



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 2, 2014
Pages 4748 to 5054

1 APPEARANCES

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25

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1 --- Upon commencing at 9:00 a.m.

2

3 THE CHAIRPERSON: Good morning. I
4 believe that we're ready to resume the proceedings of
5 the hearing. Before we turn the microphone over to
6 Me. Monnin, do we have any matters at attend to, Mr.
7 Hombach?

8 MR. SVEN HOMBACH: Yes, we do, Mr.
9 Chairman. Good morning, and good morning to the
10 witnesses from Elenchus Research Associates who just
11 arrived in Winnipeg yesterday. Mr. Chairman, the next
12 two (2) days are reserved for testimony on load
13 forecast and DSM by Elenchus Research Associates, who
14 are the independent expert on those topics appointed
15 by the Board.

16 The procedure to be followed is the
17 same that was followed with Potomac Economics
18 yesterday, which means Elenchus will testify in
19 direct. They will then be cross-examined by the
20 Intervenors. Manitoba Hydro will go second last, and
21 Board counsel will go last. However, before we get
22 started, I am advised by My Friend, Ms. Boyd, that
23 Manitoba Hydro has to speak to an exhibit.

24 MS. MARLA BOYD: Good morning. Thank
25 you. We circulated yesterday electronically, and

1 we've circulated paper copies in the room this morning
2 of Manitoba Hydro's Power Smart Plan for 2014 to 2017.
3 I've suggested it should be marked as Manitoba Hydro
4 Exhibit 153. I just wanted to confirm that on the
5 record.

6

7 --- EXHIBIT NO. MH-153: Manitoba Hydro's Power
8 Smart Plan for 2014 to 2017

9

10 MR. KURT SIMONSEN: That's correct.

11 MS. MARLA BOYD: Thank you. That's
12 the only matter we have to speak to this morning, Mr.
13 Chair.

14 MR. SVEN HOMBACH: And, Mr. Chairman,
15 I believe CAC may have to speak to an exhibit, as
16 well.

17 MS. MEGHAN MENZIES: Yes. CAC
18 (Manitoba) yesterday circulated what we propose to be
19 CAC Exhibit 51, which were pre-asks that were put
20 together by both MIPUG and CAC (Manitoba), so just to
21 confirm that that would be CAC Exhibit 51, and I have
22 hard copies here to distribute. Okay.

23

24 --- EXHIBIT NO. CAC-51: Pre-asks put together by
25 MIPUG and CAC (Manitoba)

1 MR. KURT SIMONSEN: That's correct,
2 CAC-51.

3 MS. MEGHAN MENZIES: Great. Thank
4 you.

5 MR. SVEN HOMBACH: Are there any other
6 administrative matters that Intervenors need to speak
7 to? There not being any, Mr. Chairman, I would
8 suggest that we turn it over to Me. Monnin.

9 THE CHAIRPERSON: Bonjour, Me. Monnin.

10 MR. CHRISTIAN MONNIN: Bonjour, M.
11 President, members of the panel. Just an overview of
12 how I tend to proceed today is when we'll have Mr.
13 Houldin, who's to my immediate left, and Mr. Todd
14 thereafter sworn in. We'll have them qualified, as
15 well.

16 If I could speak to some exhibits at
17 the -- at the start? There has been an errata that
18 was circulated yesterday with respect to the DSM
19 report, and that errata letter is a cover letter under
20 the pen of Mr. Todd, dated March 31st, 2014. I would
21 suggest that that be Elenchus Exhibit 2-1, and the
22 Company report, which is a new DSM report, be Elenchus
23 2-2.

24

25 --- EXHIBIT NO. ERA-2-1: Errata cover letter by Mr.

1 Todd, dated March 31st,
2 2014
3

4 --- EXHIBIT NO. ERA-2-2: The Company DSM report
5

6 MR. CHRISTIAN MONNIN: The load
7 forecasting report is already Exhibit 3.

8 We'd also suggest that the Elenchus
9 scope of work be included as Exhibit number 4.
10

11 --- EXHIBIT NO. ERA-4: Elenchus scope of work
12

13 MR. CHRISTIAN MONNIN: Then with the
14 slide decks for Mr. Houldin and Mr. Todd's
15 presentations today, starting with the load
16 forecasting slide deck, which would be Elenchus number
17 5
18

19 --- EXHIBIT NO. ERA-5: Load forecasting slide deck
20

21 MR. CHRISTIAN MONNIN: And
22 subsequently the DSM slide deck for Mr. Houldin's
23 presentation being Elenchus number 6.
24

25 --- EXHIBIT NO. ERA-6: DSM slide deck for Mr.

1 Houldin's presentation

2

3 MR. CHRISTIAN MONNIN: I think we're
4 at the point in time where we'd have Mr. Houldin and
5 Mr. Todd sworn in.

6

7 IEC ELENCHUS PANEL:

8 RUSS HOULDIN, Sworn (Qual.)

9 JOHN TODD, Affirmed (Qual.)

10

11 QUALIFICATION OF WITNESSES:

12 MR. CHRISTIAN MONNIN: Thank you. And
13 before proceeding with the questions, I just -- one
14 (1) last administrative matter. The way we propose to
15 proceed this morning is Mr. Todd will provide his
16 presentation. And following -- immediately following,
17 Mr. Houldin will provide his presentation. Then we
18 can proceed with the cross-examinations. Trusting
19 that is okay, I'll go with the -- the questions for
20 qualifications.

21 Starting with Mr. Todd, you are here on
22 behalf of Elenchus, which has been retained by the
23 Manitoba Public Utilities Board in order to assist the
24 PUB to conduct a Needs For an Alternatives To review
25 of Manitoba Hydro's propose -- proposed referred --

1 Preferred Development Plan in accordance with the
2 terms of reference and Elenchus's scope of work dated
3 September 20th, 2013, to critically review certain
4 aspects of Manitoba Hydro's Preferred Development
5 Plans and filings in support thereof, correct?

6 MR. JOHN TODD: That's correct.

7 MR. CHRISTIAN MONNIN: Elenchus has
8 prepared reports in accordance with the terms of
9 reference and the scope of work.

10 Is that correct?

11 MR. JOHN TODD: Yes.

12 MR. CHRISTIAN MONNIN: Were these
13 reports prepared by you or under your supervision and
14 control?

15 MR. JOHN TODD: Yes.

16 MR. CHRISTIAN MONNIN: You've also
17 prepared a slide deck presentation for today with
18 respect to Elenchus's report.

19 Was this prepared by you or under your
20 supervision and control?

21 MR. JOHN TODD: Yes, the load
22 forecasting one directly.

23 MR. CHRISTIAN MONNIN: And can you
24 please describe for the Board the primary areas of
25 focus in your work for the PUB?

1 MR. JOHN TODD: Trouble confirming
2 this light is on. For the load forecasting report,
3 the primary purpose was to examine the load
4 forecasting documents, all related materials, and
5 evaluate them or assess them in light of the terms of
6 reference and the scope of work that had been provided
7 by the Board.

8 MR. CHRISTIAN MONNIN: Thank you. And
9 your curriculum vitae has been filed with the panel as
10 part of Exhibit Hill Co. number 8 at Tab 2(a).

11 Can you describe your qualifications
12 and experience related to the work undertaken for the
13 PUB in these proceedings?

14 MR. JOHN TODD: Yes, I've specialized
15 in issues around regulation for about thirty-five (35)
16 years. Since establishing the original Elenchus
17 company in 1980, I've done -- been involved in over
18 two hundred (200) regulatory hearings, in particular
19 around electricity and -- and gas was the primary
20 focus since about 1990.

21 In those hearings, a large portion of
22 the work was related to General Rate Applications.
23 I've been involved in quite a few in Manitoba,
24 actually, through the '90s. I was involved in the
25 Conawapa hearing in 1990. So I have a little bit of

1 background on these proceedings.

2 Through the GRA processes, in
3 particular, throughout the thirty (30) years -- or
4 twenty-five (25) years I guess, on those, load
5 forecasting is part of virtually every application and
6 part of the material that I was responsible for -- for
7 reviewing. More recently, as we've done more work in
8 the last decade with utilities, Elenchus, with my
9 involvement, is responsible for load forecasts for
10 numerous Ontario electric distributors. In Ontario we
11 have close to eighty (80) distributors and we do load
12 forecasts for about a third (1/3) of them.

13 So I've been fairly involved in load
14 forecasting for twenty-five (25) years. Those are the
15 main qualifications that are directly relevant to the
16 assignment.

17 MR. CHRISTIAN MONNIN: Thank you, Mr.
18 Todd. Can you generally describe the type of
19 clientele that yourself and Elenchus works for?

20 MR. JOHN TODD: Elenchus has -- has a
21 mix of clients. Right now, working -- we're working
22 with a regulator. We also have done a number of
23 assignments with the Ontario Energy Board, acting as
24 their expert advisor on various policy issues. We
25 work with a large number of utilities from coast to

1 coast; done work with BC utilities.

2 In fact, Scott Thomson was formerly a
3 client of mine when he was at BC Gas, as -- as it was
4 BC Gas then, when he was responsible for regulatory
5 work. And across the other side of the country, New
6 Brunswick Power, as well as, as I mentioned, many
7 electric utilities in Ontario.

8 And our clients over the years have
9 involved quite a number of -- of Intervenor groups,
10 everything from organizations such as the Association
11 of Power Producers of Ontario -- I was on the stand on
12 their behalf in an Ontario proceeding last week -- and
13 -- and Intervenor groups, such as small customer groups.

14 In a Conawapa hearing, I was working
15 with CAC, and CAC/MSOS as an Intervenor.

16 MR. CHRISTIAN MONNIN: Thank you, Mr.
17 Todd. And that, Mr. Chair, I would ask that Mr. Todd
18 be accepted by the Board as an expert for the purpose
19 of giving evidence on the -- the reports.

20 THE CHAIRPERSON: Thank you, Me.
21 Monnin. I'd like to hear from the Intervenor groups please,
22 starting with Mr. Williams.

23 MR. BYRON WILLIAMS: Mr. Chair, I can
24 -- I had -- we -- we certainly will be welcoming both
25 Mr. Houldin and -- and Mr. Todd, in terms of their

1 evidence. I do have some questions about both of
2 their qualifications. I had kind of designed them
3 together, but I'll -- I'll -- so if -- if Me. Monnin
4 would prefer to pref -- proceed with Mr. Houldin, and
5 then I could put them together, if that's okay with
6 you?

7 THE CHAIRPERSON: I think that would
8 probably be more efficient. Go ahead, Me. Monnin.

9 MR. CHRISTIAN MONNIN: Certainly, Mr.
10 Chair.

11

12 CONTINUED BY MR. CHRISTIAN MONNIN:

13 MR. CHRISTIAN MONNIN: Mr. Houldin,
14 you are here on behalf of Elenchus, which has been
15 retained by the Manitoba Utilities Board in order to
16 assist the PUB to conduct a Needs For and Alternatives
17 To review of Manitoba's Hydros Preferred Development
18 Plan in accordance with the terms of reference in
19 Elenchus's scope of work dated September 20th, 2013,
20 to critically review certain aspects of Manitoba
21 Hydro's Preferred Development Plan and filings in
22 support thereof.

23 Is that correct?

24 MR. RUSS HOULDIN: That's correct,
25 yes.

1 MR. CHRISTIAN MONNIN: Elenchus has
2 prepared reports in accordance with the terms of
3 reference in the scope of work, correct?

4 MR. RUSS HOULDIN: That's correct.

5 MR. CHRISTIAN MONNIN: Were these
6 reports prepared by you or under your supervision and
7 control?

8 MR. RUSS HOULDIN: I -- I prepared
9 them with -- with some collaboration with -- with John
10 Todd.

11 MR. CHRISTIAN MONNIN: And you've also
12 prepared a slide deck presentation for today, with
13 respect to the DSM report.

14 Is that correct?

15 MR. RUSS HOULDIN: That's correct.

16 MR. CHRISTIAN MONNIN: And again, was
17 this slide deck prepared by you or under your
18 supervision and control?

19 MR. RUSS HOULDIN: Again, I've -- I've
20 prepared it with -- with help from -- from John Todd.

21 MR. CHRISTIAN MONNIN: Can you please
22 describe for the -- the Board the primary areas of
23 focus in your work for the PUB?

24 MR. RUSS HOULDIN: The -- the primary
25 area of focus to respond to the -- the terms of

1 reference in the scope of work dealing with the review
2 of -- of a number of issues identified by the -- the
3 scope of work, with respect to demand-side management.

4 MR. CHRISTIAN MONNIN: Mr. Houldin,
5 your curriculum vitae has been filed with the panel --
6 sorry, with the PUB as part of the Exhibit Hill Co.
7 number 8, at Tab 2(b).

8 Can you describe your qualifications
9 and experience related to the undertaken for the PUB
10 in these proceedings?

11 MR. RUSS HOULDIN: Yes. I'll -- I'll
12 cover mainly DSM, but a couple of issues are in the
13 scope of work on two (2) other matters: smart grid and
14 ecological footprints. So I'll mention those after
15 I've, briefly, reviewed my DSM qualifications, if
16 that's okay.

17 I'm going in reverse chronological
18 order. I'm going all the way back to my master's
19 degree in environmental studies. That degree was very
20 much focuses on energy efficiency as part of what was
21 then a -- people might remember the idea of the
22 'conserve a society'. So for that degree, my major
23 paper was called, "Energy and the Conserve a Society."

24

25 And -- as actually as part of that,

1 without going into a lot of detail, the -- the program
2 at York is -- is a fairly unusual one. You sort of
3 design your own -- your own program. And in my case,
4 it segued me into my first professional experience,
5 which was working as a consultant on behalf of the
6 Ministry of Environment to coordinate the submissions
7 to the Royal Commission on Electric Power Planning,
8 which had -- which had started up in 1975 under the
9 chairmanship of George Porter (phonetic).

10 And so that ran for five (5) years, and
11 a great deal of -- of what the Porter Commission
12 looked at concerned energy efficiency.

13 Moving on from the Ministry of
14 Environment, I then men -- went to the Ministry of
15 Energy, where amongst my responsibilities was actually
16 doing energy forecasts. And the models we used to do
17 those forecasts were end-use models, so as they built
18 up what I've called in the report a -- a bottom-up
19 approach.

20 So they've -- they've built up from a
21 myriad of assumptions about end uses to come up with
22 an overall forecast, not just actually of electricity,
23 but of the other fuels as well. So that -- that gave
24 me a great deal of experience in dealing with the --
25 the underpinnings, if you like, of energy efficiency

1 modelling.

2 Also as part of my work at the Ministry
3 of Energy, I did the analytical support for Ontario's
4 first Energy Efficiency Act. I then moved on to
5 Ministry of Industry. Amongst other things, I worked
6 with some of my former colleagues to develop a program
7 known as the -- the Green Industry Audit and Retrofit
8 Program, which was an energy efficiency program for
9 the -- the industrial sector.

10 And then when I moved on yet again to
11 Ministry of Finance and cabinet office, I also helped
12 develop the residential counterpart of that program
13 that was called the Green Communities Program. So
14 that was based on audits of -- of homes, looking for
15 actually not just energy efficiency, but -- but water
16 efficiency as well.

17 There was then -- it'd be like a hiatus
18 of about ten (10) years. I moved on to the Ontar --
19 to the staff of the Ontario Energy Board, and in --
20 starting in 2006, I became responsible for looking at
21 the DSM aspects of something known as the Integrated
22 Power System Plan, which was put together by the
23 Ontario Power Authority, and which was to be reviewed
24 by the Ontario Energy Board.

25 In -- in the event, as some of you may

1 know, we only had two (2) weeks of hearings, and the
2 minister of the -- at -- at the time decided to
3 actually pull the plug on the hearings, but I had to
4 have -- I -- I'd, obviously at that point, sort of
5 several years of reviewing the DSM aspects of the
6 Integrated Power System Plan.

7 So that's a summary of the DSM
8 experience. The SMART grid, the -- the Ontario
9 government passed a -- a statute in 2009 called the
10 Green Energy, Green Economy Act, which did a lot of
11 things, but amongst those was it made the Ontario
12 Energy Board responsible for the promotion of -- of
13 the Smart Grid in Ontario. And I became the sort of
14 lead for that for the Ontario Energy Board staff,
15 including chairing the main consultation vehicle,
16 which was called the Smart Grid working group.

17 And then finally, with respect to the
18 ecological footprint, I've also been a part-time
19 adjunct professor and sessional instructor at the
20 University of Toronto for twenty (20) years in
21 teaching environment courses, and among -- amongst
22 those courses, ecological footprint and related
23 techniques were -- were amongst the things that I
24 taught, and that's a -- a summary.

25 MR. CHRISTIAN MONNIN: Thank you, Mr.

1 Houldin, and if you're -- I put the question to Mr.
2 Todd where he provo -- provided a general description
3 of the type of clientele that Elenchus works for.

4 Do you care to add anything to that?

5 MR. RUSS HOULDIN: Well, for most of
6 my career, the -- I worked for the Ontario Public
7 Service and then the Ontario Energy Board, and so my
8 clients, if you like, were ministers and order in
9 council appointees. In the last year, I've -- I've
10 joined Elenchus Associates.

11 MR. CHRISTIAN MONNIN: Thank you, Mr.
12 Houldin. And with that, Mr. Chair, I would also ask
13 that Mr. Houldin be accepted by the Board as an expert
14 for the purposes of giving evidence on these reports.

15 THE CHAIRPERSON: Merci, Me. Monnin.
16 Mr. Williams, please.

17 MR. BYRON WILLIAMS: Thank you and
18 welcome to Mr. Todd and Mr. Houldin. Mr. Houldin,
19 thank you for that extensive history. I just have a -
20 - a couple questions for you at the start, and then
21 I'll come back to you a bit later.

22 I know you've worked for the Ontario
23 Energy Board. Did you have an opportunity to give
24 evidence in any regulatory proceedings?

25 MR. RUSS HOULDIN: No.

1 MR. BYRON WILLIAMS: Mr. Todd, just to
2 chat with you, first of all, about your team on load
3 forecasting.

4 MR. JOHN TODD: Yes.

5 MR. BYRON WILLIAMS: And would I be
6 right in suggesting that involved in -- in your
7 report, which is marked as Elenchus 3 on load
8 forecasting, would be yourself, Mr. Benum, and
9 Motluck?

10 Would that be correct, sir?

11 MR. JOHN TODD: Yes.

12 MR. BYRON WILLIAMS: And Mr. Motluck,
13 among his many activities, would have prepared
14 evidence on electricity load forecasts and weather
15 normalization for many local distributors or LDCs in
16 Ontario.

17 Would that be fair?

18 MR. JOHN TODD: Yes, his background as
19 a econometrician, so he's designated as our primary
20 load forecasting implementor, if you want, so he's
21 personally relied on most heavily for load -- load
22 forecast related work until he was hired by the
23 Minister of Ontario last December.

24 MR. BYRON WILLIAMS: Well, that's what
25 happens when you get good staff, Mr. Todd. And it

1 would be fair to say that between yourself and Mr.
2 Motluck and other staff at Elenchus, you've had
3 experience with dozens of a utility distribution load
4 forecasts in Ontario?

5 MR. JOHN TODD: Yes.

6 MR. BYRON WILLIAMS: And it would be
7 fair to say that, indeed, load forecasting is a
8 significant part of the business for Elenchus?

9 MR. JOHN TODD: As a percent of total
10 revenue, significant, it's noticeable, certainly not -
11 - not the bulk of our work. We're not a load forced -
12 - forecasting company. We are a regulatory proceeding
13 company, if you want. Load forecasting is one of the
14 suite of services we offer.

15 MR. BYRON WILLIAMS: Fair enough. And
16 of course, you've had an opportunity to comment upon
17 load forecasts or to review them in your role as an
18 advisor on more than sixty (60) GRAs before Canadian
19 energy regulatory tribunals.

20 Would that be fair?

21 MR. JOHN TODD: That's probably right.
22 Subject to check, I think I've been involved in over -
23 - well over two hundred (200) proceedings, and so
24 sixty (60) of them being GRAs is probably in line.

25 MR. BYRON WILLIAMS: And among your

1 clients in proceedings before Canadian energy
2 regulatory tribunals would have been BC GAS, where you
3 had the pleasure to meet Mr. Thomson. Is that fair,
4 sir?

5 MR. JOHN TODD: Yes.

6 MR. BYRON WILLIAMS: And restricting
7 your answer to energy regulatory proceedings, you've
8 also had the, no doubt, lesser pleasure of working
9 with CAC (Manitoba) and myself in regulatory
10 proceedings before the Public Utilities Board relating
11 to issues of risk and reserves related to crown
12 corporations, such as Hydro and Manitoba Public
13 Insurance?

14 MR. JOHN TODD: That's correct. I
15 think it was after a few years of working with you,
16 Byron, that I switched sides and started working for
17 utilities.

18 MR. BYRON WILLIAMS: There's a lot of
19 that going on, Mr. Todd. Speak to Mr. Dunskey
20 sometime.

21 Mr. Todd, I often think of you as a
22 regulatory economist. Would that be an appropriate
23 description of your wide-ranging skill set?

24 MR. JOHN TODD: Yes.

25 MR. BYRON WILLIAMS: And we'll come to

1 the DSM work in a moment, but focussing on your work
2 with regard to the Manitoba load forecast, it would be
3 fair to say that the Elenchus team dug relatively deep
4 into the mechanics of the load forecast, as well as
5 addressing conceptual issues, like the risks
6 associated with structural change?

7 MR. JOHN TODD: That's correct.

8 MR. BYRON WILLIAMS: Now, from a long
9 time ago from your work at the CRTC, Mr. Todd, you're
10 no doubt familiar with the -- the words of My Learned
11 Friend, Ms. Pip -- Philippa Lawson when she often
12 distinguished between a technical discussion and a
13 higher level or conceptual discussion?

14 MR. JOHN TODD: I certainly work --
15 worked with Ms. Lawson for a number of years, and I
16 don't recall that specific concept, but that's
17 consistent with my rec -- recollection of working with
18 her.

19 MR. BYRON WILLIAMS: And would I -- it
20 be fair in contrasting your approach on the load
21 forecast with your approach on the demand-side
22 management to suggest that while you conducted both a
23 technical review and a conceptual review on the load
24 forecast side, on the DSM side, the Elenchus team
25 tended to focus on higher-level or more conceptual

1 issues?

2 MR. JOHN TODD: Yeah, that's correct,
3 and we agree. Russ would agree. Russ was -- was
4 directly -- was most engaged in DSM work, so I'll let
5 him answer on that side, but from my perspective,
6 that's correct.

7 MR. RUSS HOULDIN: Yes, I would agree
8 with that.

9 MR. BYRON WILLIAMS: And the -- the
10 joint offers on the DSM side or collaborative offers
11 were you, Mr. Houldin, along with some -- some
12 collaboration from Mr. Todd?

13 MR. RUSS HOULDIN: I didn't -- offers?

14 MR. BYRON WILLIAMS: Authors.

15 MR. RUSS HOULDIN: Oh, authors. Okay.
16 Sorry. Yes.

17 MR. BYRON WILLIAMS: I misspoke. I
18 apologize.

19 MR. RUSS HOULDIN: No. I misheard.

20 MR. BYRON WILLIAMS: And when I see
21 references in the DSM report to Sir John Macdonald's
22 maxim of whis -- on whiskey, or to quantum mechanics,
23 or the apparently famous Heisenberg uncertainty
24 principle, would I be correct in suggesting that some
25 of that dialogue comes from you, Mr. Houldin, rather

1 than Mr. Todd?

2 MR. RUSS HOULDIN: Yes, you would.

3 MR. BYRON WILLIAMS: It doesn't sound
4 like Mr. Todd.

5 MR. JOHN TODD: You're suggesting I
6 know nothing about whiskey?

7 MR. BYRON WILLIAMS: Just back to you
8 for a moment, Mr. Todd. Without asking you to
9 elaborate, I'll ask you to confirm that you have
10 served on consultative or advisory committees for a
11 number of utilities, including Union Gas and West --
12 West Kootenay Power?

13 MR. JOHN TODD: Yes. You're refi --
14 referring to DSM consultatives. I was involved in
15 West Kootenay Power in BC, Union and Enbridge in
16 Ontario, as ongoing work for a number of years.

17 MR. BYRON WILLIAMS: And recognizing
18 that the work of Elenchus on the DSM side of the
19 equation was more conceptual and less technical, would
20 I be correct in suggesting that the evaluation and
21 development of DSM programming is not a central
22 element of the Elenchus business model?

23 MR. RUSS HOULDIN: That's correct.

24 MR. BYRON WILLIAMS: Now just a couple
25 more questions, both for you and Mr. Houldin, and --

1 and, Mr. Todd, I don't think you'll need a pen, but
2 I'm going to use a -- a lengthy definition.

3 So in the context of energy efficiency
4 evaluation, I am going to describe a program evol --
5 evaluation as process and impact evaluations,
6 assessment and design of evaluation plans, counsel on
7 evaluation planning strategies and proche --
8 approaches, methodological issues including
9 attribution, conventional and non-conventional
10 programs, net-to-gross, including spillover and market
11 effects, logic models and evaluation surveys,
12 development of evaluation protocols and savings
13 algorithms, and assessment of program-related non-
14 energy benefits.

15 You were right with me on that -- that,
16 Mr. Todd?

17 MR. JOHN TODD: Absolutely. I have
18 worked with Mr. Dunskey in the past, and it sounds like
19 some briefing he's done, right on target.

20 MR. BYRON WILLIAMS: Recog --
21 recognizing again that your evidence on DSM addresses
22 conceptual issues, would I be correct in suggesting
23 that you would not describe yourself as an expert in
24 energy efficiency evaluation?

25 MR. JOHN TODD: I am not. In the

1 past, when I've been involved in -- with -- in
2 proceedings that were covering a lot of turf, I've
3 relied on people like Philippe Dunsky and like Russ
4 Houldin to drill down on -- on detail as opposed to
5 looking at it as it fits into the big picture, shall
6 we say.

7 MR. BYRON WILLIAMS: Mr. Houldin,
8 just in terms of yourself, in terms of the definition
9 of 'energy efficiency evaluation' that I've described,
10 I would be correct in suggesting that you have not
11 offered expert evidence before a tribunal on that
12 subject matter?

13 MR. RUSS HOULDIN: That's correct.

14 MR. BYRON WILLIAMS: Mr. Houldin, are
15 you familiar with the concepts of DS mark -- DSM
16 market potential and comprehensive plans?

17 MR. RUSS HOULDIN: Yes.

18 MR. BYRON WILLIAMS: And is -- is that
19 something that you would be actively involved with in
20 the -- in the course of your everyday business?

21 MR. RUSS HOULDIN: Okay. Let's -- and
22 my everyday business has kind of shifted in the last
23 year as I -- I mentioned I retired from the Ontario
24 Energy Board at the end of -- of 2012, and now I've --
25 I've started to do work with Elenchus, and some of

1 that's involved DSM. So I couldn't categorically say
2 no, because the -- the, you know, every day is not --
3 is not that easy for me to define as much as it was
4 when I was a full-time public servant.

5 MR. BYRON WILLIAMS: Mr. Chair, just
6 in -- in terms of our client's position, obviously, we
7 have a -- a rich history on both sides of the table
8 with Mr. Todd, and we certainly recognize the -- the
9 qualifications of Mr. Houldin as well. So just to be
10 more precise, our clients recognize and acknowledge
11 the expertise that Elenchus brings as economists and
12 practitioners of load forecasting and weather
13 normalization in the context of load forecasting.

14 They appreciate the recognition by Elen
15 -- Elenchus that the DSM program, evaluation, and
16 design is not central to its business area, but they
17 acknowledge that through their expertise as regulatory
18 economists on the side of Mr. Todd, and also Mr.
19 Houldin's extensive experience in the issues related
20 to sustain -- sustainability.

21 They certainly accept their
22 qualifications to testify on issues such as risk and
23 uncertainty at the high-level conceptual commentary
24 presented in their DSM paper.

25

1 (BRIEF PAUSE)

2

3 THE CHAIRPERSON: Thank you, Mr.
4 Williams. Me. Hacault, s'il vous plait.

5 MR. ANTOINE HACAULT: On behalf of
6 MIPUG, if the qualifications are sought by Mr. Houldin
7 to speak to the matters in the DSM report that he's
8 prepared, at a conceptual level, we have no
9 objections. And with respect to Mistert Houldin and
10 Todd to speak both to the technical and conceptual
11 matters set out in the load forecast report, we have
12 no objections.

13 THE CHAIRPERSON: Merci, Me. Hacault.
14 Mr. Orle -- oh, pardon me, Mr. Shefman, please.

15 MR. COREY SHEFMAN: Thank you. The
16 MMF has no objection to the qualification.

17 THE CHAIRPERSON: Thank you, Mr.
18 Shefman. And I noticed Mr. Gange in the back there.
19 I'm sorry, Mr. Gange. Good morning. Over to you.

20 MR. WILLIAM GANGE: It's okay. I'm
21 sure everybody missed me, but... Just a couple of
22 questions, Mr. Chair.

23 Mr. Todd, you indicated that load
24 forecasting is one of the suite of services that
25 Elenchus offers to potential customers. That -- that

1 was how you stated that, sir?

2 MR. JOHN TODD: That's correct.

3 MR. WILLIAM GANGE: Is a review of
4 demand-side measure -- demand-side management measures
5 one of the suite of services that Elenchus offers?

6 MR. JOHN TODD: In ter -- in terms of
7 reviews and hearing processes, I've primarily done
8 that on behalf of Elenchus since 1990. In the last
9 number of years, the last ten (10) years or so, we
10 have assisted clients with DSM. We've had a couple of
11 different, should I say, subject matter experts that
12 specialize in those areas that I've had in the company
13 assisting clients in those areas, so it is part of the
14 suite of services, although it's not -- not like one
15 of the companies that are -- I would characterize as
16 DSM companies. We do it more as a sideline.

17 MR. WILLIAM GANGE: I see. And --
18 and, sir, has Elenchus in the past provided advice to
19 utilities on implementing demand-side management
20 measures?

21 MR. JOHN TODD: Not on implementing
22 measures. Our advice to clients is in the context of
23 regular hearings. So it's more explaining what
24 they're doing, to the regulator.

25 MR. WILLIAM GANGE: I see. So that

1 for -- if I can go then one step further, it's not
2 part of your services to review demand-side management
3 issues on behalf of utilities to suggest to them what
4 measures could be taken, what improvements could be
5 made.

6 Is that a fair statement, sir?

7 MR. JOHN TODD: Not outside of the
8 hearing room.

9 MR. WILLIAM GANGE: Thank you. Those
10 are my questions, Mr. Chair. Again, I -- I will echo
11 the same type of limited endorsement as has been
12 provided by Mr. Williams and Mr. Hacault, in terms of
13 -- as a high-level conceptual concept, demand-side
14 management. I have -- I have no issue with respect to
15 the load forecasting. I'm satisfied from that. But
16 the -- it's a question of weight in terms of the
17 demand-side management issues that have been put
18 forward, that review.

19 Thank you, Mr. Chair. I -- I hope I
20 made myself clear on that.

21 THE CHAIRPERSON: I think you have.
22 But, you know, I may have com -- I may come back to
23 you with --

24 MR. WILLIAM GANGE: Thank you, sir.

25 THE CHAIRPERSON: -- with some -- some

1 questions. Mr. Orle, please?

2 MR. GEORGE ORLE: Mr. Chair, subject
3 to the same comments made by previous Intervenor
4 counsel, which we'll reserve for the filed
5 presentation, we'll accept the qualifications for the
6 purpose of the hearing.

7 THE CHAIRPERSON: And on behalf of
8 Manitoba Hydro, Ms. Boyd. Thank you.

9 MS. MARLA BOYD: Thank you. Good
10 morning. Manitoba Hydro has no objection to the
11 qualifications as they were presented.

12 THE CHAIRPERSON: Mr. Hombach, please?

13 MR. SVEN HOMBACH: Mr. Chairman, Me.
14 Monnin should perhaps be given an opportunity to
15 address any matters, if -- if he has anything to add.

16 THE CHAIRPERSON: Me. Monnin, s'il
17 vous plait.

18 MR. CHRISTIAN MONNIN: No, M.
19 President, I have nothing to add.

20 THE CHAIRPERSON: I would like to
21 stand down for a few minutes so that the panel will
22 have a chance to -- to discuss in camera. And we'll
23 take five (5) minutes, please.

24

25 --- Upon recessing at 9:37 a.m.

1 --- Upon resuming at 9:45 a.m.

2

3 THE CHAIRPERSON: Mr. Hombach, please.

4 MR. SVEN HOMBACH: Yeah, the panel has
5 had an issue to deliberate, and Mr. Chairman, would
6 you like to deliver the ruling?

7 THE CHAIRPERSON: Thank you, Me.

8 Hombach. The panel has caucused and decided that it
9 was prepared to accept Messrs. Todd and Houldin as
10 what this is -- competent to speak in the area of load
11 forecast. And with respect to DSM, the -- the panel
12 are prepared to accept the testimony of the witnesses
13 with respect to high-level, conceptual issues and
14 those issues that were raised in their reports.

15 With respect to other -- other DSM
16 issues, the panel has decided it will hear from the
17 witnesses, but with respect to the issues that were
18 mentioned by counsel for CAC and GAC, we'll -- we'll
19 give the testimony we hear on the DSM issues not
20 related to high-level, conceptual issues the -- the
21 weight that it deems appropriate in the circumstances.

22 I hope that clarifies things.

23 MR. SVEN HOMBACH: Okay. Mr.
24 Chairman, if there aren't any other administrative
25 matters, I suggest we turn it over to Me. Hacault to

1 commence the direct-testimony of Elenchus.

2 MR. CHRISTIAN MONNIN: I hope M. --
3 Me. Hacaault is not the one giving direct.

4 MR. SVEN HOMBACH: I -- I apologize.
5 I'm getting my French mixed up.

6 Me. Monnin...?

7

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

9 MR. CHRISTIAN MONNIN: Merci, Me.
10 Hombach. Mr. Todd, you will be proceed -- Mr. Todd
11 will be proceeding with the load forecasting
12 presentation. Mr. Todd...?

13 MR. JOHN TODD: Thank you. Good to be
14 here again revisiting the issues, including the old
15 Conawapa issue. The -- just an overview of what I'll
16 be doing in my direct -- actually, point 1, the
17 purpose of the Elenchus load forecast evidence has
18 been covered in the introductory questions.

19 I've got a few slides setting then
20 stage, then I want to circle though the rebuttal
21 evidence of Manitoba Hydro as it related to the load -
22 - load forecasting issues, come back with key
23 messages. Those key messages are based on the
24 concluding remarks in the pre-filed evidence. And
25 finally, the scope of work responses, I'll recap

1 those, which are represented in a table at the end of
2 the appendix which go through the original scope of
3 work item by item and provide succinct and direct
4 responses to those.

5 I see I covered the purpose already.
6 Setting the stage, there's a few key concepts that are
7 at the core of the load forecasting evidence, and
8 that's what the setting the stage is trying to address
9 and -- and pull out directly for the panel. A key
10 point being made is that if there's a difference in my
11 view between load forecasting in the context of a
12 generate application versus load forecasting being
13 used for assessing a development plan.

14 In the context of a GRA, you're using
15 your forecast for setting rates in a test year. The
16 test year is one (1), sometimes two (2), three (3),
17 even four (4) or five (5) years out, but you've got a
18 very short-term time frame. Load forecasting for
19 purposes of assessing the development plan in the NFAT
20 is doing a financial analysis of the development plan,
21 which is based in large part, the starting point, on a
22 long-term load forecast.

23 So your forecast matters not in just in
24 the first few years, but ten (10) years out, and in
25 this case, twenty (20) years out, and thirty (30)

1 years out, and fifty (50) years out, because the
2 financials are affected by the long-term load
3 forecast. So perhaps I'm biassed because I'm the load
4 forecast witness, but I see the load forecast as
5 pretty fundamental to this entire evaluation.

6 The difference is that in the long run,
7 structural changes are relevant in the ship -- for the
8 development plan. In the short run, structural
9 changes are like -- very unlikely to have any sort of
10 significant impact. And you'll hear through my
11 testimony today, and you saw in the evidence, many
12 references to possible structural changes.

13 The key point about structural changes
14 is that structural changes relate to risks that are,
15 in the words of Rumsfeld, as we well know, "risks are
16 known unknowns." We know that things can happen, but
17 we don't know exactly what they are. We cannot
18 explicitly build into a load forecast changes in the
19 structure of the marketplace. Things like I've
20 referred to, in terms of the potential for great
21 parity. That cannot be predicted in a way you can
22 build in the forecast. Therefore, it is an unknown,
23 but you know that that risk is hanging out there.

24 And therefore, one of the things that
25 I'm trying to drive out of the evidence is to just

1 take a simple load forecast that you do for GRA and
2 extrapolate it out for twenty (20), thirty (30), then
3 forty (40), fifty (50) years and just assume business
4 as usual is a naive assumption without looking at what
5 things could dramatically change the marketplace, and
6 what would the consequences of those be. Do the
7 consequences assumed change fundamentally alter the
8 risks around the Development Plan. So it's relevant
9 for the NFAT, not for the GRA.

10 So we come back to Manitoba Hydro's
11 load forecasting methodology, the topic I was looking
12 at. Fundamentally throughout the evidence you'll see
13 it says that the forecast incorporates the known
14 knowns reasonably well. The known knowns are just if
15 the world unfolds in a manner that is very similar to
16 the past ten (10) to twenty (20) years, just business
17 as usual, we carry on. Economic growth is roughly in
18 line, technology is no dramatic changes, no -- nothing
19 significant, in terms of disruptive innovation. And
20 it's a good forecast.

21 I've got a number of comments, but I'd
22 call them -- them tweaks. And in most cases, experts
23 can disagree on fine points and there's opinion
24 differences. I would not characterize, I think, in
25 any case, a couple small points maybe, that I view

1 Manitoba Hydro as doing something which is
2 fundamentally flawed.

3 It's good methodologies, consistent
4 with the way they're generally done. There's some
5 things that I would suggest doing a bit differently
6 but in a standard GRA type of forecast.

7 Unfortunately, in my view, it basically
8 ignores what I've referred to here as the known
9 unknowns. Price elasticity is not factored in. We'll
10 come and more on that. It doesn't look at structural
11 changes, such as disruptive innovations. If you can't
12 get your arms around it, let's not deal with it seems
13 to be the approach in the load forecast.

14 And essentially, I think that has come
15 about because the standard load forecasting
16 methodology which has been developed and is used in a
17 GRA context has simply been adopted; the same thing
18 for the NFAT. And I have concerns about that because,
19 at the core, the NFAT is an analysis of the long-term
20 risks associated with the Development Plan as compared
21 to alternatives.

22 THE CHAIRPERSON: I just want to
23 mention, Mr. Todd, just so don't -- you don't belabour
24 the point --

25 MR. JOHN TODD: Yeah.

1 THE CHAIRPERSON: -- you know, the
2 application that's before this panel has evolved
3 considerably since last fall and the price elasticity
4 issue has been -- now been addressed in part in the
5 discussions around DSM at a very high level. So I
6 just want to make that point.

7 You made -- you -- I wouldn't belabour
8 that point. But anyways, I'd like to hear what you --
9 what -- so that you understand that there is some
10 element of price elasticity consideration in the
11 evolved plan that -- before us.

12 MR. JOHN TODD: Yes, I do understand
13 there's an update which has changed a lot of numbers.
14 And frankly, the timing of that hasn't given me a
15 chance to be on -- totally on top of all of the update
16 aspects.

17 And in any case, the elasticity in
18 Manitoba, and when we get to comments on elasticity,
19 it is still a known unknown even when you consider it
20 because we don't -- there is no way to actually figure
21 out what it is except to say there's always some price
22 elasticity.

23 So in looking at more significant
24 changes, there are two (2) potentially for -- for a
25 load forecast -- for an electric utility there are two

1 (2) worst-case potential structural change scenarios.
2 One is -- one worst case is you get a high demand
3 which is far above the range that was being considered
4 in the forecast, the 90 percent level high forecast
5 that Hydro's considered, for example, and will -- is
6 there a high demand scenario due to something
7 unanticipated that could result in supply inadequacy.

