a lot of value added in that, relative  
13 to other natural gas plays.

14 MS. DASCHUK: A I would like to, if I could just have  
15 -- we mentioned earlier and Mr. O'Riley mentioned  
16 three projects that we're doing preliminary  
17 investigation on. That would be the North Montney  
18 projects, the Bear Mountain project and the Prince  
19 George to Terrace project. We did not include any  
20 load in our forecast for those because they were -- we  
21 did not make the decision to go ahead with those  
22 projects. So I think that we've taken also a balanced  
23 approach to say we're not including the revenues in  
24 the estimates in the forecast but neither are we  
25 including the costs of some of the projects that we  
26 might need to do to attract those customers.

1 MR. INCE: Q Could it also be the case that there's a  
2 capacity constraint in the Peace region. BC Hydro has  
3 developed the DCAT line and is working on the PRES  
4 line. So could it be the sort of Catch-22 that the  
5 customers cannot electrify because they do not have  
6 the capacity.

7 MR. RICH: A No, transmission does not, for most of the  
8 growth currently, the transmission system is not the  
9 constraint. We built DCAT to relieve a constraint and  
10 so now we're able to accommodate the growth that's  
11 there. We will need the Peace region electricity  
12 supply project to accommodate the committed projects  
13 now, so that does exceed the current capacity of the  
14 DCAT line.

15 With regards to the North Montney, that is  
16 a bit of a Catch-22 because there are customers that  
17 have expressed interest but they haven't yet committed  
18 and if and when they do, then that's the basis for  
19 proceeding with the North Montney line.

20 MR. INCE: Q Perhaps we could talk about some of the  
21 actual oil and gas loads. It's a significant  
22 component of load growth going forward, at least  
23 according to BC Hydro's forecast, would you agree?

24 MR. RICH: A Yes, I would agree.

25 MR. INCE: Q And what's the actual nature of those  
26 loads? Would it be compression, pumping, fracking?



1 MR. RICH: A It would be largely compression related.  
2 Work energy.

3 MR. INCE: Q So that's basically pumping gas from point  
4 A to point B.

5 MR. RICH: A Yes. Well, and processing within the  
6 facility. So in the facilities they call the shallow  
7 cut processing, which is removing some form of the  
8 liquids before moving the gas along.

9 MR. INCE: Q Is hydraulic fracturing amendable to  
10 electrification?

11 MR. RICH: A They have, although it's been a challenge  
12 now in the low natural gas price environment. So the  
13 economics, frankly, favour self-supply at this point.  
14 And this is why, in some of our IR responses, we  
15 highlight the fact that our assumption on electricity  
16 service percentages are down relative to -- are much  
17 lower relative to previous load forecasts.

18 **'Proceeding Time 3:58 p.m. T76**

19 And that's largely a function of natural gas prices  
20 now or looking forward are a lot lower than what we  
21 thought natural gas prices were when we developed,  
22 say, the 2012 load forecast.

23 MR. INCE: Q Mr. Rich, I'll back up a bit. I was  
24 referring to specific hydraulic fracturing. So I  
25 understand there's the self-supply potential in terms  
26 of customers meeting their compression load of natural

1 gas versus the two-week activity of hydraulic  
2 fracturing.

3 MR. RICH: A Well, I guess there's a -- so you're  
4 asking whether there's electrification potential  
5 there?

6 MR. INCE: Q For the short-term effect of hydraulic  
7 fracturing.

8 MR. RICH: A I suppose so, but none of our customers  
9 are really asking for it. But certainly there's a lot  
10 of electrification potential outside the basic work  
11 energy component and there's been a number of studies  
12 by us and others that have tried to quantify the  
13 overall potential within the sector. I guess my view  
14 is that we ultimately rely on what our customers are  
15 requesting service for and if they're not requesting  
16 service for hydraulic fracturing, then they're not  
17 included in the forecast.

18 MR. INCE: Q I assume this will be a topic of the  
19 CleanBC plan and the next integrated resource plan.

20 MR. RICH: A Absolutely, yeah.

21 MR. INCE: Q Could you provide a recent assessment of  
22 the forestry and the pulp and paper sector? There's  
23 been significant developments and downgrades in the  
24 load recently.

25 MR. RICH: A Yeah, so that's -- so lucky me that the  
26 forestry sector goes through a down term in the middle

1 of the revenue requirement application. Yeah, I mean  
2 the industry has faced its structural challenges and  
3 it has been for a number of years. I would say that  
4 for a number of load forecasts, at least over the  
5 long-term we are projecting a decline as a result of  
6 those. I would say that what's happened this past  
7 summer is what is somewhat expected, it's just  
8 happening sooner and harder.

9 MR. INCE: Q So I'll refer to table 7-15 of the  
10 application. And this is Appendix O, this is the load  
11 forecast section. I don't think it's necessary to  
12 refer to the tables, but I think it's well documented  
13 that at the existing Trans Mountain Pipeline, the  
14 pumping stations are electrified. So this isn't  
15 commercially sensitive or confidential information,  
16 this is right of Trans Mountain's website.

17 MR. RICH: A Right.

18 MR. INCE: Q Within the other oil and gas forecast  
19 sector is BC Hydro -- if those expansion pumping  
20 stations were being serviced by BC Hydro, is that the  
21 bucket, the category, in which those loads would be  
22 included?

23 MR. RICH: A Yeah, everything in the oil and gas  
24 sector, other than shale gas, is in our what we call  
25 "Other large oil and gas operations." So that also  
26 includes the LNG terminals in that segment.

1 MR. INCE: Q And I notice some increases in that sector  
2 in the forecast going forward, particularly in about  
3 three years from now.

4 MR. RICH: A That's correct.

5 MR. INCE: Q And the recent Supreme Court decision on  
6 the pipeline, has that altered BC Hydro's recent view  
7 on the electrification of the expansion pumping  
8 stations?

9 MR. RICH: A Sorry, can you restate the question?

10 MR. INCE: Q The Supreme Court decision recently  
11 regarding I guess the last cause of the provincial  
12 government in terms of blocking the pipeline  
13 expansion, that's a significant development. It  
14 removes the last obstacle, at least legal obstacle,  
15 towards the expansion of the Trans Mountain Pipeline.  
16 Is that -- or will it change BC Hydro's view on those  
17 expansion loads?

18 MR. RICH: A Yeah, so I guess the short answer is we  
19 hadn't turned our mind to it, but it has no impact on  
20 the test period, regardless.

21 MR. INCE: Q I'd like to refer to Exhibit B-4. And  
22 this is BCUC 1.5.1. And again I don't think you have  
23 to refer to it, but it's the change of economic  
24 consultants that were used to develop the load  
25 forecast.

26

**Proceeding Time 4:03 p.m. T77**

1                   So, the previous -- and these are the  
2 vendors that provide things like gross domestic  
3 products, housing starts, demographics, so the basic  
4 engine of the load forecast. This was recently  
5 changed from Robert Fairholm to the Conference Board  
6 of Canada. So that's a major shift in terms of the  
7 folks who provide the key inputs to the forecast. Why  
8 was there a change?

9 MR. CLENDINNING:   A   If you don't mind, we'll hang on  
10 for the reference.

11 MR. INCE:   Q   Okay.

12 MR. CLENDINNING:   A   The contract for that service was  
13 up for renewal and so we put it out to public tender  
14 and Robert Fairholm did not participate in that event.

15 MR. INCE:   Q   Okay. So anytime you change for a model  
16 as large as the load forecast you change some of the  
17 key drivers. That certainly must have created some  
18 seams issues in terms of potentially differences in  
19 the drivers, differences in time periods, differences  
20 in base lines. How did BC Hydro deal with that  
21 substantial change like that?

22 MR. RICH:   A   Yeah, so we that there would be changes.  
23 I mean, it's a different vendor, a different  
24 proprietary model, different inputs and somewhat.  
25 They highlighted -- so part of their process was to  
26 reconcile the data with the previous data and where

1           they couldn't they identified that and I think that's  
2           summarized in their report. I don't think it had a  
3           material impact on the forecast.

4 MR. INCE:    Q    So I'd like to refer to Exhibit B-13 and  
5           the information request is Ince 3.10, 3.10, and the  
6           topic is variances. So what are the variances to date  
7           relative to the October 2018 forecast? And I'm seeing  
8           in the large industrial sector that actuals, relative  
9           to forecast, is about 125 gigawatt hours a month or 10  
10          percent. So that's implying that the most recent BC  
11          Hydro load forecast in that sector is over-forecasting  
12          by about 10 percent.

13 MR. RICH:    A    Sorry, can you confirm the reference?

14 MR. INCE:    Q    This is Exhibit B-13, Ince 3.10.

15 THE CHAIRPERSON:    Do you mean 2.10?

16 MR. INCE:    Q    Sorry, B-17. My apologies.

17 MR. RICH:    A    Yes, I have it.

18 MR. INCE:    Q    So, the issue being that variances to  
19          date, or at least as far as I can glean from the  
20          information here, I believe the most current actuals  
21          are August of last year, showing that over-forecasting  
22          in the large industrial sector by approximately 10  
23          percent per month. Is that a fair statement?

24 MR. RICH:    A    Yes, that's correct.

25 MR. INCE:    Q    What's the most recent performance on  
26          that? Again, I have until August based on the results

1 of this information request response. How are we  
2 doing for September, October and so on?

3 MR. RICH: A So, I don't have the number offhand but we  
4 can provide that as an undertaking.

5 **INFORMATION REQUEST**

6 MR. INCE: Q Please. And could you pine on whether or  
7 not that represents something that is going to  
8 persist, these endemic --

9 MR. RICH: A So the variance is largely related to  
10 what's happening in the forestry sector, so I think  
11 it'll persist through the rest of this fiscal given  
12 where we are in the fiscal. There's some uncertainty  
13 in terms to what extent it will extend into Fiscal  
14 '21. A lot of the announced reductions are temporary  
15 in nature, and some are already returned to service,  
16 but it is uncertain at this point.

17 **Proceeding Time 4:09 p.m. T78**

18 MR. INCE: Q I look forward to the results of that.  
19 The undertaking. Thank you.

20 MR. RICH: A And just to be clear, that's year-to-date  
21 variance?

22 MR. INCE: Q The most current that you have in terms of  
23 actuals.

24 MS. DASCHUK: A Of the large industrial sector?

25 MR. INCE: Q That specifically. Although to be  
26 fulsome, it might be courteous to provide the entire

1 forecast, include the residential and commercial and  
2 so on.

