



“When You Talk - We Listen!”



MANITOBA PUBLIC UTILITIES BOARD

Re:

MANITOBA HYDRO
NEEDS FOR AND ALTERNATIVES TO
REVIEW OF MANITOBA HYDRO'S
PREFERRED DEVELOPMENT PLAN

Regis Gosselin	- Chairperson
Marilyn Kapitany	- Board Member
Larry Soldier	- Board Member
Richard Bel	- Board Member
Hugh Grant	- Board Member

HELD AT:

Public Utilities Board
400, 330 Portage Avenue
Winnipeg, Manitoba
April 7, 2014
Pages 5485 to 5720

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25

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1 --- Upon commencing at 8:02 a.m.

2

3 THE CHAIRPERSON: Good morning. I hope
4 everyone had a good weekend. I don't believe there's
5 many administrative matters to attend to this morning.
6 I'm searching, looking for Ms. Ramage. There are no
7 administrative matters this morning, no documents to
8 acknowledge?

9 MS. PATTI RAMAGE: No, Mr. Chairman,
10 there are no documents. I did want to, however, just
11 go on the record, thanking the Board for agreeing to
12 stand down this morning so that those of us who had the
13 pleasure of knowing Mr. Jim Foran are able to attend
14 his service.

15 This panel did not have the benefit of
16 Mr. Foran's wise counsel, I don't believe, over the
17 years, but he was a longstanding -- he had a
18 longstanding presence in front of this Board, I know,
19 going back to the '90s. That's when I first met Mr.
20 Foran. Manitoba Hydro was the -- the lucky
21 beneficiary. When we acquired Centra Gas, we also
22 acquired Mr. Foran's counsel. And I can say it was a
23 wise counsel. And he mentored many of us, what I will
24 call, young lawyers at the time on -- on regulatory
25 matters.

1 So you are receiving, I hope, what you
2 call the benefit of Mr. Foran's work over the years.
3 And -- and I'm very grateful that the Board has agreed
4 to allow us to pay our respects.

5 THE CHAIRPERSON: Thank you, Ms.
6 Ramage. Our pleasure to be able to accommodate you for
7 this unfortunate day. So with that, I will ask Me.
8 Monnin.

9 Bonjour, Me. Monnin.

10 MR. CHRISTIAN MONNIN: Bonjour, M.
11 President. I -- I would just like to echo what My
12 Friend, Ms. Ramage, said. And I -- I thank the Board
13 very much for the flexibility for today.

14 M. President, members of the panel, we -
15 - today we have the evidence of -- of La Capra
16 Associates. We have Mr. Daniel Peaco, Mr. John Athas,
17 and Ms. Mary Neal. We will be proceeding to have Mr.
18 Daniel Peaco and Mr. Athas sworn in as experts with
19 respect to the reports, the reams of technical
20 appendices and work papers which have been provided.

21 And Ms. Neal, similar to Ms. Sarah Keyes
22 last week of MNP, we will be asking to have them sworn
23 -- her sworn in rather as a fact witness, given the
24 input and assistance that she had with respect to the
25 preparing of the reports and the technical appendices

1 and the work papers.

2 Mr. Secretary, if we can have them sworn
3 in, please.

4

5 IEC LA CAPRA ASSOCIATES PANEL:

6 DANIEL PEACO, Affirmed (Qual.)

7 JOHN ATHAS, Affirmed (Qual.)

8 MARY NEAL, Affirmed

9

10 MR. CHRISTIAN MONNIN: Two (2) minor
11 pieces of housekeeping and discussions with Mr.
12 Secretary. We will be introducing two (2) documents as
13 exhibits this morning and the balance of our documents
14 as exhibits after the presentation today.

15 Therefore, the first document will be
16 LCA-45, and that is the hard copy of the slide deck
17 presentation, which we will be -- all be receiving the
18 benefit of this morning.

19

20 --- EXHIBIT NO. LCA-45: Slide deck presentation

21

22 MR. CHRISTIAN MONNIN: And the second
23 would be LCA-46, and that's the scope of work of La
24 Capra and Associates.

25

1 --- EXHIBIT NO. LCA-46: Scope of work

2

3 MR. CHRISTIAN MONNIN: Mr. Chair, I
4 propose to run through the qualification questions with
5 Mr. Peaco, then run through the similar questions with
6 Mither Assess -- Mr. Athas, pardon me. Excuse me. And
7 then will be seeking to have these two (2) individuals
8 qualified as experts.

9

10 QUALIFICATION OF WITNESSES:

11 MR. CHRISTIAN MONNIN: Starting with
12 Mr. Peaco, you are here on behalf of La Capra
13 Associates, which has been retained by the Manitoba
14 Public Utilities Board, the PUB, in order to assist the
15 PUB to conduct the Needs For And Alternatives To review
16 of Manitoba Hydro's Preferred Development Plan.

17 Is that correct?

18 MR. DANIEL PEACO: That's correct.

19 MR. CHRISTIAN MONNIN: Mr. Peaco, La
20 Capra has prepared reports which have been filed, along
21 with numerous tech -- technical appendices and a
22 supplemental report, in accordance with the terms of
23 reference, and La Capra's scope of work dated September
24 20th, 2013, to critically review certain aspects of
25 Manitoba Hydro's Preferred Development Plan and

1 filings.

2 Is that correct?

3 MR. DANIEL PEACO: That's correct.

4 MR. CHRISTIAN MONNIN: Mr. Peaco, were
5 these reports and supporting documents prepared by you
6 under your supervision and control?

7 MR. DANIEL PEACO: Yes. All of the
8 reports were prepared under my super -- supervision and
9 control, and the -- as -- we worked as a project team.
10 Mr. Athas and Mary Neal worked as our core project team
11 and are responsible for some elements of the public
12 project, but I -- all of the reports were done under my
13 direction or control.

14 MR. CHRISTIAN MONNIN: Thank you, Mr.
15 Peaco. My understanding, Mr. Peaco, that the primary
16 areas of focus in your work for the PUB, as taken from
17 the scope of work, fall under the following headings:
18 power resource planning and economic evaluation,
19 business case and risk assessment, transmission
20 economics, review of Manitoba Hydro's export contracts,
21 financial modelling, and wind/gas/hydro alternative.

22 Is that correct?

23 MR. DANIEL PEACO: That's correct.

24 MR. CHRISTIAN MONNIN: Mr. Peaco, your
25 curriculum vitae has been filed with the panel as part

1 of Exhibit Hill Co. number 8. Your CV, in particular,
2 3a -- Tab 3a under that exhibit. I'd like to walk
3 through your qualifications and experiences generally
4 and specifically as they relate to the subject headings
5 which I identified earlier.

6 With respect to power resource planning
7 and economic evaluation, can you please describe your
8 qualifications and experience generally and
9 specifically as they relate to this particular heading?

10 MR. DANIEL PEACO: Yes. In power
11 resource and economic evaluation, I have been working
12 in the power industry in resource planning and power
13 system planning for nearly thirty-five (35) years.
14 I've -- I have worked in -- in planning capacities at
15 Pacific Gas and Electric Company, at Central Maine
16 Power Company, and for the last seventeen (17) years
17 doing consulting work in the industry at La Capra
18 Associates.

19 The -- the experience I -- I've had in
20 those -- in those assignments have covered a very broad
21 spectrum of power resource planning and economic
22 evaluation activities, all of which are related to the
23 -- to the elements of the -- of the scope of work in
24 the power resource planning and economic evaluation
25 category of our scope of work.

1 MR. CHRISTIAN MONNIN: Thank you, Mr.

2 Peaco. I'm going to ask you the same question with

3 respect to business case and risk assessment.

4 MR. DANIEL PEACO: Okay. Well,

5 business case and risk assessment is very -- very close

6 to that. As defined in our scope of work, it pertains

7 specifically to those aspects of energy resource

8 planning that deal with scenario planning, risk

9 assessment, uncertainty analysis.

10 My experience has included substantial

11 work, both in my capacity at Central -- as a manager of

12 Central Maine Power and in my capacity as consultant at

13 La Capra Associates, in conducting and reviewing

14 integrated resource plans, system planning, power

15 system plans for utilities across the country.

16 Those -- those planning processes

17 routinely include scenario analysis, uncertainty

18 analysis, risk assessments, and -- and my -- I have a

19 number of project work experience in -- in resource

20 planning that -- that pertain to the elements of the

21 business case and risk assessment test there in our

22 scope of work.

23 MR. CHRISTIAN MONNIN: Thank you, Mr.

24 Peaco. And if we take these along, we'll go to the

25 next one, which would be -- the same question with

1 respect to transmission economics.

2 MR. DANIEL PEACO: Yes. Transmission
3 economics is an area of -- of expertise. We -- part of
4 our practice is involved with evaluating transmission,
5 and transmission alternatives. We have conducted a
6 number of studies for utilities and reviewing
7 utilities' plans on transmission or transmission-
8 related issues that include preparing an alternatives
9 assessment for Central Maine Power Company's \$1.5
10 billion transmission Maine -- Maine Reliability
11 project.

12 Recently we've also reviewed
13 transmission projects in -- in MISO and -- and SPP, and
14 in other jurisdictions as well, but we -- we do -- a
15 lot of our work is in the area of transmission planning
16 and its relationship to resource planning more
17 generally.

18 MR. CHRISTIAN MONNIN: Thank you, Mr.
19 Peaco. And now moving along to the next item, which
20 would be review of Manitoba Hydro's export contracts,
21 can you please provide us with your experience and
22 qualifications with respect to that?

23 MR. DANIEL PEACO: Sure. My experience
24 with export -- with contracts generally spans my career
25 as well. At Central Maine Power, they were very active

1 in contracting, both with small power producers and
2 with Canadian utilities. We -- we -- and during my
3 tenure there, we evaluated a number of power contracts
4 for co-generation small power productions, as well as
5 contracts exchanged with New Brunswick, and proposals
6 for exchange with -- with Hydro-Quebec, including
7 transmission expansion.

8 And since that time, I have worked on a
9 number of assignments, consulting assignments, at La
10 Capra Associates that involve power contracts of
11 various types. Perhaps the most notable of that was a
12 -- we were retained by the California Bureau of State
13 Audits to review the program that -- that was conducted
14 after the power crisis in 2001, where the state entered
15 some fifty-seven (57) contracts for \$47 billion in --
16 in ninety (90) days. We were retained by the auditor
17 to review that program and prepare an audit report for
18 that program.

19 We have a number of other contracts
20 activity that we do that are more typically in our --
21 in my work experience, pertain to contracts for wind --
22 wind power and other -- other types of facilities that
23 -- where utilities are purchasing power output.

24 MR. CHRISTIAN MONNIN: Thank you, Mr.
25 Peaco, and we're -- we're moving along here. The next

1 one would be financial modelling.

2 MR. DANIEL PEACO: Financial modelling
3 as -- as it pertains to our scope of work deals with
4 the -- the elements of the cost of the program that
5 would pertain to how it affects rates. My work
6 experience in power system planning has had close
7 connections to the rate planning of utilities Central
8 Maine Power and -- and Pacific Gas and Electric when I
9 worked at the utilities.

10 And -- and a number of our work
11 activities have involved economic and financial
12 analyses that are part of rate cases and -- and rate-
13 making proceedings with utilities, and so my experience
14 in financial modelling is in that area. Our folks on
15 our team have substantial experience in this area as
16 well.

17 MR. CHRISTIAN MONNIN: Thank you, Mr.
18 Peaco. And with respect to wind, gas, hydro
19 alternatives, could you please answer the same
20 question?

21 MR. DANIEL PEACO: I'm -- I'm sorry,
22 the question?

23 MR. CHRISTIAN MONNIN: Can you please
24 provide us with your experience and qualifications with
25 respect to the last heading, which would be

1 wind/gas/hydro alternatives?

2 MR. DANIEL PEACO: Oh, sure. Yeah, my
3 experience with wind and gas and hydro, again, much of
4 that has to do -- has to do with our planning in IRP,
5 but we do a lot of evaluation, and -- and I've done a
6 lot of work in the area of -- well, let me take them
7 one (1) at a time. In the natural gas planning --
8 natural gas planning, a lot of our work in the
9 northeast markets, it's a predominantly gas region, and
10 so there's -- there's a -- there's a substantial focus
11 on our work in planning and evaluation and asset
12 valuation related to natural gas facilities and -- and
13 natural gas markets.

14 The -- with respect to wind, I have been
15 involved with evaluation of a number of wind
16 facilities. Wind IRPs for -- for purchase power
17 contracts and -- and applications for construction of
18 and -- and rate recovery for wind projects, many of
19 which are in the -- in the SPP or MISO markets.

20 The -- with respect to hydro, I have
21 worked with hydro power facilities and systems
22 throughout my career. Pacific Gas and Electric has a
23 substantial hydro power holdings, and during my tenure
24 at Pacific Gas and Electric, PG&E was going through a
25 substantial re-licensing effort for its system, and I

1 was involved with an economic analysis program to --
2 associated with that.

3 PG&E's power system also is integrated
4 with the Pacific Northwest System, which is a hydro-
5 dominated system, and so there's a -- there was a
6 substantial diversity exchange component to the
7 planning at PG&E associated with that. At Central
8 Maine Power, a smaller scale, but they had a -- some
9 400 megawatts of -- of hydro power in their system and
10 I did over the year -- my tenure there, did a
11 substantial amount of analysis associated with their
12 hydro power system. And during my tenure at La Capra,
13 I've worked on a number of hydro power related planning
14 and asset valuation exercises in my consulting
15 assignments.

16 MR. CHRISTIAN MONNIN: Okay. Mr.
17 Peaco, the scope of work which was provided to La Capra
18 on September 20th, 2013, refers to an entity known as
19 EnerNex.

20 MR. DANIEL PEACO: Yes.

21 MR. CHRISTIAN MONNIN: Can you please
22 advise us of what involvement EnerNex had with respect
23 to preparing of your report?

24 MR. DANIEL PEACO: Yes. EnerNex was
25 retained by us as a subcontractor specifically for the

1 purposes of having a -- an adjunct resource that was
2 someone with experience, specific experience, in wind
3 integration studies.

4 Mr. Bob Zavadil in particular was --
5 worked with us in reviewing the -- the materials in the
6 NFAT filing associated with the wind scenario analysis
7 and did contribute to the -- to the program. And so he
8 was -- he was part of our work team that reviewed their
9 case and sort of developed the -- the themes for what
10 we developed in our -- in our reports.

11 MR. CHRISTIAN MONNIN: Now, the
12 representative for EnerNex has not been produced today.
13 Could you please explain why?

14 MR. DANIEL PEACO: Yeah. We -- we --
15 he was part of the -- part of the team that provided
16 input. The -- the issues that came to the fore and --
17 and developed in our reports did not run specifically
18 to issues related to his particular expertise.

19 The issues that are central to our
20 evidence are matters of cost and performance
21 assumptions and characteristics of wind resources more
22 generally, which is something that we -- we work with
23 and have confirmed with him is -- is consistent with
24 his understanding of the -- of the system. But we
25 didn't -- we did not feel it was necessary to add him

1 to the wit -- to the panel for that purpose.

2 MR. CHRISTIAN MONNIN: Thank you, Mr.
3 Peaco. Now, the next question on my script here
4 normally is: Can you please describe the -- the type
5 of clientele which yourself and La Capra have worked
6 for?

7 You've provided us with quite an
8 excellent example of that, going through your
9 qualifications. If you wish to add any more to that,
10 please feel free to do so.

11 MR. DANIEL PEACO: Sure. More
12 generally, our clientele is diverse, both in terms of
13 position in the industry and geographic location. Our
14 -- while we're based in -- in New England, Boston and
15 Portland, Maine, our clientele are -- are both in the
16 US -- across the US and Canada.

17 We've -- we work for utilities, for
18 merchant generating companies. We work for entities
19 that are energy consumers or -- or representatives of
20 energy consumers. We've done considerable work for
21 regulatory commissions and energy policy agencies of --
22 of state and -- and regional governments.

23 So we -- we have a broad spectrum of --
24 of experience across a number of different participants
25 in -- in the ener -- in the energy industry.

1 MR. CHRISTIAN MONNIN: Thank you very
2 much, Mr. Peaco.

3 Mr. Chair, before I -- I ask that Mr.
4 Peaco be accepted by the Board as an expert, I -- I
5 would propose that I walk Mr. Athas through the same --
6 the same steps.

7 Mr. Athas, you're here on behalf of La
8 Capra Associates which -- which has been retained by
9 the PUB in order to assist the PUB to conduct a Needs
10 For and Alternatives To review of Manitoba Hydro's
11 Preferred Development Plan.

12 Is that correct?

13 MR. JOHN ATHAS: Yes.

14 MR. CHRISTIAN MONNIN: La Capra has
15 prepared reports which has been filed, along with
16 numerous technical appendices and a supplementary
17 report, in accordance with the terms of reference and
18 La Capra's scope of work dated September 20th, 2013, to
19 critically review certain aspects of Manitoba Hydro's
20 Preferred Development Plans and filings.

21 Is that correct?

22 MR. JOHN ATHAS: Yes.

23 MR. CHRISTIAN MONNIN: Were these
24 reports prepared by you under your supervision and
25 control, Mr. Athas?

1 MR. JOHN ATHAS: Many of the reports
2 were. I had some involved in -- with all the reports.

3 MR. CHRISTIAN MONNIN: Thank you, Mr.
4 Athas. Now, you heard me earlier describe the primary
5 areas of focus in your work for the PUB. I propose to
6 walk you through each of those as well.

7 Your curriculum vitae has been filed
8 with the -- with the panel as Exhibit Hill Co. Number
9 8, Tab 3b. I would ask you to describe your
10 qualifications and experience generally and
11 specifically as they relate to the work undertaken
12 under these headings.

13 And the first heading, Mr. Athas, would
14 be power resource planning and economic evaluation.

15 MR. JOHN ATHAS: In -- in my similar
16 thirty (30) plus years of experience in the -- in the
17 electric utility industry, I started at Northeast
18 Utilities in the system planning/capacity planning
19 department, worked my way through lots of different
20 kind of analyses to be supervising and conducting.

21 Eventually, got -- was the -- in charge
22 of strategic planning and integrated resource planning
23 for Northeast Utilities.

24 MR. CHRISTIAN MONNIN: Thank you, Mr.
25 Athas. And this is a similar question -- same question

1 rather, with respect to business case and risk
2 assessment.

3 MR. JOHN ATHAS: In our -- in my time
4 at La Capra Associates, I've -- I've done a lot of IRP
5 evaluations, from -- most recently, some -- some of the
6 IRP evaluations we are actually performing the IRP
7 evaluations. We are actually performing the IRP
8 analysis; other ones, we're reviewing, utilities' IRP
9 analysis, and sometimes it's a little bit -- it's
10 almost collaborative.

11 The -- prior to that, when I was working
12 at Northeast Utilities in charge of integrated resource
13 planning, the IRP was very much centred around the
14 business risk assessment -- 'IRP' being 'integrated
15 resource planning' -- a business risk assessment around
16 uncertainty analysis. Part of the uncertainty analysis
17 is understanding where the -- where the conditions of
18 the outside world can go in -- in your planning.

19 When I was at Cambridge Energy Resource
20 Associates in CERA, I -- we -- I was involved in
21 setting up North American gas and power scenarios to
22 look at different futures that are possible.

23 MR. CHRISTIAN MONNIN: Thank you, Mr.
24 Athas. And with respect to -- the same -- the same
25 question with respect to transmission economics.

1 MR. JOHN ATHAS: I've been involved in
2 some transmission economics of projects for particular
3 transmission, looking -- looking also at the economics
4 relative to non-transmission alternatives. Have not
5 been a transmission reliability person, but have been
6 involved in -- in making sure that the -- and testing
7 the economics, performing the financials.

8 MR. CHRISTIAN MONNIN: Thank you, Mr.
9 Athas. And the same question with respect to review of
10 Manitoba Hydro export contracts.

11 MR. JOHN ATHAS: My experience in power
12 contracts is -- started with working on an analysis
13 going into the New England long-term purchase of power
14 from Hydro-Quebec. I then worked on economics for the
15 purchase of -- of power from small power producers, you
16 know, with the weighted cost analysis and -- and
17 looking at those contracts.

18 I actually negotiated contracts with
19 many large customers and Northeast Utilities and was in
20 charge of marketing and contracting for the retail
21 business -- unregulated business and Northeast
22 Utilities for a while.

23 MR. CHRISTIAN MONNIN: Thank you, Mr.
24 Athas. And the same question with respect to financial
25 modelling.

1 MR. JOHN ATHAS: Yeah. Within the
2 integrated resource planning at Northeast Utilities we
3 actually used the -- a model that was by General
4 Electric called the Financial Simulation Program. That
5 model would do -- produce all the scenarios and cases
6 that we analyzed, all the financial statements, balance
7 sheet, income statement, working capital.

8 And -- and that was an integral part of
9 our -- of our modelling and our -- our metric
10 development in the -- in IRP at Northeast Utilities,
11 and -- and that included working hand-in-hand with our
12 financial planning department, because we actually did
13 fina -- bond rating evaluations for all the different
14 plans as part of the IRP.

15 MR. CHRISTIAN MONNIN: Thank you, Mr.
16 Athas. And with respect to wind/gas/hydro
17 alternatives?

18 MR. JOHN ATHAS: Yes. I've done a fair
19 amount of economic analysis on just -- on alternatives.
20 Some recent ones include the fact that there was some
21 projects out in -- in the Midwest for -- in -- and we
22 looked at the -- the economics of the projects that
23 were being put forth by utilities.

24 I also was involved as the independent
25 evaluator for -- from an outside party as the --

1 engaged by the Attorney General and the department
2 staff to oversee the Oklahoma gas and electric
3 procurement of -- of wind resources and their
4 evaluation criteria.

5 And my -- my background goes to back
6 then of--my first economic analysis project for
7 Northeast Utilities in 1982 was wind.

8 MR. CHRISTIAN MONNIN: Thank you, Mr.
9 Athas. In addition to what you've already described,
10 can you generally describe the type of clientele that
11 you've worked for at -- at La Capra?

12 MR. JOHN ATHAS: Yeah. At La Capra,
13 I've been invol -- working for -- directly for
14 utilities, for consumer advocates, for the commission
15 staff, at times for developers. And that somewhat
16 mirrors the clientele base that I had when I was at
17 CERA, where we had -- for our North American gas and
18 power service we had basically an equal mix of
19 investors, developers, utilities, and other interested
20 parties.

21 MR. CHRISTIAN MONNIN: Thank you very
22 much, Mr. Athas. Mr. Chair, with that, I would ask
23 that Mr. Peaco and Mr. Athas be accepted by the Board
24 as experts for the purposes of giving evidence on the
25 work performed by La Capra and Associates according to

1 its data -- scope of work, rather, under the NFAT.

2 THE CHAIRPERSON: Merci, Me. Monnin.

3 I'd like to hear from Mr. Williams, please, on behalf
4 of CAC.

5 MR. BYRON WILLIAMS: Just a couple of
6 questions. Mr. Athas, I noted you did some work in --
7 in Connecticut on their 2010 integrated resource plan.

8 Is that right, sir?

9 MR. JOHN ATHAS: That's correct.

10 MR. BYRON WILLIAMS: And could you
11 detail a little bit more about the work you did, in
12 terms of analyzing export contracts with Hydro-Quebec?

13 MR. JOHN ATHAS: As part of that IRP?

14 MR. BYRON WILLIAMS: Yeah.

15 MR. JOHN ATHAS: The -- there wasn't a
16 major component of -- of actual financial analysis
17 around the 2010 IRP. For Hydro-Quebec imports, there
18 was a lot of discussion within the IRP process on the
19 positioning of -- of imported -- large imports of
20 power, water resources, and large hydro as how that
21 would fit into the overall renewable portfolio
22 standards and the like.

23 MR. BYRON WILLIAMS: Okay, thank you.

24 And, Mr. Peaco, just in term -- in terms of EnerNex,
25 could you distinguish a little bit more the -- the role

1 they played for you as compared to the -- the role that
2 you consider to be the primary elements of your
3 assignment?

4 MR. DANIEL PEACO: Sure. We organized
5 ourselves in several project teams around the -- the
6 many reports that we did, and one of the project teams
7 obviously looked at the alternative scenarios, and Mr.
8 Zavadil was included as part of that team.

9 And we -- he participated in our -- in
10 our -- in the process and reviewed materials, and
11 participated in our -- our discussions and commentary
12 on the work that Hydro had done and the issues that we
13 felt were at hand. So he participated in -- as part of
14 that team.

15 And when we reached the point where we
16 concluded what our issues were going to be presented,
17 we had initially thought that the particular issues of
18 wind integration where his -- his core expertise lies
19 didn't really rise to the surface as something that was
20 central to the issues that we were raising in our
21 report, but -- but clearly, we discussed those issues
22 as part of the review of the process.

23 MR. BYRON WILLIAMS: And presumably, if
24 there are any specific questions about wind
25 integration, those can always be put to him as part of

1 some undertaking?

2 MR. DANIEL PEACO: That's correct.

3 MR. BYRON WILLIAMS: Okay. And in
4 terms of transmission economics, just so I -- for --
5 for both of you, Mr. -- it's -- Mr. Athas, you would
6 claim to have expertise in transmission economics, but
7 not transmission reliability? Is that the distinguish
8 -- is that how you distinguished?

9 MR. JOHN ATHAS: Yeah. I just -- I
10 mean, part of the -- part of any planning exercise is
11 to make sure that you're looking at alternatives that
12 have, you know -- provide equal service, or -- or at
13 least both hit the minimum service.

14 So when the -- in looking at -- in
15 developing any kind of transmission analysis, there
16 might be different alternatives. Way -- transmissions
17 configurations that have the same reliability benefit
18 and the like, usually that's -- you know, that's an
19 analysis that's done by another party, very often, you
20 know, a partner that we would have in the process, at -
21 - at La Capra.

22 MR. BYRON WILLIAMS: And, Mr. Peaco, in
23 -- in terms of transmission, how would you characterize
24 your expertise?

25 MR. DANIEL PEACO: I'm a civil engineer

1 by training. We -- the project team we had on the
2 transmission issues included myself, Richard Hahn, who
3 is -- similar to Mr. Athas and I, you know, spent a
4 career in the utility industry, and is now working with
5 us, and he has been for the last ten (10) years. He's
6 an electrical engineer by training, and has managed
7 transmission planning at Boston Edison, and was -- was
8 our -- our planning expert in-house for that.

9 In addition, we have a -- a second
10 individual who is an electric engineer who spent some
11 time at ISO New England, and he was also involved in
12 reviewing these things. So the three (3) -- the three
13 (3) of us worked on that, and Mr. Hahn and I have
14 worked on a number of transmission and transmission
15 alternative cases over the last several years,
16 including the Maine project that I talked about, which
17 -- so the -- so the combination of our expertise is
18 really what we brought to bear on the transmission
19 issues.

20 MR. BYRON WILLIAMS: And Mr. Chair,
21 just -- on behalf of CAC (Manitoba), My Friend Me.
22 Monnin has characterized six (6) areas of expertise for
23 the -- the team from -- from La Capra, and certainly
24 our clients are very supportive of their qualifications
25 in these -- these areas, which we understand to be: 1)

1 power resource planning and economic evaluation, 2)
2 business case and risk analysis, 3) transmission
3 economics, 4) the evaluation of export contracts, 5)
4 the eval -- financial modelling evaluation, and 6)
5 being the evaluation of wind, gas, and hydro
6 alternatives.

7 So we welcome them here, and we -- and
8 if I've mischaracterized that, Mr. Monnin, you'll catch
9 me.

10 MR. CHRISTIAN MONNIN: Thank you, Mr. -
11 - Mr. Williams. Just with respect to business case and
12 risk assessment, not risk analysis --

13 MR. BYRON WILLIAMS: Oh, I -- I
14 misspoke.

15 MR. CHRISTIAN MONNIN: -- and I pulled
16 that from the scope of work.

17 MR. BYRON WILLIAMS: Okay. We
18 certainly welcome them on behalf of CAC.

19 THE CHAIRPERSON: Mr. Gange, please?

20 MR. WILLIAM GANGE: Green Action Centre
21 accepts the qualifications of the witnesses as experts.

22 THE CHAIRPERSON: Thank you, Mr. Gange.
23 Mr. Orle, please?

24 MR. GEORGE ORLE: MKO accepts the
25 qualifications of both experts and on all six (6) areas

1 that they have expertise in.

2 MR. BOB PETERS: Mr. Chairman, I just
3 interject at this point, if I may. MIPUG's counsel,
4 Mr. Hacault, will be with us momentarily. He's not
5 used to functioning in the Eastern time zone, and --
6 but the message that I have received, and if it -- if I
7 have it accurately reflected, is that he has no
8 objection to the qualifications of these witnesses
9 either. Thank you.

10 MR. BYRON WILLIAMS: And, Mr. Chair, if
11 -- if I might on Mr. Hacault, I think any
12 responsibility for his timing changes are probably
13 mine, because I was assigned the responsibility of --
14 of briefing him, and I neglected to do so. So that's
15 my fault, not his.

16 THE CHAIRPERSON: Thank you, Mr. Peters
17 and Mr. Williams, and I'll call on Manitoba Hydro to
18 comment.

19 MS. HELGA VAN IDERSTINE: Thank --
20 thank you, Mr. Chair. I'm going to move over to the
21 other side, so that these nice witnesses do not have to
22 look at -- I don't -- I don't have to look at the back
23 of their head, and they don't have to swizzle around,
24 so I'll just move over.

25

1 (BRIEF PAUSE)

2

3 MS. HELGA VAN IDERSTINE: Thank you. I
4 -- I, too, would like to thank the panel for agreeing
5 to the adjournment. Mr. Foran was one of my partners
6 in my law firm and, of course, we are all going to miss
7 him.

8 So first off, I -- I do want to ask some
9 questions, and -- and I'm hoping that by doing so, we
10 can clarify a few things, and then thus shorten the
11 cross-examination that Manitoba Hydro will be doing
12 after you've given your evidence. So I hope you'll
13 indulge me if I'm maybe a little longer than some of
14 the others.

15 So as I understand it, the -- Mr. Athas
16 and Mr. Peaco -- is that how I pronounce it?

17 MR. DANIEL PEACO: Yes, that's correct.

18 MS. HELGA VAN IDERSTINE: You two (2)
19 are essentially the -- part of the ownership of the La
20 Capra Associates.

21 Is that right?

22 MR. DANIEL PEACO: Well, we all are.
23 We're in a -- we're an employee-owned corporation.

24 MS. HELGA VAN IDERSTINE: Oh, okay.
25 And as a -- and so is -- so Ms. Neal is also part of

1 that ownership structure?

2 MR. DANIEL PEACO: Well, as an ESOP,
3 every -- every employee is an owner of the company to
4 some degree.

5 MS. HELGA VAN IDERSTINE: And as -- and
6 as I understand it from the evidence earlier, EnerNex
7 was retained by -- or you retained EnerNex to provide
8 some advice to you?

9 MR. DANIEL PEACO: Yes.

10 MS. HELGA VAN IDERSTINE: And they're
11 not an affiliated company?

12 MR. DANIEL PEACO: They're -- they're
13 not.

14 MS. HELGA VAN IDERSTINE: And they were
15 retained by you to assist you in the scope of the work
16 that you were retained by the PUB to do?