8 The -- at the other side, there's a
9 load demand scenario which could be a worst case if it
10 creates standard -- standard assets. So extreme
11 scenarios, both high and low, can create potential
12 problems.

13 There's a concept called high
14 impact/low probability, HILP, events. And one might
15 consider just what -- how tolerable are extreme high
16 impact/low probability events. There's a recent
17 discussion of high impact/low probability events
18 referred to specifically that way. If you recall,
19 there was -- Iceland had a volcano which shut down
20 flights over Europe.

21 There was a report done afterwards by
22 the Chatham House Report -- by Chatham House Reports
23 and there's some interesting analogies in there. I'm
24 talking about concepts around HL -- HILPs.

25 They're talking there -- and a very

1 different situation, obviously, but good analogies.
2 They're talking about a complex risk environment. The
3 comment they make is:

4 "Current contingency planning often
5 assumes the return of the status quo
6 ante
7 existed before] after crisis."

8 In part, the load forecast is built on
9 the assumption that post-2008 financial crisis, that
10 everything's going to go back to you -- back to
11 normal. Therefore, if you look at the last twenty
12 (20) years and we look at the next twenty (20) years,
13 they're going to be similar.

14 I can't say that's untrue, but there is
15 a school of thought that says the world has
16 fundamentally changed, and the drivers that caused the
17 2008 financial crisis are actually drivers of this
18 fundamental change, and we're moving into, in the
19 developed world, slower growth than we've enjoyed in
20 the past, and that the way our economy will develop is
21 different now.

22 Again, this is a -- a known/unknown,
23 something which people identified as a risk. We
24 cannot pin it down, but it's something which could
25 affect the way demand grows in electricity over the

1 next -- over the coming decades as opposed to years.

2 They talk about navigating conflicting
3 interests amid uncertainty. A basic theme of mine is
4 around uncertainty. They talk about the existence of
5 competing and mutually-exclusive claims to certainty,
6 which is -- is often unavoidable during any crisis
7 situation. People get in a difficult situation where
8 there's a lot of unknowns, and people make claims
9 about certainty, that they know this is going to
10 happen or that's going to happen.

11 Obviously very different in volcanic
12 eruption, the consequences, compared to this
13 situation, but the caution in that report is, Don't
14 think you know what's going to happen. There'll be a
15 lot of people claiming that they know what's going to
16 happen. We have to approach all those apparent knowns
17 with skepticism, because the reality is we don't know
18 what's going to happen ten (10) years or twenty (20)
19 years down the road.

20 They talk about creating a robust
21 process for resilience to get the right balance
22 between planning for specific known events and
23 creating generic responses for events that are rare or
24 unexpected.

25 And that's the theme that I've been

1 pointing to in my evidence as saying we have to worry
2 -- in -- in building something that's going to take
3 decades to recover its costs. We have to worry about
4 those rare and unexpected events, not just things we
5 know today.

6 So what's there on the high-demand
7 side, high-demand structural changes? An obvious
8 possibility is a tipping point for electric vehicles.
9 'Tipping point', that's from the -- the book by
10 Malcolm Gladwell, the concept of the tipping point,
11 how little things can make a big difference.

12 The tipping point is something where we
13 expect sort of a gradual growth in use of electric
14 vehicles. There are potential innovations in battery
15 storage technology, electric vehicles generally, that
16 could cause a rapid shift to accelerated use of
17 electric vehicles.

18 That could -- that -- and if
19 transportation energy were to move from fossil fuels
20 directly to energy -- or to electricity, we could see
21 a very rapid increase in the use of electricity, far
22 beyond that anticipated.

23 Other possibilities would be major
24 industrial loads coming in in Manitoba. The
25 sensitivity that Manitoba looks at is the add on --

1 the industrial load side is adding one (1) large
2 customer or losing one (1) large customer.

3 But there's already talk about
4 TransCanada Pipeline East, which would use electricity
5 for pumping of the oil, unlike natural gas lines,
6 which use the gas in the pipe for it -- for
7 compression. That would -- could be a significant new
8 load. Get a large industrial plant locating in
9 Manitoba, I have no idea of the probability of that,
10 but you could end up with significant ratchets up in
11 load.

12 If those unanticipated events were to
13 happen, my view is that those are not disaster
14 scenarios, because industrial loads, even a rapid
15 increase in electric vehicles, those types of things
16 will not happen in a year or two. They could be rapid
17 in terms of being three (3) years or five (5) years or
18 ten (10) years, but there's a response time there.

19 Industrial loads, for example, are not
20 going to come in and build a plant without giving
21 Manitoba Hydro forewarning and making sure they've got
22 the electricity they need. They just won't do it.

23 So there could be high demand scenarios
24 beyond that which is built into the load forecast of
25 Manitoba Hydro, but it's hard to imagine one that does

1 not permit a response, that allows system reliability
2 to be maintained.

3 On the flip side, what are the types of
4 things that could lead to load demand structural
5 changes? My biggest concern, and again, it's not
6 something forecastable, is a disruptive innovation
7 that leads to grid parity. Now, be clear that what
8 grid parity means for Manitoba Hydro is, in effect,
9 competition.

10 Grid parity means that there are
11 alternative electricity generation technologies which
12 have a price equivalent to the fully allocated cost of
13 Manitoba Hydro power, for example, you know, compare
14 the parity to their grid power.

15 Of course, Manitoba Hydro's marginal
16 cost, the price they can accept and still sell their
17 power and recover their -- their operating costs is
18 very, very low. So wherever the price goes in terms
19 of competing alternatives within the province or a
20 price in the export market, they can lower their price
21 to still sell the power and not spill water.

22 But that competitive alternatives can
23 lower the price to a point where they're not
24 recovering their full costs, so it's a financial risk
25 more than a risk that the power cannot be used. Can

1 it be sold at a price that is recovering costs, is the
2 question there.

3 So to me, I think of that as
4 competition. And I've gone through a number of
5 different regulated industries, such as telecoms.
6 When I started working in CRTC proceedings, we had
7 monopoly telephone service. I went through, in the
8 '90s, the hearings that introduced long-distance
9 competition. I went through one that didn't allow it.
10 I went through a second one that did allow it. I've
11 been through local competition, introduction of cell
12 phones as alternatives. We went from a completely,
13 you know, traditional monopoly scenario to a world
14 today where telecom is essentially a competitive
15 marketplace.

16 There is a risk or a possibility that
17 we could see a transformation in the electricity
18 industry, which is similar. Think of low cost,
19 declining cost, renewable power, people putting solar
20 panels on their roofs. General Electric's building a
21 -- a small wind powered generator you can build on the
22 roof.

23 The costs are not competitive right now
24 with grid power, I know. I have a -- a property in
25 Northern Ontario where we're off-grid, and I know that

1 my cost per kilowatt hour when I installed that solar
2 power ten (10) years ago was way above the cost of
3 grid power. If I were to do it today, you'd be
4 getting close. If I did it in ten (10) years from
5 now, it might actually be more economic than full cost
6 recovery on grid power.

7 So as you decline the cost of
8 renewables plus storage -- because you need storage to
9 complement that. Again, I know from experience.
10 We've used significant storage capacity. The
11 introduction of fuel cell technology, right now,
12 there's a company called Redox Power Systems. There's
13 -- about which there's an article in MIT Technology
14 Quarterly in August of last year. The article was
15 called 'An Inexpensive Fuel Cell Generator'.

16 The startup, Redox Power, claims to
17 have made technological advances that would make fuel
18 cells as cheap as grid power. They're saying they can
19 do it today. Now, they haven't sold any. They
20 haven't scaled up to a large scale. That may be a
21 total failure, but there are -- there are fuel cell
22 options, which means that -- that people in small
23 commercial operations, industrial operations, they
24 argue, soon in your own home could take gas from the
25 gas that's piped into the house, used for heating and

1 so on, and use it in a fuel cell to produce
2 electricity.

3 That wouldn't require storage. That
4 would be 24/7 supply of power exactly as you need it,
5 easy to go off-grid.

6 Will that happen? I don't know, but it
7 is the potential disruptive technology that is out
8 there that should be cause for concern.

9 So the result of these types of low-
10 demand structural changes is potentially a low
11 marginal cost, the drives, the market price, or power.
12 Therefore, a low market price or power. It could mean
13 that grid power at full cost recovery even within
14 Manitoba is not possible. Essentially, they have to
15 either have domestic load shrink or drop the price to
16 the point where they're not recovering costs but are
17 keeping people on the grid.

18 Clearly, in the export market, if
19 things change in the export market, the demand might
20 not be there, simply the market price may be low and
21 you're not selling it at a cost recovery basis. I
22 emphasize these are not predictions. These are
23 concerns. And many people are out there saying that
24 within -- somewhere in the horizon of twenty (20)
25 years, grid power is going to be -- have to face

1 competition.

2 If that were to happen, you end up in a
3 scenario of stranded costs. If you don't have full
4 cost recovery you do not have -- you have stranded
5 costs. The question in my mind, and it's going beyond
6 -- far beyond my scope on load forecasts and the
7 financial analysis, but in these extreme scenarios,
8 structural change, do you end up with stranded costs
9 at a level that is unacceptable? I.e., could it
10 potentially do harm, financial harm, to the province,
11 is part of the spectrum of possible outcomes here;
12 bankruptcy or a severe burden on either taxpayers or
13 ratepayers in Manitoba.

14 I don't have an answer for you, but I
15 think that from a load forecast perspective you should
16 be looking at, as a -- as a fundamental part for the
17 analysis, Manitoba Hydro should be looking at the full
18 spectrum of -- of possibilities. Not just the 80
19 percent range that leaves out the bottom 10 percent
20 tail and the ten -- and the top 10 percent tail, but
21 what happens in those tails of the distribution which
22 are extreme circumstances.

23 I would like to turn now to the
24 rebuttal evidence of Manitoba Hydro. I know that the
25 panel, with previous witnesses, have interjected with

1 questions. So of course, just let me know if I say
2 something that triggers a -- a question for you.

3 It may be worth -- I'm not sure how we
4 do this -- moving off of my slide presentation to the
5 rebuttal evidence, because I'm going to refer to pages
6 in it. Do I turn this off and -- you do it? Okay.

7 And the rebuttal evidence, as I
8 understand, is Manitoba Hydro 85. And within it there
9 are several parts and I'm referring to the main
10 section which is a hundred and forty-five (145) page
11 document. Yes, I think we're -- we're there.

12

13 (BRIEF PAUSE)

14

15 MR. JOHN TODD: Yeah. And the page
16 numbers I'll be referring to are the pages within that
17 document which looks like -- actually it's the page
18 numbering in the document, so page 1 actually starts
19 with the introduction. So I will be -- relative to
20 the PDF file, I will be five (5) pages further on, I
21 think.

22 So the Section 2 of that load forecast,
23 page -- in the document page 2, so one (1) more page
24 down, is where the discussion of load forecast starts.
25 On that page, at lines 10/11, Manitoba Hydro states:

1 "The purpose of the load forecast is
2 to present the best estimate of long-
3 term future energy requirements for
4 Manitoba."

5 To me, that's an incomplete purpose. I
6 think you'll understand that from the comments I've
7 made so far. The best estimate is one (1) possibility
8 of what the future will look like. And we know that
9 the world will not unfold in accordance to the best
10 estimate. You know, the old saying about a forecast,
11 the one thing you know for sure about a forecast is it
12 will be wrong.

13 So to me the purpose is not to come up
14 with the best estimate. The purpose is to identify
15 that for planning purposes, but also to develop as
16 comprehensive an understanding as possible of what the
17 range of possible scenarios are around the future load
18 forecast.

19 As I -- as I emphasized, from a
20 modelling perspective, you have to assume essentially
21 an extrapolation of continued business as usual and
22 you'll have a range of outcomes, which Manitoba Hydro
23 grasps well. But you also need to consider what are
24 the more extreme possibilities in doing something like
25 an NFAT.

1 If you slide down that page a little
2 bit, there's a dia -- there's a -- a figure there.
3 It's not hard to see that what we have in the load
4 forecast is essentially an extrapolation of the past,
5 assuming a continuation of historic trends.

6 As the numbers show, it's easy to see
7 on the graph, clearly built into that is no structural
8 change. That may be right, but should we base our
9 entire analysis on that to exclusion of anything else?

10 Flipping over to the next page, 3, the
11 rebu -- an issue raised in the rebuttal is: Do we
12 look at the past ten (10) years or the past twenty
13 (20) years? They're objecting to Elenchus, which is -
14 - in -- in our report is focussed on the past ten (10)
15 years. That's giving more weight to what's happened
16 in the last ten (10) years than what's happened over
17 the -- the first ten (10) years over the last twenty
18 (20) years.

19 The question -- and again, I don't have
20 -- can't prove the right answer -- the question being
21 raised in our report is: Is the future going to be
22 more like the last ten (10) years or is going to be
23 more like the last twenty (20) years? Because the
24 last ten (10) years is different than -- than the
25 prior ten (10) years, the first ten (10) years, the

1 last twenty (20) years.

2 From 2003, yes, that includes a ten
3 (10) year period that had a major economic disruption.
4 That period, if it is the beginning of a period of --
5 of longer-term slower growth than we've enjoyed in
6 Western countries, not just for the last twenty (20)
7 years but beyond that, that will be the best predictor
8 of what's going on -- what is going to happen in the
9 coming decades.

10 So again, I'm not saying that Hydro is
11 wrong to be using twenty (20) years, but we have to be
12 cautious and say, You know what, the past ten (10)
13 years may be a better predictor. And there are
14 economists out there, macroeconomists out there, who
15 are saying things have changed and it's a better
16 predictor. And that would drive load forecast as well
17 as other factors in the economy.

18 Section 2.2 is really a continuation of
19 -- of 2.1, the way I read it, starting on page 4. On
20 page 4, lines 3 to 15, they make reference to the EIA
21 forecast, which goes out to 2040. It's also a single-
22 best estimate. So using that as a reference point,
23 and as we see on the following page, which we'll come
24 to, which talks about the range of everybody's
25 different forecasts in the States and saying they're

1 in the ballpark, yeah.

2 All the forecasts are done the same
3 way. They assume no major disruptions. It's building
4 in modest year-over-year changes. But the EIA, when
5 you actually look at -- it's cited in -- in the
6 footnote report. When you look at it, they have a
7 scenario called best available technology case.

8 And from 2011 to 2040, so over a thirty
9 (30) year period, under the best available technology
10 case, the total growth that they forecast in the US is
11 7 percent -- not 7 percent per year; 7 percent over
12 thirty (30) years.

13 So they envisage a case of very slow
14 growth in load demand. That's in the report that's
15 discussed in the rebuttal evidence. And that compares
16 to a high economic case of 42 percent over those
17 thirty (30) years.

18 So the high is a little bit over 1
19 percent. The low at 7 percent over thirty (30) years,
20 you're talking about .2 percent, almost flat. And
21 that does not consider disruptive innovations. So I'd
22 say there's still things that -- that are outside of
23 their projections in their modelling which could lead
24 to even lower than 7 percent growth over that thirty
25 (30) year period.

1 So the graph on page 5 which shows is -
2 - is a scatter of -- of all of the -- of a number of
3 different forecasts, I accept that Manitoba Hydro is
4 in the ballpark of everybody else. But these
5 forecasts are being done for somewhat different
6 purposes. There's different risks involved. They're
7 all essentially building around business as usual.
8 And what they're showing that they're consistent with
9 are the what's viewed as most likely scenarios,
10 straight continuation of business as usual. And if
11 you make those assumptions, it's all quite reasonable.

12 Section 2.3 looks at and comments on
13 the work of -- of myself and -- and other Intervenor
14 experts on growth by sector. As you get into that
15 detail in my evidence, I'd essentially say most of the
16 issues are we're -- we're quibbling over detail. It's
17 not -- not quite as bad as saying we're debating over
18 how many angels can dance on the head of a pin, but
19 certainly for GRA purposes we're quibbling over
20 detail. As a base case, probably we're quibbling over
21 detail.

22 Some of the references that Hydro makes
23 says it doesn't make a lot of difference. You know,
24 I'd agree with that. It doesn't really worry me, the
25 kind of details back and forth between Manitoba Hydro

1 and myself. But I would like to point out a couple of
2 -- of statements or -- or pieces in their rebuttal
3 evidence that I think should be flagged.

4 If you go to page 9. And you can't see
5 -- there's two (2) graphs on that page. And if you
6 can sort of look at the top graph and flip down to the
7 lower graph, you can see the top graph is a very
8 strong upward sloping line and the bottom graph -- oh,
9 you can show us both, thank you -- is sort of coming
10 down and then getting fairly flat.

11 And just below the top graph -- you
12 don't have to show it, just leave the graphs up on the
13 screen -- Manitoba Hydro says in its rebuttal
14 evidence:

15 "This is an unreal -- unrealistic
16 analysis
17 Elenchus evidence] because one needs
18 to examine the broader historic
19 trend."

20 I would point out that the scales, look
21 at the left-hand scales on the two (2) graphs, are
22 very different. This strong upward line, which I
23 think is giving the impression that the Elenchus
24 comments are -- their words are unrealistic. If you
25 use the same scale as in the bottom graph, that line

1 over 2007 to 2012 is going from two point seven-six-
2 five (2.765) to two point seven-eight-five (2.785),
3 point o-two (.02) difference.

4 If you redrew that graph on the same
5 scale as the lower graph, it would look like a flat
6 line. It's essentially flat, in terms of the accuracy
7 of the forecasts. So this unrealistic -- because
8 we're looking at rapid growth, I think is -- it's easy
9 to get a false impression if you don't look at the --
10 at the graph carefully and look at the scaling on it.

11 Turning to Section 2.3.3, the next
12 page, a discussion of the growth and average use per
13 dwelling. Down -- you can see just in the bottom of
14 the screen, going down to the bottom of the page and
15 over the next page, Manitoba Hydro talks about three
16 (3) drivers. And it leads to a conclusion on page 11
17 below the third point that says:

18 "These differences reflecting
19 Manitoba's unique -- unique market
20 are contributing to the overall 1.4
21 percentage growth projected for the
22 residential sector."

23 Okay, let's look at this unique market
24 for a minute to understand that comment. Flip back to
25 the item number 1. They're talking about heat

1 recovery ventilators being required, saying that,
2 Yeah, I mean, we have a heat recovery vent -- an HRV
3 in an electrically heated home. It reduces
4 electricity by 313 kilowatt hours per year.

5 But when you have one in a gas heated
6 home, natural gas heated home, it increases
7 electricity use, because the device uses electricity,
8 by 1,895 kilowatts per year. So you actually get more
9 electricity use from the gas because of this change
10 than you get a saving on electrically heated homes.

11 But let's put that number into context.
12 Leaving the screen where it is, you look up on line
13 16, you see reference to:

14 "Gas furnaces are generally installed
15 with multi-speed fans that consume
16 approximately 1,750 kilowatt hours
17 per year."

18 There's -- the impact on a gas heated
19 home of this HRV is about equivalent to a fan.

20 If you flip over to the next page in
21 discussion under item 2, it notes that an average
22 dwelling using electric heat for -- electricity for
23 heat in Manitoba in 2012/'13 used approximately 25,700
24 kilowatt hours compared to 10,200 kilowatts for a
25 dwelling not using electricity for heat.

1 So in other words, the heating by
2 electricity has an impact of 15,500 kilowatt hours per
3 year. So whether a -- a home is electrically heated
4 versus gas heated is a huge impact compared to the
5 impact of the HRV, to just put this into context.

6 The most important part of this
7 discussion, though, in terms of the uniqueness is
8 second and third points. On point number 2,
9 currently, thirty-six point three (36.3) of all
10 dwellings use electricity for space heating. They're
11 expecting that to go up to thirty-nine point three
12 (39.3), the first line of the next page, by 2032/'33.

13 And item number 3 points out that
14 there's currently 49 percent of dwellings use electric
15 -- use electricity for water heating, and that's
16 expected to increase from 49 percent to 62.5 percent
17 in 2032/'33.

18 This is unique. This kind of
19 penetration for electricity in areas that have gas
20 service is very, very high.

21 Now, the question in my mind is, is
22 there something unique about Manitoba that leads to
23 these high penetration rates for electricity? And I
24 say yes, there is. There's a utility, electric
25 utility, that owns the gas company.

1 I work across Canada in every
2 jurisdiction. I work in electricity and I work in
3 gas. The gas utilities aggressively go after
4 developers to build homes with gas heat. They
5 advertise to the marketplace about the comfort of gas
6 heating. They are pushing hard for people to convert.

7 I'm not aware of anything to suggest
8 that Manitoba Hydro is pushing people toward
9 electricity, but my -- from what I see in terms of
10 advertising and so on is that they are at least
11 agnostic.

12 And there are benefits generally seen
13 to gas heating, the comfort. You can -- with -- with
14 gas heating, you've got central air. It's easier to
15 condition the air, you know, give it -- give it --
16 make the air more moist, the dry air, and it's
17 cheaper. Manitoba Hydro, on the record, has a
18 comparison of gas and electricity. It is cheaper.

19 In addition, if people were to -- if --
20 if a gas utility were to aggressively go after
21 conversions to gas, that would have an impact on the
22 future demand. The load forecast is driven in -- in
23 part, as Manitoba Hydro says in its rebuttal, by this
24 increasing penetration of electricity. Elsewhere,
25 it's increasing penetration of natural gas.

1 My point there is that this is not
2 something that is beyond the control of Manitoba
3 Hydro. If I look at marketing in other gas utilities,
4 it's partially within the control of the -- of the gas
5 utility.

6 So those numbers are not something
7 that's destined, and they're not just observing and
8 saying, Here's what it's going to be. They're saying,
9 Here's what we predict, and maybe they're saying, This
10 is what's going to result from the way we're
11 approaching our customers.

12 The rebuttal turns to the top consumers
13 at Section 2.3.5, page 13. They say -- flipping a bit
14 ahead, they say on page 15, lines 8 to 10, Manitoba
15 Hydro agrees the top consumer's -- the top consumer's
16 loads can be difficult to forecast in the long term,
17 as their energy requirements are driven by many
18 distinct factors. They agree with me. I agree with
19 them. Top consumers are a problem in -- as from a
20 forecasting perspective. Manitoba Hydro identifies
21 reasons. I identify reasons.

22 They object to my use of a five (5)
23 year view at -- at page 16, lines 3 to 10. The five
24 (5) year period of length as selected for their
25 analysis includes four (4) years with lower than

1 average growth in one (1) year. Well, I've already
2 made the point that we're into a different -- some
3 people believe we're into a different world now, and
4 you're not going to see the kind of growth that has
5 been experienced in the past for industrial loads in
6 future years as was experienced in the past years.

7 Manitoba Hydro looks at the last twenty
8 (20) years. And if you look at page 17, lines 1 to 7
9 in the rebuttal, they refer to at the, you know, those
10 top lines:

11 "Over the past twenty (20) years,
12 there were four (4) new customers,
13 totalling 1,100 gigawatt hours of
14 consumption, nine (9) instances of
15 customers with major expansions,
16 totalling 1,400 gigawatt hours.
17
18 hours of growth], and two (2)
19 existing customers who closed
20 operations, reducing consumption by
21 700 gigawatt hours."

22 That's a net growth of 2,100 gigawatt
23 hours over twenty (20) years, roughly 90 gigawatt
24 hours per year, the 1,800 divided by twenty (20).
25 Their forecast assumes 100 gigawatt hours from the

1 fourth year in the forecast on, so nothing new in the
2 immediate term, but after that, beyond the term when
3 they would have any specific knowledge, they're
4 assuming 100 gigawatt per year, which is a little
5 greater than the experience of the past twenty (20)
6 years.

7 Across Canada, because again, I work in
8 other jurisdictions, we see across Ontario, we see in
9 New Brunswick, we've seen Nova Scotia, industrial
10 loads shutting down. Forestry sector decimated.
11 Trees grow faster in South America. The pulp and
12 paper operations are -- are moving to South America.
13 We've actually been involved in hearings to set
14 special rates to try to fight the loss of industrial
15 loads. Mining sector, there's a lot of sectors with
16 better -- are struggling in Canada, and our economy,
17 some people believe we're going through a change, and
18 we're not going to see new large industrial loads
19 coming along.

20 Certainly the university is not going
21 to disappear. They're included as top -- top
22 consumers, but to assume a continuation of the good
23 times of the last twenty (20) years may be optimistic.
24 Again, I can't prove that's wrong, but I just warn --
25 caution.

1 And a final point on top consumers, if
2 actually we flip back, because it's a kind of minor
3 point on page 14, and I think this has been raised in
4 the hearing already, lines 3 to 5. The rebuttal
5 states that:

6 "Given the risks associated with the
7 shortfall of a suitable energy
8 supply, it is in the best interest of
9 customers to provide Manitoba with
10 accurate information regarding their
11 future energy need -- energy needs."

12 I deal with a lot of utilities, and I
13 often hear complaints that if somebody's going to be
14 reducing their load, they never tell the utility until
15 the last minute, because they don't want the utility
16 planning for reduced load until the company is
17 absolutely certain that they're not going to need it.
18 So a possible shutdown is not mentioned, plus the fact
19 they don't want to disclose to anybody that they're
20 shutting down, because they don't want the press to
21 get a hold of it. So they don't consider it public
22 information.

23 On the flip side, if they're looking at
24 growing their demands or looking at relocating, the
25 first thing you do is go to the utility to say, We're

1 going to need more power, can you serve us? They want
2 to get their new loads built into the plan. Sometimes
3 those plans get scuppered at the last minute.

4 So I would say, in fact, there's not an
5 incentive to provide accurate information. There's an
6 incentive to provide optimistic projections of top
7 consumer loads.

8 On the -- the price elasticity point,
9 and I think both my evidence and the rebuttal are a
10 little bit out of date on the price elasticity item,
11 but I would like to point out that the discussion in
12 the rebuttal fails to separate two (2) concepts of
13 elasticity. There is cross-price elasticity and own-
14 price elasticity.

15 The cross-price elasticity is the --
16 the impact on the price of something else, on the
17 demand for electricity, primarily natural gas, which
18 is discussed in the middle -- middle paragraphs on
19 page 19. Own-price elasticity is the response in
20 electricity demand to the increasing price of
21 electricity itself.

22 The cross-price elasticity is what
23 they're discussing there, and -- and there's a -- a
24 figure on the top of page 20. And maybe I'm
25 misinterpreting the point they're making, but the

1 point in the -- in the words at the -- the bottom of
2 page 19 -- you don't have -- you do not have to slide
3 back up to it:

4 "The following graph shows that the
5 model built with the 2012 data would
6 predict the historical data and
7 clearly show -- clearly shows that
8 the model was not performing as
9 expected in 2011 and 2012."

10 When I look at the graph as a whole,
11 yeah, '11 and '12 are off, but it looks like a pretty
12 close correlation to me, so I'm not sure why that
13 means there's no confidence in the model, unless I'm
14 missing something there.

15 And when they're talking about
16 conversions, my previous comment was, to some extent,
17 That's in the control of Manitoba Hydro. Is this
18 because of some forces beyond their control? Is this
19 because the way that they have been marketing natural
20 gas, if you want, to their customers?

21 When it comes to own-price elasticity,
22 that's the paragraph below the diagram where other
23 jurisdictions have come up with values in the range of
24 minus zero point zero-five (0.05) to minus zero point
25 two-five (0.25). Note, read carefully the minus sign

1 before the zero point two-five (0.25) is the line
2 ahead of it. There is a minus before the zero point
3 two-five (0.25) and higher.

4 What should we assume here? As
5 Manitoba Hydro says -- where was that cite? I didn't
6 write it down, but they say -- they say that,
7 basically, price has gone up roughly in line with
8 inflation, so you wouldn't expect -- see, they have no
9 historical data on which you can actually calculate on
10 own-price elasticity, just haven't had that
11 experience. But the NFAT price projections say that's
12 going to change. There will be ongoing price
13 increases that exceed inflation.

14 I would flag that, being from Ontario,
15 we have had some real experience with price
16 elasticity. In 1990, Cona -- the Conawapa hearing we
17 had in 1990 was building Conawapa for Ontario.
18 There's going to be a transmission line. There's a
19 contract with Ontario. The plan then was to build
20 Conawapa. Ontario was going to pay for the entire
21 plant over a twenty (20) year contract, and Manitoba
22 Hydro came in correctly saying, And we'll end up with
23 a free dam at the end of twenty (20) years. Ontario
24 will have paid for it.

25 Ontario was entered in the contract

1 because they were forecasting at the time very
2 significant increases in demand in Ontario, which
3 would require significant new supply.

4 Then Darlington came on-stream and
5 price -- the electricity price in Ontario went up by
6 about 30 percent over a three (3) year period. Demand
7 plummeted. The need for new generation disappeared.
8 Growth, new generation essentially stopped being built
9 from the mid-'90s until more recently, when we, after
10 a long lag, got into around 2010 -- Russ probably
11 knows the date better than I do -- we finally reached
12 the point where we're actually, we worried about
13 having insufficient generation to meet our summer
14 peaks.

15 But that was a lag of almost twenty
16 (20) years when there's no construction. And we'd
17 gone from this massive construction campaign in
18 something called the -- the Demand-Supply Plan in
19 1990, which got pulled -- said, We don't need
20 anything. And that was the result of some economic
21 factors in the '90s, but a large part of it was that
22 30 percent increase in electricity rates, which
23 triggered some of the industrial shutdowns across --
24 across Ontario, particularly in North, as well as
25 conservation.

1 2.5 gets into adjusting for weather;
2 there's reference there. The -- it's -- the
3 differences in approach have minimal impact; I agree.
4 We're -- we're quibbling over details, but I would
5 point that -- point out that on page 21, line 15/16,
6 they make reference to:

7 "Moving -- the result of moving from
8 ten (10) year to twenty-five (25)
9 year averages was a significant
10 improvement in year-to-year
11 stability, with only a small
12 reduction in accuracy."

13 So good -- better for stability; not
14 quite as accurate. But guess what? When you move
15 from year to year, and you got a twenty-five (25) year
16 forecast, each year you're changing one (1) data point
17 in twenty-five (25) versus on a ten (10) year period,
18 you're changing one (1) data point in ten (10). When
19 you've got twenty-four (24) of twenty-five (25) data
20 points not changing versus nine (9) of ten (10), it's
21 more stable. Absolutely, by definition it's going to
22 be. But still you're reducing accuracy. So I'm not
23 sure that that's a -- a good tradeoff. Again, that's
24 -- that's judgment. Different experts -- and Manitoba
25 Hydro are experts -- have different views on these

1 things.

2 On page 23, lines 18 to 22, the
3 rebuttal states that:

4 "The primary purpose of weather
5 adjustment at Manitoba Hydro is to
6 explain monthly revenue variances
7 between forecast revenue and actual,
8 with majority of the variance being
9 due to weather."

10 Yet all through this, I characterize
11 this as the comments are coming to this with a GRA
12 mind-set. In the long run, we're not just trying to
13 see what is the deg -- the degree -- the degree-day
14 impact right now for revenue purposes. What we really
15 care about is: Is the impact of degree days going to
16 change over time, over a period of decades?

17 So for example, if climate change means
18 that Manitoba has hot -- hotter summer than it used
19 to, probably more people will install air
20 conditioning. More air conditioning means that each
21 degree-day, heating degree-day, will actually cause a
22 greater impact. The same degree-day in a marketplace
23 with low penetration of air conditioning versus one
24 (1) of the high-penetration of air conditioning, the
25 same degree day will have a different impact. That

1 could affect the load forecast in the long run.

2 That's a scenario which could be considered.

3 Similarly, if Manitoba ends up with
4 colder summers, you'd have -- you could have lower
5 impact on degree-days. So what is the impact of
6 changing, like literally, the amount of electricity
7 which is -- which is consumed as a result of a degree-
8 day? That's changes in the marketplace. That's the
9 kind of changes I'm talking about which are -- which
10 could change the structure of marketplace.

11 3.2.6 -- sorry, 2 -- 2.6 -- Section
12 2.6, starting at page 25, moves into forecast of
13 variability and accuracy. They talk about having a
14 target of 5 percent accuracy -- within 5 percent --
15 actual being within 5 percent of -- of forecast over
16 five (5) years, and with a ten (10) year forecast, and
17 the tenth year having 10 percent accuracy. That
18 comment's around page 25, lines 7 to 8.

19 And they've been performing up --
20 roughly performing up to that target. In fact, we
21 looked at going out a further fifteen (15) years, and
22 their fifteen (15) year accuracy was roughly
23 comparable to ten (10) year accuracy. What that shows
24 is that, in the past, their accuracy has been within
25 that range of target.

1 And if the world does not change,
2 there's every reason to believe that accuracy will
3 continue, that they will be within, say, 10 percent on
4 a ten (10) year forecast, so say, for a fifteen (15)
5 year forecast, within 10 percent, perhaps even for
6 longer periods, but if there are fundamental
7 structural changes, all bets are off. That goes out
8 the window.

9 So that leads into the discussion of
10 scenarios and probability. I want to make sure you
11 understand the difference between the scenario
12 approach that I'm talking about and the probabilistic
13 approach that Manitoba Hydro's talking about.

14 Manitoba Hydro looks at that past
15 variability -- we just talked about it -- and they
16 say, We can do a statistical or probabilistic analysis
17 of the past. And based on that variation in outcomes,
18 actual outcomes, reld (phonetic) or a forecast, we can
19 come up with what statisticians would call the
20 standard deviation, and we can use probabilistic
21 techniques where we say we can identify 10 percent
22 point, 10 percent probability.

23 That means that the 10 percent level
24 they're talking about says there's a 10 percent chance
25 that demand will be below our 10 percent forecast.

1 The 50 percent is the midpoint. There's a 50 percent
2 chance you'll be above or a 50 percent chance you'll
3 be below that forecast, and the 90 percent is saying
4 there's a 90 percent chance we'll be at or below that
5 forecast -- i.e., there's a 10 percent chance you'll
6 be above it.

7 So when they show charts with their 50
8 percent, 90 percent, and 10 percent range, what
9 they're showing is if you -- three (3) scenarios -- a
10 high, a medium, a low -- which captures 80 percent of
11 the probable outcomes.

12 By definition, and it's in all the
13 textbooks, a probabilistic approach assumes no
14 structural change. It says we're modelling using data
15 from the past to project the future, and the data from
16 the past are relevant to the future if there's no
17 structural change. If there is structural change, all
18 bets are off.

19 So that range they're talking about,
20 from a probabilistic perspective, the methodology's
21 completely consistent with a probability analysis,
22 completely appropriate, but it has a fundamental
23 assumption of no structural change.

24 When I talk -- when I talk about doing
25 some scenarios, what I'm saying is, maybe when we're

1 talking about decades in the future, we're doing a
2 financial analysis of the NFAT, we should actually be
3 thinking about the kinds of structural changes that
4 could occur, and do some, in effect, stress tastes --
5 stress testing on those extremes that I've referred to
6 previously, a -- a high and a low scenario that are --
7 reflect fundamental changes in the marketplace that
8 can -- that could have significant impact.

9 On the low side is the one I've always
10 -- already made clear I'm concerned about. What
11 happens if, in fifteen (15) years, say, fifteen (15)
12 years -- let's go out to 2029/2030 -- growth goes to
13 zero due to grid parity? Do you still have a
14 Preferred Development Plan that's actually attractive?

15 Do you have a Preferred Development
16 Plan that is actually financially viable? Have you
17 built dams? Have you built huge resources that
18 require either growing domestic demand or a strong
19 export price to be viable? And if you go through some
20 of these scenarios, do you end up with something which
21 is unacceptable?

22 That's a stress test. That's like the
23 stress test after the financial crisis with the banks.
24 Let's take extreme scenarios and say, Do we survive
25 that extreme scenario? So when I'm talking about

1 scenario analysis, I'm talking about including, in
2 effect, some stress testing.

3

4 (BRIEF PAUSE)

5

6 MR. JOHN TODD: Now, in --

7 THE CHAIRPERSON: I wonder if it would
8 be an appropriate time -- we've been at it for a while
9 now. I wonder if it would be an appropriate time to
10 take a break? Say, we take ten (10) minutes and --
11 and give the opportunity to -- to refresh their coffee
12 and so on. So back here in about ten (10) minutes.

13

14 --- Upon recessing at 10:47 a.m.

15 --- Upon resuming at 11:02 a.m.

16

17 THE CHAIRPERSON: Back to you, Mr.
18 Todd.

19 MR. JOHN TODD: Just to let you know,
20 Mr. Chair, I'm almost finished the discussion of the
21 rebuttal, and the rest of my evidence is actually kind
22 of covered off through the rebuttal. So I'd say
23 fifteen (15), twenty (20) minutes max left.

24 THE CHAIRPERSON: Okay.

25 MR. JOHN TODD: Just to provide

1 context to the last comment before we broke around the
2 sensitivity -- the scenarios and the probability
3 analysis, in -- in Manito -- the way the load forecast
4 is used in the analysis, the -- the load forecast is
5 not considered to be one of the high impact factors.
6 Therefore, the range of different load forecasts is
7 not used as part of the twenty-seven (27) scenarios
8 that Manitoba Hydro runs in its primary part of its
9 analysis.

10 Where it looks at the variation in the
11 Manitoba load is in the sensitivity analysis part,
12 which, in Chapter 10, Section 10.2.3 is where it
13 addresses the sensitivity of the results to the -- to
14 the high and low ranges, the -- the ten (10) and the
15 ninety (90) of the Manitoba load.

16 Elsewhere in the analysis, it's one
17 forecast that is used. It's, you know, the main
18 forecast, the 50 percent forecast. In that -- in --
19 in Chapter 10, pages 48 to 53, it has a energy growth
20 rate at the low end of one point two (1.2), a high of
21 two point zero (2.0); capacity growth, a low of one
22 point one (1.1), a high of two point one (2.1). So
23 that's the ranges that are looked at in their
24 sensitivity analysis.

25 And in that analysis, there's no

1 interactions. It's saying, Here's the sensitivity in
2 terms of the numbers for the different plans based on
3 those ranges. It shows the sensitivity of -- of the
4 plans to load as a factor, but does not correlate it
5 with other things. So, for example, if one's view of
6 the -- of the future of the -- of the electricity
7 market, if you want, is that low demand in Manitoba
8 would tend to correlate with low demand in North
9 America, because the phenomena that would lead to
10 structure changes and load demand are -- are not
11 specific to Manitoba. Then one might want to say
12 there should be correlation between a low export price
13 scenario and a -- and a load forecast scenario.

14 So in looking at load forecast within
15 the context of the whole NFAT analysis, just doing
16 that sensitivity, number 1, in my view, the
17 sensitivity doesn't look at a broad enough range for
18 the reasons I've outlined. And -- and secondly, it
19 doesn't look at how that may interplay with -- with
20 other possibly correlated factors which would affect
21 the Manitoba results.

22 Flipping back to the final parts of the
23 rebuttal evidence that related to the load forecast,
24 Section 2.7 on page 26, talked about the sensitivity
25 I've just referred to, and I would point out that

1 there's a quote there on lines 31 to 34, which is a
2 quote from Kurbursi and Magee, where they state that:

3 "The probabilistic framework is
4 worked out to identify the load,
5 given the probability of the actual
6 load will be less than the forecast
7 load. This is an improvement over
8 using arbitrary, pessimistic, or
9 optimistic forecasting to bracket the
10 forecast."

11 Okay. That's -- so that appears lines
12 31 to 34. I would like to point out that those
13 comments were done in the context of a GRA. In the
14 context of GRA, I agree with it entirely. I don't
15 know whether they would have the view that in the
16 context of an NFAT, the same -- they would have the
17 same view. My view is certainly different in the
18 context of an NFAT.

19 And the advantage of a scenario
20 analysis is that a scenario analysis can look at
21 something that does not assume no structural change.
22 The probabilistic ness -- analysis that I mentioned
23 earlier is built on the assumption of no structural
24 change. That's part of fundamentals of doing a -- a
25 probability model unless you have a dummy variable in

1 there to explicitly recognize structural changes.