3 MR. RICH: A Understood.

4 THE CHAIRPERSON: Is that on a monthly basis you're  
5 asking? Or --

6 MR. INCE: Q Monthly please. So one of my favorite  
7 topics, elasticity, and this I know was a key  
8 recommendation coming out of the last review of the  
9 BCUC of the last load forecast, and I notice BC Hydro  
10 made the change from minus .05, to minus .1, and am I  
11 understanding elasticity appropriately that if BC  
12 Hydro had a hundred percent rate increase, and it's  
13 not to alarm anybody, but a 100 percent, there would  
14 be a 10 percent corresponding reduction in load. Is  
15 that an accurate representation of elasticity?

16 MR. RICH: A That's correct. In real prices.

17 MR. INCE: Q In real dollars, yes. And so can Hydro  
18 confirm that BC Hydro applies the same minus .1  
19 elasticity factor into all customer sectors,  
20 residential, commercial, industrial? Or should I say  
21 residential general transmission?

22 MR. RICH: A It does, and it is consistent with the  
23 recommendations of the consulting outfit we hired to  
24 review that price elasticity.

25 MR. INCE: Q And that elasticity is applied across all  
26 time horizons and irrespective of absolute rate



1 levels? That the same elasticity value is applied?

2 MR. RICH: A Yes.

3 MR. INCE: Q Would BC Hydro expect that as rates  
4 increase, that the elasticity would increase? That is  
5 if customers get closer to shall we say distress, that  
6 elasticity should increase?

7 MR. RICH: A Well, I think if you really took a  
8 theoretical view, probably every single one of our 2  
9 million customers has its own price elasticity. So, I  
10 think the one phrase that struck me from the  
11 consultant's report is price elasticity is more of a  
12 butcher knife than a scalpel. So, don't expect your  
13 studies to yield accurate results, and to produce  
14 accurate when you apply it to produce accurate  
15 results. So, it really is intended to be a  
16 directional application of the impacts of electricity  
17 price increases.

18 MR. CLENDINNING: A And I'd add to that in terms of the  
19 magnitude of elasticity changes, all things being  
20 equal, you know, the net change we could expect on the  
21 load forecast from elasticity is on the order of 20 to  
22 40 gigawatt hours on total, on 55,000 gigawatt hours  
23 for the system. So, although it is not a scalpel, the  
24 butcher's knife is still operating on a fairly small  
25 amount of energy.

26 MR. INCE: Q Right, that's over the test period. As

1           you go further out it obviously compounds?

2 MR. RICH:    A    That's correct.

3 MR. INCE:    Q    So I have -- it's a broad brush,  
4           elasticity of minus .1. There is questions such as do  
5           high income customers have a higher elasticity? Or a  
6           lower elasticity? Do some customers that have space  
7           heating have a higher elasticity versus a lower  
8           elasticity? But again, it's all the same approach?

9 MR. RICH:    A    Correct.

10 MR. INCE:    Q    Is it an urban legend within BC Hydro that  
11           there is one customer that heats his driveway 365 days  
12           a year?

13 MR. RICH:    A    I don't know.

14 MR. INCE:    Q    I was implying that perhaps some customers  
15           have such high incomes that the electricity prices  
16           simply don't matter.

17 MR. RICH:    A    Maybe the prince when he arrives.

18 MR. INCE:    Q    I've also heard the urban legend perhaps  
19           that there was a BC Hydro customer, residential that  
20           consumed 700,000 kilowatt hours per year because of  
21           driveway heating and others, so 70 times the average.

22                    But you know, seriously on that point,  
23           elasticity is it possible that some high-income  
24           customers particularly with larger homes, simply don't  
25           care about electricity prices and therefore  
26           elasticity, or rate increases are not an effective

1 signal?

2 MR. RICH: A Well I think that applies to the value  
3 itself. I mean, generally speaking a .1 means that  
4 all our customers are generally priced inelastic, that  
5 they don't respond to electricity price increases.

6 MR. CLENDINNING: A Again, as a class. So, we're  
7 talking -- I think Mr. Rich put it very well, there is  
8 2 million different elasticities and some of those are  
9 very sensitive, some of our customer classes. It's a  
10 very important piece of it, but when taken in  
11 aggregate and applied for these levels of energy that  
12 I spoke about, that's the characteristics of our  
13 service area of the province.

14 MR. INCE: Q Can I also suggest there is more than two  
15 main elasticities and that each household has  
16 appliances or end uses in which there is sub-  
17 elasticities?

18 **Proceeding Time 4:14 p.m. T79**

19 So, let's use the example of a customer  
20 with a hot tub, perhaps a more discretionary  
21 recreational use, not to insult anybody with a hot  
22 tub. But could more discretionary end uses such as a  
23 hot tub be subject to a higher elasticity?

24 MR. CLENDINNING: A It's possible.

25 MR. INCE: Q And conversely those customers with space  
26 heating and low income presumably could be relatively

1 inelastic because it's a life commodity?

2 MR. CLENDINNING: A It's possible.

3 MR. INCE: Q Mr. Rich, you mentioned something about  
4 low elasticity. Is it possible that BC Hydro's  
5 elasticity value could be much higher? The report  
6 that you alluded to in terms of elasticity that BC  
7 Hydro recently completed, the result that they could  
8 have produced could have been much higher based on  
9 industry benchmarks. Is that accurate, that  
10 elasticity values could have been much higher?

11 MR. RICH: A So just a quick summary of the consultant  
12 studies. So it was a combined jurisdictional review  
13 as well as looking at our own studies and the .1  
14 recommendation in terms of the jurisdiction review was  
15 that was the one that's most commonly used by other  
16 utilities. So yes, there is a lot out there in the  
17 literature with the wide-ranging values, but that's  
18 the most common one used by other utilities and then  
19 they reviewed that value against some of our studies,  
20 and in particular our RIB evaluation which is filed as  
21 part of this application has a very similar result.  
22 So on the basis of that, DNV's recommendation was to  
23 increase our negative 0.5 to .1.

24 MR. CLENDINNING: A To clarify that RIB that Mr. Rich  
25 is referring to, it's the residential inclining block,  
26 rate.

1 MR. INCE: Q So I'd like to talk about economic  
2 assumptions built into BC Hydro's load forecast. The  
3 Exhibit is B-6 and the Information Request is Ince  
4 1.8.16. And this is referring to the economic  
5 assumptions built into BC Hydro's load forecast. And  
6 this is via the Conference Board of Canada. So as we  
7 talked about earlier, the Conference Board of Canada  
8 is providing basic inputs into the BC Hydro load  
9 forecast such as housing starts, GDP demographics.

10 So I see, Mr. Rich, you're at the right  
11 page. There's a list of projects that are included in  
12 the Conference Board of Canada's economic  
13 calculations.

14 MR. RICH: A Correct.

15 MR. INCE: Q So these are large capital projects that I  
16 assume spawn GDP and housing starts and population  
17 growth and jobs and so on. So they are key inputs  
18 into the economic growth of the economy.

19 MR. RICH: A That's correct.

20 MR. INCE: Q And I note within those projects there is  
21 Site C, LNG Canada Export Terminal, the Woodfibre LNG  
22 Terminal, Coastal Gas Link Project and the Trans  
23 Mountain Pipeline expansion. Can you confirm that all  
24 of those projects are assumed within the Conference  
25 Board of Canada economic inputs to the forecast?

26 MR. RICH: A Yes. But they also undertook a -- we also

1 wanted to understand the implications of a no LNG  
2 scenario. So yes, that's part of their base forecast  
3 but we also asked them to do a scenario that excluded  
4 any LNG.

5 MR. INCE: Q But to confirm for the base forecast, this  
6 list of projects is included in BC Hydro's base load  
7 forecast.

8 MR. RICH: A Well, in the Conference Board's economic  
9 forecast.

10 MR. INCE: Q Which then flows into BC Hydro load  
11 forecast.

12 MR. RICH: A Correct.

13 MR. INCE: Q And can you please refer to -- I think  
14 it's two IRs further on, the same exhibit, B-6, Ince  
15 1.8.18. BC Hydro's response to my information  
16 request is that LNG exports from B.C. will not cause  
17 any permanent increase in population, and hence  
18 housing starts and associated load, as the  
19 construction of these terminals will involve fly-in  
20 and fly-out. So basically an imported labour force.  
21 Is that an accurate assessment?

22 **Proceeding Time 4:19 p.m. T80**

23 MR. RICH: A Yeah, that appears to be the Conference  
24 Board's assessment.

25 MR. INCE: Q So perhaps you can explore that. I assume  
26 those terminals would be assumed would be assumed to

1           be largely built, perhaps converted cruise ships that  
2           come in. The modules on LNG come in offshore and  
3           skidded on site, hooked up, and the labour force is  
4           largely fly-in, fly-out or imported from offshore.  
5           That would be the assumption.

6 MR. RICH:    A    Well, I don't know, you'd have to ask the  
7           Conference Board.

8 MR. INCE:    Q    Referring to Exhibit B-6, Ince Information  
9           Request 1.6.4. And this refers to electrifying gas  
10          production.

11                        So what are the obstacles to electrifying  
12          gas production? I believe BC Hydro mentioned low  
13          cost, a low cost environment, that producers were  
14          incented to self-supply with gas-fired generation --  
15          or, sorry, gas-fired compression because of the low  
16          cost of natural gas. Is that a realistic assessment  
17          of the current situation, that it's hard for  
18          electricity to compete against direct gas drives?

19 MR. RICH:    A    Yes, that's correct. As an overriding --  
20           I mean certain projects have different circumstances  
21           that are effecting their ability to proceed or not,  
22           but as a general commentary, yeah, the natural gas  
23           price environment generally favours new gas projects  
24           to self-supply their work energy requirements than  
25           taking service from BC Hydro.

26 MR. INCE:    Q    And finally, Exhibit B-15. And this is BC

1 Hydro's load forecast, specifically to electric  
2 vehicles. I'll save the best for last. It's my  
3 understanding that the June 2019 forecast uses a new  
4 forecast methodology for electric vehicles. That it's  
5 based on, if I were to refer the *Zero-Emission*  
6 *Vehicles Act* enacted in May, 2019, is that correct?

