



COMMISSION OF INQUIRY RESPECTING THE MUSKRAT FALLS PROJECT

Transcript | Phase 1

Volume 13

Commissioner: Honourable Justice Richard LeBlanc

Tuesday

9 October 2018

CLERK (Mulrooney): This Commission of Inquiry is now open.

The Honourable Justice Richard LeBlanc
presiding as Commissioner.

Please be seated.

THE COMMISSIONER: Good morning.

All right.

Good morning.

Mr. Learmonth.

MR. LEARMONTH: Thank you.

The first witness today is Dr. Wade Locke, but before I ask him to be sworn, there are a few exhibits I want to enter. They are: P-00311 to 00318, P-00374 to 00378, and P-00425 to P-00427. Those are the documents that are in the – for Dr. Locke.

In addition, there's one other document which is P-00413 and that's a copy of Statutes of Newfoundland and Labrador 2018, *An Act To Amend The Electrical Power Control Act, 1994 And The Public Utilities Act*.

I won't be asking Dr. Locke any questions about that. I may ask Dr. Feehan, who testifies this afternoon. So, this is just a general exhibit that I'd like to be entered into the record if that's satisfactory.

THE COMMISSIONER: Okay.

All right, those exhibits will be marked as entered.

MR. LEARMONTH: Okay.

THE COMMISSIONER: And, I'll ask you to stand, Sir, please. Place your right hand on the bible.

CLERK: Do you swear that the evidence you shall give to this inquiry shall be the truth, the whole truth and nothing but the truth so help you God?

DR. LOCKE: I do.

CLERK: State your full name, please.

DR. LOCKE: Leonard Wade Locke.

CLERK: Thank you.

THE COMMISSIONER: You can be seated, Sir.

Mr. Learmonth.

MR. LEARMONTH: Yes.

Dr. Locke, what is your occupation.

DR. LOCKE: I'm a full professor of economics at the department of Economics at Memorial University, and I'm academic head for the department.

MR. LEARMONTH: You're the head of the Economics department at Memorial, is that right?

DR. LOCKE: I'm the academic head, yes.

MR. LEARMONTH: How long have you been head of the Economics department at Memorial?

DR. LOCKE: In my last year of six years.

MR. LEARMONTH: Last year of six years.

DR. LOCKE: Yes.

MR. LEARMONTH: And, in addition to your teaching and other duties at Memorial, is it correct that you own – you have, or run – a privately-owned consulting business through which you do contractual work for entities outside Memorial?

DR. LOCKE: Yes.

MR. LEARMONTH: Yes.

All right.

Would you please state your educational background after high school? I just note that at P – Exhibit P-00311, which is tab 1, we have your curriculum vitae. I don't want you to go through it, you know, page by page, but I would like you to state your educational background

since high school, and also a general description of the other work that you've done in addition to your two teaching and research duties at the university, since you became a professor there.

Would you do that, please?

DR. LOCKE: I will, but can you just please clarify what you mean by other work?

MR. LEARMONTH: Well, the – I understand you've published papers and so on.

DR. LOCKE: Yes.

MR. LEARMONTH: That's what I'm talking about.

DR. LOCKE: Okay. As per my curriculum vitae – it's 108 pages long and I can appreciate that going through it now would not be an appropriate use of your time – I have a earned Ph.D. from McMaster and I received that in 1990. I have an M.A. from McMaster in 1981; I have a B.A. first class degree in Economics from Memorial University, I have a B.Sc. in Biology from Memorial University, and I have a certificate in Applied Petroleum Economics from Van Meurs Associates provided through the Centre for Management Development, and that was in 1991.

I have a number of awards – I don't know if you're interested in that – but I have done 14 refereed publications, six vetted by editorial boards, six with chapters, 200 non-refereed publications, over 200 non-refereed publications and over 200 presentations at workshops, and have acted as an expert witness on 15 separate occasions.

MR. LEARMONTH: In the courts of Newfoundland and Labrador?

DR. LOCKE: It could be; I mean, I was an expert witness for (inaudible) but oftentimes it would be for – for example, I was an expert dealing with the residential school case that the province was involved in. I was an expert retained by that – both by the federal government and by the plaintiff – by the provincial government and by the plaintiff, I'm sorry.

MR. LEARMONTH: Okay.

Now Dr. Locke, the main reason you've been called as a witness here today centers around a presentation you made at The Harris Centre at Memorial on January 17, 2012, that was entitled Muskrat Falls: The Best Option question mark. This exhibit has been entered as P-00317, and I would ask Madam Clerk to bring up Exhibit P-00317.

DR. LOCKE: Sorry. I can move in.

MR. LEARMONTH: Okay.

Please provide us with a summary of the background circumstances which led to your making this presentation at The Harris Centre, and in making this – answering this question you're free, as you are throughout these proceedings, to refer to the exhibits in the book before you.

DR. LOCKE: Right. I'll do that. I'll refer to Exhibit – it looks like 00013 at pages 2 and 3. But before I do that I just want to make sure that the Commissioner and the people assembled here understand what I do as a professional. I spend a lot of time presenting various issues to help people be more informed, to make better decisions about issues that are important to them. I see that as my essence, my being, my professional mission statement to ...

You know, being at the university and being paid by the public purse, I think it's important that we use some of our intellectual capital to try to address issues that are sometimes more complex, and to help people become more informed so they can make better decisions. I have done probably 10 or 12 of these kinds of presentations at the Harris Centre. This would not be the first one; it probably won't be the last one, although we'll see.

But in doing that, Dr. Vardy – well, starting off that there was a joint panel. As part of the environmental process for Muskrat Falls, they put out a report. And I had some concerns with that report, but it – the people who did it, I thought, were quite qualified to do it. And so it seemed to me that if they had concerns, either there was a problem with the project or that the

benefits of the project weren't as well explained as they might have been.

MR. LEARMONTH: You're referring to the Joint Review Panel report which is dated August 2011?

DR. LOCKE: I don't know the date but, yes, I'm referring to that report.

MR. LEARMONTH: Okay.

DR. LOCKE: And I had done some work for Action Canada as well before, just on general economy. And then I saw the Harris Center put out an Action Canada report by Dr. Vardy, basically arguing that Muskrat Falls wasn't the best option. And it drew on – heavily drew on – the joint panel report. And I looked at it and I thought, well, that's not my understanding of the project. I had been doing some economic impact analysis of the project –

MR. LEARMONTH: For Nalcor.

DR. LOCKE: I was doing it for – not for Nalcor directly but indirectly, yes.

MR. LEARMONTH: Yeah.

DR. LOCKE: I was working for a company called Strategic Concepts who had a contract to –

THE COMMISSIONER: What was the name of the company again, please?

DR. LOCKE: Strategic Concepts, Incorporated, I think, is how they're referred to.