2 So, you know, I -- I would not consider
3 that quote as something which is necessarily
4 inconsistent with what I'm saying in the context of
5 the NFAT.

6 My final comment on the rebuttal, just
7 because I talk about grid parity is, to flip further
8 through, it's more in the DSM section, but Section 3.6
9 at page 41 deals with solar and grid parity.

10 Lines 27 to 30, the first paragraph
11 there, point out that it's the sort of general
12 agreement, they refer to themselves and Mr. Dunskey,
13 considerable long-term uncertainty over the future.
14 And so where Manitoba Hydro does refer to grid parity
15 as one type of structural change. They seem to agree
16 that there's significant uncertainty.

17 One can try to forecast the impact of
18 grid parity, and we probably have a reasonably good
19 sense that the impact will be gradual change, and that
20 it will come slower in Manitoba than elsewhere, but if
21 we're looking out ten (10) or twenty (20) years, it'll
22 be gradual, but if we look at, I would say, sort of
23 fifteen (15) years and beyond, there certainly are
24 people out there who are anticipating, in effect, a
25 tipping point, a -- a major change, but that will

1 depend upon significant innovation, a -- a notable
2 innovation that will dramatically change things, which
3 is inherently unpredictable.

4 And with that, I will leave the
5 rebuttal evidence. I'll return to my slides, and as I
6 mentioned, in my slides, I go through concluding
7 remarks, which, on the slides, what you'll see, if you
8 -- if we flip to the next one, what's on the slides is
9 the text taken directly from the concluding remarks in
10 my evidence, which appear at page 42 and 43 of my
11 evidence, and I'll just take a moment to run -- run
12 through these eight (8) points.

13 And I think the most efficient way is,
14 you know, just -- just read them, and most of it has
15 been covered off, but I just want to make sure that
16 you're comfortable with -- with those conclusions.

17 At the current time, the load forecast
18 does not provide any alternative economic or
19 population scenarios to test the sensitivity of the
20 load forecast changes in these assumptions, so it's --
21 that's the extrapolation point being made.

22 Elenchus believes that as input for
23 effective long-term resource planning, Manitoba Hydro
24 should provide alternative economic and population
25 growth scenarios, that's a deviation from the pob --

1 probabilistic approach, and their associated effects.

2 While Manitoba Hydro provides a
3 simplified probabilistic confidence interval analysis,
4 this does not test the sensitivity of the load
5 forecast changes in input assumptions on economic and
6 population growth.

7 What I'm presenting here, that's --
8 that's referring to changes -- they capture changes
9 other than structural changes that I'm referring to,
10 but they do not capture the significant structural
11 changes.

12 Again, I -- I have to say I'm not --
13 this is not meant as a severe criticism of them. What
14 I'm saying is that there are things that are on -- in
15 -- inherently cannot be predicted with any accuracy.
16 They're not included in their forecast, because you
17 can't. You can't come out with a forecast with actual
18 numbers that build these kinds of variables in it.
19 It's all got to be done through sensitivity analysis
20 of -- of alternate scenarios. And the key question
21 is, does it create a dramatic impact on the NFAT
22 analysis if load is flat, for example?

23 Remark 2:

24 "Consideration should be given to the
25 financial risks related to potential

1 market transformations such as grid
2 parity that could result in a
3 disconnect between Manitoba Hydro's
4 projection of total domestic demand
5 future demand for grid power."

6 I just want to make sure that -- that
7 my point comes across that you could take a look at
8 Manitoba Hydro's forecast and say that is probably a
9 fairly good forecast of electricity demand. But what
10 matters for the NPAT -- NFAT is: What is the demand
11 for grid power?

12 And I think it's -- in my mind, I think
13 it's important to draw a distinction between total
14 electricity demand -- which would include self-
15 generation, microgrids, things like that -- and the
16 demand for a grid on -- for power that comes from the
17 grid. Manitoba Hydro -- demand may keep going up, but
18 Manitoba Hydro's only serving demand for grid power.

19 We're getting into a couple of
20 technical points now around what could be done with
21 the load forecast both for GRA purposes and -- and for
22 an NFAT -- future NFAT review. Additional
23 transparency about the choice of model and model
24 accuracy needs to be provided.

25 For example, methodological changes in

1 specification of econometric models have been made
2 from one year -- from one to another without adequate
3 explanation about why the changes were made and the
4 effects of the changes.

5 Model performance, including within-
6 sample error and alternatives considered and rejected,
7 would also help increase transparency.

8 Manitoba Hydro, in the past, has been
9 focussed on, Here's the model, here's our latest
10 forecast. We felt that it was almost like there's a
11 basic approach that was taken year after year after
12 year. There were tweaks made. That was in the
13 context of this year. It was, I mean, not a -- it
14 wasn't de novo start every year, obviously.

15 But we could not see a lot of
16 explanation of kind of the evolution of the change in
17 the methodology. It seemed to be, Whatever gives us
18 our best forecast this year is -- is what we're doing.

19 And if you're looking at each year in
20 isolation, that's probably the right way to do it.
21 But one is always concerned about when there's
22 changes, what's really driving those changes. And --
23 and we would have liked to have seen more explanation
24 of how they got from method -- how they went through
25 methodological changes and -- and what the impacts

1 were, other than on a macro basis.

2 An updated residential survey to
3 reflect current conditions within the residential
4 market should be undertaken. When they look at the
5 residential market, they've done a -- a survey of the
6 residential market in terms of -- of use, residential
7 use.

8 And 2009, I -- if my -- if I recall
9 correctly, was when they had done their last one.
10 It's now been -- it's now in the fifth year since
11 that's done. Residential use changes over time. An
12 update to that is -- is due. They may well have that
13 for next time they come for GRA.

14 So it should be undertaken and up --
15 and integrated into the load forecast to verify
16 assumptions about electric heat market share and the
17 end-use model parameters. Outdated end-use model
18 parameters may be misleading.

19 Alternate models for projecting the
20 number of residential customers should be explored and
21 reported on. Alternate population scenarios and the
22 effects of the residential and GS mass market should
23 then be included.

24 Arguably, the 10 percent/90 percent
25 are, in effect, scenario analysis. And, as I've said,

1 essentially in the short run, that -- I'm sure that
2 covers the spectrum.

3 However, even the short run, things
4 like -- like population, there are questions about
5 whether we should just be extrapolating from the past
6 and saying, from a probabilistic perspective, looking
7 at the past, using that on a go-forward basis, perhaps
8 there are actually some changes we should consider, in
9 particular around some of the population scenarios.

10 There are again alternative models in
11 the GS mass market forecast. Manitoba Hydro has sort
12 of changed the methodology through time. Again, as
13 I've said earlier, experts can disagree. One can even
14 disagree or change one's mind in oneself or find
15 something that seems to work better and change from
16 year to year.

17 Though this process, we could not see
18 strong support for those changes. I think that's a
19 documentation issue. It's not a methodological
20 criticism, per se.

21 Alternative economic growth scenarios
22 and additional transparency analysis in the top
23 consumer forecast would improve transparency. As I
24 referred to earlier when talking about the rebuttal
25 evidence, we all agreed that the top consumer

1 forecasts is the difficult one. There is a
2 possibility that -- that more than one (1) top
3 consumer can disappear, if we're talking about a time
4 frame of fifteen (15), twenty (20), thirty (30) years.
5 Similarly, there could be -- there could be more
6 growth.

7 So there's not -- there's not a lot
8 behind the assumptions made on the possible growth
9 scenarios around top consumers. It's just -- we don't
10 really know, so let's talk about plus or minus one (1)
11 top consumer. There's not any analysis rationale to
12 say, Here are top consumers and looking out twenty
13 (20) years, here's how many are at risk, for example.
14 We don't know.

15 Elenchus believes the weather
16 adjustment process applied by Manitoba Hydro should be
17 treated with caution and may result in potential
18 various outcomes. Manitoba Hydro should investigate
19 using a time series longer than two (2) years to
20 estimate the weather sensitivity with weather-
21 sensitive consumption sectors, or a thorough
22 explanation of the weather adjustment process needs to
23 be developed to allow stakeholders to understand the
24 process more accurate -- clearly.

25 What was there, I mean, they're --

1 they're using the -- the two (2) year estimate -- is
2 what they've moved to. To -- to -- from our -- from
3 our perspective, that's inconsistent with standard
4 practice. Weather sensitivity is looked at over a
5 longer period of time. And frankly, we just -- there
6 wasn't documentation that we were able to obtain in
7 the -- in this process to really get comfortable with
8 the use of a two (2) year -- for the base of the
9 estimate.

10 For the next GRA, probably, that's
11 something that could be better documented and either
12 supported in a way that justifies using the two (2)
13 years or would lead back to a longer term -- in terms
14 of time period, longer time series for doing that
15 weather sensitivity analysis.

16 So I just want to quickly run through
17 the -- the scope of work. And again, this is straight
18 out of the appendix in the evidence that appears at
19 the back, just following the concluding remarks. It's
20 in tabular form and goes through the scope of work
21 with a -- a brief summary of our reaction or comments
22 on that scope of work.

23 So scope of work item 1, from an energy
24 demand perspective, we were asked to comment on the
25 extent which Manitoba's Preferred Development Plan

1 addresses the reliability and security requirements of
2 Manitoba's electric supply. The Preferred Development
3 Plan and alternatives is designed to address --
4 specifically designed to address the reliability and
5 security requirements of Manitoba's electric supply as
6 forecast. While actual demand could exceed the
7 forecast, the adequacy supply would only be
8 compromised those extreme circumstances. That's sort
9 of the up-side risks.

10 And as I've said, the -- the potential
11 impact on reliability and security would only come
12 from extreme circumstances of -- of demand growing
13 more than the high end in the forecast. We're
14 comfortable that's that -- with the options available
15 to Manitoba Hydro, that they could react to
16 circumstances and the -- the forecast gives you a good
17 enough sense of the high end that we're comfortable in
18 that regard.

19 "Review Manitoba Hydro's load
20 forecast factors and comment on
21 whether they are complete,
22 reasonable, and accurate."

23 Well, I think you know where I'm coming
24 from there. The load forecasting methodology is
25 reasonable, assuming there are no significant

1 structural changes to the demand drivers that underpin
2 the forecasting methodology. However, given the time
3 frame of the NFAT analysis, it can be expected that
4 there may -- I would be tempted to say, "will" -- but
5 may be significant structural changes that could
6 result in dramatically different domestic demand in
7 the coming decades.

8 "Comment on the use of an econometric
9 and -- and used forecasting
10 methodology."

11 In our view, the methodology is
12 generally reasonable, although, some refinements are
13 suggested. Again, we're talking about tweaking,
14 judgment of experts.

15 "Assess the reliability of Manitoba
16 Hydro's short and long-term domestic
17 load forecasting modelling."

18 Manitoba Hydro's methodology is
19 generally appropriate for short-term forecasting, no
20 structural changes. There's limited consideration of
21 factors that could dramatically impact on the demand
22 in the long run over the next decade and beyond.
23 Enough said on that, over and over.

24 "Review the extent to which Manitoba
25 Hydro has used appropriate scenario

1 planning to examine the potential
2 impacts of changes in the industry,
3 the Manitoba and Canadian economies,
4 available technologies, generation
5 and loads, and energy efficiency
6 measures, cost, and cost
7 effectiveness."

8 Rather than a specific point forecast
9 associated only with a reference forecast, Elenchus
10 believes a -- an approach with a range of outcomes
11 based on low, medium-low, reference, medium-high, and
12 high economic scenarios should be paired with the load
13 forecast outcomes. Manitoba Hydro used this approach
14 until 20 -- 2009.

15 Manitoba Hydro does have, in effect,
16 three (3) scenarios: the 10, 50, and the 90. Basic
17 point here is that that's sort of a -- a top down, or
18 it looks at the past probab -- probabilistic analysis.
19 So by looking at that, they're not saying, What are
20 the drivers that could change load requirements in
21 Manitoba, and building up a forecast from scenarios of
22 different drivers. Their, sort of, scenarios are a
23 probabilistic range which assumes stability of the
24 drivers of demand in Manitoba.

25 What we're saying is it can be

1 complemented by looking at, Okay, what things may
2 change and let's actually have some bottom-up
3 scenarios, which -- which look at what's dri -- what's
4 driving the load that could change in the future and
5 come up with more descriptive scenarios which could be
6 converted into high and low load forecasts.

7 I'll comment on the appropriate use of
8 probability analysis in projected load forecast. The
9 probability approach used by Manitoba Hydro is less
10 transparent and provides less insight than the
11 multiple scenarios approach used in 2009, see Item 5
12 above. The point there is it's probabilistic. It
13 doesn't explicitly look at what is causing changes in
14 demand.

15 A comment on extent to which
16 retrospective load analysis provides confidence in the
17 load forecast. Retrospective load analysis indicates
18 that confidence in the load forecast is justified
19 except for top users. In other words, the historical
20 trend has been fairly stable. The forecast is quite
21 consistent with it. So on that basis, you can have a
22 lot of confidence in that as a no-change scenario.

23 Top user loads can change significantly
24 in unanticipated ways, since their demands are driven
25 by many idiosyncratic factors that cannot be known to

1 Manitoba Hydro. Probably just a large -- large
2 numbers things. You've got a relatively small number
3 of top consumers. One (1) coming or leaving has a
4 significant impact. There's no reason that it
5 couldn't be two (2), or three (3), or four (4), if
6 you're talking a ten (10) to twenty (20) year period,
7 that come or leave. So there's a lot more -- a lot
8 less confidence in that portion of the forecast.

9 Review, that's -- that's captured in
10 all the other SOW -- SOW options or items.

11 This piece has several parts:

12 "Compare Manitoba Hydro's 2012 and
13 '13 load forecasts with Manitoba
14 Hydro's historical load forecast back
15 to 2008 with specific reference to:
16 A) population growth, birthrates,
17 immigration."

18 Historical trends are reflected in the
19 load forecast. Possible future changes in the
20 historic trends are not specifically considered, just
21 the assumption that we will continue similar to the
22 past.

23 "B) changes in number size and
24 occupancy is -- of residential
25 dwellings; historical trends are

1 reflected."

2 Same comment, possible future changes
3 in historic trends are not specifically considered.
4 Just to illustrate that point, one of the things
5 that's been happening in recent years across Canada
6 and elsewhere is that students today have a lot more
7 trouble finding jobs than when I came out of
8 university. It's a much -- it's a common phenomenon
9 for students to graduate from university and go work
10 at Starbucks and live at home. I get coffee from very
11 well-educated people. But that's driving people back
12 to home.

13 So underlying that is, have we gone
14 through a financial blip and a few years down the road
15 we're back to business as usual from before the 2008
16 financial crisis? Or has there actually been a
17 structural change where young people will continue to
18 have a problem finding jobs and that people will go
19 through -- even at a young age, will go through long-
20 term unemployment. And if you go through some long-
21 term unemployment, the chances of getting back into
22 the workforce are much lower.

23 So there are certainly economists who
24 are looking at -- at the way out economy is growing
25 and saying that history is not a good indicator of

1 what's going to happen for the next ten (10) or twenty
2 (20) years. Are they right? I can't guarantee it.
3 I'm just saying there -- there certainly is that
4 viewpoint out there.

5 "C) A comparison of the load
6 forecasts with similar markets; are
7 Manitoba Hydro's assumptions
8 consistent with neighbouring
9 jurisdictions?"

10 Broad brush, yes. There's the table
11 which we looked at in the rebuttal which highlights
12 that point. Again, the usual thing, nobody's looking
13 at these game changers. But usually in most other
14 jurisdictions they're not looking at a capital
15 investment which is so significant compared to the
16 existing capital base and compared to the economy of
17 the jurisdiction they're in.

18 Peak demand and energy trends,
19 including seasonal variation in load forecasting.
20 Manitoba Hydro's methodology is based on the
21 questionable assumption that past trends will continue
22 for the full planning period. The load forecast does
23 not explicitly address seasonal variations, it's not
24 intended to.

25 Scope of work 10:

1 "Review Manitoba Hydro's weather
2 adjustment methodology with res --
3 with specific reference to non-
4 heating load, electric heating load,
5 et cetera."

6 Manitoba Hydro gives explicit and
7 appropriate consideration to each factor identified in
8 its weather adjustment methodology, subject to the
9 caveats noted above. But those are minor concerns.

10 "Assess the consistency of
11 transmission and distribution losses
12 under various loads and weather
13 occurrences and the assignment of
14 such losses to customer classes."

15 The load forecast does not include this
16 level of detail, in terms of the information provided
17 to us.

18 "Assess the impacts on load forecast
19 resulting from potential fuel
20 switching, particularly in light of
21 recent trends in the cost of natural
22 gas."

23 Potential fuel switching is treating by
24 load -- for load forecast purposes as an independent
25 customer decision. Manitoba Hydro controls both

1 electric and natural gas utilities. Its decisions in
2 marketing policies are likely, certainly in my view,
3 to have significant influence on both the decisions
4 made by developers for new buildings and fuel
5 switching decisions, driven in part by the
6 availability of natural gas as a result of system
7 expansion.

8 So that's pointing out that Manitoba
9 Hydro controls both who has gas pipes down their
10 street and the effort being made to get people who
11 have gas going down their street to actually connect.
12 Over the longer term, the market penetration of
13 natural gas for space heating could be significantly
14 influenced by Manitoba Hydro, in my view.

15 "Comment on the price elasticity and
16 impact of electricity rate changes in
17 demand."

18 Manitoba Hydro has not been able to
19 quantify the price elasticity of demand for electric -
20 - electricity empirically for its own jurisdiction.
21 And it consequently excludes -- this is now -- should
22 be amended -- price elasticity from its load
23 forecasting methodology.

24 This result may be a reflection of the
25 historic low price of electricity in Manitoba and the

1 fact, it hasn't gone up more than inflation. But it
2 is not consistent with the experience in other
3 jurisdictions to assume there'll be no price response.
4 The changes to reflect a price response are important
5 to recognize.

6 "Review and comment on Manitoba
7 Hydro's historical and forecast
8 growth in electric heating relative
9 to natural gas heating in the context
10 of electricity and natural gas
11 pricing."

12 I think that point is covered, nothing
13 more to add.

14 "Review and comment on the extent to
15 which demand-side management and
16 energy efficiency measures have been
17 relied on as an alternative to
18 generation."

19 You will be hearing much more about
20 demand-side management shortly. Manitoba has not
21 utilized integrated resource planning as a basis for
22 establishing a cost-effective level of DSM in
23 Manitoba. It has conducted a sensitivity analysis
24 with respect to the current planned level of DSM.

25 The whole DSM topic has been modified

1 with the Board. Its Power -- new Power Smart plan has
2 come out, and so that whole -- the impact of DSM and
3 load forecast has been certainly changed with the
4 updating of Manitoba Hydro's plans, DSM plans.

5 "16. Review and comment on the
6 appropriateness of and uncertainty
7 related to the timeliness of future
8 generation assets to meet domestic
9 load requirements and export
10 commitments."

11 From a load forecasting perspective,
12 the time lines appeared adequate for meeting domestic
13 load requirements and export commitments. The
14 greatest risk relates to the ability of adjusting to
15 lower growth and demand in the even of market
16 transformation such as grid parity in Manitoba and/or
17 in export jurisdictions.

18 In other words, you can -- if you
19 haven't built capacity, you can always build more
20 capacity. And while some options, such as major hydro
21 developments, have a -- have a long lead time, there
22 are other ways to meet unexpected increases --
23 increases in demand by building natural gas fire
24 plants or something, which can be done much more
25 quickly. And some preplanning can be done to keep opt

1 -- options, such as that, readily available as
2 required.

3 The more difficult thing is if you end
4 up with low demand, you cannot dis-invest once you've
5 built a major generating station. Therefore, you're
6 relying on -- on the export price if domestic demand
7 is down.

8 "Comment on the impact of global
9 warming on the load forecast."

10 The impact climate change on the
11 climate in specific areas is -- is proving very
12 difficult to predict. A lot of the terminology has
13 moved from 'global warming' to 'climate change'. I've
14 always said that as a Canadian if -- if it really was
15 global warming, bring in on; it doesn't bother me.
16 Let's spew carbon out.

17 But the reality is it's climate change
18 making things less predictable, more extreme weather.
19 And therefore, there is increased uncertainty and more
20 frequent extreme weather conditions. It's therefore
21 difficult to build the impact of climate change into
22 Manitoba Hydro's load forecast. So it's not really
23 there, but I don't know how you'd build it in, because
24 we -- we know what sort of global trends are, and we
25 know that there's significant impacts of climate

1 change. But to try to predict what the impact will be
2 for Manitoba, I'm not aware that science has reached a
3 point where we can make those kinds of predictions.

4 The primary consideration is that
5 longer term trends are more uncertain than ever, which
6 suggests that flexibility in development plans may be
7 of increased importance.

8 "Comment on the load forecast for
9 industrial and commercial consumers."

10

11 As pointed out, the forecast for top
12 consumers is the only component of the load forecast
13 that has shown in the past large variances. In recent
14 years there's been a tendency to over-forecast top
15 consumer demand. It does -- it does fluctuate and
16 there's a pattern, probably because of the -- the lag
17 time, in terms of the methodology used to react to
18 major events like the 2008 financial crisis.

19 There's a risk that top consumers could
20 opt for self-generation in the future, resulting in
21 declining rather than in -- dec -- it was supposed to
22 say, "rather than increasing demand." I got both
23 decreasing there. There is also a risk that closure
24 in the coming decades could have a significant impact
25 on top consumer demand, given the small number of

1 customers in this class.

2 Again, the -- when you look at
3 alternatives I've referred to, for example, that
4 company that's building fuel cells, the first target
5 market for them are customers with significant
6 electricity demand. And they're basically saying, We
7 have an option that we can sell to you, which they
8 claim right now is good, competitive. Probably not in
9 -- we don't have pricing -- probably not in Manitoba
10 with relatively low prices, but we'd start in high
11 priced jurisdictions and start with top consumer type
12 customers that they'll be building equipment which
13 will allow them to go off grid.

14 So whether or not these top customers
15 survive as -- as their industry survive, there is a
16 question of might they, in a time frame of ten (10),
17 twenty (20), or thirty (30) years find it attractive
18 to move off the grid.

19 19, which is other responsibilities,
20 not applicable. And that ends my comments. And we
21 can move on to DSM. And I will just get this other --
22 the other set of slides out. Hang on a second.

23

24 (BRIEF PAUSE)

25

1 MR. CHRISTIAN MONNIN: Mr. Chair, if
2 it might assist, Mr. Houldin's presentation is -- is
3 roughly an hour.

4 DR. HUGH GRANT: Could I ask a
5 question but also sort of a comment as well? Part of
6 the difficulty I have with this whole area is sorting
7 out the relationship between forecasting and long-term
8 planning. And I think it comes back, to me, the
9 distinction -- the age-old distinction between risk
10 and uncertainty.

11 When you talk about known unknowns,
12 this is into the realm of uncertainty. I think what
13 we're really engaged in forecasting is: To what
14 extent can you cope with risk? To what extent does
15 the recent past allow you to calculate probabilities
16 that allow you to forecast things into the future?

17 And so I get a bit confused in your
18 presentation when you want Hydro to stress test some
19 things which I deem to be uncertainty, and yet, you
20 know, might criticize them for not dealing with other
21 things that realistic probabilities could be assigned
22 to.

23 So, for example, I don't suspect you
24 want Hydro to stress test their demand forecast for
25 the probability of nuclear war. It doesn't really --

1 you know, it's not really useful to the analysis.

2 So I guess what it -- it comes down to
3 is, I'm still left a little bit uncertain what you
4 think of their forecasting model because you indicated
5 on the one slide, in terms of scope of work number 3:

6 "Comment on the use of an econometric
7 and end-use forecasting model."

8 Econometrics isn't just statistics.
9 Econometrics is a model; it's a theory. It's
10 forecasting a demand curve. And so much of your
11 comments seem to imply that you don't think they have
12 a very robust model. And then, on the scope of work,
13 you say, It's not bad.

14 And so, I mean, I was just struck on
15 page 18 of your report, you provide, you know,
16 regression equations that I presume are from Hydro
17 which, if this is the forecasting model, I've got
18 some, you know, significant concerns about -- about
19 it; you know, degrees of freedom of seventeen (17).

20 Incidentally, they're your own price
21 elasticities there, right? There -- they actually
22 seem kind of reasonable, although they don't look
23 terribly robust.

24 So I guess what I'm wondering about is,
25 aside from not stress testing and high and low

1 forecasts and things of that nature, is there a sound
2 forecasting model that Manitoba Hydro is using?

3 MR. JOHN TODD: I'm going to split my
4 response to your comments, which are right on target,
5 into two (2) parts. And this is something I've
6 struggled with from day 1.

7 The mandate that we had on this work
8 was to evaluate Manitoba Hydro's load forecast. If I
9 had looked at that and divorced it from the NFAT, I
10 would have had -- that's a large part of the analysis
11 in the report that I've sort of referred to as -- as
12 tweaking.

13 As I say, well, it's not bad. There's
14 some things that, you know, I'd suggest doing
15 differently. There's certainly some recommendations I
16 would suggest for change. But, frankly, in terms of
17 forecasts that would result, it would be a minor
18 change; particularly when you take the range of the
19 ten (10), fifty (50), and ninety (90). There may be -
20 - you know, there -- there might be some improvements.

21 What I've struggled with is the load
22 forecast is an input to the rest of the NFAT analysis.
23 And if we view them as separate items, in effect the
24 load forecast is handed off to the other parts of
25 Manitoba Hydro and to the other IECs, in my -- from --

1 from my perspective is handed off to others to then
2 say, Okay, given this load forecast, should we choose
3 the Preferred Development Plan?

4 And so I say, well, while as a load
5 forecast it's very difficult to criticize it and say
6 there's a different set of numbers that's better --
7 you know, what we did not do from the beginning was to
8 say, We're going to develop our own load forecast with
9 a different set of numbers. If we did that, we
10 wouldn't come up with anything much different.

11 But in the context of the NFAT, I think
12 there's a deception around the level of certainty,
13 talk about certainty/uncertainty. If, when you come
14 to divvying the -- the financial analysis or the parts
15 of the analysis, you say, Oh, well, the range of
16 possible loads in the future are given me by my ten
17 (10), fifty (50), ninety (90).

18 Therefore, when you get to the, you
19 know, Chapter 10 in particular, which is looking at
20 the sensitivity analysis and so on, you say, Well, we
21 don't have to include that in our twenty-seven (27)
22 scenarios because the difference between the high and
23 the low are not big enough for it to be a major source
24 of risk.

25 And I'd say, But that's misleading, in

1 my view. I mean, given the time frame we're talking
2 about and given what we know is going on out there
3 that could affect grid demand, saying there's actually
4 much greater risks that, in essence, can't be
5 forecasted but should be part of the load forecast
6 scenarios, if you want, that are fed into the rest of
7 the analysis.

8 So what I'm trying to say is, as a load
9 forecast per se, i.e., a set of numbers that come out
10 of it, I find it hard to criticize it very seriously.
11 But as an input to the other analysis, I have to flag
12 to the panel that if you think that's the full range
13 of where load may go over the lifetime of these
14 plants, you're deceiving yourselves, in my view.

15 Does that help?

16 DR. HUGH GRANT: It does, although I
17 guess --

18 MR. JOHN TODD: It doesn't give you a
19 lot to go on, does it?

20 DR. HUGH GRANT: I mean, it's -- it's
21 quite plausible to say the best way to forecast load
22 growth over the next little bit is just simple time
23 trend, you know, that it could be that these income
24 elasticities are insignificant, cross-price, you know
25 -- you know, so that's quite plausible.

1 So if you're -- if you're saying that
2 these forecasts, no matter how good or bad, seem to be
3 within an acceptable range of error, that's okay.

4 But, you know, as one (1) of the other independent
5 consultants have said, you can develop precise
6 mathematical models out to a gazillion decimal points.

7 MR. JOHN TODD: Yeah.

8 DR. HUGH GRANT: But don't confuse
9 that with, you know, long-term planning. It's -- it's
10 a guide. It may help you eliminate some decisions
11 right away, but... And so -- and those are questions
12 about uncertainty and how you deal with that.

13 So I take your point that this forecast
14 is -- is, in -- in a sense, extrapolating the recent
15 past into the near future, and that's what we all seem
16 to do. But I -- so I guess we're in agreement.

17 MR. JOHN TODD: If -- if I were to
18 have put in one (1) box which is the broad level
19 conclusion of advice to the panel, I'd go back to that
20 HLIP (sic), so, you know, that -- are we looking at --
21 is something we have to consider a high impact/low
22 probability scenario that has catastrophic
23 consequences for the province?

24 And the answer I would like to hear as
25 a panel is, okay, if we take -- through stress

1 testing, take an extreme situation, and I've tried to
2 lay that out here, and follow it through the
3 consequences, does it end up meaning that we have to
4 raise rates for Manitoba Hydro customers by 2 percent
5 in 2040, or do we have to raise rates by 20 percent in
6 2040.

7 And -- but knowing that would tell me,
8 do I make the leap of faith to say let's go and build
9 and jump off the cliff and we'll see what -- you know,
10 what may happen because in one scenario you say, The
11 worst-case scenario isn't too bad, so let's go after
12 the upside. In the other scenario you might say, You
13 know what, the potential -- the risk of calling it
14 wrong is so significant we have to find a way to
15 mitigate that risk; we have to get a private-sector
16 investor to take half the risk or we have to go with
17 less -- lower capital cost option, do something
18 different.

19 And to me, that's what the load
20 forecast analysis ultimately is all about. Is there a
21 scenario where, you know, everybody in this room will
22 say, Oh my God, I sure got it wrong, when -- you know,
23 twenty (20) years after we're dead.

24 DR. HUGH GRANT: No, I accept your
25 point completely. I guess it's just these are sorts

1 of things that assigning probabilities to aren't
2 perhaps terribly useful. What's the probability a
3 fuel -- fuel cell develops in the next 'X' period?

4 But I do understand the point of
5 running different scenarios and forecasting what the
6 outcome would be.

7 MR. JOHN TODD: And in the -- in the
8 ex -- in the analysis, you look in the -- you know,
9 the texts around dealing with uncertainty and so on,
10 one of the recommendations -- I mean, the most recent
11 PUB review reports, sort of a regulation text, the
12 second edition just came out a couple of months ago,
13 they talk about that.

14 And, you know, their focus is you -- if
15 you're going to do scenario analysis, you've got to
16 have probability weightings. And so you come up with
17 an expected value and you'd make your decision on an
18 expected value.

19 And to me, that way of thinking about
20 it is correct if you have no high impact/low
21 probability events that you have to worry about. If
22 you can rule those out, let's just go with the best
23 expected value, which is essentially the approach
24 Manitoba Hydro is taking.

25 But when you have tails that have ex --

1 unacceptable results, then you have to think about
2 mitigation. That's where I come from.

3 THE CHAIRPERSON: Mr. Williams, go
4 ahead, please.

5 MR. BYRON WILLIAMS: Just because I'm
6 this afternoon, I wasn't sure I got Board member
7 Grant's page reference, whether it was page 17 or 18,
8 so.

9 DR. HUGH GRANT: 18.

10 MR. BYRON WILLIAMS: 18, okay.

11 THE CHAIRPERSON: I have a question
12 relating to -- I seem to recall, Mr. Todd, that you
13 were involved in the Muskrat Falls application before
14 the Newfoundland regulator.

15 MR. JOHN TODD: Yes, in a minor way.
16 I work with the consumer advocate in Newfoundland.

17 THE CHAIRPERSON: Were you addressing
18 load forecasts at that -- at the hearing?

19 MR. JOHN TODD: No. We had a very
20 minor role. It did not address load forecast. The
21 constraints put on that were extremely limited. I
22 think Manitoba Hydro International looked at
23 everything in much more detail.

24 THE CHAIRPERSON: And did that include
25 too the Maritime link proposal?

1 MR. JOHN TODD: The Newfoundland
2 regulators, com -- Board of Commissioners review did
3 not include the link. That was reviewed in a Nova
4 Scotia proceeding that I wasn't involved in.

5 THE CHAIRPERSON: I don't believe the
6 panel has any more questions, although, you know,
7 we're -- we're off schedule, so be -- to be frank with
8 you. And so I'm concerned. It looks like we're going
9 to be working late today if we're going to maintain
10 the schedule.

11 So I would suggest that we keep going
12 for the time being and maybe recess at around 12:30 in
13 the interests of balancing the -- the morning and the
14 afternoon 'cause expecting people to sit down for five
15 (5) -- over five (5) hours this afternoon is a bit of
16 a -- I expect we'll work till 6:00.

17 So I -- it's a bit of a -- it's -- it's
18 tough on everybody. So let's -- let's try to balance
19 the morning and the afternoon and keep going for a
20 while. And -- and then -- so we may have to interrupt
21 you in the middle of your presentation, but I hope
22 you'll -- you'll accept the reason why we're doing
23 that.

24 So -- so go ahead, please.

25 MR. CHRISTIAN MONNIN: Mr. Chair, I

1 think he just needs to -- Mr. Houldin just needs to
2 rearrange the laptop to get in position to proceed.

3 MR. RUSS HOULDIN: Okay. Thank you.
4 And actually, Mr. Chair, I'm -- I'm very much of the
5 same mind, as I -- I think people's attention spans
6 beyond about -- about an hour are -- are not that
7 great. So I think -- I think -- I very much
8 appreciate the need to manage the time in that way.

9 So I'm -- I'm very pleased and -- and
10 honoured to have the opportunity to present my -- my
11 evidence today. And I will -- I'll try to be fairly
12 expeditious. So like John, the purpose of the
13 evidence I think already addressed in -- in the -- in
14 the earlier part of the -- of the morning, it's to --
15 it's to address the -- the scope of work.

16 The -- my slide is div -- divided into
17 two (2) sections: there's general issues that
18 emphasize the key messages, which are really
19 essentially the executive summary of -- of my
20 evidence; and then the scope of work issues which,
21 when I get to them, will be essentially a -- a
22 recapitulation of much of what I've -- I've flagged in
23 the -- the general issue slides. I'm -- I'm hoping we
24 can -- we can move through those very quickly.

25 Here are the -- the key messages.

1 Elenchus is -- and this is slide 3, is of the view
2 that Manitoba Hydro's approach to DSM is -- is
3 reasonable. It -- it's fully comparable to other
4 North American utilities. On its own, DSM, it's
5 Elenchus's view that it has a minimal impact on the
6 timing of -- of Keeyask.

7 However, we do think there are
8 improvements that could be made to, again, what is a
9 fully reasonable approach by Manitoba Hydro, and
10 specifically, they -- they are -- Manitoba Hydro, I
11 think, could consider moving back to using integrated
12 resource planning, as it -- as it used to. Out of
13 Manitoba Hydro's control is the possibility this would
14 have to be a -- a government decision of moving to a
15 different delivery model for -- for energy efficiency.
16 Yes?

17 THE CHAIRPERSON: I wonder, Mr.
18 Houldin, just before you get too far in, I just want
19 to get some sense of the perspective that you are
20 addressing. Are you -- you know, the -- the ground
21 has shifted as far as DSM in the last -- last few
22 weeks.

23 MR. RUSS HOULDIN: Yes.

24 THE CHAIRPERSON: And I'm just
25 wondering, your perspective was based on the work that

1 -- pardon me, the application that was submitted as
2 part of the -- the work of this panel. So your --
3 your frame of -- frame of reference is -- is funded on
4 last fall's information, basically, right?

5 Are you -- are you -- to what extent
6 are you aware of the -- of the changes that have
7 occurred the last few weeks in -- in the DSM plan?

8 MR. RUSS HOULDIN: Yeah, I -- I've
9 reviewed the -- the new evidence that -- that Manitoba
10 Hydro presented to the panel on -- on March 4th.
11 There's, again, slides for the -- for the -- the
12 direct evidence, and I also actually reviewed the
13 transcripts. And I've -- we did receive last night
14 the -- the updated Power Smart Plan. Obviously,
15 that's -- that's -- that isn't -- that isn't factored
16 in the -- Elenchus' evidence.

17 THE CHAIRPERSON: So the -- the point
18 -- the point is that you -- you -- that what we will
19 be hearing from you is informed by that -- that new
20 knowledge that you have, to the extent --

21 MR. RUSS HOULDIN: Absolutely.

22 THE CHAIRPERSON: -- that you were
23 able to do it over the last twenty-four (24) hours,
24 yeah?

25 MR. RUSS HOULDIN: Yeah. Yeah.

1 Because again, just to the -- I think the point that
2 was -- has -- was been made earlier, the approach
3 Elenchus has taken is -- is indeed conceptual. We --
4 when we looked at the -- the assignment back in the
5 fall, we -- we looked -- we saw that there were
6 extremely competent and professional parties already
7 available to the panel to drill down into -- into the
8 -- the details of DSM, so we thought we could serve
9 the -- the Public Utilities Board best by -- by
10 dealing with some -- some high-level conceptual
11 issues.

12 So that's -- that -- that really hasn't
13 -- hasn't changed.

14 THE CHAIRPERSON: Thank you. That's
15 very helpful.

16 MR. RUSS HOULDIN: So, again, one (1)
17 of the -- again, these are -- these are really
18 suggestions for the -- for the future, which,
19 actually, I have more of a bearing on the last point
20 on the slide, which is when Manitoba Hydro, as it's --
21 it's indicated it will, will review the Conawapa in-
22 service date. These sort of considerations, they --
23 they might take in mind, such as, let's say, moving to
24 -- to IRP -- moving back to IRP, actually, in the case
25 of -- of Manitoba Hydro.

1 And I'm also flagging here the -- the
2 possibility of other -- other models for the delivery
3 of -- of energy efficiency, such as a -- an energy
4 service company concept, which is where our -- you
5 spin off. You would essentially spin off the -- the
6 part of Mani -- Manitoba Hydro that delivers DSM now,
7 and have it actually earn revenues.

8 So that's one suggestion. Another
9 suggestion is that Manitoba Hydro could conduct
10 retrospective studies to get a better hand -- better
11 handle on some of the assumptions in its -- its DSM
12 forecast, and I'll -- I'll explain that in a -- in a
13 few minutes, if you don't mind just while I'm giving
14 the overview now.

15 We suggest that you'd -- that -- that
16 Manitoba Hydro could consider modelling the
17 uncertainty of DSM, explicitly. And -- and this is
18 very much to the -- the point that panel member Grant
19 just -- just made -- the difference between risk and -
20 - and uncertainty. Risk deals within -- ultimately,
21 you assume that there's some probable -- probability
22 distribution that is knowable. And you can assign
23 probabilities to the various events. Uncertainty is
24 outside that. Uncertainty there -- there is no --
25 there is no known or even knowable probability

1 distribution, so you have to try and deal with it in a
2 different way.

3 And then, as a relatively, minor ad --
4 additional recommendation that, actually, stems more
5 directly from one (1) of the scope of work items, that
6 the -- the multiple account evaluation that Manitoba
7 Hydro currently does, could -- could be made more
8 complete. And I'll be -- I'll be explaining that in -
9 - in a later slide.

10 And so again, the -- the -- these
11 improvements could affect the Conawapa in -- in-
12 service date, but I present that as again, more of an
13 opportunity for -- for Manitoba Hydro to evolve along
14 with the industry, in -- in terms of -- of how -- how
15 to -- to best deal with -- with energy efficiency.

16 Just a very quick lexicon; there --
17 there's no really accepted terminology for a lot of
18 the energy efficiency DSM fields, so these are sort of
19 my working definitions as we -- as we go through the
20 slide.

21 Energy efficiency -- I tend to focus on
22 the
23 technologies, so it's -- it's about technologies that
24 use energy more efficiently. In contrast,
25 conservation is something that -- that's addressed a

1 consumer behaviour, and is usually in one (1) form of
2 another about educating the consumer to -- to change
3 energy consumption habits.

4 A soft path is an idea most associated
5 with Amory Lovins, a combination of energy efficiency
6 and renewable energy to -- to, if you'd like, to
7 effectively avoid large-scale energy projects.