7 MR. CLENDINNING: A That's correct.

8 MR. INCE: Q So previously BC Hydro had an internal  
9 electric vehicle forecast that was dependant on a  
10 number of drivers. Is it the case now that the new  
11 forecast is driven from the targets within the *Zero-*  
12 *Emission Vehicles Act*?

13 MR. CLENDINNING: A The wording here suggests maybe  
14 that there was an overhaul to the methodology. There  
15 wasn't, it's just reflected -- we had may certain  
16 assumptions about what electric vehicle uptake would  
17 be and that's a tricky business in that kind of  
18 nascent technology, but what this has given us is sort  
19 of a lower end anchor. So the province has set out  
20 that they anticipate that there'll be ten percent of  
21 new sales of vehicles in 2025, we adjusted the model  
22 to reflect in the mid case that that's exactly that we  
23 thought would happen. There's risk around that and  
24 that's why there's the uncertainly bands. Legislation  
25 could change between now and then as policy shifts.

26 MR. INCE: Q Is this low end anchor in the new forecast



1 higher than what would have occurred in the previous  
2 forecast?

3 MR. CLENDINNING: A Yes.

4 MR. RICH: A Yes.

5 MR. INCE: Q That was substantially higher in terms of  
6 number of vehicles?

7 MR. CLENDINNING: A I think to put it in magnitude for  
8 you, the October 2018 load forecast in the mid had 77  
9 gigawatt hours in Fiscal '20 and 105 gigawatt hours in  
10 Fiscal 2021. There's no change for '20, but we're  
11 showing now 226 or an increase of 121 gigawatt hours  
12 as a result of those changes.

13 MR. INCE: Q And this is outside the test period, but I  
14 see a hundred percent of electric vehicle sales is the  
15 target by 2040?

16 **Proceeding Time 4:24 p.m. T81**

17 MR. CLENDINNING: A I believe that is the legislation.

18 MR. INCE: Q Thank you for your responsive answers.

19 THE CHAIRPERSON: Thank you, Mr. Ince. Perhaps before  
20 we continue, I was going to wait until the end of the  
21 day to have this discussion, but perhaps we should  
22 have it now, because I don't know how long the  
23 discussion will take. And that's about the rest of  
24 the schedule and tomorrow.

25 So, based on the estimates that I have  
26 here, some of them are ranges. So taking the top end

1 of the range, because that seems a conservative  
2 assumption at this point. From what I can see, we  
3 have still got roughly nine hours left. And there  
4 isn't nine hours of cross-examination time in a day.  
5 We may get half an hour done this afternoon, I don't  
6 know, but that would still leave an extended day  
7 tomorrow, perhaps a considerably extended day again,  
8 rough math would be starting at 8:00, and possibly  
9 ending at 8:00 if the goal was to get this panel  
10 finished tomorrow.

11 So, is anyone prepared to discuss that now?  
12 Do you want to think about it and talk about it? I  
13 see we have a taker.

14 MR. QUAIL: I just want to make one comment, because I  
15 understand the concern that Mr. Ghikas and everybody  
16 has and that is about the panel potentially being left  
17 in limbo. My understanding of the underpinning of the  
18 general rule regarding the status of witness under  
19 cross-examination is that it goes to issues of  
20 credibility. And the risk of tainting of the  
21 credibility of a witness if in a trial or other  
22 proceeding they communicate while in the middle of  
23 cross-examination. And in fact, if anything,  
24 everybody's expectation I think in these proceedings  
25 is, of course, the witnesses they talk to each other,  
26 they got back to the shop, they get information. In

1 my submission, there is really no basis for that, and  
2 it should be made clear that if they are left, there  
3 is no impediment on them going about things and  
4 communicating, including about the subject matter of  
5 these proceedings and their evidence. In fact, it's  
6 probably useful if that happens.

7 I just raise that now to the extent that  
8 that is one of the considerations that might be  
9 causing -- troubling people's minds.

10 THE CHAIRPERSON: That's very helpful, Mr. Quail,  
11 perhaps we would like to hear what Mr. Ghikas has to  
12 say about that?

13 MR. GHIKAS: I think that Mr. Quail's comments are  
14 personally reasonable and consistent with my  
15 understanding of what the general approach is. I  
16 think to a large extent, our concerns are practical as  
17 well, as well as consideration of the panel, and just  
18 simply as a human desiring to be finished a stressful  
19 experience. So that's another indicated -- or  
20 motivation for us.

21 So, I think up to a point I think we would  
22 really like to get it done. There may be a point at  
23 which everybody is too exhausted to continue, but I  
24 really think it would be useful to try to make that  
25 push to get us finished with the panel. If it works,  
26 and if it looks like we are not getting there, then

1        maybe we need to pull the ripcord at some point. But  
2        I really would like to push for it if we could.

3 THE CHAIRPERSON:        So given what you're saying, Mr.  
4 Ghikas then, perhaps we should look at starting at  
5 8:00 in the morning, because I think that starting at  
6 8:30 -- I don't know that starting at 8:00 frankly  
7 will push the dial much at all, but it would at least  
8 be -- it would at least give us half an hour. But I  
9 will put that to everyone else.

10 MR. GHIKAS:        We would be supportive of that.

11 THE CHAIRPERSON:        Okay, thank you. Does anyone else  
12 have submissions they'd like to make?

13 MR. AUSTIN:        Mr. Chair, members of the panel, members  
14 of the panels -- there are actually two panels so  
15 maybe that works. I am not in agreement with Mr.  
16 Quail's interpretation of why there is the need to  
17 essentially empanel witnesses. And I don't want to  
18 set a precedent for future proceedings, because  
19 frankly I don't want witnesses talking to each other  
20 when the panel is under cross-examination. However,  
21 what we can do in this circumstance is, and I'm  
22 willing to do it, is waive that prohibition on  
23 communication for this instance. That's point number  
24 one.

25                            **Proceeding Time 4:29 p.m. T82**

26                            Point number two, I don't think starting at

1           eight o'clock in the morning is going to add to our  
2           ability to finish cross-examining this panel. It's a  
3           very large panel, so what often happens with very  
4           large panels, and I don't disagree with it, is they  
5           tend to want to chat amongst themselves with respect  
6           to certain questions and that causes the amount of  
7           time for the cross-examination of the panel to  
8           increase. I don't have any difficulty with that, but  
9           that's just an observation that when you have very  
10          large panels there's more communication, it takes more  
11          time to cross-examine them. So the idea of starting  
12          at eight o'clock and adding another half an hour I  
13          don't think is going to get us very far.

14        THE CHAIRPERSON:        I agree with you and it won't get us  
15          very far if we're looking at an end time of five  
16          o'clock, but if we were looking at potentially going  
17          until we finish tomorrow then starting at 8:00 would  
18          at least make the end time half an hour earlier and  
19          that would be -- in my view, that would be a  
20          motivation to do that. Now, I'm not suggesting  
21          necessarily we do that, but I'm saying if that was the  
22          decision then --

23        MR. AUSTIN:            Well, I don't think going until eight  
24          o'clock with a panel of this size and with the  
25          complexity of the issues that it has to deal with is  
26          going to benefit anybody.

1 THE CHAIRPERSON: So it's your submission we wouldn't  
2 look at a sort of open-ended end time tomorrow? We  
3 should --

4 MR. AUSTIN: Based on my experience and based on the  
5 issues that we're dealing with and the ability of the  
6 panel to concentrate for 12 hours, even with breaks,  
7 is not going to lead to a result that I think we're  
8 all going to be proud of.

9 THE CHAIRPERSON: Fair enough. Mr. Ghikas?

10 MR. GHIKAS: My suggestion would just be that we start  
11 at eight and then see where we get to, because even if  
12 we can get through people that's one less thing that  
13 we have to do in February when we've got the three  
14 days and stuff to deal with in those three days. I  
15 mean, I'm cognizant of that as well.

16 So, you know, at some point there is also  
17 value -- I mean, don't get me wrong, there's also  
18 value from BC Hydro's perspective, their witnesses,  
19 it's hard to be on for 12 straight hours. I just hold  
20 out the hope that sometimes people's estimates fall  
21 away when people ahead of them are going. I realize  
22 that hasn't been --

23 THE CHAIRPERSON: I mean, that hasn't happened yet.

24 MR. GHIKAS: I realize that hasn't happened, but I  
25 actually -- it actually seems to be a departure from  
26 what typically happens.

1 THE CHAIRPERSON: Yes, I agree.

2 MR. GHIKAS: So I have this faint hope that maybe that  
3 could someday change.

4 THE CHAIRPERSON: You're an optimist.

5 MR. GHIKAS: Yes.

6 THE CHAIRPERSON: Does anyone else have comments?

7 MR. QUAIL: I'd just like to say, you know, some of us  
8 still bear the traumatic damage that there was a  
9 proceeding years ago, it was around the Duke Point, in  
10 a process some of us will all remember well that went,  
11 I think, until about nine o'clock at night and it was  
12 horrible. And commented about at great length  
13 frequently whenever we had a chance to remind the  
14 Commission that this was not a good idea. So I'm just  
15 raising that now.

16 It would make more sense to try and ply out  
17 a little more today, maybe start a little earlier  
18 tomorrow, but I urge the Commission and Hydro not to  
19 have the mindset that somehow we'll grit our teeth and  
20 go through it because it's brutal, it becomes  
21 unproductive, everybody's ability to absorb what's  
22 going on just vanishes after a certain point. It's  
23 very hard on people and it's not just counsel,  
24 there'll be others who have parental and other  
25 responsibilities, so it's a real hardship. They may  
26 feel reticent about complaining about it, but they

1           should be accommodated as well.

2   THE CHAIRPERSON:       I agree, fair enough, yeah. Mr.  
3           Miller?

4   MR. MILLER:            I have one additional suggestion, Mr.  
5           Chair. Even though it hasn't been -- no notice has  
6           been given, our next two interveners' time estimates  
7           are 45 minutes to an hour collectively. I'd prefer to  
8           get those two done tonight and then start tomorrow so  
9           we have at least a fair chance of getting done  
10          tomorrow. So --

11   THE CHAIRPERSON:       So you're talking about CEC --

12   MR. MILLER:            CEC and Sustainable Energy, so the  
13          collective estimate is 45 to an hour, so --

14   THE CHAIRPERSON:       Sustainable Energy is not next, at  
15          least not on my list. I think you may have a  
16          different list.