And just for the record, I'm not an associate, I'm not – I have no ownership relationship with this company, just –

MR. LEARMONTH: Yeah.

DR. LOCKE: – we were associated doing research over the years.

MR. LEARMONTH: Could I just refer to – the work that I think you're referring to, Dr. Locke, is Exhibit P-00313 which is in tab 3 of your book. Can you look and see whether you can confirm that?

DR. LOCKE: Yeah, that would be one of the reports we have done, sure.

MR. LEARMONTH: Yeah, but is that the one you're referring to in terms of the Joint Review Panel work?

DR. LOCKE: Yeah, that looks like what we – yeah.

MR. LEARMONTH: Yeah.

DR. LOCKE: We would do advice and we would do analysis, which it'd eventually show up into a report like this, yes.

MR. LEARMONTH: Yeah, yeah. So this report, it was prepared – it says, if we just go down a little bit on it and bring it up, it says: Prepared for Nalcor Energy by Strategic Concepts, Inc. and Dr. Wade Locke. So this was a joint venture or a joint effort, is that correct?

DR. LOCKE: That is correct.

MR. LEARMONTH: Okay, very good. And it's dated December 10, 2010.

Okay, just carry on with what you were saying.

DR. LOCKE: So Muskrat Falls, on one level, should be a pretty simple sort of project. It's either the least-cost option or it's not the least-cost option. It's either needed or it's not needed. It's a relatively straightforward sort of exercise.

It's turned into something other than that. It has developed a whole political dimension to it and it's generated a lot of derision within the province and a lot of antagonism within the province, which is unfortunate. But at that point in time there seemed to be a lot of heated discussions around Muskrat Falls about whether or not it was worthwhile doing or not doing.

And so I read David's paper. I don't know –

MR. LEARMONTH: You say David. That's –

DR. LOCKE: Dr. David Vardy.

MR. LEARMONTH: – David Vardy.

DR. LOCKE: I read his paper that was on the Harris Centre report that was done for Action Canada. And my reading of the report wasn't the same thing as my understanding of what the project meant. And I thought, well, okay, well, we do a lot of these kind of things, so I proposed to David that we have a discussion, a debate, around the report. He thought that was a good idea and so did the Harris Centre.

And so what happens with these kinds of presentations is that you typically meet at some point – ambushing anybody for anything gives you short-term satisfaction but no long-term benefit; it's not a great sort of thing. So what happens with these kinds of presentations is that you meet and you discuss about I'm going to talk about the following, and then the other person will talk about the following.

So myself and David and Doug May from the – what is now called CARE but was called the applied research initiative back then – and Mike Clair and maybe one of the people in the Harris Centre, I'm not sure whether or not there was another person who was there. But those were the principals: David, myself, Mike Clair and Doug May met to discuss the format and the kinds of questions that we would talk about.

And as part of that – it only was half an hour to an hour discussion. So I would say I'm going to say the following kind of things and David would say he's going to say the following kinds of things. In that process, I identified to David that some of the things that he was going to say, he might want to look at certain sources to help clarify that that might not be entirely correct. And that went on for a period of time and then we left. It was a pretty amicable meeting and I was getting ready now for doing the debate based upon the discussion.

And as you see in Exhibit P –

MR. LEARMONTH: Exhibit P-00378?

DR. LOCKE: – 00378.

MR. LEARMONTH: I'm going to ask you to turn to Exhibit 00378, yeah.

DR. LOCKE: Yeah, I will read –

THE COMMISSIONER: What tab is that?

MR. LEARMONTH: 00378.

THE COMMISSIONER: What tab?

DR. LOCKE: Tab 13.

So, if I might, I'll read –

MR. LEARMONTH: You can, yeah.

DR. LOCKE: – the relevant portions.

MR. LEARMONTH: Please do.

DR. LOCKE: So on the next day from that meeting on December – it's labelled here on page 3 of that Exhibit. It says: From David Vardy, December 1, 2011, at 12:20 p.m. to Wade Locke, Mike Clair and Doug May, who were involved in that meeting. And the meeting was the previous day – this was the next day. I think that's the gist of it but it's either the next day or the same day, but ...

So David Vardy says: Wade, "upon reflection I have come to the conclusion that it would be foolhardy of me to enter into a 'debate' with you on Muskrat Falls. I know what my limitations are and" – that – "I have to operate within them. I am no energy economist. You are an energy economist at the 'top of his game.' My 'best before' date as an economist is long past.

"At the risk of losing some dignity, I must acknowledge that I am not the right person to debate this issue with you and that I must withdraw. I regret that this inescapable conclusion was not blindingly obvious to me when we first met to discuss ... Sorry for any inconvenience."

I am pleased that you have agreed to do a Muskrat – Memorial Presents on Muskrat Falls. I thank – "I think that this will promote the kind of public discussion we all want to take place.

"I am copying this note to Mike and Doug." Cheers, Dave.

This is followed up by an email on page 2 of that same exhibit from Mike Clair at 1:59. And it says – it is to Wade Locke – Wade Locke at

home, David Vardy, Doug May, and Robert Greenwood who was the head of the Harris Centre at the time.

“Hi, folks! While I somewhat disagree with David’s assessment of what he would bring to” – the – “discussion, I respect his decision and thank him for having awakened Wade from his dogmatic slumbers.

“Wade, I firmly believe that this is a session very much worth having and hope that you will agree to keep with it. My initial reaction is to provide you with the full hour to make your presentation, and then solicit questions from the audience – much as we did with your session on equalization a few years ago. I’m sure the complexities of the Lower Churchill project are” – much – “such that you could easily take an hour to dissect it and clarify it for the audience.

“In any event, I look forward to hearing from you once you’ve had a chance to sleep on it.”

And at some point – I was encouraged by Mike to continue on, and others as well – and at some point, I decided it would be worthwhile, putting some extra research into it, to provide an assessment to help people understand, at least, my understanding of Muskrat Falls. And if you have two hours and 10 minutes of time that you’re not doing anything yourself and you’re bored, you might want to look at the video online – that’s still online. So you don’t have to ask, what did he say? Or how did he say it? It’s there for you to see.

So there’s a video, an actual video, and I guess Rogers played it every day – every minute of everyday for a period of time, until Mr. Bruneau came along and they replaced it with that. But I thought this was a good thing to do to help people understand, and it was unfortunate that we weren’t having a debate, but I wasn’t out selling this project per se. I was trying to fill a need that I saw in terms of helping people get more information on Muskrat Falls in order to be better informed so they can make a better decision about whether they support it or didn’t support this project and what the positives and negatives were with respect to the project.

Yeah, I think that gives you a background for that.

MR. LEARMONTH: Okay, thank you.

Now, the presentation was made on January 17, 2012. Could you advise what preparation you did for – in making this presentation and during what time period?