8 Conservation in demand management, CDM,
9 is a term that we -- we see a lot. I -- I regard that
10 as -- as programs that combine energy efficiency with
11 conservation; the DSM programs that deliver estimated
12 customer savings through energy efficiency measures.

13 The idea of an end use is the energy
14 used by the actual services to -- to -- that are
15 provided by energy. And those services are, of
16 course, very varied, but we can -- where -- where
17 they're usually classified into space conditioning,
18 either heating or cooling, lighting, process- specific
19 end uses in the case of industry, and purely
20 electrical uses like computers, VCRs, and so on.

21 A measure is something that -- that I
22 use to refer to a component of a CDM or DMS program.
23 And then IRP is a method of treating supply-and-demand
24 side measures, equivalently. So moving to the
25 conceptual framework that -- that I use -- now, I'm

1 not saying this isn't -- this isn't meant to be -- I
2 should -- I should probably, have made this point more
3 strongly in the evidence, that I'm -- I'm not trying
4 to depict what Manitoba Hydro actually does. This is
5 a conceptual approach to all of -- of actually not
6 just DSM as I've defined it, but any effort to
7 forecast the -- the impacts of energy efficiency on --
8 on future energy demand, because we're -- we're
9 concentrated on electricity.

10 So -- so what we have, if you like, is
11 a formula. So DSM savings at any particular time, say
12 this year, 2014, is the sum of the difference between
13 the -- what I call the -- the tertiary energy
14 associated with a reference technology for that end
15 use, and a more efficient technology. That's --
16 that's the first term.

17 And by tertiary energy, I just mean the
18 end use, the -- the final amount of energy, so the
19 kilowatt hours per lumen in the case of, say, lighting
20 or a kilowatt -- or the kilowatt hours per square foot
21 in the case of space conditioning.

22 So tho -- so that's what I'm referring
23 to, is -- is tertiary energy, and then you mult -- you
24 simply multiply that bracket by the number of end-use
25 measures, and the sum of all of that is -- it gives

1 you the -- the DSM savings that exist in -- in the
2 year 2014.

3 And one (1) of the key points that I --
4 that I hope my evidence has made is that that bracket,
5 that first bracket, is something that cannot be
6 measured directly. You can only infer the difference
7 between a reference technology and a more efficient
8 technology on the basis of either some sort of
9 baseline data, what I -- what a consumer consumed
10 before they put in the more energy-efficient
11 technology, or engineering assumptions, or knowledge
12 of what, you know, say typical lighting, what --
13 fluorescent lighting, or incandescent lighting, how
14 much energy they use, and then again, how that could
15 be improved by moving to some other kind of bulb.

16 But the -- but what -- but the -- the
17 actual savings is something that you -- you don't
18 observe. The -- the number of end-use measures is
19 usually in the literature decomposed as looking at the
20 total population of services provided by -- by the
21 end-use measures, so the -- the -- if you like, the
22 total number of light bulbs in Manitoba.

23 And then there's usually some notion of
24 a saturation limit, so that -- that, for whatever
25 reason, we're not going to be able to get a hundred

1 percent of -- of the total number of -- of light
2 bulbs, and then usually, the other -- the next factor
3 is the penetration rate.

4 So of that target number of light bulbs
5 established using a saturation limit, how -- how many
6 per year expects, usually as a percentage of the total
7 population, can we actually get? So that then gives
8 us a number, the number of end-use measures that we
9 can multiply by our -- our unit DSM savings.

10 And the key point about all of that is
11 that the saturation limit and the penetration require
12 assumptions about market behaviour, and I'll -- I'll
13 come back to that. And then, going into the future,
14 the -- so savings at 2015 or 2016 and on and on, on,
15 'T' plus one (1), we typically look at the savings
16 that -- that you have at time 'T', so 2014, by some
17 kind of decay factor or recognition that -- that the
18 existing suite of measures that -- that we have out
19 there will become less effective over time.

20 So that's -- that's the -- the
21 conceptual framework that lies behind my -- my
22 comments. So we move into what I -- I characterize as
23 the -- the central concern with DSM, and again here,
24 I'm saying that I -- that, certainly in -- in the view
25 of Elenchus, DSM has become the preferred

1 institutional form of -- of the delivery of energy
2 efficiency.

3 There -- there are other forms out
4 there, as I've mentioned, energy service companies,
5 pure incentive programs, education, codes and
6 standards, or some -- or some combination of those,
7 but the -- the key point is that DSM savings, again,
8 can't be measured.

9 We can't observe something that might
10 have happened. So I'm saying that's -- that's like
11 the famous Cheshire Cat of -- of Alice in Wonderland.
12 You could see the grin of the cat. You know there
13 must be a cat there because you see the grin, but you
14 don't actually -- actually see it.

15 And so we observe the load, but we can
16 only infer the -- the savings -- the cat, the balance
17 of the cat -- behind that -- that observed load on the
18 basis, as I've said, either doing some kind of
19 baseline analysis or engineering analysis.

20 And the -- the key point about that is
21 either of those methods -- there are -- there's an
22 inherent uncertainty, and again, this is -- this is an
23 uncertainty. This isn't a known -- this isn't a -- a
24 risk. This isn't we -- we know what the probability
25 distribution looks like. We just know that -- that

1 there's a range of possibilities that we -- we can't
2 get a fix on.

3 So that actually leads to, I guess, the
4 -- the really key point, and that is the -- if you
5 like, that we've now got a collision of inherent
6 uncertainty, with a very stringent need for certainty,
7 I'd say a -- an unusually stringent need for
8 certainty, in electricity system operations.

9 It's simply not good enough for an
10 electricity system to guess how much load there is,
11 because as we know, at all times, load must actually -
12 - much -- must exactly equal supply.

13 Now, that's an operational, you know,
14 literally minute-to-minute consideration, but when
15 you're -- when the system planners look out into the
16 future, their number one (1) concern is to make sure
17 that there's enough capacity to be able to meet that
18 operational requirement out there in -- in the future.

19 And the -- the asymmetry is that if you
20 underestimate DSM -- in other words, there's more DSM
21 than you expected, in other words, load is lower --
22 the -- the essential cost of that is -- you're
23 underutilising the -- the capacity you built, so
24 that's not to be minimized.

25 Or -- or of course, in the very much --

1 that's a general statement. In Manitoba, you have
2 this happy circumstance of -- of also being -- being
3 able to export a lot of your -- your power, but your -
4 - your opportunities may be foregone if -- if you
5 underestimated the -- the amount of DSM.

6 On the other side, if DSM is
7 overestimated, if you assume that load would be lower
8 than it really is, and you didn't build the capacity,
9 then you're in the scenario I think that's every
10 system planner's nightmare. You're -- you're into a
11 situation where you -- you face blackouts or -- or
12 brownouts.

13 So that's the asymmetry to which I -- I
14 refer. And -- and the -- the central problem that DSM
15 poses is how to -- how to deal with this inherent
16 uncertainty.

17 Now, so moving on from that, one (1) of
18 the suggestions that -- that the -- the Elenchus
19 evidence makes is that Manitoba Hydro should go back
20 to what it -- what it did for many years, and -- and
21 use full integrated resource planning.

22 So this -- this is just a -- a slide
23 that tries to capture what I think is -- is the real
24 difference there. So I've adapted figures that we
25 used in slides 49 and 50 in the March 4th Manitoba

1 Hydro testimony. That's on the -- on the left, the --
2 the two (2) funnels. So basically, Manitoba Hydro
3 undertakes a -- an analysis of possible DSM programs,
4 puts it through its various filters, chiefly relying
5 on the -- the total resource cost.

6 But as Manitoba Hydro explains very
7 thoroughly in its -- its Power Smart documentation,
8 that's augmented by other metrics, and also by -- by
9 judgment. That results in a Power Smart Plan. That
10 whole plan, then, is thrown into the next hopper,
11 along with possible supply options, and -- and they're
12 subjected to a -- a financial evalua -- evaluation,
13 and that's how you get a -- the resource plan. That's
14 how we got the Preferred Development Plan that --
15 that's before you.

16 In contrast, what I call full IRP, and
17 I -- I should apologize for a -- a typo though. I've
18 got the IRM. That's a -- that's a Freudian slip,
19 because up until a little over a year ago, I was staff
20 of the Ontario Energy Board, and IRM means Incentive
21 Rate Mechanism, which is sort of the -- the system of
22 setting rates that's been in place in Ontario since --
23 since 2006.

24 Anyhow, the -- the difference that I
25 capture there is we -- in the hopper, we have

1 everything. I -- I'm not -- I -- I didn't try to
2 populate my hopper with lots and lots of balls, but
3 you've basically got a mixture of DSM options and
4 generation options all being evaluated together on the
5 basis of the levelized unit energy cost inclusive of
6 multiple accounts. And I -- that's why I bolded that.
7 That -- in whatever way that the -- that the -- the
8 non-financial and non-economic factors are -- are
9 chosen to be addressed, they're addressed at this
10 level of -- of selecting all of the alternatives.

11 And this connects a little bit to what
12 I'll be talking about later in -- in respect of the
13 ecological footprint. So that's slide 8, and I guess
14 I should -- I should emphasize if I hadn't already, if
15 you -- if -- if you want to ask questions as -- as
16 they occur to you, rather than wait to the end, please
17 -- please feel free to do so.

18 So moving onto slide 9, another aspect
19 of -- of the Elenchus evidence is this idea of -- of
20 coherence. And the -- the suggestion that the load
21 factors could be used as a diagnostic tool, a rule of
22 thumb, if you like, that could help determine
23 coherence.

24 And -- and as lit -- I think it might
25 be helpful if I give a little bit of background on

1 this. When I -- when we talked about this assignment
2 back in -- in the fall, I -- I was looking for a way
3 to build on the -- the stress testing that Manitoba
4 Hydro had done at that time. You know, because that
5 has been updated, and I'll -- I'll talk a little bit
6 about that later in the presentation.

7 But what would be a useful way to the
8 Public Utilities Board of building on -- on the stress
9 testing that Manitoba Hydro presented in -- in its --
10 in its business case, and what had struck me from my
11 war upon the Integrated Power System Plan back in --
12 in Ontario, which never -- and I'm -- I have to say,
13 this was never tested in the -- in a hearing, because
14 the hearings were abandoned after two (2) weeks.

15 But the -- what I noticed about the
16 Integrated Power System Plan was -- was two (2)
17 things, was that the -- the system load factor was
18 very volatile over the period that -- that was -- was
19 forecasted in -- in the IPSP, and not only was it
20 volatile, it didn't correspond terribly well to the
21 load factor of -- of the -- of their DSM plan. So I
22 thought this could be a useful diagnostic to apply to
23 the -- to the Manitoba Hydro case, and so just flag
24 that.

25 I think there's a -- Manitoba Hydro in

1 its -- its rebuttal evidence, so this is -- I -- I
2 don't know if we need to switch to that document, it's
3 page 42, line 36, says that -- it - it quotes Elenchus
4 as saying that:

5 "DSM demand and energy savings must
6 be in the same proportion as system
7 load."

8 That's not what our evidence is, and
9 the evidence is that this is just a -- a --
10 essentially, a -- let's call it a semi-qualitative
11 tool that -- that is put forward as a way to get to
12 grips with -- with addressing the question of, How
13 does the bottom-up and the top-down hang together, do
14 the -- when you do a -- a bottom-up, which is what the
15 Power Smart Plan is, it's built up from -- from
16 actually thousands of different measures aggregated up
17 to an overall forecast of savings, and where the top
18 down simply says, Well, what if it's one and a half (1
19 1/2) times, twice, three (3) times, four (4) times the
20 -- the base -- the base forecast? How do we know that
21 these things actually come together?

22 And by that, I mean that they're
23 obviously -- when you -- when you go to, say, four (4)
24 times the DSM you think is the level, the reference
25 level, you're -- you have to be thinking something

1 about prices. You have to be thinking something about
2 income effects. You have to be thinking -- that --
3 that's both cross-price and own-prices, you have to be
4 thinking about, What's the nature of technological
5 change, what are consumer preferences?

6 All of those that are hidden
7 assumptions in getting from a -- a bottom-up fore --
8 forecast of a certain level and simply saying, Well,
9 what if it was four (4) times that? Well, that
10 implies all kinds of other things must have happened
11 in the world.

12 So the idea was and is in the evidence
13 that, Well, let -- let's look at the load forecaster -
14 - sorry, the load factor as a -- as a -- as some kind
15 of indicator. And happily, what I find when I -- when
16 I do that is that Manitoba Hydro's bottom-up and top-
17 down, I think, meets the test very well. I think the
18 -- in -- in the terms that I've been -- been using,
19 it's -- it's a -- a pretty coherent analysis that --
20 that I see.

21 And now the last point on the slide is,
22 I guess, to sort of emphasize this, is if you -- if
23 you look at the load factor with and without the
24 curtailable rates program, it -- it's very different.
25 It's -- it's of the order of the low 30 percent with

1 the low -- curtailable rates program included and it's
2 about 54 percent without, versus a -- a system load
3 factor of -- of about sixty-four (64) or something
4 like that.

5 So I'd say the difference -- so this
6 is, you know, a rough and ready thing, so it's a
7 difference between fifty-six (54) and sixty-four (64)
8 is -- is, in my view, pretty coherent, and -- and for
9 the reasons that Manitoba Hydro spell out in -- in the
10 rebuttal evidence, that -- that on a measure-by-
11 measure basis, you -- there's -- there's nothing --
12 there's no logical connection that when you add all of
13 that up, it will add up to the same -- the same thing
14 as the -- the overall system load factor. I -- I
15 fully agree with that.

16 That -- that, again, that wasn't the
17 intent in -- in putting forward this as a - as a
18 diagnostic tool. Oh, shoot. Okay, thanks.

19 So just very -- this is just a quick
20 chart of -- of the load factors. I've also thrown in
21 the other metrics that I think are of -- of
22 importance, mainly the capacity reserve and -- and
23 capacity factors.

24 And so, in -- in my view, what -- what
25 we see here when we plot these from the base -- the

1 base case for Manitoba Hydro is, again, a very
2 coherent and well-behaved set -- set of -- of factors.

3 Now, I've talked about, in general
4 terms, that there's an inherent un -- uncertainty in -
5 - in savings estimates. So you might well ask, What -
6 - what are the sort of specific ways in which some of
7 the more -- more specific ways in which -- in this
8 which these uncer -- this inherent uncertainty
9 manifests itself?

10 And the one way to think about that is
11 that I think there's no doubt at all in the literature
12 on -- on energy that load growth rates in the
13 immediate post-war period from roughly 1950 to -- to
14 about 1970 were very high in -- in Manitoba, and --
15 and throughout North America, and that since then,
16 annual load growth rates have declined a lot.

17 But there's no consensus that I find in
18 the -- the energy policy literature on what the
19 relative contributions are of -- of all of these
20 different factors. I -- I won't go through each one.
21 The -- but the point being that the last item there,
22 the amount that -- that you can attribute to DSM and
23 other energy efficiency programs is -- is something
24 that's -- that's very hard to pin down.

25 There's really no -- there's no

1 consensus in the -- in the literature on -- on how
2 much of that reduction in annual load growth as --
3 could -- we could attribute to DSM and other energy
4 efficiency programs.

5 Given -- given that, how can DSM
6 uncertainties be handled? And I think the -- the way
7 to handle it is to tackle the problem head-on and to
8 explicitly acknowledge that we -- we have this -- this
9 collision of the need for great certainty in system
10 planning, and an inherent uncertainty in DSM savings
11 that arises from the fact that you can't actually
12 observe the -- the savings.

13 And some of the -- some of the elements
14 of -- of doing this, I've -- I've listed here. I've -
15 - I've made the suggestion that Manitoba Hydro's
16 system planners might take an analogy, and I stress
17 this is an analogy. I'm not saying that DSM actually
18 behaves like wind power.

19 The analogy is that, in jurisdictions
20 in which wind power is becoming a significant
21 proportion of the supply, system operators are
22 building up a probabilistic picture of when wind will
23 -- will be available.

24 So in Ontario, for example, the system
25 operator dispatches generation every five (5) minutes.

1 So, in effect, it's -- it's with -- on the basis of
2 the wind power plants that are available, it's
3 building up a picture. And this is a -- again, this
4 is not an uncertainty. This is -- this is a risk.
5 This is -- this is an -- an -- we're
6 developing an actual probability distribution of when
7 wind capacity will be available, and in future
8 planning, I assume, the -- the -- as I -- I indicated,
9 the Integrated Power System Plan was sort of put on
10 hold, but there is a notion there will be a new one,
11 that this information will then be used to come up
12 with a dependable -- a -- a refer -- you know, a
13 statistically reliable picture within well-defined
14 confidence limits of how much dependable wind will be
15 available in the future.

16 So understand, by analogy, Manitoba
17 Hydro might view its DSM programs through that lens,
18 acknowledging that -- that the -- that you can't use
19 direct statistical methods for all of that, because
20 again, it's an uncertainty, not a risk. But we can
21 decompose that into -- into two (2) elements. One is
22 the tertiary energy use, the -- the unit energy, the -
23 - you know, per kilowatt hour for space heating, per
24 kilowatt hour for lighting, and -- and so forth, from
25 the behavioural assumptions.

1 And for the -- the unit energies, the
2 tertiary energies, I make the suggestion that Manitoba
3 Hydro could do retrospective studies, where -- where
4 you -- where you have statistical data going back many
5 years, maybe as much as twenty (20) years, on
6 participating and non-participating customers in DSM
7 programs, and to come up -- allow that to come up with
8 statistical estimates of -- of the -- the tertiary
9 energy uses.

10 So that would improve that component of
11 the overall conceptual model. The -- the behavioural
12 side is -- is more difficult, but I think it's
13 beneficial to be explicit about what -- what you're
14 doing, what -- what we find in most of tho -- the --
15 the work that's done on this is the assumptions are --
16 are sort of -- are -- are buried, that when people
17 come to -- for example, the -- the EnerNOC study
18 that's -- that's -- the DSM potential study by EnerNOC
19 that's been undertaken for Manitoba Hydro and is part
20 of the evidence, a -- a state of the art piece of
21 work, but that report, like others, basically turns
22 judgments about the difference between potential
23 savings and mock realizable savings on the basis of,
24 essentially, made-up numbers of -- of what percentages
25 of -- of the technical potential will actually show up

1 in the marketplace.

2 So I think it's advantageous to address
3 the uncertainty head on, and could take a leaf from
4 experimental theory. I don't know how many -- I -- I
5 was originally a chemist, so I'm now a fallen man. I'm
6 a -- I'm a mere economist now, or -- stand there with
7 the slime and the green worms. But back when I was a
8 chemist, we -- you know, we were all taught that when
9 you -- when you're doing an experiment, you have to
10 understand the limits of the observations that you
11 make.

12 So people might remember, for example,
13 doing acid-base titration, so you have a -- you have
14 glass vessels of different sizes, and the limits of
15 the meniscus of the solutions, water has an -- has an
16 actual meniscus, and so depending on -- on the size of
17 the -- the beaker or the -- or the burette, there's a
18 -- there's a limit to which you can actually make an
19 accurate measurement.

20 The -- basically, the smaller the --
21 the gauge of the -- the -- the vess -- the vessel, the
22 more -- the -- the smaller the uncertainty in your --
23 in your reading. So there's a whole, you know,
24 there's a whole side of not just chemistry, but all of
25 physical sciences that -- that deals with the handling

1 of those limitations in our observations.

2 So I guess what I'm saying, by --
3 again, by analogy, if you -- if you stop to pin down
4 what are the limit -- what are the likely limits of --
5 of the -- of your estimates of the -- the number of
6 end uses, you'll at least have an explicit rather than
7 an -- an implicit view of -- of the uncertainty.

8 So -- but having said that, the --
9 you'll -- you'll see that in Elenchus's evidence,
10 nevertheless, we -- we suggest that the panel should
11 accept the evidence of -- of Dunskey and -- and
12 EnerNOC, so why, you know, why -- why do we take that
13 position?

14 So again, without rehearsing, I've gone
15 on at some length about the measurability pro --
16 problem and so on, but -- but, nevertheless, as I read
17 it, and I've -- I've read, you know, very many of
18 these kinds of analyses, the -- the Dunskey and the
19 EnerNOC-ers are sort of as good as you get, but
20 they're as good as you get within the limitations of
21 this measurement problem.

22 Nevertheless, I don't -- don't want to
23 leave the impression that -- that the panel should
24 discount -- should simply say, Ah, there's so much
25 uncertainty, we'll just simply, you know, throw the

1 baby out with the bathwater, and so I don't think
2 that's -- that's good either.

3 I -- I think there is now accumulated a
4 large body of -- of evidence that energy efficiency
5 can indeed act as an alternative to supply at below
6 the cost of -- of new generation. In -- in my view,
7 the -- the analysis that relies on saying, Well, is --
8 there are all these barriers to why consumers aren't
9 just buying any energy efficiency anyhow, then that's
10 the role of -- of DSM programs.

11 I -- I've actually changed my own
12 thinking in -- over the years about this. As -- as
13 you may have gathered from my recitation of my -- my
14 experience earlier, I -- I was in -- you know, I was
15 involved in actually creating energy efficiency
16 programs twenty-five (25) years ago, and in fact,
17 wrote cabinet submissions saying very much the same
18 sort of things as you'll find in the Dunskey report and
19 the EnerNOC.

20 But after all that time, I've started
21 to think, Well, all of these barriers, are they still
22 there? Why -- is that a really a good explanation as
23 to why we don't have more energy efficiency than --
24 than is called for on the basis of -- of the economic
25 analysis, showing that it's -- that there are low

1 costs?

2 So that's a caveat, but with that
3 caveat, I -- I've still got to acknowledge that
4 there's a -- there -- there's a -- a great deal of
5 evidence that -- that suggests that energy efficiency
6 can compete with -- with generation.

7 And again, I think the -- the way
8 forward is to apply the best evidence we have, like
9 the -- the studies that have been done in -- in this
10 proceeding, but acknowledge the uncertainties that
11 I've talked about.

12 THE CHAIRPERSON: This is probably an
13 appropriate time to --

14 MR. RUSS HOULDIN: Yes.

15 THE CHAIRPERSON: -- take a break, and
16 my plan is -- I'm -- I'm sorry, Mr. -- Mr. Hombach.
17 I'm -- I'm just going to suggest that we take forty-
18 five (45) minutes for lunch, which would take us to
19 twenty (20) after 1:00, and did you want to add
20 anything, Mr. Hombach?

21 MR. SVEN HOMBACH: I was actually
22 going to make the same suggestion, Mr. Chairman, that
23 you just made.

24 MR. RUSS HOULDIN: Yeah. And -- and
25 this is a good -- I'm sort of switching gears here.

1 This would be a very good time to -- to stop.

2 THE CHAIRPERSON: Okay, so let's --
3 let's break, and we'll see -- I'm sorry. Mr.
4 Hacault...?

5 MR. ANTOINE HACAULT: Both Mr.
6 Williams and I have canvassed counsel on cross-
7 examination times, and I certainly expect to have less
8 than my allotted time, and some of the other counsel
9 behind me, also. So I'll just let the panel know that
10 perhaps we're not quite as rushed on time as we might
11 have thought.

12 MR. BYRON WILLIAMS: And just, Mr.
13 Chair, if I might? Our best guess -- I note that Mr.
14 Hacault was not pointing at me when he said, "less
15 time." I'll be no more than my allotted time, but
16 perhaps a bit less. I think the MMF and MKO are
17 around zero. I believe that GAC will be around an
18 hour, and My Friend, Mr. Hacault, I think is around an
19 hour. So that's just to give a bit of guidance.

20 THE CHAIRPERSON: Thank you very much
21 for that. So let's break. Thank you.

22

23 --- Upon recessing at 12:36 p.m.

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

25

1 THE CHAIRPERSON: I believe that we're
2 ready to resume the proceedings and so I would suggest
3 in the interest of time I'll -- I'll let Mr. Houldin
4 resume his presentation.

5

6 (BRIEF PAUSE)

7

8 THE CHAIRPERSON: Good afternoon, Mr.
9 Houldin. Please continue.

10 MR. RUSS HOULDIN: Thank you, Mr.
11 Chair. So part of the scope of work on DSM that was
12 given to Elenchus was to do a stress testing. And so
13 I -- as I mentioned before lunch I tried to think of
14 some way to build on what Manitoba Hydro has done in -
15 - in its evidence.

16 And just a -- as a small note, the --
17 there's a -- there's a slight difference between the
18 scope of work. The scope of work number 12 actually
19 talks about spending on -- on DSM, whereas I -- I
20 think I'm right in saying that Manitoba Hydro's
21 analysis was actually multiples of the actual gigawatt
22 hours or -- or gigawatt of -- of capacity: multiples
23 of those. And that's -- that's what I -- I did as
24 well. I didn't -- really had no basis to -- to know
25 what the spending was. So -- so this analysis builds

1 on looking at the -- the stress testing that Manitoba
2 Hydro did.

3 And the -- so I tried to connect it
4 with this sort of coherence concept that I -- that I
5 outlined earlier. And I should stress that this is --
6 this is an illustrative analysis, not -- not designed
7 in any way to say that these are, you know, actual,
8 you know, results.

9 So there are -- there are two (2)
10 elements to what I'm going to show you very quickly in
11 a couple of slides; is I just simply made the
12 assumption -- and this is just an assumption -- it's
13 that we could represent some of the in -- inherent
14 uncertainty to which I've referred earlier in the DSM
15 programs as the difference between the system load
16 factor and the DSM load factor.

17 Again, I'm not trying to argue that
18 that is actually the case, but I'm saying what -- it's
19 a what if, a heuristic analysis. What if we say that
20 that difference represents the uncertainty, what would
21 -- what would that look like? And the case that we're
22 -- we're most interested in is -- is where the -- the
23 uncertainty results in a -- a lower amount of DSM
24 capacity actually being available. I didn't consider
25 the -- the opposite case.

1 And then in addition to that, I -- and
2 this is again, purely arbitrary on my part -- I tried
3 to reflect the uncertainties in the -- in looking at
4 the market potential. So, aga -- again, the
5 demographic factors in -- in my original conceptional
6 slide; how we add up the number of end-use measures
7 there are.

8 And so for that I just -- just looked
9 at illustrative assumptions about how -- how much
10 uncertainty there -- there might be. And this
11 analysis also does not consider imports or exports,
12 and consistent with what I said earlier, there's no --
13 load curtailment is not included in the -- the
14 analysis.

15 So this is the -- just the logic again.
16 I've already -- I won't spend a lot of time 'cause I -
17 - essentially recapitulating what I just said. The
18 idea is, in trying to mesh these top-down and bottom-
19 up analyses you've got an uncertainty. And -- and the
20 stress testing tried to look at how we could
21 illustrate that uncertainty in -- in two (2) ways.
22 One (1) in looking at the difference between the
23 system and the DSM load factors, and the other just
24 simply making arbitrary assumptions about the extent
25 to which estimates of -- of market potential could

1 have a range of -- of uncertainty related to them.

2 And so this is -- so this is the -- a -
3 - a chart of the first part of that. So this just
4 looks at saying that the -- the 'what if' of suppose
5 the DSM load factor was the same as -- as the system
6 load factor. What would be the -- what would be the
7 results -- resulting application to the -- the --
8 these scenarios? Again, the one and a half (1 1/2),
9 twice, three (3) times, four (4) times base DSM.

10 And the lesson that -- that I would --
11 would draw from -- from this, again, and it's -- it's
12 illustrative, is -- is, I think, goes in the direction
13 as I've already indicated that it -- it supports
14 Manitoba Hydro's view that increasing the levels of
15 DSM don't -- wouldn't lead a -- let's call a risk
16 averse system planner to want to move the in-service
17 dates, especially not of -- of Keeyask.

18 By the way, I should have mentioned
19 this graph -- the -- includes Keeyask. That's the
20 bump-up that you see arou -- around 2020.

21 But you see all the lines -- so I guess
22 the two (2) -- one (1) is the -- the range there. And
23 then the other is the -- the lines are all sloping
24 down. In other words, we're getting closer and closer
25 to not having enough capacity reserve, which, again,

1 I'm taking as -- yes, ma'am.

2 MS. MARILYN KAPITANY: Sorry. Before
3 you move on, could you just say again the point you
4 made about this not affecting the in-service date for
5 Keeyask? How -- how does this graph reflect that?

6 MR. RUSS HOULDIN: Again, because you
7 get a bump-up when Keeyask comes online. But,
8 thereafter -- and, again, the point being is this --
9 this very large range as you go from one (1) DSM level
10 to another, they're -- they're all indicating that in
11 -- in the succeeding years that the capa -- the
12 capacity reserve which is what's plotted on the -- on
13 the vertical axis is -- is declining. And so in the -
14 - in -- in the absence of -- of Keeyask, you would be
15 -- you would be running, you know, a -- a pretty
16 severe risk that -- that you might not have enough
17 capacity to meet load.

18 MS. MARILYN KAPITANY: So which of
19 these lines shows the load, then, that you're speaking
20 to?

21 MR. RUSS HOULDIN: Oh, okay. No --
22 okay, let me -- I -- I apologize for not giving a
23 proper description.

24

25 (BRIEF PAUSE)

1 MR. RUSS HOULDIN: Yeah. Yeah, the --
2 what this is a plot of is the capacity reserve. So
3 that's the -- that's the percent of -- of capacity
4 over projected peak. So that's the -- the -- I would
5 say the sort of universal measure used by utilities to
6 assess the overall status of how much capacity they
7 have. And -- and the -- the horizontal lines show the
8 average capacity reserve for -- for Manitoba Hydro
9 projected from the past; and then the target of -- of
10 12 percent.

11 So I guess maybe part of your
12 puzzlement would -- would be that we don't -- other
13 than the base case, we don't get down to -- to 12
14 percent. But I think that's -- I think it goes back
15 to the -- the sort of famous aphorism of -- of Sir
16 John A. Macdonald -- or, actually, I heard it from --
17 the doyen of Ontario Hydro's load forecast is Larry
18 Higgins, when he said that the -- the right amount of
19 capacity reserve is -- is the same as the right amount
20 of whiskey, according to Sir John A. Macdonald. In
21 other words, a little bit too much is just enough.

22 And so -- so it's -- it's really I'm
23 looking more at that -- that average line that -- that
24 if I were a system planner, I'd start to get nervous
25 that if that DSM is not going to keep us close to the

1 historical levels of reliability to which Manitobans
2 are -- are accustomed.

3 So the -- so the -- the verti-class
4 (phonetic) isn't load, it's -- it's capacity reserve.
5 And it's not any -- I guess I'm not maybe at this
6 point terribly clear. It's not any one (1) line.
7 What -- what I think is important is the -- the family
8 of lines and -- and the behaviour over the period,
9 because, again, these are all built on assumptions,
10 and it's -- it's a 'what if' analysis. It's not -- I
11 can't claim in any way it's grounded in, you know,
12 likely variables. I'm not trying to portray it that
13 way.

14 THE CHAIRPERSON: Just to make sure
15 that we're all on the same wavelength here at the
16 panel level, so that we can have the most fruitful
17 discussion possible, so the capacity reserve is the
18 amount of capacity over and above the peak level
19 required by the Manitoba system?

20 MR. RUSS HOULDIN: Yes.

21 THE CHAIRPERSON: So if the peak level
22 is 'X', the capacity reserve needs to be 12 percent
23 above that. Would that be --

24 MR. RUSS HOULDIN: Right.

25 THE CHAIRPERSON: To make sure we have

1 enough capacity?

2 MR. RUSS HOULDIN: Yes, absolutely
3 right, yeah. And then the -- the Keeyask, again, is -
4 - is just another of the assumptions. I -- I guess I
5 could have -- I could have -- and the -- I believe in
6 the evidence I have some more charts that show without
7 Keeyask, as well. But I just tried to focus it on
8 what I -- what I think of the -- the -- sort of the --
9 the key charts, rather than -- you know, I could have
10 flooded you with -- with dozens of charts.

11 So that's -- so that's the case of
12 again trying to use -- depict rather -- depict the
13 uncertainty as being the difference between these load
14 factors, again, just simply as a heuristic device.
15 And then this chart then applies these arbitrary
16 assumptions that I made about how, over time, the --
17 the amount of market potential is -- is less than is -
18 - than you would get from just simply multiplying the
19 base case by one and a half (1 1/2), two (2), three
20 (3), and -- and four (4).

21 And I've -- so the -- so, for example,
22 the one and a half (1 1/2) case -- so that's the --
23 I've got to find -- so that's the green line with the
24 triangles, that assumes that -- that the -- the amount
25 of DSM capacity declines at 2 percent per year over

1 the period.

2 THE CHAIRPERSON: Could you explain
3 why that is? Could you explain the factors that would
4 account for a decline in achievable potential?

5 MR. RUSS HOULDIN: Well, okay, just as
6 -- as a preface to that, I don't -- I mean, these are
7 just arbitrary assumptions. I don't want to mislead
8 the panel in thinking that -- that there's some --
9 some deep analytical basis for them. This was just an
10 attempt to say, Well, what if -- what if in the one
11 and a half (1 1/2) case at a rate of 2 percent per
12 year the -- the DSM capacity across the whole suite of
13 measures declines at a 2 percent -- 2 percent rate?

14 But what could -- what could lead to
15 that are, again, all of those factors I listed
16 earlier. It could be, compared to the base or
17 reference case, prices have shifted, income levels
18 have shifted, antonymous technological change has --
19 has resulted in a different -- different set of
20 technology available to the consumer. Consumer
21 preference has changed, so they -- they won't --
22 they're not behaving in the same way as was assumed in
23 -- in the reference case. So all of those -- all of
24 those factors could be the reason that we get this 2
25 percent decline.

1 But in this analysis, the -- the 2
2 percent number is just basically a heuristic device.

3 MS. MARILYN KAPITANY: Is it -- is it
4 partly the decay rate that you spoke of before?

5 MR. RUSS HOULDIN: No. No, the -- the
6 decay rate -- I'm assuming -- okay, I'm assuming that
7 the -- built in of the base case that Manitoba Hydro
8 will have applied decay rates to its different
9 measures. And -- and in fact, you can -- at the
10 aggregate level, Manitoba Hydro is very clear about
11 that in -- in the -- some tables to the -- to the
12 Power -- the -- the Power Smart Plan.

13 So -- so that's -- so that's -- that's
14 part of the base case. This is applying on top of the
15 base case, again, arbitrary heuristic assumptions
16 about -- well, what, in addition to the decay rate
17 that Manitoba Hydro have used. There are a whole host
18 of changes in all of the other factors that results in
19 a much smaller percentage of the total market
20 potential, or -- well, the total realizable potential,
21 for that matter, actually being achieved in -- in each
22 year.

23 And then for the -- and then basically
24 I've upped the rate for -- for each of the different
25 levels. So when you get to four (4) times the base

1 I'm saying that -- that the -- the -- that from year
2 to year the -- the market potential declines by 3 1/2
3 percent. And -- and that's -- that's simply an
4 assumption based on proportionality, that -- that if
5 you've -- if you've got four (4) times the base case -
6 - and again, as I indicated earlier, you don't -- you
7 don't really know which of that list of factors I've
8 indicated are going to -- are changing the results in
9 four (4) times more than the amount of DSM that you --
10 you assumed, that the -- that -- if you liked it,
11 again, proportion, because you've got more there's a -
12 - there's a greater scope for being wrong.

13 That's -- that's basically the -- the
14 intuition that's -- that's behind that. I really
15 can't justify it much -- much more than that.

16 THE CHAIRPERSON: Could you give us
17 that definition of decay rate again?

18 MR. RUSS HOULDIN: The decay rate is
19 the -- is the percent -- so if you go back to my
20 conceptual framework, we've got -- we get the savings
21 on the basis of the -- of the difference between the
22 reference and the more efficient technology times the
23 number of measures. And then the decay effects the --
24 the number of measures. That's just simply from year
25 to year.

1 The -- the percent by which the total
2 savings, the total -- the two (2) terms in the
3 brackets when multiplied together give you total
4 savings. That decays from year to year, because the
5 measures get more and more ineffective.

6 You know, just to give an almost
7 trivial example -- I keep going to lighting, I guess,
8 because it's a -- you know, from one (1) year to the
9 next it -- it simply may be the case that people who -
10 - who put in compact fluorescents. And so for 2014
11 they have the benefit of having more efficient
12 lighting over incandescent bulbs. But then when you
13 get to 2015 they don't bother to replace them. With -
14 - some of the compact fluorescents are supposed to
15 last a long time, but I think as we all know they --
16 they kind of don't seem too. Or at least that's what
17 happens with me.

18 So people who signed up for -- are
19 included in the -- it doesn't have to -- I was going
20 to say if there was a program promoting compact
21 fluorescents and -- of -- of which there are a number.
22 But it could just be just you make assumptions about
23 how many people will put in compact fluorescents in
24 the following year. It's -- it's reasonable to assume
25 that -- that some of those don't replace all of those

1 bulbs with similarly efficient bulbs.

2 So that would be that case. And you --
3 you -- that happens across all of the suites of
4 measures, so that from -- from year to year, in effect
5 you've got a decay of -- of the amount of savings,
6 unless you're introducing, you know, new -- new
7 programs.

8 So again in -- in my mind this just
9 reinforces the -- the previous slide, that again in
10 this heuristic sense that I look at this and -- and
11 put my -- my, you know, system planner's hat on and I
12 would -- I would be very wary of -- of recommending to
13 -- to the -- the bosses that we should -- we should
14 defer any ca -- capacity on the basis of -- of DSM.

15 So just to wrap up this, the -- the
16 conclusions are that -- that I think that my stress
17 testing on the top of Manitoba Hydro's stress testing
18 do -- does show that Manitoba Hydro's analysis is --
19 is robust. The DSM has a minimal impact on the timing
20 of Keeyask. Conawapa could be modestly affected,
21 simply because it's further out in the future.

22 And then finally, I -- as I mentioned
23 at the outset, I did take a look at Manitoba Hydro's
24 new evidence that they introduced on March 4th, and I
25 find my conclusions are -- are unaffected by -- by

1 that analysis. So in other words, the -- the same
2 conclusions there I think would stand.

3 And I just put a -- a little chart
4 together that -- that emphasizes that point. This
5 chart again shows, in the vertical axis, the capacity
6 reserve. And it shows the red line is the -- my --
7 Elenchus's -- well, I called it 'Stress 4'; that's the
8 four (4) times base analysis from the -- the previous
9 chart. The blue line is the original Manitoba Hydro
10 four (4) times DSM line. And then the green line is
11 the new one that -- the DSM level -- level for --
12 level 3.

13 THE CHAIRPERSON: Mr. Houldin, you
14 said something that we need to dwell on some more.
15 You -- your -- your last statement before we got into
16 this just, I think, conclusions, is you said something
17 to the effect -- if I -- if I can paraphrase, you
18 basically said we shouldn't be relying too much on the
19 impact of DSM when making a decision about Keeyask.

20 MR. RUSS HOULDIN: Yes.

21 THE CHAIRPERSON: Yet, if you look at
22 Table 17 -- you know, I realize that with DSM you get
23 a -- a line that's tracking fairly closely the -- the
24 base case. And if you were to push that line out
25 beyond -- beyond say year 2028 --

1 MR. RUSS HOULDIN: Yeah.

2 THE CHAIRPERSON: -- you clearly are
3 getting an effect that demonstrates, in my opinion,
4 that, you know, the in-service required for Keeyask is
5 a number of years out, which is part of, I think, what
6 we heard from Manitoba Hydro. So there's a disconnect
7 between what you're saying and what we heard
8 previously from Manitoba Hydro.

9 So I just want to make sure that I
10 understood and -- and we adequately discuss that.

11 MR. RUSS HOULDIN: Yeah. I guess the
12 -- I mean, I -- I'm -- I'm not -- is it -- we're
13 trying to second-guess Manitoba Hydro. The -- the
14 premise of -- of what I've done here is to -- is to
15 take the work that they did and -- and respond to the
16 Public Utilities Board request for -- for a -- for a
17 stress testing.