17   MR. MILLER:            So, I have CEC number two and then BCSEA  
18          is number three.

19   THE CHAIRPERSON:       Oh number three. Oh there, I see,  
20          all right. My apologies, yeah.

21   MR. MILLER:            So that's 45 minutes to an hour. I'd  
22          prefer to get through those two tonight even if we  
23          have to start early tomorrow. But unless anyone -- I  
24          mean, the other interveners can read the transcript  
25          for what's happened if they need to leave early.

26   THE CHAIRPERSON:       Are there any objections to doing



1           that?

2   MR. ANDREWS:        I'm just rising to say that I don't have  
3           an objection to that. I realize that there are other  
4           considerations, but the BCSEA would be happy to  
5           proceed today if that's what the panel decides.

6   THE CHAIRPERSON:    Thank you. And then, Mr. Miller, are  
7           you proposing starting at 8:00 in the morning?

8   MR. MILLER:         I have no preference for start time  
9           tomorrow, whether it's 8:00 or whatever, whatever is  
10          convenient but I'd like to knock off the next two  
11          interveners.

12   THE CHAIRPERSON:    That will be on the record, Mr.  
13          Miller.

14   MR. MILLER:         Literally, Mr. Chair.

15   MR. GHIKAS:         That is one of the problems when we get a  
16          little punchy later in the afternoon.

17   THE CHAIRPERSON:    It is, yes.

18   COMMISSIONER MASON:   It's only 4:30.

19   MR. C. WEAFFER:     With that warm welcome, should I start?

20   THE CHAIRPERSON:    Pardon me?

21   MR. C. WEAFFER:     With that warm welcome, should I start?

22   THE CHAIRPERSON:    You should start, yes. So let's try  
23          to hear the next two interveners and let's -- I'll  
24          delay a decision on tomorrow morning until we have to,  
25          thanks.

26   **CROSS-EXAMINATION BY MR. C. WEAFFER:**

1 MR. C. WEAFFER: Q Thank you, panel. My name is Chris  
2 Weafer, I'm counsel for the Commercial Energy  
3 Consumer's Association of British Columbia and I'll  
4 start like I did with the last panel. We filed a  
5 number of information requests in this proceeding. We  
6 want to express our appreciation for the work that you  
7 and your team did and the responsive answers and I've  
8 got to talk as fast as I can so if we need to --

9 **Proceeding Time 4:35 p.m. T83**

10 Just following up on Mr. Ince's very  
11 helpful cross-examination -- and I forgot my glasses,  
12 so.

13 There was discussion with Mr. Ince around  
14 the bias and forecast, and I take BC Hydro does  
15 concede that it has a history of over forecasting on  
16 its load forecast since at least 2009, subject to  
17 doing a little better the last couple of years. Is  
18 that fair?

19 MR. RICH: A Yeah, that's a fair comment.

20 MR. C. WEAFFER: Q Okay, thank you. The reference for  
21 that would be Exhibit B-23-3 of Ince's IR 4.7.0 and I  
22 think you might be familiar with that graph, Total  
23 System Gross Requirements after DSM, that sort of sets  
24 out that information.

25 I'd like to turn you to Exhibit B-23-3 and  
26 IR response -- response to the Clean Energy

1 Association 4.60.1.

2 THE CHAIRPERSON: Sorry, 4.6 point?

3 MR. C. WEAFFER: Q 4.60.1. Now, as I understand the load  
4 forecast it's at 1 percent.

5 MR. RICH: A That's correct.

6 MR. C. WEAFFER: Q And in the response to this IR from  
7 Clean Energy, the question: How does 1 percent growth  
8 expectation compare to that of other electric  
9 utilities in Canada and the U.S. and then goes on to  
10 qualify the B.C. circumstance with the proposal for  
11 the carbon electrification plan which I'll get to  
12 later. But can we -- if we go down to the box that  
13 sets out the forecast energy, annual energy demand for  
14 growth rate in Canada and then the four named regions  
15 of the U.S., are those numbers comparable, if I look  
16 at the forecast annual energy demand growth rate, are  
17 they comparable to the 1 percent? Is that apples to  
18 apples in terms of those forecasts and your forecast  
19 of 1 percent?

20 MR. RICH: A Yeah, I believe so. I mean I don't know  
21 the specific -- or the methodology in detail of the  
22 people who provided the benchmark information is, but  
23 I think it's a fair statement.

24 MR. C. WEAFFER: Q Okay, and in your cross-examination,  
25 and I'm not sure you have the answer, there was a  
26 comment about the weakening of the relationship

1           between economic activity and demand growth. Would  
2           you agree with me that this is good evidence of that  
3           in terms of the lesser demand, as I understand, at  
4           least according to Mr. Trump we've got the strongest  
5           U.S. economy we've ever had, and I'm not going to give  
6           statistics. But we've got the strong U.S. economy and  
7           we see demand at, in some instances, of 25 percent  
8           less than that which was proposed by BC Hydro and in  
9           one instance would appear approximately 90 percent  
10          less than BC Hydro's proposed load growth.

11                           Is that what you were -- when you referred  
12          to a weakening of demand that we're seeing a  
13          flattening of load growth in economies that are  
14          otherwise quite strong.

15   MR. RICH:    A    So I think I just -- making a general  
16          comment. There's a fairly well-known graph out there  
17          that shows GDP growth with electricity load growth  
18          over the last few decades, and at some point in the  
19          mid-2000s you see the separation, and so it was really  
20          a reflection of that. I think what you're seeing here  
21          is probably also a reflection of that general  
22          relationship.

23   MR. C. WEAFFER:  Q    Thank you. The Canada -- just with  
24          respect to the .56 percent across Canada, in BC  
25          Hydro's preparation of its forecast, does it take into  
26          account that fairly significant difference between the

1 rest of the Canada and British Columbia?  
2 MR. RICH: A Well, I'm not sure if I draw a conclusion.  
3 I mean this is an aggregate of a whole bunch of  
4 different utilities and that, so I don't know whether  
5 it's a weighted average in the circumstances in other  
6 jurisdictions so I don't know if I would draw that  
7 conclusion. There was another IR where we did compare  
8 our annual forecast to our neighbour next door in  
9 Alberta and the Alberta electric system operator  
10 that's responsible for developing their long-term load  
11 forecasts, and they are in the order of about 1  
12 percent a year.

13 **Proceeding Time 4:40 p.m. T84**

14 MR. C. WEAFFER: Q .9 percent?  
15 MR. RICH: A One percent.  
16 MR. C. WEAFFER: Q .9 percent I think is their forecast.  
17 It's provided for in response to that IR as well. The  
18 AESO 2019 long term outlook as a reference scenario of  
19 .9 percent? Is that correct?  
20 MR. RICH: A Correct.  
21 MR. C. WEAFFER: Q Thank you. Now, from a ratepayers  
22 perspective, one of the concerns is, and I will take  
23 you to Exhibit B-13, which is CEC IR 2.121.1, and I  
24 have finished with the other IR.  
25 THE CHAIRPERSON: Sorry, it is 2.12?  
26 MR. C. WEAFFER: Sorry, it is 2.121.1. Exhibit B-13,

1 CEC IR.

2 MR. C. WEAFFER: Q Now, this follows up on an earlier  
3 question, and the question here is "Please confirm  
4 that the acquisition of unneeded resources that are  
5 supplied by BC Hydro can result in unnecessary cost  
6 increases and price burdens on ratepayers," et cetera.  
7 And the second paragraph, the response notes a number  
8 of other factors that there may be benefits to over-  
9 forecast. Is that a fair summary?

10 MR. CLENDINNING: A I think the response is a fair  
11 summary to the question in the IR, but I don't think  
12 it is a summary of over-forecasting.

13 MR. C. WEAFFER: Q Fair enough, but what I'm saying is,  
14 the responses, while ratepayers may be concerned about  
15 costs, in one instance Hydro sees other potential  
16 benefits by potentially over-forecasting? By having  
17 more resource than is necessarily needed.

18 Effectively the long-term benefits may  
19 outweigh short-term costs. Is that a better way to  
20 summarize?

21 MR. CLENDINNING: A In some scenarios, yes, that is  
22 true.

23 MR. C. WEAFFER: Q Okay, thank you. Would you agree  
24 with me that analysis would also be carried out by the  
25 86 other utilities that were referenced in the earlier  
26 IR response, that that type of assessment will be done

1 by any utility when it is looking at its load  
2 forecast? Particularly ones that are larger like BC  
3 Hydro?

4 MR. CLENDINNING: A Possibly.

5 MR. C. WEAFFER: Q Thank you. You think they wouldn't?

6 MR. CLENDINNING: A I couldn't characterize 86 other  
7 utilities, but I would imagine some of them would,  
8 perhaps some of them would not.

9 MR. C. WEAFFER: Q Is that something that you've  
10 assessed in terms of how the utilities have set their  
11 load forecast?

12 MR. CLENDINNING: A No, that's not typically  
13 information that they'd expose.

14 MR. C. WEAFFER: Q Okay. There was some -- I'm trying  
15 to move along. There was some discussion around  
16 economic conditions in the forestry sector, and here  
17 I'm going to take you to Exhibit B-22, and it is BCUC  
18 Staff IR 4.319.1. Let me know when you have that.

19 And I'm not one that likes to promote  
20 negative economic conditions, but I actually was in  
21 the hearing room in 2008 October when we had a fairly  
22 significant economic meltdown. So, it's something we  
23 do need to talk about.

24 Here we're focused on the forest industry,  
25 and there's reference to a September 13<sup>th</sup> CBC article  
26 highlighting the series of mill curtailments and

1 closures over the past few months. And you spoke with  
2 Mr. Ince about this a little bit. And the focus in  
3 this IR response is on the load related to the mills.

4 **Proceeding Time 4:45 p.m. T85**

5 But I'm mindful of the comments by Mr. O'Riley on Gold  
6 River, and when he appeared and talking about stranded  
7 asset investments as a result of impact on a  
8 community.