DR. LOCKE: I would have been preparing for this before this as part of a discussion to have with David, but then it went into high gear. And I would have met with anybody who – like I don’t know who at Nalcor we would have met with, but I certainly would have asked questions of Nalcor and I would have met with them face to face and, you know, there would have been multiple meetings trying to understand the project as best I could.

MR. LEARMONTH: Meetings with representatives of Nalcor?

DR. LOCKE: Yeah, there would be a room like – they wouldn’t all be lawyers, but there would be a room like this where there would be lots of people who had the expertise on forecasting or on other kinds of things, where I would ask questions and try to get clarification so that I get a better understanding.

People sometimes suggest that I’m smart but I’m not smart. What I am is a hard worker and what I try to do is take things down to a bite-size pieces so I can understand them. I figure if I can understand them in bite-size pieces, I can explain it to you in bite-size pieces, so that you can at least go away and make a better-informed decision.

Complex kinds of things are not helpful for explaining to others. And so it’s important to try and get an understanding down to basic level of what this really means and that’s – so I would have met with anybody who had something that they could help me understand the project.

MR. LEARMONTH: During what period of time did you conduct your research for your presentation at the Harris Centre on January 17, 2012?

DR. LOCKE: I suspect it would have been before November –

MR. LEARMONTH: Yeah.

DR. LOCKE: – because we were getting ready for the meeting with David, that got cancelled. And all through December and, you know, I would get up at 6 in the morning and start, and this was my primary focus. I would read whatever I could read. I would research the Internet. I would research whatever it is. I would talk to anybody who was foolish enough to talk to me, and if somebody had some expertise to help me understand various aspects, because there are a lot of moving parts to this particular project and no one person, even at Nalcor, no one person would have a good appreciation of all of this stuff. They would have to be advised by their experts. Like, you had, you invited one of their forecasters to come and he'd explain to you the complexities of forecasting recently. So, I would have spoken to him and others like him.

And Mr. Goudie who is referenced in one of your various things, would have been meetings. But had I realized that it was coming to a meeting like this here and that it was important to have every meeting I ever took and every person I ever spoke to, I would have took notes on that kind of stuff. I didn't, because for me, I was just trying to get an understanding, so that I could then go and do a public presentation.

I'm now a lawyer. I'm not a bureaucrat. I don't take those kind of notes. I assume when I'm at a meeting, you know, I'm getting informed about stuff and then I take that information and try to portray it as accurately as I can.

But there would have been lots of discussions, lots of research all through November trying to make sure I had as good an understanding as I could have.

There is an exhibit here, an email from Dawn Dalley –

MR. LEARMONTH: Yes.

DR. LOCKE: – who has attempted to answer questions that we had asked, I guess, in a meeting.

MR. LEARMONTH: That's – for the record – that's Exhibit 00374, tab 9. Is that the one you're referring to, Dr. Locke?

DR. LOCKE: Tab 9, yes.

MR. LEARMONTH: Yes. Okay.

DR. LOCKE: So, my reading of this here – I had forgotten about this completely but one of your staff sent it to me last night, I think, last night.

MR. LEARMONTH: Not last night, I don't think.

DR. LOCKE: No, okay. But, anyway, it was sent to me recently, the last couple of days anyway.

This appears to me to be some questions that would have come up in a meeting and they attempted to answer them. And so – and they sent them to me somewhere at 6 in the morning, I think, and I had a chance to read them over and I asked for clarification on those kind of things. And that's the kind of process that would have happened.

So, you know, you would ask questions and someone would provide answers; you either understood the answer and then went on from that next step, or you didn't understand the answer and try to get clarification, in order to present the presentation at Muskrat Falls as accurately as you could.

MR. LEARMONTH: Right.

DR. LOCKE: As I explained why I did the – in the video, if you look at the video. To me, my analytical ability as an individual – I didn't have a team, you know. I don't have a team with me. I – this is Wade Locke, but I thought this was important to do. I tried to understand it as well as I could. In so doing, you would make mistakes.

Now, the gist of the message was reasonable, okay?

MR. LEARMONTH: Yeah, just before we get to the content –

DR. LOCKE: Sure.

MR. LEARMONTH: – of your report –

DR. LOCKE: Sure.

MR. LEARMONTH: – I just wanna ask you a few more questions –

DR. LOCKE: Go ahead.

MR. LEARMONTH: – about what you did in preparing –

DR. LOCKE: Sure.

MR. LEARMONTH: – for this presentation.

You mentioned that you met with and also received information by email and perhaps other means from Nalcor. What about the Government of Newfoundland and Labrador? Did you have meetings with representatives of the Government of Newfoundland and Labrador to obtain information for your presentation, or did you receive any information from the Government of Newfoundland and Labrador to assist you in preparing your presentation?

DR. LOCKE: I'm sure I would've had discussions with Mr. Bown.

MR. LEARMONTH: Charles Bown?

DR. LOCKE: Yeah, Charles Bown.

MR. LEARMONTH: Yeah.

DR. LOCKE: I don't know what exchange of information – I couldn't find any exchange of information or emails between myself and him, other than where I let him know that we're not having a debate but we're having a presentation on Muskrat Falls, when David Vardy removed himself from the debate.

I would've had a request from the Minister of Natural Resources, doctor – not doctor, Mr. Jerome Kennedy at the time wanting to talk about natural gas, and to help me understand that he, and an individual by the name of Walter Carter, I think, was there at the meeting – had done some work on what the prices would be with and without Muskrat Falls, and I explained to him what I knew about natural gas at that point in time and he took some notes on that.

MR. LEARMONTH: Well, okay, could I just refer –

DR. LOCKE: Yes.

MR. LEARMONTH: – to the exhibit –

DR. LOCKE: Yes.

MR. LEARMONTH: – because I think there's more than natural gas contained in this –

DR. LOCKE: Yeah.

MR. LEARMONTH: – record.

DR. LOCKE: Okay.

MR. LEARMONTH: Exhibit 00316 – P-00316, which is at tab 6, is, as I understand it, notes in the handwriting of then Minister of Natural Resources Kennedy of a January 11, 2012 meeting with you. So that would've been six days before the Harris Centre report.

DR. LOCKE: That's correct.

MR. LEARMONTH: And there's a reference to Harris – to at the top: Harris Centre public presentation. So I don't think it was just on natural gas, do you –

DR. LOCKE: No –

MR. LEARMONTH: – acknowledge that?

DR. LOCKE: – it was in the context –

MR. LEARMONTH: Yes.

DR. LOCKE: – of the Harris Centre presentation in order for him to get a better understanding of natural gas, and a lot of other things would've come up in the context of that, and these here are his notes. I had a hard time reading them but I got through them at some point. I mean, I want him to understand why the Henry Hub price wasn't the price that they could expect in St. John's.