18 So -- so the fundamental idea is
19 Manitoba Hydro have made these top-down assumptions
20 about -- about DSM, and then come to their -- their
21 own conclusions about what that -- what the
22 ramifications are for -- for new capacity. I don't
23 find from the additional stress testing that I've done
24 any basis for -- for saying that that -- that judgment
25 is -- is incorrect. It doesn't lead me to -- to

1 second guess Manitoba Hydro's conclusions.

2 Does that help or...?

3 THE CHAIRPERSON: I think it does.

4 I'm not sure that what you just said matches what I
5 heard earlier, so maybe I misread what you said
6 earlier.

7 I was under the impression you said we
8 shouldn't rely too much on DSM's ability to be able to
9 make a decision about deferring the building of
10 capacity?

11 MR. RUSS HOULDIN: Right.

12 THE CHAIRPERSON: And are we on the
13 same --

14 MR. RUSS HOULDIN: Yeah. And the --
15 the fundamental reason which I've not explained is --
16 is this uncertainty. It's the -- it's the -- again,
17 you know, the -- the big picture for me is this
18 collision of -- of inherent uncertainty in -- in what
19 DSM's actually going to deliver with the need for the
20 system planners to be really quite sure about how much
21 capacity they need.

22 And -- and so the analysis is -- is
23 designed to test that. And I -- I find that -- I
24 mean, I'm -- the way I interpret the results, I may
25 not have explained them well enough so far, is that I

1 -- I find their analysis robust, that they -- I
2 wouldn't -- so I wouldn't make a decision on --
3 especially on -- on Keeyask, because it's just -- it's
4 simply closer in time. And there are also, I haven't
5 talked, but there, as we all know, there were lead
6 times in building a major hydraulic facility.

7 So decisions have to be made if you --
8 to hit a, you know, a relatively close in-service
9 date. I wouldn't want on the basis of the -- of the
10 DSM projections to -- to move that date from the date
11 that -- that Manitoba Hydro has in mind from its --
12 its complete view of -- of the situation, including
13 what I haven't gone into at all, the financial
14 analysis of the -- of the different pathways.

15 So it's -- it's -- I guess, I'm --

16 THE CHAIRPERSON: Well, it's an
17 important point. It's an important point, and I see
18 Mr. Williams has got his finger on the microphone
19 button.

20 MR. BYRON WILLIAMS: Just -- and I
21 apologize very much for the intrusion. Could -- could
22 I ask that we stand down for just two (2) minutes. So
23 if I could chat with my Learned Friend for one (1)
24 second.

25

1 --- Upon recessing at 1:52 p.m.

2 --- Upon resuming at 1:59 p.m.

3

4 THE CHAIRPERSON: Where were we?

5 MR. SVEN HOMBACH: Mr. Chairman, if I

6 -- if I may either distract from the process or put it

7 back on track. I've had a discussion during the break

8 with My Learned Friend, Mr. Monnin, and have been

9 advised that Elenchus has not had an opportunity in

10 detail to review and update its analysis based on the

11 changed underlying assumptions that Manitoba Hydro

12 filed on March 10th in its presentation.

13 I've further had a discussion with Mr.

14 Monnin that the most efficient way to update the

15 analysis would perhaps be to let Elenchus deal with it

16 by way of undertaking. That would be an undertaking

17 to review Manitoba Hydro's March 10th evidence and

18 update its analysis, including the heuristic analysis

19 as necessary, and file that revised analysis with the

20 Board.

21 MR. CHRISTIAN MONNIN: Thank you, Mr.

22 Hombach, and -- and that's acceptable. We can either

23 blame or thank also My Learned Friend Mr. Williams on

24 that point, so.

25

1 --- UNDERTAKING NO. 91: Elenchus to review Manitoba
2 Hydro's March 10th evidence
3 and update its analysis,
4 including the heuristic
5 analysis as necessary, and
6 file that revised analysis
7 with the Board
8

9 THE CHAIRPERSON: And, Mr. Williams,
10 you'll confirm that's acceptable?

11 MR. BYRON WILLIAMS: I think it's
12 efficient.

13 THE CHAIRPERSON: So, back to you,
14 please, Mr. Houldin.

15 MR. JOHN TODD: So -- so to be -- to
16 be clear, Mr. Chair, we'll provide an undertaking
17 which, as a result of the update, the direct impact
18 was on -- on the DSM numbers, but also that flows
19 through to the Development Plan which then feeds back
20 to these kinds of graphs, which is -- includes more --
21 much more than the DSM. So what we have not done is
22 looked at all the flow-through impacts and got them
23 back, and that is creating confusion because what
24 we've got here is based partly on outdated evidence.

25 So the update will address the

1 confusion that's been created by that inconsistency
2 with updated charts and some explanation to make sure
3 that it's clear on the record.

4 MR. BYRON WILLIAMS: And, Mr. Chair,
5 just -- sorry. And this is my last interruption I
6 promise. Just from the perspective of CAC Manitoba, I
7 -- I don't -- I don't expect there's anything that we
8 would need to follow up from the undertaking but
9 there's always that risk. And so if -- if we're
10 reserving the right to seek a mechanism to follow-up
11 on the undertaking, if -- if we could, we're seeking
12 your permission to do so.

13 THE CHAIRPERSON: Thank you for that,
14 Mr. Williams. So back to you, Mr. Houldin.

15 MR. RUSS HOULDIN: Yeah. Yeah, I'm --
16 I -- I apologize if I didn't explain that terribly
17 well, but there -- there is new evidence that I
18 haven't reviewed and we will try to deal with it by
19 way of the undertaking whi -- which Mr. Todd just
20 explained.

21 So I'm going to move on to the
22 ecological footprint which is the last of my general
23 slides. I should -- I need to explain where this came
24 from, though. This is actually scope of work Item 13-
25 E that Elenchus was asked to examine Manitoba Hydro's

1 current and potential use of DSM investments in terms
2 of the carbon dioxide footprint.

3 Now, I -- I may have over-interpreted
4 the -- the request made by the Public Utilities Board
5 in that I -- I extended the idea of a carbon dioxide
6 footprint to what is known in the literature as an
7 ecological footprint. But -- but that's where it came
8 from and it caused a number of interrogatories. So
9 this slide just tries to -- and I'll -- I'll come back
10 very briefly when I review the scope of work items,
11 including 12e, but this is just a little overview on
12 ecological footprint.

13 I would emphasize that it's -- it's
14 just one (1) methodology of -- of analyzing
15 environmental impacts. What it does is it reduces all
16 of the environmental impacts associated with -- with a
17 project such as Keeyask or Conawapa or the entire
18 Preferred Development Plan to the area of the earth's
19 surface that is required to support all of the
20 activities; that's the fundamental concept of the
21 ecological footprint.

22 The -- if you like, the -- the glib
23 thirty (30) second comment that comes out of the
24 ecological footprint is something you might have
25 heard, is the idea that we actually need six (6)

1 earths now to -- to support the global level of
2 economic activity.

3 So groups that have done a -- a full
4 ecological footprint analysis of -- of the entire
5 global economy have come up with estimates like that.
6 That if you add up the area we need to support our
7 existing population's economic activity we actually
8 have already used up the surface we have available on
9 earth and, in fact, we need another five (5). So
10 that's to give a little bit more context for you.

11 In general, environmental imp -- impact
12 methodologies are of two (2) types. There's types
13 that actually result in a single metric of some sort,
14 like the ecological footprint, or -- or multiple
15 factors or qual -- either qualitative or put into some
16 kind of index. And other examples are economic --
17 traditional economic benefit cost analysis reduces all
18 of the environmental impacts to a dollar. And you can
19 do a net present value analysis just as you would do
20 for a financial analysis based on that.

21 There's also a technique known as net
22 energy analysis which, again, reduces everything to a
23 common denominator of energy units. It could be
24 gigajoules, kilowatt hours, whatever, but you can --
25 you can reflect by the techniques that have been

1 developed in net energy analysis the impacts of -- of
2 any project as an energy number, if you like.

3 In terms of the qualitative or index
4 based approaches, Manitoba Hydro's multiple accounts
5 is -- is such an approach. They've got these multiple
6 accounts and they just present them as -- as
7 qualitative considerations. Some people go further
8 and construct indices around those, but Manitoba Hydro
9 doesn't do that.

10 The -- the -- you know, the -- I guess,
11 the granddaddy of all these is the traditional
12 environmental impact matrix. So this is just where
13 you look at all the elements of your -- of your
14 project; in this case it would be the Development
15 Plan. And you would look at impacts on air, impacts
16 on land, impacts on water. And first of all, you
17 would describe them and then you might come up with a
18 -- a ranking index for each one (1) of those to -- to
19 come up with an overall assessment of -- of the -- of
20 the environmental impacts of -- of the -- of the
21 Development Plan in this case.

22 So that's just a quick overview of
23 where our ecological footprint sits in the -- in the
24 world of environmental impact assessment.

25 Now, at this point I would refer you to

1 Manitoba Hydro's rebuttal evidence. Actually, it's --
2 it's page 113, lines 14 to 22.

3

4 (BRIEF PAUSE)

5

6 MR. RUSS HOULDIN: So have we got --
7 yeah, so basically what I read Manitoba Hydro to be
8 saying is that -- and I think it's -- is that -- is
9 that page number 13?

10

11 (BRIEF PAUSE)

12

13 MR. RUSS HOULDIN: Yeah, line -- could
14 you just -- it's cut in at 14 -- oh, okay, that's it.
15 That -- yeah, that is -- I got it right.

16 So basically what Manitoba Hydro is
17 saying is that they didn't judge that the cost of
18 doing something like an ecological footprint -- and by
19 the way I -- I should -- I should have explained that
20 within the idea of the ecological footprint is the
21 idea of a life cycle assessment, that you look at the
22 environmental impacts of the full life cycle of -- of
23 the -- of the technology being evaluated.

24 So in this case we're talking about DSM
25 technologies. You would look at the environmental --

1 the life cycle of manufacturing a -- a compact
2 fluorescent bulb of its use and then its disposal.
3 All of that full life cycle would -- would be turned
4 into an ecological footprint.

5 And so Manitoba Hydro is saying that
6 they -- they've made, if you like, high level judgment
7 that it's not worth the cost of -- of doing that.

8 So I actually have a lot of sympathy
9 with that view. I think from my very earliest days in
10 environmental assessment that one (1) of the problems
11 that has bedevilled environmental assessment has been
12 the kind of almost relentless pursuit of ever greater
13 levels of detail. It's always easier for the
14 approving authorities to agree to more and more
15 demands for more and more detail, which -- which
16 imposes costs. So I have a lot of sympathy for that.

17 But -- but I note that, just at a --
18 from the point of view of just general evaluation
19 theory that you should always compare alternatives in
20 whatever evaluation you're doing on the basis of
21 commensurate data. So data that's roughly at -- at
22 the same level. And -- and I'd say fairly clearly in
23 this case Manitoba Hydro hasn't done that insofar as
24 it has looked at the life cycle impacts of DSM
25 technology.

1 And the -- I guess to sort of sharpen
2 that point, if you look at -- and the cases say the
3 'base levels', you could make a hand-waving argument
4 that it's not going to make any difference. But when
5 you start to look at four (4) times DSM programs, so
6 that's, say, four (4) times more efficient fridges
7 than you expected, four (4) times more compact
8 fluorescent bulbs, it's not as clear any more that the
9 ecological footprint of these enlarged programs is --
10 is insignificant.

11 And -- and the direction, of course,
12 that that would move in is that it would actually make
13 the hydraulic capacity options, Keeyask and Conawapa,
14 relatively look better. So if you were doing a full
15 IRP analysis that included all of the environmental
16 impacts, if those impacts are indeed larger for DSM
17 then all other things being equal it would make your
18 supply options look better.

19 So that's the end of the general
20 slides. I'll go very quickly through the -- the scope
21 of work questions. So these are all summarized in the
22 table at the end of the -- of the report.

23 So are Manitoba Hydro's DSM factors
24 complete, reasonable and accurate? Yes, I -- I
25 believe they are.

1 We were asked to review Manitoba
2 Hydro's assessment of technical, economic, and real
3 DSM and energy efficiency opportunities relative to
4 other jurisdictions. Elenchus finds that Manitoba
5 Hydro's assessment of DSM opportunities is -- is
6 comparable to other North American jurisdictions.

7 I was asked to review the extent to
8 which Manitoba Hydro has designed and implemented
9 large utility DSM and energy efficiency programs at
10 the residential, commercial, and industrial levels in
11 a manner consistent with other North American
12 jurisdictions where such programs have been
13 implemented. Elenchus finds that Manitoba Hydro's DSM
14 programs for the major customer seg -- segments,
15 residential, commercial, and ind -- and industrial are
16 consistent with utility practice in -- in North
17 America.

18 We were asked to comment on the proper
19 use of the total resource cost, that's TRC, and the
20 rate impact measure or RIM test evaluation tools, as
21 well as the total societal cost and benefit analysis
22 for DSM and energy efficiency opportunities. Elenchus
23 believes that Manitoba Hydro uses these measures in a
24 manner consistent with North American utility
25 practices in relation to DSM and in con -- its

1 consideration of other benefits is -- is reasonable.

2 Comment on Manitoba Hydro's approach to
3 measuring actual DSM and energy savings. So this is
4 slide 26 and it refers to Scope of Work 5. With the
5 panel's indulgence for the rest of them I'll just
6 refer to the scope of work number. Then I don't have
7 to read out all the rubric. Is -- is that acceptable?

8 So in -- in relation to this, Manitoba
9 Hydro follows accepted industry protocols, but these -
10 - these could be improved. And I've talked about this
11 at great length already. That existing protocols
12 don't adequately, in my view, recognize inherent
13 uncertainty due to the unobserveability of DSM
14 savings.

15 Scope of work 6: I believe that
16 Manitoba Hydro's adoption of smart grid technologies
17 for DSM is appropriate.

18 Scope of work 7: Manitoba Hydro
19 follows accepted industry practice in basing its
20 estimates of DSM marginal costs on reference standard
21 technologies. However, as I've indicated, this
22 approach does add to the potential uncertainty of
23 estimates of actual DSM potential.

24 Scope of work 8: Manitoba Hydro
25 includes estimated export revenues in the evaluation

1 of DSM opportunities as part of its multiple metrics'
2 approach. This is reasonable. But again, I note that
3 it also tends to -- to add to the -- the overall
4 uncertainty.

5 Scope of work 9: Manitoba Hydro's DSM
6 forecasts are reasonable, thorough, and sound, but
7 their uncertainty could be more explicit and addressed
8 in an approved way, as I've -- I've again gone on at -
9 - at some length.

10 Scope of work 10: The preferred and
11 alternative resource and conservation evaluations are
12 largely complete, accurate, thorough, reasonable and
13 sound. There is uncertainty over the accuracy of DSM
14 savings, as I've indicated, that's not like the fault
15 of -- of Manitoba Hydro, it's just simply inherent in
16 DSM. And the evaluation would be more complete if the
17 environmental impacts of DSM programs were evaluated,
18 as I've -- I've just discussed.

19 Scope of work 11. The DSM potential
20 study by EnerNOC is a state-of-the-art study, but its
21 approach glosses over key uncertainties which, again,
22 I've -- I've discussed. I won't -- I won't rehearse
23 again now.

24 Scope of work 12: Elenchus stress
25 testing of DSM level supports Manitoba Hydro's

1 conclusion that DSM programs are not sufficient to --
2 to justify the deferral of -- of new hydro electric
3 capacity. And, of course, that's now subject to the -
4 - the undertaking to which we -- we just agreed a few
5 minutes ago.

6 Scope of work 13(a): Manitoba Hydro
7 treats DSM capacity as non-dispatchable and a hundred
8 percent dependable. Elenchus suggests that DSM should
9 be -- should be treated as a non-dispatchable resource
10 but subject to explicit dependability factors in the
11 way that I've explained by analogy to the way wind
12 power is evaluated by systems that now have
13 significant amounts of wind on them.

14 13(b): (a) was on capacity, so the
15 same comments apply to dispatchability of energy.

16 13(c): Manitoba Hydro makes no
17 provision for backup of -- of DSM. For operating
18 reserve this is appropriate but for capacity reserves,
19 Manitoba Hydro should treat DSM as a non-dispatchable
20 resource subject to explicit dependability factors,
21 again, somewhat on the analogy with -- with wind
22 power.

23 13(d): Manitoba Hydro considers the
24 cost effectiveness of DSM in terms of the total
25 resource cost, total societal cost, and levelized

1 utility costs. These -- these are appropriate tests.

2 13(e): I've spent a little bit of time
3 introducing this, that while Manitoba Hydro has made a
4 thorough assessment of the carbon dioxide impacts of
5 new generation, it has not looked at the life cycle
6 impacts of DSM.

7 If Manitoba Hydro conducts a new
8 assessment of -- of Conawapa, it should consider using
9 an ecological footprint analysis as an alternative to
10 its multiple apparenst approach.

11 (f): The -- just a small point.
12 Initially, this is the -- the curtailable rates
13 program. The scope of work refers to it as the
14 'curtailable rate program.' Manitoba Hydro generally
15 refers to it as the curtur -- curtur -- curtailable
16 rates program. Although I noticed in the -- the
17 update that we received last -- last night, the new
18 Power Smart Plan, the -- they've also now call it the
19 'curtailable rate program.' So a small semantic
20 point.

21 In Elenchus's view, the curtailable
22 rates or rate program should play no role in DSM
23 investments since relying on capacity reductions due
24 to curtailable rates would be imprudent. Elenchus
25 makes no comment on the -- on the -- the other

1 purposes of the curtailable rates program.

2 And I just wanted to just mention a
3 little bit about some statements in the Manitoba
4 Hydro's rebuttal evidence. I don't know if you want
5 to go to -- maybe it's not necessary to go to the
6 documents since I've quoted.

7 It seems to me that Manitoba Hydro does
8 not include the curtailable rate program in its
9 Development Plan but in the rebuttal evidence there
10 are two (2) -- these two (2) contradictory statements.
11 The one there on page 47, line 10, and then the other
12 one on page 43. One seems to say -- the one says:

13 "Does not include the curtailable
14 rates program."

15 Whereas the other one says:

16 "It's reasonable to consider the
17 curtailable rate program as a DSM
18 initiative."

19 So I think that's -- that's something
20 that Manitoba Hydro might -- might clarify later on in
21 the proceeding.

22 Moving to 13(g). Surplus energy
23 program plays no role in -- in DSM and Elenchus makes
24 no comment on its other purposes.

25 13(h): Manitoba Hydro uses qualitative

1 factors as well as metrics in designing its DSM
2 program. Location could be a factor but Elenchus does
3 not see that anywhere in -- in the evidence.

4 So scope of work 14: In Elenchus's
5 view, DSM is not likely to defer Keeyask or Conawapa
6 alone or in conjunction with other none -- non-
7 hydraulic resources. Again, we'll revisit that in --
8 in the context of the undertaking that we -- that was
9 just discussed.

10 Scope of work 15: Elenchus agrees with
11 the benchmarking done by Dunskey of Manitoba Hydro's
12 DSM programs. For completeness there are -- as for
13 the load forecast there are a couple of items in the
14 scope of work that ask Elenchus to do any additional
15 work as requested. But since there hasn't been any,
16 I've not included that in -- in these slides.

17 So thank you very much for your
18 indulgence and I -- if I can be of any more assistance
19 in cross-examination I'll do my best.

20

21 (BRIEF PAUSE)

22

23 MR. RICHARD BEL: I have a question
24 for Mr. Todd. And it's the concluding remark number
25 1. And digesting this over lunch, it seems to me what

1 your point here is, is that we don't have adequate
2 information to make a decision because of uncertainty,
3 and that it's possible -- or would be possible to have
4 a better understanding of those unknowable futures
5 with Hydro running a few more scenarios.

6 So what scenarios would you suggest
7 that you've outlined in your remark here? Sorry, that
8 was page --

9 MR. JOHN TODD: Slide 10.

10 MR. RICHARD BEL: -- number 10 --
11 slide 10.

12 MR. JOHN TODD: Yes. Actually, I'm
13 looking at the version that's in my evidence, which is
14 the same words. I think that what I said was,
15 essentially, I'm worried about load growth being lower
16 than expected more than higher. And there's been a
17 massive amount of work done already, so how did we get
18 -- cut to the chase with a minimum amount of work?

19 I would -- I would like to see the
20 financial impact of a scenario where there's zero load
21 growth as of, say, 2025/2030, ten (10) years out. The
22 kind -- that's the kind of time frame where there
23 certainly are people predicting that grid parity will
24 have been achieved, and it will be that effective
25 competitive alternative, which will have people moving

1 off the grid.

2 The -- the US forecasts said to 2040, 7
3 percent growth in total is getting pretty close to
4 flat growth, particularly if you have growth in the
5 meantime up to 2025, say. That would provide a good
6 reference point. If you take that as a load forecast,
7 flow it through to the financial analysis, because the
8 load forecast doesn't tell you what you should do in
9 terms of a Development Plan. You have to flow that
10 through the -- the financial analysis to see what the
11 implication of stagnant load growth after 2025 would
12 be.

13 That would, in my view, have to be
14 combined with a consistent forecast of the export
15 price. Again, I'm not the -- I'm not the export
16 market expert, so I couldn't say what that should be,
17 but stagnant load growth in Manitoba would only occur
18 if you've also got grid parity in other jurisdictions,
19 and essentially, you've got competitive alternatives
20 throughout North America by 2025, in which case, my
21 assumption would be that the export price would be
22 held down to a sort of marginal cost of alternate
23 supplies, which would probably be low price, but you'd
24 need electricity pricing experts to suggest what the
25 consistent number is.

1 But with those two (2) things, and
2 everything else the same, you'd have a -- a scenario
3 which would say, Is this something you have to worry
4 about, or is this something we don't have to worry
5 about, from a finan -- financial perspective?

6 MR. RICHARD BEL: Thank you.

7 THE CHAIRPERSON: You link the low --
8 the low load forecast -- I'm sorry, the -- you linked
9 the low growth to a consistent export price. Now,
10 explain that one to me, the ex -- the consistent
11 export price?

12 MR. JOHN TODD: Okay. I'm going
13 beyond the scope of my load forecast projection,
14 obviously, so -- but here's the way I'm thinking of
15 it. It wasn't in my evidence, because this is going
16 beyond the scope.

17 The scenario that says that you have
18 innovative technologies, which give customers the
19 option to go off-grid, which is the driver of -- which
20 is a most risky driver of zero or even negative load
21 growth, would not be something that occurs in Manitoba
22 alone. It's something that would be -- you know,
23 those technologies would be available everywhere.

24 And therefore, you'd have similar
25 constraints on supply -- or sorry, constraints on

1 demand throughout North America, at least, probably
2 throughout the world, and you'd have some high-cost
3 jurisdictions where it would bite first. You'd see it
4 coming, but if you've got demand being restrained
5 throughout North America, there's a lot of existing
6 supply. Certainly, that supply would gradually be
7 retired, but the meantime, you'd expect to have a
8 supply-demand imbalance, which, in basic economic
9 terms, would say prices can be restrained. It's --
10 and what you're going to tend to have is the price of
11 electricity is always driven by the marginal supply.

12 If we continue to build, and then
13 demand doesn't -- it doesn't develop the marginal
14 supply, the -- the price setting supply is probably
15 going to be a lower cost supply. You -- you're
16 getting rid of your higher marginal cost supplies as
17 being actively used in the marketplace. Therefore,
18 that would put downward pressure on -- on prices. How
19 much requires some pricing models to determine. I can
20 only comment on it directionally, but clearly a
21 widespread slowing of demand growth, just, as an
22 economist, you say that's got to result in a lower
23 price directionally.

24 THE CHAIRPERSON: Okay. The panel has
25 no further questions, so I will turn the microphone

1 over to you, Mr. Williams.

2

3 CROSS-EXAMINATION BY MR. BYRON WILLIAMS:

4 MR. BYRON WILLIAMS: And I'm -- good
5 afternoon, members of the panel. I'm going to go off
6 script for a few minutes and jump around a little bit,
7 but we might as well -- perhaps we could pull up --
8 Mr. Todd, you're going to have to remind me how to say
9 your firm's name -- Elenchus number 3, Roman numeral -
10 - page 2, and so that's the load forecast document,
11 Mr. Todd.

12 And, Mr. Todd, you'll agree with me in
13 your discussion with Board member Bel and -- and the
14 Chair that, in essence, you were talking about a -- a
15 grid parity double whammy, in that your -- the
16 scenario that you would like examined would
17 contemplate grid parity in Manitoba, and also grid
18 parity in the markets into which it sells.

19 Is that fair?

20 MR. JOHN TODD: Yes, and I believe --
21 I -- I know it was before the Manitoba Board. I think
22 it was in actually that Conawapa hearing in 1990,
23 where one of the issues discussed was when sensitivity
24 analysis is done on several factors, to look at all of
25 the factors in isolation is incomplete when certain

1 factors are correlated.

2 So where different factors are
3 correlated, you have to make sure that you're looking
4 at the package of factors in a consistent way. And so
5 my point is it's -- it's double whammy, because price
6 -- both grid parity and price relate to -- you know,
7 one (1) cause. The other would -- would result from
8 reduced demand.

9 MR. BYRON WILLIAMS: And I want to
10 just dissect that answer, and -- and, Mr. Todd, it --
11 it might have been the Conawapa GRA, but it -- I --
12 I'm -- I'm sure you'll agree with me it came up in --
13 in the context of certain Manitoba Public Insurance
14 general rate applications, as well, when -- when the
15 point was made that one had to look at these factors
16 if there was a positive correlation in -- taking into
17 account that relationship.

18 MR. JOHN TODD: Yes, and insurance is
19 an obvious place where these kinds of things are
20 considered appropriately.

21 MR. BYRON WILLIAMS: So if -- if we
22 can start on rom -- is it 'Elenchus', Mr. Todd? Do I
23 have it right?

24 MR. JOHN TODD: Yes, it is. From the
25 Greek, so it's got a 'K' sound.

1 MR. BYRON WILLIAMS: The 'K' there.

2 MR. JOHN TODD: The 'ch' is 'K'.

3 MR. BYRON WILLIAMS: That might be my
4 toughest question of the day.

5 MR. JOHN TODD: Tough for you, maybe.
6 It shouldn't be for me.

7 MR. BYRON WILLIAMS: We'll see if the
8 --

9 MR. JOHN TODD: One tough question.
10 Ask what it means.

11 MR. BYRON WILLIAMS: No doubt it means
12 'truth and wisdom', Mr. Todd. No, I --

13 MR. JOHN TODD: I'll give you a hint.
14 It's as in 'Socratic Elenchus', so you're close.

15 MR. BYRON WILLIAMS: Just taking the
16 concept of -- of grid parity in -- in its stride, we
17 can't forecast the timing of it or its impact, but we
18 would expect it to be reached sooner in high-cost
19 jurisdictions than in low-cost jurisdictions, agreed?
20 All other things being equal, sir?

21 MR. JOHN TODD: Like the ceteris
22 paribus added. Yes. In -- in general, yes. There
23 are a few factors such as, to the extent that grid
24 parity's in solar. The generation you get out of
25 solar panels depends on location, things like that.

1 The same with wind.

2 MR. BYRON WILLIAMS: Fair enough. And
3 -- and so the -- the premise of your grid parity
4 double whammy is that if we have reached grid parity
5 in a relatively low cost jurisdiction such as
6 Manitoba, it is more likely than not, all other things
7 being equal, that we will have reached grid parity in
8 some of the jurisdictions in which Manitoba Hydro
9 depends for its export sales.

10 Would that be fair?

11 MR. JOHN TODD: Yes, you'd expect good
12 parity to be achieved in some of those export markets
13 before it's -- it's reached in Manitoba, assuming
14 Manitoba electricity prices stay low comparatively,
15 and that differential will be declining, based on the
16 current forecast, as I understand it.

17 MR. BYRON WILLIAMS: Fair enough, sir.
18 And -- and so let's move to the implications of grid
19 parity -- right here is just fine, thank you -- grid
20 parity in the marketplace in which we sell -- or the
21 marketplaces into which we sell.

22 What that means is that consumers in
23 those jurisdictions will have a -- another option
24 apart from the grid supplier, a price-competitive
25 other option?

1 MR. JOHN TODD: Yes. The alternatives
2 will be declining in price over time. It is not
3 expected that most of the existing sort of sources of
4 grid supply will have declining prices. Therefore,
5 there will be -- reach a cross-over point, at which if
6 the price of power from the grid stays -- stays high,
7 then people will switch. That'll reduce demand.

8 And it leads to one (1) of two (2)
9 consequences. Either the suppliers take lower prices
10 so they can maintain the load, or they sell less,
11 which means they make less money. And -- and if
12 they're selling less, but at the same costs, and it is
13 a fixed cost industry, then if they're selling less
14 and they seek to raise the rates, you can into the
15 classic death spiral, which I didn't think existed
16 until the recent TransCanada Pipeline hearings, where
17 they're dealing with the -- the -- their pipeline
18 across Canada that is facing issues related to what
19 looks like a death spiral.

20 MR. BYRON WILLIAMS: And in that
21 circumstance, if there's grid parity in the
22 marketplaces into which Hydro is selling, one would
23 expect that Hydro would -- would have lower or
24 diminished prospects for earning as -- as high of a
25 revenue from its export sales as -- as it would

1 expect?

2 MR. JOHN TODD: Yes. To try to put it
3 as simply as I can, grid -- I think of grid parity as
4 a price constraint, and anybody whose costs are above
5 the grid parity price stops producing electricity.
6 That's the marginal cost. And others will underprice
7 the grid parity price in order to keep people on the
8 grid, and that price constraint is what will dictate
9 the export price.

10 MR. BYRON WILLIAMS: And again, going
11 back to your original prem -- premise, all other
12 things being equal, if we reached grid parity in those
13 jurisdictions -- excuse me, if we reach grid parity in
14 Manitoba, we would expect to be at grid parity in
15 those relatively higher cost jurisdictions?

16 MR. JOHN TODD: Yes.

17 MR. BYRON WILLIAMS: And hence your
18 argument that there may be a -- a positive correlation
19 between -- between the -- the two (2) circumstances?

20 MR. JOHN TODD: Yes.

21 MR. BYRON WILLIAMS: And then in this
22 grid parity double whammy, Manitoba Hydro is faced
23 with the dilemma, not only of diminished export
24 revenues in the export market, but that it's also
25 facing pressure on its ability to -- to achieve its

1 desired revenues on the domestic market, as well?

2 MR. JOHN TODD: Yes, because the --
3 there would be a -- a grid parity price, if you want,
4 a -- a market constraint price constraint in both
5 markets. Given the traditional utility model, if
6 Manitoba Hydro is earning less in the export market,
7 that would mean it comes back and does -- does a
8 revenue requirement hearing and raises rates in
9 Manitoba. But if there's a price constraint in
10 Manitoba then either -- you know, if they raise the
11 price so that they cover all their costs, that price
12 will drive people off the grid, in a good parity
13 scenario. If they don't raise it, it means they're
14 not recovering their full costs and can't support
15 their debt.

16 MR. BYRON WILLIAMS: Okay. And that's
17 the -- the scenario that you're -- that you believe is
18 deserving of further exploration for the purposes of
19 the -- this panel providing informed advice to the
20 province?

21 MR. JOHN TODD: In the context of load
22 forecast evidence, I cannot follow it through far
23 enough to say is this a concern or not. I mean, in a
24 simplistic notion as strictly looking at load
25 forecasting, I sort of say, well, if the load is above

1 expected it just means there's less exports. If it's
2 below what's expected it just means more exports. Who
3 cares, from a financial perspective. Unless there's a
4 pricing constraint which then starts to affect the
5 ability to charge domestic customers whatever is
6 required given export revenues.

7 MR. BYRON WILLIAMS: Now, I'm going to
8 -- Board Member Bel pre-empted some of my questioning
9 for which I -- I thank him. I'm sure the Board will -
10 - will thank him as well.

11 And so I'm -- but, Mr. Todd, your
12 advice, you know, in responding to the Board you
13 indicated that the development of a scenario isn't all
14 on -- on your plate, you -- you'd also need some
15 advice from -- on the export market situation as well.

16 MR. JOHN TODD: Yes. Because what
17 matters to this process is not what the load forecast
18 is but what the financial prospects are for the
19 Preferred Development Plan, and that goes well beyond
20 my mandate.

21 MR. BYRON WILLIAMS: Okay. Now, as I
22 said, I am going -- I'm going to come back to you in
23 terms of structural challenges in the -- the
24 marketplace, Mr. Todd.

25 But, Mr. Houldin, I'm not going to have

1 as many questions for you as I should because My
2 Friend, Mr. -- My Learned Friend Mr. Gange has a bunch
3 I'm told, so.

4 But I -- I'm going to have a few
5 questions just because I wanted to visit at the start
6 and then I'll have a few towards the end of our
7 discussion as well. But I wonder if you could pull up
8 Exhibit Elenchus 6 and slide 41 for a moment. And I
9 think this is a slide that may be of interest not only
10 to my client perhaps but to Mr. Orle's client as well.

11 Mr. Houldin, you suggest that in terms
12 of -- in terms of designing DSM programs location
13 could be a factor.

14 Is that correct?

15 MR. RUSS HOULDIN: Yes.

16 MR. BYRON WILLIAMS: And -- and, sir,
17 I wonder if you could elaborate on that, please.

18 MR. RUSS HOULDIN: Yeah. I -- well, I
19 -- it's -- it's my interpretation of what is in the
20 Power Smart plan. The -- Manitoba Hydro indicates
21 that it -- it uses several numerical screening
22 metrics, the main one being the -- the total resource
23 cost. But they -- all -- but it uses those as a
24 guideline and it uses other -- other qualitative
25 judgments as well. And so I'm -- I guess I'm

1 inferring that location could -- could be one of those
2 factors. I don't know that it is.

3 Again, the context is we were asked to
4 comment on this in -- in the scope of work so that --
5 that's sort of as far as I thought I could go in
6 responding to that.

7 MR. BYRON WILLIAMS: And, sir, if I'm
8 taking you too far you'll just rebuke me and you --
9 you shall not hurt my feelings too much.

10 But I'm trying to understand what you
11 mean by that. But let us say, for example, rather
12 than just taking in -- into account economic
13 considerations, one wanted to look at a social need.
14 For example, inadequate shelter for remote First
15 Nation communities who are already suffering the
16 adverse effects of ongoing hydro development; that
17 could be a factor.

18 MR. RUSS HOULDIN: Absolutely, yes.

19 MR. BYRON WILLIAMS: And could you
20 give some practical examples, sir, of -- some -- when
21 we're talking about locational factors, others that
22 you...

23 MR. RUSS HOULDIN: Well, along the
24 same lines, and -- and obviously I'm -- I'm
25 speculating here, because as far as I know, there's

1 nothing in the Manitoba Hydro evidence that actually
2 spells this out, but along the same lines, there could
3 be programs of improving the energy efficiency of
4 homes of low income people. And -- and I'm -- I
5 apologize. I don't know the geography of Manitoba as
6 well as I should, and it may be the case that -- that
7 there are locational pockets, let's call it, of -- of
8 low income people as -- aside from First Nations.

9 And so -- and -- and this has happened,
10 by the way, and I'm -- I'm -- and I'm speculating in
11 the context of Manitoba. I'm not speculating in
12 relation to this kind of program. There are many
13 jurisdictions that have -- have programs specifically
14 addressed to -- to the needs of -- of lower income
15 consumers.

16 MR. BYRON WILLIAMS: Okay.

17 MR. RUSS HOULDIN: So that would be --
18 so that would be another example of how location could
19 enter into -- into the design of the -- the DSM
20 programs and my, you know, opinion would be perfectly
21 leg -- legitimate.

22 MR. BYRON WILLIAMS: Thank you for
23 that. I wonder if, again, Mr. Houldin, I -- I'm going
24 to stay with you for a -- a couple of questions I've
25 just been dying to ask you ever since I saw your

1 evidence.

2 MR. RUSS HOULDIN: Yeah.

3 MR. BYRON WILLIAMS: If we can go to
4 Elenchus Exhibit 2-2, which is the revised review of
5 Manitoba Hydro's demand-side management plan, and in
6 particular, to page 24. And scroll up just a little
7 bit, please. Scr -- scroll down, please. Thank you.

8 MR. RUSS HOULDIN: Yes.

9 MR. BYRON WILLIAMS: And -- and, sir,
10 this is probably just a terminology challenge, and I'm
11 not going to refer you to this quote just yet, but I
12 will in a second. But you're in ware -- aware in
13 Manitoba that we talk about constraints upon the
14 system, for planning purposes, being energy
15 constraints, or compa -- or -- or capacity
16 constraints.

17 You're -- you're aware of that?

18 MR. RUSS HOULDIN: Oh, yes.

19 MR. BYRON WILLIAMS: And in your
20 analysis for the purpose of this hearing, in terms of
21 the requirement for new generation resources, sir,
22 which premise have you been operating upon? Has it
23 been a -- a premise that there is a capacity
24 constraint or a energy constraint?

25 MR. RUSS HOULDIN: Well, for the --

1 for the purpose -- yeah. For the purpose of the
2 analyses that -- that I have done, I've assumed it's -
3 - we're concerned about building the right amount of
4 capacity. So I think in the language you're using,
5 the capacity constraint.

6 Having said that, I'm -- I'm well aware
7 that operationally, that Manitoba Hydro has an energy
8 constraint system, but in the context of the -- of the
9 NFAT decision, the decision is whether to add capacity
10 or not, so the concern is -- is a capacity constraint
11 in that context.

12 MR. BYRON WILLIAMS: And, again, we
13 may have a terminology challenge, sir, but isn't the
14 timing of the need date driven by the energy
15 constraint?

16 MR. RUSS HOULDIN: The timing of the
17 en --

18 MR. BYRON WILLIAMS: And --

19 MR. RUSS HOULDIN: -- I'm going to
20 need a bit more explanation of that.

21 MR. BYRON WILLIAMS: Well, let -- let
22 us turn to chapter 4 of --

23 MR. RUSS HOULDIN: Yeah, I think --
24 sorry, I -- I --

25 MR. BYRON WILLIAMS: We shouldn't talk

1 over each --

2 MR. RUSS HOULDIN: I think of energy
3 con -- energy constraint as an operational
4 consideration, and -- and I may -- may have got this
5 wrong, but from the discussions we had with Manitoba
6 Hydro, as well as the -- the evidence, this was the
7 discussions -- let me call them in lieu of
8 interrogatories -- that occurred between the
9 independent consultants, that this was largely a
10 matter of managing the water.

11 And so that this is a -- this is an
12 operational fact of life for the system operators of -
13 - of Manitoba Hydro.

14 MR. BYRON WILLIAMS: I wonder if we
15 can turn to the business case, the Need for an
16 Alternatives (sic) analysis, Chapter 4, page 4, and
17 scroll down to the bottom of that page. And -- and
18 again, there -- you'll -- you'll agree with me, Mr.
19 Houldin, how -- Houldin, I apologize. I'm -- I'm
20 tired.

21 There's a suggestion on line 21 through
22 23 that in terms of the requirement for nee -- for --
23 for new resources, while the need date has varied, it
24 has consistently been due to a need for energy as
25 opposed to capacity.

1 Do you see that reference, sir?

2 MR. RUSS HOULDIN: Yes.

3 MR. BYRON WILLIAMS: And would that be
4 different from the assumption upon which you performed
5 your analysis, sir?

6

7 (BRIEF PAUSE)

8

9 MR. RUSS HOULDIN: Does the -- the
10 evidence go on to explain that a little more?

11 MR. BYRON WILLIAMS: I -- I can...

12 MR. RUSS HOULDIN: Maybe we scroll
13 down.

14 MR. BYRON WILLIAMS: I doubt it on
15 that page. I do have another -- another reference. I
16 can show you one other reference, sir, which would be
17 page 12-6 of the original evidence, if that would
18 help.

19

20 (BRIEF PAUSE)

21

22 MR. BYRON WILLIAMS: And Me. Monnin,
23 when your witnesses are done, this page might help a
24 little bit. And perhaps we could go to the top of
25 page 12-6, and then scroll -- scroll to lines 3 and 4?