17 MR. DANIEL PEACO: That's correct.

18 MS. HELGA VAN IDERSTINE: And that
19 scope of the work is identified, and I think
20 encapsulated by point 12 in your scope of work, and
21 that's LA's -- LCA's Exhibit number 46?

22 That was to address the relative
23 generation and integration costs of hydro, wind,
24 natural gas turbines, single cycle, combined cycle and
25 demand-side management, but it would be the wind area

1 that you were consulting with EnerNex?

2 MR. DANIEL PEACO: Yes, and it was a --
3 there was an amendment to our scope of work to include
4 several items that were specific that we -- there's a
5 EnerNex sort of listing of scope of work, sort of
6 within our scope of work as well.

7 MS. HELGA VAN IDERSTINE: Yes, so --

8 MR. DANIEL PEACO: But it -- but it all
9 fits within that -- the area that you pointed to.

10 MS. HELGA VAN IDERSTINE: That's what
11 I'm saying -- going to. So EnerNex was then retained
12 to do the -- the ten (10) items that are identified
13 within their scope of work.

14 MR. DANIEL PEACO: That's correct.

15 MS. HELGA VAN IDERSTINE: So just so
16 we're following it through, you were retained initially
17 to do number 12. You felt you needed assistance with
18 respect to the wind -- wind, and you therefore retained
19 EnerNex?

20 MR. DANIEL PEACO: That's correct.

21 MS. HELGA VAN IDERSTINE: And the
22 person at -- at EnerNex that you've writ -- worked with
23 was Mr. Zavadil, and his -- he's referenced in the
24 materials?

25 MR. DANIEL PEACO: That's correct.

1 MS. HELGA VAN IDERSTINE: And I take it
2 he was only involved in writing the chapters in your
3 report which addressed wind, which would be Appendixes
4 2 and 3b?

5 MR. DANIEL PEACO: I think that's
6 correct, yes.

7 MS. HELGA VAN IDERSTINE: He wasn't
8 doing anything else with respect to the report?

9 MR. DANIEL PEACO: No. The subtotal of
10 his involvement was respect -- with respect to the
11 evaluation we had of Manitoba Hydro's wind case and the
12 -- and the issues of wind resources as -- as a resource
13 option in particular.

14 MS. HELGA VAN IDERSTINE: So I take it
15 the reason you consulted Mr. -- Mr. Zavadil at EnerNex
16 was because they had specialized knowledge that you
17 felt that you didn't have within your organization?

18 MR. DANIEL PEACO: Well, in discussing
19 the scope of work issues with the PUB at the outset,
20 their -- they had identified a particular interest in
21 making sure that the wind resource options were
22 developed and had asked some particular questions about
23 wind integration issues.

24 And so they suggested, I think, with
25 some -- within -- you know, to make sure that we had

1 enough coverage there for whatever might come up. And
2 -- and so Mr. Zavadil was available to -- to join our
3 team, and so we -- we brought him in.

4 MS. HELGA VAN IDERSTINE: So the simple
5 answer to that was 'yes'. I asked you if you retained
6 him because he had specialized knowledge, and you --
7 your answer to that really is 'yes'.

8 MR. DANIEL PEACO: Yes.

9 MS. HELGA VAN IDERSTINE: Good. And
10 just to follow up on that, he had more knowledge with
11 respect to the wind costs in the interior of the US
12 than you did?

13 MR. DANIEL PEACO: He has knowledge, as
14 do we. I don't -- I don't know whether I would
15 characterize it as more --

16 MS. HELGA VAN IDERSTINE: Okay.

17 MR. DANIEL PEACO: -- but he -- but he
18 clearly has an abundance of knowledge, yes.

19 MS. HELGA VAN IDERSTINE: And one of
20 the areas that was of concern was how the generation of
21 wind resources might impact on power grids where
22 capacity was a concern to the power grid.

23 MR. DANIEL PEACO: I'm sorry?

24 MS. HELGA VAN IDERSTINE: One of the
25 areas that was of concern would be the -- how

1 generation of wind resources might impact on power
2 grids where capacity is a concern for the power grid.

3 MR. DANIEL PEACO: Are you reading that
4 from the scope of work?

5 MS. HELGA VAN IDERSTINE: No, but that
6 would be one of the concerns with respect to
7 integration, that you didn't have knowledge that --
8 that you didn't have the knowledge of to deal with.

9 MR. DANIEL PEACO: I -- I just -- I
10 wasn't sure where you were -- where you --

11 MS. HELGA VAN IDERSTINE: I'm sorry.

12 MR. DANIEL PEACO: -- what that
13 reference was referring to.

14 MS. HELGA VAN IDERSTINE: Sorry. I
15 wasn't clear. So that would be one of the concerns
16 that you -- that --

17 MR. DANIEL PEACO: Could you state the
18 question again?

19 MS. HELGA VAN IDERSTINE: So one of the
20 concerns that prompted you to retain EnerNex was
21 because the generation of wind resources might impact
22 on the power grid, specifically when the capacity was
23 an issue.

24 MR. DANIEL PEACO: That's -- that's
25 among the concerns that you would look at, yeah. I

1 don't -- I wouldn't say that it was a specific issue
2 that we said, That's something that we -- that -- that
3 -- the reason we brought him in. But that's among the
4 issues you would look at, sure.

5 MS. HELGA VAN IDERSTINE: And that
6 would be an issue for Manitoba Hydro within its system?

7 MR. DANIEL PEACO: That's correct.

8 MS. HELGA VAN IDERSTINE: And I take it
9 you would defer to Man -- to Mr. Zavadil's expertise
10 with respect to the inte -- wind integration issues?

11 MR. DANIEL PEACO: I would.

12 MS. HELGA VAN IDERSTINE: And the other
13 people who worked on those chapters of the report,
14 Chapters 2 and 3a, as I understand it -- and I'm
15 looking at a response to an IR, Manitoba Hydro/LCA
16 001a, so referring to Appendixes 2 and 3a, the names
17 that you referenced were Jeffrey Bower, Carrie Gilbert,
18 and Dan Peaco.

19 MR. DANIEL PEACO: Correct.

20 MS. HELGA VAN IDERSTINE: And John
21 Athas, excuse me. So other than those five (5) (sic)
22 people, no one else in your organization worked on
23 those chapters of the report?

24 MR. DANIEL PEACO: I'm sorry, which
25 chapters are you referring to?

1 MS. HELGA VAN IDERSTINE: Indexes 2,
2 3a, and 3b.

3 MR. DANIEL PEACO: Let me just take a
4 look at that. And which -- which IR was that?

5 MS. HELGA VAN IDERSTINE: LCA -- Man --
6 Manitoba Hydro/LCA 001a.

7 MR. DANIEL PEACO: Okay. So you're
8 asking about Appendix 2?

9 MS. HELGA VAN IDERSTINE: I'm asking
10 about Appendix 2 and 3a and 3b, because we were talking
11 about where wind falls --

12 MR. DANIEL PEACO: Yes.

13 MS. HELGA VAN IDERSTINE: -- and that
14 falls within those two (2) -- or those three (3)
15 chapters, right?

16 MR. DANIEL PEACO: Yes. I'm not sure
17 that you mentioned Mr. Zavadil in your list.

18 MS. HELGA VAN IDERSTINE: No, because
19 he doesn't work for you.

20 MR. DANIEL PEACO: All right. But he's
21 listed in the -- in the response.

22 MS. HELGA VAN IDERSTINE: Other than
23 that, Mr. Bower, Ms. Gilbert, Mr. Peaco, and Mr. Athas
24 are the only people from your office who worked on the
25 -- those chapters of the report.

1 MR. DANIEL PEACO: Those are the
2 primary contributors, yes.

3 MS. HELGA VAN IDERSTINE: Oh. Were --
4 were there others that contributed to it?

5 MR. DANIEL PEACO: To a -- to a lesser
6 degree. But the response asked -- the question asked
7 for primary contributors, and those are the folks that
8 did most of the work on the project on those -- on
9 those reports.

10 MS. HELGA VAN IDERSTINE: So you
11 understood 'principle authors' to mean 'primary
12 contributors'?

13 MR. DANIEL PEACO: Yes.

14 MS. HELGA VAN IDERSTINE: And have any
15 of those persons done any work with respect to wind in
16 Canada?

17

18 (BRIEF PAUSE)

19

20 MR. JOHN ATHAS: To -- recently, I -- I
21 think it was last year -- testified as -- as my work on
22 behalf of the small business advocate in Nova Scotia in
23 a proceeding on the South Canoe Wind Project approval,
24 inclu -- which included a review of their procurement
25 of -- of the wind project. And it was a joint utility

1 and private developer project.

2 MS. HELGA VAN IDERSTINE: Okay. And
3 who are you retained by on that matter?

4 MR. JOHN ATHAS: The small business
5 advocate of Nova Scotia.

6 MS. HELGA VAN IDERSTINE: Okay. Who
7 are advocating for wind?

8 MR. JOHN ATHAS: Who are advocating for
9 the small businesses.

10 MS. HELGA VAN IDERSTINE: Yes. And --
11 and the small business organization was advocating for
12 wind to be installed in Nova Scotia?

13 MR. JOHN ATHAS: No. The small
14 business advocate was -- engaged consultants, like
15 myself, to evaluate whether the idea put forward by the
16 utility was a good idea and whether it was done in a
17 prudent manner.

18 MS. HELGA VAN IDERSTINE: And they then
19 advocated to the utility that it should -- wind should
20 be added to their resource?

21 MR. JOHN ATHAS: We had some concerns
22 with the procurement process for the -- that specific
23 wind project, and there was not -- there was a not a
24 need to develop an overall position on wind in this
25 Nova Scotia resource.

1 MS. HELGA VAN IDERSTINE: So when I
2 looked at your website and in the information you
3 provided to the PUB, and it's on their website, your
4 business is described as:

5 "An independent energy consulting
6 firm focussed on helping clients make
7 policy -- policy [comma], planning
8 [comma], investment [comma], pricing,
9 and procurement decisions."

10 Does that sound accurate?

11 MR. DANIEL PEACO: Yes.

12 MS. HELGA VAN IDERSTINE: And your
13 staff is described as having backgrounds in economics,
14 finance, law, management, and engineering?

15 MR. DANIEL PEACO: That's correct.

16 MS. HELGA VAN IDERSTINE: That would
17 encompass all of the expertise -- areas of expertise
18 that your office considers itself to be strong in?

19 MR. DANIEL PEACO: Yes, those are the
20 capabilities that we have, yes.

21 MS. HELGA VAN IDERSTINE: And as I
22 understand it, there's twenty-one (21) staff in your
23 organization?

24 MR. DANIEL PEACO: I think there's
25 twenty (20), but there's -- yeah, about -- we're about

1 twenty (20).

2 MS. HELGA VAN IDERSTINE: And about
3 three (3) of those are office administrative staff?

4 MR. DANIEL PEACO: Yes.

5 MS. HELGA VAN IDERSTINE: So the
6 remaining seventeen (17) or eighteen (18) would be
7 consultants or analysts?

8 MR. DANIEL PEACO: That's correct.

9 MS. HELGA VAN IDERSTINE: And as I
10 understand it, when I did the math, looking at that
11 exhibit we were looking at just a moment ago, about
12 fifteen (15) of your staff were involved in this
13 particular project.

14 Is that right?

15 MR. DANIEL PEACO: I'll take your word.
16 I think that's about right.

17 MS. HELGA VAN IDERSTINE: Now, there's
18 -- one of the areas you talked about having expertise
19 in was engineering?

20 MR. DANIEL PEACO: Yes.

21 MS. HELGA VAN IDERSTINE: I just want
22 to confirm that none of you are licensed as engineers
23 in Manitoba?

24 MR. DANIEL PEACO: That's correct.

25 MS. HELGA VAN IDERSTINE: And, Mr.

1 Peaco, are you involved every time La Capra gives -- or
2 somebody from La Capra gives evidence?

3 MR. DANIEL PEACO: No.

4 MS. HELGA VAN IDERSTINE: But you would
5 know when they were giving evidence?

6 MR. DANIEL PEACO: Yes.

7 MS. HELGA VAN IDERSTINE: And generally
8 what they were working on and what the evidence was
9 about?

10 MR. DANIEL PEACO: That's correct.

11 MS. HELGA VAN IDERSTINE: And I see
12 that you've listed in your CV -- and I think that was
13 Exhibit 8, Tab 3 --

14 MR. CHRISTIAN MONNIN: Tab 3a.

15 MS. HELGA VAN IDERSTINE: -- Tab 3a, a
16 listing of the times that you have given evidence as an
17 expert in various proceedings?

18 MR. DANIEL PEACO: Yes, I have.

19 MS. HELGA VAN IDERSTINE: And would it
20 be fair to say that when you're deciding who comes to
21 give evidence on a proceeding, it would be -- you try
22 and put forth the people that have the most knowledge
23 and expertise to do so?

24 MR. DANIEL PEACO: Yes.

25 MS. HELGA VAN IDERSTINE: So in

1 addition to the times that are listed for you having
2 given evidence here, there would be other times that
3 other people would be giving evidence as well that are
4 not listed in your CV, or from the corporation or from
5 La Capra?

6 MR. DANIEL PEACO: A question of who --
7 who in La Capra Associates actually provides expert
8 testimony? Yes, there are a number of individuals that
9 do.

10 MS. HELGA VAN IDERSTINE: So when I
11 look at your CV, I'm just trying to follow it; it's --
12 it's on page 7.

13 That's the times that you've been
14 qualified as an expert to give evidence?

15 MR. CHRISTIAN MONNIN: I'm not sure if
16 it'd be a benefit to the panel that you bring this up
17 on the screen, Ms. Van Iderstine.

18 MS. HELGA VAN IDERSTINE: Thank you.
19 So going down to the second item, I see that you gave
20 expert testimony regarding the evaluation of four (4)
21 hydro power plants, totalling 260 megawatts.

22 And that was in Vermont?

23 MR. DANIEL PEACO: Yes.

24 MS. HELGA VAN IDERSTINE: And that was
25 in two thir -- 2013?

1 MR. DANIEL PEACO: Correct.

2 MS. HELGA VAN IDERSTINE: And the next
3 time -- if you go down a little further, the third --
4 three (3) more down, you see the -- in an arbitration
5 case, you gave expert testimony regarding the
6 evaluation of 4 megawatts of hydro power facilities?

7 MR. DANIEL PEACO: Correct.

8 MS. HELGA VAN IDERSTINE: And I think I
9 might have skipped over one (1), because I thought
10 there was one where you gave a testimony about -- oh,
11 sorry, I did skip over one (1).

12 There's another one just above that --
13 two (2) above that, where the evaluation was of a 7
14 megawatt hydro power facility.

15 MR. DANIEL PEACO: Yes.

16 MS. HELGA VAN IDERSTINE: Have I missed
17 any other times that you've given evidence with respect
18 to hydro power?

19 MR. DANIEL PEACO: Yes.

20 MS. HELGA VAN IDERSTINE: Which one?

21 MR. DANIEL PEACO: Go to the very end.

22 MS. HELGA VAN IDERSTINE: So that was
23 in 1988?

24

25 (BRIEF PAUSE)

1 MS. HELGA VAN IDERSTINE: Mr. Peaco,
2 that would be 1988?

3 MR. DANIEL PEACO: Yes.

4 MS. HELGA VAN IDERSTINE: And that was
5 while you were employed by Central Maine and -- Power?

6 MR. DANIEL PEACO: That's correct.

7 MS. HELGA VAN IDERSTINE: So you
8 weren't testifying as an expert that time, you were
9 just give -- you were giving fact evidence.

10 MR. DANIEL PEACO: No, I was qualified
11 as an expert.

12 MS. HELGA VAN IDERSTINE: And that was
13 -- would have been with Central Maine -- Power. They
14 don't have a hydroelectric facility that -- per se.
15 They have transmission lines. Is that right?

16 MR. DANIEL PEACO: At that time, they
17 had hydro facilities, and -- and the -- the docket
18 there was for a proposal for a transmission line and a
19 contract for 900 megawatts of hydro power resourced
20 from Hydro-Quebec.

21 MS. HELGA VAN IDERSTINE: So that
22 evidence was with respect to a -- a hydro line
23 transmission line that was being put into --

24 MR. DANIEL PEACO: In the 900 megawatt
25 power contract.

1 MS. HELGA VAN IDERSTINE: Wasn't with
2 respect to a plant purchase or a plant development?

3 MR. DANIEL PEACO: No, and I believe
4 there's another one in there. There's a -- I testified
5 at the Maine commission on a -- on a 25 megawatt
6 project that CMP redeveloped, as well.

7 MS. HELGA VAN IDERSTINE: So other than
8 those five (5) items that you've identified, have --
9 have you or any of your colleagues given evidence on
10 hydroelectric power previously?

11

12 (BRIEF PAUSE)

13

14 MR. DANIEL PEACO: Yeah, I'm -- I'm not
15 specifically aware of others. I'm just not sure. Mr.
16 Hahn has testified extensively as -- as a -- has a list
17 as long as mine, and I'm not sure that he -- if he has
18 anything in his resume that would -- would go to that,
19 but other than that, I'm not aware of any.

20 MS. HELGA VAN IDERSTINE: Okay. I've
21 got Mr. Hahn's CV here, and I didn't see that he'd
22 listed it, but I may have missed it. So if -- if we're
23 wrong, you'll let us know, will you?

24 MR. DANIEL PEACO: I will.

25 MS. HELGA VAN IDERSTINE: Thank you.

1 Now, you're aware that Manitoba Hydro has
2 approximately...

3

4 (BRIEF PAUSE)

5

6 MR. CHRISTIAN MONNIN: Yeah. We'll
7 accept that as an undertaking.

8

9 (BRIEF PAUSE)

10

11 MS. HELGA VAN IDERSTINE: To advise if
12 Mr. Hahn has any experience giving evidence with
13 respect to hydroelectric power.

14

15 --- UNDERTAKING NO. 100: La Capra to indicate if Mr.
16 Hahn has any experience
17 giving evidence with
18 respect to hydroelectric
19 power

20

21 MS. HELGA VAN IDERSTINE: Now, you're
22 aware that Manitoba Hydro has approximately 5,700
23 megawatts of power in its system?

24

MR. DANIEL PEACO: I am.

25

MS. HELGA VAN IDERSTINE: And that

1 would be greater than the amount that you were dealing
2 with, even when you were with Pacific Gas & Electric?

3 MR. DANIEL PEACO: That's correct.

4 MS. HELGA VAN IDERSTINE: And there --
5 Manitoba Hydro is applying to add another 2,200
6 megawatts of power?

7 MR. DANIEL PEACO: Yes.

8 MS. HELGA VAN IDERSTINE: Again, that
9 would be much larger than any of the contracts or any
10 of the times that you've given evidenced with respect
11 to hydro -- hydroelectric?

12 MR. DANIEL PEACO: Those other
13 facilities, yes, with the exception of the resources
14 supporting the 900 megawatt Hydro-Quebec contract.

15 MS. HELGA VAN IDERSTINE: And with
16 respect to your experience at Pacific Gas & Electric,
17 that was in 1982 and '83, I believe -- or '82 to '86,
18 excuse me?

19 MR. DANIEL PEACO: That's correct.

20 MS. HELGA VAN IDERSTINE: And at that
21 time, you were a planning analyst, and very early on,
22 dealt with contracts?

23 MR. DANIEL PEACO: Well, one of my
24 assignments was -- was -- my initial position at PG&E
25 was within the cogener -- co-generation contracts

1 group, but I spent about two (2) years in the hydro --
2 hydro power planning group.

3 MS. HELGA VAN IDERSTINE: And that, as
4 -- as we can see from your CV, that was in the first
5 few years after you left university?

6 MR. DANIEL PEACO: Yes.

7 MS. HELGA VAN IDERSTINE: Now, in terms
8 of the construction of the hydroelectric plans that are
9 -- Manitoba Hydro is discussing, in your report, you
10 make and refer to Knight Piesold.

11 MR. DANIEL PEACO: Correct.

12 MS. HELGA VAN IDERSTINE: And that
13 would be one of the other IECs that have been retained
14 by Manitoba Hydro?

15 MR. DANIEL PEACO: That's correct.

16 MS. HELGA VAN IDERSTINE: Or, sorry,
17 not Manitoba Hydro. Excuse me. I've been corrected
18 immediately here.

19 MR. DANIEL PEACO: You slipped that one
20 by me.

21 MS. HELGA VAN IDERSTINE: Retained by
22 the PUB.

23 MR. DANIEL PEACO: Yes.

24 MS. HELGA VAN IDERSTINE: And you would
25 know that Knight Piesold is a consulting company

1 providing engineering services in the power industry?

2 MR. DANIEL PEACO: That's my
3 understanding, yes.

4 MS. HELGA VAN IDERSTINE: And so if I
5 understood your report correctly, you have deferred to
6 Knight Piesold for their expertise in the analysis of
7 the construction and -- of Keeyask and Conawapa.

8 Is that right?

9 MR. DANIEL PEACO: That's -- that's
10 correct.

11 MS. HELGA VAN IDERSTINE: And likewise
12 -- and I -- it appears that you were also deferring to
13 them with respect to the construction or the analysis
14 with respect to thermal generation as well?

15 MR. DANIEL PEACO: Yes, and the
16 engineering and cost estimates for those facilities
17 would be -- would have been in Knight Piesold's scope
18 of work, and -- and not ours.

19 MS. HELGA VAN IDERSTINE: And with
20 respect to the transmission reliability, you were
21 referring to -- you -- you had deferred to Power
22 Engineers, another IEC retained by the PUB?

23 MR. DANIEL PEACO: That's correct.

24 MS. HELGA VAN IDERSTINE: And with
25 respect to the forecasting, were you also deferring to

1 Potomac, one of the other IECs that was referred -- was
2 retained by the PUB?

3 MR. DANIEL PEACO: Yes, we did not do
4 any -- any specific review of the energy market
5 forecast. That was a Potomac scope of work, and we
6 conferred with them and relied on their analysis to --
7 to structure our analysis, but we did not look
8 specifically at -- at the power markets. That was in
9 their scope of work.

10 MS. HELGA VAN IDERSTINE: Now, looking
11 over at -- again, I'm sorry to take -- jump around a
12 little bit, but back on -- in Manitoba Hydro/LCA 001a
13 IR, where you described who the primary contributors --
14 were to the chapters?

15 MR. CHRISTIAN MONNIN: Ms. -- Ms. Vam -
16 - can you please put that up for the benefit of
17 everyone else, please?

18 MS. HELGA VAN IDERSTINE: Thank you.
19 You don't have that? Oh.

20

21 (BRIEF PAUSE)

22

23 MR. KURT SIMONSEN: Mr. Chair, I think
24 that's one of the IRs that may be in the scrubbing
25 phase with Manitoba Hydro, subject to check.

1 MS. HELGA VAN IDERSTINE: My apologies.
2 I -- I'd -- I'm -- I think I can say with absolute
3 confidence this is not one that they're going to be
4 suggesting has any CSI in it, so I -- I'm not concerned
5 that it's being referred to at the moment. I'm just
6 sorry that we don't have it for you.

7 MR. DANIEL PEACO: And it -- if it's
8 helpful, I've got a magic button. I can put it up.

9 MS. HELGA VAN IDERSTINE: Okay. That
10 would be fantastic.

11

12 (BRIEF PAUSE)

13

14 MR. DANIEL PEACO: I believe I do.
15 Here we go.

16 MS. PATTI RAMAGE: Oh, if I could just
17 interject? It's Patti Ramage in the back row. Just so
18 -- for the record, those were forwarded to the PUB last
19 Thursday, so they're all clear to go. They just
20 haven't been posted, I understand.

21 MR. KURT SIMONSEN: Thank you for that.

22 MS. HELGA VAN IDERSTINE: So just
23 looking down here, this -- the -- the question that was
24 asked of you was to identify the principle authors of
25 each appendix to your report, and the response is set

1 out in this table below.

2 Is that how I understand it?

3 MR. DANIEL PEACO: That's correct.

4 MS. HELGA VAN IDERSTINE: So if we look
5 at the ta -- the table with respect to contracts,
6 Appendix 7a, export contracts?

7 MR. DANIEL PEACO: Yes.

8 MS. HELGA VAN IDERSTINE: I see that
9 Mr. Alex Cochis was identified as one of the people
10 that was involved in that chapter?

11 MR. DANIEL PEACO: Correct.

12 MS. HELGA VAN IDERSTINE: And if I
13 understood his CV and your company's business model,
14 he's the only person in your company's employment, or
15 however you describe your association, that has legal
16 experience?

17 MR. DANIEL PEACO: That's correct.

18 MS. HELGA VAN IDERSTINE: But he does
19 not -- and he had input into that particular appendix?

20 MR. DANIEL PEACO: Yes.

21 MS. HELGA VAN IDERSTINE: But he -- if
22 I understood the way he's described in his CV, his main
23 area of expertise was on the regulatory side of matters
24 in -- in Massachusetts particularly?

25 MR. DANIEL PEACO: That's correct.

1 MS. HELGA VAN IDERSTINE: And he's not
2 a lice -- lawyer licenced in Manitoba?

3 MR. DANIEL PEACO: I'm sorry?

4 MS. HELGA VAN IDERSTINE: He's not a
5 lawyer who's licensed in Manitoba?

6 MR. DANIEL PEACO: He's not.

7 MS. HELGA VAN IDERSTINE: And not in
8 Minnesota or North Dakota?

9 MR. DANIEL PEACO: He is not, and it --
10 and we are not offering him as -- as an expert for our
11 -- our opinion and his work were not -- are not offered
12 as legal opinion.

13 MS. HELGA VAN IDERSTINE: And none of
14 the three (3) of you have any legal experience --

15 MR. DANIEL PEACO: I -- I am a -- I'm a
16 --

17 MS. HELGA VAN IDERSTINE: -- other than
18 testifying, I mean?

19 MR. DANIEL PEACO: I've spent way too
20 much time with lawyers, I think, but no. Fortunately,
21 no, I'm not one. No offence.

22 MS. HELGA VAN IDERSTINE: It's my life.
23 Now, in terms of providing the -- your report on the
24 environmental issues, and that would be in paragraphs -
25 - or chapter -- sorry, Appendixes 4 and 5?

1 MR. DANIEL PEACO: Yeah, mostly 4.

2 MS. HELGA VAN IDERSTINE: And those --
3 the people identified there, Carrie Gilbert, Dan
4 Koehler, Mary Neal, yourself, and then in par -- 5, Mr.
5 Smith, as well, those would be the people that were
6 involved in those -- preparing those chapters?

7 MR. DANIEL PEACO: That's correct.

8 MS. HELGA VAN IDERSTINE: And as you've
9 used the word 'primarily', was there -- do you know
10 whether there was -- was there anyone else that was
11 involved in those chapters?

12 MR. DANIEL PEACO: There may have been.
13 I mean, we -- you know, Mar -- you could probably put
14 Mary Neal's name on all of these. I mean, she was --
15 she was the quarterback for all of the projects. We
16 have other people that were, you know, conferred with.
17 You know, for example, Mr. Hahn played a role on our
18 team where somebody would say, Well, what do you think
19 about this, you know? So I would probably say that he
20 had some input to all of these things, as well, but
21 they didn't -- they didn't rise to the level of being
22 primary contributors to the report.

23 MS. HELGA VAN IDERSTINE: These would
24 the -- be the people who's had the -- had the expertise
25 you thought was necessarily (sic) to -- to compile and

1 put together those chapters.

2 Other people may have contributed a
3 small amount to reviewing it?

4 MR. DANIEL PEACO: That's correct.

5 MS. HELGA VAN IDERSTINE: Okay. So my
6 understanding of Ms. Gilbert's expertise is that she
7 works primarily in the area of financial modelling?

8 MR. DANIEL PEACO: No. I mean, she
9 does financial modelling, but she does a substantial
10 amount of our renewable energy work.

11 MS. HELGA VAN IDERSTINE: Okay. So
12 primarily with wind?

13 MR. DANIEL PEACO: No.

14 MS. HELGA VAN IDERSTINE: No? That's --

15 MR. DANIEL PEACO: No.

16 MS. HELGA VAN IDERSTINE: I was going
17 to say, let's take a look at her -- her CV on your --
18 on -- on how she's described here.

19 MR. DANIEL PEACO: Okay.

20 MR. CHRISTIAN MONNIN: Do you want to--

21 MS. HELGA VAN IDERSTINE: Do you have
22 that up?

23 MR. CHRISTIAN MONNIN: -- do you want
24 to share that with everyone else, Ms. Van Iderstine?

25 MS. HELGA VAN IDERSTINE: Do you have -

1 - it should be part of the CVs you provided under -- to
2 Manitoba Hydro, did you not?

3 MR. DANIEL PEACO: Do you have -- you
4 do not have that either? I can put that --

5 MS. HELGA VAN IDERSTINE: Sorry.
6 Exhibit 8.

7 MR. DANIEL PEACO: I could -- well,
8 they got it. I wasn't sure if that was...

9 MS. HELGA VAN IDERSTINE: Oh, sorry,
10 Caroline (phonetic) Gilbert. Okay.

11 MR. CHRISTIAN MONNIN: That's not part
12 of the exhibit, Ms. Van Iderstine.

13 MS. HELGA VAN IDERSTINE: All right.
14 I'll -- I'll leave that for now then. Mr. Smith, he
15 also was involved in preparing that exhibit -- or,
16 Appendix 5?

17 MR. DANIEL PEACO: Yes.

18 MS. HELGA VAN IDERSTINE: And his
19 expertise is -- well, he's described as a senior
20 analyst?

21 MR. DANIEL PEACO: Senior consultant.

22 MS. HELGA VAN IDERSTINE: Senior
23 consultant, and with experience in accounting,
24 database, and software development, quality assurance,
25 and project management?

1 MR. CHRISTIAN MONNIN: Again, are you
2 going to share that with the rest of us, or are you
3 just going to read from your script?

4 MS. HELGA VAN IDERSTINE: Well, I'm
5 reading from -- actually, from the -- from the La Capra
6 website, so I'm sorry, but --

7 MR. CHRISTIAN MONNIN: You're relying
8 on it, and I would ask you that you share it with the
9 balance of the room, please.

10 MS. HELGA VAN IDERSTINE: I'm -- It was
11 part of an LCA -- Manitoba/LCA 0001b response. I'm
12 surpri -- I'm sorry -- sorry that you didn't -- that
13 wasn't available to the panel.

14 MR. DANIEL PEACO: I -- I put that up
15 on the...

16 MR. KURT SIMONSEN: We've got it.

17 MR. DANIEL PEACO: Oh, you've got it.

18 MS. HELGA VAN IDERSTINE: So just
19 accurately describe Mr. Smith's background.

20 MR. DANIEL PEACO: I'm sorry, could you
21 say that again?

22 MS. HELGA VAN IDERSTINE: Let's find
23 it. That he was a -- a consultant to various
24 industries with a background in analysis, finance,
25 accounting, database and software development, quality

1 assurance, and project management. That's from the
2 first paragraph of his CV.

3 MR. DANIEL PEACO: CV as filed?

4 MS. HELGA VAN IDERSTINE: Or as -- from
5 your -- yes, it would more -- be more your summary that
6 you -- as provided us, the beginning of the CV.

7 MR. DANIEL PEACO: It -- it sounds
8 right. I don't -- I don't have his CV committed to
9 memory, but I'll take your representation.