9 Would you agree with me that there's also  
10 potential load implications in respect of poor  
11 economic conditions in a community which is highly, if  
12 not solely, dependent on the forestry sector for its  
13 economic survival?

14 MR. RICH: A Sorry, can you repeat the question?

15 MR. C. WEAFFER: Q Probably not, but the point of it was  
16 -- the point of it was that the focus in response, and  
17 it is a serious issue, is the state of the forest  
18 industry in the province and particularly regions of  
19 the province which have heavy employment dependency on  
20 the forestry sector. You'd agree, we have regions of  
21 this province that the mill closures impact load not  
22 just because of mill closures, there can be other  
23 implications in terms of the local economy, in terms  
24 of small business, car dealerships, the economic  
25 activity in the community.

26 MR. RICH: A Yes, absolutely.



1 MR. C. WEAFFER: Q You'd agree that those are factors to  
2 consider as well?

3 MR. RICH: A Yes, absolutely.

4 MR. C. WEAFFER: Q Yes, thank you. And that, as we  
5 looked at the troubling time for the forestry sector,  
6 those secondary issues -- and I should add, there's  
7 also implications to the province in terms of tax  
8 revenues and other activities in the province  
9 resulting from the challenge the forestry is facing,  
10 you'd agree with that?

11 MR. RICH: A I agree.

12 MR. C. WEAFFER: Q And that can also affect load, that  
13 has load implications as well.

14 MR. RICH: A Yes.

15 MR. C. WEAFFER: Q And those have been factored into the  
16 BC Hydro load forecast? You're satisfied that --

17 MR. RICH: A I would say, yes. So, I think my earlier  
18 comment says we have been projecting a decline in the  
19 forestry sector and those projections were reflected  
20 in some of the inputs that we provided to the  
21 Conference Board's forecast that informed the October  
22 2018 load forecast.

23 MR. C. WEAFFER: Q It's difficult to do, I respect, but  
24 you have to do it and you're satisfied that you're  
25 picking up not just the load losses of the mills but  
26 the secondary and tertiary implications on Hydro's

1 load that can arise?

2 MR. RICH: A Well, the Conference Board forecast is a  
3 sub-regional forecast for the province of B.C., so  
4 those regions, presumably, that are impacted by some  
5 of the forestry sector impacts would have been  
6 reflected in the Conference Board's forecast.

7 MR. C. WEAFFER: Q And just remind me, when was that  
8 most recently produced?

9 MR. RICH: A Well, I guess subject to check – this is  
10 the first time I get to say that – I think their  
11 report that informed the October 2018 forecast was  
12 prepared in June of 2018.

13 MR. C. WEAFFER: Q And so I take it in terms of doing  
14 another load forecast for the IRP, which will be a  
15 very important load forecast, we'll have more current  
16 information this situation and that will be  
17 incorporated in --

18 MR. RICH: A That's correct.

19 MR. C. WEAFFER: Q Okay, yeah. Thank you. Also related  
20 to the economic issue that was touched on briefly with  
21 Mr. Ince, and this does relate to the electrification  
22 of the province, particularly with respect to the  
23 natural gas industry. The comment was -- and I don't  
24 think that I need to go to the IR response, but the  
25 comment is the price of gas remains low and it's not  
26 looking like it's going up anytime soon. Is that a

1 fair -- natural gas, is that a fair comment?

2 MR. RICH: A Well, I'd say there's some uncertainty in  
3 the near term, but I think the long-term projections  
4 have natural gas prices increasing, as well as the  
5 price of liquids which is just as import and in some  
6 circumstances it's even more important than the price  
7 of gas.

8 So, for example, in some of the facilities  
9 where there's significant liquids production they  
10 almost don't care what the price of natural gas is.

11 MR. C. WEAFFER: Q With respect to the MOU that the  
12 Government of B.C. signed with the Government of  
13 Canada, my understanding of its summary of Hydro's  
14 responses to Clean Energy Association of B.C.'s IRs in  
15 the Exhibit B-23, were that there is concerns in that  
16 industry with respect to the price of gas in terms of  
17 moving forwards with projects. Is that a correct and  
18 accurate summary of those responses?

19 MR. RICH: A Yeah, I'd have to see the reference just  
20 to confirm that.

21 MR. C. WEAFFER: Q Sure, it's Clean Energy of B.C., it's  
22 Exhibit B-23, IR No. 4-64-1. And it refers in the  
23 response,

24 "Please refer to BC Hydro's response to CEABC's  
25 IRs 4.65.2 and 2.41.1, which indicates that  
26 declines in natural gas prices have generally

1 favored self-supply over electricity supply."

2 Do you recall that answer?

3 **Proceeding Time 4:50 p.m. T86**

4 MR. RICH: A Yes.

5 MR. C. WEAFFER: Q Okay, thank you. I'm just trying to  
6 be expeditious. Stop me if I am going too fast.

7 Thank you. I appreciate your responses.

8 The next topic I wanted to go to, and I get  
9 a little concerned whether I've got the right panel,  
10 but I will go here anyway, and I am trying to look at  
11 the impact of an expected change in load forecast on  
12 costs, both in the test period and potentially beyond.  
13 If I could turn you to Exhibit B-5? And sorry, IR of  
14 BCUC 1.108.1.2. And this may be for the capital  
15 panel, but I will try here and see how we do.

16 Are you there? Exhibit B-5, BCUC IR  
17 1.108.1.2.

18 MS. DASCHUK: A Yes.

19 MR. C. WEAFFER: Q You have that, okay. Okay, there is  
20 a table on page 2 of 3, which is a response to table  
21 below lists the projects that were deferred or  
22 cancelled specifically as part of the Fiscal 2020 to  
23 Fiscal 2024 capital plan reductions. And if we look  
24 at the first four items, the reason for deferral  
25 cancellation, expected change in load forecast. What  
26 load forecasts caused that change? Because this is

1           before the June forecast comes out, as I understand  
2           the date of the IR. So what load forecast caused that  
3           change on those four items?

4 MS. DASCHUK:    A    So, I think the best place to answer  
5           those questions is at the capital panel. But I can  
6           say that the -- I might get my dates mixed up. But  
7           the October load forecast was an energy only forecast.  
8           For doing capital planning, you actually manage your  
9           capital plans to the peak, which is the maximum  
10          demand. When we saw the decrease in the energy  
11          forecast, in the October 2018 load forecast, the  
12          capital planning group, the asset managers started to  
13          question whether or not some of the projects would in  
14          fact need to be delayed. We asked the load  
15          forecasting team to develop a peak load forecast,  
16          which was the June forecast.

17                        We've subsequently issued a notification to  
18          the Commission that for example the Metro North  
19          project is not just delayed, it has been cancelled.  
20          So we were getting early indications of declining load  
21          from the October 2018, and we've now started to  
22          clarify those using the most recent peak forecast.

23 MR. C. WEAFFER:   Q    So a change in the peak forecast  
24          caused a change in the capital plan?

25 MS. DASCHUK:    A    A change in the energy forecast gave us  
26          pause to suggest that we should be revisiting -- once

1 we got the peak forecast, now you're starting to see  
2 some of the effects. We also issued a notice to the  
3 Commission that the Peace to Kallie Lake capacitors  
4 project, the growth portion of that has been  
5 cancelled. Those are all effects that are now coming  
6 from this most recent load forecast, the peak load  
7 forecast.

8 MR. C. WEAFFER: Q Thank you. Will it be the capital  
9 panel that will give us an indication of how much  
10 money was spent on those projects before they were  
11 cancelled by the change in the forecast? I assume  
12 there was time and effort spend on these projects?

13 MS. DASCHUK: A Yes, in a previous panel, I can't  
14 remember which one, we did talk about the fact that we  
15 do have a project write-off amount in our revenue  
16 requirements. To the extent that the write-offs of  
17 actual projects cause us to exceed the budgeted  
18 project write-offs, that's a cost incurred by the  
19 shareholder and not by the ratepayer.

20 So we did signal in our letter about Metro  
21 North, that the cost of the write-off of Metro North  
22 is actually going to be borne by the shareholder.

23 MR. C. WEAFFER: Q So, in anticipation of -- and we're  
24 going to have a month to prepare, so if I could ask  
25 that the cost associated with these projects that are  
26 identified as being at least deferred, what

1 expenditures have been incurred that will be the  
2 account of ratepayers?

3 **INFORMATION REQUEST**

4 **Proceeding Time 4:55 p.m. T87**

5 MS. DASCHUK: A Okay, as a clarification I will make  
6 sure that when they come they will also explain that a  
7 project being deferred does not cause a project to be  
8 written-off. The decision to actually cancel the  
9 project or to delay the project significantly, that's  
10 what triggers the write-off. So some of these  
11 projects, the deferral itself may not in fact trigger  
12 any costs.

13 MR. WEAFFER: Q That would be great news and I look  
14 forward to that panel's appearance.

15 MS. DASCHUK: A Okay.

16 MR. WEAFFER: Q The point I am trying to understand in  
17 terms of the past bias potentially of -- well,  
18 actually I'll leave it at that. Thank you.

19 If I could turn you now to Exhibit B-15 and  
20 it's CEC IR 2.133.5. And we're back to the recession  
21 discussion briefly. And this IR --

22 MS. MATTHEWS: A Can you repeat that, please?

23 MR. WEAFFER: Q Of course. It's BC -- or sorry, CEC IR  
24 2.133.5, Exhibit B-15. B-15. Oh I apologize. Sorry,  
25 I have the wrong reference on this. I did not see  
26 this date. I'm going to have to skip that question.

1 I apologize, I've got a bad reference on my  
2 information.

3 CEC IR 1.13.2, Attachment 2 is the other  
4 reference I have on this. I except that's the proper  
5 one for this proceeding if that's --

6 COMMISSIONER FUNG: What's the exhibit number?

7 MR. WEAVER: Q I think in the interest of time I'm just  
8 going to move on and leave that. That's fine. That's  
9 fine.

10 The last area of --

11 THE CHAIRPERSON: You can come back later and ask that  
12 question.

13 MR. WEAVER: Q Well, I think it's B-6 is where we find  
14 the CEC IRs and that may be -- so it's B-6. So that  
15 would be CEC IR 1.13.2, Attachment 2. And the  
16 question was, "Please provide BC Hydro's assessment of  
17 the impact of each of these recessions on BC Hydro's  
18 load." And at that time BC Hydro indicated that it  
19 would take considerable time to prepare that type of  
20 analysis and chose not to perform it.