1 And sir -- Mr. Houldin, I'm not sure I can convince
2 you in the course of cross-examination that this is
3 the case, but if -- if it was a energy constraint,
4 i.e., the -- a shortfall of dependable energy as -- as
5 compared to a capacity deficit, I wonder if you would
6 be prepared to discuss how your analysis might --
7 might be different, or...

8 MR. RUSS HOULDIN: I don't think --
9 well, John wants to jump in, so...

10 MR. JOHN TODD: I think I can help
11 from the sort of broader perspective. The Development
12 Plan is adding capacity and energy. The timing of the
13 date of the in -- of required in-service date is
14 driven by energy, not by capacity.

15 As I recall, the diagrams that show
16 both energy and capacity, you would hit your capacity
17 constraint a couple of years after the energy
18 constraint. So I mean, it's not a vast difference,
19 but there's a bit of a difference, but you are
20 providing both energy and capacity. DSM provides both
21 energy and capacity.

22 So in the chart that you're looking at
23 on page 24, it's -- it's looking at capacity and
24 energy. I think the basic -- the basic point that is
25 being made in the evidence is that given all the

1 uncertainties around DSM, we're not talking about
2 shifting in-service dates. That was a point made by
3 Mr. Houldin earlier. But you're -- you're going to
4 have an impact on both capacity and on energy, and you
5 want to analyze both capacity and energy in the
6 context of DSM, because different DSM programs affect
7 capacity and energy differently, and therefore, it's
8 just, Here's the impact of DSM on capacity and energy.

9 This is not drawing -- I think that
10 it's not drawing a conclusion about the impact on the
11 in-service date. That's a -- sort of a different
12 question.

13 MR. BYRON WILLIAMS: Perhaps if we can
14 go to slide 20 of Elenchus 6? Just so I understand --

15 MR. JOHN TODD: This is one of the
16 slides we'll be addressing in the undertaking.

17 MR. BYRON WILLIAMS: Obviously, and --
18 and I'm not asking, but just conceptually, this
19 analysis isn't examining energy, it's examining
20 capacity, agreed?

21 MR. RUSS HOULDIN: Yes, that's --
22 that's correct.

23 MR. BYRON WILLIAMS: And so I -- I
24 guess my question, just to repeat -- and perhaps we --
25 we could go back to page 24 of Elenchus 2-2?

1 MR. RUSS HOULDIN: Yeah.

2 MR. BYRON WILLIAMS: And you'll see at
3 line 3, since -- the statement from Elenchus that:

4 "Since this proceeding focusses on
5 the need for additional capacity,
6 only the polar case in which
7 estimated DSM capacity is too low is
8 -- is modelled."

9 Do you see that statement?

10 MR. RUSS HOULDIN: Yes.

11 MR. BYRON WILLIAMS: If I'm
12 understanding your evidence, you're suggesting that
13 even if the premise was that the proceeding was
14 focussed on a need date driven by energy, your
15 analysis would not differ?

16 MR. RUSS HOULDIN: Okay, I -- I think
17 there's maybe a little bit of clarification we should
18 -- we should make before I try and actually answer
19 that question. What's driven my analysis is just
20 simply, you can't have energy without capacity. If
21 you haven't built Keeyask, you can't get any energy
22 from it, right?

23 So that's really what -- what this is
24 saying. It is saying, as maybe perhaps flirting with
25 the outer edges of remit (phonetic), although the

1 scope of work does ask directly about the -- the --
2 does DSM suggest that we could defer Keeyask and --
3 and Conawapa. So I take that as being the focus of
4 the panel's decision, Should Manitoba Hydro put
5 shovels in the ground early next year and start
6 building Keeyask or not? So that's capacity.

7 That's -- and -- and energy that flows
8 from that is -- you know, that's going to be a
9 function of water levels some point in the future, and
10 that's factored into Manitoba's analysis, as -- as
11 they've described, where they look at polar cases of
12 where -- where water levels can fluctuate by a factor
13 of about three and a half (3 1/2), or 350 percent.

14 MR. JOHN TODD: To try to clarify,
15 just, you know, I know -- Mr. Houldin, I know these
16 proceedings, it's the way of looking at it, and it is
17 a terminology issue, okay? To Russ, he's saying, This
18 is about building dams. To Russ, in his background,
19 building dam is adding capacity. The timing is being
20 driven by the need for energy. You're adding a -- a
21 dam, which has capacity and energy.

22 So if you think of those words as
23 saying this proceeding is looking at the need for new
24 hydro dams, that's all Russ is saying there, and it
25 doesn't make a difference to the analysis, because

1 we're not talking about -- about timing, we're -- and
2 where timing comes into play is just with the
3 uncertainty.

4 And what's he's saying is that, given
5 the uncertainty around what you're really going to get
6 from DSM, and all the other uncertainties that are
7 there, given the long lead times, he's saying that, On
8 its own, if you target higher DSM, that's not a reason
9 to delay Keeyask. Keeyask is too soon to get the
10 cumulative impact of DSM.

11 So he has set aside that timing
12 question, which is the energy question, and I think
13 the wording here, unfortunately, is taking off track
14 of what he -- what the message is.

15 MR. BYRON WILLIAMS: And -- and I
16 don't want to belabour the point too much, but I am
17 going to for a couple more moments. I can give you a
18 reference, but if you would accept, subject to check,
19 that based upon the 2013 planning assumptions, the
20 dependable energy need date was 2023/'24, and the
21 winter peak capacity need date was 2026/2027.

22 Your evidence is that your -- your
23 analytic approach would not have changed?

24 MR. RUSS HOULDIN: No, I don't believe
25 my -- if I understood the question correctly, and I'm

1 not absolutely certain I did, I -- I don't believe it
2 would -- would alter the analysis that I did at all.

3 MR. BYRON WILLIAMS: Okay. If we can
4 turn to slide 17 just for a moment. And then, Mr.
5 Chair, I note that we haven't introduced our exhibits
6 and you probably want a -- a break.

7 But if I looked at the analysis on this
8 page, sir, and I think you've made this evident. But
9 I just -- I want to make it clear.

10 If I wrote a note beside this analysis
11 and said, Purely heuristic assumptions for
12 illustration, that would be an accurate note?

13 MR. RUSS HOULDIN: Yes.

14 MR. BYRON WILLIAMS: And if I wrote
15 another note underneath and I said, Function of the
16 arbitrary assumed multiples of the base, that would
17 also be accurate.

18 Is that right, sir?

19 MR. RUSS HOULDIN: That would also be
20 accurate.

21 MR. BYRON WILLIAMS: Okay. Thanks.
22 And, Mr. Chair, if we -- if...

23 THE CHAIRPERSON: Let's take ten (10)
24 minutes. Thank you.

25

1 --- Upon recessing at 3:01 p.m.

2 --- Upon resuming at 3:18 p.m.

3

4 THE CHAIRPERSON: I believe that
5 everybody is in position, so, Mr. Williams, please.

6 MR. BYRON WILLIAMS: And, Mr. Chair,
7 if -- if I could perhaps get some guidance from the
8 panel what the -- how late we're running today.

9 THE CHAIRPERSON: Well, we were -- we
10 were optimistic that -- that we would be able to
11 complete your cross-examination and that of Mr.
12 Gange's -- Mr. Gange as well today. But we're
13 prepared to sit longer than 4:30, and -- and, you
14 know, given the time constraint we're facing I'll try
15 to get as much information today as we can. So I
16 would suggest that we keep going and hopefully we can
17 get both you and Mr. Gange done today.

18 THE CHAIRPERSON: And, Mr. Chair, if
19 you're starting to run out of patience with me I do
20 have some stuff towards the end that I -- like, if
21 you're -- if you're feeling I'm monopolizing too much
22 of the panel's time you'll -- if you could give me
23 twenty (20) minutes or so of notice then I'll...

24

25 CONTINUED BY MR. BYRON WILLIAMS:

1 MR. BYRON WILLIAMS: Mr. Todd, just
2 going back to the very start of our discussion. You
3 had a -- a chat with the Chair and with Board member
4 Bel in terms of if you were advising an -- the
5 additional adverse scenario that needed to be
6 undertaken. You were giving a verbal description of -
7 - of what it would look like. And speaking strictly
8 for my client, I wonder if you would undertake to --
9 to, in writing, set out the adverse scenario that --
10 that you believe is the most important one for the
11 Board to assess?

12 Would you be prepared to do that, sir?

13 MR. JOHN TODD: Yes, I -- I can
14 prepare as an undertaking a description of the
15 scenario that would have to be run through Manitoba
16 Hydro's models to look at the impacts. I, of course,
17 cannot do that run, but I can put in, as an
18 undertaking, my view of what should be done which
19 other parties may have reason to comment on.

20 MR. CHRISTIAN MONNIN: I -- it's --
21 it's provided Mr. Todd is able to do that, that's
22 fine. I -- I'm just wondering if that would have an
23 impact on other IECs, and if that's something that
24 should be considered.

25 MR. BYRON WILLIAMS: And certainly if,

1 from our perspective, Mr. -- Mr. Todd, if -- if you
2 can agree to, in consultation with the other IECs, and
3 -- and I -- I guess if -- if it's not possible you'll
4 get -- you'll get back to us.

5 MR. JOHN TODD: There would be no
6 reason I can't consult with other IECs except for time
7 perspective. I'm assuming that to the extent that
8 consultation with other IECs is required and I cannot
9 get in touch with them overnight, that the undertaking
10 does not have to be completed before we get off the
11 stand. If -- so if you have it Friday that would not
12 be a problem.

13 MR. BYRON WILLIAMS: Not at all, sir,
14 and I thank you -- you and Mr. Monnin for the
15 consideration.

16 And I understand that the undertaking
17 is subject to the proviso that if you're unable to get
18 -- if you need assistance from your colleagues and
19 you're unable to get it you won't be able to comply
20 with it?

21 MR. JOHN TODD: Yes.

22 THE COURT REPORTER: Can we get that
23 undertaking clarified?

24 MR. JOHN TODD: Undertaking verified
25 as to what it is?

1 THE COURT REPORTER: I need to know
2 exactly what it is --

3 MR. JOHN TODD: Yeah. Okay. The
4 undertaking will be to prepare a description of the
5 advess -- adverse scenario that I -- outlines kind off
6 the top of my head with Mr. Bel, and to lay out a
7 recommended scenario for Manitoba Hydro to run through
8 its models to determine the impact on the Preferred
9 Development Plan as compared to others. And that will
10 be prepared with consultation with other IECs as
11 appropriate.

12

13 --- UNDERTAKING NO. 92: Elenchus to prepare a
14 description of the adverse
15 scenario, and to lay out a
16 recommended scenario for
17 Manitoba Hydro to run
18 through its models to
19 determine the impact on the
20 Preferred Development Plan
21 as compared to others. And
22 that will be prepared with
23 consultation with other
24 IECs as appropriate

25

1 CONTINUED BY MR. BYRON WILLIAMS:

2 MR. BYRON WILLIAMS: Thank you. And,
3 Mr. Todd, you recall at the start of your direct
4 evidence you went back to the late '80s, early '90s,
5 and drew from your experience in the telecom industry.

6 Do you recall that, sir?

7 MR. JOHN TODD: Yes.

8 MR. BYRON WILLIAMS: And just for a
9 moment, I wonder if we -- I can take you back there
10 again. And, Mr. Todd, you're familiar with the
11 acronym POTS, standing for plain old telephone
12 service?

13 MR. JOHN TODD: That's correct. This
14 is Back to the Future is it now? The -- the past with
15 telecom and the future with electricity?

16 MR. BYRON WILLIAMS: Well -- and I'll
17 suggest to you, sir, in the late '80s, early '90s, we
18 were looking at a world that Alexander Graham Bell
19 might have had some familiarity with: A world before
20 Skye. A world before voice-over internet. A world
21 with a -- a long-distance monopoly. A world with no
22 local competition.

23 Do you remember that world, sir?

24 MR. JOHN TODD: Yes. That's the world
25 my kids call the medieval days, I think.

1 MR. BYRON WILLIAMS: I remember it
2 well. And, sir, the thrust of your -- your message at
3 the start of your evidence was we're in an era in the
4 telecommunications world that Alexander Graham Bell
5 would no longer recognize.

6 Would that be fair?

7 MR. JOHN TODD: Yes. There's been
8 many speeches in recent years of it and the talk about
9 the telecom system would not be recognized by -- by
10 Bell, but the electrical system would be recognized by
11 Edison or other electrical -- people with electrical
12 background.

13 MR. BYRON WILLIAMS: And, sir, while
14 you offer -- you -- you do not pretend to predict the
15 future with any certainty, what you're saying to those
16 who are sceptical is that there is a risk that the
17 electrical industry over the next twenty (20) to
18 thirty (30) years may be transformed in a way such
19 that Mr. Edison would not recognize it.

20 Would that be fair?

21 MR. JOHN TODD: Yes.

22 MR. BYRON WILLIAMS: And your advice
23 to the Board, which I think they -- they have is that
24 that type of scenario, as we look at investments in
25 excess of \$16 billion, is one that we have to look at

1 to assess whether our plans are robust enough to -- to
2 endure in -- in the face of a dramatic structural
3 changes?

4 MR. JOHN TODD: That's correct. And a
5 reason you -- you have to consider it is there --
6 there's a school of thought which is becoming
7 increasingly strong, I'm certainly a member of it,
8 that says this transformation in the industry will
9 happen. The only uncertainty is -- is when.

10 MR. BYRON WILLIAMS: And, sir, you're
11 not -- you're -- you're point is you're -- you're not
12 the -- a lone wolf on this issue, that -- that whether
13 it's a -- a consensus or not, there are -- there is a
14 growing body of opinion that is saying the trans --
15 transition will happen and it's a matter of when?

16 MR. JOHN TODD: Yes.

17 MR. BYRON WILLIAMS: And, Mr. Chair, I
18 am -- I am tired today, so I apologize for this. I
19 neglected to introduce two (2) exhibits. And I
20 apologize for this. And I'm going to ask that we
21 introduce CAC Exhibit 45-9. And I'll ask Ms. Menzies
22 to provide copies to Mr. Simonsen. Oh, she has
23 already. And -- and also to distribute them around
24 the room. And they have apparently.

25 So I -- I'd ask if that could be marked

1 as Exhibit 45-9.

2 Yes, I apologize for that, it's -- it
3 has one (1) tab and it is our excerpts -- or it's
4 actually the -- the notes for remarks from Mr. Bruce
5 Campbell.

6

7 --- EXHIBIT NO. CAC-45-9: Notes for remarks from Mr.
8 Bruce Campbell

9

10 MR. BYRON WILLIAMS: And also Exhibit
11 CAC-45-10. And that is a three (3) tabbed document
12 include -- including two (2) tabs from the Ontario
13 Power Authority and one (1) from the California Energy
14 Commission. And I would ask that be marked as CAC
15 Exhibit 45-10.

16

17 --- EXHIBIT NO. CAC-45-10: Three (3) tabbed document
18 including two (2) tabs from
19 the Ontario Power Authority
20 and one (1) from the
21 California Energy
22 Commission

23

24 CONTINUED BY MR. BYRON WILLIAMS:

25 MR. BYRON WILLIAMS: Mr. Todd, if I

1 could ask you to turn to CAC Exhibit 45-9, and
2 specifically to page 11, focussing on the last two (2)
3 paragraphs. Sir, first of all, you'll agree with me
4 that this is a poor photocopy of speaking notes from
5 Mr. Bruce Campbell, notes which you cited in your load
6 forecast paper?

7 MR. JOHN TODD: Yes.

8 MR. BYRON WILLIAMS: And Mr. Campbell
9 is president and CEO of the Independent Electric --
10 Electricity System Operator in Ontario.

11 Is that correct, sir?

12 MR. JOHN TODD: Yes.

13 MR. BYRON WILLIAMS: And not focussing
14 you on any quote at this point in time, but you'll
15 agree with me that in his overall notes, or
16 presentation, Mr. Campbell was raising the prospect of
17 one (1) possible future we -- we should have in mind
18 where the so called smart grid could challenge the
19 fundamental role of every segment of the Ontario
20 electricity value chain from bulk generation to the
21 family home.

22 Would that be fair, sir?

23 MR. JOHN TODD: Yes.

24 MR. BYRON WILLIAMS: And in the second
25 last paragraph on page 11 he's flagging four (4)

1 unknowns, four (4) key factors, including the
2 potential for cheaper solar, the potential for cheaper
3 energy sor -- storage, the potential for more internet
4 connected devices, and the potential for low-voltage
5 DC power networks, agreed?

6 MR. JOHN TODD: Yes.

7 MR. BYRON WILLIAMS: And he's raising
8 the potential that this could achieve -- lead to a
9 very fundamental change in the Ontario energy
10 industry, agreed?

11 MR. JOHN TODD: Yes. And as the Chair
12 -- as the president and CEO of the IESO, his remarks
13 were talking about how the IESO was preparing for the
14 future. And this relates to projects and what they
15 were doing.

16 I was there at the lunch when he was
17 speaking and have spoken to him a couple times since
18 then. And, you know, this is -- this is underpinning
19 in a sense the -- some of the projects that the IESO
20 is involved in such as sponsoring storage -- four (4)
21 different storage technologies that are being operated
22 on a travel basis, trying to find the best ones for
23 the future, which would be very important for improved
24 efficiency of the Ontario system.

25 MR. BYRON WILLIAMS: And we'll come

1 back to this document in just one (1) second. But if
2 we could pull up the -- the Information Response
3 PUB/CAC/GAC-6a, the attachment. And that should be a
4 document by Mr. Binz et al., from Ceres.

5 Mr. Todd, I'm not sure if you're
6 familiar with this specific publication by Ceres in
7 terms of practising risk aware electricity regulation.

8
9 Is it something that you've reviewed,
10 sir?

11 MR. JOHN TODD: No, I haven't.

12 MR. BYRON WILLIAMS: Okay. I -- I
13 won't -- I -- I'm going to move to a page, but if
14 you're uncomfortable discussing it with me, Mr. Todd,
15 you'll -- I don't think you will, but you'll -- you'll
16 let me know, and I will -- but if we could pull up
17 page 33 for a moment, focussing on the right-hand
18 side.

19 Mr. Todd, you'll agree with me that
20 Ontario is not an island and the -- the uncertainty
21 that Mr. Campbell was talking about is an uncertainty
22 being expressed in other jurisdictions in -- in North
23 America?

24 MR. JOHN TODD: Yes.

25 MR. BYRON WILLIAMS: And again, if

1 you're -- it's certainly, some would suggest, and I'm
2 directing your attention to the second full paragraph
3 on the right-hand side, that in the American context
4 they're again talking about important unknown factors
5 affecting energy planning.

6 Would you agree with that sentiment,
7 sir?

8 MR. JOHN TODD: Yes, significant
9 overlap with Mr. Campbell's remarks.

10 MR. BYRON WILLIAMS: And that is your
11 understanding of some of the dialogue in the American
12 marketplace, as well, sir?

13 MR. JOHN TODD: Yes. As I -- as I
14 mentioned to Bruce Campbell, I said, I thought it was
15 a great speech. A great speech is something which
16 says very eloquently what I believe. And these kinds
17 of things I just -- I'm reading every week almost. In
18 our office, of course, we're monitoring. We -- we
19 have an information service, which you may be aware,
20 of with subscribers, so we're monitoring the Canadian
21 regulatory jurisdiction, but we also have staff who
22 are tracking sort of policy discussions of various
23 sources in the US.

24 And this is a big topic. I have -- I
25 have in my office a binder of -- of information on

1 articles and research around grid parity and -- and
2 distributed -- distribute networks and various topics
3 around there. There's just -- it's -- it's something
4 people are trying to get their head around in a major
5 way.

6 And the other side of it is that
7 there's all of these promising technologies. I
8 approach them with -- with caution. You know, fuel
9 cells are something which were going to be ready for
10 cars next year for about the last thirty (30) years.
11 So, you know, many of the technologic innovations that
12 are anticipated in being around the corner are not
13 realized, and that's what makes the predictions very
14 hard.

15 But there's so much happening that it's
16 hard not to believe that there will be breakthroughs
17 on some of the efforts being made.

18 MR. BYRON WILLIAMS: And while we're
19 turning to CAC-45-9, page 8, Mr. Todd, you'll recall
20 this morning -- page 8. And scroll down just a little
21 bit. Keep scrolling, please. Thank you. Right there
22 is perfect.

23 Mr. Todd, you'll recall this morning
24 you spoke of, in the context of these times of great
25 uncertainty, the need for, and I believe I'm quoting

1 you, "a robust process for resilience."

2 Do you -- do you recall words to that
3 effect?

4 MR. JOHN TODD: Yes, words to that
5 effect.

6 MR. BYRON WILLIAMS: And you'll agree
7 with me, focussing on the -- the third last paragraph,
8 the second last paragraph on the -- the page before
9 us, that that was a central message from Mr. Campbell
10 as well, about the critical necessity of having the
11 flexibility necessary to respond to an uncertain
12 future, agreed?

13 MR. JOHN TODD: Yes. I mean, I'm
14 looking at a couple of paragraphs sort of out of
15 context of the total document. Subject to check, I
16 agree that's sort of -- the message. Certainly it's
17 the message in this paragraph.

18 MR. BYRON WILLIAMS: And based upon
19 your thick stack of binders in your office, sir, with
20 relevant material, you'll agree that a -- a message
21 throughout most jurisdictions in -- in North America
22 is the need for flexibility and to avoid betting the
23 farm on a narrow set of options?

24 Is that a sentiment that you're
25 familiar with, sir?

1 MR. JOHN TODD: Well, it's a -- a
2 sentiment that is expressed in the way I'd expect from
3 the little boy from Souris, but -- betting the farm.

4 I think -- going back to my earlier
5 comments on the -- the paper around the Icelandic
6 volcano. We're trying to balance what we know against
7 -- against the risks. I mean, you can't say we don't
8 know what the future's doing, so we're going to stop
9 building. You still have to make the best decision
10 you can.

11 And one (1) of the ways you -- we do
12 that in things like investment markets is you -- you
13 diversify. So if betting the farm you're saying, you
14 know, putting -- another farm analogy -- all your eggs
15 in one (1) basket, right, you're not diversifying.
16 You're -- you're going in a direction and making huge
17 commitments that require extended periods to, you
18 know, to -- of -- of growth to make them pay off.
19 Then that's a concern.

20 Something in finance we call it -- we
21 talk about option value. You know, to -- there --
22 there's a value to having options; that's the
23 flexibility. And there's a point at where you want to
24 look at the option value.

25 Now, how do you -- how do you build

1 that into an analysis of -- of options? Well, you
2 sometimes say uncertainty implies greater risk, so you
3 use a higher risk factor, or a higher discount rate.
4 Which is -- the higher discount rate is because
5 there's a -- a risk factor built in. That's something
6 which I think require a future discussion with other
7 IECs around -- in -- in this hearing room.

8 And at some point the -- the
9 undertaking about another scenario that could be run
10 is to try to just get a handle on how bad a mistake
11 can we make. You know, if under worst case scenario
12 the impact of getting it wrong is minor you say:

13 Well, okay. I'm -- I'm prepared to bet the farm if
14 the farm's not important to me.

15 But if I'm going to be devastated if I
16 lose the farm, you're not going to bet on it.

17 MR. BYRON WILLIAMS: Chickens, farms;
18 Mr. Todd, if we get a cow in this cross-examination
19 I'm going to be so excited. Keep that in mind, sir.

20 MR. JOHN TODD: Is it the cow you own
21 or your son owns, yeah?

22 MR. BYRON WILLIAMS: Mr. Todd, I won't
23 -- I'll be mindful you had, actually, a pretty
24 extensive discussion of price elasticity this morning.

25 You're -- you recall that, sir?

1 MR. JOHN TODD: Yes.

2 MR. BYRON WILLIAMS: So I'll -- I'll
3 cut to the chase. But assuming double the rate of
4 inflation rate increases for between sixteen (16) and
5 -- and twenty (20) years, sir, based on your
6 experience in other jurisdictions you would have --
7 you would expect some dampening of demand, all other
8 things being equal?

9 MR. JOHN TODD: Yes. There's two (2)
10 factors. One (1) is, as with inflation itself,
11 there's what the consumer anticipates, and there's
12 what the consumer experiences. As the experience rate
13 increases -- and even double inflation on a year-by-
14 year basis would be moderate and could be -- could be
15 absorbed with -- with little psychological reaction.

16 When -- if the public has a broad
17 recognition that there is an extended period of
18 greater than inflation rate increases then they start
19 thinking about things like, Oh, electricity is going
20 to become increasingly expensive, and when they buy
21 new washing machines they're going to be more strongly
22 motivated to buy an energy efficient one.

23 If they're looking at things like, you
24 know, a solar panel: I'm redoing my roof. Maybe they
25 say, Well, you know what, I'm not going to redo my

1 roof for another twenty (20) years, now is the time
2 while I'm up there working on the roof I'm going to
3 put a solar panel on it.

4 You know, people start thinking
5 differently due to the context. And one (1) of the
6 things I look at with -- with this plan is that the
7 message is going to be getting out that we're talking
8 about a sustained period of increasing electricity
9 prices and that, depending on how widespread it is and
10 how the press hammer it home and marketing and so on,
11 that would be a strong message for people to change
12 the way they -- they consume.

13 MR. BYRON WILLIAMS: Thank you. I
14 don't think I need to give you a reference for this,
15 Mr. Todd, but you'll agree that you retained a comment
16 on the reliability and accuracy of the short and long-
17 term domestic load forecast for 2013, as well as
18 historically to the extent possible with available
19 information?

20 Would that be fair?

21 MR. JOHN TODD: I missed the first
22 couple of words. I did what was it?

23 MR. BYRON WILLIAMS: To comment.

24 MR. JOHN TODD: Oh, comment. Yeah, I
25 comment. Yes, I was supposed to comment on it. Yes.

1 Yes.

2 MR. BYRON WILLIAMS: Mr. Dod -- Mr.
3 Todd, in -- in terms of a retrospective analysis of
4 the hydro forecasting methodology, would it be
5 accurate to say that this is not the same forecast
6 methodology as five (5) years ago, especially with
7 regard to the residential market, and with regard to
8 the general service mass market?

9 MR. JOHN TODD: Yes, there has been an
10 evolution in the methodology.

11 MR. BYRON WILLIAMS: And I meant to do
12 this right at the start of our conversation before I
13 got all excited and went off -- off scope, but you
14 recall some questions from Board Member Grant earlier
15 this morning referring you to page 18 of your load
16 forecast report, being Elenchus Exhibit 3.

17 Do you recall that, Mr. Todd?

18 MR. JOHN TODD: Yes.

19 MR. BYRON WILLIAMS: And if you -- if
20 you can scroll down on the page please to the -- where
21 those formula -- keep -- keep scrolling, please. Stop
22 there. Thank you.

23 And I just wanted to clarify a point,
24 if I could. Sir, what's being presented here are the
25 specifications with regard to -- I hate to use these

1 words, but the econometric regression model had that
2 predicted weather-adjusted GS mass market sales.

3 Is that correct, sir?

4 MR. JOHN TODD: Yes.

5 MR. BYRON WILLIAMS: And among the
6 variables used as explanatory variables were weather-
7 adjusted sales, the previous year real price of
8 electricity, and the Manitoba population.

9 Agreed, sir?

10 MR. JOHN TODD: Yes.

11 MR. BYRON WILLIAMS: And in terms of
12 this -- these specifications, sir, you'll agree with
13 me that they relate to a time prior to 2009? These
14 are from 2002 and -- and -- so -- so to be -- sorry
15 for that --

16 MR. JOHN TODD: It's based on data
17 from eight (8) -- from 1989 to 2002.

18 MR. BYRON WILLIAMS: And, sir, these
19 specifications were no longer used starting with the
20 2009 electrical load forecast?

21 MR. JOHN TODD: That's -- that --
22 that's correct, as stated at -- starting at line 10.

23 MR. BYRON WILLIAMS: So these are the
24 old specs?

25 MR. JOHN TODD: Yes, which is quite --

1 quite different -- as a -- an equation, quite
2 different from what appears later on page 19.

3 MR. BYRON WILLIAMS: And if we flip to
4 page 19, being lines 10 through 15, you'll see that
5 that more sophisticated methodology was abandoned in
6 or about 2009 and replaced with a simpler regression
7 equation which had only one (1) explanatory variable,
8 being the annual change in the Manitoba real gross
9 domestic product.

10 Would that be fair, sir? You don't
11 have to accept the word 'abandoned'.

12 MR. JOHN TODD: Yes, what's there is -
13 - is shown, yes.

14 MR. BYRON WILLIAMS: And we'll --
15 we'll go to, in a couple of moments, sir, some of the
16 changes that have been made over the last few years
17 with regard to the residential forecast.

18 But you'll agree with me, at a high
19 level, that there's been some -- some changes to that
20 methodology, as well?

21 MR. JOHN TODD: Yes.

22 MR. BYRON WILLIAMS: And one (1) of
23 the challenges you experienced in your analysis in the
24 course of this proceeding was that there were a number
25 of methodological changes, and in certain cases the

1 changes were either not documented or the reasons for
2 change were not addressed.

3 Would that be fair?

4 MR. JOHN TODD: Yes. I mean, there
5 was some discussion through the replacement of the IR
6 process. There's some discussion with Manitoba Hydro
7 staff around the changes. The information that was
8 available from discussions was not -- what you'd
9 normally like to see is a full explanation of why we
10 moved from -- why there's a movement from one (1)
11 particular model to a different model.

12 I -- I think that -- my understanding
13 is that what Manitoba Hydro was trying to do was, at
14 each point in time, say what's the best model. And,
15 you know, a driver was not consistency from -- from
16 year to year.

17 And that's where I talk about the GRA
18 sort of mentality, that if -- if what you're doing is
19 doing a model for a GRA and each time you come for a
20 GRA it's kind of a standalone process, what you want
21 is a forecast which looks to the data and gives you
22 the best fit based on the existing data and provides
23 what you believe to be the very best possible forecast
24 you can make for the coming few years.

25 Now, once you change that methodology

1 you tend to stick with it for a few years. So if
2 you're changing methodology, what I would like to see
3 is you don't make that decision based on a comparison
4 of one (1) year. You actually would do a more
5 extensive study to say, over time, if we're going to
6 have one (1) methodology, this is the methodology that
7 actually would have been just as good in the past, and
8 if you look at the last couple years, it would have
9 been better, therefore we're switching to it. And
10 maybe for a couple more years you do a comparison
11 between the different specifications and use the best
12 specification.

13 Certainly from, you know, the -- the
14 part of me that's an academic background, that's the
15 way you'd approach it. You want to have a strong
16 reason for changing equations.

17 When you're doing econometrics, one (1)
18 of the fundamental concepts is that you don't just
19 write an equation and say you take whatever gives you
20 the best fit. You've got to have a theory underlying
21 the equation you use, because you can have a best fit
22 any particular year just be -- by chance. You want to
23 make sure that it's -- it actually is conceptually the
24 best equation. And what you believe conceptually the
25 best equation is something that should have staying

1 power in that it should be, while not necessarily the
2 best in any particular year, is a good methodology
3 that you can use year after year after year and always
4 gives you a consistently fairly good result, and over
5 the long-term should give you the best result.

6 So I would give a little more weight to
7 consistency from here rather than saying, you know,
8 the -- the equation has the best fit this year. If
9 you come to -- I'll go with that one. And that may
10 become the one you use the next five (5) years. It
11 may not be the -- actually the best equation to use.

12 MR. BYRON WILLIAMS: And just to the
13 chair, in terms of time estimates, I'm figuring about
14 twenty (20) more minutes with Mr. Todd, and then
15 twenty (20) minutes or so with Mr. Houldin, just
16 roughly.

17 Mr. Todd, it, of course, is -- is more
18 than just an issue of academic interest though, you'll
19 agree with me? Especially in the context of a --
20 looking out for the por -- purposes of resource
21 planning?

22 MR. JOHN TODD: Particularly for
23 resource planning, a longer term, you want to make
24 sure you have confidence in your methodology.

25 MR. BYRON WILLIAMS: And if I'm

1 misstating your conclusions you'll correct me, sir,
2 but ultimately it was the conclusion of Elenchus that
3 Manitoba Hydro does not maintain sufficient
4 documentation on the impact of past changes to its
5 load forecasting processes to support an adequate
6 assessment of the reasonableness of its forecasting
7 methodology in the context of the NFAT.

8 Is that accurate, sir?

9 MR. JOHN TODD: Yes, we had -- we had
10 two (2) options. We could discuss the changes with
11 Manitoba Hydro and have them give us reasons for the
12 change, and we would either be convinced or not.
13 There is not sufficient background detail explaining
14 it or testing the alternatives and so on to
15 demonstrate to us that what they were using was the
16 best available model. It may be, but we can't draw a
17 conclusion on that.

18 We did not go down the alternative path
19 of taking all the historical data and independently
20 running a bunch of different specifications and trying
21 to come up with what we thought was the most
22 appropriate specification. In part that's because as
23 -- as we discussed with -- with the staff of Manitoba
24 Hydro, to come up with the best specification you want
25 to understand the underlying loads and the load

1 forecast. There's a -- there's a conceptual or a
2 theoretical aspect to it. It's not just a matter of
3 running the numbers. And we don't know their
4 customers the way they know their customers.

5 So that input, which is part of their
6 judgment on what is the best model, you know, can only
7 come from them. So we were relying on them to
8 convince us the change was appropriate, and we have to
9 be agnostic on that.

10 I'm not saying -- so we're not saying
11 it was wrong to do; we're just saying we -- we don't
12 have the information to say it was definitely an
13 improvement.

14 MR. BYRON WILLIAMS: Thank you. I
15 wonder if we could turn to Exhibit Elenchus 3, page 5.
16 Mr. Todd, you -- you kind of skipped over some of this
17 in your presentation this morning. But I -- am I
18 correct in suggesting to you that one (1) of the key
19 drivers for the residential basic forecast is the
20 estimat -- estimated number of residential customers?

21

22 (BRIEF PAUSE)

23

24 MR. JOHN TODD: Yes, there's the --
25 the number of residential customers, as in meters,

1 times the use.

2 MR. BYRON WILLIAMS: Thank you. And I
3 apologize for the imprecision.

4 And am -- am I correct in suggesting to
5 you that the -- the residential customer forecast is
6 achieved by -- by dividing the Manitoba Hydro
7 population forecast by the assumed people per
8 household?

9 MR. JOHN TODD: Yes, that's shown in
10 the equation that appears between lines 8 and 9. But
11 I would -- I don't think it's really fair to call it
12 assumed; it would be the -- the forecast people per
13 household. There's not -- it's not just picking a
14 number. It's -- it's a separately anticipated number
15 --

16 MR. BYRON WILLIAMS: Okay.

17 MR. JOHN TODD: -- forecast number.

18 MR. BYRON WILLIAMS: And that forecast
19 number, as I -- I'll ask you to confirm, is kept fixed
20 throughout the forecast at two point seven nine
21 (2.79)?

22 MR. JOHN TODD: Yes. So the -- the
23 forecast -- and that's based on the expectation that
24 that is the best forecast of that number by Manitoba
25 Hydro.

1 MR. BYRON WILLIAMS: And I -- I wonder
2 if we could turn to -- and so just stay on this page
3 for a second. So in essence, we've got the -- the
4 critical residential customer focus derived from the
5 calculation dividing the forecast Manitoba Hydro
6 population by the people -- forecast people per
7 household.

8 That's -- I've got that right, sir?

9 MR. JOHN TODD: Yes. It's the
10 Manitoba Hydro population forecast of the Manitoba
11 population. Yeah.

12 MR. BYRON WILLIAMS: Right. Thank
13 you. If we could turn to page 7 for a moment. I
14 don't know if we can make that any bigger or not. And
15 if we could scroll it to the left a little bit. I
16 want to keep -- get the years 2034 on the screen.
17 Okay. That's -- oh, we're not going to be able to do
18 that. We'll come back to that. That's perfect there
19 for right now.

20 Mr. Todd, am I corr -- you'll agree
21 with me that in forecasting the Manitoba population,
22 Manitoba Hydro relies upon five (5) forecasters,
23 correct?

24 MR. JOHN TODD: That's my recollection
25 as well.

1 MR. BYRON WILLIAMS: And we'll see
2 that -- you'll -- you'll agree with me that four (4)
3 of them run all the way out in this table from 2012
4 out to 2034, with IHS Global Insight falling off after
5 2017, correct?

6 MR. JOHN TODD: Right. And, of
7 course, that confirms the five (5) is right here;
8 you've got the five (5) listed in this table.

9 MR. BYRON WILLIAMS: You're quick, Mr.
10 Todd. If we could scroll now to the left, and act --
11 well, actually we have to go back a little bit once
12 more. Mr. Todd, let's focus our eye on the Conference
13 Board, which is the second from the top.

14 And you will agree with me that it
15 would be accurate to describe the Conference Board as
16 consistently the most optimistic of these forecasters,
17 sir? And just, Mr. Todd, if you -- I'll work -- I'll
18 work through this with you if you want.

19 Let's take 2019 as an example. You'll
20 agree with me that the Conference Board, subject to
21 check, is about thirty-two thousand (32,000) persons
22 higher than anyone -- anyone else on this -- on this
23 table, sir?

24 MR. JOHN TODD: Okay. I would adjust
25 your phrasing to say that that particular forecast of

1 the Conference Board --

2 MR. BYRON WILLIAMS: Okay.

3 MR. JOHN TODD: -- has higher
4 population numbers than the other forecasts.

5 'Consistent' would imply what they're doing through
6 time. You know, it's not -- that's not to say their
7 next forecast wouldn't be something other than the --

8 MR. BYRON WILLIAMS: Fair enough. And
9 I appreciate the rephrasing. Let's move to 2028 if we
10 might, scrolling around, remem -- remembering that the
11 Conference Board is second from the top.

12 And you'll agree with me in that
13 particular year that particular forecast by the
14 Conference Board, again, is the highest, being some
15 seventy-six thousand (76,000) higher than its next
16 estimate.

17 Would that be fair, sir?

18 MR. JOHN TODD: Which -- which --
19 yeah. It's - it's higher. The seventy-six (76) --
20 sorry, what year did you say?

21 MR. BYRON WILLIAMS: Yeah. And in
22 2028 being some seventy-six thousand (76,000) higher
23 than its nearest estimate -- the -- the nearest other
24 forecaster, being fifteen (15) -- one million, five
25 hundred and eight (1,508,000), sir?

1 MR. JOHN TODD: Yeah. Seventy (70) --
2 yeah. Seventy-six (76). Yeah, I agree with your
3 numbers. Pretty good math for a lawyer.

4 MR. BYRON WILLIAMS: A farm boy
5 lawyer. Scroll over to 2034, if you would. And
6 you'll again see, Mr. Todd, that we have the
7 Conference Board in that particular year, that
8 particular forecast being the highest. And I'll
9 suggest to you one hundred and eight thousand
10 (108,000) higher than -- than its -- its nearest
11 forecasting brother or sister.

12 MR. JOHN TODD: Yes.

13 MR. BYRON WILLIAMS: Well, just bear
14 with me for a couple of minutes on this table, sir.
15 Let's go back to the -- to the left and let's look at
16 Spatial Economics.

17 Spatial Economics, Mr. Todd, you'll
18 agree with me, is the top on -- on this table of
19 forecasters, correct?

20 MR. JOHN TODD: It's the first row,
21 yes.

22 MR. BYRON WILLIAMS: And let's take
23 Spatial out to 2019. And we'll see there that Spatial
24 is, at this point in time, for this particular year,
25 neither the highest or the lowest.

1 Would that be correct, sir?

2 MR. JOHN TODD: Correct.

3 MR. BYRON WILLIAMS: If we go out to
4 2023, focussing again on -- on Spatial, by this point
5 in time we can see Spatial starting to become somewhat
6 more pessimistic in this particular year with this
7 particular forecast than the other forecasters.