And he did show me an analysis that he and Walter had done on what the prices would be with and without Muskrat Falls, and I said to him at the time, you know, if you make that public, I will include that in the presentation, which I did do. So there is a slide there on the

price with and without Muskrat Falls, and it says Government of Newfoundland as the source.

I've tried to, in doing this presentation, use publicly available sources where it was possible to do so. I went through all of the exhibits as much as I could to try to understand that and to try to put it into a context that fit it into a presentation.

MR. LEARMONTH: So was the discussion at your presentation on January 17, 2012, in relation to natural gas, included at the suggestion of Mr. Kennedy?

DR. LOCKE: No.

MR. LEARMONTH: No.

DR. LOCKE: No, it was included because that was an issue.

MR. LEARMONTH: Okay.

DR. LOCKE: It was an issue as an alternative source of power. I had asked – if you go back to the Dawn Dalley email – I'm not sure what number that was right now, but you had referenced –

THE COMMISSIONER: Tab 9.

DR. LOCKE: Tab 9.

You'll see that I've asked her – asked Nalcor, and she's responded, because she was the vice president for public engagement – I'm not sure what the term would be, but she was a vice president at Nalcor who interacted with the public and with the government. I asked her about how much BTUs – what were the price of BTUs needed to make them equivalent and what would be the amount of greenhouse gasses that would be generated, and so on page 2 and 3 is the questions and the response, point 3 and point – point 3, point 4 and point 5 of pages 2 and 3 –

MR. LEARMONTH: Yes.

DR. LOCKE: – indicate their response. And on page 1, it indicates any further clarification I had on – with respect to that.

MR. LEARMONTH: Yes.

DR. LOCKE: Okay.

MR. LEARMONTH: Okay.

I'd like you to turn – or bring up page 3 of Exhibit P-00317, tab 7.

DR. LOCKE: Tab 7. Well, I'm in tab 7, so what did you want?

MR. LEARMONTH: Three.

DR. LOCKE: Page 3?

MR. LEARMONTH: Page 3.

DR. LOCKE: Yes.

MR. LEARMONTH: Have to turn your binder around, yeah.

DR. LOCKE: Sure.

MR. LEARMONTH: Okay, the third point down in your introduction, you state: "I have been on the record as supporting the Muskrat Falls Development as a good for the province." Now when did you first go on the record supporting the Muskrat Falls development as good – as a good for the province?

DR. LOCKE: I don't know, but your people sent a press clipping component where Mike Connors – and I assume that was the same date. I'm sorry, I don't know that it's here – one of your –

MR. LEARMONTH: I think you're referring to Exhibit P-00314, tab 4.

DR. LOCKE: Tab 4 – okay.

MR. LEARMONTH: If it –

DR. LOCKE: So –

MR. LEARMONTH: Tell me if that's what you're referring to.

DR. LOCKE: Yeah, that's what I'm referring to. And if you look on page 2 and 3, you'll see that Mike Connors was – people were reacting to the report from the joint panel, and people who were opposed to it were making their

points. And then Larry Jay, if I – could I – may we read this?

MR. LEARMONTH: Please do.

DR. LOCKE: Okay. Larry Jay says: “And still with Muskrat Falls, an economist says the project is still the best option for our province despite the environmental report. Wade Locke argues that Nalcor needs to do more to explain the project to the public. To explain that, here’s” – Mike – “NTV’s Michael Connors.”

Mike Connors then says: “The environmental review has given lots of ammunition to opponents of the Muskrat Falls ... The report concluded that Nalcor’s economic analysis of the project wasn’t adequate. MUN” – professor – economics – “MUN Economics Professor Wade Locke works with Nalcor on assessing employment benefits from the project. He stands by the economic analysis that Muskrat Falls is the lowest cost option for providing power.”

Wade Locke says: “My view is that the Muskrat Falls is the best economic option for meeting the needs, the energy needs of the province.”

Mike Connors: “The report called on Nalcor to investigate alternative” – energy sources – “such as natural gas, but Locke says there’s no viable natural gas industry in the province right now.

“WADE LOCKE: We don’t have a natural gas development right now and you know bringing natural gas ashore, if it were ashore and we got a market for it, then that might be a cheap alternative to Muskrat or to other alternatives. However, we don’t have a natural gas development and the amount of” – natural – “gas that would be brought ashore to make it efficient, you’re still going to have to export somewhere. You got the same problem in terms of doing that, and right now there are no developments for natural gas.”

Mike Connors: “But Locke does not take issue with the environmental panel itself. He says that the panel needs more information and Nalcor and the government will have to do a better job of explaining” – that.

“WADE LOCKE: The panel is a credible group and obviously if a credible with” – I guess group

should be there – “no obvious agenda comes to the conclusion they came to, we need to explain this better and in fact I’m trying to commit to some degree to that process right now” – through that interview.

MR. LEARMONTH: Okay, so before you started conducting your research for your presentation you had already formed the opinion that Muskrat Falls was the least-cost option? Is that correct? According to that interview, I think that’s what it says.

DR. LOCKE: I think that’s – yeah – well, I had a positive perception of the project based upon the economic impact analysis we did. So you know, yeah, I think that’s a reasonable characterization there. I was favorably disposed of the project, and I don’t think I ever gave an impression that wasn’t that way.

MR. LEARMONTH: Okay, but then you conducted your research. I mean, don’t you think it’s preferable for someone doing research to approach the subject matter, the research, with an open mind?

DR. LOCKE: Well, I – yeah, of course it is. And the fact that I may have believed that was the best project, the best option, doesn’t mean that my mind was closed to the possibility that it wasn’t, and that’s why you do the research. Even if you believe that you know the answer, doing the research helps you confirm that that answer is either correct or refutes that and allows you to come to a different opinion.

MR. LEARMONTH: Are you familiar with the term confirmation bias?

DR. LOCKE: I’m not, but I think I understand the – why don’t you explain it to me.

MR. LEARMONTH: Okay, it’s a tendency for someone to interpret new evidence as confirmation of one’s existing beliefs or theories.

DR. LOCKE: Okay.

MR. LEARMONTH: But do you believe that confirmation bias played a role in your belief that you stated at the Harris Centre presentation:

that Muskrat Falls was, on balance, the lowest cost option?

DR. LOCKE: Well –

MR. LEARMONTH: What I’m saying is that you appear to have formed the – before you did your research, you’re on record as saying that it was the least-cost option in your opinion, then you did your research. I wonder whether you were – your research was influenced by confirmation biases.

DR. LOCKE: Sorry, if I may. What it says here: “My view is that ... Muskrat Falls is the best economic option for meeting the needs, the energy needs of the province.”

MR. LEARMONTH: Right.

DR. LOCKE: Not the lowest cost.

MR. LEARMONTH: Okay.