10 MS. HELGA VAN IDERSTINE: Sixty-four
11 (64) of sixty-seven (67), sorry.

12

13 (BRIEF PAUSE)

14

15 MS. HELGA VAN IDERSTINE: There you go.
16 Sorry about that. I -- I should -- I should have been
17 more clear. So it was the second paragraph there about
18 halfway through the page. I was just reading off that.
19 The first paragraph -- in the first paragraph there.

20 MR. DANIEL PEACO: The end of the first
21 paragraph? Are you reading the --

22 MS. HELGA VAN IDERSTINE: Solid
23 background analysis, finance and accounting --

24 MR. DANIEL PEACO: Yeah.

25 MS. HELGA VAN IDERSTINE: -- database

1 and software development --

2 MR. DANIEL PEACO: Yeah.

3 MS. HELGA VAN IDERSTINE: -- quality
4 assurance, and project management.

5 MR. DANIEL PEACO: Yes, I'm with you.

6 MS. HELGA VAN IDERSTINE: So that's how
7 he would describe himself?

8 MR. DANIEL PEACO: Yes.

9 MS. HELGA VAN IDERSTINE: Now, none of
10 those people that I've identified have described
11 themselves as having any expertise in hydrology
12 meteorology?

13 MR. DANIEL PEACO: Probably not.
14 You're right.

15 MS. HELGA VAN IDERSTINE: They're not
16 experts in fluvial geomorphology?

17 MR. DANIEL PEACO: No.

18 MS. HELGA VAN IDERSTINE: None of them
19 would be scientists doing research or experiments in
20 the area of clim -- climate change?

21 MR. DANIEL PEACO: That's correct.

22 MS. HELGA VAN IDERSTINE: They're not
23 doing research into the watershed in which -- from
24 which Manitoba Hydro draws its power?

25 MR. DANIEL PEACO: That's correct.

1 MS. HELGA VAN IDERSTINE: They're not
2 doing research into the distinctions or impacts of
3 hydrological or meteorological risk?

4 MR. DANIEL PEACO: Right.

5 MS. HELGA VAN IDERSTINE: They're not
6 qualified in any proceedings as experts in hydrology?

7 MR. DANIEL PEACO: To my knowledge, no.

8 MS. HELGA VAN IDERSTINE: And they're
9 not publishing original research in the area of climate
10 change?

11 MR. DANIEL PEACO: No.

12 MS. HELGA VAN IDERSTINE: And they've
13 not been qualified as experts in the area of climate
14 change in any proceedings?

15 MR. DANIEL PEACO: Correct.

16 MS. HELGA VAN IDERSTINE: Thank you
17 very much for your time. I'm just going to have to
18 consult with Ms. Ramage as to how she wants to conclude
19 this portion, but if you can give me two (2) minutes,
20 we should be able to deal with that.

21 THE CHAIRPERSON: Do you want us to
22 stand down for a couple minutes?

23 MS. HELGA VAN IDERSTINE: Yeah, thank --

24 THE CHAIRPERSON: Okay, let's --

25 MS. HELGA VAN IDERSTINE: -- thank you.

1 That would be --

2 THE CHAIRPERSON: -- let's do that.

3 Let's do that. We can all refresh our coffee cup.

4

5 --- Upon recessing at 9:04 a.m.

6 --- Upon resuming at 9:11 a.m.

7

8 THE CHAIRPERSON: Ms. Vanerd -- Van
9 Iderstine, please?

10 MS. HELGA VAN IDERSTINE: Thank you
11 very...

12

13 (BRIEF PAUSE)

14

15 MS. HELGA VAN IDERSTINE: Thank you
16 very much. So I can advise the panel that we are
17 prepared to accept the expertise of this panel -- of
18 this -- of these witnesses in the areas requested, but
19 that we do have some concerns with respect to whether
20 they have -- with the amount of expertise that they
21 have with large hydroelectric projects in a
22 predominantly hydro system, and we do not accept that
23 they have any expertise with respect to climate change.

24

25 (BRIEF PAUSE)

1 MS. HELGA VAN IDERSTINE: I'm reminded
2 that I -- I should be saying that -- yeah, it's all, of
3 course, subject to weight that you might determine of
4 any of the evidence. Thank you.

5 THE CHAIRPERSON: Me. Coma -- Me.
6 Monnin, would you like to comment on this, please?

7 MR. CHRISTIAN MONNIN: Oui, M.
8 President. I'll -- I'll be very briefly. Certainly
9 with respect to the qualifications that My Friend is
10 seeking to attain with respect to large hydroelectric
11 projects, I think, with her cross-examination of Mr.
12 Peaco and the -- and the folks from La Capra, she
13 established that he has, at least on six (6) occasions,
14 provided expert evidence on the hydroelectric projects.

15 With respect to the climate change, I
16 don't think you'll get any quarrel from -- from La
17 Capra indicating that they're experts in climate
18 change. They are -- they relied on input from other
19 consultants, just as Hydro has done, for example, on
20 price forecasting to prepare their reports. And those
21 are my comments on that. Thank you very much.

22 THE CHAIRPERSON: Thank you. The panel
23 will sit -- will stand down for a few minutes just to--

24 MR. BYRON WILLIAMS: Mr. Chair?

25 THE CHAIRPERSON: I'm sorry? Mr.

1 Williams, please.

2 MR. BYRON WILLIAMS: With the panel's
3 indul -- indulgence, I'd just like to make a -- a
4 couple of comments. As we understood what the -- the
5 folks from La Capra were presenting, they're presenting
6 a skill set in power resource planning; in particular,
7 integrated resource planning. And we understood it is
8 within that context that they bring a skill set that
9 enables them to analyze different options, including
10 wind, gas, energy efficiency, small hydro, large hydro.

11 And certainly we heard in evidence this
12 morning, both from Mr. Athas, in terms of the work he's
13 done just as one (1) example, the Connecticut 2010 IRP,
14 looking at a very -- some relationship with the
15 Province of Quebec as part of their renewal plan; as
16 well as the very large sale that Mr. Peaco spoke of,
17 the 900 megawatt sale.

18 So certainly from our client's
19 perspective, it's -- we're not seeking expertise in
20 particular with large-scale hydro. It is within a good
21 planning process and the ability to analyze these
22 different supply sources and these different demand
23 sources. So that's simply from our client's
24 perspective. And we think our -- the witnesses from La
25 Capra have amply de -- demonstrated that expertise.

1 THE CHAIRPERSON: With that, the panel
2 will stand down for a few minutes to consider these
3 issues. Thank you.

4

5 --- Upon recessing at 9:15 a.m.

6 --- Upon resuming at 9:23 a.m.

7

8 THE CHAIRPERSON: I believe that we're
9 ready to resume the proceedings. The panel has
10 deliberate -- deliberated and has come to the following
11 conclusion.

12 It is prepared to accept the -- both the
13 -- both Messrs. -- Messrs. Peaco and Athas as expert
14 witnesses in the following areas: number 1) power
15 resource planning and economic evaluation; number 2)
16 business case and risk assessment; number 3)
17 transmission economics; number 4) review of export
18 contracts; number 5) financial modelling; and number 6)
19 the examination of wind and the integration of
20 wind/gas/hydro into a generation mix.

21 The comments in respect of the expertise
22 of these witnesses in the areas of large hydro projects
23 and climate change have been noted, and the Board will
24 attribute the weight to those areas that it judges
25 appropriate under the circumstances.

1 So with that, I'll turn the microphone
2 over to you, Mr. -- Me. Monnin.

3

4 EXAMINATION-IN-CHIEF BY MR. CHRISTIAN MONNIN:

5 MR. CHRISTIAN MONNIN: Merci beaucoup,
6 M. President, members of the panel. Thank you very
7 much for your thoughtful deliber -- deliberation. I
8 now will give the microphone over to Mr. Dan Peaco, who
9 will carry the bucket, as we say, for the presentation.

10

11 (BRIEF PAUSE)

12

13 MR. DANIEL PEACO: Try that again.
14 Good morning. First, I'd like to offer our condolences
15 to those of you who are mourning the loss of -- of a
16 colleague and a friend, and we appreciate the -- the
17 sombre moment that most -- many of you are engaging in
18 today and wish -- wish you our condolences.

19 With respect to -- yes, let me put up...
20 We have prepared a presentation to provide our direct
21 evidence, and we'll start -- and my understanding is
22 that we will go to -- till about ten o'clock. And so I
23 will proceed, and just let me know when you -- when you
24 need to break. And I'm also happy to entertain
25 questions you have as we go along, if we have to do

1 that.

2 What I'm prepared to talk about in our
3 direct presentation today is to first review our scope
4 of work, as I'm sure you know there's a lot of piece
5 parts to that, and I want to kind of tie that a little
6 bit together so -- so we have an understanding of what
7 we have done and -- and how that ties together in our -
8 - in our -- our -- the materials we provided.

9 I will also -- I will then talk about
10 the over -- overview of the economics of the Preferred
11 Development Plan as we understand it today. And we --
12 as you know, there have been many changes in -- in the
13 -- in the case, including very recently. And we -- we
14 feel like our presentation needs to be ground in -- in
15 that current reality, so we'll talk a little bit about
16 that.

17 We will then go through our assessment
18 of alternative development plans, and review there.
19 We'll then talk about the risk assessment and
20 uncertainty analysis that we've done about those --
21 around those plans, and -- and then conclude with a
22 discussion about the past -- pathways and decision
23 framework that -- that's sort of central to the
24 decision making that you -- you have before you in this
25 case.

1 So moving to the scope of work. As
2 we've -- as we've heard in the -- in the qualification
3 discussion here this morning, La Capra Associates is --
4 the scope of work is categorized into six (6) areas,
5 and I won't -- I won't belabour them any more here now.
6 I think we've talked sufficiently about what those are.
7 But -- but -- and I -- I'll go through a little bit on
8 each one of these as to -- in terms of what we have
9 done.

10 The -- our work really has been in three
11 (3) phases. The initial filing, we submitted a set of
12 reports: a main report and, at that time, nine (9)
13 technical appendices. It was based on information that
14 we had from Manitoba Hydro and other sources through
15 late December. And for a number of reasons, the -- the
16 record was -- was not complete, in terms of information
17 that -- that had been solicited. And so we -- we
18 continued to work as information came in and -- and
19 prepared supplemental filings in late February.

20 We -- since we filed our supplemental
21 filing, there has been additional information,
22 including some pretty substantial information that has
23 come forward from Manitoba Hydro in -- in the course of
24 the hearings up till now. And we -- we were asked to
25 look at that additional new information. And so we

1 have spent time working on that to supplement that.

2 So we have also issued, within the last
3 week, an addendum analysis. We have incorporated many
4 of the -- the results of the change in capital cost
5 into the economic analyses figures that were included
6 in our Appendix 9.

7 So -- so we have -- I think of it in
8 terms of we've done work in three (3) phases, and we've
9 produced materials that reflect the information that's
10 -- that's come forward in the case in each of those
11 phases.

12 So the evidence that we filed in our --
13 I would say in -- in the context of the first two (2)
14 phases, the initial main report was a synopsis of our
15 findings in that first round. And we filed technical
16 appendices in -- in the areas of resource planning,
17 generation alternatives, alternative resource plans --
18 and, by the way, I'm going to be tracking slide numbers
19 here hopefully for the record; I'm on slide 6 of our
20 presentation -- environmental issues and policy,
21 hydrologic risk, export markets, export contracts,
22 transmission economics, economic analysis, financial
23 analysis.

24 Basically, we took our scope of work and
25 -- and organized it into these ten (10) areas of work

1 and -- and prepared reports on each one. Much of our
2 scope -- or a -- a component of our scope of work in
3 each of these areas was what I would call foundational
4 information. We would prepare our information in terms
5 of background, context, explanation in terms of the
6 issues, and some of it was clear -- was clearly
7 investigative in nature.

8 The -- a lot of the -- the culmination
9 of the -- the work in those proceedings in terms of the
10 -- the economic analysis shows -- shows up in the
11 economic analysis table of Appendix number 9. Many of
12 the other pieces provide inputs that -- that culminate
13 in that analysis.

14 In the supplemental main report, we
15 provided -- actually, in -- in the -- in the
16 supplemental round, we provided a -- a supplemental
17 main report, and then it shows four (4) sort of part
18 'B's to -- to part -- to reports we'd previously filed:
19 the Alternative Resource Plans, the Export Contracts,
20 the Economic Analysis, and the Financial Analysis. We
21 also, at that time, filed our hyl -- hydrologic risk
22 report.

23 Each of those reports contain work that
24 we're -- that -- that derived from two (2) substantial
25 pieces of new information that we got from Hydro in the

1 intervening time. Part of that was the additional
2 alternative resource development cases that we had
3 requested that Hydro run, and they prepared that and
4 provide -- provided the results and the -- and the
5 details for those alternative cases.

6 The additional -- the other piece of
7 information is for the fifteen (15) cases that they had
8 run. They had produced detailed hydrologic-specific
9 output of their SPLASH model and other things, which
10 allowed us to look at some of the -- some of the issues
11 in detail that we were -- weren't able to do prior to
12 having that information.

13 So thematically, I think those
14 supplemental reports built off of the prior work,
15 taking advantage of that new information. And -- and
16 that's the -- the -- sort of the distinction in that --
17 in the -- in between those two (2) phases.

18 We also, in conjunction with --
19 particularly with our initial filing, part of our
20 charge was to -- not only to prepare reports, but to
21 prepare analysis in a -- spreadsheet models to be made
22 available for others to be -- have access to it if --
23 if and as needed, and we've done that.

24 So and -- and along with our initial
25 main report, and -- and as we've supplemented that,

1 we've also provided electronic copies of our economic
2 and financial models that we -- we've developed to do
3 the work that we have done and we'll talk about today.

4 And so the entirety of that -- that --
5 the work papers that are associated with that work were
6 also provided. So -- and I believe I -- I heard the --
7 the groaning of the data system here as we -- as we
8 dump that much information into the record, but there
9 was a lot of material to produce, and we -- we provided
10 that. So I wanted to make sure that we had some sense
11 of the -- of the context of -- of all that material
12 that we have provided.

13 So the key findings that we had as a
14 result of our work on these, what I call phase 1 and
15 phase 2, is first we concluded that the economic case
16 for the Preferred Development Plan that -- that
17 Manitoba Hydro put -- put forward was very marginal,
18 and it incorp -- required a very long-term perspective.

19 As we developed in those reports, the
20 economics analysis was done over a seventy-eight (78)
21 year period, and that in looking into the analysis and
22 looking at the alternatives, you -- it -- it really --
23 it really is structured around the notion that you have
24 -- that -- that it becomes economic if you look at that
25 seventy-eight (78) year time horizon, but -- but not

1 shorter periods of time, and we developed some analysis
2 of that in our -- in our reports.

3 The -- the -- also, we looked at various
4 elements of their planning. We found that their
5 analysis on the year of need for dependable energy and
6 capacity was conservative, and was -- could be moved
7 several years as a result of some changes that could be
8 done.

9 I think subsequently we have seen, with
10 -- with the advent of DSM, that's -- it's exactly
11 what's happened in the case.

12 Manitoba Hydro's assumptions on -- on
13 certain key alternatives, we felt were -- were too
14 high, and I -- I would -- as an example, I would -- in
15 particular, I note, we believe that the costs and
16 performance assumptions they had for wind in the wind
17 case were excessively high, and we've -- we've offered
18 an alternative to that.

19 The -- we found -- we were asked to
20 review and consider broadly the alternatives to the --
21 to the plans, and whether they were sufficiently broad
22 in their consideration of the alternative development
23 plans, and we found that -- that their consideration
24 was -- was too limited, and -- and have suggested a
25 number of things that could be -- could have been or

1 could be explored to broaden that consideration.

2 Manitoba's choice of the seventy-eight
3 (78) year net present value metric as their decision
4 criteria, I've mentioned is -- is something that we --
5 A) we point out. We don't -- we don't necessarily take
6 issue that that's an important metric to look at it,
7 but it really was the only one (1) they presented.

8 And part of our scope of work was
9 specifically to ask to look at different timeta -- time
10 frames and different metrics, and we've developed those
11 in our scope of work, and we found that those other
12 metrics provide some additional insight and may -- may
13 offer you some information that -- that you can't glean
14 simply from looking at the seventy-eight (78) year NPV.

15 Manitoba's uncertainty analysis -- we
16 did a -- we did a different take on the certainty
17 analysis than they did. We found that the analysis
18 that they did, did not offer a -- a comparison of two
19 (2) plans across the set of assumptions they were
20 looking at, and so we -- we developed -- basically took
21 their -- their uncertainty analysis, and developed it
22 and used the information to do case-by-case
23 comparisons, looking at the -- the -- say, the All Gas
24 Plan and the Preferred Development Plan across the
25 spectrum of assumptions to see how they perform, and --

1 and presented our information in that way.

2 And so that's a -- we felt was an -- a
3 useful piece of information for the panel to have, and
4 we developed our -- our evidence, adapting the
5 methodology to that -- in that respect.

6 We felt -- we looked at the US -- the
7 transmission economics, and particularly the US
8 transmission line, and could not -- had not -- did not
9 find, and -- and we're really not quite to that point
10 yet, the -- the underlying basis for the need for the
11 US transmission line, so we felt like -- that there was
12 additional information that -- that should be brought
13 to bear to -- to support the -- the representations
14 that are made on that.

15 And we pointed out at that time that we
16 felt that the -- the cost uncertainty for Conawapa was
17 -- was very limited in their analysis, and that it was
18 based in part on our -- our view of uncertainty on
19 other projects of that type, but also in -- in
20 consultation with Knight Piesold. And then, obviously,
21 subsequently, the -- the costs have changed and -- and
22 things have -- have turned around, so that -- that --
23 that piece of information will be -- is -- is clearly
24 updated from -- from where we -- where we were at that
25 time.

1 So that's -- that's kind of the -- the
2 synopsis of what we had filed in -- in our two (2) --
3 our -- our initial and supplemental reports. Since
4 that time, what I've called our phase 3 work, we --
5 we've prepared an addendum analysis. There are two (2)
6 key changes that we included in that.

7 Clearly, we had from the hearings,
8 Manitoba Hydro produced updated cost information on
9 Keeyask and Conawapa, including the new cost estimates
10 and a new representation of the -- the uncertainty
11 range that are used in their uncertainty analysis.

12 They also indicated that they were
13 offering -- or -- or proposing to include Level 2 DSM
14 in all of our planning analysis. The original analysis
15 that we did was all based on the old cost estimates,
16 and basically a reference level of DSM that was much
17 less aggressive than -- than that Level 2 option.

18 So what we did in our supplemental
19 analysis is we updated all of the economic analysis in
20 the -- it's embodied in our Appendix 9a and 9b, the
21 economic analysis appendix, so that all of the tables
22 in there for the cases have been updated, and not all
23 fifteen (15) were updated, but the cases that were
24 updated, we provided an addendum where the -- the
25 tables numbered in sequence with a -- with a designated

1 'U' after them for 'update' that reflects the changes
2 that -- to those that would -- those tables that would
3 encompass the -- the new capital cost and the new
4 probability assumptions that Hydro had offered.

5 At this point, we've done a very limited
6 review of the recently filed DSM cases. The
7 information on those cases have only come to us very
8 recently, and -- and at a time when we -- we basically
9 were at the point where we needed to focus on preparing
10 our presentation for today. So we have -- have yet to
11 look at that in any detail, and it's not reflected in
12 our -- in our addendum -- our March addendum.

13 For today, we feel that enough has
14 changed that our direct evidence here today should
15 focus on the new information to the extent possible.
16 What we've attempted to do is -- is to, you know, we --
17 we will -- I'm -- I'm not planning to sort of walk
18 through our initial supplemental reports in -- in
19 detail, but glean from those things that we have
20 learned and reflect upon how that informs the
21 information that we have before us today, including --
22 including the updated information that we've had some
23 opportunity to look at.

24 So to the extent possible, I will try to
25 prepare -- offer my remarks today that -- that is as

1 much as we can, at this point, grounded in what the
2 current state of the case is, as opposed to what it was
3 in January, or at the end -- end of February.

4 So the -- the next section of the -- of
5 -- of my presentation, I -- what I intend to do is
6 basically review with you what I understand -- or what
7 we understand at La Capra as -- as the changes in the -
8 - in the case from the time it was initially filed to
9 where we sit today with the case, so that -- so that
10 you can -- for the -- we can explain what we understand
11 about the change in the case, and how it affects our --
12 our recommendations and -- and our observations to you,
13 and -- and ground the -- the assessments of -- of what
14 we're proposing today in the context of -- of that
15 understanding.

16 So first, what we've -- what we've --
17 this is sort of a synopsis of what we understand the --
18 the material changes in the case for the Preferred
19 Development Plan has -- has been since they filed the
20 NFAT submission about a year ago, and -- or last
21 summer. The Manitoba Hydro -- my understanding is they
22 continue to seek authorization with the Preferred
23 Development Plan, or at least certain key elements of
24 that.

25 They -- the case they have made hasn't

1 changed materially, obviously, as we've talked, even
2 since our reports were filed. We -- we don't yet have
3 a full update of the economics reflecting all the
4 information, and I mentioned the DSM in particular, but
5 there's other information on the details of the -- the
6 analysis that Hydro has done that we are either waiting
7 for or have in hand but have not yet been able to
8 process.

9 And -- and so -- so our -- our sense of
10 that is not full and complete, but we'll -- we'll
11 clearly point out what we have done, and point what --
12 what gaps there are in either -- what -- what we've
13 been able to do, or -- or what information would be
14 needed from Hydro to -- to follow through. So our --
15 our best understanding of that is -- is put forward
16 here.

17 So what I want to do is just step
18 through these changes one (1) at a time and talk about
19 how it affects the economics. And we'll start
20 basically from the presentation they made in the NFAT
21 submission, and talk about everything that we
22 understand has changed between now and -- between then
23 and now.

24 So this may look familiar to you, but
25 this is a -- this is a -- the -- the numbers in what I

1 would call reference case assumptions filed in the NFAT
2 app -- submission for the fifteen (15) plans that they
3 analyzed. And I've highlighted in green on slide 12
4 the -- the Preferred Development Plan, which is Plan
5 14, and the -- the benefit relative -- and these
6 numbers are all, as you -- as I'm sure you're aware,
7 are all compared to or differences from the Plan number
8 1, the All Gas Plan. So, by definition, All Gas is
9 zero, and everything else is relative to that, and the
10 reference case benefit for the Preferred Plan at that
11 point in time was nearly \$1.7 billion.

12 This -- this next slide, we show an
13 additional set of information. The first I would
14 mention that the blue bars are the exact same data as
15 on the prior slide, the -- the net benefits relative to
16 All Gas, and if you look at plant -- the Preferred
17 Development Plan, Plan 14, the -- the blue bar, the net
18 benefit is still 1.7 billion. What's shown in the red
19 bars is the present value of the capital expenditure in
20 each plan.

21 So you can see, and -- and as was-- as
22 was constructed by Manitoba Hydro in putting these
23 together in sequence, it goes -- it goes -- the number
24 -- numbering system for these plan goes from the lowest
25 capital investment plan to the highest, and what --

1 what we've simply done here is shown that the present
2 value of the capital investments over time in tho -- in
3 each of those plans is shown there.

4 And so, for example, you -- you can look
5 at the \$1.7 billion benefit relative to All Gas
6 associated with the incremental capital investment of -
7 - of present value \$6.2 billion in investment, and so
8 that's -- that's -- we just sort of put this together
9 in terms of putting the -- the incremental benefits
10 over All Gas relative to the incremental costs or
11 incremental investments in those plans.

12 And as you can see, that -- that varies
13 quite a bit if you compare. For example, Plan 4, the
14 incremental benefits are -- are somewhat less than --
15 than the Preferred Development Plan, but the -- the
16 benefits in proportion to the -- to the investment is -
17 - is clearly much different.

18 The third perspective, and one that --
19 that -- and this is actually a slide from Manitoba
20 Hydro's presentation. The third per -- perspective
21 obviously is the impact from the provincial view. Much
22 of the economic analysis that Manitoba Hydro prepared
23 is -- is from the -- from the perspective on the impact
24 on Manitoba Hydro.

25 Two (2) cost items from that accounting

1 perspective are -- are payments made to the province,
2 so clearly the -- the province has -- is a beneficiary
3 to the extent that they're receiving the water rental
4 and capital tax revenues, and they're receiving the --
5 the fees on the -- on the debt guarantee that -- that
6 go along with the -- with the plan.

7 And so you can see that, again, in this
8 -- in this bar, again, I've highlighted Plan 14 in
9 green, which is now down to the bottom of slide 14.
10 The -- the \$1.7 billion in benefit to Hydro is -- is in
11 there, and then added to that are the -- are the
12 estimates of the benefits for water rental and capital
13 tax. So the -- the benefits from -- from the
14 provincial perspective are much more than the -- as
15 Hydro has analyzed the reference case, is much more
16 than -- than the view from Manitoba Hydro's
17 perspective.

18 So what have we learned about what's
19 changed in -- in that since those initial numbers were
20 put together? One (1) thing we've learned, and we've -
21 - we -- we heard a lot about, and -- and we've -- we've
22 reviewed the materials that -- from the -- from the
23 hearings is the -- the discussion around seventy-eight
24 (78) year NPV, expected value, the -- the consideration
25 of prominent risk is the -- the position Manitoba Hydro

1 is taking is that the expected value basis -- the
2 expected value of the information from their
3 uncertainty analysis is what they advocate be used as
4 the decision criteria.

5 All of the information that we've just
6 gone through is not expected value results. It's their
7 reference case results, and so one of the things that
8 we've -- we'll be focussing on is looking at -- making
9 sure that we're looking at the information from the
10 view of -- at least in looking at their information
11 from the view of, What does their expected value
12 results look like relative to their reference case
13 results?

14 The second thing that we learned is that
15 their new -- new cost estimates -- estimates for
16 Keeyask, Conawapa, and -- and the US transmission, and
17 in the case of Keeyask and Conawapa, those changes
18 obviously are -- are material and have a -- a
19 noticeable effect on the economic analysis that have
20 been done up to that point.

21 The Company has also indicated that the
22 Conawapa facility -- or in-service date as planned will
23 -- is deferred a year. It has a lower load forecast
24 than was used in that initial analysis from their 2013
25 update. It has indicated in -- in hearings -- in the

1 hearings this -- this past month that -- that they will
2 -- they are now prepared to move to Level 2 DSM, and --
3 and include that in their analysis as their baseline
4 assumption, and that's a material change from the prior
5 analysis.

6 They learned fairly early on, but since
7 the NFAT filing, that -- that Wisconsin Public Service
8 was no longer prepared to invest in the US transmission
9 line, so that effectively increased the cost -- the
10 planning cost for the US transmission line, and
11 transferring cost to Manitoba Hydro in those cases, and
12 that -- where that transmission line is involved, and
13 they have very recently struck new contracts with
14 Wisconsin Public Service.

15 There's a -- in addition, there's a set
16 of updated 2013 assumptions on discount rates, energy
17 prices, and so forth that have been featured in some
18 analysis -- was -- was actually featured in -- in the
19 initial NFAT submission in reference case form, but
20 those updates are available and not yet fully embodied
21 in full, I would say, the -- the probabilistic
22 uncertainty analysis that -- that they've done with --
23 based on 2012 assumptions.

24 So there's -- there's quite a number of
25 things that have changed in the -- in the case that

1 have a bearing on the economics of the Preferred
2 Development Plan. So we -- we prepared this chart to
3 break down Manitoba Hydro's reference case.

4 As we see, it's changed from -- from
5 initial submission to today. The beginning number here
6 is the same, \$1.7 billion, that I -- I referred to
7 earlier. The final number of 45 million is the number
8 that's in the record from Manitoba Hydro's testimony,
9 and what we've gone through is kind of look at the
10 individual components of things that have changed and
11 how that sort of leads to that new number.

12 So again, on reference case analysis,
13 the first thing is that if you move to their more
14 current reference case energy market prices forecast,
15 and -- and the new contracts, and -- and include that
16 in there, that increases the reference case analysis by
17 some \$531 million.

18 And -- and I guess, for the record, I'll
19 -- I'll try to be a bit better at this, but slide 16
20 for -- for the purposes of the transcript.

21 Moving -- moving Conawapa one (1) year
22 and looking at the -- some of the cases where they had
23 Conawapa in different years, to us, it looks like that
24 has very little effect on the overall economics, and so
25 we've put that at zero.

1 The decrease in load up to 2013, we've
2 est -- we've estimated that from other -- other work
3 that they've -- that has been done to be a -- a
4 reduction in the -- in the benefits in the -- in the
5 reference case of \$102 million.

6 The change in discount rate in their
7 reference case from what was five point o-five (5.05)
8 to now five point four (5.4) reduces the -- the number
9 by 663 million. The -- the added cost to Manitoba
10 Hydro with -- with Wisconsin Public Service not picking
11 up a portion of the transmission line costs was 217
12 million, and these are all expressed in net present
13 value terms.

14 And then the capital cost update for
15 Keeyask and Conawapa in particular reduces it by 871
16 million, and by introducing a Level 1 DSM, it -- it
17 reduces it another 329 million. So those are the
18 components that get you from what was 1.7 billion in
19 benefits over All Gas to 45 million.

20 From the provincial view, we did the
21 same analysis. The sa -- the adjusters are the same.
22 It's just that the -- the levels are different because
23 of the -- the water rental, capital tax, and -- and
24 debt guarantees.

25 But this is show -- a similar number

1 that the -- the total of three sixty-nine (369) --
2 3.697 billion in the original reference case,
3 provincial view analysis, is now -- is -- is lowered to
4 just under \$1.9 billion on their reference case
5 analysis.

6 And again, everything so far here is our
7 -- our understanding of the information that Manitoba
8 Hydro has put on the table as their case.

9 Now we want to shift from reference case
10 discussion to, Where does their expected value for the
11 Preferred Development Plan reside today? What -- so
12 what we've done -- what I'll show here going left and
13 right on slide 18 is to start with the same \$1.7
14 billion reference case analysis that was included in
15 the initial submission, move to the expected value
16 result from their uncertainty analysis.

17 So if you -- if you take the initial
18 submission and you look at the -- the twenty-seven (27)
19 branches of the decision tree, and you take the -- the
20 probability of weighted composite of that, the expected
21 value of all of those cases is -- is one point one
22 (1.1) -- or -- or one billion, one fifty-five
23 (1,155,000,000). So that -- that takes a -- a
24 substantial reduction.

25 So the reference case assumptions lead

1 to a somewhat higher statement of the value of the
2 Preferred Development Plan than -- than does their
3 expected value analysis. So we made that -- first made
4 that adjustment. So everything from here on is --
5 results from the uncertainty analysis on an expected
6 value basis. So we've made similar kinds of
7 adjustments.

8 On the power prices and -- and
9 contracts, they've increased their reference price,
10 energy price forecast, but we don -- they have not yet
11 put into the record anything new in terms of a new
12 range and probability distributions around the energy
13 price forecasts.

14 And so it's our understanding the
15 reference point may have moved, but we don't yet have
16 any -- anything from Manitoba Hydro that alters the
17 probability assignments or the -- or the ultimate
18 ranges, and so we've included that as -- as a zero
19 here.

20 Similarly with the Conawapa deferral, it
21 has -- has little effect on the economics, as it did in
22 the reference case analysis. The decrease in load has
23 a very similar effect, because it goes -- goes across
24 all the cases, so that reduces it by 102 million.