8 Would that be fair, sir?

9 MR. JOHN TODD: Yes.

10 MR. BYRON WILLIAMS: And let's go to
11 2028 if we could.

12 Again, remembering that Spatial is the
13 top row, you'll agree with me that by 2028, Spatial is
14 clearly the -- in this particular year, the most
15 pessimistic?

16 MR. JOHN TODD: Yes.

17 MR. BYRON WILLIAMS: And out to 2034,
18 you'll agree with me that by 2034 Spatial is about one
19 hundred and three thousand (103,000) persons less than
20 its -- its nearest forecaster in this particular year?

21 MR. JOHN TODD: Yes.

22 MR. BYRON WILLIAMS: And, sir, you can
23 accept this subject to check or if you want to double-
24 check my statement, you can refer to page 11 of the
25 Elenchus load forecast document. But would I be --

1 scroll down, please.

2 Would I be correct in suggesting to you
3 that of the forecasters relied upon by Hydro, your
4 understanding is that only Spatial was using 2013
5 data?

6 MR. JOHN TODD: The 20 -- the Spatial
7 Economics forecast was dated the 22nd of March, 2013.
8 Conference Board and IHS were December, so they were,
9 you know, approximately three (3) months earlier, as
10 was Manitoba Bureau of Statistics and Metrica was
11 October, so -- so sort of five (5) months earlier.

12 MR. BYRON WILLIAMS: Okay.

13 MR. JOHN TODD: So there's not a full
14 year difference but there's a few months difference.

15 MR. BYRON WILLIAMS: And one -- just
16 staying on this page, sir. One (1) of the phenomena
17 you noted for the 2012/'13 year - referring you to
18 lines 5 and 6 - is that Statistics Canada was
19 reporting a significant drop in immigration in
20 Manitoba in that particular year.

21 Would that be fair, sir?

22

23 (BRIEF PAUSE)

24

25 MR. JOHN TODD: Yes. And what you're

1 referring to it refers to the 2012/'13 number and
2 after a slight drop in 2011/'12 and those split years,
3 as the footnote notes, was from July to June. So it's
4 a -- a mid-year cycle.

5 MR. BYRON WILLIAMS: And what -- what
6 we see, sir, is that there was a drop of roughly
7 twenty-four hundred (2,400), twenty-five hundred
8 (2,500) people in the split year between 2011/'12 and
9 2012/'13. Agreed?

10 MR. JOHN TODD: Yep. Yes.

11 MR. BYRON WILLIAMS: Roughly 16
12 percent, subject to check?

13 MR. JOHN TODD: Subject to check, yes.

14 MR. BYRON WILLIAMS: And so you reach
15 no conclusions but in observing that Spatial was both
16 the most recent of the forecasts and also the
17 phenomena of the immigration drop, you -- you make --
18 you -- you ask the question whether the more
19 pessimistic view of Spatial is due to the
20 incorporation of more pessimistic immigration
21 expectations.

22 MR. JOHN TODD: Yes. And that's
23 putting together the dates as described in there where
24 the forecast came out in March, Citizenship and
25 Immigration Canada updated its figures in February, so

1 Spatial could have, probably did, use updated
2 population statistics.

3 MR. BYRON WILLIAMS: And it's unclear
4 whether that was the primary driver of what appears to
5 be the more -- the greater pessimism of Spatial or
6 whether there were other factors. Agreed?

7

8 (BRIEF PAUSE)

9

10 MR. JOHN TODD: That one would expect
11 -- you know, I don't know exactly how their -- their
12 modelling works, one would expect that if they
13 received low immigration figures from -- you know,
14 official figures, that that would have a reduction in
15 the short run.

16 Why that would have an impact on the
17 long-term would be a function of their model, which
18 could be driven, in part, off the short-term
19 immigration rates. But we don't know enough about
20 their model to be sure of that.

21 MR. BYRON WILLIAMS: Thank you. Mr.
22 Todd, I - I do have some more questions for you but
23 I'm -- I'm going to -- to deal with Mr. Houldin and
24 then if I have any more time left at the end -- of
25 course, if I see one (1) yawn, I'm -- I'm out of here,

1 so.

2 MR. CHRISTIAN MONNIN: From who?

3 MR. BYRON WILLIAMS: Mr. Hacault.

4

5 (BRIEF PAUSE)

6

7 CONTINUED BY MR. BYRON WILLIAMS:

8 MR. BYRON WILLIAMS: Mr. Houldin, in -

9 - in your work on issues related to stain --

10 sustainability and energy efficiency, have you come

11 across the work of the Northwest Planning Council,

12 sir?

13 MR. RUSS HOULDIN: Just before I

14 answer that I want to take up your agricultural

15 challenge and ask you if you intend to milk this

16 line...

17 MR. BYRON WILLIAMS: Well done, sir.

18 MR. RUSS HOULDIN: The answer to your

19 question is, no, I haven't heard of it.

20 MR. BYRON WILLIAMS: Well, perhaps I

21 might milk this -- this line for -- and I'll -- I'll

22 see if I can refresh your memory.

23 Within the United States, I'll suggest

24 to you, sir, that it is -- it is recognized that in

25 the area of energy efficiency the pacific northwest is

1 generally regarded as among the leaders in terms of
2 innovative thinking in energy efficiency programming.

3 Would that be your understanding, sir?

4 MR. RUSS HOULDIN: I don't think the
5 whole pacific northwest. Oregon is regarded as -- as
6 a leader, but I'm -- I'm -- in -- in my mind, I
7 wouldn't throw a blanket over the whole pacific
8 northwest. I guess that means Washington State, as
9 well, but...

10 MR. BYRON WILLIAMS: Okay. And
11 accepting that -- your recognition that Washington
12 State and Oregon are leaders in terms of energy
13 efficiency planning in -- in the United States, are
14 you aware of what, if any, role the Northwest Planning
15 Council plays in -- in dialogue within that particular
16 region, sir?

17 MR. RUSS HOULDIN: No, that's not
18 something that I have -- I have particular -- with
19 which I have particular familiarity, no.

20 MR. BYRON WILLIAMS: Okay.

21

22 (BRIEF PAUSE)

23

24 MR. BYRON WILLIAMS: Sir, at -- if
25 you're looking for a reference, we can probably go to

1 page 15 of your exhibit, Elenchus 2-2. And stay right
2 there.

3 Without asking you to elaborate, I'll
4 ask you to concer -- to confirm that your suggestion
5 in terms of addressing what you characterize as the
6 uncertainties of DSM would be to incorporate the
7 alleged uncertainties into planning by the treatment
8 of DSM as akin to dispatchable intermittent
9 generation.

10 Would that be correct?

11 MR. RUSS HOULDIN: That's correct.

12 MR. BYRON WILLIAMS: I'm going to come
13 right back to you, Mr. Houldin, and probably be
14 referring you to about page 6 of your evidence.

15 But, Mr. Todd, you would agree with the
16 statement that you have hung around with lawyers at
17 regulatory proceedings for far too many years?

18 MR. JOHN TODD: Absolutely.

19 MR. BYRON WILLIAMS: And you are
20 aware, sir, that when a lawyer refers to an argument
21 as novel, she or he is suggesting that it is one that
22 is not currently recognized by the courts?

23 MR. JOHN TODD: I'll accept that,
24 subject to check.

25 MR. BYRON WILLIAMS: And, Mr. Houldin,

1 did I hear you correctly today in terms of the
2 proposed treatment of DSM as akin to dispatchable
3 intermittent generation, that you were recommending
4 that Manitoba Hydro draw from the methods of
5 experimental theory?

6 MR. RUSS HOULDIN: Yes, that's right.
7 Yes.

8 MR. BYRON WILLIAMS: And, Mr. Houldin,
9 in making this recommendation, would I be -- would it
10 be accurate to suggest that you do not cite any
11 practice of a North American system planner currently
12 treating DSM in this manner?

13 MR. RUSS HOULDIN: I'm -- that's --
14 yeah, that's correct. I'm unaware of -- of any system
15 planner that has taken that step, not -- not just in
16 North America.

17 MR. BYRON WILLIAMS: Now, if I could
18 refer you to page 6 of your evidence, sir, lines 20
19 through 22.

20

21 (BRIEF PAUSE)

22

23 MR. BYRON WILLIAMS: And for the
24 purpose of this discussion, Mr. Houldin, I'm going to
25 read you a statement and then see if I've interpreted

1 it correctly and you'll correct me if I've
2 misinterpreted it. We see a line:

3 "While we are not aware of
4 jurisdictions which have yet taken
5 such approach, California has taken a
6 significant step in this direction."

7 Do you see that statement, sir?

8 MR. RUSS HOULDIN: Yes.

9 MR. BYRON WILLIAMS: And am I correct
10 in suggesting that you were referring to the treatment
11 of DSM as dispatchable intermittent generation, sir?

12 MR. RUSS HOULDIN: No.

13 MR. BYRON WILLIAMS: Okay.

14 MR. RUSS HOULDIN: No, I'm -- it -- in
15 the direction of recognizing uncertainty, yeah.

16 MR. BYRON WILLIAMS: So just so I
17 understand your point, this specific pro -- proposal
18 of treating it as akin to dispatchable intermittent
19 generation, you weren't suggesting that for
20 California. What you were suggesting is in terms of
21 treatment of what you consider to be the uncertainty
22 associated with it.

23 Is that --

24 MR. RUSS HOULDIN: That -- that's
25 correct. It was really -- it was continuing the

1 thought from the previous sentence.

2 MR. BYRON WILLIAMS: Okay. And one
3 (1) of the authorities that you rely from -- on -- for
4 that is the article by Meyers and Kromer, reported at
5 footnote 11 of this paper.

6 Would that be fair, sir?

7 MR. RUSS HOULDIN: Yes.

8 MR. BYRON WILLIAMS: Now, if -- if I
9 could ask you, Mr. Houldin, to turn to CAC Exhibit 45-
10 10, Tab 3. And specifically to page 34, handwritten
11 very nicely by Ms. Menzies in the bottom right-hand
12 corner.

13 MR. RUSS HOULDIN: Right. It's --
14 it's page?

15 MR. BYRON WILLIAMS: Thirty-four.

16 MR. RUSS HOULDIN: In -- in the
17 handwritten, but it's page 87 in the --

18 MR. BYRON WILLIAMS: Yes, it's...

19 MR. RUSS HOULDIN: -- in print.

20 MR. BYRON WILLIAMS: Yes. And I
21 apologize for speaking over you. The court reporter
22 gets mad at me if I do that. So I apologize to her as
23 -- as well.

24 And, sir, what -- what we're looking at
25 is an excerpt from the California Energy Commission

1 Staff Final Report. Their energy demand final
2 forecast for the years 2014 through 2024.

3 Is that correct?

4 MR. RUSS HOULDIN: I'm just reading
5 this now.

6 MR. BYRON WILLIAMS: Oh.

7

8 (BRIEF PAUSE)

9

10 MR. BYRON WILLIAMS: You have not seen
11 this before?

12 MR. RUSS HOULDIN: No.

13 MR. BYRON WILLIAMS: Okay.

14 MR. RUSS HOULDIN: Well, no -- no,
15 well, I've -- I've not read it before. It was --
16 actually, I'm not certain.

17 MR. CHRISTIAN MONNIN: It was provided
18 yesterday evening. Thank you for the email, Mr.
19 Williams. It's the gist of it.

20

21 CONTINUED BY MR. BYRON WILLIAMS:

22 MR. BYRON WILLIAMS: And that's --

23 MR. RUSS HOULDIN: And this's the
24 first opportunity I've -- I've had to actually read
25 this.

1 MR. BYRON WILLIAMS: Okay.

2 MR. JOHN TODD: Mr. Williams, I'd just
3 point out that given the cover page 27 in the handout
4 says, "California Energy Demand Final Forecast," I was
5 the one who looked at it, rather than Russ.

6 MR. BYRON WILLIAMS: Oh, well, Mr.
7 Todd, that's -- that's fine. I'm always happy to --
8 to talk with you and...

9 MR. JOHN TODD: Division of
10 responsibility.

11

12 (BRIEF PAUSE)

13

14 MR. BYRON WILLIAMS: And this
15 question, Mr. Todd, can go to you, and if you need to
16 refer it on, happily.

17 Would it be your understanding that in
18 California, there was a recent agreement between the
19 independent system operator CalISO, the regulator, the
20 CPUC, and the energy agency, the CEC, establishing
21 amounts of DSM to be counted on for planning purposes?

22 MR. JOHN TODD: I believe that's
23 covered in the document.

24 MR. BYRON WILLIAMS: Okay. And when
25 we look at the first paragraph of what is mark -- what

1 -- what is page 34 of CAC Exhibit 45-10, you'll see a
2 -- an indication, I'll suggest to you, Mr. Todd, that
3 one (1) element of the -- in California of the
4 efficiency assessment is a recognition of committed
5 efficiency savings from initiatives that have been
6 approved, finalized, and funded.

7 Would that be fair?

8 MR. JOHN TODD: Yes, and I believe
9 that's sort of consistent with, from a load
10 forecasting perspective, what would be done with an
11 existing DSM.

12 MR. BYRON WILLIAMS: And you'll see as
13 well, though, sir, that in California, there's a
14 recognition that there are likely additional savings
15 from initiatives neither finalized nor funded, which
16 are described as 'achievable'.

17 Do you see that reference?

18 MR. JOHN TODD: Yes, and that's --
19 that's the practice from my reading of the document
20 last night.

21 MR. BYRON WILLIAMS: And so, in
22 California, resource and transmission planners now
23 require an adjustment to the baseline forecasts, which
24 include only committed savings, to account for these
25 likely impacts.

1 Is that your understanding, sir?

2 MR. JOHN TODD: Sorry, can you repeat
3 that?

4 MR. BYRON WILLIAMS: I'll do better.
5 I'll say it better, Mr. Todd. Let me back up.

6 In California, the folks responsible
7 for keeping the lights on are the resource and
8 transmission planners, agreed?

9 MR. JOHN TODD: Yes.

10 MR. BYRON WILLIAMS: And now, in
11 addition to the approved, finalized, and funded DSM,
12 they now require an adjustment to the baseline
13 forecasts to account for likely impacts, what they
14 call 'achievable'.

15 Would that be fair?

16 MR. JOHN TODD: Yes. That's exactly
17 the words. In -- in essence, what they're doing is
18 saying, We have programs that are delivering some
19 savings that are built into the forecast. We also
20 want to, in effect, build in some forecast of savings,
21 which is logical.

22 MR. BYRON WILLIAMS: Now, if we could
23 pull up the response of GAC/CAC to the PUB-8a?

24

25 (BRIEF PAUSE)

1 MR. BYRON WILLIAMS: Would anyone from
2 the Elenchus witness panel have had an opportunity to
3 review this response?

4

5 (BRIEF PAUSE)

6

7 MR. BYRON WILLIAMS: And I'm -- I'm
8 not getting any ack -- acknowledgment.

9 MR. JOHN TODD: I may have some time
10 ago.

11 MR. BYRON WILLIAMS: Which I'm used
12 to.

13 MR. JOHN TODD: It's not fresh -- it's
14 not fresh in my --

15 MR. BYRON WILLIAMS: Okay.

16 MR. JOHN TODD: -- in my head. And,
17 Russ?

18 MR. RUSS HOULDIN: No, I haven't -- I
19 haven't seen this before.

20 MR. BYRON WILLIAMS: Okay. Well, let
21 me ask it a different way then.

22 Is Elenchus familiar with the practice
23 in New England by the independent system operators in
24 terms of what they use for planning purposes related
25 to DSM?

1 MR. RUSS HOULDIN: No. No.

2 MR. BYRON WILLIAMS: Okay.

3 MR. RUSS HOULDIN: This is good, new
4 information.

5 MR. BYRON WILLIAMS: Would Elenchus be
6 familiar with the practice in Nova Scotia?

7 MR. RUSS HOULDIN: I -- I am not.

8 MR. JOHN TODD: I'm somewhat familiar,
9 because I do work for the Efficiency Nova Scotia,
10 although that's cost allocation, not DSM program
11 design. But I've been involved in their workshops
12 which have gone through their methodology. So I may
13 not know the details, but I'm somewhat familiar with
14 what they're doing.

15 MR. BYRON WILLIAMS: Would -- would
16 you accept, subject to check, Mr. Todd -- and thank
17 you for your assistance -- that in Nova Scotia, NSPI,
18 the utility, nets 100 percent of planned DSM out of
19 its forecast?

20 MR. JOHN TODD: Yes. There's an issue
21 of the -- you know, familiarity with -- with -- yes,
22 given their model, which is that the DSM is done by an
23 independent government agency, Efficiency Nova Scotia,
24 and so they have a target which they achieve. And
25 NSPI, essentially, for their load forecasting purposes

1 assumes that that independent agency will achieve its
2 targets, which it has done a very good job of doing.
3 Incidentally, it's a excellent model in my view. Not
4 just because they're a client.

5 MR. BYRON WILLIAMS: You may be
6 talking to the converted over here, Mr. Todd. Let's
7 go to Ontario. And you'll be more familiar with --
8 with Ontario.

9 Would that be fair?

10 MR. JOHN TODD: Yes.

11 MR. BYRON WILLIAMS: And if we can
12 pull up CAC Exhibit 45-10, Tab 1, page 10, in the
13 bottom right-hand corner. Mr. Todd or Mr. Houldin, in
14 Ontario I'd be correct in suggesting that load
15 forecasts are prepared both by the Ontario Power
16 Authority and by individual utilities.

17 Would be that fair?

18 MR. RUSS HOULDIN: No, I don't think
19 that's fair. It depends what kind of forecasts you're
20 referring to. The utilities -- by 'the utilities',
21 you mean the distributors and the transmitters, they
22 prepare loa -- as Mr. Todd has explained, they prepare
23 load forecasts as part of their rate applications.
24 But they're in no way comparable to the long-term
25 energy plan.

1 MR. BYRON WILLIAMS: Fair enough. And
2 the question was poor -- poorly asked. And I thank
3 you for that clarification. And it's not a big point
4 but just so I'm clear, what you're telling us is that
5 the individual utilities, both transmission utilities
6 and distribution utilities, prepare, for general rate
7 application purposes, their load forecasts, correct?

8 MR. RUSS HOULDIN: That's correct.
9 Yeah.

10 MR. BYRON WILLIAMS: And then in
11 addition, you'll agree with -- you'll agree that a
12 load forecast is prepared by the OPA, or Ontario Power
13 Authority, correct?

14 MR. RUSS HOULDIN: I wouldn't
15 completely agree with that, no. The Ontario Power
16 Authority, if you look over its history since it was
17 created in 2004, has not generally provided forecasts
18 outside of the integrated power system plan.

19 MR. BYRON WILLIAMS: So let me try it
20 again and maybe I'll -- I'll ask it better.

21 For the purposes of the 2013 Ontario
22 long-term energy plan, did the -- and for the purposes
23 of overall provincial planning, did the OPA prepare a
24 load forecast?

25 MR. RUSS HOULDIN: Subject to check, I

1 -- I mean, I -- I believe that they've obviously
2 prepared a document. The relationship of the document
3 that they prepared and the government's long-term
4 energy plan is something I would have to look into. I
5 -- I couldn't -- I -- I don't know what that
6 relationship is.

7 MR. BYRON WILLIAMS: That's fair
8 enough, and -- and just noting the time, Mr. Houllind
9 (sic), if I were to suggest to you that, for the
10 purposes of the 2013 Ontario Long-term Energy Plan,
11 the Ontario Power Authority subtracted energy
12 efficiency and time-of-use savings from gross demand
13 to yield net demand, that's not something you could
14 answer today, because it's -- it's not something
15 you're familiar with?

16 MR. JOHN TODD: Yes. Let me add to
17 that, that load forecasting is complicated in Ontario.
18 As you mentioned, the distributors do forecasts, a lot
19 of them we do, so I'm familiar with that. The system
20 operator is actually the one that does sort of ongoing
21 load forecasting, but it's short-term. The produce an
22 eighteen (18) month outlook on a -- I think it's every
23 six (6) months. Six (6) months or so?

24 MR. RUSS HOULDIN: And actually, they
25 -- they had -- they periodically produce longer-term

1 forecasts. There are ten (10) year forecasts that the
2 independent electricity system operator is issued.

3 MR. JOHN TODD: And exactly what he
4 said. The short-term and periodically long-term.

5 MR. RUSS HOULDIN: Oh, the eighteen
6 (18) month, sorry.

7 MR. JOHN TODD: And the -- and the OPA
8 has done, for the long-term energy plan, a forecast.
9 What I'm not clear, and I think neither of us are, is
10 that there is collaboration amongst the Ontario
11 agencies, so I suspect, but cannot confirm, that the
12 OPA would be relying in part upon the work of the
13 IESO, but they do, do an independent forecast.

14 I can tell you that there is no attempt
15 to reconcile the forecast of individual distributors
16 to, for example, the long-term energy plan forecast.

17 MR. BYRON WILLIAMS: Okay. I'm just
18 thinking of efficiency, Mr. Todd and -- and Mr.
19 Houldin. I -- I -- I'll probably address this issue
20 through my -- through my own witness, and Mr. Houldin,
21 if I were to suggest to you that in the United States,
22 a -- a jurisdiction such as Vermont -- let me back up.

23 In preparing your opinion for Elenchus,
24 Mr. Houldin, did you explore the treatment of energy
25 efficiency in jurisdictions such as -- did you explore

1 the treatment of energy efficiency for planning
2 purposes in jurisdictions such as Vermont?

3 MR. RUSS HOULDIN: Yes.

4 MR. BYRON WILLIAMS: Okay. Would you
5 agree with the -- the suggestion that in Vermont, it -
6 - there is an increase in the value of energy
7 efficiency by 10 percent to account for its risk
8 benefits?

9 MR. RUSS HOULDIN: I -- I'd have to --
10 I'd have to check that, unless there's a -- there's a
11 -- you have a document to hand. I mean, that sounds -
12 - Vermont is regarded as the -- if not among the
13 leaders, the leader in energy efficiency programs, no
14 question about that, but I -- I don't -- I don't know
15 I can confirm the 10 percent number without checking
16 it.

17 MR. BYRON WILLIAMS: And would you be
18 prepared, sir, by way of undertaking to explore
19 whether, for planning purposes in Vermont, they
20 increase the value of energy efficiency by 10 percent
21 to account for its risk benefits?

22

23 (BRIEF PAUSE)

24

25 MR. BYRON WILLIAMS: And, Mr. Houldin,

1 if you're not able to, that's -- that's okay. It's --
2 it's on the record elsewhere.

3

4 (BRIEF PAUSE)

5

6 MR. RUSS HOULDIN: Oh, could you just
7 restate that, and then I'll...?

8 MR. BYRON WILLIAMS: I'll do my best,
9 sir. I'll -- I'll milk the drama. And would you
10 undertake to explore the treatment of energy
11 efficiency for planning purposes in the State of
12 Vermont and address the issue of whether or not there
13 is an increased value of 10 percent added to energy
14 efficiency to account for its risk benefits?

15 MR. RUSS HOULDIN: Yes, I think I
16 could undertake to do that, yeah.

17 MR. BYRON WILLIAMS: I thank you for
18 that.

19

20 --- UNDERTAKING NO. 93: Elenchus to explore the
21 treatment of energy
22 efficiency for planning
23 purposes in the State of
24 Vermont and address the
25 issue of whether or not

1 there is a increased value
2 of 10 percent added to
3 energy efficiency to
4 account for its risk
5 benefits

6
7 MR. BYRON WILLIAMS: Mr. Chair, I'm
8 actually -- I'm pretty much on schedule. I -- I think
9 we've had enough -- you've had a -- probably had
10 enough of me today. I'm going to invite my -- My
11 Learned Friend Mr. -- Mr. Gange, or -- or Mr. Hacault,
12 excuse me, whoever's up next to -- to proceed if --
13 subject to your direction?

14

15 (BRIEF PAUSE)

16

17 THE CHAIRPERSON: Thank you, Mr...
18 Before we -- I think we'll take a -- a few minutes,
19 but -- but I have to add my words to this and -- and -
20 - you asked for this, Mr. Williams, you have plowed
21 lots of land and it's yielded a rich harvest of
22 information, but that harvest will be -- will have to
23 be winnowed of its chaff to yield kernels of truth.

24 MR. WILLIAM GANGE: And, Mr. Chair, if
25 I may say, I was about to throw a cow if -- if Mr.

1 Williams had gone any longer, so.

2 THE CHAIRPERSON: Let's take five (5).

3

4 --- Upon recessing at 4:32 p.m.

5 --- Upon resuming at 4:44 p.m.

6

7 THE CHAIRPERSON: I believe we're

8 ready to resume the proceedings. If everybody can get

9 into position we will start the cross-examination by

10 Mr. Gange, please.

11 MS. MARLA BOYD: Mr. Chair, I -- I --

12 over here, sorry. I interrupted Mr. Gange just so

13 that I could file a few undertakings before Mr.

14 Williams takes his leave and before the cows come

15 home.

16 Manitoba Hydro has four (4)

17 undertakings to file, one of which I think will

18 benefit from a little bit of discussion from Mr.

19 Wojczynski if you'll indulge us just for a minute.

20 The first one is Manitoba Hydro's

21 response to undertaking number 74. It's from

22 transcript page 4,044. And Manitoba Hydro was asked

23 to provide a brief summary of what was said in the

24 Wuskwatim PDA regarding transmission, including

25 details of financial arrangements on a yearly basis.

1 We would propose that that be filed as Manitoba Hydro
2 Exhibit number 154.

3

4 --- EXHIBIT NO. MH-154: Response to Undertaking 74

5

6 MR. KURT SIMONSEN: That would be
7 correct.

8 MS. MARLA BOYD: Would you like me to
9 keep going or do you want them in front of you?

10 The next one is Manitoba Hydro
11 Undertaking number 77. It's from transcript page
12 4,129. Manitoba Hydro was asked to indicate if there
13 had been any additional elements of the Burntwood
14 Nelson agreement renegotiated. And we would propose
15 that that be filed as Manitoba Hydro Exhibit number
16 155.

17

18 --- EXHIBIT NO. MH-155: Response to Undertaking 77

19

20 MS. MARLA BOYD: The next, which is
21 the one that Mr. Wojczynski will speak to just after I
22 finish this is Manitoba Hydro's response to the
23 request regarding the evidence of Mr. Thomson, which
24 was actually made by Mr. Gange a couple of spots in
25 the transcript, pages 245, 4269 and 4270.

1 We were asked, assuming flat load a 750
2 megawatt line, Keeyask and existing and new contracts
3 extended into the future, what would be NPV in that
4 circumstance. And we propose that it be filed as
5 Manitoba Hydro Exhibit 156.

6

7 --- EXHIBIT NO. MH-156: Response to: Assuming flat
8 load a 750 megawatt line,
9 Keeyask and existing and
10 new contracts extended into
11 the future, what would be
12 NPV in that circumstance

13

14 MS. MARLA BOYD: And maybe I'll just
15 finish and enter the last one and then if we can turn
16 to Mr. Wojczynski. Hopefully you'll have the document
17 in front of you.

18 The last one is Manitoba Hydro's
19 response to Undertaking number 43. It's taken from
20 transcript page 2,602. And Manitoba Hydro was asked
21 to provide a high level variance explanation of the
22 revised capital costs relating to Keeyask and
23 Conawapa. So we would propose that that be marked as
24 Manitoba Hydro Exhibit number 157.

25

1 --- EXHIBIT NO. MH-157: Response Undertaking 43

2

3 MS. MARLA BOYD: And when you're
4 ready, Mr. Wojczynski can just provide some
5 explanation of Manitoba Hydro Exhibit 156.

6 MR. ED WOJCZYNSKI: Thank you for
7 indulging us in being able to bring this forward and
8 discuss it right now. It feels like a long time since
9 I've been at the mic.

10 This is actually, I think, an exhibit
11 that you will all find very interesting. And we were
12 going to -- we were aiming to have it ready for
13 tomorrow morning, but based on the discussion that was
14 going on today we rushed it and -- and have it
15 available now.

16 And just to go back into the genesis of
17 this, in the first day of this hearing Mr. Thomson was
18 presenting and Mr. Gange on behalf of his client asked
19 him about the hypothetical scenario that actually was
20 being discussed today. And that was the one where,
21 for whatever reason, let's use grid parity as being an
22 example but whatever the reason, that out in time in
23 the '20s that load growth stops and is flat after
24 that.

25 And the question of Mr. Thomson was,

1 well, would the projects be economic and as per
2 discussions with Mr. Gange and his client both on the
3 record and off the record we sort of agreed on how
4 that should be handled.

5 Mr. Thomson in the record had said that
6 assuming that the future export contracts have the
7 same prices -- we're talking about the dependable
8 contracts -- have the same prices as the -- the cur --
9 recently signed contracts, he thought that the
10 projects in that case would con -- continue to be very
11 economic.

12 In discussion with GAC, Mr. Gange, what
13 we've done here is a somewhat more conservative
14 analysis where we have said the -- the load forecast
15 stops in '22, '23 -- pardon me, the load stops going
16 then. And secondly, that the uncommitted dependable
17 contracts are sold at the forecast price not at the
18 recently negotiated prices that we have talked about.

19 So what was done was we -- as per the
20 discussion by Mr. Thomson there's a new time line.
21 There's Keeyask in 2019 and then we -- the load is
22 flat after that. What we did is we kept all the
23 energy volumes constant and we used our standard
24 methodology and we used the export price forecast, the
25 reference export price forecast.

1 We used the new capital costs, the new
2 definition of WPS. We used all the 2013 assumptions
3 and we used the weighted average cost of capital of
4 5.4 percent. So this is consistent with the updated
5 analysis Ms. Flynn has presented and I have presented
6 over the last couple of weeks.

7 If you turn the page to the second
8 page, you can see at the top we did a comparison
9 against what we call 'no new generation.' So that's
10 the existing system as it would be in 2021 and -- and
11 then we did one with Keeyask19 and the 750. We did
12 the -- the NPV differential between those two (2) sin
13 -- consistent like everything else we've done, but
14 there's no load growth. And -- forever. And the NPV
15 at 5.4 percent is \$400 million.

16 I just want to draw to your attention
17 that this \$400 million number is very, very similar to
18 the \$400 million number we've seen for Plan 5, because
19 this is a similar Plan 5. It actually, I guess, is
20 Plan 5. It's the same roughly 400 million we've seen
21 in all the DSM analyses. That it's bouncing within a
22 few tens of millions of dollars around \$400 million.
23 So there seems to be a consistency here that
24 regardless of load growth we seem to be -- and DSM
25 level, we seem to be getting a -- a benefit from the

1 Plan 5 within the order of \$400 million NPV when you
2 only consider the benefits to Manitoba Hydro and you
3 inclu -- you use the weighted average cost of capital
4 of the 5.4, which is the standard one we're using.

5 As previously discussed, embedded of
6 course in the WACC is a return on equity which is
7 available for maintaining the debt/equity ratio and
8 contributing to Manitoba Hydro's and its ratepayers
9 net benefit or to absorbing risks. So if you -- that
10 -- if you include that return on equity like we have
11 discussed previous times, that raises the incremental
12 NPV to \$1.19 billion.

13 We -- what we ran out of time to do was
14 do the calculation of what the provincial transfers
15 would be but they'd be very close to the 1.1 billion
16 that we did for the previous analysis you've seen. So
17 if you take that 1.2 billion and the 1.1 billion you
18 get in the order of \$2.3 billion from the -- from
19 Keeyask and the tie-line in this scenario, which is
20 the same kind of number you've seen before.

21 I would add that there's a lot of
22 interest expressed today in the hypothetical scenario
23 where you have grid parity, which is a -- a worse-case
24 risk I guess you could call it. A pretty extreme one,
25 in our view, but I'm -- I -- I'm not going to testify

1 on that. I'm not here to testify on those things.

2 What I can tell you that would, I
3 think, help everybody, is that while we -- Manitoba
4 Hydro has not done 2013 evaluations with a low price
5 sensitivity, we did in the 2012, and Ms. Flynn talked
6 extensively about that. And if you go to that quilt
7 that was provided, the adjusted quilt, the updated
8 one, and you see that reg -- whether -- if you look at
9 the two (2) different discount rates there, if you
10 look at the difference for Plan 5 from reference to
11 low export prices, eve -- keeping everything else the
12 same, the drop was just over \$800 million. In one (1)
13 case, 838 million, in another case \$839 million.

14 Now, that's a 5.05 percent, and at a
15 somewhat different export price. My judgment is that
16 number would be a bit smaller if we had the time and
17 wherewithal to do it to this scenario. So the
18 conclusion would be, if you did this combined double
19 whammy super risk scenario, and you would end up with,
20 depending on what metric you want to use, the \$1.2
21 billion or the \$2.3 billion benefit, if you went to
22 the other extreme of the low export prices, take off
23 \$800 million.

24 You'd still end up being something that
25 was positive for the province and positive for

1 Manitoba Hydro. Obviously not as profitable as what
2 we would like, and so the -- the extreme double whammy
3 risk scenario would not lead to bankruptcy. Thank
4 you.

5

6 (BRIEF PAUSE)

7

8 THE CHAIRPERSON: Thank you, Mr.
9 Wojczynski. I'll pass the -- the microphone over to -
10 - to Mr. Gange, please.

11 MR. WILLIAM GANGE: Thank you, Mr.
12 Chair.

13

14 CROSS-EXAMINATION BY MR. WILLIAM GANGE:

15 MR. WILLIAM GANGE: Mr. Todd, I'd like
16 to start with you if I may, sir. Your report, which -
17 - your original report is -- has been marked as
18 Elenchus number 3, the load forecast report -- doesn't
19 make mention of the fuel-switching report that the --
20 that Manitoba Hydro undertook.

21 Was that -- did -- did you -- do you
22 recall reviewing the fuel-switching report?

23 MR. JOHN TODD: Yes, that was reviewed
24 back in -- you know, before -- early in the stage of
25 writing the -- the document.

1 MR. WILLIAM GANGE: Thank you. So
2 you're aware, sir, that the -- that one (1) of the
3 issues that Manitoba Hydro has been wrestling with
4 over the past, I don't know, four (4) or five (5)
5 years has been the fact that -- that there is -- there
6 has been a significant -- I'll use the word 'slippage'
7 of natural gas use to electricity.

8 MR. JOHN TODD: Yes, and those numbers
9 show up in the report in ways that are -- are in -- in
10 -- sorry, in -- in their evidence and in their
11 rebuttal in ways that I've referred to.

12 MR. WILLIAM GANGE: Yes. And one (1)
13 of the things that you've -- you mentioned in Elenchus
14 number 3, page 12 and 13, if we could go to that? And
15 -- and you -- you have forecast market share electric
16 heat, and -- and you make mention of the -- a
17 potential area of concern, the estimate of market
18 share of electric heat.

19 And then if I could go to page 13,
20 almost at the bottom. You've got highlighted that --
21 and it's lines 21 -- yes, in my copy, it's -- it's
22 bolded, "Residential Customers Switching to Electric
23 Heat." It did not specifically address the switch
24 away from electric heat:

25 "For modelling purposes, the effect

1 should be assumed to be at least
2 symmetrical."

3 I'm not sure what you meant by that,
4 sir.

5 MR. JOHN TODD: Yes, in -- in my -- by
6 the way, in my copy, it's not bolded, so I'm not sure
7 what happened in producing copies there. And my
8 recollection is that this question -- this was
9 addressed as a question in the IR responses. But what
10 we were saying, there's sort of two (2) parts that I
11 recall the -- the question addressed -- symmetry
12 question, and then also asked about the 'at least
13 symmetrical' comment. The...

14

15 (BRIEF PAUSE)

16

17 MR. JOHN TODD: And I'm just -- I'm
18 just sort of quickly rereading this paragraph to make
19 sure I answer correctly.

20

21 (BRIEF PAUSE)

22

23 MR. JOHN TODD: There'S -- there's a
24 comment which I didn't cite here in the evidence. I
25 think it was the sensitivity analysis. I'd have to

1 check that, but I think it's the sensitivity analysis.
2 They -- they looked at the impact of increased
3 switching to electric heat. And clearly the scenario
4 does have a switching to electric heat.

5 In terms of any variances from that,
6 certainly there could be switch away -- away from
7 electric heat. And so there's a symmetry that could
8 be looked at there, in terms of -- of switching away.
9 I'd actually like to go back to my IR response. What
10 -- what exhibit are the IR responses?

11

12 (BRIEF PAUSE)

13

14 MR. WILLIAM GANGE: And, sir, is it a
15 GAC IR? Do you recall that?

16 MR. JOHN TODD: I thought it was a
17 Manitoba Hydro IR, but I could be --

18 MR. WILLIAM GANGE: Oh, okay. Thank
19 you.

20 MR. JOHN TODD: -- I could be wrong.

21 MR. SVEN HOMBACH: For what it's
22 worth, the IRs are filed under the name of the party
23 that asked them. So if you're referring to a Manitoba
24 Hydro IR, that's going to be a Manitoba Hydro exhibit.

25

1 MR. CHRISTIAN MONNIN: If we could
2 stand down just for a second. Mr. Todd, come here for
3 a second.

4

5 (BRIEF PAUSE)

6

7 MR. JOHN TODD: Manitoba Hydro 68.
8 You can call that up on the screen.

9

10 (BRIEF PAUSE)

11

12 MR. WILLIAM GANGE: Mr. Todd, if you
13 could repeat the IR number so that the document
14 manager can call it up.

15 MR. JOHN TODD: I think Sven said it
16 was 68, Manitoba Hydro 68.

17 MR. SVEN HOMBACH: Sorry, that is the
18 exhibit number. I'm not sure which IR you wanted to
19 look at, Mr. Todd.

20 MR. CHRISTIAN MONNIN: Perhaps if --
21 Mr. Gange, if I could suggest this. We have the --
22 the universe of the IRs from Elenchus here. There is
23 eighteen (18) pages. If we could take an undertaking
24 to after today's hearing we could find it, isolate
25 that one (1) IR. And if you want, Mr. Todd can

1 address your question at the top of the morning.

2

3 CONTINUED BY MR. WILLIAM GANGE:

4 MR. WILLIAM GANGE: Sure. Mr. Todd,
5 is that -- I mean, I -- I don't -- I don't really want
6 to put you to more work compiling undertakings if --
7 if you can answer it yourself. But -- but at the same
8 time, if it's going to take a long time to find it,
9 then let's move on.

10 MR. JOHN TODD: I don't remember the
11 answer, so I'd like to make sure that I at least refer
12 to the answer that I -- that I've put on the record.

13 MR. WILLIAM GANGE: Okay. Thank you.

14 MR. JOHN TODD: There may be multiple
15 explanations, of course.

16 MR. WILLIAM GANGE: And if -- if we
17 could look at GAC Exhibit 20, page 2. And -- and down
18 at the bottom of that page. So, Mr. Todd, this is
19 evidence from my client, Green Action Centre, and Mr.
20 Chernick in reviewing the material that had been
21 provided by Manitoba Hydro; indicated that by
22 2032/'33, Manitoba Hydro projects the addition of
23 almost sixty-four thousand (64,000) water heaters,
24 which would increase electric use by about 223
25 gigawatt hours.

1 So that -- that was the evidence, in
2 terms of -- of fuel switching from gas water heaters
3 to electric water heaters, or the addition to the
4 system of electric water heaters.

5 And -- and that type of information,
6 are you familiar with, sir?

7 MR. JOHN TODD: Yes, I think that was
8 covered also in the rebuttal evidence in my comments
9 this morning.

10 MR. WILLIAM GANGE: Yes. And -- and
11 then on page 3 of that same exhibit, Mr. Chernick had
12 also summarized and found that:

13 "By 2032/'33 Manitoba -- Manitoba
14 Hydro projects the conversion of over
15 thirty-one thousand (31,000) water
16 heaters, which would increase
17 electric use by about 109 gigawatt
18 hours."

19 So with that, sir, when you were
20 looking at the load forecast, were you looking at --
21 did you take into account the fact that there is this
22 slippage from gas to electricity?