21 I apologize for the confusion on the  
22 reference.

23 MR. RICH: A Okay, I have the reference.

24 MR. WEAVER: Q Do you? CEC IR 1.13.2, Attachment 2.  
25 Got it?

26 MR. RICH: A Yes.



1 MR. WEAFFER: Q Okay. And so the question -- and I'm  
2 mindful of Mr. O'Riley's comment around, "You want us  
3 to cuts costs and then you want us to take on  
4 projects," but to what extent has BC Hydro changed in  
5 terms of assessment of impact of recessions on load  
6 and load forecast? Has BC Hydro increased its efforts  
7 to get a better understanding of the impacts on load  
8 since this 2016 proceeding?

9 MR. CLENDINNING: A We have. And so I mentioned  
10 earlier the different approach that we take to the  
11 load forecast. So we have the A plus B equals C  
12 approach, the algebraic for the mid, and then we use  
13 Monte Carlo simulations to look at the high and the  
14 low. And so when looking at the low, you know, we  
15 take -- we looked at comments from the Conference  
16 Board of Canada, you know, they say, you know, given  
17 it is impossible to accurately predict the timing of  
18 recessions in the long-term, they don't include it in  
19 their long-term forecast.

20 **Proceeding Time 5:00 p.m. T88**

21 We dug a bit deeper into our Monte Carlo  
22 simulations, and one of the things that it varies in  
23 those simulations is GDP. And so in doing the Monte  
24 Carlo simulations and producing that low-end of the  
25 band, we looked at for all the variables that were  
26 changing, how often in each of those thousands of

1 simulations of potential future load did we see  
2 recessions? And in the 20 years of historical GDP  
3 that is included in our forecasting that we use for  
4 that model, it included the 2008 recession and so  
5 that's an input into that Monte Carlo simulation. You  
6 should at least go that low on GDP to see negative  
7 growth.

8 And so what we found was of the 30,000  
9 samples that we took, 13 percent of the time the  
10 simulation included periods of recession. So, those  
11 are actually quite deep recessions, because the model  
12 only works on a yearly basis. So a recession is  
13 defined on a per quarterly basis of negative GDP, but  
14 these were years, whole years of negative GDP. So  
15 what I will say is, I think our responses in the past  
16 have said we don't make those predictions about  
17 exactly when a recession will happen, but we do feel  
18 confident that our Monte Carlo processes do  
19 incorporate the risks associated with recessions and  
20 other potential negative consequences to customer  
21 demand for load that could in aggregate really hurt  
22 us. And that is where we get that lower part of the  
23 band.

24 MR. C. WEAFFER: Q Okay, thank you, that's helpful. If  
25 I could turn you over to the page 2 of 2 of the  
26 attachment, one of the stark indicators of this graph,

1           this is the actual total gross requirements, that at  
2           least until 2016, BC Hydro never came back to the 2008  
3           gross requirements, is that correct?

4 MR. RICH:    A    On this chart, yes.

5 MR. C. WEAVER:   Q    And if you -- I don't know if you are  
6           able to do it off the top, but if we add in 2017,  
7           2018, 2019, have you got back to the 2008 level?

8 MR. RICH:    A    So, most of that drop that occurred  
9           starting just before 2008 actually, and extending  
10          through a couple years, I would say about 70 percent  
11          of that drop is attributed to the pulp and paper mill  
12          closures.

13 MR. C. WEAVER:   Q    That's fine, thank you. So it's  
14          indicative of a significant change, structural change  
15          that we just never went back to, so would you call it  
16          anomalous or would you call it something possible to  
17          happen?

18 MR. RICH:    A    I would, because I mean, that dip is  
19          largely explained by what happened in the forestry  
20          sector at that time. I wouldn't say it's generally a  
21          reflection of the economy at large.

22 MR. C. WEAVER:   Q    Fair enough. Thank you, that is  
23          helpful.

24                    The last questions I have relate to a  
25                    decision of the Commission, and I notified your  
26                    counsel last night and we asked about this -- it's

1 pages of a public document, pages of a decision of the  
2 Commission, Exhibit C9-17.

3 (EXCERPT FROM BCUC REASONS FOR DECISION RE. BC  
4 HYDRO...APPLICATION FOR ELECTRICITY PURCHASE AGREEMENT  
5 RENEWALS... DATED NOVEMBER 8, 2019 MARKED EXHIBIT C9-17)

6 MR. WEAFFER: Q And we are off load forecast here, and I  
7 am not entirely certain you'll take the questions, but  
8 feel free to assign as appropriate.

9 This is the decision of the Commission of  
10 November 8, 2019, the application for electricity  
11 purchase agreement renewals for Sechelt Creek Hydro,  
12 Brown Lake Hydro, and Walden North Hydro.

13 And before commenting, you probably want to  
14 look at who the panel was.

15 THE CHAIRPERSON: Why is that, Mr. Weaffer?

16 MR. C. WEAFFER: Q I recognize that there are not a lot  
17 of IPP renewals coming up, but we also recognize that  
18 until we have a new IRP, we are in a bit of a no-man's  
19 land in terms of what is the best and appropriate way  
20 to respond to renewals in terms of protecting  
21 ratepayers.

22 This decision we spoke earlier in this  
23 proceeding is a successful decision is when you get  
24 what you ask for. You didn't exactly get what you  
25 asked for in the decision here, is that correct?

26 MR. CHOW: A Yes.

1 MR. C. WEAFFER: Q Okay, and the Commission, and there  
2 has been no -- the date is passed for a refiling, an  
3 extension, is that --

4 MR. CHOW: A BC Hydro requested an extension, and the  
5 Commission granted it. So the BC Hydro will be making  
6 a submission by February the 21<sup>st</sup>.

7 MR. C. WEAFFER: Q You've made an application to extend?

8 MR. CHOW: A Yes, we made a request to extend the --

9 MR. C. WEAFFER: Q The request for a short-term  
10 extension, you've made that request?

11 MR. CHOW: A No, sorry, so the Commission in its  
12 decision made a suggestion that BC Hydro work with the  
13 IPPs to reconfigure the contracts to a shorter term  
14 and it gave BC Hydro until January the 7<sup>th</sup> to respond.

15 **Proceeding Time 5:05 p.m. T89**

16 And so the extension that I was referring  
17 to was the extension of that timeframe. So, BC Hydro  
18 is still working with the IPPs and it plans on making  
19 a submission prior to -- or on February 21<sup>st</sup>.

20 MR. C. WEAFFER: Q Thank you, that's helpful. Sorry for  
21 the confusion. The decision, in terms of the  
22 economics of the application, in terms of the proper  
23 evaluation, and this is in the handout, the second  
24 page from the back of the handout, the panel's  
25 determination.

26 The panel finds insufficient evidence that

1 any of the three EPAs are cost effective over the 40-  
2 year contract period. And the panel finds that the  
3 interim market approach is the more appropriate method  
4 to value the EPA renewals of BC Hydro's opportunity  
5 costs.

6 Does BC Hydro take issue with that part of  
7 the decision?

8 MR. CHOW: A No, and I have to be careful here because  
9 the proceeding is still underway with the Commission.

10 MR. C. WEAFFER: Q Fair enough, but we do have a  
11 decision that's public.

12 MR. CHOW: A This is still an open process. Okay, yes.  
13 And I should note that BC Hydro has in its IR  
14 responses indicated that it has an interim market  
15 approach for making decisions.

16 MR. C. WEAFFER: Q That's fine.

17 Mr. Chairman, those are my questions.  
18 Thank you panel, I appreciate your time.

19 THE CHAIRPERSON: Thank you, Mr. Weafer.

20 MR. ANDREWS: Mr. Chairman and members of the  
21 Commission panel, I have a witness aid that members of  
22 the witness panel may have a copy of. I believe their  
23 counsel was provided with a copy. Evidently not, so  
24 it will take a little longer.

25 **CROSS-EXAMINATION BY MR. ANDREWS:**

26 MR. ANDREWS: Q Members of the panel, my name is

1 William Andrews. I represent the B.C. Sustainable  
2 Energy Association. I will be moving I think more or  
3 less in numerical order through the pages in the  
4 witness aid. These materials are all on the record  
5 already and so I don't believe this needs to have an  
6 exhibit number.

7 And I'm going to begin on the topic of the  
8 load forecast and first noting that Hydro has said in  
9 its evidence that the CleanBC plan is not reflected in  
10 the load forecast, finalized October 2018, correct?

11 MR. RICH: A Correct. Just as I guess a slight  
12 clarification, because in retrospect we do have the  
13 low-carbon electrification program which predated the  
14 public release of the CleanBC plan but it's entirely  
15 consistent with the objectives of the plan. So that's  
16 reflected in the October 2018 load forecast.

17 MR. ANDREWS: Q Thank you. And I think we have a  
18 similar confirmation on page 3 of the witness aid.

19 On page 4, it's the second half of the  
20 Hydro response in Exhibit B-6 to BCSEA IR 1.9.1.  
21 Hydro says that once the B.C. government releases its  
22 plans over the next several months to achieve the  
23 remaining 25 percent of the 2030 goals, BC Hydro will  
24 be better able to evaluate the impacts to the load  
25 forecast. Do you see that?

26

**Proceeding Time 5:10 p.m. T90**

1 MR. CLENDINNING: A I do.

2 MR. ANDREWS: Q And just to explain there, the  
3 reference to the remaining 25 percent of the 2030  
4 goals, those are the 2030 goals in the CleanBC Plan  
5 and the 25 percent that wasn't specifically addressed  
6 within the CleanBC Plan document.

7 MR. CLENDINNING: A That's correct.

8 MR. ANDREWS: Q The reference on page 5 is to Exhibit  
9 B-6, BCSEA IR 1.7.1, and in this response there's a  
10 reference to the electric vehicle load forecast model  
11 and Hydro says as "part of the development efforts for  
12 future load forecasts, we intend to place more focus  
13 on our EV modelling given the emphasis that the  
14 CleanBC Plan places on the electrification of  
15 transportation." And this was a June 6<sup>th</sup>, 2019  
16 response.