25 The change in discount rate, similar to

1 the power prices, we do not have a new probability
2 distribution ranges of high and low to consider, so we
3 -- we assumed that the -- the change in reference case
4 doesn't necessarily -- doesn't lead them, or hasn't led
5 them, to offer a new distribution on -- on discount
6 rate probabilities for their analysis, so we show that
7 as no change.

8 The -- the lot -- the same adjustment
9 for the Wisconsin transmission line is there, minus two
10 seventeen (217), and the capital cost changes across
11 the Preferred Development Plan reduces the expected
12 value by 818 million, and then the Level 2 DSM
13 adjustment of three twenty-nine (329) takes the
14 expected value result based upon their numbers as we
15 understand it today to minus three eleven (311), which
16 means it's three (3) -- \$311 million less attractive
17 than the All Gas case with DSM, so that when you
18 compare All Gas with -- with their Level 2 DSM to the
19 Preferred Development Plan today, with all of the
20 updated assumptions with Level 2 DSM, the All Gas Plan
21 is better than the Preferred Development Plan by \$311
22 million.

23 And from the provincial perspective,
24 we've done the same analysis, the same shifting effect
25 by and large, and the -- the original nearly \$3.7

1 billion benefit is -- is, you know, on an expected
2 value basis today, is about \$1.5 billion.

3 So what we've learned about Manitoba
4 Hydro's Preferred Development Plan economics is the
5 reference case assumptions, the plan is virtually the
6 same as All Gas, virtually -- you know, going from 1.7
7 billion to 45 million in benefit takes virtually all of
8 the -- the advantage over All Gas off the table.

9 The expected value basis clearly moves
10 it to be -- to 300 million less than -- actually the --
11 I should say there's a -- there's a typo in the -- in
12 the one (1) line. It says, "Approximately 500
13 million." There should be approximately 311 million
14 less than the -- than the All Gas plan, so on an
15 expected value basis, there's -- there's -- it's a
16 slight negative relative to All Gas.

17 So essentially what's happened -- what -
18 - these changes have -- have moved the Preferred
19 Development Plan to a distinct advantage over All Gas
20 to -- basically on parity with -- with some -- some
21 discussion that we'll go into in terms of the
22 uncertainty analysis.

23 From the Province of Manitoba
24 perspective, still positive be -- largely because of
25 the water rental and capital tax benefits, but the --

1 but the underlying economics of the -- of the program
2 are -- are basically, as -- as in the case of the
3 Manitoba Hydro perspective, are -- are basically a wash
4 on the All Gas.

5 So in the -- as -- as a start to our
6 presentation, we will -- we will talk about everything
7 else we're going to talk about today in the context of
8 where we are today with the Preferred Plan, as opposed
9 to where it started.

10 And I believe that may be a place to
11 stop.

12 THE CHAIRPERSON: It's probably the
13 perfect time to -- to recess now, and we will resume
14 the proceedings at one o'clock this afternoon. Any
15 parting words before we...? If not, then we'll --

16 MR. BYRON WILLIAMS: Mr. Chair, sorry.

17 THE CHAIRPERSON: I'm sorry. Mr.
18 Williams...?

19 MR. BYRON WILLIAMS: There was
20 reference to a -- a March update to the La Capra work
21 that was referenced this morning, and I do not believe
22 that the Intervenors have received that -- that
23 information, which puts us at a bit of a disadvantage,
24 so it would be helpful to get an update on when we
25 might receive it and if we can expect to receive that

1 today.

2 MS. PATTI RAMAGE: Perhaps I can jump
3 in here. I believe that was received over the weekend,
4 Mr. Williams, by Manitoba Hydro. It's in the redaction
5 process right now, and we will try to get that out as
6 quickly as possible.

7 MR. ANTOINE HACAULT: This is Mr.
8 Hacault, on behalf of MIPUG, for the record. We
9 express the same concern, and I've prepared a line of
10 cross-examination based on the existing material.

11 It appears, based on this slide deck,
12 that there's been some analysis which is fairly
13 significant and fairly important, and it'd be pretty
14 challenging to try and guess what's in this addendum
15 and do a meaningful cross-examination, at least on that
16 part, which -- which appears to be pretty significant,
17 as significant as the changes were that we just went
18 through.

19 THE CHAIRPERSON: Thank you for those
20 comments. With that we will recess, and we'll see each
21 other again at one o'clock this afternoon. Thank you
22 very much.

23

24 --- Upon recessing at 9:59 a.m.

25 --- Upon resuming at 1:03 p.m.

1 THE CHAIRPERSON: Good afternoon. I
2 believe that we're ready to resume the proceedings.
3 Unless there's some administrative matter to attend to,
4 I will turn the microphone over back to Mr. Peaco,
5 please.

6

7 CONTINUED BY MR. CHRISTIAN MONNIN:

8 MR. DANIEL PEACO: Okay. Welcome back.
9 And we were -- we broke at the end of a section of our
10 presentation, and I -- I kind of stepped through that
11 to try to get to the -- to the break point by ten
12 o'clock. And if I -- I don't know if you have any
13 questions on that, but if -- if not, I'll proceed on to
14 the next section.

15

16 (BRIEF PAUSE)

17

18 MR. DANIEL PEACO: We -- before the
19 break, we reviewed our understanding of where Hydro's
20 case is on the Preferred Development Plan economics
21 relative to their All Gas alternative. And now I'd
22 like to sort of talk through a number of issues related
23 to alternative development plans.

24 One of the -- one of the central
25 elements of our scope of work was to look at the

1 alternatives considered and whether sufficient
2 alternatives were considered. And if -- if there were
3 alternative development plans that might be
4 economically competitive with the Preferred Development
5 Plan, that we should identify those and -- and bring
6 those forward for -- for consideration. And so that's
7 the essence of the section of this -- of the
8 presentation I'm intending to focus on now.

9 So now on slide 22 of our -- of our
10 presentation, and just to kind of give you an overview
11 of where we are. The -- clearly, from what we've just
12 -- what we talked about before the break, the -- the
13 Preferred Development Plan economics clearly has
14 changed considerably since we started this process. In
15 -- and, I guess, in combination with that through work
16 that we have done -- and -- and much of that
17 information is contained in our initial supplemental
18 reports.

19 We -- we have ident -- identified
20 several alternative development plans that are either,
21 in our view, different in economic look -- outlook or
22 one -- or than -- than was portrayed in the -- the
23 submission, or ones that weren't considered that we
24 think should be considered. So I'm going to walk
25 through each of those kind of one (1) at a time and

1 then -- and explain what was looked at and -- and how
2 we -- what we've prepared for information on those so
3 you can -- can see that to consider.

4 So I guess in -- in this section what I
5 wanted to do is a few things, and it's kind of listed
6 here. I'm going to talk a little bit first about
7 metrics. And we -- we mentioned this morning the
8 seventy-eight (78) year net present value. We have
9 prepared a number of other metrics, some of which were
10 specifically identified in our scope of work, IRR,
11 internal rate of return, and -- and interim metrics on
12 how plans perform.

13 So I'm going to explain the metrics that
14 we've developed and -- and what they are and how we're
15 going to use them. And then as we go through and talk
16 about these -- these plans, you'll see some of those in
17 the -- in some of the -- the figures that I'm going to
18 talk about.

19 The second thing we'll talk about is
20 I'll go through and I'll talk about the Natural Gas
21 Plan. The -- the Company's primary benchmark for
22 measuring the Preferred Development Plan and their
23 other alternatives was the All Gas Plan, and we've
24 looked at that and some variants of that. And I'm
25 going to explain what we looked at and what -- what we

1 think the issues are there as that alternative

2 Next, I'm going to go through a case
3 that Hydro did not feature in its submission, but one
4 that they -- that we requested, consistent with our
5 scope of work.

6 And they subsequ -- you know, after the
7 -- they -- they did an analysis for their SPLASH --
8 SPLASH model and economic runs, which we're calling the
9 LCA No Generation Plan, which was -- really ties to the
10 charge in our scope of work to look at plans that
11 deferred investment in generation as long as possible.
12 So we did a -- did that analysis, and I'll talk about
13 what we learned from that.

14 The third thing -- the third area we're
15 going to talk about is the wind alternative. Hydro did
16 include a -- a wind -- one of their development plans
17 was a wind-based case. I'm going to talk about that,
18 and some of our critique and -- and some of it, and
19 some of our analytical results based upon assumptions
20 that we've proposed.

21 The -- the next area I'm going to talk
22 about is -- is some added dimensions to plans featuring
23 hydro power, and this particularly looks at some defer
24 -- deferral cases, and some of those cases were
25 identified sort of in -- in the IR process, and some of

1 those are things that we were looking at. But I'll --
2 I'll talk a little bit about some of -- some
3 alternative configurations of the hydro power options.

4 And now, lastly, I'll make some comment
5 about the DSM plans. We looked at that some, although,
6 as I mentioned this morning, we have yet to really see
7 and be able to -- to process the -- the economic
8 modelling results that Hydro has done on their DSM
9 planning that they've produced very recently. But I
10 will -- but we do -- we will comment on that.

11 So moving to slide 23, the metrics for
12 alternative plans, we -- it -- it's our view that --
13 and -- and it's our experience that seventy (70) -- the
14 -- the net present value over -- over the life of the
15 investment asset clearly is an important metric, and
16 we've -- we -- we would routinely do that as a matter
17 of course anyway.

18 However, it's in and of itself doesn't
19 tell you what you want to know to understand exactly
20 the -- the entirety of the economics of -- of a plan,
21 particularly one that's -- that's as long-lived as
22 this.

23 A seventy-eight (78) year planning
24 horizon is -- there's a lot going on over seventy-eight
25 (78) years in those -- in those analyses, and so the

1 met -- some of the metrics we've proposed will sort of
2 shed some insight into that.

3 So one -- one reason to do that is that
4 the additional metrics we're talking about, this --
5 will -- will basically illustrate more of the
6 characteristics of each of the plans and how they
7 compare. You could have two (2) plans that come --
8 come to the same point at the end of seventy-eight (78)
9 years, but they get there in very different ways, and
10 they -- and different implications. So doing some of
11 the interim metrics help you kind of understand what
12 the road along the way looks like to -- to that end.

13 We also find that there are probably as
14 many different perspectives on making decisions as
15 there are people who make decisions, and that not
16 everybody looks at it through the same lens.

17 I know that there was some discussion
18 before about whether this kind of a decision is made on
19 an expected value basis or -- or risk-averse basis or
20 some other perspective, but what find is that folks
21 bring different perspectives to the table when they
22 make a decision, and having some of these -- some --
23 some better metrics and analysis of these cases helps
24 folks that are looking at it from different
25 perspectives get what they need to, to get comfortable

1 with -- with the decision that you're making.

2 And the third is, we feel like,
3 particularly with a planning study as long a duration
4 as this, it does give some insight into the extent to
5 which the results are relying on the -- the very long-
6 term forecast.

7 If you have a situation which -- which
8 we pointed out in our report, the Preferred Development
9 Plan has in -- in their reference case analysis, had a
10 lot of benefits, but the -- the benefits really only
11 accumulated in -- in the last ten (10) or fifteen (15)
12 years of the plan, you -- you -- you're saying, That
13 benefit really depends upon what you believe about
14 years '60 to '78.

15 And so -- so we thought it was important
16 that we understand that and be able to focus in on --
17 on the -- the -- sort of the -- the derivation of the
18 benefits and -- and how they get there, so that -- the
19 interim -- the interim metrics and some of the other
20 metrics that we'll talk about help provide some -- some
21 visibility to some of those issues.

22 So let me move on to the next slide, 24.
23 And I'll take a little bit of time to explain this
24 table, and this is kind of a -- we call it a baseball
25 card, or -- or maybe it's a hockey card, I don't know.

1 But -- but this kind of goes through the plans and so -
2 - shows on one page several of the metrics that we've
3 developed.

4 And I believe this -- if you see in the
5 bottom of this page, these are results from the -- from
6 the original analysis that we went through this
7 morning, the reference case 2012 assumptions. So these
8 are numbers from -- that -- that come back from the --
9 the original submission on the reference case analysis.

10 But the purpose of showing this slide is
11 to talk about the -- the metrics we use and explain
12 those. You'll see, for example, if you look to --
13 toward the bottom, the next to the last row is Plan 14,
14 the Preferred Development Plan. You see if you go to
15 the column that is -- the second column of numbers is
16 titled, "Seventy-eight (78) NPV." You'll find our \$1.7
17 billion, which we talked about this morning. So that's
18 -- that's the same -- these are the same set of numbers
19 we -- we started with this -- first thing this morning,
20 reference case analysis from the submission.

21 And so what we've done with that initial
22 analysis is populated in this table and looked at
23 different things. So you can see the second column
24 that I just referred to is exactly the same numbers for
25 each of the plans: reference case, seventy-eight (78)

1 year NPV that we've talked about. So that's the number
2 that Hydro has -- has used and presented in -- in a lot
3 of its analysis.

4 We -- the -- the first column is
5 actually data that was in one of our charts this
6 morning. And that's the -- the seventy-eight (78) year
7 present value of the total capital investment. And --
8 and so if you recall I had a chart this morning where
9 there was a darker blue bar and a lighter blue bar.
10 One was the benefits and one was the present value of
11 the investment. That's what those numbers are.

12 And then what we -- what we have going
13 from left to right, the fifty (50) year CPV, cum --
14 cumulative present value, is -- is -- and we have
15 actually those next three (3). There's a fifty (50), a
16 thirty-five (35), and a twenty (20). The fif -- those
17 numbers refer to number of years, so if we -- the --
18 the fifty (50) is years 1 to 50 of the study. It's the
19 -- the summation of the present value of the cost and
20 benefits up to that point in time.

21 So we're adding up from year 1 to 50 of
22 the study what -- what the present value of the -- of
23 the net cost or benefits to that point. And it
24 truncates at that point, but it -- it basically is a
25 marker that says up to that point where is -- where is

1 the tally on the -- the net present value that
2 ultimately, in year 78, gets you to the seventy-eight
3 (78) year number.

4 And so the -- the fifty (50), thirty-
5 five (35), and twenty (20) are just, you know, adding
6 up the present value over twenty (20) years, over
7 thirty-five (35) years, over fifty (50) years, and
8 ultimately over seventy-eight (78) years. So just kind
9 of -- you can see how the -- the plan is progressing
10 toward the -- the ultimate benefit that -- that shows
11 up in the seventy-eight (78) year number.

12 The column to the right of that is
13 labelled, "Seventy-eight (78) Year IRR," internal rate
14 of return. And so that basically is a metric that's --
15 looks at the -- the amount of benefit in -- in terms of
16 a -- of a return. So if you've got so much investment
17 in -- in a plan incremental to the -- the -- to the All
18 Gas Plan, and you get so much benefit, you can reduce
19 that to, what's the rate of return, sort of implicit in
20 that if you're comparing those two (2) cases.

21 And so these -- so these -- these
22 numbers sort of compute the metric. And you'll see
23 that be -- in the -- in the reference case analysis,
24 they did the Wind/Gas case was negative -- was the only
25 one that was negative benefit relative to All Gas. And

1 so that doesn't have an IRR. But all the others had
2 some positive benefit relative to -- relative to All
3 Gas, and so they have a positive IRR. But they -- they
4 vary by plan.

5 And then the -- the last number we call
6 the breakeven year relative to All Gas base case.
7 That's the year, as you're going through the cumulative
8 present value process, we just say, At what year does -
9 - does it cross and become zero? So at that point the
10 present value of the Gas Plan and the present value of
11 the -- of the alternative you're looking at are the
12 same. And then the benefits accrue after that.

13 So we were -- so if you look at the
14 Preferred Development Plan, the -- the present value of
15 the total capital invested is \$6.2 billion. The net
16 present value over seventy-eight (78) years in this
17 case is -- is \$1.7 billion. And then as you go from
18 twenty (20) -- and I'll kind of go backwards on the
19 chart. From twenty (20) to thirty-five (35) to fifty
20 (50) you can see after twenty (20) years the Preferred
21 Development Plan, the present value up to that point,
22 is -- is 3.8 billion less than the All Gas Plan.

23 By year 35, the -- the -- it's -- it's
24 behind the All Gas Plan by \$766 million. And then by
25 year 50 it's -- it's positive 714 million, and it

1 ultimately gets to a billion seven (1,700,000,000) in
2 this case. And the seventy-eight (78) year IRR for
3 that is 6.15 percent.

4 The breakeven year is year 2054. So
5 that's the year at which the plan actually get --
6 starts -- begins accumulating positive present value
7 relative to the Gas Plan. So there's a -- there's a
8 lot in there, but let me stop and see if you have any
9 questions before we move on.

10 MS. MARILYN KAPITANY: I -- I have a
11 question.

12 MR. DANIEL PEACO: Okay. We got a
13 couple of them, so I...

14 MS. MARILYN KAPITANY: Go ahead, Hugh.

15 DR. HUGH GRANT: Oh, no, I'm used to
16 this.

17 MS. MARILYN KAPITANY: He's really not,
18 you know. I apologize if you said this.

19 But the first column there is the
20 seventy-eight (78) year cumulative present value of
21 total capital?

22 MR. DANIEL PEACO: Yes.

23 MS. MARILYN KAPITANY: And then the
24 second one is the seventy-eight (78) year net present
25 value, but not cumulative?

1 MR. DANIEL PEACO: Well, the net
2 present value is sort of the final tally. That's the -
3 - the same number that Hydro has used. And they have,
4 I think, a residual value effect at the end of that,
5 which is included in there. Is that right, John?

6 MR. JOHN ATHAS: Yeah, the -- the first
7 column is isolating capital as one of the costs and
8 just talking about that particular cost. So it's --
9 because it's a capitalized investment, then it's be --
10 and so it could be -- it helps provide focus as to the
11 capital intensity of the plans.

12 And -- and by the order of the
13 numbering, Manitoba Hydro had -- had pointed that out
14 as a relevance for something to keep track of, as well.
15 The seventy-eight (78) year NPV is a cost-benefit
16 number at the end, cumulatively through seventy-eight
17 (78) years.

18 MR. DANIEL PEACO: But essent --
19 essentially what you could -- the way you could think
20 of it, these are all cumulative. The seventy-eight
21 (78) year number is actually an accumulation of the
22 same, so it's -- it's similar math. It's just that
23 when you're -- if you're saying, I'm -- I'm looking at
24 an investment that goes over the years, and you're
25 looking at something that's measuring only a portion of

1 the plan, then it's basically progress to date as
2 opposed to a final, you know, all-in analysis. That's
3 the only distinction we're drawing here.

4 And in the case of the cumulative
5 present value of the -- the -- in the -- in the first
6 column, that is accumulation across the entirety of the
7 plan, the seventy-eight (78) years.

8 DR. HUGH GRANT: So the -- the CPV
9 wouldn't include the residual value of the capital
10 stock?

11 MR. DANIEL PEACO: That's right.

12 DR. HUGH GRANT: Okay.

13 MR. DANIEL PEACO: Yeah.

14 DR. HUGH GRANT: And so essentially
15 then, both the breakeven column and the CPV columns are
16 really just saying that the Keeyask/Conawapa based
17 projects are more capital intensive, and so there's
18 large capital outlays initially. So you're not going -
19 - they're going to show up as negative CPV, but --
20 okay.

21 MR. DANIEL PEACO: That's right. And
22 so this kind of gives you -- you know, it's -- it's --
23 you know, you could think of a very simple payback
24 analysis kind of thing. It's a little bit different
25 than this, but it's the same kind of concept. It's

1 like if you're going to make an investment, you know,
2 over what period of time does it -- does it become
3 accretive.

4 And these things, we're trying to give -
5 - give some indicator of -- of what you're talking
6 about in terms of how this plan, you know, delivers
7 benefits relative to what you would see in benefits and
8 costs from the All Gas Plan or some other plan that you
9 might compare it to.

10 So it -- it's simply -- you know, it's
11 more information to kind of see how -- you know, what
12 happens along the way to get to the seventy-eight (78)
13 year number.

14 MS. MARILYN KAPITANY: So, Mr. Peaco,
15 is this one of the tables that you're going to be
16 redoing with the new information? Because it seems
17 pretty key in terms of being able to compare across a
18 number of different metrics.

19 MR. DANIEL PEACO: Yes. We have -- we
20 actually have one in -- in the slide deck later. And -
21 - and it's also in the package for the plans that we've
22 got updated information for.

23 MS. MARILYN KAPITANY: Great. Thank
24 you.

25 MR. DANIEL PEACO: Yeah. So -- well,

1 anyway, I wanted to make sure -- this slide here is --
2 the numbers are familiar because we've talked about
3 them before, but my -- my point in showing this here is
4 simply to sort of introduce the concept of what metrics
5 we use and what -- what they are, and so -- because I'm
6 going to be referring to these later. And it's
7 obviously more helpful if you understand what I'm
8 talking about when we get there than -- than not.

9 So these are the things that we've
10 developed in the metrics as we look at the plan.

11 THE CHAIRPERSON: I have one (1)
12 question related to --

13 MR. DANIEL PEACO: Sure.

14 THE CHAIRPERSON: -- number 3, the
15 Wind/Gas, which is kind of behaving strangely relative
16 to the other ones. It seems to be -- the current
17 present value seems to be jumping all over the place.

18 Could you explain that one?

19 MR. DANIEL PEACO: Yeah. But I think
20 we have a slide coming up that will actually be easier
21 to talk from, rather than sort of talking without --
22 without the -- some -- the graph in front of us.

23 So I'll move to slide 25. Some of the
24 limitations in their consideration of alternative plans
25 that we've identified kind of go to how it measures

1 against the economic benefits of the All Gas Plan.

2 So the first issue in item 2 here is:

3 Is Plan 1 the best configuration of gas generation?

4 Manitoba Hydro put together a -- what they call an All

5 Gas Plan as uses -- as a measure, and they -- they've

6 got a configuration there. But one of the things that

7 we spent some time looking at is -- is: All right, so

8 is that a fair point of comparison? Is that the -- is

9 it -- if -- if your mission was to do the best gas plan

10 you could do, is this it, or is there a better gas plan

11 to be used as a point of comparison?

12 So we've -- we've done some -- some work

13 along the lines of just testing to see whether we think

14 that there's a better gas plan to be had, and we -- are

15 we fairly testing it against the best you could do if

16 you decided gas was your -- gas was your resource?

17 The second issue that we explored were:

18 Are there other options to consider? And at the time,

19 DSM was not -- was -- was under study, but of the

20 fifteen (15) plans they all had a reference case level

21 of DSM. And there was no information in the -- in the

22 analysis that said, What happens if you have any more

23 or less DSM than what they had assumed? So that was

24 one of the options to consider.

25 Fuel switching was one we talked about

1 because -- because we looked at the -- in -- you could
2 see in the load forecast there was measurable growth in
3 peak demand, a substantial increase in penetration in -
4 - in electric space heat that was -- that was driving
5 some of that growth. And so we -- we felt like that
6 the plan that -- that would encourage more natural gas
7 space heat and less electric space heat would have the
8 effect of both reducing energy and -- and peak demand.

9 We also looked at imports. There was -
10 - there was nothing really in any of the fifteen (15)
11 plans that looked at increased imports. And one of the
12 things that we were asked specifically to look at in
13 our scope of work was, you know, what about if we rely
14 on more imports. So we looked at that.

15

16 The next issue we -- we looked at, Are -
17 - are there other non -- the other non-hydro plans the
18 best, or are the non-hydro plans the best. And so we -
19 - and -- and really the other non-hydro plan of
20 interest was the Wind/Gas Plan, the plan -- what was
21 Plan 3 on the -- on the chart. So we -- we've looked
22 at that, and we'll talk through what we -- what we
23 found about that in some detail in this presentation.

24 And the last issue was: Are there other
25 hydro-based plans that are better? And we've looked a

1 little bit at some of the alternative timing and
2 configuration plan -- analyses that Hydro has done, and
3 we've tried to extend that a little bit.

4 MS. MARILYN KAPITANY: So when you say,
5 "now," are other plans better now, do you mean in view
6 of the new information that you have?

7 MR. DANIEL PEACO: Well, we -- yes.
8 Yeah, and I think ultimately it -- it's our
9 understanding that your -- your -- I'm -- I'm presuming
10 that you're going to want to say, How do we factor all
11 that new information in and make a decision on
12 everything -- everything that we've learned and we know
13 now -- as of now? And we -- we don't have all that
14 tied together in a bow today, but we are at least going
15 to try to talk about where we think that landing point
16 is as best we can, because we realize you've got a
17 finite amount of time to make a decision.

18 So -- so we will talk about -- we will -
19 - we will show you what we have done and indicate where
20 it's out of date and the direction where it would go.
21 And -- and in some cases we've given -- we'll give you
22 some indicators of where we think the update would --
23 would leave you. So as best we can today with the
24 information we have, we'll try to do that.

25 So slide 26. We shift to talk about the

1 natural gas generation plans. The -- Hydro's Plan 1,
2 the All Gas Plan that they used as their -- as the --
3 as the point of comparison for the other -- other plans
4 and the charts we've seen today, we -- we examined that
5 in some detail. And we also looked at a new --
6 additional plan that Hydro ran at our request. And I -
7 - I think it both in -- in a combined response to a
8 request from us and from PUB staff to -- to look at an
9 alternative gas plan.

10 So they ran a plan that is 100 percent
11 combined cycle. In their All Gas Plan, they had a
12 mixture. They started with some combustion turbine
13 peaking unit gas plans, and -- and then over time mixed
14 in some combined cycle units, more efficient, you know,
15 gas -- gas fired generation. In the all combined cycle
16 case they added only the more efficient units and
17 didn't add any of the peakers.

18 And, so they -- basically they -- they
19 had a like amount of capacity to meet peak demand but
20 added more efficient generation. And it provided more
21 -- more energy at a -- at a lower cost into the plan.

22 The all combined cycle case was -- was
23 done by Hydro and provided to us. We -- we did not --
24 and this -- this is one of the -- one of the things
25 that was captured in our supplemental report, the

1 second -- the second set of reports. We didn't have
2 the -- the results from all of that together to be able
3 to get it into our initial filing, and so the -- some
4 of the results of that is featured in our supplemental
5 report.

6 The -- the combined cycle gas turbine
7 case basically adds three (3) additional combined cycle
8 units over the All Gas Plan to -- I think, for a total
9 of seven (7) units added over -- over the -- through --
10 between now and 2050 in the plan, and it -- it -- and
11 so there's -- that's -- that's kind of the -- the
12 difference in the plans.

13 The observations that we have from
14 looking at those two (2) plans in terms of the natural
15 gas is one -- first, the economic results from the All
16 -- the combined cycle case was very similar to the All
17 Gas case, and so they're -- they're not very different.
18 The combined cycle case actually was slightly less
19 economic overall on the -- on the -- the analysis, but
20 there -- it -- it was not very different.

21 The combined cycle plan actually showed
22 higher exports in low water conditions, so as you added
23 those and -- and some of that I'll have to talk about
24 in our CSI section, but -- but as you added those, you
25 -- you saw some of that being run for export, and --

1 and some of the reasons why that comes about has
2 interactions with -- with a hydro system. And -- and
3 we'll -- we'll have some -- I'll have a couple of
4 figures on that in the CSI portion of our -- of our
5 direct.

6 The results point to -- to us, point to
7 a third case that's somewhere in between. You know, I
8 think that -- well, we didn't have an opportunity to --
9 to sort of test that. We looked at each of the plans
10 to see how they were performing. We had some of the
11 detailed results to look at that to try to make some
12 inference as to whether we thought either of these
13 plans was sort of the best that you could do with gas.

14 And we -- we saw some -- some merits to
15 add -- added combined cycle, but I think going to --
16 going to adding all combined cycles probably added more
17 capital cost for less benefit, you know, and adding one
18 (1) or two (2) more might well be better than either of
19 the plans we looked at.

20 The combined cycle case also showed a
21 interaction with storage to increase the on-peak
22 exports, which is kind of related to the above, and --
23 and that's something that we'll talk more about.

24 The cases show -- these cases, to us,
25 also showed that the import limitations are a real

1 factor on the -- the economics of the plan, so to the
2 extent that they -- these gas plants are running simply
3 because there's an inability to import power that's
4 less expensive from -- from MISO, you know, that leads
5 to -- to more expense in the plan. So -- and we'll
6 talk a little bit about that.

7 And so I -- one (1) of the things that
8 we -- looking at this and other plans, take away is the
9 -- the All Gas Plan suffers from an import limitation
10 between -- and so the gas plants will run -- run more
11 than perhaps they would if you had expanded import
12 capability.

13 Moving to slide 27, we'll show a little
14 bit about some of the results. In this chart -- let me
15 explain the chart. There are two (2) pieces of data
16 here. The -- the chart is showing capacity factor for
17 the combined cycle unit in the two (2) gas plants, and
18 on the left is the -- is the new case, the all combined
19 cycle case, and on the right is the -- is the original
20 All Gas plan. So that's the one (1) that has a
21 combination of peakers and combined cycle. So I'm
22 looking at the capacity factors of the combined cycle
23 units in each of those plans.

24 And we looked at it -- one of the -- one
25 of the pieces of data that we received from Hydro in

1 the process was we asked them to, as you may know, when
2 they run their SPLASH model, they have ninety-nine (99)
3 different hydro water -- water conditions that they run
4 through there, and so that they average across all
5 kinds of water conditions to get an average output.

6 We asked them to break that apart so we
7 could see individual water condition year results
8 across the -- the ninety-nine (99) spe -- spectrum so
9 we could look at very dry year performance and very wet
10 year performance, and so the -- the red line is -- is
11 indicative over time of what combined cycle units'
12 capacity factor would look like during the various
13 driest years.

14 So if you think about, if you -- if we
15 took the driest year across each of those years and
16 said, What's the combined cycle doing when you're in
17 drought condition, basically? It's basically running
18 100 percent of the time in the All Gas case throughout
19 the -- throughout the -- the fifty (50) years on the --
20 or the forty (40) -- you know, from -- from '22 to '47
21 is the period we're looking at here.

22 This is the -- the extent of the SPLASH
23 output actually, is -- is -- SPLASH only runs through
24 2047. But in the case of the -- the combined cycle,
25 all combined cycle case, you can see that, when we get

1 out toward the -- toward the second half of this
2 timeline, the -- the drought year capacity factors of
3 the combined cycle begin to be less than 100 percent,
4 which says, even in a dry year, the combined cycle
5 units are -- are not all being fully utilized. Not
6 that they should be, but it's just an indication that
7 there's -- there's a difference in those plans, even in
8 the dry years.

9 When we look at the blue line, the blue
10 line is -- is sort of a -- on average hydro conditions.
11 So the -- if you think of the continuum from dry to
12 wet, this is the one -- the median case. This -- this
13 is what it was running on average. And you could that
14 in the combined cycle case where you're adding seven
15 (7), it's -- they're running at about 40 percent
16 capacity factor.

17 In the -- in the All Gas case, the
18 combined cycle units that are in that plan are running
19 more like 60 percent, so they're getting better
20 utilization in those plans, even in average year
21 conditions.

22 So this is just an -- one of the ways
23 for -- we opened this -- opened this up with this data
24 to kind of get a sense. We really wanted to know how
25 are these units operating across the different water

1 conditions in the -- in the system as you add them.

2 And so this is one of the things we looked at to do
3 that.

4 Going to the next slide, slide 28, this
5 is -- this is something that's indicative. It shows --
6 it -- it goes to a point that I made before about the
7 role of imports. And what we did here is we -- we
8 looked at the relationship between the combustion
9 turbine, the simple -- the peaking -- the peaking unit
10 operation in the All Gas Plan relative to imports.