23 MR. JOHN TODD: That is -- that is
24 built into Manitoba Hydro's load forecast.

25 MR. WILLIAM GANGE: Yes.

1 MR. JOHN TODD: So it's -- it's part
2 of the forecast that I was commenting on.

3 MR. WILLIAM GANGE: Yes. And one of
4 the things that you commented upon in your testimony
5 was that you indicated that this jurisdiction is
6 perhaps unique. I'm not sure you used the word
7 'unique', but you described it as different because
8 the gas utility and the electrical utility are all
9 under the same roof.

10 Do you recall that, sir?

11 MR. JOHN TODD: Yes, the word 'unique'
12 came into play from the rebuttal evidence, where at --
13 in the rebuttal evidence page 11, lines 19 and 20,
14 Manitoba Hydro says:

15 "These differences reflecting

16 Manitoba's unique market."

17 So that's where the 'unique' word came
18 into play and I was saying -- referring to how it is -
19 - why it is unique.

20 MR. WILLIAM GANGE: Thank you, sir.
21 And I think that you testified, as I recall, that in -
22 - in jurisdictions where gas utilities are standalone
23 corporations, that those gas utilities are often very
24 aggressive, in terms of attempting to ensure their
25 market share.

1 And that would be -- that -- that's
2 been your experience, sir?

3 MR. JOHN TODD: Yes. In Canada the
4 natural gas utilities, other than Manitoba, are
5 separate from the electric utility. And as it
6 happens, the gas utilities are shareholder owned in, I
7 think all cases, and that I think is a factor in their
8 behaviour as well, the profit motive.

9 MR. WILLIAM GANGE: Thank you. If we
10 could go to the GAC IR with Elenchus number 6. Do you
11 recall this, sir, we asked Elenchus to:

12 "Describe ways in which Manitoba
13 Hydro and its affiliate, Centra Gas,
14 could discourage the choice of
15 electricity for space and water
16 heating where gas is available."

17 And your answer is -- well, your answer
18 started off by saying:

19 "Elenchus would note that it is not
20 so much discouraging customers from
21 using electricity for space heating
22 as it would be encouraging consumers
23 to convert to gas."

24 And -- but the -- I think the point
25 that was -- or that -- that was requested of you was

1 whether there were ways, from your perspective, that
2 Manitoba Hydro could achieve or assist in the
3 achievement of the choice of gas over electrical for
4 space heating. And -- and I'm not sure, but I -- I
5 don't think that that answer -- or that -- that any
6 suggestions were made by you in that answer.

7 MR. JOHN TODD: Could you scroll --
8 can you scroll down a bit? I think what I was
9 referring to here was -- and it's maybe subtly words,
10 rather than discouraging, sort of being negative on
11 electricity, I was saying normally what you see and
12 probably is good practice in marketing would be being
13 positive about natural gas.

14 So at lines 32 to 34 I refer to the
15 most common approach used by natural gas utilities.
16 The -- the most important target for penetration of
17 natural gas is new development. What you want is you
18 want a house built with natural gas, not being looking
19 at retrofit conversions. It's much more expensive
20 obviously to retrofit than it is to build.

21 And so natural gas utilities work very
22 hard with developers at trade shows, at having
23 salesmen out there, they know who's developing, who's
24 building in a marketplace. They're out there working
25 with them, sometimes providing incentives to build

1 natural gas homes when they do a development.

2 In addition, a lot of the marketing
3 that natural gas utilities do is they market about the
4 benefits of natural gas heating. So they're going
5 after the end user and trying to, in essence,
6 stimulate the demand amongst home buyers to want to
7 buy and pay a premium for a naturally gas-heated home.

8 The reason they approach it that way is
9 that for a developer it is more expensive to build a
10 natural gas heating home than to put in baseboard
11 heating. So a developer is going to incur more cost,
12 therefore, they need a bit of a push to build natural
13 gas homes. And the push can come both from the
14 utility and from customer demand. So that's -- that's
15 essentially the way they go after the new build
16 market.

17 In addition, to a lesser extent, they
18 will go after the -- the conversion market. So we see
19 the main -- the main approach there is that they do
20 system expansions which basically means going into
21 projects where they put a pipe down a street so that
22 people can connect. And in the process of doing that,
23 they will often have people going door-to-door saying
24 gas is coming available; here's marketing information
25 on the difference in cost; we encourage you to -- to

1 sign up and convert.

2 There are -- I've done work for natural
3 gas utilities on the development of programs, methods
4 to make conversions cheaper for homeowners, such as
5 the development of offerings where you can in effect
6 do on-bill financing for a conversion to natural gas,
7 which lets you pay -- in essence, pay for the
8 conversation over time through the savings that you
9 have in your monthly bill of gas versus electricity.
10 So that there's no -- in -- in essence, upfront cost
11 out of the pocket of the customer.

12 You take another jurisdiction such as
13 New Brunswick -- I do a lot of work out in New
14 Brunswick on the natural gas file with the government
15 there. They've got what was a -- a green field
16 natural gas development as of 2000, bringing natural
17 gas to the people of New Brunswick, and a lot of
18 incentives were built into their business plan.
19 There's been some financial issues out there, another
20 issue, but certainly in terms of attracting customers
21 there's large financial incentives for getting people
22 to convert in a green field location it was all
23 conversions.

24 MR. WILLIAM GANGE: Thank you. Would
25 you agree with me, sir, that because of the unique

1 nature of Manitoba, however, that there is -- the
2 uniqueness from this perspective is that not only can
3 the natural gas company, Centra Gas, offer incentives,
4 but, in fact, the gas -- or the electrical utility,
5 Manitoba Hydro, can discourage the use of electricity
6 over natural gas, which is -- which is unique in that
7 it isn't something that you'd find anywhere else.

8 Isn't that the case, sir?

9 MR. JOHN TODD: In any jurisdiction,
10 the electric utility could discourage conversion if
11 they don't want conversion. I think what you're
12 saying is because they own both that they could have
13 policies internally affecting both that would
14 discourage conversion. In talking --

15 MR. WILLIAM GANGE: Well, let's --

16 MR. JOHN TODD: -- in talking to
17 Manitoba Hydro's staff, what I was hearing was that
18 they see the benefits of conversion, and I was hearing
19 nothing that suggested to me that, in fact, there were
20 -- there were internal policies to steer people to
21 electricity as opposed to natural gas.

22 But there is a fairly clear message
23 that, shall we say, we're not out there trying to get
24 people to take natural gas. It's more of an agnostic
25 approach, so I did not get any sense, in terms of my

1 contacts, that there's actually a discouragement
2 policy.

3 MR. WILLIAM GANGE: Right. And -- and
4 in fact, when Ms. Morrison and Mr. Kuczek were
5 testifying, 10 these many years ago at the start of
6 this hearing, the -- the information -- and -- and
7 I'll try to put the position as fairly as I can -- was
8 that this is a consumer's choice whether they're going
9 to make a -- a decision to put in electrical or
10 natural gas, but that Manitoba Hydro would provide as
11 much information to permit an informed choice.

12 Would that be consistent with what you
13 were told?

14 MR. JOHN TODD: Yes.

15 MR. WILLIAM GANGE: And we also,
16 during that -- that week at the start of this hearing
17 had some discussions about extra measures that
18 Manitoba Hydro could institute. For instance, having
19 significant hook-up fees for the electrical power for
20 electric heat, that that would be one (1) way of
21 making an immediate discouragement of going the
22 electric heat route.

23 Does -- does that -- does that kind of
24 a -- a method appeal to you as something that would,
25 in fact, discourage not only the -- the end user, but

1 the -- the contractors?

2 MR. JOHN TODD: In terms of equi --
3 efficacy, I would have to say yes. In terms of public
4 relations for a Crown corporation to have fees for
5 connecting the electric utility that are not cost-
6 based, I'm not sure of the sort of political policy,
7 public relations aspect of that, but as a cost
8 allocation expert, another one of my hats, if it's not
9 cost-based, I would have difficulty supporting that
10 kind of a charge. But from a policy perspective, it,
11 yes, clearly -- yeah -- yeah, people respond to
12 dollars, so it -- it would probably be effective.

13 MR. WILLIAM GANGE: Thank you. And
14 certainly from a -- a -- from a utility -- a utility
15 perspective, when one is considering both Centra Gas
16 and Manitoba Hydro, and the freeing up of electrical
17 resources, it would make sense on that basis, would it
18 not, sir?

19 MR. JOHN TODD: I've always been a
20 believer in carrots rather than sticks, so if you took
21 the same dollars and said, There is a value to
22 conversion, you could take the same dollars and use
23 them in a -- as an incentive to connect to gas, rather
24 than having a charge for electricity, and the -- and
25 the customer response to being a -- being given an

1 incentive to do something rather than paying a charge
2 for some -- something is much more positive, but you
3 could have exactly the same dollars involved.

4 Of course, the difference is that if
5 you're charging for an electricity connection, that
6 becomes other revenue to the electric utility which
7 would mean lower rates for other things. You know,
8 for -- for your -- for your electricity. You could
9 have lower electricity rates, which is a bit of an
10 offset of -- an offset of the incentive. Well, we've
11 got a participant issue there, whereas the -- the
12 subsidy would have to be -- on -- on the gas side,
13 would have to be covered through future gas rates.

14 The IR response talks about what's been
15 done in terms of US states. There are -- there is
16 legislative -- legislation promoting natural gas that
17 built on this, but those generally work toward
18 incentives as opposed to disincentives.

19 MR. WILLIAM GANGE: Thank you, Mr.
20 Todd. If I could move on --

21 MR. JOHN TODD: Before you move on,
22 the IR that we were trying to find earlier has been
23 located. Would you like to go back to that now?

24 MR. WILLIAM GANGE: Sure, that would
25 be great.

1 MR. CHRISTIAN MONNIN: That's Manitoba
2 Hydro Exhibit 68, page 2. Should be Elenchus number
3 9, and that's with the assistance of -- assistance of
4 Madam Boyd and Mr. Hombach. Thank you very much.

5 MR. JOHN TODD: So we still have the
6 wrong one, do we? PUB-9?

7 Oh, it's a PUB question, not a Manitoba
8 Hydro question. Thank you. So we're looking at PUB-
9 9. What we've got up is Manitoba Hydro 9.

10 MR. CHRISTIAN MONNIN: Let's try that
11 again, then. Okay, you're at PUB-1, so go down to 9.

12 MR. JOHN TODD: PUB-Elenchus, it would
13 be, number 9. There we are. Okay, so PUB asked that
14 exact question:

15 "The Elenchus report states that
16 while Manitoba Hydro analyzed the
17 effect of residential customers
18 switching to electric heat, it did
19 not specifically address a switch
20 away from electric heat. For a
21 modelling purpose, the effects should
22 be assumed to be 'at least'
23 symmetrical. Please explain your
24 reasoning that the effect would be
25 'at least' symmetrical."

1 Yeah, that's why I wanted to refer to
2 this. It's a bit of a -- a lengthy response. I think
3 the essence of the response was sort of your starting
4 point in terms of how many -- what's your -- the --
5 the number of potential switchers in each direction,
6 if you're starting with a -- a high penetration of
7 electricity, saying there's -- there's more potential
8 to switch back to gas than there is add to
9 electricity.

10 Electricity's been around for a long
11 time. Basically, saying that the opportunity with
12 appropriate incentives to get people moving to gas
13 would be greater than the other way. In part,
14 Manitoba Hydro is looking at new build as main
15 electricity. You could do a lot more in terms of --
16 of reducing the penetration in new builds for
17 electricity than you could to increase it, which is
18 why I said, you know, conceptually, logically, it
19 would at least symmetric if you're looking at both
20 directions of change.

21 Does that answer your question?

22

23 CONTINUED BY MR. WILLIAM GANGE:

24 MR. WILLIAM GANGE: It -- it does.

25 Thank you very much, Mr. Todd. If I can move to

1 Elenchus 2-2, the revised report on demand-side
2 management?

3 Mr. Houldin, I under -- or what I take
4 from your report, is that your main concern about DSM
5 is that it's uncertain, because there's difficulties
6 in measuring it?

7 MR. RUSS HOULDIN: Yes, that's
8 correct.

9 MR. WILLIAM GANGE: Okay. And on page
10 17 of this report, starting at line 7, there's a
11 paragraph that talks about a market for DSM supplied
12 through energy service companies, ESCOs, that offer
13 services that reduce the energy bills of customers.

14 I believe the -- the ESCOs are --
15 you're referring to the American experience there?

16 MR. RUSS HOULDIN: Yes, this is
17 referring to a -- an American study by Lawrence
18 Berkeley Labs, but there are Canadian ESCOs, as well.

19 MR. WILLIAM GANGE: Okay. And then
20 you have -- have gone on to -- to cite this study by
21 the Lawrence Berkeley Laboratories, which you cited at
22 paragraph -- or footnote 25, correct, sir?

23 MR. RUSS HOULDIN: That's correct.

24 MR. WILLIAM GANGE: ESCOs are a -- a
25 particular type of company, are they not, sir, that

1 primarily service projects in the institutional
2 sector?

3 MR. RUSS HOULDIN: I think that's --
4 that's a fair character -- yeah, that -- that's right.

5 MR. WILLIAM GANGE: Mostly hosp --

6 MR. RUSS HOULDIN: Most of the market
7 is in the so called MUSH sector, munic --
8 Municipalities, Universities, Schools, and Hospitals,
9 yeah.

10 MR. WILLIAM GANGE: Yeah, so
11 hospitals, schools, those types of institutions?

12 MR. RUSS HOULDIN: Yeah.

13 MR. WILLIAM GANGE: And -- and the --
14 the comment:

15 "The private market for energy
16 services in the US is about \$1
17 billion."

18 Do you see that, sir?

19 MR. RUSS HOULDIN: Yes.

20 MR. WILLIAM GANGE: That's in
21 reference to the ESCOs, is it not?

22 MR. RUSS HOULDIN: That's right. Yes.

23 MR. WILLIAM GANGE: So the -- the
24 comment that pri -- the private market for energy
25 services is about \$1 million -- or \$1 billion, that's

1 only in reference to the ESCOs, but there's -- there's
2 significantly more money than that for energy
3 efficiencies that are -- are being paid for in the
4 United States.

5 Wouldn't you agree with that, sir?

6 MR. RUSS HOULDIN: Presumably. I -- I
7 mean, in -- in the form of customer choice. I mean,
8 customers without any programs, or incentives, or --
9 or anything else buy electrical appliances every hour
10 of every day. We don't know exactly what governs
11 those choices. I mean, one (1) of the -- one (1) of
12 the factors is undoubtedly the energy efficiency of
13 the -- of the appliances. But what the value of that
14 is, I don't -- I don't know of anyone who's tried to
15 estimate it.

16 MR. JOHN TODD: Yes, sir, but --

17 MR. RUSS HOULDIN: But that's energy
18 efficiency.

19 MR. JOHN TODD: -- are you referring
20 to programs as -- like utility programs as well?

21 MR. WILLIAM GANGE: Well, I'm just
22 trying to understand the comment here, because it
23 says:

24 "The private market for energy
25 services in the US is about \$1

1 billion."

2 MR. RUSS HOULDIN: I guess I could
3 have been more exact than -- I -- I mean, ESCOs.
4 Those are ESCO revenues.

5 MR. WILLIAM GANGE: Yes.

6 MR. RUSS HOULDIN: That's taken from
7 the LBL report. That's --

8 MR. WILLIAM GANGE: And -- and you say
9 that it's then close to about 0.1 percent of energy
10 revenues?

11 MR. RUSS HOULDIN: Right, in the US.

12 MR. WILLIAM GANGE: But then you go
13 on, sir, to extrapolate that to say -- when you -- when
14 you compare that to the claimed savings by utilities
15 of about 4 percent of energy revenues.

16 Do you see that, sir?

17 MR. RUSS HOULDIN: Yes.

18 MR. WILLIAM GANGE: And you then
19 compare the 4 percent of energy revenues to the .1
20 percent of -- of savings by ESCOs and say that this
21 represents forty (40) times more than the energy
22 services for which customers are willing to pay?

23 MR. RUSS HOULDIN: Right. The ESCOs -
24 - actually, the 1 billion overstates that. The -- the
25 -- about three-quarters (3/4) of ESCO revenues in the

1 States, according to Lawrence Berkeley Laboratories,
2 are derived actually from utility programs. Utilities
3 pay the private ESCOs to actually undertake the
4 programs.

5 So, in fact, it's -- the -- the amount
6 that customers are willing to pay themselves on their
7 own accord is -- is an even smaller number.

8 MR. WILLIAM GANGE: But, sir, the --
9 the 4 percent, that is what -- what you say is claimed
10 savings by utilities --

11 MR. RUSS HOULDIN: Right.

12 MR. WILLIAM GANGE: -- are about 4
13 percent of energy revenues.

14 MR. RUSS HOULDIN: Right.

15 MR. WILLIAM GANGE: They're not just
16 reporting the ESCO savings, are they?

17 MR. RUSS HOULDIN: No, they're
18 reporting -- those are reportings of -- of savings
19 claimed by US utilities.

20 MR. WILLIAM GANGE: Yes, correct. And
21 that would include residential savings, which would
22 not be included in the ESCO savings, correct?

23 MR. RUSS HOULDIN: Oh, yes, I agree.

24 MR. WILLIAM GANGE: So it would
25 include large industrial savings, which are not

1 included in the ESCO savings?

2 MR. RUSS HOULDIN: Correct.

3 MR. WILLIAM GANGE: So this comment
4 that -- when you say:

5 "In contrast, claimed savings by
6 utilities are about 4 percent of
7 energy revenues, or about forty (40)
8 times more than the energy services
9 for which customers are willing to
10 pay."

11 MR. RUSS HOULDIN: M-hm.

12 MR. WILLIAM GANGE: Is a meaningless
13 extraction of data. Wouldn't --

14 MR. RUSS HOULDIN: No, it's --

15 MR. WILLIAM GANGE: -- you agree with
16 me?

17 MR. RUSS HOULDIN: No, I would not
18 agree at all with that.

19 MR. WILLIAM GANGE: Well, sir, you're
20 -- you're -- you've acknowledged that the \$1 billion
21 that you've cited there relates solely to the ESCO
22 market.

23 We're in agreement on that, sir?

24 MR. RUSS HOULDIN: Yeah, that's right.
25 That's their revenues.

1 MR. WILLIAM GANGE: Yes. And you've
2 agreed with me that that \$1 billion does not include
3 the energy efficiency savings in the residential
4 market, correct, sir?

5 MR. RUSS HOULDIN: Correct.

6 MR. WILLIAM GANGE: Which would
7 increase that energy saving value very substantially?

8 MR. RUSS HOULDIN: No, I disagree with
9 that. No -- no evidence at all that -- that -- well,
10 the best we can say, we don't know what the revenues
11 would be from the residential sector. I would say the
12 evidence is the residential sector is prepared to pay
13 very, very little for energy services.

14 MR. WILLIAM GANGE: Really, sir? Are
15 you saying to me that -- that the residential market
16 in the United States does not -- has not switched to
17 energy-efficient lighting in their homes?

18 MR. RUSS HOULDIN: Well, John wants to
19 get in.

20 MR. JOHN TODD: I think there's a
21 misunderstanding on the point being made here, so
22 let's be clear. It is not suggesting that there's a
23 leverage of forty (40) times for the spending. The
24 point of this is saying that the bulk of that 4
25 percent of energy revenues savings the utilities are

1 claiming is a result of programs that have, in many
2 cases, significant incentives to help customers along.
3 The ESCOs, the emphasis there is that's the private
4 market. So without incentive programs, i.e., strictly
5 on the basis of economics, we're getting fairly small
6 participation in -- in that.

7 Russ did add the caveat that we don't
8 know to what extent people are paying a premium for
9 energy efficient furnaces and fridges and things like
10 that, where they get savings. But I would point out
11 that people such as at the OPA, Jan Carr, the former
12 CEO, the -- the founder of it, he's -- has often said
13 that the way to really get behaviour changed is
14 through standards and codes which make higher
15 efficiency devices available as -- in the marketplace
16 and mandatory in the marketplace. He is somebody who
17 is responsible for conservation and demand management
18 in -- in Ontario.

19 He can tell you he was sort of
20 frustrated at how difficult it was to get the average
21 consumer to spend more money to save; to spend extra
22 in order to get energy efficiency without there being
23 significant incentives. Therefore, it's -- and that's
24 the point being made here. Not -- not trying to say
25 there's a forty-one (41) sponsoring (phonetic).

1 MR. WILLIAM GANGE: But, Mr. Todd, I
2 have to say that that last sentence "In contrast" -- I
3 mean it reads very plainly to me:

4 "In contrast, claimed savings by
5 utilities are about 4 percent of
6 energy revenues or about forty (40)
7 times more than the energy services
8 for which customers are willing to
9 pay."

10 That -- that -- simply because one can
11 say a study of one part of the industry, you can't
12 extrapolate that, to then say that because it's 1 per
13 cent -- 0.1 percent of energy revenues that you've then got
14 a -- a forty (40) times base case. I -- I don't
15 understand that at all.

16 MR. JOHN TODD: What it's saying is
17 that using the forty (40) times, roughly the -- the
18 market -- the ESCOs are market-driven behaviour.
19 Private market. And an ESCO is not subsidizing the --
20 the customer to implement energy savings.

21 An ESCO goes into a customer and says,
22 If you implement these programs and pay the full cost
23 of it, you'll end up with a lower energy bill. And
24 they will facilitate the financing of it, because
25 often with an ESCO you -- you pay for the energy-

1 saving equipment out of the savings. But that's a
2 pure market transaction.

3 The only point being made here is that
4 the market transactions being observed appear to be a
5 lot smaller than the total energy efficiency activity
6 that's going on. That's -- that's all that's trying
7 to be said here.

8 MR. WILLIAM GANGE: I see. Okay. So
9 when -- when the words -- when Elenchus uses the
10 words:

11 "In contrast, claimed savings by
12 utilities are about 4 percent of
13 energy revenues."

14 And I'm going to put emphasis on
15 'claimed savings'. Elenchus isn't trying to be
16 pejorative of the savings. You're saying, In contrast
17 the savings, not claimed savings, but the savings of 4
18 percent.

19 Is that -- is that correct?

20 MR. RUSS HOULDIN: Well, again, the --
21 the -- as -- as claimed by utilities in filings to the
22 United States Energy Information Agency. The -- so
23 there -- there's a reporting to the USEIA by
24 utilities, and -- and that's what they say that --
25 just in exactly the same way, before you, Manitoba

1 Hydro has claimed that Power Smart has saved certain
2 amounts of energy. Reports from all the US utilities
3 go to the EIA, and they -- they claim that that
4 amounts to 4 percent of total energy revenues.

5 MR. JOHN TODD: But it is not saying
6 that there's a disconnect there, and therefore those
7 claimed savings aren't real?

8 MR. WILLIAM GANGE: Okay. Thank you.
9 And -- and would you agree with me -- and -- and I'll
10 throw this one up, it's a jump ball -- that there's
11 been -- although I have to acknowledge that I don't
12 have anybody in the Final Four, but -- the -- the
13 savings that are -- that -- that arise as claimed by
14 the utilities in the United States, those savings
15 undergo rigorous third-party evaluation, do they not?

16 MR. RUSS HOULDIN: Well, my
17 understanding is -- is, yeah, there's always some kind
18 of EM&V protocol that's attached to those. So that's
19 estimation, measurement and -- and validation programs
20 attached to -- to all of those, yes.

21 MR. WILLIAM GANGE: And -- and are you
22 aware, sir, that -- that those evaluations are usually
23 overseen by third-party evaluators? In other words,
24 it's not -- it's not Manitoba Hydro -- using Manitoba
25 Hydro as an example, but it -- so it wouldn't be

1 Manitoba Hydro saying it. It would be a third-party
2 evaluator reviewing that.

3 MR. RUSS HOULDIN: Yeah, that's very
4 definitely the -- the industry standard to do that.
5 Yes.

6 MR. WILLIAM GANGE: And -- and that
7 third party evaluator submits the -- the report of
8 their evaluation to the stakeholders and to the
9 regulators for final approval, correct, sir?

10 MR. RUSS HOULDIN: I don't have
11 comprehensive knowledge of -- of every single US
12 jurisdiction, but I -- I think that's -- that's
13 broadly correct from what I do know.

14 MR. WILLIAM GANGE: And -- and fair
15 enough. We know that -- that in -- in numerous
16 states, not all of them, but in numerous states, there
17 are legislated DSM targets that must be met.

18 You're aware of that, sir?

19 MR. RUSS HOULDIN: Yes. Yes.

20 MR. WILLIAM GANGE: And -- and those -
21 - those targets must undergo third-party evaluation,
22 correct, sir?

23 MR. RUSS HOULDIN: Correct.

24 MR. WILLIAM GANGE: Are you aware that
25 -- that Mr. Dunsky, for instance, is the third-party

1 evaluator of twenty-three (23) California el -- energy
2 efficiency programs?

3 MR. RUSS HOULDIN: Oh, I thought it
4 was twenty-six (26).

5 MR. WILLIAM GANGE: He says twenty-
6 three (23).

7 MR. RUSS HOULDIN: Oh, well, he
8 probably knows better, since it's himself.

9 MR. WILLIAM GANGE: Thank you. So --
10 so when you're saying that -- that one (1) of the main
11 complaints that you have about the DSM is that it's
12 unknown, isn't it the case, sir, that -- that
13 evaluations can and are done to -- to verify the DSM
14 savings?

15 MR. RUSS HOULDIN: The protocols are -
16 - are followed. What I would dispute is anyone can
17 verify something which isn't observed. You can have a
18 protocol for anything you like. A set of procedures
19 that produce a result, that doesn't mean necessarily
20 that that result is accurate.

21 Let me give you an illustration, again
22 drawing on my deep past. I actually recall this from
23 lectures as an undergraduate on experimental methods.
24 The example was given of the people of China were
25 asked to give an estimate of the height of the

1 emperor.

2 And the result of that procedure is a
3 very precise estimate, because you have a -- a billion
4 people, a billion points of data. The problem is,
5 almost no one has seen the emperor. So in the context
6 of what I was learning, there's a big difference
7 between precision and accuracy.

8 And in -- in the case of the -- of the
9 current discussion that we're having about EM&V, yes,
10 you can have techniques that come up with estimates,
11 but none of those estimates have actually seen the
12 Cheshire Cat grin.

13 MR. WILLIAM GANGE: Okay, well, I -- I
14 guess we'll -- we'll -- I'll -- I'll move on from
15 that. If you could go to page 6 of the Elenchus
16 report, Exhibit 2.2? And at line 4, the paragraph
17 starting at line 4, you talk about:

18 "Recent experiences with
19 decentralized renewable energy have
20 pointed to a promising approach to
21 DSM that builds on integrated
22 resource planning. Systems which
23 have added significant amounts of
24 wind power are learning to operate
25 their systems to be able to

1 accommodate the variability and
2 volatility of wind power."

3 And you then go on, sir, to say:

4 "As more wind capacity has been
5 brought on-system, operators are able
6 to build up a progressively more
7 certain estimate of the amount of
8 wind capacity that is stochastically
9 equivalent to dependable generation."

10 So that you've -- you make the point
11 there that -- that with a large enough database, that
12 you're able to make more certain estimate of the
13 amount of wind capacity, correct, sir?

14 MR. RUSS HOULDIN: That -- that's --
15 yeah, that's absolutely right, yes.

16 MR. WILLIAM GANGE: But --

17 MR. RUSS HOULDIN: But not wind
18 capacity, the wind -- wind energy, wind output at
19 specific times, and again, most system operators
20 operate at least down to the -- a five (5) minute
21 interval.

22 MR. WILLIAM GANGE: Okay, although you
23 did use the word 'wind capacity' in your report. I
24 didn't misquote it?

25 MR. RUSS HOULDIN: No, no, but the

1 capacity then, it's -- it's the -- the wind -- it's
2 the amount of -- of wind energy that's actually -- the
3 -- the data you have, you know, the recorded meter
4 data is energy data at five (5) minute intervals, but
5 you can add that up to be a -- a capacity equivalent.

6 MR. WILLIAM GANGE: But similarly,
7 sir, as Manitoba Hydro implements DSM and observes the
8 resulting load, it can also improve its estimates of
9 the effects of DSM, can it not?

10 MR. RUSS HOULDIN: Again, we've come
11 back to the -- the same discussion we just had. What
12 you observe is load. You don't observe the load that
13 you would have had if you hadn't had DSM. You cannot.
14 This isn't a -- an empirical matter. It's a logical
15 matter. You can't -- you can't observe what didn't
16 happen.

17 So -- so this is an analogy, and I -- I
18 think I emphasized this earlier, that I don't -- you
19 can't exactly use this model because, again, to use
20 the language of -- of panel member Grant, it's a
21 matter of risk versus uncertainty. In the case of
22 wind power, you have a statistical distribution that
23 you can observe.

24 In the case of DSM, you -- you have
25 some -- you have an uncertain range of possible values

1 of DSM savings. So that's where I went on probably at
2 too much length about reading meniscus levels and
3 burettes and so on, as that would be a more
4 appropriate technique for -- for applying this to DSM
5 than applying directly the -- the building up a -- a
6 statistical picture, because again, what you're
7 actually looking for isn't what is observed. You're -
8 - you observe actual load, not what load would have
9 been.

10 MR. WILLIAM GANGE: Sure. I
11 understand that, sir, but you have people that -- that
12 do this. This is the -- this is their job. This is
13 their expertise. This is what they do, Mr. Dunskey,
14 under -- under reviewing these things on twenty-three
15 (23) separate energy efficiency programs in the state
16 of California alone.

17 Surely those -- those experts have
18 developed an expertise that is able to develop a -- a
19 model that -- that can give us a pretty accurate sense
20 of what that load would have been?

21 MR. RUSS HOULDIN: No, they give a
22 precise estimate, or a more or less precise estimate
23 depending on the amount of data that they have
24 available, the number of observations that they have.
25 They can't give much impression of the accuracy

1 because they've haven't seen the Emperor of China.

2 MR. WILLIAM GANGE: Yes, I know that,
3 sir. But how -- how accurate does one have to be, in
4 your argument, before the DSM data can be held to be
5 reliable? I mean, that's the part that I do not
6 understand. You say that there's a risk because you
7 can't get a precise number.

8 MR. RUSS HOULDIN: You can get a
9 precise number. You can't get an accurate number.
10 And a system planner requires an accurate number.
11 Again, earlier on, I think a quote was from the -- the
12 Elenchus report about the equivalence to supply. On
13 the supply side system planners don't reply -- don't
14 rely on the nameplate capacity of their generators
15 when developing the amount of capacity that will be
16 available in the future.

17 They use the nameplate capacity as
18 modified by experience in terms of either derating or
19 uprating of -- of that capacity. So all I'm really
20 saying is if we're -- if we're going to treat DSM
21 equivalently to supply then we should be doing the
22 same thing with -- with DSM.

23 MR. WILLIAM GANGE: Okay. Well, I --
24 I guess we'll -- we'll have Mr. Chernick and -- and
25 Mr. Dunsky -- they -- they'll take a look at that.

1 You make the point in line 14 that:

2 "If energy efficiency estimates prove
3 to be overestimates of savings,
4 supply must still be available."

5 Correct, sir?

6 MR. RUSS HOULDIN: Yes. Yep.

7 MR. WILLIAM GANGE: But in -- in each
8 and every year Manitoba Hydro, the experts at -- at
9 the Corporation observe the actual energy requirements
10 of the peak demand, correct, sir?

11 MR. RUSS HOULDIN: Yes.

12 MR. WILLIAM GANGE: And so -- and --
13 and those experts can see if load is growing faster
14 than forecast. They have that ability, sir?

15 MR. RUSS HOULDIN: Well, again, I
16 think that's more Mr. Todd's expertise. That's the --
17 that's what he's tried to address and what he's
18 talking about is can -- can they forecast it.

19 There's no question with the past that
20 they've recorded what the peak was. The -- the -- I
21 think the issue you mentioned is with -- is can they
22 project that in the future? Well, that's -- that's
23 the matter of the load forecast.

24 MR. WILLIAM GANGE: Yes, and through
25 that load -- load forecast they can take steps such as

1 adding additional DSM or they can build more wind, or
2 they can build combustion turbines, or they can
3 contract for capacity and energy as its forecast
4 change. That -- tho -- all of those options are open
5 to Manitoba Hydro?

6 MR. RUSS HOULDIN: Oh, abs --
7 absolutely, yes.

8

9 (BRIEF PAUSE)

10

11 MR. WILLIAM GANGE: If I can go to
12 page 7 -- or actually, the bottom of page 6 and then
13 we'll move to page 7. And so, sir, at the bottom of
14 page 6, you say that:

15 "Elenchus suggests that the adoption
16 of the integrated resource plan and
17 the incorporation of a DSM
18 dependability analysis into the
19 integrated resource plan should be
20 considered by Manitoba Hydro."

21 In reference to the DSM dependability
22 analysis, would you agree with me, sir, that -- that
23 with respect to wind, the dependability analysis looks
24 at the probability that the wind plant will be
25 operating at the time of peak, or when the capacity is

1 needed?

2 MR. RUSS HOULDIN: At -- at peak and
3 depending on -- the -- you know, the -- the design of
4 the system, at other times as well, but, yes, peak
5 obviously is -- is very important.

6 MR. WILLIAM GANGE: Which may not --
7 may or may not be the case. I mean, that is -- that
8 is -- my client is a -- is an advocate of wind, but it
9 understands that -- that that's the main criticism,
10 that wind may not be available when it's needed the
11 most.

12 MR. RUSS HOULDIN: That's right, but -
13 - but just to -- but -- as -- as I pointed out, as --
14 as in the case of wind, you can build up over time a
15 statistical picture of -- of the output of the wind
16 generators. Again, there will be a known probability
17 to distribution that will allow you to -- to calculate
18 an expected value that's -- that's within whatever the
19 confidence limits you choose, 95 percent, 99 percent,
20 99.9 percent, that, you know, 100 megawatts, 120
21 megawatts will be available at peak.

22 MR. WILLIAM GANGE: And -- and then,
23 sir, in -- on the same vein, with respect to DSM, is
24 your concern with whether the efficiency improvements
25 will reduce load at peak, or whether the DSM will save

1 energy?

2 MR. RUSS HOULDIN: Well, they'll --
3 they'll -- you know, they'll do both. I mean, better
4 insulating houses that use electrical space heat will
5 both reduce the total energy use of that house, and
6 reduce the -- the peak that it draws on.

7 MR. WILLIAM GANGE: Thank you.

8

9 (BRIEF PAUSE)

10

11 MR. WILLIAM GANGE: If -- if we could
12 go to page 10, and -- and on this point, sir, you --
13 you mentioned that there are two (2) uncertainties:

14 "The contribution of such existing
15 measures in the future and the extent
16 to which Manitoba Hydro measures may
17 also not be based on marginal cost
18 estimates."

19 And this is in reference to passing the
20 TRC test.

21 MR. RUSS HOULDIN: Yes, that's --

22 MR. WILLIAM GANGE: Correct, sir?

23 MR. RUSS HOULDIN: -- that's right.

24 Yes.

25 MR. WILLIAM GANGE: With respect to

1 number 1:

2 "The -- the contribution of such
3 existing measures in the future."

4 Is that, in fact, an uncertainty, sir,
5 or is it a matter of choice for Manitoba Hydro?

6 MR. RUSS HOULDIN: No, I -- I think
7 it's --well, actually, I need you to -- what do you
8 mean by choice --

9 MR. WILLIAM GANGE: Well --

10 MR. RUSS HOULDIN: -- of Manitoba
11 Hydro?

12 MR. WILLIAM GANGE: -- because you've
13 said that -- that I guess it's the uncertainty that I
14 -- I -- that I'd like you to explain. You say there
15 are two (2) uncertainties:

16 "The contribution of such existing
17 measures in the future."

18 What do you mean by that?

19 MR. RUSS HOULDIN: Okay. So when
20 you've got a -- well, ac -- actually, the fir --
21 number 1 is true of -- of any measure, but I'm
22 focussing specifically in this section on measures
23 that do not pass the TRC test, but -- but because they
24 have other considerations, they are included in the
25 program. But the -- the first point there is actually

1 -- is actually true of any measure, it's just in this
2 context it's -- it's true of those measures. And --
3 and it's true because there's this in -- inherent
4 uncertainty. You're not -- you're not sure exactly
5 how much load reduction you'll get from any particular
6 measure or any suite of measures.

7 MR. JOHN TODD: If -- if I can
8 interject, I think it will be helpful.

9 As I mentioned, I do cost allocation
10 work with Efficiency Nova Scotia and that's for their
11 rate-setting process. There's a separate charge that
12 -- where they recover the cost of their DSM programs.

13 Through that process we assist them in
14 setting the charge by rate class on a prospective
15 basis. And setting the charge on a prospective basis
16 is: What are they planning in terms of programs for
17 delivering to each sector: residential, commercial, so
18 on, industrial. And they set a rate that will recover
19 those costs.

20 At the end of the year they then take a
21 look at what the programs actually cost which is
22 basically determined by the level of participation in
23 the programs, and a reconciliation is done. There
24 have been a couple of years, particularly in the
25 industrial sector, where through the reconciliation

1 there was money being handed back to the customers
2 because there is so little participation compared to
3 the forecast that in the subsequent year the dollars
4 that were owed back were greater than the cost of the
5 new programs in the subsequent year.

6 So from a forecasting perspective you
7 can plan to do a certain amount of DSM in the next
8 year. You can have targets for the next year. But I
9 can tell you from -- from that experience of following
10 the numbers that things do not come out the way you
11 want.

12 If you build a gas-fired generation
13 plant, you know, other than unexpected outages you
14 know what you're going to get out of it. You can plan
15 ahead. You can say, Ten (10) years from now we're
16 going to build a plant. It's a hundred megawatt plant
17 and we're going to get a hundred megawatts out of it
18 for a certain percentage of the time.

19 With DSM you set a target. The same
20 kind of thing. You -- you cannot say today that by
21 implementing programs we will get a hundred megawatts
22 in ten (10) years. You can plan to do it. But -- and
23 to extent you're -- you're -- what you're saying is
24 it's -- it's within the control of the company because
25 the comp -- company has to develop the programs and

1 market them, and sell them and so on.

2 But they may not do as good a job as
3 they planned to. They may do a better job than they
4 planned to. That's the unreliability. It's part of
5 it. You -- you -- and from a planning perspective you
6 can't say we're doing a hundred megawatts and know
7 that you're going to get it.

8 MR. WILLIAM GANGE: Thank you. Mr.
9 Chair, it's almost 6:00. I'm not done yet. I -- I
10 probably have another half hour to forty-five (45)
11 minutes. I'm a little bit lo -- well, I am much
12 longer than I thought I was going to be. But that's
13 the way life is. Could -- could -- I -- I don't know
14 about you, but I'm about to fall over. And -- and I'm
15 sure that Mr. Todd and Mr. Houldin are waiting for
16 supper.

17 THE CHAIRPERSON: In my other life I
18 was a union negotiator, so. No, I -- I'm ready.

19 MR. JOHN TODD: We've just begun.

20 THE CHAIRPERSON: No, I'm ready to --
21 to go home as well. Why don't we adjourn for the day,
22 and I will res -- we will resume proceedings tomorrow
23 morning by -- at nine o'clock. Do we have any
24 business to attend to before we adjourn?

25 MR. SVEN HOMBACH: No business to

1 attend to, Mr. Chairman. In terms of timing, I note
2 that two (2) of the Intervenor counsel aren't in the
3 room any more. I'll touch base with them in the
4 morning as to timing. I am advised that Mr. Todd has
5 a plane tomorrow, I believe around 6:30. And the --
6 both Elenchus witnesses have a plane tomorrow at 6:30
7 in the afternoon. So I'll -- I'll seek instructions
8 and we may just all have to cut our testimony a little
9 bit short.

10 THE CHAIRPERSON: So the plan would be
11 that Mr. Gange would be able to resume the -- his
12 questioning tomorrow morning at nine o'clock. Yes.
13 Okay. Thank you. Have a good evening, everyone.
14 Thank you very much.

15

16 --- Upon adjourning at 5:57 p.m.

17

18

19 Certified Correct,

20

21

22 _____

23 Cheryl Lavigne, Ms.

24

25

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