DR. LOCKE: But to answer your question specifically, I may go into all kinds of projects with a belief about what might be the outcome. That doesn’t mean that the outcome after the research will be the same. I have spent my career in trying to provide credible, easily understood answers to questions, and I’m open to people explaining why they disagree and why this particular position is not a correct one. I’m okay with that as part of the academic process.

MR. LEARMONTH: Okay.

Now, could you please turn to – it’s tab 7, Exhibit P-00317, page 5.

DR. LOCKE: Page 5? Yes.

MR. LEARMONTH: Okay, so I’m just going to read this. The question at the top: Why get involved in this Contentious Debate?

“For the record, I am not being paid by anyone to undertake this research and I do not represent anyone, but myself, on this issue. I am not under contract to NALCOR or the provincial government for anything pertaining to Muskrat Falls.

“As part of the EIA process (the Joint Review Panel), I was asked as a subcontract to another company which had a contract with NALCOR to estimate the economic (employment and income) impacts associated with the expenditures emanating from the Lower Churchill. I have been consistently up front about my involvement in the estimating the employment and income” aspects of the project.

And that’s that economic analysis report that referred to earlier – that you’re referring to. Is that correct?

DR. LOCKE: That’s a correct statement, yes.

MR. LEARMONTH: Yeah.

Okay, next: “I am receiving no compensation, either direct or implied, by undertaking this research and/or presenting my beliefs here tonight that are honestly held even” – though – “if you don’t agree with them or believe them to be incorrect.

“I hope you ... consider the information presented here tonight and give it whatever weight you feel it deserves in making your own conclusion about this important public policy facing Newfoundland and Labrador today.”

Now, I’d like to refer to – oh, before I do that, did you believe that this statement about your work on the EIA process for the Joint Review Panel was an adequate disclosure of your connection over the years to Nalcor and the provincial government?

DR. LOCKE: I did, yes.

MR. LEARMONTH: Yeah. Do you still believe it was?

DR. LOCKE: Yeah. Yes, it tells you that I was doing work on economic impacts, which is the case.

MR. LEARMONTH: Yeah.

DR. LOCKE: Now, when this research was done I was not doing work on economic impacts. It was before and after.

MR. LEARMONTH: Okay.

Now, we'll just look at Exhibit 00312 which is at tab 2.

DR. LOCKE: Tab 2?

MR. LEARMONTH: If that could be brought up, Madam Clerk?

Now, Dr. Locke, you're familiar with Exhibit 00312, are you?

DR. LOCKE: Sure.

MR. LEARMONTH: Yeah.

And this was an ATIPPA response to an ATIPPA request. And it – the summary, which you and I have discussed as to the amounts of these records, shows that between November 6, 2013 [sp 2003], and July 7, 2016, you or Wade Locke Economic Consulting, received fees of \$615,149 from the Government of Newfoundland and Labrador. Is that correct?

DR. LOCKE: How much was the number you said?

MR. LEARMONTH: 615,149.

DR. LOCKE: – 129.44 but, okay.

MR. LEARMONTH: Okay, well, we'll split the –

DR. LOCKE: Yeah, that's okay.

MR. LEARMONTH: Well, no, we'll go with your number, okay?

DR. LOCKE: That's fine.

MR. LEARMONTH: Yeah.

And also that in terms of amounts that were paid to Strategic Concepts, which I understand you worked on, the total was, for that period – actually, it was from 2009 to 2015 was 331,734 –

DR. LOCKE: I have 754 but that's okay.

MR. LEARMONTH: Okay, we're just out a few dollars. And you've advised me that of that figure of 331 – well, I said 734 but we'll take

your number – that you received \$158,657. Is that correct?

DR. LOCKE: That is correct.

MR. LEARMONTH: Okay.

Now, the question I have for you is that when you went to the Harris Centre you referred to one piece of work that you had done, you know, for Nalcor on the (inaudible).

DR. LOCKE: Just before we go on, Mr. Learmonth, let me be clear on a couple of things as well.

THE COMMISSIONER: Well, just a minute now, Sir. What I want you to do is listen to the questions that are being asked and then answer them. And if you have something you want to add –

DR. LOCKE: Okay.

THE COMMISSIONER: – certainly we'll give you that opportunity –

DR. LOCKE: Sure. I'm sorry.

THE COMMISSIONER: – to do so.

Go ahead, Mr. Learmonth.

MR. LEARMONTH: Okay.

So my question, Dr. Locke, after we see all these – the work that you've done, as indicated in the exhibit, and the substantial dollar amount – that I ask whether you agree with me that in the interest of fairness and proper disclosure you should've disclosed your extensive connection over the years with both Nalcor and the provincial government, as indicated in Exhibit P-00312? Do you agree that you should've done that?

DR. LOCKE: No.

MR. LEARMONTH: Okay. Why not?

DR. LOCKE: Well, let me give some clarification first. Involved in the 615,129 number there would've been 15 subcontracts,

which had a value of \$180,448 that's paid to somebody else. And –

MR. LEARMONTH: So of that – you're saying of that 615,000, 180,000 was paid to someone else?

DR. LOCKE: Yes.

MR. LEARMONTH: Okay, so that reduces it down we'll say. Okay.

DR. LOCKE: Three hundred and thirty-two thousand.

MR. LEARMONTH: Yeah.

DR. LOCKE: So the total amount that I would've received, less HST, would've been 435,000 not counting expenses.

MR. LEARMONTH: Yeah.

DR. LOCKE: Okay? That works out to about 2.6 – I charge a rate of \$250,000 an hour.

MR. LEARMONTH: Two-hundred-and fifty –

DR. LOCKE: Sorry, \$250 an hour. Sorry. I can aspire to \$250,000 but I'm not a lawyer so it's – it won't work that way. But \$250 an hour and that works out to about 2.6 hours per week. And for the work on Nalcor we're talking about doing an hour a week. I want that to be clear.

When I was hired for any of these projects – and while your exhibit doesn't show for Justice, for example, what work was done in the notes that I gave you and is available to counsel here, I've gone through to explain the particular ones when it says for Justice, for example. I just wanted to make this clear to people.

So the contract for Justice for 4,520 or 42,494 on your exhibit, they were for the moose-vehicle accident case. I was hired by, at that point in time, Peter Ralph. My understanding at the time was they were hiring me to do an economic analysis of the report that one of the expert witnesses for Mr. Crosbie had provided. And I had taken a small contract to see whether or not I could be helpful to Mr. Ralph.

I don't believe that any of these contracts where I was being hired for political patronage or to channel money to me in order to influence my particular views, even if they were worth something to somebody other than myself. So these cases were long, complicated and in each of the cases – and you can ask Mr. Ralph, because he's here, whether or not they made a difference in terms of their settlements. And my understanding there's tens of millions of dollars that saved the province as a result of this going forward.

None of the contracts I took on face value. When Mr. Ralph or anybody else decided to hire me, it was for a particular reason, not because I was a political something or another. I've never done work for a political party, never, right, just so you understand that.