11 And you can see that what happens is --
12 this is a data point across the -- the ninety-nine (99)
13 water years for a particular year. And you can see
14 that the combined cycle unit -- unit runs at some
15 minimal amount as imports increase from zero up to
16 4,000 gigawatt hours.

17 And then the gas -- after that, the --
18 the combustion turbine kicks in, as you can --
19 effectively, what's happening is -- is that the -- so
20 long as there's capacity for import in the transmission
21 system, the combustion turbines are more expensive than
22 importing power. And once -- once you reach the
23 transmission limit, then you're running the peakers.

24 And so that's -- that's showing what
25 you're doing. And so what we -- what we could see here

1 is -- is that -- is the debt -- debt relationship
2 indicated, that if you build more peakers in a system
3 that's import limited, you're going to find that you're
4 -- you're running more expensive units when, if you had
5 some added import capability, that would give you more
6 access to -- to market opportunities, potentially.

7 And so we were looking -- one of the
8 things we were looking at in this case is to see, you
9 know, the economics of import and export transmission
10 options as well.

11 DR. HUGH GRANT: Sorry. What's my
12 choice between a single cycle and a combined cycle? Is
13 it just one has a larger capital expense? Is that --

14 MR. DANIEL PEACO: Yeah. Yeah. So --
15 so there's more capital investment. You get -- you
16 know, a combined cycle is -- really has -- has a simple
17 cycle combustion turbine in it, and then it also has a
18 steam cycle. So you -- it's a -- it's a -- and -- and
19 the combined effect gives you a much lower -- a much
20 better efficiency overall for the energy you produce --

21 DR. HUGH GRANT: So that --

22 MR. DANIEL PEACO: -- but obviously
23 more capital expense.

24 DR. HUGH GRANT: So low -- but a lower
25 marginal cost, lower fuel --

1 MR. DANIEL PEACO: That's right.

2 DR. HUGH GRANT: -- fuel use.

3 MR. DANIEL PEACO: That's right.

4 DR. HUGH GRANT: And they both would
5 have a similar lifespan?

6 MR. DANIEL PEACO: Yeah, pretty much, I
7 think. Do you -- I don't know that they'd be any
8 different, do you, John?

9 MR. JOHN ATHAS: And there's a lot of
10 different combustion turbines. The lifespan is similar
11 when you start -- when you have similar combustion
12 turbines. Some combustion turbines made for peakers
13 have shorter lives.

14 DR. HUGH GRANT: And these are normally
15 twenty (20), twenty-five (25) years sort of length,
16 or...?

17 MR. JOHN ATHAS: I've seen a lot of
18 claims for thirty (30) to forty (40) years on -- on --
19 from the combust -- in the technology they're using
20 now.

21 THE CHAIRPERSON: Why would you -- you
22 may get into this later, but why would you -- why would
23 import electricity from the same generation source,
24 gas, be cheaper from the US than it would be from
25 Canada?

1 Is it just the effect of subsidies in
2 the US? Is that...?

3 MR. DANIEL PEACO: Well, it wouldn't
4 necessarily be import from the same generation source.
5 If you go to MISO's market, there are not many hours
6 where combustion turbines would be running. And I
7 guess more to the point with the -- with Hydro's
8 storage system, I think the importing wouldn't
9 necessarily be instantaneous.

10 You can import -- if you're in a dry
11 year condition, you can import off-peak and use that in
12 on-peak. And so the -- really, the use of the
13 combustion turbines in -- in Manitoba Hydro's system is
14 really, you know, more of an energy deficit, because
15 you can't get enough energy in to cover loads, so it
16 means you're going to have to run on top of that.

17 And so you -- you might find that you
18 can import more energy from MISO at something that's
19 much less than, you know -- maybe it's combined cycle
20 cost or maybe something less, but there's only so much
21 you can move into the system during the night. And so
22 if you're going to -- if that energy limitation means
23 that you have to run peakers to supplement that, then
24 that's what's going on here.

25 So it wouldn't necessarily be that MISO

1 is running peakers and you're running here instead. So
2 it's the -- without a tra -- and we'll see -- we may --
3 it may be clearer as we get into some of the charts.
4 But I think what's going on here is that there's --
5 just the inability to move power into the system means
6 that you -- you have to run peakers internally to do
7 that.

8

9 (BRIEF PAUSE)

10

11 MR. DANIEL PEACO: So on slide 29, we -
12 - I want to move to the -- to the next plan -- the next
13 set of plans. So this is the -- what we call the --
14 the no-generation case. So this is the second case,
15 additional analysis that -- that we requested from
16 Hydro and they -- they provided, which they ran a case
17 that met the -- the -- as I mentioned, in this scope of
18 work, that we are asked to consider options that --
19 that rely on imports and deferred investment in
20 generation in Manitoba for as long as possible.

21 And so what we -- what we did, we were
22 able to -- to have a case run. And so the case we
23 postulated to test this out was to increase DSM, for
24 one. And the DSM case -- assumption that was in that
25 case was 150 percent of -- of the reference case

1 assumptions. Now, just as a point of comparison, the
2 DSM Level 2 that Hydro has now talked about using is --
3 is four (4) times the reference case number. So the
4 amount of DSM that we have in this case is a lot less
5 than the Level 2 amounts that were talked about. And
6 so we'll talk about them more later.

7 But we also asked them to put in an
8 assumption of a -- of a fuel switching program to
9 mitigate electric space heating load growth to reduce
10 peak demand and -- and energy consumption by having
11 more of the space heat growth fed by -- by natural gas.

12 The third thing that we -- we put in the
13 plan was a expanded transmission for import. And part
14 of -- as we -- as I was saying, part of what we learned
15 from the Gas Plan was that there is -- there is a
16 limitation on imports in the -- in their modelling that
17 -- that would benefit from this.

18 So we wanted to test to see what would
19 happen if -- if you increased the import limits on
20 this. For purposes of this analysis, basically the --
21 the parameters of the 750 line to -- to Minnesota was --
22 -- was what was represented in this case. The -- and --
23 and the cost of that line was attributed -- was -- was
24 attributed a hundred percent to Manitoba Hydro in the
25 economics of this.

1 The -- the next thing we did is we asked
2 Hydro to relax the reliance on imports to 20 percent
3 from their current 10 percent planning criteria,
4 meaning they currently have a planning criteria where
5 they will not rely on imported energy for more than 10
6 percent of the dependable energy in their -- in that
7 calculation in their planning standards. And so we --
8 we wanted to -- to relax that to see if -- if, by
9 relaxing that, that that led to any better performance
10 in the -- in the plan or not.

11 And then associated with that there was
12 a capacity charge added to basically firm up some of
13 the imports -- added imports that would come in from --
14 from those -- those assumptions.

15 So the -- that's the sort of the
16 definition of the plan as -- as it was analyzed. The
17 reasons that we did that, obviously, was, of all the
18 fifteen (15) plans that were done, they added
19 generation and reference DSM at a fixed load forecast.
20 There wasn't any sensitivity. There really -- we
21 really didn't have any of the plans where we had a
22 different load forecast we -- or a different level of
23 DSM. It was all sort of variants of generation with
24 Mani -- within Manitoba, and so we wanted to --
25 obviously we -- we were -- wanted to have a plan that -

1 - that actually analyzed some of the things about
2 reliance on imports that -- that we really couldn't
3 answer from any of the cases that they pre --
4 presented.

5 I wanted to add a case to illustrate an
6 approach to deferral of generation to see what that
7 would look like, and see what -- what it might -- what
8 -- what kind of a cost performance you might expect to
9 see, and in this case, it -- it def -- it deferred
10 generation for about twenty (20) years, I believe.

11 The -- and then we wanted to add
12 something that -- that tested the demand side, because
13 at that point, there really wasn't anything in the
14 record, or in any of their analyses that had -- had us
15 any way of -- of imputing any inf -- information about
16 the value of demand-side management or imports in -- in
17 their -- in their system, and so this would give us
18 some insight into that.

19 So on the next slide, slide 30, this
20 shows a little bit about the imports, and what we're
21 showing here is -- again, we used some of the -- a lot
22 of your specific data to say -- we wanted to look and
23 see what was sort of the maximum reliance on imports,
24 so we looked at across the water spectrum, and you can
25 see this is -- this is the -- the extent to which some

1 of the -- some of the water year conditions relied on
2 the plan.

3 So you can see that in the red, the
4 transmission line was assumed to be built in 2029
5 there, so the red jumps up there, and that's basically
6 because the transmission is built at that point, and in
7 -- in the dry -- when it -- when it's in dry year
8 conditions, you can see the level of imports.

9 We compared to that in the grey the
10 level of imports at -- at -- basically, in dry
11 conditions that would -- that you'd see under the
12 Preferred Development Plan, and what's -- there's a
13 couple things to point out about that.

14 One is you can see that in dry year
15 conditions, the added transmission is -- is actually
16 lending itself to added imports for the Preferred
17 Development Plan, and an element of the Preferred
18 Development Plan of -- in the 750 line of that is
19 actually a drought hedge in dry conditions, as it's --
20 it's -- the -- that plan is seeing some advantage of
21 having added -- added access to the MISO market in dry
22 conditions, and you can see that in this grey bar, at
23 least and until later in the plan, when some additional
24 gas fire generation gets added in as -- as well that --
25 that subsides a bit. But you can see that in dry

1 conditions, even the Preferred Development Plan is
2 using a transmission for import, at least during some
3 of the drier conditions.

4 And then by comparison, the All Gas
5 Plan, which doesn't have any added transmission --
6 transmission import, its -- its imports are kind of
7 pretty much constant at the four thousand (4,000) level
8 across the time, and that's -- that's indicative of the
9 fact that there's basically an import limitation due to
10 the transmission in the model.

11

12 (BRIEF PAUSE)

13

14 MR. DANIEL PEACO: Going to the next
15 slide, this is information that shows how much thermal
16 generation in the system is happening under these
17 various plans. Slide 31. And the -- again, the red
18 line is the -- the case where we allowed the fuel-
19 switching DSM and imports, and you can see that in the
20 early years, the fuel switching and DSM are keeping --
21 are keeping the generation -- thermal generation in the
22 Manitoba level pretty low. And then you can see in
23 2029, when the transmission comes in, it basically goes
24 to zero for several years, and then only picks up later
25 on in time.

1 The -- in the Preferred Development
2 Plan, you can see is, you know, obviously is -- is --
3 the thermal generation is very low. There is -- it's
4 not -- it's not zero, but it's very low throughout that
5 period of time, and in which I would -- I would guess
6 that generation is -- some of it is -- is sort of
7 minimum required operation.

8 And some of that you can see is during
9 the 2030 to 2036 period, it's actually got more thermal
10 generation than the -- than the plan with the -- with
11 the expanded transmission import case. And then, of
12 course, the All Gas Plan is -- is using a lot of
13 internal thermal generation in -- in lieu of importing
14 or -- or hydro production.

15

16 (BRIEF PAUSE)

17

18 MR. DANIEL PEACO: Yes? Okay, I will.
19 My apologies.

20 On slide 32, let me take a minute. This
21 is a complicated chart. Let me make sure -- let me
22 explain the chart, and then we can get to -- this is
23 where we get into some of the metrics, but the -- the
24 purpose of this chart, which I'll get to after I
25 explain it, is -- is to compare the economic

1 performance of the no gen case to the Preferred
2 Development Plan and to the All Gas -- to the -- to the
3 two (2) gas cases we looked at. So let me explain what
4 this chart is, and it goes back to the discussion we
5 had about metrics earlier.

6 First, we are plotting the -- each data
7 point. For example, if you go to the far right, you'll
8 -- and look at the blue line. The blue line is the --
9 the results from the Preferred Development Plan. The
10 very -- very right-hand side of that curve is -- and
11 this is -- I believe that this is the reference case.
12 Yes, the 2012 reference case. So this is exactly the
13 same numbers we started the day with.

14 The -- the last number in the blue curve
15 is our \$1.7 billion number from the Preferred
16 Development Plan. And if you recall our discussion
17 about the cumulative present value statistics, we're --
18 we're basically score carding or keeping track of the
19 cumulative present value of costs and benefits of the
20 plans through time.

21 And so the blue line here is, basically,
22 every year, it's a computation of the cumulative
23 present value of the costs and benefits up to that
24 point in time. So you can see, for example, if you
25 look at the very bottom of the curve where -- where it

1 goes over its minus six (6) -- 6 billion actually in
2 2025. That's accumulation of all the spending.
3 Obviously, that's -- that's probably at the end of the
4 -- the spending for Keeyask for the transmission line
5 and -- and a fair amount of the Conawapa.

6 So the -- the capital spending is -- is
7 probably beyond its peak at that point, and -- and then
8 -- and -- and then the benefits are obviously kicking
9 in as you -- as you're getting done the construction
10 phase, and -- but -- but at that point, the -- the
11 present value of all the spending and the present value
12 of all the -- the revenues from that case come together
13 to get to be minus 6 billion.

14 And then -- and then it, as -- as time
15 goes on, and -- and revenue is earned off of the
16 projects that are built, it -- it turns around and
17 comes back to a positive. This is -- that's a number
18 that's relative to -- it's the difference between that
19 plan and the All Gas Plan, and it's numbers that are
20 basically the -- the cash -- on a cash flow basis, the
21 cap -- capital spending and the revenues of the time
22 present value.

23 And -- and so, in the -- and by
24 definition, the All Gas Plan here is -- is basically
25 the zero axis, because we're comparing everything to

1 that. So the gas -- the -- the results of the Gas Plan
2 compared to itself is -- is, by definition, zero. You
3 can see that there's a grey line that's very near zero
4 for the entire event. That's the all combined cycle
5 case, and then there's the black line is the no gen
6 case, and you see that there's some spending for
7 transmission and -- and DSM and fuel switching in the
8 front end, and then there's benefits. It -- it gets
9 above zero after that.

10 The -- what we've shown on here is the
11 2032, the 2047, and the 2062. That's the twenty (20),
12 thirty-five (35) and fifty (50) year points that we --
13 we report out our statistics on cumulative present
14 value. So if we go back to the metrics chart that we
15 talked about, that's -- those are the -- those are the
16 -- the points in time, the -- the snapshots of
17 cumulative present value that we've been reporting out
18 in those -- in those charts and we feature in some of
19 the 'S-curve charts that -- that we -- you may have
20 seen, and we'll talk about later.

21 So we're just taking snapshots of where
22 the -- where the plan is as -- as of those points. But
23 this -- this kind of shows in -- in sort of year-to-
24 year form what's really going on in detail, and the --
25 the twenty (20) or thirty-five (35) or fifty (50) year

1 metric is -- is telling us sort of where these plans
2 are as of that point in time as the -- as the plan --
3 planning analysis goes forward in time. And then the -
4 - the seventy-eight (78) year NPV number is simply the
5 number at the very right-hand side of the -- of the
6 chart.

7 And so what you -- what you can tell
8 from this is you could -- I could say that so the --
9 the relative effect of the capital spending of the
10 Preferred Development Plan relative to the other plans.
11 The combined cycle case obviously has somewhat more
12 spending than the All Gas case, but it's not nearly as
13 significant as what you're looking at with the
14 Preferred Development Plan.

15 And the -- the spending on the no gen
16 case is -- is more in the -- in the first few years
17 than the -- either of the gas plans, but then it -- it
18 turns around by something around 2030.

19 You can see the other thing, when we
20 talk about the breakeven year on the metric chart, if
21 you look at the Preferred Development Plan line, the
22 blue line, the -- the point at which it reaches zero is
23 the number we report out as the breakeven year, if you
24 recall that number.

25 So that's -- and you can see that the

1 breakeven year for the -- say in the case of the no gen
2 case relative to the All Gas Plan is around 2030. The
3 combined cycle case doesn't have a breakeven year
4 because it never goes positive relative to the All --
5 the original All Gas Plan.

6 So I apologize. It's a fairly
7 complicated chart. But I wanted to -- this kind of --
8 this is sort of laying open so we can see what's going
9 on in the economics of the plans over time that we've
10 been talking about.

11 THE CHAIRPERSON: Just to confirm, the
12 no gen case addressed the sunk costs related to Keeyask
13 and Conawapa?

14 MR. DANIEL PEACO: Yeah, the sunk costs
15 are -- are basically embedded in all the plans.

16 THE CHAIRPERSON: Okay.

17 DR. HUGH GRANT: What is the
18 expenditure? Why would the -- so let me try this
19 again. In the no gen case --

20 MR. DANIEL PEACO: Yes.

21 DR. HUGH GRANT: -- what are the
22 upfront expenditures? Is this related to incentives
23 for DSM and things of that nature? Why would it be...?

24 MR. DANIEL PEACO: Well, there's --
25 there's three (3) things that would -- would require

1 some investment or some expense. And John may know me
2 -- more the details. But conceptually, you're building
3 a transmission line.

4 DR. HUGH GRANT: You build -- so you're
5 building it for 2029 though, aren't you?

6 MR. DANIEL PEACO: Yeah, but the -- the
7 spending would obviously come ahead of that.

8 DR. HUGH GRANT: Right.

9 MR. DANIEL PEACO: You're spending some
10 money on DSM and you're spending some money on fuel
11 switching. And, I don't know, do we have -- do you
12 have the details on -- or -- on what makes up that
13 spending?

14 MR. JOHN ATHAS: Not right handy, but
15 we -- we could pull it up a little later. But the --
16 but you're right, that -- the DSM expenditure is the
17 main expenditure that's -- that's causing that, because
18 DSM is essentially a upfront capital resource.

19 MR. RICHARD BEL: So this -- this no
20 gen case is assuming one point five (1.5) DSM?

21 MR. DANIEL PEACO: That's correct.

22 MR. RICHARD BEL: So if it was the new
23 DSM case, we'd expect -- what will we expect and --

24 MR. DANIEL PEACO: Well, you'd expect -
25 -

1 MR. RICHARD BEL: -- of that black
2 line?

3 MR. DANIEL PEACO: Well, you -- as we
4 were talking about, you'd see more upfront spending
5 because you -- because this says one point five (1.5)
6 times the reference case DSM, and the Level 2 that
7 they've talked about if four (4) times reference case
8 DSM. So it's a substantial increase in the DSM effort,
9 so there would be more expense upfront. But obviously,
10 there would be more load reduction that comes with that
11 and more savings over time.

12 So we -- we won't have the one combining
13 the high level of DSM with this particular case in
14 hand, but -- but Hydro has done now several cases
15 testing this level of DSM or levels of DSM with some of
16 the other plans. And we have some of that that we can
17 talk about to get a sense, but -- but I -- but it'd be
18 -- it'd be hard to know exactly how much more DSM would
19 be beneficial in this case.

20 I will have to say though, there is --
21 the -- the fuel switching program takes a fair amount
22 of load out of -- out of this plan, as well, so there's
23 -- in some sense, it's -- there's some analogy to the
24 higher level of DSM. We speci -- but we specifically
25 wanted to -- to feature a -- I would say we decided to

1 go with a more modest DSM acceleration and combine it
2 with fuel switching, rather than to go to a more
3 aggressive DSM plan, per se. But we clearly could have
4 structured the case in that way, as well.

5 MR. RICHARD BEL: And the aggressive --
6 the -- the fuel switching is an aggressive fuel
7 switching that's expanding the natural gas system to
8 areas that currently aren't served. Is that...?

9 MR. JOHN ATHAS: The -- the -- we asked
10 Hydro and worked with them on -- to say, you know, If
11 you had more encouragement, more information, and an
12 outreach of some sort, you know, what could -- you
13 know, and you made some -- you'd have some effect on
14 the penetration, the choice of natural gas for -- for
15 heating, and maybe even some conversions to natural
16 gas.

17 They modelled that within the
18 constraints of -- of where natural gas is available.
19 They -- they didn't -- my understanding is they didn't
20 assume a major expansion of the amount of the territory
21 that has natural gas as an option. So they -- it
22 didn't -- it wasn't postulated to an extent that --
23 that would go along with a large increase in build-out
24 in -- in the gas system.

25 MR. RICHARD BEL: Okay.

1 MR. DANIEL PEACO: Okay. Are we set to
2 move on?

3 MR. JOHN ATHAS: One thing that I just
4 wanted to point out is in some ways our metrics are an
5 attempt to provide some insights on this type of chart
6 for many different plans, as we -- as we get even later
7 on, and many different kinds of scenarios, because you
8 -- as you can see here, it gets pretty busy when you
9 have three (3) sli -- three (3) lines on it. But if --
10 if we put all fifteen (15) on it, it would start to,
11 you know, completely lose its value as seeing stuff
12 year by year.

13 But this picture itself is a metric that
14 -- that many times decision-makers look at. It's like
15 how far down versus how far up in the general sense
16 that it's -- you know, for those that are more
17 pictorial in their thinking than digital, this -- I --
18 I'd say this is -- you know, this is a metric.

19 It's just that it's very hard to -- to
20 say what does it look like over so many different plans
21 and so many different scenarios. So that's why we --
22 we take the snapshots that we did.

23 The -- and as Dan mentioned, the amount
24 of -- the amount of -- in the -- in the IRR calculation
25 essentially, the -- when the plans like the Preferred

1 Development Plan are becoming more and more negative,
2 that's considered essentially like an investment. And
3 when it gets -- and when -- and when it's climbing,
4 that's considered almost like a return that -- that
5 contributes to an IRR.

6 So it helps give the -- the IRR metrics
7 help provide some relativeness between the end point
8 and the amount that you have to go down. So it kind of
9 gives you a -- a path image, so something that ends up
10 -- so the two (2) plans that end up in this chart very,
11 very equal have very different investments to get there
12 from -- from that standpoint.

13 MR. DANIEL PEACO: The other -- the
14 other thing to say, and I think I mentioned it in one
15 sense, but let me make sure. I don't want to say what
16 it is, but what it isn't. These are -- I think I
17 mentioned that these are basically the present value of
18 the cashflow numbers that they've used in their
19 economic model.

20 They're not results from the financial
21 model. Obviously, it doesn't include the financing
22 into things, so that this -- this pattern wouldn't --
23 wouldn't necessarily replicate itself in a -- in -- in
24 rates. You'd have financing and it would be -- these
25 things would be smoothed off. But obviously, this --

1 this is sort of the raw capital spend. It's not the --
2 not the -- sort of the financial impact that you'd
3 actually manifest in rates.

4 And so I just want to make sure that you
5 understand that that's -- that this -- you shouldn't
6 sort of jump to saying, Well, this is the right impact
7 analysis. This is just the cashflow on the -- on the -
8 - what -- what you're spending and what you're getting
9 year to year analysis.

10 Okay, the next slide, 33. So what did
11 we learn from the no gen case? The DSM and fuel
12 switching deferred the year of need to 2029, which is
13 the reason that the transmission line was added in
14 2029, because there was -- the -- the programs of DSM
15 and fuel switching we put in there basically was enough
16 to provide enough dependable energy and capacity to
17 move the year of need out to that point.

18 Now, what we found in -- in what Hydro
19 has recently submitted with a Level 2 DSM, they
20 basically have come to the same result. So I think
21 they found that -- they've testified with a Level 2
22 DSM, that pushes their year of need for -- for energy
23 and capa -- dependable energy and capacity out to about
24 the same time.

25 And so it gives a sense of what kind of

1 effort does it take to move -- move the year of need up
2 to that point in time. And -- and it -- it's -- it
3 manifested in this plan, and it's obviously shown up in
4 the -- in the level 2 DSM analysis that Hydro has since
5 put together.

6 The other thing we learned is the -- the
7 potential drought hedge value of increased import
8 limits. In these cases, whether it's the Preferred
9 Development Plan that we saw or the -- or in comparing
10 it to the -- to the plan that we have with -- with the
11 added import capabilities, we didn't really see as much
12 -- you know, it -- it gives an opportunity to take more
13 advantage of the market during dry conditions with
14 added import capability.

15 It illustrates the impact of DSM and
16 imports on thermal generation. So the -- the other
17 thing was, by adding this amount of DSM and fuel
18 switching, we saw that it largely mitigated the need to
19 run internal thermal generation for quite some time.

20 And the -- while -- while it is a
21 hypothetical plan, the results do point to the
22 potential for added elements. DSM, import -- import
23 limit cap -- capabilities are all elements of -- of a
24 plan that -- that may be some -- may be of some
25 promise, either by themselves or in some combination.

1 And, you know, the fact that the -- the
2 end -- the end result of this exercise came up with a
3 present value that was more or less akin to what was in
4 the current Preferred Development Plan indicates that -
5 - that, you know, there's a lot of interesting elements
6 from this -- from this analytical exercise that -- that
7 might suggest that we should -- that, you know, it
8 would be worth looking at -- at more -- more -- in more
9 detailed fashion, some of these alternatives, and how
10 they might play out in a -- in an alternative strategy.

11 THE CHAIRPERSON: You -- you haven't
12 discussed the -- the drought hedge as part of what
13 we've seen up to now. I guess that's embodied in some
14 other --

15 MR. DANIEL PEACO: Yeah, let me go back
16 --

17 THE CHAIRPERSON: Okay.

18 MR. DANIEL PEACO: -- and tell you why
19 I -- the -- and I guess there really was -- kind of
20 going back to this one, because when we looked at this
21 plan and we compared in this particular -- and I'm on
22 slide 30.

23 And part of what -- what I said about
24 the drought hedge, really had to -- what I -- what we
25 learned about put -- when we were doing the comparison

1 of this plan to the Preferred Development Plan, and we
2 said, Oh, look at that. In the dry years, the
3 Preferred Development Plan is importing, and that was
4 not something that we'd really sort of thought about
5 before.

6 But when you -- when we look at it this
7 way, you could say the transmission line, even in that
8 case, clearly is being used in dry years, and would --
9 would mitigate the cost you would otherwise have by
10 running internal -- more expensive internal thermal
11 generation, and so even in the Preferred Development
12 Plan, you're seeing in -- in dry conditions, some
13 utilization of that export transmission line for import
14 purposes.

15 Is that -- so that -- that was kind of
16 the clue to me that said, If it -- if it works as a
17 drought hedge for the Preferred Development Plan, it's
18 got to work for -- for other plans as well. Does that
19 -- does that make sense?

20

21 (BRIEF PAUSE)

22

23 THE CHAIRPERSON: Now, you also
24 indicate the -- the -- sorry, the last -- the -- the
25 slide before this one (1), thirty-three (33) --

1 MR. DANIEL PEACO: All right. Okay,
2 thirty-three (33).

3 THE CHAIRPERSON: -- you indicated,
4 While it's a hypothetical plan. Now, why would you say
5 that?

6 MR. DANIEL PEACO: Well, the -- the --
7 you know, and I -- and I'm sure we'll hear Hydro say,
8 Hydro says we can't build the transmission line solely
9 for import. And they would, you would, so we -- the
10 way I view this plan, is I say I'd like to sort of
11 postulate this thing, these are things I think that we
12 could do, and we could at least -- at least do some
13 serious planning on, but the first thing you want to do
14 is to sort of just, let's -- let's postulate this with
15 some plausible numbers.

16 And, you know, if the -- if the answer
17 was, It was a clear loser, and we'd say, Well, we don't
18 even need to -- we don't need to do any more work, so -
19 - but I -- I feel like this was sort of a -- a test to
20 see whether -- whether the -- any of these concepts are
21 worth sort of investing planning time into them, to see
22 whether you could actually develop a specific plan to
23 implement this.

24 You wouldn't necessarily have to build
25 the transmission line to Minnesota, and in fact, I

1 think if you were really of the mind-set, I'm going to
2 build transmission for import, you would probably look
3 to a different point than you would if you were
4 building a transmission line for export.

5 When you're exporting, you want to go to
6 the market with the highest price. When you're
7 importing, you want to go to the place in the market
8 with the lowest price. So a line to North Dakota might
9 make more sense, so you -- that would be something
10 you'd want to study if you were really going to sort of
11 fall through on this.

12 But -- but in terms of at this level,
13 the economic analysis, does -- it doesn't really matter
14 to the case, 'cause we're simply just saying, As an
15 economic test, does the concept even make any sense?
16 And it's -- you know, it -- it actually proved to be
17 pretty interesting, so then we -- so then the question
18 is, Where do you go with it from here?

19 So the -- on slide 34, we shift gears,
20 and we talk about our -- our -- the next plan we wanted
21 to talk about was the wind -- plans based on wind, and
22 we tested the sensitivity of wind in a little different
23 way. When we looked at that -- well, the -- the --
24 sort of the -- the largest conclusion that we had was
25 that we -- we did not view, and -- and it was

1 consistent with -- with the -- the checks that we did
2 with -- with EnerNex and with Knight Piesold, kind of
3 all of the view the -- the subsidy they have for cost
4 of -- of wind are not consistent with what we're seeing
5 in the current market, particularly in -- in the upper
6 Midwest US market, where there's a lot of wind
7 development in the -- of recent.

8 And, so we -- we go into our report in
9 some lengths some -- some of the reasons why we think
10 that the numbers that -- that Hydro has used are -- are
11 too high, or -- or unfavourable to -- to the wind
12 resource. And we talk about that.

13 It -- so -- and the second point, I
14 guess, was that the -- the analysis, not only as a
15 starting point, the costs that we see in the market
16 today were not consistent with the numbers that Hydro
17 is using. They didn't -- they didn't assume that that
18 improved over time. And there's -- there's a fair
19 amount of literature that says that the developing
20 technology in wind is -- will lead to some improvements
21 in performance and cost of wind over time. So those
22 are things we looked at.

23 The observations with this is that we --
24 we think that the -- the Plan 3 numbers that they ran
25 could overstate the cost of the -- of the plan by

1 something as much as a billion two (1,200,000,000) net
2 present value. Under the 2012 ref assumptions, Plan 3,
3 if we make the adjustments that we're recommending,
4 becomes lower cost than the All Gas Plan, rather than
5 be more expensive.

6 And then we -- we also think that, like
7 with -- like the comments we made with the -- with the
8 gas plans, we think there's probably a better
9 configuration of utilizing wind and gas together. They
10 might improve upon that.

11 So this is -- on slide 35 is sort of a -
12 - a synopsis of the differences in -- in the
13 assumptions from what Hydro used and the -- the case we
14 postulated. On the capital cost for winds, they used
15 twenty-four hundred dollars (\$2,400) a kW installed
16 cost for -- for the wind. And we -- we see the -- the
17 market in the -- in -- in -- at least in the Upper
18 Midwest to be more like seventeen-fifty (1,750). And
19 there've been some projects that have been -- been
20 lower than that, but that's a -- that's a better, more
21 representative number of projects that have been
22 developed recently.

23 We think that the capacity factor in
24 this -- in this region is -- is -- tends to be a bit
25 higher than that, and so we -- we increased the -- the

1 40 percent that they used to 43 percent. And we've --
2 we've seen that number in a number of projects in the -
3 - in the states to the south here.

4 The -- and they had a -- they assumed a
5 twenty (20) year life, and we -- we postulated a
6 twenty-five (25) year life, which was -- which is the
7 number we see more -- quite often in -- in planning
8 studies and -- and presentations for projects that
9 utilities have -- have done. The -- and then the
10 cost decline over time, they assumed that the -- that
11 the twenty-four hundred dollars (\$2,400) a kW would be
12 the -- be the cost of wind that they added throughout
13 the seventy-eight (78) years. And we -- we included it
14 in our -- our estimate a decline, 1 percent per year,
15 through 2032.