17 I take it with the passage of the *Zero-*  
18 *Emissions Vehicle Act* Hydro did change the inputs to  
19 its EV model. Is that --

20 MR. CLENDINNING: A That's correct.

21 MR. ANDREWS: Q Now, on page 6 and in Exhibit -- a copy  
22 of Exhibit B-6, BCSEA 1.8.1 says that

23 "...Hydro has not yet developed a detailed  
24 work plan for metalogical improvements to  
25 its upcoming EV forecasts. We anticipate  
26 this work will completed in time to inform



1                   the Integrated Resource Plan."

2                   Is this a reference to different changes  
3                   than the ones that were -- that amounted to changing  
4                   the parameters based on the *Zero-Emission Vehicle Act*?

5 MR. CLENDINNING:    A    They are.  As we get more firm  
6                   detail, not only in terms of an active legislation but  
7                   regulations programs, program funding, and we're  
8                   seeing that role out, we'll continue to update the EV  
9                   forecast.

10                   What I can say is we do have more  
11                   information since May 2<sup>nd</sup>, 2019 about our plans.  We'll  
12                   make those changes to our existing model, and for  
13                   context our existing model started around the time  
14                   when there were double digit electric vehicles in  
15                   British Columbia and now we are in the range of 30,000  
16                   and so our work plan include changing out our model to  
17                   some more commercially available -- commercially  
18                   supported software that incorporates the learnings  
19                   from many other jurisdictions.  And we anticipate that  
20                   that at this early time – the workplan is not  
21                   finalized – would be part of our February 2021 load  
22                   forecast.

23                   But for the IRP, it's obviously critical  
24                   for us to incorporate as much of the CleanBC plan,  
25                   again legislation, regulation, programming, and  
26                   perhaps very importantly funding that we see for

1 electric vehicle adoption in British Columbia.

2 MR. ANDREWS: Q So is the work on creating a new EV  
3 forecasting model part of the test period work plan,  
4 that is the fiscal 2021 workplan? Is that happening  
5 in the current test period?

6 MR. CLENDINNING: A So to incorporate the CleanBC  
7 information as it becomes available, you know, if it  
8 does become available during the test period we'll  
9 incorporate that. But we are coming to the end of the  
10 window for the development of the IRP load forecast.  
11 Mr. Rich can speak a little bit more about that. So  
12 our approach will be we will see the additional 25  
13 percent of the CleanBC plan. For 2030 we anticipate  
14 additional tranches of changes to come and our annual  
15 load forecasting process will incorporate that as we  
16 go.

17 MR. ANDREWS: Q Can I just maybe take a step back, wind  
18 back a bit there. Can I make a distinction between  
19 developing the model for the EV load forecasting and  
20 incorporating new data into it.

21 MR. CLENDINNING: A Right.

22 **Proceeding Time 5:14 p.m. T91**

23 MR. ANDREWS: Q And in terms of the development of the  
24 model -- let me just ask, where does that stand, and  
25 when do you expect to have it finished?

26 MR. CLENDINNING: A So we make changes to our modelling

1 processes, and update inputs at the same time as we  
2 develop a load forecast for many of the different  
3 forecasts. And so we have made additional minor  
4 methodological improvements and updated the data that  
5 we had in hand in order to inform the IRP load  
6 forecast. We'll make a similar change for the  
7 following load forecast, but we anticipate that that  
8 will be in an entirely new model. So there are input  
9 changes happening simultaneously with what I would  
10 call product development improvements to the load  
11 forecast itself.

12 MR. ANDREWS: Q All right, and then you referred to a  
13 February 2021 load forecast. Is that the load  
14 forecast that would inform the IRP and the next  
15 revenue requirement application?

16 MR. CLENDINNING: A No, the load forecast from this  
17 coming spring will inform the IRP.

18 MR. ANDREWS: Q Is there a month that we can attach to  
19 that load forecast at this point?

20 MR. CLENDINNING: A I'm using the word "spring" as we  
21 talk about load forecast, there is an approval process  
22 and board oversight that has to come into play. And  
23 that can be a tricky process to navigate. So we  
24 finish technically at a certain date, and then go  
25 through that approval process. So, I don't have a  
26 specific month, but it's very soon.

1 MR. ANDREWS: Q Thank you. On page 7 of the materials,  
2 Exhibit B-6, BCSEA IR 1.8.2.1, there is a distinction  
3 discussed between electric vehicles and heavy duty  
4 electric vehicles. And Hydro says that, to  
5 paraphrase, that it's developing a separate model for  
6 forecasting heavy duty vehicle EV load.

7 Can you give the panel a sense of where  
8 that stands and whether I guess in particular that  
9 will be included in the spring 2020 load forecast that  
10 would inform the upcoming IRP and the next revenue  
11 requirement application?

12 MR. CLENDINNING: A So, to our knowledge, we are one of  
13 the first jurisdictions that's engaged in studies of  
14 heavy duty vehicle electrification to try and  
15 understand that on a utility scale, and we are working  
16 with some municipalities in order to be able to do  
17 that as well. There is keen interest in that topic.  
18 However, we are still at the study phase for that, and  
19 so HDEV electrification won't be a part of this coming  
20 IRP.

21 MR. ANDREWS: Q Thank you for that information.

22 My next question has to do with the  
23 sequencing of load forecasts, and on page 8 there is a  
24 copy of Exhibit B-12, BCUC IR 2.209.1, that the  
25 response is lengthy, but the point I'm going to direct  
26 your attention to is the very beginning, the

1 introduction, that describes three ways in which BC  
2 Hydro normally makes changes to its load forecast, and  
3 with each one having different frequency. Can you  
4 explain those three methods and situate that Spring  
5 2020 load forecast within the three types that you do?

6 MR. RICH: A Well, I'll start. So I would describe,  
7 for example, the October 2018 load forecast is a  
8 comprehensive load forecast update. So we literally  
9 updated everything, all these inputs that are listed  
10 on the following page relative to our last load  
11 forecast, which was the May 2016 load forecast.

12 **Proceeding Time 5:19 p.m. T92**

13 So that's how I would describe the October 2018 load  
14 forecast.

15 The load forecast that's currently being  
16 prepared for the IRP is similarly a comprehensive  
17 update. We are updating everything, all the inputs,  
18 even relative to the October 2018 load forecast.

19 MR. ANDREWS: Q And what you're describing as a  
20 comprehensive load forecast is what was referred to  
21 earlier as the spring 2020 load forecast? Just the  
22 word?

23 MR. RICH: A Right, that's correct.

24 MR. ANDREWS: Q Thank you. In terms of the workload to  
25 carry out this forecasting, there was a recommendation  
26 in the GDS component of the internal audit that there

1           be additional resources. And on page 13 of the  
2           witness aid there is an excerpt from Exhibit B-12,  
3           BCUC IR 2.203.2, in which Hydro's responses to the  
4           recommendations of the internal audit of load  
5           forecasting are set out. And on the first page of the  
6           response it indicates that management action includes  
7           two staff have been added to the load forecast team,  
8           and the annual consultant and subscription service  
9           budget has been increased from approximately 200 to  
10          300,000 dollars.

11                           Is that -- well, have there been any  
12          changes since then?

13   MR. RICH:    A    No.

14   MR. ANDREWS:  Q   This was September, dated September  
15                    2019.

16   MR. RICH:    A    Right.

17   MR. ANDREWS:  Q   And in your view are those actions  
18                    sufficient to allow Hydro to carry out the load  
19                    forecasting that it's going to need in the test  
20                    period, particularly with an eye to the IRP and the  
21                    next revenue requirement application?

22   MR. RICH:    A    I think there's always a tradeoff in terms  
23                    of, you know, what we would like to do on the model,  
24                    what inputs we'd love to modify, and to be able to do  
25                    additional studies, but I think, you know, the audit  
26                    took a very unbiased and level view to that and I

1 think we've seen -- although it did take some time to  
2 get the resources up to speed once we had them on  
3 board, I do feel for the level of analysis that we're  
4 being called upon to do, the regulatory requirements  
5 that have come along with it. It's an uncomfortable  
6 balance, but one that is working for us right now.

7 MR. ANDREWS: Q Thank you. I'm going to change to a  
8 different topic. This is in the cost of energy field  
9 and the Biomass Energy Long-Term EPA Renewal heading,  
10 and the reference on page 15 of the handout is Exhibit  
11 B-23, Hydro's response to BCSEA IR 4.90.1.

12 This is an electricity purchase agreement  
13 with Atlantic Power for power from the Williams Lake  
14 biomass generation facility. I discussed it with Mr.  
15 O'Riley when he was on Panel 1. And the key point of  
16 contention is the statement at the end that the  
17 Northwest Energy EPA, which is the one related to this  
18 facility, does not preclude delivery of power from  
19 retired railway ties.

20 Mr. Chow, are you able to address this  
21 topic?

22 MR. CHOW: A Yes, I am.

23 MR. ANDREWS: Q Can you tell the Commission panel why  
24 it was that Hydro chose not to require that the fuel  
25 for this biomass generation be clear or renewable  
26 exclusively?

1 MR. CHOW: A Yes. So just a little bit of a background  
2 on the contract itself. So this contract was entered  
3 into under the biomass energy program. And that  
4 program was an outcome of phase 1 of the comprehensive  
5 review. And that program was developed in  
6 consultation with government, and government set out  
7 certain objectives, socioeconomic and environmental  
8 objectives within the forest sector for the program.

9 **Proceeding Time 5:24 p.m. T93**

10 And in doing so the government noted that these  
11 facilities -- there are seven facilities in the  
12 program, and they provide jobs and contribute to the  
13 economies of the forest sector dependent communities.

14 So with the issue of railway ties, BC  
15 Hydro's position is that the discarded railway ties  
16 include a mix of organic and inorganic materials, and  
17 only the organic wood portion of the railway ties are  
18 considered biomass or biogenic waste and hence clean  
19 or renewable.

20 And in general with our biomass EPAs, the  
21 BC Hydro allows for a certain limited amount of non-  
22 clean fuel for auxiliary fuel. And for example, you  
23 know, there are a lot of these facilities are tied to  
24 industrial operations and they need to use diesel as  
25 backup or support. And so that is what we refer to as  
26 the auxiliary fuel, and there are generally limits in



1 the EPAs to limit the use of auxiliary fuel to a small  
2 percentage, and that percentage is generally  
3 determined by heat content.