I've been on the receiving end of some negative things from parties, all parties, just so we understand that, too, but I continue to do what I think is appropriate to do. And in no cases did the amount of effort and time I put into it, and the remuneration I received for it, did that influence what I had to say in the Muskrat Falls presentation at the Harris Centre.

So if people believe that I was paid for political purposes to influence my opinion so I would go out in January of 2012 and do a positive presentation for this, then you need to talk to the people who hired me for that purpose because that wasn't my understanding; and if somebody has that understanding, you need to talk to them, not to me.

MR. LEARMONTH: Okay.

Now, I just want to carry on with the – what I was asking about was the disclosure issue, in terms of what you told the people at the Harris Centre.

DR. LOCKE: Sure.

MR. LEARMONTH: Disclosure – we can talk about that at greater length – what you just talked about, at greater length later, but I just want to talk about the disclosure issue –

DR. LOCKE: Okay.

MR. LEARMONTH: – now.

And I want you answer this question: Do you agree that it would be expected by a reasonably well-informed member of the public who listened to your presentation at the Harris Centre that you would make a more complete disclosure of your long-standing connection to Nalcor and the provincial government, rather than simply referring to your work for Nalcor in relation to the Joint Review Panel?

I mean, the record indicates, I suggest, Dr. Locke, that the provincial government and Nalcor were ongoing clients of yours.

DR. LOCKE: They were, but what you need to appreciate is that they represent 7 per cent of the contracts I was engaged in –

MR. LEARMONTH: Yeah.

DR. LOCKE: – over my career. So they weren't a huge part of it. There were other bigger people we had that were clients. And so, doing something that is not entirely correct or honest with a particular client can destroy your reputation, and we weren't about to do that. I wasn't about to do that.

With respect to why I focused on the work on income and employment benefits and the Lower Churchill, because the critics, before my presentation, were out talking about that I was a director or representative of Nalcor doing this kind of stuff, and people like Jim Morgan and others were on the radio every day talking about how I was working for Nalcor on these kinds of issues. And I wanted people to understand that I had done work on the economic impacts. And I want people to understand as well that for this presentation and for this period of time I was not under contract to Nalcor.

MR. LEARMONTH: No, but you acknowledge that Nalcor was an ongoing client of yours?

DR. LOCKE: At that point in time, I think there were three things that we had done. And they weren't a client of mine – just so we understand that as well. They were a client of – I was a client of Strategic Concepts, who had subcontracted me. And they were a client –

Nalcor or the equivalent were a client of Strategic Concepts.

MR. LEARMONTH: The government was a client of yours?

DR. LOCKE: Yeah, without a doubt.

MR. LEARMONTH: It didn't have that qualification you're making about the subcontract work with –

DR. LOCKE: No, no.

MR. LEARMONTH: Yeah.

DR. LOCKE: No, no, that's right. And this was unrelated, in my mind.

MR. LEARMONTH: Okay.

But nevertheless, do you agree that you were an ongoing – at the time you made this presentation, the Government of Newfoundland was an ongoing client of yours and that Nalcor was in the manner that you qualified earlier as that you were doing work for Strategic Concepts as a subcontractor. You were deriving income from Nalcor.

DR. LOCKE: Yes.

MR. LEARMONTH: Yeah.

DR. LOCKE: I suggested exactly the amount and the amount was listed there.

MR. LEARMONTH: Yeah. Okay.

And just so I'll understand, your position on this point of disclosure is that you made an adequate disclosure to the public at the Harris Centre on January 17, 2012 by referring only to the work that you did for the Joint Review Panel. Is that your position?

DR. LOCKE: That's my position. Had that not been my position, I would have done more.

MR. LEARMONTH: Okay.

DR. LOCKE: So yeah, that's my position. Others can have a different perspective on that. I appreciate that.

MR. LEARMONTH: Yeah.

Well, you're entitled to your own perspective, but I want to give you an opportunity to state your position on it, and I think you have.

DR. LOCKE: Thank you.

MR. LEARMONTH: Okay.

Now, the information that you received from Nalcor and government and other – any other sources that you relied on in making your presentation at the Harris Centre, did you accept all of that information or, upon critical review, did you find errors or points in that documentation that you disagreed with?

DR. LOCKE: With respect to capital costs and operating costs were the various components, we would've taken those as a given. When they talked about trying to show how those things feed into a price for electricity and those kind of things, we would've tried to check those out, yes. With respect to debt and what happens if you have a different rate of return, we would've done those, depending upon – but, as a general rule, any cost that Nalcor had put forward publicly would have been what we'd taken as a given, yes.

MR. LEARMONTH: You would've taken it as a given?

DR. LOCKE: Yes.

MR. LEARMONTH: Now, did you have your presentation reviewed by anyone for accuracy? In other words, I know when you do scholarly papers, they are peer reviewed. I'm not suggesting such a rigorous process, but did you have your presentation reviewed by any of your colleagues for accuracy?

DR. LOCKE: Not in the context you're talking about. I mean they – I probably would have showed it to people to get their opinion on it and were there any (inaudible) but no, not in the context you're talking about. But what I do do – always do – whenever we do something public, we make it publicly available to everybody – anybody who wants to scrutinize this can scrutinize it.

MR. LEARMONTH: Okay.

Dr. Locke, do you agree that there was a significant error in your presentation, in that the error being that you failed to take into account the cost of transmitting power from Muskrat Falls to Soldier's Pond when we were discussing the cost of electricity – do you acknowledge that that error was made?

DR. LOCKE: No. What was the – you're talking about the point that Dr. Feehan made with respect to the transmission price?

MR. LEARMONTH: No, I'm suggesting that you didn't include the cost of transmission when you were making your presentation.

DR. LOCKE: No –

MR. LEARMONTH: Even though the cost of transmission was at least equal to the cost of the power at 7 cents.

DR. LOCKE: Similar, it was similar –

MR. LEARMONTH: Yeah.

DR. LOCKE: – for sure.

MR. LEARMONTH: Yeah.

DR. LOCKE: What we did – let's be clear what we did here, in the present worth analysis, okay, cumulative present worth analysis, those costs would have been in there –

MR. LEARMONTH: Yeah.

DR. LOCKE: – so what Dr. Feehan was talking about was when we did up the – how did Nalcor get the 7.5, 7.6 cents per kilowatt hour, shouldn't you have put in another 7 cents to reflect the fact that it cost money to transport. That was not what we were trying to get at, but again, that's a valid point. That you ought to take into account which would have been taken into account in terms of the prices that the minister provided, it would have been in the cumulative present worth analysis. But I didn't highlight – as he correctly pointed out – that there was an additional 7 cents.

But we weren't trying to do that, we were trying to explain to people how they came up with the 7.5, 7.6-cent price for Muskrat Falls power. But yeah, that – if I had my time back, I would have done a separate analysis on that and put it in, yes.