16 And on the right side of this chart we
17 show kind of a -- a -- what we'll call a waterfall
18 chart similar to the chart we looked at this morning.
19 It starts with the Preferred Development cost, the
20 present value of the cost of the plan. And this
21 doesn't factor in the -- but the cost of the plan to be
22 somewhere around \$3 billion.

23 The cost -- the total cost of the Wind
24 Plan was, as their -- in their Wind Plan, the Plan 3
25 was over \$5 billion. And then as we make our

1 adjustments in the various adjustments that are in the
2 table on the left, you can see that the capital cost
3 adjustment, the capacity factor adjustment, the project
4 life adjustment, and the -- the cost decline over time,
5 combined to reducing the cost of -- of the -- of the
6 Wind Plan by some \$1.2 billion.

7 And it -- it doesn't -- it doesn't
8 equate to the Preferred Development Plan at -- at that
9 juncture, but it does improve it enough to be better
10 than the Wind -- the -- the All Gas Plan. And we'll --
11 we'll see that in a -- in a later slide.

12 MS. MARILYN KAPITANY: What was your
13 rationale for the 1 percent per year cost decline over
14 time?

15 MR. DANIEL PEACO: Well, there's --
16 we've -- we've -- in our report, we cite some -- a
17 couple of industry studies that have been talking about
18 the developments in the technology and where it's
19 likely to go. And so we picked a number off of -- of
20 one of those studies. And so there's a citation to
21 that there. But that's the -- the development of the
22 turbine technology and the -- the size of the towers
23 and the size of the blades and the designs have been
24 advancing in those. That's some of what folks are
25 expecting to see as that -- as that progresses.

1 So this next slide, 36, compares the --
2 the wind cost -- our -- the -- the two (2) -- the two
3 (2) wind cases, the Plan 3 and La Capra's version of
4 Plan 3, to reference case -- on reference case
5 assumptions 2012 to All Gas so that you can see on the
6 red line is Manitoba Hydro's case. So this is again is
7 the year-to-year cashflow numbers for the plan.

8 So there's -- there's a lot of spending.
9 And what happens in their plan is they add wind with no
10 credit for capacity, because -- because in the winter -
11 - in the wintertime, at the time of system peak, wind
12 does not perform as well. So -- so they -- so they add
13 in combustion -- at the same time, they add combustion
14 turbines for capacity.

15 So they're adding combustion turbines
16 for capacity and wind for energy, and -- and so there's
17 a fair amount of spending in the front end of that.
18 And you can see once they've done the spending, it sort
19 of stays at that lower -- you know, performs more
20 poorly than gas over time. It sort of flattens out
21 there.

22 You can see the same kind of effect in -
23 - in our case, but because the -- the changes in the --
24 in the cost of performance that we've pro -- formed in,
25 you can see how much -- the impact that that has on the

1 performance of -- of the Wind Plan relative to All Gas.
2 So this -- init -- obviously the spending is there; it
3 still goes negative. But then it turns around and
4 eventually, about the year 2050, turns positive and --
5 and produces something to almost \$500 million worth of
6 benefit by the end of the -- the study -- the seventy-
7 eight (78) years.

8 So the -- this is how the change in
9 assumptions that we've looked translated into a net
10 benefit. So we -- when we look at the initial chart
11 that we looked at this morning, we're looking at all
12 fifteen (15) plans in the -- in the wind case being
13 negative, that's -- that's reflective of the numbers in
14 the red line.

15 But if you -- if you -- the test of that
16 case we did, we -- we figured into that plan our
17 assumptions. And -- and it leads to enough of a change
18 to make it ultimately, on a seventy-eight (78) year
19 base -- basis, better than the Gas Plan.

20 Now, because of the configuration of
21 that and -- and this result in which I -- well, if
22 that's good, is that the best we can do. And we
23 haven't really gone there. But I think because of the
24 combinations of the additions of -- we didn't change,
25 in this analysis, the -- the timing or configurations

1 of adding gas and wind. But -- but -- so we don't
2 really know at this point whether if we -- if we change
3 that sequence, whether we can improve on that or not.

4 But this -- but -- but just changing the
5 cost assumptions, obviously, at least brought it back
6 into -- into the game as being something that's at
7 least competitive, if not better than the -- the All
8 Gas by itself. So some other combination of gas and
9 wind, you know, might be better than either of the two
10 (2) cases that were tested alone.

11 MR. JOHN ATHAS: The other thing, Dan,
12 just to point out, the -- the earlier question that you
13 had, Mr. Grant, about the -- about why was it jumping
14 around, essentially, on the -- the negative numbers for
15 the Plan 3 as opposed to kind of the other ones were
16 trending in one direction or not, the -- that's
17 essentially reading off of this red curve.

18 And what the -- what's jumping around is
19 after -- after the year '35, where kind of the analysis
20 predicated on -- the only expenditures you have are the
21 replacement of -- of the wind -- wind that went in and
22 replacement of the -- of the gas turbines that went in.
23 So that's causing -- the timing of those replacements
24 is the choppiness that's in there, and it just happens
25 to catch it.

1 I mean, I wouldn't put any significance
2 onto the -- the passing, rather than it's relatively
3 flat.

4 MR. DANIEL PEACO: Mr. Chairman, I
5 think this kind of ties into the question you asked me
6 earlier, and I -- I put you off until then. I don't
7 know if we want to go -- if we go back to 24, which I
8 think is where your question was. That's -- that's
9 what John was trying to tie back to.

10

11 (BRIEF PAUSE)

12

13 MR. DANIEL PEACO: Okay. So unless
14 there's other questions, we'll step ahead to slide --
15 slide 37. So moving to the next set of questions on
16 alternative.

17 The -- I guess the alternative hydro-
18 based plans, there were a couple of configurations of
19 Keeyask and Conawapa in the fifteen (15) plans that
20 Hydro put together in their submission.

21 But what we did -- but we really didn't
22 have -- the -- the only configuration we had was
23 Keeyask at '19 combined with the transmission addition
24 and a contract with Minnesota Power or, by itself, an
25 in-service date, I think, of 2022. But it really

1 didn't answer the question: What hap -- you know,
2 particularly in the context of what we're talking about
3 in deferring generation, you know, what happens if you
4 -- if you defer that for a longer period of time?

5 So we didn't have an opportunity to get
6 Hydro to do another -- another case that said delay
7 Keeyask for -- for a further period of time, but what
8 we did have was enough detail on what I would say Plan
9 1 and Plan 2, Plan 2 being the only differ -- it --
10 it's Keeyask by itself, and otherwise, it's the All Gas
11 Plan.

12 So it's just invest in Keeyask, no
13 contracts, no transmission. So -- so that's -- that's
14 the only case we have where we say, All Gas Plan on one
15 (1) case, and -- and invest in Keeyask in the other
16 case, and measuring it by itself.

17 The -- the thing that we -- that said
18 was, Well -- and -- and we've got some questions on
19 this, so we wanted to figure it out. So what we did is
20 we took the results from Plan 1 and Plan 2, and we
21 realized that, from an economic model standpoint, that
22 we could sort of combine those two (2) plans, and --
23 and get some insight into what a -- what a delay would
24 be.

25 And so we -- we took the -- we assumed

1 that you went down the All Gas Plan for -- for a longer
2 period of time, and then, when you were about to invest
3 in the next gas plant, we said, Instead, let's -- let's
4 pick up there and just use the Keeyask results from
5 there forward. So it's effectively gave us some
6 insight into a -- a delay of -- of Keeyask to -- I
7 think it was 2028 or '29.

8 And so that's -- you know, we're sort of
9 calling it for this purpose Plan 2A, and this plan adds
10 gas generation first, and then Keeyask. And I guess we
11 got K28. So -- so it's got two (2) combustion
12 turbines, then -- then Keeyask, and then it goes on and
13 -- and adds more gas.

14 So that's -- fin -- we thought it was a
15 -- a reasonable approximation of -- of what it would
16 look like if you -- if you actually did that, as
17 opposed to the timing on -- on Plan 2. It effectively
18 approximates the five (5) year delay of Keeyask from
19 Plan 2.

20 So -- and what we wanted to know is, you
21 know, what happens if you do that? Is it -- is it --
22 does it cost you -- what does it cost you? So on the -
23 - on the ref/ref basis, on the -- on the 2012 reference
24 case basis, net present value of Plan 2 and Plan 2A
25 were exactly the same, so it -- it really had no -- no

1 cost effect overall on the plan if you did that.

2 And it indicated to us that the benefits
3 -- you know, the benefits of Keeyask would be -- be
4 preserved, and part of what we see in all of these
5 plans is these long-term hydro investments, clearly,
6 the benefits are in the long-term, and particularly in
7 the cases where you see carbon prices baking into the -
8 - to the market price and so forth, the benefits are
9 really back-end.

10 And this analysis sort of suggests if
11 you -- if you wait five (5) years on that, you're still
12 going to see those benefits longer term. You're not
13 making so much money in the first few years, at least
14 in a case where you're doing it absent an export
15 contract, so that -- so that it costs you much in the
16 five (5) years.

17 What we didn't do, but you would have to
18 consider if you're really going to look at this
19 further, would be say, We'd have to update for new
20 information, and I suspect if you just change the
21 capital cost, a delay case might actually look somewhat
22 favourable.

23 And -- but you'd also have to look at --
24 if you're going to delay it that long, you may have
25 some added costs. You know, Hydro has talked in it --

1 in its submission about being able to delay a few years
2 and still hold its permits, but you may not be able to
3 hold the permits forever or you may have to do some
4 other things. So we may incur some costs to stop
5 construction and resume it, you know, in -- in ten (10)
6 years.

7 But this -- this plan would say -- you
8 know, it really was our first attempt to say -- if you
9 ask the question, What if we wait to do Keeyask until
10 we -- until a year of need after DSM phase Level 2 has
11 -- has been implemented? We were trying to sort of get
12 a fur -- some insight into what that might look like.

13 And at least at this initial cut
14 suggests that, from a net cost and benefits of -- of,
15 you know, Keeyask alone invested in -- in 2022 versus
16 2028, it does -- it doesn't really cost you too much.

17 If you -- if you did the analysis again
18 with DSM Level 2 and with the added costs, you'd --
19 you'd get somewhat different results, and I suspect it
20 would -- it would be somewhat more reinforcing to, you
21 know, delaying is okay from that standpoint.

22 There's a lot of other considerations
23 obviously. You'd have to go into that. But just from
24 the -- an economic exercise, you know, what is due to -
25 - it's -- it's not -- this particular exercise wasn't

1 introducing a cost penalty.

2 On slide 38, this is kind of the last in
3 the alternatives section. We talk about the Level 2
4 DSM included in all plans. Hydro offered in its
5 hearing -- in the hearings its Level 2 DSM, which is
6 four (4) -- I think we mentioned is four (4) times the
7 reference DSM levels. And they indicated that it
8 proved economic in all the plans that they tested.

9 It's -- that outcome does not surprise
10 me, although we haven't had a chance to look at the
11 results. The -- we also see from the results they
12 provided that the impacts are not uniform.

13 For example, the All Gas case benefits
14 more from adding DSM to it than -- than the PDP,
15 principally because the All Gas Plan, as we saw, is --
16 doesn't have the advantage of imports, and is -- is
17 using more -- more gas generation, which is -- which
18 ends up being more expense to that. So -- so the DSM
19 is displacing, in the All Gas Plan, I would presume is
20 displacing Manitoba generated gas in that case, as
21 opposed to displacing imports, perhaps, or export -- or
22 -- or imports from MISO in -- in the -- in the PDP.

23 So that one (1) piece itself says that
24 adding DSM to the All Gas Plan is a way that -- it
25 improves its economic position relative to PDP, even if

1 you do it on -- with both plans.

2 Okay. So what we observed so far from
3 this is -- well, we said we -- we just received the
4 case results, and we haven't reviewed those in detail
5 yet.

6 We do know from what they've submitted
7 as a year of need from that is -- is materially
8 affected with this level of DSM. They've -- I think
9 the estimate was somewhere, depending on the pipeline
10 load, between 2027 and 2030 is when the year of need
11 would kick in for the system, if -- with -- with that
12 level of DSM. We've -- as we've talked about, it
13 compares -- it's a higher level of DSM that was
14 included in the No Gen Case that we looked at, and it
15 clearly points to the fact that its something that we
16 commented on in our first reports, that the lack of DSM
17 consideration in the fifteen (15) plans was a
18 limitation in -- in their analysis initially as
19 submitted.

20 So in -- and sort of tying together our
21 -- our observations on the alternative development
22 plans, we -- as we've talked about here, we think -- at
23 least the -- the wind plan and the gas plan, which were
24 the primary alternatives used to test the -- the PDP,
25 were what I call suboptimal, meaning if you're going to

1 do an All Gas Plan, can you do better than the one they
2 postulated? Yeah, I think we can.

3 If you're going to do a wind plan than
4 the one they postulated, can you do better than what
5 they postulated? Yeah, I think you can, and clearly,
6 part of that would be the admission of DSM in any of
7 those cases would probably enhance both of those
8 plans, and as -- as Hydro's analysis has shown, the add
9 -- addition of DSM to All Gas improves that plan
10 relative to PDP with DSM.

11 There are better, non-hydro alternatives
12 portfolios than those tested. We obviously didn't have
13 the luxury of having the model to set up our own cases
14 and run, but if they were tested, that there were --
15 there clearly are some -- some things that could well
16 be tested, and -- and looked at in more detail that
17 would -- might lead to a -- a better sense of how much
18 better and what -- what kind of outcome there would be.

19 The second point is, I think, that the
20 range of alternative development plans was too limited.
21 There clearly is a broader set of options, timing, and
22 com -- and combinations to consider, whether it's
23 different timing in the gas plan, whether it's a
24 combination of DSM and gas and wind, or some other
25 things. The -- those things, the -- what we've looked

1 at here indicate that -- that there -- there's
2 potential for some combinations of -- of these
3 resources that might lead to a -- a better alternative
4 plan than any of the ones that we've -- that -- that
5 are on the table.

6 The current information poses a material
7 change, meaning the -- the updated information on
8 capital cost clearly immediately brings all the hydro
9 cases into more parity with some of these alterative
10 cases, even under Hydro's analysis, and so I think that
11 in our charts, to sort of say, Are there -- are there
12 conceivable plans out here that might be economically
13 competitive with the PDP?

14 I think clearly, those changes would --
15 would mean that, in addition to the things we've talked
16 about, rolling in some of the updated cost information
17 would -- would sort of only sort of reinforce the --
18 the conclusions that we've offered here in terms of the
19 -- the comparative analysis relative based on the --
20 the initial NFAT filing information.

21 THE CHAIRPERSON: Why would you say
22 that All gas results inflate the PDP value?

23 MR. DANIEL PEACO: Okay. Because it --
24 it's -- it's simply a point of comparison, because what
25 you're saying, the PDP benefits are defined as how much

1 better than All Gas am I, right? So if -- it's kind of
2 like saying if you and I decide to have a race, and you
3 say how -- how much faster are you than me? It would
4 be one thing if I was -- if we both had a -- a fair
5 shot, and we were equally situated, but if -- but if I
6 had to carry an extra -- a 15-pound pack on my back, we
7 wouldn't really know how fast I could be if we were --
8 if we had a fair race.

9 I think what we're saying here is the
10 part -- if -- if you -- if you look at this and decide,
11 I want to build the best gas plant I can build, a --
12 our -- our sense is there's something better, and so
13 that -- so that that would be a better comparison to
14 the PDP, because you're saying, you know, if you really
15 were going to do that, you would do it and take
16 advantage of, you know, some of these other things.

17 You might say, Well, if we're going to
18 do gas, we're clearly going to want to blend in DSM
19 with that, because we're not going to -- we're not --
20 we don't want to spend a lot on -- on gas and on energy
21 when we could -- you know, if we're -- if we're going
22 to -- if we're intending to do that, you'd probably
23 want to do that as well.

24 THE CHAIRPERSON: It's kind of a
25 technical issue, but in your -- one of your appendices,

1 you indicated that Manitoba Hydro should have optimized
2 the -- the alternative plans before they -- they
3 decided whether it's plan -- you know, basically
4 looking at Plan 1, how do you optimize Plan 1? How do
5 you optimize Plan 2?

6 How do you optimize -- how do you do
7 that before proceeding to the quilt and so on?

8 MR. DANIEL PEACO: Well, you know, it -
9 - it -- having said that, it -- it is a challenge. I
10 mean, the limitations with Hydro and doing this
11 analysis of -- are -- are real, because their -- their
12 modelling system, their -- their physical generating
13 system is very complicated. Their modelling system is
14 very complicated, and it's very difficult the -- for
15 them to turn around -- to postulate cases and turn
16 around analyses on those until you can have those.

17 So they have -- they're -- they're
18 situated in a case where they -- they are only able to
19 do a few postulated tests. You know, in more simple
20 syste -- in more, say, a thermal based system, there's
21 models where you can -- you can hit 'go' on a computer,
22 and it can generate thousands of alternatives, and you
23 can get data from that, and -- and look at that in a
24 more efficient time frame, and that really isn't
25 practical for the -- for the modelling system that

1 they're -- they're currently working with.

2 And so the -- part of the commentary
3 here is simply an observation, is they -- they aren't
4 really in a position to test a limited set of options.
5 And so in looking at that, our job was to say, you
6 know, Do we think -- do we think that the tests that
7 they decided to do were actually leading to a -- a
8 decent cut?

9 And what you would ultimately get if you
10 had the ability to take the time that -- that's
11 necessary to make sure that you had, you know,
12 basically a level playing field comparison between
13 these alternative plans, and what we've identified here
14 is basically some things that we think that could
15 improve that, if you wanted to go in that direction.

16 And I think particularly with the change
17 in the capital cost, even -- even some of their own
18 numbers puts some of these other plans in -- in parity.
19 As we saw at the beginning, as we stand here today, the
20 Preferred Development Plan economics on an expected
21 value base are -- are negative relative to -- to All
22 Gas, as they've postulated it. So -- so that -- that
23 changes the game a little bit, too.

24 THE CHAIRPERSON: I think it'd ben an
25 appropriate time to take a break. So let's -- let's

1 take ten (10), and we'll resume with the next portion
2 of the presentation. Thank you.

3

4 --- Upon recessing at 2:30 p.m.

5 --- Upon resuming at 2:47 p.m.

6

7 THE CHAIRPERSON: Good afternoon. I
8 believe that everybody is in position, or will be
9 shortly, very, very shortly. I'll turn the microphone
10 back over to you, Mr. Peaco.

11 MR. DANIEL PEACO: I'm not sure my --
12 my -- this system's not on, is it? Oh, I have -- there
13 we -- okay, we're on.

14 So slide 40 is the start of our next
15 section, and we're going to move now from -- we've --
16 we've been talking about sort of the structure of the
17 various alternative plans, and the economics in -- in
18 reference case load. A lot of the discussion we had
19 was in reference case information from 2012, and we're
20 going to move into the -- the uncertainty analysis that
21 was done.

22 So what we -- what we want to talk about
23 here, first, I want to talk a little bit about the
24 uncertainties that are inherent in this case generally,
25 and the -- in the -- in the plans in particular. I'll

1 talk again a little bit about some metrics issues that
2 are specific to the -- the uncertainty analysis.

3 I'll talk about the methodology issues
4 that have come up. And we'll explain what we're doing
5 with the methodology on this analysis and then go
6 through some of the results, to -- to show you some of
7 what we've learned from that, and hopefully enough to
8 provide insight and not so much that it gets -- gets
9 tedious. But I apologize for the detail of some of
10 these figures.

11 The -- so I guess I wanted to comment
12 first on what I see as some of the uncertainties in
13 here -- in this case that sort of factor in how you
14 look at the -- the results that we've been looking at;
15 one is the time dimension.

16 Seventy-eight (78) years is a very long
17 planning horizon. It's very long-life assets, and you
18 need to have an understanding of what the value is of
19 these over time. But seventy-eight (78) years also
20 necessarily exposes you to, you know, a lot of
21 forecasting uncertainty.

22 You know, a lot of people think thirty
23 (30) years' forecasting is -- is highly uncertain, but
24 seventy-eight (78) years clearly is -- is a challenge.
25 So the time dimension is a -- is a very difficult thing

1 to -- to deal with, from an uncertainty standpoint.

2 The second thing -- dimension is -- is
3 basically the inputs. Clearly any -- any energy
4 resource planning or electric planning exercise is
5 looking at long-term assets, long-term forecast of a
6 number of things that are inherently uncertain: capital
7 cost, fuel prices, load forecast, and so forth.

8 All those things have an inherent
9 uncertainty, so you have to look at it from -- from a
10 number of perspectives. And so you have to do the
11 uncertainty analysis. But those things clearly are all
12 uncertain parameters, and many of those are -- are
13 featured in the uncertainty analysis that Hydro has
14 done.

15 The methodology is also important
16 because models cannot capture all considerations or
17 represent all seventy-eight (78) years. So it's --
18 it's instructive to look at how well these plans
19 perform over uncer -- under uncertainty, but you can in
20 no way sort of get to the point where you say, I've --
21 I've baked all of the uncertainty into the analysis and
22 -- and I know what the answer is.

23 You could say, The analysis is
24 structured to help give you -- provides some insight as
25 to how the uncertainty would affect it, but it's not --

1 not an exhaustive consideration or a complete
2 consideration of everything that might be uncertain in
3 -- in the plan, but it is featuring some of the
4 important ones.

5 And so you're still left with making
6 some judgment about, All right, so I know something
7 about the things that we have analyzed, but there are
8 some things that you -- that you can't analyze that
9 also are important to consider. And so you can't --
10 you can't find putting yourself to a point where you're
11 saying, Everything I need to know is baked into this --
12 this analytical exercise. There's -- there's some
13 other consideration that necessarily needs to be
14 applied to -- to sort of understanding what to do with
15 that information.

16 And the last thing I wanted to mention
17 is that the -- the uncertainty's related to
18 perceptions. And in doing this uncertainty analysis,
19 there's a number of ways to sort of consider these --
20 these kind of approaches. But the -- the decision
21 analysis framework that the Company has used is a very
22 -- is a very standard one, where you postulate
23 different scenarios, you assign probabilities to those,
24 and then you see how that affects things.

25 Well, the process of assigning

1 probabilities is not something -- it's unlike -- you
2 can -- you can sort of, by the laws of physics, figure
3 out what the probability is of getting a head or a
4 tail. That's -- that's something you can do
5 experiments or -- or you can -- you can know what the
6 probability of that event is.

7 And some of the things we're talking
8 about here, it's really somebody's judgment as to what
9 the probability of certain outcomes are. And in the
10 case of Hydro, they've gone through a process and have
11 considered a number of their own and external expert
12 opinions to come up with probability assignments, but
13 they're still judgments.

14 And ultimately, you folks will be in a
15 position to make judgments of what you think the
16 probabilities of certain outcomes are and -- and so
17 forth. And so this will give you a sense of what --
18 what the outcomes look like using Hydro's probability
19 judgments. But you may -- you may make the judgments
20 like they're more -- they're more optimistic or they're
21 more pessimistic on that thing than I am, and so you
22 might judge it a different way.

23 But the probability assignments clearly
24 are, you know, basically an expression of somebody's
25 judgment about likelihoods of outcomes that -- that you

1 really can't determine the way you can determine the
2 probability of -- of a heads or tails.

3 And so I just wanted to make sure that
4 that's out there, because I think the -- you know, the
5 -- those are -- that all gets back to this is clearly
6 important information to understand the uncertainties
7 here, but -- but there's clearly different ways to look
8 at this information and use it to -- to make decisions.
9 And so I don't want to say -- say any more than that,
10 but just to be mindful of the fact that all of these
11 things need to come into -- into play in sort of
12 thinking about how to use this information.

13 On slide 43, the -- the metrics
14 discussion. The expected value, net present value, of
15 this analysis over an investment life is important. We
16 -- and this is -- this is something that the Company
17 stressed, and in -- in reviewing the transcripts, we
18 talked -- they talked a lot about focussing on the
19 expected value and making that an important decision
20 metric in the -- in the analysis.

21 I think it's important, but there are
22 some -- some limitations that -- with that look that
23 can be addressed with additional looks and information.
24 And we've talked about some of those in the -- in the
25 prior discussion, and we'll get to some more of those in

1 this discussion.

2 The internal rate of return is helpful
3 to put in perspective the scale of benefits and costs.
4 And one of the things that we -- we have to do is you
5 could -- you can imagine a situation where you have an
6 expected net present value of -- of a number. But if
7 you compare that to the magnitude of the investment, it
8 may be a relatively small number.

9 So if you've got two (2) plans, and in
10 the case of pres -- the PDP and All Gas, you basically
11 have a difference in -- in an earlier slide of
12 something like in excess of \$6 billion incremental
13 investment.

14 And to the extent that you're looking at
15 net present -- even if the PDP was a -- was a net
16 present value \$100 million better than All Gas, you --
17 you -- the question would be: If it's \$100 million
18 plus or minus a large range, then you don't whether
19 you're ahead or behind relative to a plan, the -- the
20 other plan that's -- that's much less investment.

21 So the internal rate of return will give
22 you some insight into the scale of the -- the benefit
23 relative to investment and so forth. And it's one --
24 one additional piece of information that's useful to
25 know and helps give some insight into that kind of an

1 issue.

2 The cumulative present value, we
3 obviously talked about before, is another way to look
4 at that and -- and give you some sense of how it plays
5 out over time.

6 The -- in -- in decision making with
7 uncertainty, the methodology issues -- we fea --
8 Manitoba featured an S-curve approach. What they --
9 what they actually did is they show -- in their quilts
10 analysis, they show the numbers that are absolute costs
11 of each plan under each set of assumptions, less a -- a
12 what I've called constant.

13 They took the Plan 1 reference case
14 result as a number and they subtracted it from all of
15 those things. And so it's essentially removing the
16 constant number from all -- all the results. It
17 doesn't really -- you can -- and I think Mr. Borison
18 testified to this. You could -- you could use any
19 number you want. There's no -- there's no real
20 relevance to them comparing it to the -- the Gas Plan
21 ref/ref/ref.

22 The -- the issue that we have with that
23 is it -- is it leads one to believe that you're somehow
24 doing a comparative analysis between plans, when in
25 fact you're taking an arbitrary reference point and

1 comparing all the plans to -- you know, less a certain
2 number.

3 And so what we wanted to do is we -- we
4 said, We -- we think it's instructive to -- to do a
5 comparative analysis of two (2) or more cases across
6 all branches. So you could say, How does All Gas and -
7 - and PDP perform if you've got low prices, high
8 prices, or reference case prices, or change in discount
9 rates? And so you see how each plan performs when you
10 test each one of those.

11 And so what we've done is put together
12 an analysis that -- that does that type of a
13 comparison. So it's a little different mathematics to
14 show the same data. So when you're looking at the
15 curves that we have, it will be comparing -- each of
16 the data points will be comparing two (2) different
17 plans with the same set of assumptions, and then just
18 going through the twenty-seven (27) combinations of
19 assumptions and saying, How do the plans perform across
20 each one of those, and how many of those does one win
21 over the other? Does that -- if that makes sense.

22 The -- it clearly can be instructive to
23 see both sets of information. And -- and I -- you
24 know, but -- but we felt what was missing, there --
25 there were some very limited sets of information in the

1 -- in the submission where Hydro actually did the kind
2 of calculation we're talking about. But most of their
3 S-curve analysis went and did the -- the former
4 approach that I talked about, which is basically
5 subtracting that one (1) number from everything. And -
6 - and so it -- it presents a different look at that
7 information. And we thought it was instructive to see
8 the -- the look that we presented.

9 And I guess the last thing I want to
10 say, that there was some discussion in -- in the -- in
11 the rebuttal and in the hearings about a regrets
12 analysis and a regrets decision criteria. And I wanted
13 to comment on that a little bit as -- as preamble to
14 what we're going to talk about.

15 Both in the work that we've done and
16 what Hydro has shown in its -- in its application,
17 there's data on the uncertainty ranges that shows sort
18 of the limits. Not only do you get the reference case
19 value and the expected value, which is the probability
20 weighted average of all of the -- all of the twenty-
21 seven (27) branches. It shows you just kind of what
22 the -- what the extremes are, the -- the opportunity on
23 the upside, and the regret on the downside kind of
24 analysis.

25 That's what I would say information you

1 can use. You can see how much the range is, so if it's
2 net present value of -- of a -- of a billion dollars,
3 but it's plus or minus \$3 billion, that's important to
4 know as opposed to if it's plus -- plus or minus 10
5 percent. The -- so you'll get some -- some information
6 from that.

7 However, there was some discussion that
8 kind of implied that by doing that analysis, you're
9 necessarily implying a -- a decision framework upon
10 which to make the decision, which is there are what I
11 would call regrets criteria, where if you're -- if
12 you're a risk adverse, you might want to say, I want to
13 do the plan that has the -- the lowest minimum number,
14 you know, so that I'm -- I'm ensuring that the -- the
15 worst -- the worst-case outcome is -- is as high as it
16 can be, as -- minimizing regrets kind of -- of
17 criteria, as opposed to maximizing upside or -- or
18 taking an expected value approach.

19 We -- we don't -- we haven't discussed
20 that in our material, and we don't sort of presume to
21 necessarily recommend any particular way that you ought
22 to think about the problem, but I just wanted to make
23 sure that we sort of distinguish between -- all this
24 information would help you look at that, but you may
25 come to a judgment that I'm comfortable saying, Given

1 all this the expected value numbers is really what I
2 want to hang my hat on, or you can look at some other
3 way.

4 And I -- you know, those -- those are
5 all fine decision frameworks, but by presenting the
6 analysis the way we did, we were not presupposing any
7 particular way to think about that information in terms
8 of making a decision, if that's -- if that's helpful.

9

10 (BRIEF PAUSE)

11

12 MR. DANIEL PEACO: The expected value
13 decision criteria that -- that Hydro has talked about
14 basically argues that when all is said and done, you
15 look at the expected data over seventy-eight (78)
16 years, and that -- that kind of is the -- is the --
17 what you hang your hat on. So we -- we sort of started
18 at that -- at that point, and as we've talked about,
19 not all decision makers are expected value decision
20 makers.

21 And I think particularly, we've seen
22 risk-adverse decision criteria are often considered in
23 -- in very large dollar situations, and so, we -- we
24 felt it was very important to -- to lay this open as
25 much as possible be -- so that -- to the extent that

1 you needed information to know how much the risk was in
2 sort of making a judgment as to where you were
3 comfortable, that the information base was there so you
4 could do that.

5 The -- and as we have talked about,
6 we're basically trying to lay out some information that
7 might help you do that. The uncertainty analysis can
8 be of -- clearly, we expect to be informative through
9 the decision making, because not all uncertainties are
10 shown. For example, in this -- in -- in the quilt
11 analysis, the load forecast is the same in all of those
12 -- all of those paths, and so obviously, load forecast
13 is an uncertainty, but it's not anywhere explicitly
14 embedded in any of those judgments.

15 And the probability judgments and the
16 methods have some limitations, but -- but nevertheless,
17 it's -- it's informative, but as I said before, it's
18 not sort of driving to a -- to a mathematical certainty
19 that that's -- that the answer as a result on that is -
20 - is the decision criteria, but it -- it gives you a
21 better -- a much better sense of the information than
22 the range of uncertainties and how to think about the -
23 - the comparative analysis between plans.