4 MR. ANDREWS: Q So just to pause on that point, the  
5 EPAs BC Hydro has for biomass electricity that I  
6 understood are characterized as clean or renewable  
7 fuels, some of them include auxiliary fuel that is  
8 fossil fuel?

9 MR. CHOW: A Yes, diesel.

10 MR. ANDREWS: Q Diesel?

11 MR. CHOW: A Yes, a small -- so the primary fuel is  
12 biomass, but diesel can be used for backup, and for --  
13 as part of their processes as well.

14 MR. ANDREWS: Q So the auxiliary fuel, would that be  
15 used for start-up in particular?

16 MR. CHOW: A As start-up or as part of their industrial  
17 process.

18 MR. ANDREWS: And what percentage of the fuel would that  
19 normally amount to?

20 MR. CHOW: A It varies, but it's a small percentage.

21 MR. ANDREWS: Q So in contrast, the Williams Lake  
22 biomass facility and the burning of retired rail ties,  
23 what's your understanding of the percentage of the  
24 fuel that comes from, or could from retired rail ties?

25 MR. CHOW: A I can't comment on specifics because it's  
26 a confidential EPA.

1 MR. ANDREWS: Q Does the EPA include a specification of  
2 what portion or what proportion of the fuel can come  
3 from retired rail ties?

4 MR. CHOW: A In general our biomass EPAs do have limits  
5 on the amount of auxiliary fuel that can be used.

6 MR. ANDREWS: Q Well, are you saying that the Atlantic  
7 Power EPA allows the burning of contaminated rail ties  
8 only as auxiliary fuel and that would be in a very  
9 small proportion like the use of diesel in other  
10 existing biomass facilities?

11 MR. CHOW: A Again, so the railway ties themselves are  
12 comprised of organic and inorganic materials. And the  
13 inorganic proportion would be comprised of small  
14 amount of the electricity generated and that's by heat  
15 content. And as I said, I can't speak to the  
16 specifics of this particular EPA, but in general if  
17 you look at our biomass EPAs there are limits to what  
18 can be -- and they are very --

19 MR. ANDREWS: Q Would you --

20 MR. CHOW: A Sorry?

21 MR. ANDREWS: Q Go ahead.

22 MR. CHOW: A And they vary based on the operation.

23 MR. ANDREWS: Q Would you agree with me that the  
24 facility in Williams Lake is allowed to burn up to  
25 some 25 percent of its fuel in the form of retired  
26 rail ties?

**Proceeding Time 5:28 p.m. T94**

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MR. CHOW: A Yes, so you're referring to the air permits and the facility does have an air permit, and under all of our EPAs all facilities are required to operate -- and it's IPPs responsibility to operate within the terms of their permits.

MR. ANDREWS: Q And so the Atlantic Power EPA, when the response says, "does not preclude deliver of power from retired rails ties," that contemplates that the facility could be providing power in which the fuel is up to 25 percent retired rail ties. And I guess my point is that is different that auxiliary diesel in a very small proportion of the fuel.

MS. MATTHEWS: A I'll answer, because I think it's actually been answered. The reason that Mr. Chow is talking about generalities is because we can't actually answer your specific question about this specific EPA, so that's why he's been characterizing it in general and we're not going to actually be able to reply to specifics.

MR. ANDREWS: Q Well, and so I guess I want to home in then. You're saying that there's something in the EPA itself that's confidential and it relates to the proportion of fuel that could come from contaminated rail ties under that EPA?

MS. MATTHEWS: A No. I'm saying that it's a

1 confidential EPA so there's a whole bunch of things in  
2 there that are confidential.

3 MR. ANDREWS: Q Well, I'm not asking about other  
4 aspects of the EPA. I'm asking about the proportion  
5 of fuel that can be not clean or renewable. And the  
6 answer here is that the EPA does not preclude delivery  
7 of power from retired railway ties.

8 So let me ask, does it follow from that  
9 that under the EPA the Northwest Energy or Atlantic  
10 Power is allowed to use whatever proportion of railway  
11 ties as its fuel stock that it's permitted to do under  
12 air emissions legislation?

13 MR. GHIKAS: So, I will rise now. Mr. Chairman, the  
14 witnesses have explained the commercially confidential  
15 nature of the IPP agreements, and in my submission it  
16 is entirely appropriate to protect commercially  
17 sensitive information of IPPs under the contract. And  
18 so my friend is really seeking to identify in a public  
19 forum the specific terms of the agreement and in my  
20 submission I think the witnesses are answering  
21 appropriately in declining to provide the information.

22 THE CHAIRPERSON: Mr. Andrews?

23 MR. ANDREWS: With respect, I don't understand my  
24 question to be asking for confidential information  
25 beyond what was already on the public record, that the  
26 EPA does not preclude the delivery of power from

1           retired railway ties.

2   THE CHAIRPERSON:        So what in addition to that are  
3           you --

4   MR. ANDREWS:            What I'm asking the witness to  
5           acknowledge is that the amount, it appears -- and this  
6           is what I'm asking for confirmation, that the amount  
7           of contaminated railway ties that could be used for  
8           fuel from this facility is limited by the air  
9           emissions permit and that that is in the nature of 25  
10          percent of the fuel.

11   THE CHAIRPERSON:        But I think they've said that's  
12          confidential. My understanding is they have said that  
13          that is confidential.

14                            Is that what's confidential? Is the answer  
15          to that question confidential?

16   MR. CHOW:     A    The specific percentage would be  
17          confidential and the specific terms in the EPA, but in  
18          general the EPAs require the proponent or the IPP to  
19          live within the terms of its permits.

20   THE CHAIRPERSON:        When you say "its permits", you mean  
21          the air pollution permit?

22   MR. CHOW:     A    That would be one of its permits.

23   THE CHAIRPERSON:        What other permits would you be  
24          talking about?

25   MR. CHOW:     A    Well, let's say for a hydro project it  
26          would have a -- like, that would be primary permit in



1 the decision that the Commission has to make, that  
2 certainly in those circumstances we should just be  
3 heeding the interest in confidentiality.

4 COMMISSIONER FUNG: But could I just ask you a question  
5 though, Mr. Ghikas. Are not the terms of the  
6 emissions permits public?

7 MR. GHIKAS: The emissions permits, as I understand it,  
8 are public. I believe my friend is asking whether  
9 there are requirements that differ from the --  
10 whether the terms of the agreement specify levels,  
11 specific requirements within the context of the  
12 agreement. He is trying to get the witnesses to  
13 confirm whether or not those are the same as the  
14 permit. That's my understanding of what my friend is  
15 trying to do. Not asking what the terms of the permit  
16 are, because those would be a public record issue, as  
17 I understand it.

18 THE CHAIRPERSON: I think that has been testified to,  
19 25 percent, right?

20 MR. CHOW: A I don't know that that's the correct  
21 number.

22 THE CHAIRPERSON: But in any event.

23 MR. ANDREWS: First to clarify, I am not in a position  
24 to make a confidentiality undertaking regarding this  
25 EPA, nor would I want to. However, let me propose a  
26 submission that my question to the panel, and my

1 proposition, which I am expecting the contents of the  
2 EPA would respond to, is that in fact the EPA does not  
3 have a limit on the amount of fuel that can be not  
4 clean or renewable, except as through the reference to  
5 the air emissions permit, and that I would invite  
6 Hydro to take an undertaking to file that EPA with the  
7 Commission in confidence, so that the Commission can  
8 confirm my interpretation, which is flowing entirely  
9 from the response Hydro made to this IR, which is that  
10 the EPA does not preclude the delivery of power from  
11 retired railway ties.

12 THE CHAIRPERSON: I think we have a confirmation of  
13 that, that it doesn't preclude it, don't we?

14 MR. CHOW: A That's correct, yes.

15 MR. ANDREWS: Q So then when I -- then why are you  
16 saying there is something confidential about the EPA  
17 that relates to the amount of contaminated rail ties?

18 MR. CHOW: A So you're asking -- so we've confirmed  
19 that the EPA does not preclude that as a fuel source,  
20 but you're asking for specific terms about specific  
21 details about how BC Hydro sets limits on the use.

22 MR. ANDREWS: Q I'm not asking --

23 MS. MATTHEWS: A We can confirm your question of what  
24 you said, that it has already been filed with the  
25 Commission confidentially, so they actually already  
26 have it.



1 MR. ANDREWS: Q Yes, I would assume that that is the  
2 case. And I'm not totally sure of the evidentiary  
3 basis, the Commission's ability to look at something  
4 that has been filed already in a different context.

5 THE CHAIRPERSON: I'm not sure that --

6 MR. ANDREWS: Yeah, I'm not sure that we are --

7 THE CHAIRPERSON: -- even if we are --

8 MR. ANDREWS: Q I think we may have reached the end of  
9 what we need to get to on the topic. With one  
10 exception which is a semantic clarification.

11 Mr. Chow, you used a term that Hydro has  
12 used in the past, distinguishing organic and  
13 inorganic, and to chemists, I put to you those are the  
14 reverse of the normal usage of the term. That you  
15 call the wood organic, and the pentachlorophenol and  
16 the creosote inorganic? I suggest that the  
17 contamination in the rail ties is a toxic material  
18 that, for example, would often be called an organic  
19 chemical.

20 So just to avoid confusion when you talk  
21 about allocation between organic and inorganic, when  
22 you use the word inorganic, you are referring to the  
23 toxic components that make it not clean or renewable.  
24 The pentachlorophenol and the creosote.

25 **Proceeding Time 5:39 p.m. T96**

26 MR. CHOW: A I'm sorry, I can't comment on the -- I

1 don't have a background in chemistry, so I can't --

2 MR. ANDREWS: Q All right. I'll leave it at that.

3 Thank you very much, panel. Those are my  
4 questions.

5 THE CHAIRPERSON: Thank you, Mr. Andrews.

6 Just give me a moment to talk to my panel  
7 members.

8 Okay, so we'll start at 8:00 tomorrow  
9 morning. It won't be open-ended tomorrow. We'll aim  
10 to end at 4:35ish. Let's see where we get. But we'll  
11 start at 8:00 and see what we can do.

12 Okay? Thank you. See you in the morning.

13 Safe trip home.

14 **(PROCEEDINGS ADJOURNED AT 5:41 P.M.)**

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