MR. LEARMONTH: Yeah.

DR. LOCKE: He pointed that out; I agreed to it. It's a complicated process, right, I mean, there's a lot of moving –

MR. LEARMONTH: Yeah.

DR. LOCKE: – parts, and it's hard to think everything through. And as I encouraged Dr. Feehan at the meeting – at the presentation, you should come and present publicly on the issues. And that would be helpful 'cause those kinds of things could be clarified.

MR. LEARMONTH: Now, is it correct that the error or mistake that you made on the – not including the transmission costs was corrected by Nalcor a few days after the presentation?

DR. LOCKE: I had failed to understand – I had personally failed to understand that, as part of the CPW, those costs were in there as part of the fixed costs.

MR. LEARMONTH: Right.

DR. LOCKE: They were, Nalcor corrected that and certainly – I think Gilbert Bennett called me up and said hey, they're in there. So – and then a reporter – so I was caught off guard when the reporter called and I – and, you know, it's a long, complicated process. But even Dr. Feehan, when he was talking to David Cochrane the next week, indicated that those numbers were in there.

But, yeah, that's a mistake, and I'm okay with understanding – if I only do things that I never make mistakes on, then we'll have a very uninteresting life. So making mistakes is part and parcel of any analysis you do. You shouldn't be afraid to make mistakes. You shouldn't be afraid to take risk, right. And so, was that an error? That was an error that I wish I had back, I would have fixed without a doubt.

MR. LEARMONTH: Right.

DR. LOCKE: So I – yes, it is no doubt that getting power from Churchill Falls to St. John's is an important part of that there.

MR. LEARMONTH: Muskrat Falls.

DR. LOCKE: That hadn't gone to sanction at that point in time, just so we know.

MR. LEARMONTH: Yeah.

DR. LOCKE: And so the issues that I understood that were around at that point in time was the 7.8 cents, 7.6 cents per kilowatt hour and how they got to that. That was primarily the purpose in looking at what the alternatives were and whether or not they made any sense.

MR. LEARMONTH: Now, the major point that I – I just question why Nalcor would correct this error rather than you. You made the presentation. It wasn't Nalcor's presentation was it?

DR. LOCKE: No, it was my presentation.

MR. LEARMONTH: Yeah.

DR. LOCKE: They called me up to explain to me that their numbers included the transmission costs and the CPW.

MR. LEARMONTH: Yes.

DR. LOCKE: At that point in time, I called back. The – this was embarrassing at the time, but I called back the reporter and said that the numbers were there. They were in that, I didn't realize it.

It's trying to – it's not an excuse, it's just trying to explain to you that there were a lot of complications and I was trying to understand it all on my own, late at night, for a long period of time and that was a mistake on my part not knowing that it was there – which I said to you, I took their numbers as given. I didn't understand that in part, including those numbers, was to – it wasn't called transmission, it was called fixed cost – was that transmission cost.

MR. LEARMONTH: Right.

DR. LOCKE: It's not that the numbers weren't there and that it wasn't 2.2 billion difference in CPW. It's just that I didn't understand that when I answered that question.

MR. LEARMONTH: Yeah. Okay, and that's why the error was made.

DR. LOCKE: That's why the error was made.

MR. LEARMONTH: All right.

When you were receiving and analyzing the data that you received from Nalcor and the provincial government, were you aware that at this stage when – the numbers you were looking at were Decision Gate 2 numbers –

DR. LOCKE: Yes.

MR. LEARMONTH: – and they were prepared at a time when only 5 per cent of the engineering for the project had been done.

DR. LOCKE: I was not –

MR. LEARMONTH: Were you aware –

DR. LOCKE: – aware of the specifics, no.

MR. LEARMONTH: Yeah. But do you see any problem in, you know, approving a project in the way you did, on a balance of probabilities, when you only got one-twentieth or 5 per cent of the engineering done?

I just point out, like the Public Utilities Board apparently, and I'm generalizing, but they declined to express an opinion on the reference question that was put to them because the data hadn't been developed enough. Did you have any problem with that, or were you aware that only 5 per cent of the engineering had been done at the DG2 level?

DR. LOCKE: I was not aware of that. That was not – the engineering aspects of these kind of things. I took on face value the capital and operating costs. But what I will say to you, Counsellor, is it is clear in my presentation, tab 7, Exhibit 00317, page 46, and I will read this for you just so we're on the record of that as well.

The third bullet point says: "Not extending the PUB ... creates an air of suspicion that can be avoided. If I were asked, I would recommend that sufficient time be provided to fully assess this project.

"You do not have to force a benefit on someone, but you" do "have to explain it so that they fully understand the nature and extent of the benefit."

So, in my opinion, and I'm sure this was not what the government wanted to hear either, that they should have extended the PUB so that by the time the extension was done they had the DG3 numbers and they could either say yea or nay. I believed on the basis of the numbers we had available to us that this was the lowest-cost option based on what we had available to us.

MR. LEARMONTH: And the question to the PUB, do you agree that it would've been preferable – with a position, that it would've been preferable for the government to make a wide or broad question to submit to the PUB? In other words, what is the lowest-cost option, and let the PUB conduct studies of natural gas, wind, combinations and so on, rather than have the narrow reference that was framed?

DR. LOCKE: I don't know if it's better or not, but, I mean, I wouldn't be objecting to that.

So, you know, when Mr. Wells and others talked about they didn't have enough time, I don't understand why you wouldn't give them enough time to do the analysis that we're all comfortable that this is the right answer. So I don't see any reason why you wouldn't give the PUB enough time to do a full analysis.

MR. LEARMONTH: Using the DG3 numbers?

DR. LOCKE: Using the DG3 numbers, yeah. In three months' time, or whatever the period of time you're asking for, they would've had those numbers.

MR. LEARMONTH: Yeah.

Okay, I'd like you to turn to – well it's tab 7, Exhibit 00317, page 12.

DR. LOCKE: What page?

MR. LEARMONTH: Twelve.

DR. LOCKE: Yep.

MR. LEARMONTH: At the top of this, the first point – by the way, I think, just for the record, it's the C.D. Howe Institute. That must be a typo – yeah.

DR. LOCKE: And you know, Counsel, you'll find lots of typos. When you do this stuff late at night by one person you –

MR. LEARMONTH: Yes.

DR. LOCKE: – you know, I don't have the staff –

MR. LEARMONTH: No, I'm not making a criticism.

DR. LOCKE: No, no, no, I get it.

MR. LEARMONTH: I'm just clarifying the reference –

DR. LOCKE: Yes, it should be the C.D. Howe, without a doubt.

MR. LEARMONTH: Okay, fair enough.