24 So an illus -- it's the first
25 illustration of the uncertainty analysis we want to do

1 is to compare -- well, just con -- simply compare the
2 Preferred Development Plan to All Gas, we'll be using,
3 again, the original Manitoba Hydro 2012 assumptions in
4 the NFAT, and then we'll show a -- a second set with
5 updated for new capital costs.

6 So we'll -- we'll profor -- we'll --
7 what we're going to do -- two (2) things we're going to
8 do, is going to illustrate our methodology with this,
9 and I'm also going to show how much the results change
10 when you introduce the updated costs for Keeyask and
11 Conawapa, so make that one (1) change, and then show
12 you how that -- how that works. We'll then sort of
13 show the same thing on the provincial perspective, so
14 you get a sense of how that works.

15 And we already -- I've already talked
16 about the fact that we're doing twenty-seven (27)
17 branches compare -- using -- comparing the two (2)
18 plans with like assumptions, and we're going to show
19 seventy-eight (78) year NPV, and the cumulative present
20 value for twenty (20), thirty-five (35), and fifty (50)
21 years from the chart that we discussed earlier today.

22 So going to slide 47, this first chart.
23 This chart is -- is the -- the comparison of -- of the
24 PDP to All Gas and the methodology that I just
25 described to you that we're using. So obviously, this

1 is a complicated diagram, so let me take a few minutes
2 to explain.

3 The first thing to look at is you'll see
4 that there is a red dashed line that goes right up the
5 vertical axis. Because we are taking a difference, all
6 the data here is -- is showing the amount for any
7 particular combination of assumptions, the amount that
8 the PDP is different from the All Gas Plan.

9 So if you look at -- there's -- you look
10 at the point where it crosses zero. There's about --
11 it's about at 42 probability. At that -- that
12 particular -- there -- there's a combination of input
13 assumptions which lead All Gas and PDP to be exactly
14 the same number under this -- under this set of
15 assumptions in these -- these numbers as you go through
16 this thing.

17 And then there's clearly a number of
18 cases where the PDP is -- is more cost effective than -
19 - than the gas. And then there are cases where it's
20 less cost effective.

21 But the solid blue line that's -- that's
22 furthest to the right is plotting the data of each of
23 the twenty-seven (27) cases as the difference between
24 All Gas and PDP for the twenty-seven (27) combinations
25 of input assumptions. And you can see from that line

1 that there's a probability of 42 percent, if you're
2 going from the bottom up, that there are case -- that
3 the PDP will be less attractive than -- less -- less
4 cost effective than the All Gas Plan. And then the
5 balance of that, the -- the 58 percent or so of the --
6 of the cases, the probability is that the PDP is --
7 actually performs economically than the All Gas Plan.

8 And if you take the probability-weighted
9 average of all the data points on that chart, you get
10 the expected value number, which is about \$1.1 billion
11 to the good. So -- so the -- the range of outcomes
12 gets collapsed to the \$1.1 billion present value number
13 that we talked about earlier today.

14 You -- what we -- as you -- if you'll
15 recall the discussion we had about the twenty (20),
16 thirty-five (25), and fifty (50) year metrics, what
17 we've done is we just took the cumulative present value
18 data from -- from those -- from those results and --
19 and used those to -- to plot the same -- same
20 distribution.

21 And so in the twenty (20) year case,
22 clearly we saw that's a point in time in the PDP life
23 cycle where they spent a lot of money but they haven't
24 made a lot of it back yet, and so it's very negative.
25 And so as you can see across the spectrum, regardless

1 of the input assumptions, after twenty (20) years
2 there's no probability that PDP is better than the Gas
3 Plan.

4 If you look at the next -- the next
5 dotted curve to the right, which is the thirty-five
6 (35) year point, you see that there -- there is -- it
7 eventually crosses at about the 80 percent level so
8 that there are -- after thirty-five (35) years, 20
9 percent of the -- the cases on a probability weighted
10 basis actually begin to -- to look better than the All
11 Gas Plan.

12 And then if you go to fifty (50) years,
13 that line actually crosses right in the middle, so it's
14 a 50/50 proposition after fifty (50) years which plan
15 would be better under this analysis, okay. Does -- and
16 then at seventy-eight (78) years, you -- you get the
17 result there. And you can compute the expected value
18 of difference between those -- from each of those
19 cases. And we've done that in -- in other charts that
20 we'll talk about later.

21 But that's the essence of the -- of the
22 analysis that we've done and it -- what it -- what it
23 shows you so that the -- the -- you think about the
24 data points at the bottom and you look at the -- the
25 blue comment bar in the bottom right of the -- of the

1 diagram: low energy prices, high discount rates, and
2 high capital costs. So if you -- if you have those
3 combination of outcomes, those are going to define the
4 cases that are least favourable to the PDP and the most
5 favourable to Gas in -- by comparison.

6 And then, conversely, on the other side,
7 the -- the very top of the -- the diagram, those data
8 points are going to be high energy prices, low discount
9 rates, and low capital costs, would favour the PDP over
10 -- over the Gas case. So that's kind of how read this
11 chart.

12 Let me stop there and just make sure I
13 didn't leave over too many things at one -- one shot.

14 DR. HUGH GRANT: So I think I'm okay
15 with this. I'm just -- there's something -- there's an
16 implicit bias in this sort of thing because your base
17 case always looks like this incredibly low risk set of
18 option. And then the one you're comparing it to, the
19 PDP in this case, is like -- you look like you're, you
20 know, on some wild ride that you're a great risk taker
21 by opting for it. And I -- I just wonder how it would
22 change one's perception if the PDP was the base case,
23 and you compared all these other plans to it.

24 So in some ways -- like, I take your
25 point. This -- this planning methodology that, instead

1 of this single pass through it, why don't you do -- you
2 do one (1) pass. You find that you've got a Preferred
3 Development case, and then it would be interesting,
4 actually, to use it as the base case, because in some
5 ways, I'm wondering if the PDP was the vertical line,
6 and you were to show All Gas, you know, under these
7 different scenarios. You might...

8 MR. DANIEL PEACO: But act -- actually,
9 you'd just flip the curve, right?

10 MR. JOHN ATHAS: Yeah, the -- the
11 picture would look -- it would --

12 MR. DANIEL PEACO: Be --

13 MR. JOHN ATHAS: -- would be a flip,
14 and it would be a negative and positives flip. So you
15 essentially -- you -- where you there mentioned 42
16 percent for crossing for the solid blue line, the solid
17 blue line would now be All Gas, and it would cross at
18 58 percent.

19 DR. HUGH GRANT: Or, sorry, I'm going
20 to -- I'm going to rotate it, or flip it?

21 MR. JOHN ATHAS: It's kind of --
22 essentially, it's almost like starting the cumulative -
23 - the top of the chart would be zero. At the -- a
24 hundred percent makes that -- make that zero, make the
25 bottom a hundred percent, and probabilities, and you

1 make your -- and change your negative and positives.

2 So you're kind of doing that -- that kind of effect to

3 -- to do your planning, but bas -- but basically, it's

4 -- it's the complement of the -- whatever -- what --

5 the number you had.

6 So the negatives and positive numbers

7 would flip exactly, and the -- the differences versus a

8 hundred are -- become the complement for the

9 probability. So it does show a very different -- it

10 does show a different, you know, look as to which one

11 has risk, but it provides some insights as to being

12 able to read similar numbers. So you -- so you'd be

13 able to say when -- what's the probability, given these

14 twenty-seven (27) branches that we -- as an outcome?

15 What's the probability of one (1) plan

16 being better than the other plan?

17 MR. DANIEL PEACO: Yeah. What -- what

18 you should really take from this is -- is something a

19 little bit different than where I think where you're

20 going here, and I -- and I understand Hydro's concern

21 about this too, is that it's not to say that Gas Plan

22 has no risk and the other one does. It's to say that

23 these plans perform different -- very differently under

24 these assumptions.

25 Like, we've -- we've got a chart where

1 we'll see where if you look at the combined cycle case
2 for the CT case, they're almost together. So -- so
3 what you'd take from that is, you know, they're going
4 to perform similarly across all of the assumptions, and
5 so then the question is, you know: You're not so
6 really worried about this?

7 But in this case, you could see whether
8 you did it 'A' minus 'B', or 'B' minus 'A', the shape
9 of these curves are going to look the same, because
10 you're saying when you compare these two (2) plans,
11 they perform very differently across the range of
12 assumptions that you're testing, all right? And so --
13 and so depending on what you -- what you believe about
14 -- about the risks and the opportunities of low and
15 high prices and high and low discount rates and other
16 things, would tend you to lead to say something
17 different.

18 So I think the first thing to take away
19 from this thing, obviously these two (2) plans are very
20 -- perform very differently, and you'd expect that when
21 one (1) is a Gas Plan and one (1) is a Hydro Plan, and
22 this just kind of says how much. But you would -- you
23 would be looking at something that -- that looks
24 fundamentally the same, because if you did the PDP as
25 the -- the reference, you're still doing -- instead of

1 doing 'A' minus 'B', you're doing 'B' minus 'A' and
2 plotting that data.

3 DR. HUGH GRANT: Right.

4 MR. DANIEL PEACO: All right?

5 MR. JOHN ATHAS: The -- the other thing
6 that I was going to -- just going to mention is that if
7 you -- if we wanted to -- if it -- if it's possible to
8 pull up a chart from -- from Technical Appendix 9a on
9 page 67? Pull up that page.

10

11 (BRIEF PAUSE)

12

13 MR. JOHN ATHAS: This is our -- this
14 is the chart that's in our Technical -- Technical
15 Appendix 9a, and it compares to two (2) different
16 methodologies. The -- the solid lines are the Manitoba
17 Hydro methodology, which does preserve an element of
18 risk in the -- for the -- for the Gas Plan. So the --
19 the dark maroon number there, that solid maroon is the
20 Gas Plan and it shows that risk.

21 This risk, in my mind, this is
22 essentially a cost risk profile, because it shows you
23 how the plan -- the -- the cost of the plan of the All
24 Gas will vary over time, because it's been subtracted
25 from a constant and versus the cost of the -- of -- of

1 the Preferred Development Plan.

2 When you look at these two (2) curves,
3 it looks like that, except for one (1) part where they
4 -- where they kiss here a little bit, that you have a
5 dominant case, where it almost reminds you of the fact
6 that you could look at it and walk away and say, Oh,
7 it's always better to use -- to do the Preferred
8 Development Plan, and that would be an in -- a wrong
9 takeaway from the -- from the information. It wouldn't
10 be intended to -- to have someone take away that
11 information, but it would be the wrong one if that was
12 what was inferred by the decision maker.

13 In -- in the methodology that we do by -
14 - by trying to do the value basis -- and the value
15 basis is, what do I get back -- what do I net out for
16 my money of spending the extra capital dollars that Dan
17 spoke about? In the -- in our equat -- then you say,
18 This is how many time -- what's the probability of
19 being right on the big -- making the big investment, or
20 what's the probability of make -- of being better off
21 by making the smaller investment?

22 And so that -- that's -- and they --
23 they have the -- they have a similar value. They have
24 -- both have value to a decision maker. You just have
25 to make sure that you don't -- that you don't imply

1 information that's not -- that wasn't intended from the
2 -- from the curves.

3 DR. HUGH GRANT: Just bear with me here
4 for one moment. I guess what I'm having a bit of
5 trouble with is trying to think about how you should
6 cope with uncertainty. And I understand that you view
7 the big capital project as the risky one and something
8 like All Gas as being less risky.

9 But another way of viewing it would be
10 that the risk-adverse case is to build the big hydro
11 dams because, you know, you've got this big expenditure
12 but those costs are -- are fairly well known. And so
13 basically you could build a big hydro project and then
14 guarantee yourself -- you would know the cost of
15 electricity, would you not, over the next hundred
16 years, 'cause the -- the marginal cost is fairly small,
17 right?

18 So in some ways, you know, that -- if
19 you want a perfect hedging strategy, that -- that's the
20 one to take. Now, you could look pretty silly with a
21 stranded asset twenty (20) years out, or you could
22 look...

23 MR. DANIEL PEACO: I think the -- the
24 complicated -- I mean, that would be true to the extent
25 that you were building it solely for domestic

1 consumption.

2 DR. HUGH GRANT: Okay.

3 MR. DANIEL PEACO: But -- but part of
4 what you're doing here is you're building -- you're --
5 you -- necessarily -- given the scale of things, you --
6 you're building something bigger than you can absorb
7 all in one shot. And so it's dependent upon, you know,
8 taking advantage of the market to sort of pay for some
9 of that up front, and some of that to the extent that
10 you can -- you can sort of build into that hedge the
11 hedge of the -- the price certainty and the con -- and
12 the export contracts that mitigates that part of it.

13 But nevertheless, part of what you see
14 with the uncertainty here is there's still a lot of
15 that that's exposed to the market. And that's --
16 that's the -- you know, I think it's -- it's the part
17 of the project that necessarily is exposed to whatever
18 is happening in the -- the external export market that
19 you can't sort of -- you can't take a hedge position
20 for all of that energy, is -- is where -- where that
21 isn't exactly what -- what you're doing.

22 But I -- I take your point. I think if
23 you -- you -- it is a decision of -- it's like any
24 hedge. Do I -- do I get a certain cost now and then
25 sort of a little bit of that over time, or do I take

1 the market and -- clearly the market uncertainty here
2 is driving a lot of this.

3 But -- but the market uncertainty
4 affects gas and hydro -- hydro as proposed here,
5 because the hydro is exposed to the -- to the market to
6 a fairly -- to a fair -- to a large degree. They
7 affect it -- affect it in different ways, clearly in
8 opposite ways.

9 DR. HUGH GRANT: Okay. But once built,
10 my cost of generation is known.

11 MR. DANIEL PEACO: Yes.

12 MR. JOHN ATHAS: Yeah -- yeah, that's
13 the key. The -- the -- you're fixing your cost to
14 produce the electricity, but you're not fixing the cost
15 to the consumers that -- that -- how much they have to
16 pay of that cost to -- that you fixed. And in our --
17 in our financial paper, 10a, we have a chart that --
18 that shows the -- how the price of electricity varies
19 in the PDP over -- over the different scenarios.

20 And so -- and it's far from vertical.
21 And, so it's -- and -- and it's compared to the All Gas
22 one, because it's not -- not a difference of the two
23 (2). They're both priced -- average priced to the
24 consumers. And that's -- that's one way to get at the
25 -- and we had a data request similar to this number.

1 But that's one way to get at the: How do I understand
2 the differences in the -- of the risk of both of those
3 plans?

4 MR. RICHARD BEL: Isn't -- isn't one of
5 the -- one of the benefits of the All Gas Plan the fact
6 that the capital investment is incremental so that if
7 you did get it wrong in the future, you don't invest?

8

9 (BRIEF PAUSE)

10

11 MR. DANIEL PEACO: Sorry about that.
12 Yeah, and again that gets into the pathway discussion.
13 We're actually planning to move to that at some point.
14 But I think -- yeah, you -- then you have to say --
15 because all of these plans that we've talked about so
16 far, we're basically saying, Let's postulate a
17 portfolio that we're going to commit to today for
18 seventy-eight (78) years. And whereas in -- in
19 practice you're going to commit to things you have to
20 commit to today, and then you're going to reserve
21 judgment to make further choices later on, when you --
22 when you know more. So the whole discussion about what
23 you -- what you learn in the intervening time and --
24 and what you -- how that'll affect decisions you make
25 next.

1 But -- but you're right. You know,
2 there's -- there's a sequence of decisions you -- if
3 you think of the All Gas Plan, we were talking about
4 the plan where you -- you're adding seven (7) combined
5 cycle units. Well, you might add one (1) and then you
6 -- and then a few years later -- you'd have to wait a
7 few years to see whether the second one made sense or
8 not.

9 You wouldn't make a decision on what you
10 know today. You'd make a decision on everything you
11 would know at that point in time. And at -- and at
12 that point you may say, The US just put in this huge
13 carbon market, and we better go hydro big time. You
14 know, and -- and -- whereas today, you don't
15 necessarily know that for sure.

16 MR. JOHN ATHAS: Yeah, and that gets
17 into the -- the que -- the whole issue of -- of -- that
18 Dan was talking about, with sub-optimal. The -- these
19 path -- these plans are a straight-ahead postulation
20 for -- for adding unit -- adding that type of resource
21 that characterized the plan through the first thirty-
22 five (35) years and then extending it.

23 The -- but the truth is, they're both
24 more dynamic, so you -- there's an optimum choice to
25 make, as we'll see in the pathway discussions. But

1 that's part of the -- the same issue around the opt --
2 the optimality.

3 MR. DANIEL PEACO: Okay. So a couple
4 of other things to mention on this chart, and then
5 we'll move on. I've got a red arrow there simply as a
6 visual aid.

7 So when we go look at the next one, the
8 pro-forms and the capital cost change, it's easier to
9 kind of let your mind's eye -- we'll flip back and
10 forth so you can see kind of how these curves shift by
11 int -- so you -- it'll give you the sense of the
12 magnitude of those capital cost changes and how they
13 would affect the shapes of these curves.

14 The second thing I'll point out is --
15 and we mentioned this before -- is the expected value
16 was different than reference case. On these curves, a
17 reference case actually resides somewhere up near the
18 arrow we pointed in there.

19 And so the reference case -- sometimes
20 you tend to think in terms of, well, the reference case
21 must be the median value or the -- you know, it -- but
22 it -- it doesn't necessarily be that, and Hydro didn't
23 represent it to be. But -- but you tend to think of it
24 in those terms.

25 But in this -- in this particular case,

1 the probability formulation that they have, the
2 reference cases actually falls somewhere north of the -
3 - the crossover point here above -- above the median
4 value. And so it's just important to know where the
5 reference case assumptions lie on the continuum between
6 the low and high in this -- in this presentation.

7 So the next slide I'm going to show you
8 is going to be the same curve with -- the only thing is
9 the PDP cost changes will -- the costs will be
10 reflective of the updated costs, capital costs.

11 So you can see the -- the red arrow, and
12 I'll show you this. We'll start with that. So the red
13 arrow at the 50 percent point, the debt value for the
14 PDP is slightly less than the All Gas Plan, whereas in
15 the prior slide, on slide 47, it's clearly at the 50
16 percent point.

17 It's -- so -- so the curves basically
18 shifted to the -- to the left by that amount. And so
19 otherwise, you see the shapes aren't too different.
20 The capital cost uncertainty is a little bit different.
21 But this is -- it basically fundamentally shifts these
22 curves to the left.

23 And you could see that, with the change
24 in capital cost, the -- this distribution, the
25 probability that -- across these cases, the probability

1 that the Gas Plan is the more cost effective is
2 slightly higher than 50 percent. And the probability
3 that the -- that the PDP is more cost effective is --
4 is about 45 percent. So -- as opposed to on the prior
5 slide, 47, it was about the reverse.

6 So that -- that kind of -- so we show
7 this. Basically, this -- this shows the -- with simply
8 taking the 2012 assumptions and pro-forming in the
9 change in capital costs, this is the -- the --
10 essentially the -- the shift in those curves and the
11 relationship between these two (2) plans.

12 The next -- in the next slide, what we
13 show is same distribution, same case. And this is with
14 the updated capital costs for the provincial plan. So
15 the -- so the -- the 2012 assumptions with updated
16 capital costs that show the probability the provincial
17 outcome is positive is, you know -- or is negative is
18 about 40 percent. And the -- the probability that it's
19 positive is 60 percent.

20 And -- and included in -- in this, we've
21 -- we've included in the capital tax and the water
22 rate, but not the debt guarantee. And we -- we -- and
23 we talked in our report about the fact that we think
24 the debt guarantee is -- basically is a transfer for --
25 for us.

1 It's not strict revenue to the province.
2 It's a compensation for costs that they incur
3 elsewhere. But -- but that's something we could talk
4 about. But for purposes of this chart, just -- you
5 should understand that that's what's in these numbers.

6 So moving to slide 50. The second thing
7 we want to illustrate in the uncertainty analysis is to
8 compare PDP to Plans 4, 5, and 6. And these are plans
9 that have basically Keeyask only and not Conawapa. And
10 we're going to compare those, obviously, using the All
11 Gas comparison framework.

12 First -- first, we're going to show
13 using -- again showing the 2012 assumptions. Second,
14 we're going to show for the updated capital costs. And
15 then -- and then, as -- as it says here, their -- their
16 variance was with Keeyask only. The -- the comparison
17 we show, each one of those will be the difference
18 between the All Gas. And so you'll see the relative
19 shape of each of the plans, how they perform relative
20 to the All Gas and relative to each other.

21 Well, again, what we show is the -- the
22 seventy-eight (78) net present value difference across
23 twenty-seven (27) cases. In this case, we've added a
24 text box into it to -- to show reference case, expected
25 value, and reward/regret information.

1 Moving to slide 51. This figure shows
2 the -- the analysis -- the uncertainty analysis of
3 those cases, those four (4) -- those four (4) plans,
4 Plan 14, which is the Preferred Development Plan, and
5 4, 5, and 6, which are -- which are a variants of
6 Keeyask-only plans.

7 And you can see that they're fairly well
8 grouped and -- and reasonably similarly shaped. The --
9 the Preferred Development Plan has a larger upside and
10 a -- and a bigger downside than the other plans. But
11 4, 5, and 6 all perform relatively similarly compared
12 to the Preferred Development Plan.

13 But you can see that under this
14 circumstance there's -- if you look, the -- the light
15 blue line, which is the Preferred Development Plan, is
16 the lowest performer about 42 percent of the time. And
17 then for the rest of the time, it's -- it's better.

18 So the -- the -- clearly, the -- it
19 stands out relative to those other plans because of the
20 -- the greater upside with the conditions that are
21 predominant in the top part of the curve relative to
22 the others.

23 So again I put -- just for -- for the
24 mind's eye help, I put the red arrow at the 50 percent
25 point. And as we go to the next slide to look at this

1 with the upgraded -- updated capital cost, you can see
2 that the shift, the PDP, obviously, because it has both
3 Keeyask and Conawapa and its -- its cost increasing, it
4 -- it changes so that it's -- it's now -- the PDP is --
5 performs more poorly than the other plans 55 percent of
6 the cases looked at, and obviously still has -- has
7 more upside on the other end. But -- but it shifts
8 there.

9 The -- the other thing to note is the 4,
10 5, and 6 -- I think we only have 4 and 5 on here, but
11 we didn't have the results for 6 for the updated
12 capital costs; 4 and 5 still perform -- in -- in the
13 majority of the cases, performed better than All Gas,
14 even with the -- with the adjusted capital cost. But
15 there are -- 40 percent of the time where -- where
16 they're below the Gas as opposed to, in -- in slide 51,
17 they were better about 35 percent of the time. So that
18 -- that's sort of the effect of the capital cost change
19 on that analysis.

20 And in the -- in the boxes here, you'll
21 see we've put in the reference case values across the
22 plans, the -- what we call the 10th percentile risk.
23 So what -- what the -- if you -- if you take the -- the
24 bottom 10 percent number off there, how -- how bad can
25 -- obviously, the -- the PDP has a minus three billion,

1 two ninety-two (3,292,000,000), which is must larger
2 negative at the -- at the one tail than the others.
3 And the it also has, you know, a \$4 billion -- 44 --
4 four billion, four twenty-four (4,424,000,000) outcome
5 on the 95th percentile on the upside.

6 So the -- there's much different
7 characteristics to those plans. And this is a way to
8 show them across the twenty-seven (27) cases.

9 The -- moving to slide 53. The third
10 illustration we want to do -- and this is the last one.
11 So the -- we want to show the sensitivity analysis on
12 certain parameters. One of the things we want to show
13 is -- is a continuation of PDP, the -- in the Plans 4,
14 5, and 6 example, the -- the sensitivity analysis on
15 uncertain parameters. First, we're going to look at
16 the discount rate parameter, and we did a discount --
17 this is an analysis we did in our -- in our reports.

18 We tested four and half (4 1/2), five
19 and a half (5 1/2), seven and a half (7 1/2) load --
20 low, reference, high discount rates as opposed to the -
21 - the numbers used in the -- in this -- in the Hydro
22 submission of three (3) and a -- three point three-five
23 (3.35), five o-five (5.05), and six five (6.5), and
24 these are numbers that we've -- we sort of developed in
25 conjunction with Morrison Park Associates. So we used

1 those as a -- as a test of -- of the change in discount
2 rates.

3 The -- the second test we'll show you is
4 the sensitivity of these results to energy price
5 probabilities. So we used a -- a 40 percent low, 50
6 percent reference, 10 percent high as compared to the
7 numbers that were in the prior -- Hydro's numbers that
8 were compared in the higher -- prior cases of 30
9 percent low, 50 percent reference, and 15 percent high.

10 So there's -- their numbers are somewhat
11 more weighted to the high -- high cases than the ones
12 we're going to test. So we're testing a -- what if
13 they're somewhat lower or -- or the low prices are
14 somewhat more probable than what -- what they're --
15 what they assume?

16 The third piece we're going to test is
17 capital cost, and this is going to be capital cost we -
18 - analysis that we did before we had the capital cost
19 update. So this is based on the 2012 analysis. What
20 we did is we postulated in our reports, Let's set the
21 low -- and -- and again, we talked through this and
22 sort of postulated a case that we talked through with
23 Knight Piesold.

24 So we set the low capital cost equal to
25 the reference case assumptions. We set the reference

1 case equal to reference plus 20 percent, and the high
2 equal to the high plus 20 percent that they had. So
3 basically, it's a -- a shift up in the cost for those,
4 and we can still show that sensitivity. It -- it
5 doesn't match up exactly with the -- with the cost
6 change, but it -- but it's instructive as to show the
7 sensitivity to the cost changes in those projects.

8 So the discount rate sensitivity, what
9 we see here is that this shows the dis -- the -- the
10 curve results with -- with the discount rates at four
11 (4), five (5), and seven (7), and you'll -- you see
12 that the -- the PDP obviously is -- is the least
13 attractive plan about half the time, the lower half,
14 and then they're -- they're all sort of cross the --
15 the -- or they're sort of equally likely to be more or
16 less attractive than the Gas Plan, because they all
17 cross at about the 50 percent point.

18 And -- and the -- the expected value
19 numbers, you can see the PDP -- by changing those
20 discount rates to this level, the expected value of the
21 Preferred Development Plan is actually slightly
22 negative, at minus twenty-one (21), and the other three
23 (3) plans are slightly positive to the -- you know,
24 two-eighty-six (286), two-o-two (202), and -- and four-
25 sixty-four (464).

1 The box in the top left shows sort of
2 the change in expected value between -- for each of the
3 plans between sort of the -- the -- under -- under this
4 case versus the -- the Hydro's -- Hydro's case, and you
5 could see, like, for example, Plan 4 was -- the -- the
6 expected value was a -- a billion forty-one (41). It -
7 - it -- under this sensitivity, it got -- it drops to
8 464 million, for a difference of 577 million by
9 changing the -- the level of discount rates. So it
10 shows you the -- the extent to which these results are
11 sensitive to discount rate.

12 The next slide, 55, is the energy price
13 probabilities sensitivity, and as we'd talked about, we
14 -- we changed the probability somewhat to be somewhat
15 low, so the prices are -- are on average somewhat lower
16 than this, and so you can see the shape here is -- is
17 not dissimilar from the one (1) we just looked at. The
18 expected value under this -- this test moved -- for
19 Plan 4, moved from -- from a billion forty-one (41) to
20 eight-twenty (820). So that's -- that -- \$220 million
21 drop from the -- that change in the probabilities.

22 And you can see that the -- the -- each
23 of the plans has a similar change, and the -- there's a
24 text box at the -- on the right at the -- at the lower
25 right that shows the -- the probability assignments in

1 the two (2) -- in the two (2) cases that we compared.

2 The third one (1) is the capital cost
3 sensitivity, where we -- we put the -- the location at
4 the reference assumptions, the original reference
5 assumptions, and then increased the -- the reference
6 case 20 percent, and increased the high case 20
7 percent.

8 And those -- those numbers change the
9 results for the 4, 5, and 6 by a little over \$500
10 million, and it changed the Preferred Development Plan
11 by 1.2 billion, taking it slightly negative on the
12 expected value basis, and you can see that -- and --
13 and with that kind of a sensitivity, the Preferred
14 Development Plan is -- is the lowest plan for about 70
15 -- 70 percent of the cases looked at in this -- in this
16 thing, so obviously more sensitive to capital cost
17 change than the plans without Conawapa.

18 The -- so -- and I'm done with those. I
19 won't abuse you anymore with -- with more of those
20 charts, but these -- these are samples of the tests we
21 included. We tested a lot of different sensitivities --
22 sensitive -- sensitivities, and included those in
23 Technical Appendix 9A, and -- and some additional ones
24 in 9B, including some quartile analysis that we were
25 asked to perform.

1 And so if you're interested in more
2 information, or more looks comparing different plans,
3 those -- those are provided in our -- in our reports,
4 but I wanted to use these to -- to show you a little
5 bit about what we've done, and -- and how to think
6 about ways to look at the uncertainty information and -
7 - and consider that.

8 The model that we used to -- to do this
9 analysis is part of the work papers that I mentioned in
10 the beginning that we provided. So, you know, anybody
11 so inclined, they can pick up the model and plug in
12 their own probabilities, or whatever they want to do,
13 and see what happens to that, or their own input
14 assumptions on many of the parameters, but -- so -- so
15 that's something that if you -- if you're -- someone's
16 interested in that, that that's available in our -- in
17 our materials that we filed, as well.

18 So this -- some uncertainty analysis for
19 the new cases that we looked at, and I want to shift
20 gears now that we've gone through that. The La Capra
21 wind case, the combined cycle case, and the no gen
22 case, we put together somewhat the -- we -- we got
23 information from each of those to put into the same
24 kind of thing to see how those compare, and -- and
25 compared those to the Preferred Development Plan just

1 to see how they map out.

2 So this -- this shows a few things. The
3 -- again, the same data, but what I want to -- what
4 I'll explain here is the red line -- or -- or first,
5 the -- the blue -- the -- the light blue line going
6 across is the Preferred Development Plan, the one we've
7 been looking at, and again, this is -- this is the case
8 with 2012 assumptions with the updated capital costs
9 for -- for the Preferred Development Plan.

10 And compared to that is the -- the red
11 line is the no generation case. The green line is --
12 is our version of the wind case, and the dark blue line
13 is the original Plan 3, or the -- or Manitoba Hydro's
14 wind case. So you can see the change in our -- in our
15 assumptions going from the dark blue to the green on
16 the wind case, making it -- obviously, the wind case is
17 -- performs differently than -- than gas, and it has
18 some of the same -- you know, same characteristics as -
19 - as hydro as being more favourable toward the top end
20 of the curve and less favourable to the bottom.

21 And you can also see there's a light
22 grey bar more or less up and down the middle, which is
23 the -- which is the all combined cycle case, which is
24 similar to the -- the All Gas case. So we've done this
25 comparison, as well, to show that, particularly, the --

1 the no gen case and the wind case as we've postulated
2 them, and how they compare to All Gas and -- and PDP
3 with the updated capital cost.

4 So to wrap up on the uncertainty
5 analysis, this obviously illustrates the range of -- of
6 uncertainty. Cases with positive expected value can
7 also have probi -- high probability negative outcome.
8 You see there's quite a range of -- of outcomes here
9 that -- that can be had.

10 It -- the -- we feel like this is an
11 important -- this clearly is an important add -- to --
12 to have when looking at expected value in reference
13 case, because there is such large uncertainty here
14 looking at the -- the reference case, or just the
15 expected value number. Clearly you're not going to get
16 the flavour of that.

17 And so understanding that -- that these
18 cases -- these proj -- these plans perform very
19 differently depending on what kinds of assumptions you
20 have, is important to factor in, and it's going to be -
21 - makes it difficult to sort of choose among them. The
22 -- the uncertainty analysis for a full update to
23 current information is not complete. We only recently
24 received the Level 2 DSM case analysis, and most of the
25 uncertainty analysis that we've got today is, really,

1 still based on the 2012 assumptions.

2 So with the exception of -- of building
3 in some of the capital cost changes, we don't have the
4 -- the rest of the sort of the updated information
5 built into any of the uncertainty analysis to -- to
6 present at this time.

7 We've got -- we've got one (1) more
8 segment to our presentation. Yeah.

9 THE CHAIRPERSON: Make sure we have no
10 questions of this sec -- this particular section. I
11 just wanted to go back to the last slide you showed,
12 59, which -- 59. And I'm trying to understand what's
13 going on there in terms of the no new generation.

14 It's -- the -- the gain that we're
15 seeing there at the top end with respect to new gen --
16 new generation -- no new generation versus the All Gas
17 Plan is the fact that it's really a voided cost, isn't
18 it?

19 MR. DANIEL PEACO: Yeah. In -- in that
20 case, if you recall the top end there, you have low
21 market prices. So having more import capability allows
22 you to take advantage of -- you know, so you -- you --
23 basically, the -- the stuff you're importing is really
24 lower cost.

25 So if you have the ability to import

1 more -- more -- more ener -- more energy from a very
2 inexpensive market, then that's going to improve that
3 plan relative to gas that doesn't have that import
4 capability.

5 MR. JOHN ATHAS: But on the DSM
6 component of the -- of the no new -- new generations
7 component, you're right. The -- the cases up there
8 that tended -- would have high -- high avoided costs
9 would tend to contribute to that --

10

11 THE CHAIRPERSON: Just changing the
12 perspective, or it's just re -- you know, it's really -
13 - if you were to use new -- new -- no new generation as
14 the -- the base point, you'd probably get a very
15 different perspective on the outcomes.

16 MR. DANIEL PEACO: Yeah.

17 THE CHAIRPERSON: Yeah.

18 MR. JOHN ATHAS: And when we compare it
19 to the other cases, yeah.

20 THE CHAIRPERSON: Okay. I think we're
21 ready to go.

22 MR. DANIEL PEACO: Okay. Okay. So the
23 last section we want to talk about is sort of -- so
24 far, we've been talking -- and as I mentioned earlier,
25 we've been talking about sort of these resource-

1 specific portfolios: we've got gas plans, wind plans,
2 hydro plans, and we're comparing those.

3 But now it gets back to Dr. Bel's
4 earlier question about sort of the next decision and --
5 and what you -- what you have to decide and what --
6 what comes -- you're not making a decision on all
7 seventy-eight (78) years.

8 And Manitoba Hydro presented their
9 discussion on pathways and so forth, and -- and -- both
10 in their NFAT submission, and it was discussed in the
11 hearings and -- and amended in the hearings.

12 And so we wanted to comment on that,
13 both -- first on sort of the concepts and the
14 methodology, and then on the pathway options that
15 they've identified, and some -- and some analysis on
16 their preferred option.

17 So on the pathway concepts, alternative
18 -- the alternative development plans clearly are
19 illustrative portfolios or -- or illustrative of the
20 set of decisions you would make to fulfill requirements
21 over the seventy-eight (78) years.

22 It's a mixture of near-term choices with
23 longer-term, more sort of hypothetical additions that
24 you're clearly not having to decide today, but in order
25 to do the analysis, you -- you populate the -- the plan

1 with -- with some additional resources to evaluate the
2 -- the investments you are making over the life of the
3 asset.

4 Manito -- Manitoba Hydro's pathway
5 concept is a good approach, and it's -- you know, it's
6 a common approach, and it's -- and it's a good way to
7 think about the near-term decisions. It focusses -- it
8 -- it brings -- once you've done this analysis, it
9 brings you back to focus on the decisions needed now on
10 the next investments, and the next actions that you
11 want to take in -- in investing in the -- in the
12 system.

13 And you -- you've got to consider the
14 timing and the extent and then -- of the needs and the
15 lead-time options as part of that, because the --
16 obviously, to the extent that you make an investment,
17 and -- and it's -- it's going to affect the
18 perspective.

19 For example, if you have a -- a short
20 lead time, if you can build a gas turbine in -- in a
21 short period of time, then -- then your decision time
22 frame is different than if you're investing in a hydro
23 plant where you necessarily have a fairly lengthy
24 planning and permitting and construction lead time
25 built into those kinds of options.

1 For needs that go beyond those met by
2 the options, obviously all options are open. So you
3 can probably -- well, we -- well, we have a plan that's
4 all gas. You can do one (1) gas/hydro/wind -- you
5 know, a one (1) gas/hydro/wind plan does not require
6 all gas/hydro/wind. So when -- when decision -- when
7 it actually comes time to make a decision, you're not
8 choosing a seventy-eight (78) year portfolio. You're
9 choosing -- looking at those to -- to help you inform
10 you what -- what do you choose next.

11 And I don't think I'm saying anything
12 any different than Hydro said. It's just that this is
13 sort of -- we -- we agree with the framework, and I
14 think that we'll use that framework to talk about some
15 of the -- what we've learned and how it affects the --
16 what pathways you might want to consider.

17 There is clearly a situation where some
18 options may be mutually exclusive or limited in time.
19 You know, if you decide to delay Keeyask, obviously
20 you're putting at risk the notion that Minnes --
21 Minnesota Power's contract, as currently written, may
22 not stick around. They'd have to renegotiate that if
23 it was going to stay in place.

24 And so there's -- there's clearly time-
25 limited elements to any resource decision. But as a

1 general matter, you know, investments that you make in
2 a -- in a gas plant or a wind plant or -- or a hydro
3 plant could be -- could be altered if you -- if you ch
4 -- decided it was economic to change the sequence.

5 So the pathway methodology. Analysis of
6 the path decision, what we want to do here is to
7 compare alternative path options with common longer
8 term assumptions in this case. So where we now have
9 been -- where we have been comparing, you know, an All
10 Gas Plan to an All Hydro Plan or -- or something else,
11 what you want to say, If I make a -- a set of
12 decisions, if I'm going to decide to build a gas plant
13 next or Keeyask next, you'd want to say, Now that I've
14 got this I want to say -- make each of those
15 investments. And then I assume after that, that the
16 plan decisions are the same.

17 So you can see how those two (2) plan --
18 how those two (2) investment paths compare directly.
19 So there's a little bit different analyses you do.
20 There are some of the fifteen (15) analyses that Hydro
21 did where -- lend -- lends yourself to looking at
22 exactly that, but not all of them. And so that's
23 something that we'll -- that we'll -- we talk about a
24 little bit here.

25 The other things you want to think

1 about, and this obviously is once you've done it, you
2 know, with a -- with a large hydro investment, what's
3 the longevity of the solution and -- and how long is it
4 before you -- you expect you're going to next have to
5 invest? And what does that tell you about the --
6 whether you're foreclosing options or not and whether -
7 - whether you're -- whether you've got a hedge that's
8 in position for a long time?

9 And -- but it does obviously affect the
10 flexibility to respond to new information. If you're -
11 - if you basically make -- make an investment that --
12 that locks you into something and -- and you're --
13 you're good for twenty (20) years, then that's
14 different than if you have more flexibility. And that
15 may be a good or bad thing, depending upon the choices
16 you make.

17 And I want to comment a little bit on --
18 on the learnings process. I know there was a lot of
19 discussion in the hearings earlier the la -- last month
20 about the learnings you would do. Obviously, in this
21 concept what you would do is you would make decisions,
22 whether it's a follow-on decisions, with then-current
23 information.

24 And you -- you necessarily will be more
25 informed about those decisions at that time than you

1 are today. And so that's -- that's something that,
2 looking at these -- those -- those longer-term
3 decisions are more to help do the analysis today for
4 these decisions, and not make -- make commitments to
5 those longer-term decisions.

6 So what Hydro put together and presented
7 in its direct was a proposition that the pathways that
8 they'd originally proposed in the NFAT were five (5)
9 and are now three (3). And they've -- they've included
10 one (1) path as -- as a -- building a gas plant in '23
11 only for domestic load, and then do something else
12 later.

13 They -- the second one they feature is -
14 - is Keeyask in '23; basically Keeyask by itself,
15 foregoing the transmission line, foregoing the -- the
16 Minnesota Power contract, and doing something else
17 later.

18 And then path -- the third and fourth
19 one, which is basically the -- which is basically doing
20 Keeyask and the 250 line, with the Minnesota -- with --
21 with some of the contracts, the Minnesota Power
22 contract, along with that has been taken off the table
23 because of the hypothetical nature of the 250 megawatt
24 transmission line option.

25 Number 4 was taken off the table because

1 the -- because due to the signing of the WPS 308
2 megawatt contract which, in that plan, that path was
3 building Keeyask with a 750 line and the Minnes --
4 Minnes -- Minnesota Power contract. So basically, the
5 difference between 3 and 4 was the -- was the size of
6 the transmission line.

7 So taking those out, left with path --
8 their Path 5, or the third path that's still in play
9 for them, is -- is building Keeyask in '29 (sic) with a
10 750 line, the Minnesota Power sale, and with the 308
11 megawatt Wisconsin contract. So -- and this is sort of
12 -- this is where they've left the pathway discussion
13 from their -- from their testimony.

14 But we have some additional input from
15 Hydro to think about, in terms of what -- how to think
16 about the pathways. They spent a lot of time talking
17 about Level 2 DSM and -- in all paths, but that's
18 really not reflected in the table that they've
19 presented.

20 They've -- they have indicated in their
21 testimony that -- that Level 2 DSM moves the year of
22 need for dependable energy to 2027 or -- or later, and
23 for -- for winter capacity to '31/'32. The -- there
24 really is no need -- and there is no need to make a
25 commitment of Conawapa at this time is something that

1 they -- they've indicated very directly in -- in their
2 oral testimony.

3 I guess the third element of this is
4 that the Wisconsin Public Service 308 megawatt contract
5 is very clearly contingent on Conawapa. So including
6 it as part of Pathway 5, which I'll go back to slide
7 65, is not consistent with sort of waiting later to do
8 Conawapa or something else.

9 In order for it to be part of Path 5,
10 they would either have to build Conawapa or they would
11 have to decide to waive the condition that Conawapa be
12 built as part of that. So the -- the inclusion of it
13 in Path 5 in this chart is a little inconsistent with
14 the -- the structure of the agreement. And it's tied
15 to both Keeyask and Conawapa being built.

16 So with that, we also feel like, from
17 the analysis that we've done and we've talked about
18 today, clearly transmission has value as import and
19 export enabler. And it looks like every plan we have
20 with transmission in it, to some level, so long as it
21 includes some import capability, it has some value. So
22 we have to think about whether that's an important
23 resource to be looking at in and of itself.

24 The limited economics for advancing
25 hydro, the defer cases show similar results to -- to

1 the deferring -- advancing meaning building a hydro
2 before you actually have a need for capacity and energy
3 -- without some associated build of transmission and
4 export contracts isn't there. And so it -- it really -
5 - that pathway isn't so clear.

6 And then the mix of resources can offer
7 some value, as well. So what we've postulated based
8 upon what we've looked at, there's probably a broader
9 set of pathways that ought to be considered at this
10 time. And I think based on -- particularly based on
11 Hydro's testimony, the first resource had -- to our
12 understanding, that they're recommending is Level 2 DSM
13 for all of those, which immediately puts the year of
14 need for dependable energy and capacity in -- for
15 domestic load out close to -- to 2030.

16 So then what does that leave you for
17 second resources? Path -- what I would say is Path 1
18 is the fifth path that Manitoba Hydro has put together,
19 advancing Keeyask with the Minnesota Power contract and
20 the 750 line. However, I -- I sort of removed from
21 this the Wisconsin contract because, as -- as I
22 mentioned earlier, one of the -- one of the essential
23 elements of going forward with the Wisconsin contract
24 is -- is it's contingent on Conawapa.

25 So that really kind of goes into follow-

1 on decisions. They really have an option today to
2 exercise in the event that they go forward with
3 Conawapa. But -- but they're not -- but it's really
4 not a commitment that's bound to choosing to do Keeyask
5 and the Minnesota Power contract and the 750 line.

6 The second one on our list is DSM Level
7 2 Keeyask23, which is -- which is Manitoba Hydro's path
8 to -- with the DSM Level 2 added in. That's called an
9 alternative path because they have it in there. They -
10 - they just -- it should be amended to include the DSM
11 Level 2.

12 And I put a corollary to that because
13 it's -- it's -- up until just before the hearings, the
14 250 mine -- the 250 megawatt line was -- was an option
15 in play and evaluated a lot of the cases. We've left
16 that in there because it's really not clear to us
17 whether that -- that's an opt -- that -- that's an
18 option that's off the table or not.

19 But it -- but it seems that -- so we've
20 left it in here because I -- it would seem that we need
21 more information to know whether a 250 line to some
22 delivery point is -- is feasible. It looked to be more
23 economic in some of the cases, and so it seemed to
24 ought to at least be put in and -- and run to ground a
25 little more than it has been today.

1 The -- the third option we have is
2 basically deferring Keeyask to 2028, and that's sort of
3 the -- the analysis I talked about earlier. That would
4 align Keeyask more with the year of need that results
5 when you do DSM Level 2, and it's -- and a corollary to
6 that would be doing that with a smaller transmission
7 line.

8 Pathway 4 is again, DSM Level 2, and new
9 gas capacity around 2028, and that's enough lead time.
10 You don't really need -- need to make a commitment for
11 a gas capacity at that timeline, but that would be the
12 -- sort of the -- a -- a path to consider as well.

13 Path 5 would be -- think about doing
14 transmission on its own. Obviously, the -- the No
15 Generation Case showed with some added imports some
16 interesting economics, so I think at least at a
17 minimum, that would be a pathway you'd want to think
18 about, whether there's some level of transmission by
19 itself that might add value as import capacity.

20 Pathway 6, again, DSM Level 2 and a
21 smaller transmission line, with being sure to include
22 the import capacity. The -- the 250 line, you may
23 recall, was -- was postulated as two fifty (250) export
24 and fifty (50) import, but with a -- with a small
25 incremental investment, could be increased to two fifty

1 (250) import. So it looks like the import would be
2 something you'd want to consider there.

3 And Path 7, DSM Level 2 with some
4 combination of wind and gas, as you need capacity and
5 energy later on.

6 So as we looked at these things,
7 particularly with the -- the change in the economic
8 Preferred Development Plan, rather than whittling
9 things down it seems like these are all -- in -- in
10 terms of -- particularly given our charts that say, Are
11 there -- are there plans that are potentially cost
12 competitive with the Preferred Development Plan, which
13 I now think is really reflected in Path 1, then all of
14 these things, at least from the information we have
15 would seem to be potentially cost competitive with --
16 with that alternative.

17

18 (BRIEF PAUSE)

19

20 MR. DANIEL PEACO: On slide 69. So,
21 the current economic analysis for these particular
22 pathways really hasn't been developed. As we've talked
23 about, some of the updating is still at works, and some
24 of these -- some of these particular pathways have not
25 been evaluated, and I'm not sure that they're -- Hydro

1 is actually evaluating them at this -- at this
2 juncture.

3 But the indicators of value from the
4 work that has been done to date we'll go through a
5 little bit to try to inform things, and these are --
6 this is partly reflected in some of the addendum work
7 that we've done, and -- and we've tried to roll in --
8 some of that into some -- some information here.

9 The 2012 assumptions with updated
10 capital costs for -- is available for some plans. The
11 2013 reference case updates is available for some of
12 these plans. The DSM Level 2 analysis for some plans,
13 and that information is just in, but those are all
14 pieces of what you would need to evaluate some or all
15 of these pathways.

16 Not all of this is -- is in hand yet or
17 -- or underway, but that would be the nature of the
18 kind of analyses you want to do, and so what we've
19 tried to do in -- in lieu of having such analysis would
20 be to cobble together what we can glean from what we do
21 have in hand, and -- and show what that might say about
22 some of these plans.

23 First, we -- and I think -- I think
24 there was a question earlier for something like this.
25 This is our -- our hockey card for the several plans --

1 some of the several plans that we're looking at. You
2 notice Plan 2, the K22 is really a variant of one of
3 the pathways that Hydro has produced -- proposed, which
4 is doing Keeyask by itself.

5 And we've done this -- this is
6 information based upon, I believe, the -- this is 2012
7 ref -- reference with updated capital cost, so it's
8 updated only to the extent that the capital costs are
9 there, and you can kind of see what those numbers are,
10 and this is the nature of the kind of information that
11 we built into our addendum sub -- submission that came
12 in last week, as updating a number of our tables where
13 we have information to reflect this.

14 So this is updated to the extent that
15 the Keeyask and Conawapa capital costs are changed, so
16 you can say that Preferred Development Plan, seventy-
17 eight (78) net present value. This is -- yeah, and
18 this is reference case assumptions is seven ninety-
19 eight (798). So that would compare to the billion
20 seven (1,700,000,000) number that we started the day
21 with, and these others are -- are there.

22 So these are all sort of reference case
23 numbers, but it shows you how -- so you could see where
24 Plan 2, which is one (1) of the pathways that -- that -
25 - or that Hydro has suggested, that would essentially

1 be the -- the analysis for that relative to the -- to
2 the gas plan.

3 And so that would give you a measure of
4 that particular pathway and the relative variance, so
5 you could see, if you look at K22 versus gas, which is
6 this number on reference case assumptions, with updated
7 capital costs, it has a -- a break in the year of 2059
8 versus gas, and it shows a over seventy-eight (78)
9 years, a -- a \$489 million present value outcome.

10 And when we look at Plans 3 -- 5 -- so
11 this is a chart very similar to the one we saw before.
12 We put on this chart our wind case, Hydro's wind case,
13 the combined cycle case, the All Gas case clearly is
14 the reference point.

15 And we put on this, instead of the per -
16 - instead of the prior Preferred Development Plan, we
17 put on Plan 5, which is Conawa -- Keeyask in '19 and
18 the 750 line, with Wisc -- with -- with Wisconsin sale
19 and investment in there. So it's a -- it's a somewhat
20 out-of-date plan, but -- but it's fairly close to the
21 result for the -- what I think is now the Preferred
22 Plan that Hydro has put forward.

23 And so with updated capital costs, you
24 can see that that plan sort of falls -- it's very close
25 to the -- the La Capra Associates's wind -- wind case,

1 the green line, and -- and you could see how that
2 compares.

3 So with updated capital costs, not
4 updating for other things, then the -- the -- let me go
5 back to the -- to the chart. This is -- this is a
6 close approximation of -- or the closest approximation
7 we have of Path 1, which is -- which is Hydro's Path 5.
8 It doesn't have level 2 DSM in it, but it does have the
9 -- sort of the configuration of second resources that
10 Hydro is now featuring in its path.

11 And then what we've also shown here is
12 some information we have going on expected value basis,
13 going from the original analysis, 2012 evaluations, and
14 this is somewhat -- there's a lot of data on this
15 chart, but if you -- let's -- let me explain the
16 original.

17 On the original, you have the -- the bar
18 to the most left is -- is the Plan 14 expected value
19 outcome from Manitoba Hydro's perspective. The bar --
20 the lighter -- lighter pink bar next to it is -- is the
21 same plan with a provincial view, and so each of these
22 plans is paired -- the Hydro view and the provincial
23 view are paired together.

24 The -- the third bar, the -- the darker
25 blue bar is Hydro's Plan 4, which is one of the Keeyask

1 -- Con -- yeah, Keeyask-only cases, and next to that is
2 its counterpart provincial view.

3 And we then have Plan 5 and Plan 6. So
4 it's -- it's Plan 14, 4, 5, and 6, and it just shows
5 how those have changed. The second set of numbers
6 shows the same sequence with both views updated for
7 capital costs.

8 And then the third one, it removes --
9 removes the -- the Wisconsin Public Service investment
10 that's built into the original ones for those cases
11 that had it in, in the first place.

12 And then the last case is -- and it's
13 shaded lightly, same plans, but we looked at the
14 information we had on these plans in the DSM cases.
15 They haven't been melded together, so we -- we don't
16 really have the hard numbers as we do with the -- with
17 the other cases, but this is sort of our best back-of-
18 the-envelope to where those -- where those cases would
19 come out if you layered into them the -- the Level 2
20 DSM as well.

21 And so those aren't -- those aren't hard
22 numbers, but we -- what we wanted to do is to say what
23 they would do -- what we think they would -- a
24 direction in what they would do and a -- and a rough
25 magnitude based upon what information we do have to

1 kind of show you where that might be.

2 And I think that -- so our -- so and
3 conclude an observation on pathways. The DSM Level 2
4 clearly changes the starting point for all the
5 pathways. Changes in the case are materially altered
6 by -- alter the Hydro base path in particular, because
7 in addition to the DSM 2, you have the capital cost
8 changes, and several new alternative pathways really
9 kind of come into the picture that -- that potentially,
10 you would want to consider.

11 And the -- and the economic analysis
12 that we have really hasn't caught up with all the
13 changes that have really come to the fore in the last -
14 - last few weeks, but we've tried to give some insights
15 into that, and finally, we're through our presentation.

16 I will -- I will mention that we've
17 talked about earlier, some of this analysis is -- is
18 pulled from the addendum that we submitted last week,
19 which basically goes through a lot of our economic
20 analysis, and where we have the information, updates it
21 for the new capital cost information. So some of what
22 we showed you here was the old -- the -- the original
23 analysis updated for capital cost.

24 We actually went through our entire
25 economic appendix and did all the updates that we could

1 with those capital costs, and it was suggested that
2 perhaps we -- we walk folks through that at some point,
3 and we'd be happy to do that if that's -- if that's
4 your pleasure.

5 MR. BOB PETERS: Thank you, Mr.
6 Chairman. Yes, I can follow up on Mr. Peaco's last
7 comment, that in addition to preparing for their
8 testimony, La Capra Associates has also provided an
9 addendum to Technical Appendices 9a and 9b, and with
10 the assistance of Manitoba Hydro, who had an
11 opportunity to ensure that there was no CSI in the
12 document, and if there was, to redact it, Manitoba
13 Hydro this afternoon released it, and it's been
14 electronically circulated to all parties.

15 And in addition to that, Manitoba Hydro
16 has provided paper copies to -- to those of us in the
17 hearing room. Just for purposes of identification, I
18 believe it would be marked as La Capra Exhibit 47.
19 Sorry, I'm getting a head shake. Mr. Monnin will
20 perhaps revise that number.

21 MR. CHRISTIAN MONNIN: I -- sorry for
22 in -- intruding, Mr. Peters. It would be -- I have a
23 list of exhibits, which I will go through with Mr.
24 Secretary. But to allow Mr. Peters to conclude his
25 point, the addendum to 9a and 9b, we are suggesting,

1 goes under LCA-12-2, and we will do the balance of the
2 exhibits before the end of the day.

3

4 --- EXHIBIT NO. LCA-12-2: Addendum to Technical
5 Appendices 9a and 9b

6

7 MR. BOB PETERS: Thank you for that.

8 And, Mr. Chairman, Exhibit 12-2 of La Capra's is the
9 addendum to Technical Appendices 9a, 9b. It has only
10 been provided to the hearing room this afternoon. And
11 because of that, and amongst counsel discussions, we
12 would -- we would feel we would benefit from La Capra
13 taking all parties through the addendum to Technical
14 Appendices 9a and 9b in -- in some detail, probably
15 tomorrow morning before coffee break, just to explain
16 to the parties, first of all, what they have done.
17 Perhaps we will also be able to compare on the screens
18 what the prior information was, and where it is in the
19 materials to what the new information is.

20 And then thirdly, it may be beneficial
21 if La Capra can identify what additional information is
22 needed to ensure that the PUB panel is current in
23 understanding the -- the complete evidence of La Capra
24 and what may also be needed to -- to complete -- to
25 complete that -- the view.

1 So Mr. Chairman, I'm suggesting that
2 subject to any questions and any comments from counsel
3 opposite, this may be an appropriate time to adjourn
4 for the day. It has been a -- a lengthy day.

5 In terms of tomorrow, if the panel is
6 inclined, we would impose on Mr. Monnin and Mr.
7 Weinstein to again ask their witnesses to take the
8 panel as well as all parties through the new addendum
9 to 9a and 9b, which we're marking as La Capra Exhibit
10 12-A (sic).

11 And then at the time for cross-
12 examination, I -- I think that I did have a brief
13 discussion with my colleague Ms. Fernandes, and I'm not
14 sure -- Manitoba Hydro has had the benefit of perhaps
15 seeing this document a little longer than others, and
16 whether or not Manitoba Hydro would be prepared to --
17 and Ms. Van Iderstine, if she's the one --

18 MS. PATTI RAMAGE: No, excuse me, Mr.
19 Peters. I have not had the benefit of seeing this
20 document, it -- and we will not be able to go ahead.

21 MR. BOB PETERS: All right, and then
22 that means Mr. -- Mr. Williams is expected to be back
23 with us tomorrow morning, and he would start his
24 questioning, and we would follow the -- the order that
25 we have published previously.

1 THE CHAIRPERSON: I'd like to hear from
2 the Intervenor counsels, please. Mr. Gange, do you
3 have any news?

4 MR. WILLIAM GANGE: No, that -- that --
5 the -- the proposal that Mr. Peters just set out is
6 acceptable to us, and we'll be ready to commence our
7 cross-examination right after Mr. Williams. We're
8 ready to go.

9 THE CHAIRPERSON: Ms. Menzies, did you
10 wish to comment?

11 MS. MEGHAN MENZIES: No. I think that
12 that -- that sounds good for CAC (Manitoba). Just to
13 clarify, the expectation, then, would be that Mr.
14 Williams would be up at 10:30 around, just after --
15 okay. And subject to check with Mr. Williams, I -- I
16 can say that that would be good for CAC.

17 THE CHAIRPERSON: Thank you, Ms.
18 Menzies. Me. Hacaault, any comments?

19 MR. ANTOINE HACAULT: We'll do our best
20 to ask the questions that we can. It is challenging
21 when you get an explanation of something sometimes,
22 we'll see, and then immediately have to ask questions
23 on it, but we'll do our best. We have to proceed on
24 and meet your time limits.

25 THE CHAIRPERSON: Thank you, Me.

1 Hacault. Mr. Orle, any comments at all?

2 MR. GEORGE ORLE: No comments other
3 than I'll -- I'll wait till we see what tomorrow
4 morning brings in terms of how it affects the main
5 report dealing with rates, and then I'll be in a better
6 position to determine that.

7 THE CHAIRPERSON: Thank you, Mr. Orle.
8 And Ms. Saunders, please?

9 MS. JESSICA SAUNDERS: No comments.
10 Thank you.

11 THE CHAIRPERSON: Thank you, Ms.
12 Saunders. With that, Me. Monnin, do you have anything
13 you would like to say?

14 MR. CHRISTIAN MONNIN: Merci, M.
15 President. I just wanted to round out the -- the new
16 La Capra exhibits, which -- with Mr. Secretary, and it
17 shouldn't take very long. Under -- under LCA number 3,
18 we'll have the March 2014 redacted, no redactions LC
19 initial NFAT report, and that'll be LCA-1 (sic).

20

21 --- EXHIBIT NO. LCA-3-1: March 2014 redacted NFAT
22 report and no redactions
23 initial report

24

25 MR. CHRISTIAN MONNIN: Then proceed to

1 supplemental expert analysis report, LCA-2.

2

3 --- EXHIBIT NO. LCA-3-2: Supplemental expert
4 analysis report

5

6 MR. KURT SIMONSEN: That'll be 3-2, I
7 assume? Is that...?

8 MR. CHRISTIAN MONNIN: Yes.

9 MR. CHRISTIAN MONNIN: Moving on to the
10 appendices. Under Appendix 1, the March 2014 redacted
11 resource planning, LCA-4-1.

12

13 --- EXHIBIT NO. LCA-4-1: March 2014 redacted
14 resource planning

15

16 MR. CHRISTIAN MONNIN: Appendix number
17 2, generation alternatives, March 2014 redacted
18 generation alternatives, LCA-5-1.

19

20 --- EXHIBIT NO. LCA-5-1: March 2014 redacted
21 generation alternatives

22

23 MR. CHRISTIAN MONNIN: Under Appendix
24 3, alternative resource plans, Appendix 3b will then
25 become LCA-6-1.

1 --- EXHIBIT NO. LCA-6-1: Appendix 3b

2

3 MR. CHRISTIAN MONNIN: Under Appendix
4 4, environmental issues and policy, that will become --
5 sorry, March '14 -- March 2014 redacted environmental
6 issues and policy, LCA-7-1.

7

8 --- EXHIBIT NO. LCA-7-1: March 2014 redacted
9 environmental issues and
10 policy

11

12 MR. CHRISTIAN MONNIN: Under Appendix
13 6, export markets, March 2014 redacted export markets,
14 LCA 9-1.

15

16 --- EXHIBIT NO. LCA-9-1: March 2014 redacted export
17 markets

18

19 MR. CHRISTIAN MONNIN: Appendix 7,
20 export contracts, March 2014 redacted 7a will be LCA-
21 10-1.

22

23 --- EXHIBIT NO. LCA-10-1: March 2014 redacted 7a

24

25 MR. CHRISTIAN MONNIN: Appendix 7b will

1 be LCA-10-2.

2

3 --- EXHIBIT NO. LCA-10-2: Appendix 7b

4

5 MR. CHRISTIAN MONNIN: Under Appendix
6 9, Appendix 9b will be LCA-12-1.

7

8 --- EXHIBIT NO. LCA-12-1: Appendix 9b

9

10 MR. CHRISTIAN MONNIN: As we indicated
11 earlier, addendum to 9a and 9b will be LCA-12-2.

12

13 --- EXHIBIT NO. LCA-12-2: Addendum to Appendix 9A and
14 9B

15

16 MR. CHRISTIAN MONNIN: Under Appendix
17 10, Appendix 10b would be LCA-13-1.

18

19 --- EXHIBIT NO. LCA-13-1: Appendix 10b

20

21 MR. CHRISTIAN MONNIN: And also, Mr.
22 Secretary, there was a -- a letter attaching a diskette
23 provided to your earlier today, a duplicate, which
24 should be LCA-44, and that diskette contained LCA
25 Exhibits 14 through 43.

1 --- EXHIBIT NO. LCA-44: Letter attaching a diskette

2

3 MR. KURT SIMONSEN: Thank you very

4 much. So noted.

5 THE CHAIRPERSON: I believe there's a

6 consensus that we should adjourn immediately, so I will

7 go with the consensus in the face of -- of agreement

8 amongst all the parties. So we will adjourn for the

9 day, and I wish everybody a good evening. We'll see

10 each other again tomorrow morning at nine o'clock.

11 Thank you very much, everyone.

12

13 --- Upon adjourning at 4:13 p.m.

14

15 Certified correct,

16

17

18 _____

19 Cheryl Lavigne, Ms.

20

21

22

23

24

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