So the first point. On January 17, 2011, Dr. Feehan released a paper through the C.D. Howe – you got it right there – C.D. Howe Institute, which argued: if prices were increased to reflect the price of fuel, then excessive power consumption would be curtailed and this could make the expense of Muskrat Falls unnecessary.

I understand that you disagreed with Dr. Feehan's position?

DR. LOCKE: No, I think what I disagreed with was what – what he gave people the impression was that if you could have a small increase in price, the problem would go away. So he used, in this case here, an elasticity – implicit elasticity of about 0.25. At that point in time, the elasticity was about 0.3, 0.32. So 0.25 was not anything you'd need to be quibbling about.

However, my understanding of the load forecast was that there would be extra power needed from thermal option. So increasing it by 20 per

cent wouldn't be enough in order to – it would be enough to forego 5 per cent of the demand but not enough to forego 20 per cent of demand which we needed, and that would be a price of 80 per cent.

And as you saw from the response from Dawn Dalley that should the price go up to 80 per cent of what they were forecasting or higher, you would see a big change in the demand and there would be no need for Muskrat Falls, basically, with that big change in demand. That's what this is about. It's about that you can put things in, if they're not accurately reflecting the full situation, you need to be clear on that.

And it's part of an academic process that if you put out something saying the elasticity is 0.25 or 0.3 or 1.2 or 0.4 or 0.15, you should assume that other people might look at how you did it and might offer an alternative to your particular position as part of an academic debate.

MR. LEARMONTH: Mm-hmm.

But I take it from that that you disagreed with Dr. Feehan's position on that. Is that correct?

DR. LOCKE: If his position was that 20 per cent increase was always needed, then yes.

MR. LEARMONTH: Okay.

Now please turn to page 21 – excuse me – yes, 21 of Exhibit P-00317, tab 7. We're talking about assumed Nalcor oil prices.

DR. LOCKE: Yes.

MR. LEARMONTH: If we could bring that up – yes.

Now, did you review – in making your presentation, did you review the methodology that Nalcor employed in making projections for the cost of fuel until, I think, it was 2067?

DR. LOCKE: I think they used PIRA. And so PIRA is a private company that does this kind of stuff for a living. What we did review was available –

MR. LEARMONTH: Well, I think – just to clarify, I think the PIRA estimate went out to

2030 and then there's a 2 per cent annual increase compounded to take the figure up to – I think it was 2067 or –

DR. LOCKE: That's a normal way of doing it, if you looked at –

MR. LEARMONTH: Right.

DR. LOCKE: – the publicly –

MR. LEARMONTH: Yeah.

DR. LOCKE: – available forecasts just –

MR. LEARMONTH: Yes, okay. It's a normal way of doing it.

But do you agree with me that putting reliance on projected fuel prices out, you know, 20, 30, 40 years is a very risky business?

DR. LOCKE: Sure. Anything – when I came here this morning it's a risky business just getting across the street, just so I can get up to your office here. So anything that you don't know about now will involve some risk for the future. The further in the future you go, the more likely it is not to be correct. So in the sense that not correct is higher risk or a deviation from your expected value is a higher risk, yes.

MR. LEARMONTH: Yeah. And don't you agree that projecting fuel oil prices – crude oil prices over that period is extremely risky?

DR. LOCKE: It is risky, yes – but necessary.

MR. LEARMONTH: Okay.

Now, please turn to page 38 of your presentation, once again that's Exhibit P-00317, tab 7.

DR. LOCKE: Sure.

MR. LEARMONTH: Now, you're talking about domestic natural gas.

DR. LOCKE: Yes.

MR. LEARMONTH: And the – in the earlier Exhibit of the September 4, 2011, discussion you had with NTV News, you referred to natural

gas and you expressed the view, generally, that you would excluded it from consideration. Is that a fair way to put it?

DR. LOCKE: That's a fair way of putting it, yes.

MR. LEARMONTH: Okay.

Now, on September 4, 2011, when you made this comment on the NTV News report, what information did you have that provided support for your position that natural gas was not a viable option? What research had you done? What information had you received?

DR. LOCKE: Okay.

One of our major clients was Husky Energy and we were involved with Husky Energy on oil and natural gas as part of their research. We were retained – I think it was for, Noia, Newfoundland offshore industry association, to do some work – I'll have to refer to my CV in a second, but we did a number of pieces on compressed natural gas.

MR. LEARMONTH: No, I'm not talking about compressed.

DR. LOCKE: No, I understand. But compressed natural gas would require the feedstock in order to be able to do that as well, so we would've looked at the availability of natural gas as well. And speaking to people like Malcolm Maclean, who was the vice-president for Husky I think. So that's – you know, I'm not sure if Malcolm was there at that point in time, but we had access to – speaking with people who were in charge at Husky over the years. We did a lot of work with oil companies and specifically with Husky.

MR. LEARMONTH: Do you have any record of those discussions?

DR. LOCKE: I do not.

MR. LEARMONTH: No.

DR. LOCKE: Just in my head and it's not as clear as it should be.

MR. LEARMONTH: Well, what information did you derive from those discussions with people at Husky?

DR. LOCKE: That you needed \$10 a thousand cubic feet in the UK in order to make this a viable option. And right now the only thing that was being planned, at that point in time, was to use natural gas for pressure maintenance and for burning electricity on the rigs.

MR. LEARMONTH: So was that the extent of the information that –

DR. LOCKE: Yes.

MR. LEARMONTH: – led you to conclude that natural gas – or exclude natural gas as a viable option to meet the energy needs of the province?

DR. LOCKE: You mean domestic natural gas?

MR. LEARMONTH: Yes.

DR. LOCKE: Yes, there was no market for natural gas. In order to –

MR. LEARMONTH: Yeah.

DR. LOCKE: – in order to generate electricity for natural gas –

MR. LEARMONTH: Mm-hmm.

DR. LOCKE: – you still needed to be able to export 75 per cent. That was what the compressed natural gas study did for us, right? It talked about – the reason compressed natural gas didn't work is because you needed – in order to have an efficient pipeline you had to bring on more gas than you could possibly use. You needed an export market and there was no export market, there was no royalty at that point in time for natural gas – there was no market for natural gas.

MR. LEARMONTH: But why does there have to be an export market?

DR. LOCKE: Because the amount of natural gas needed to be brought ashore to make it economic to do – requires bringing ashore more natural gas that can be used domestically even if

all the domestic electricity were turned to natural gas.

MR. LEARMONTH: What's your basis for making that conclusion – or forming that –?

DR. LOCKE: It was based upon the work that we did for compressed natural gas studies.

MR. LEARMONTH: But I'm not talking about compressed natural gas.

DR. LOCKE: I understand, but when we did that the pipeline – whether you turned it into compressed natural gas or not, the pipeline would be the same kind of pipeline.

MR. LEARMONTH: That's your belief, is it?

DR. LOCKE: That's my belief, yes.

MR. LEARMONTH: And that was based on the discussions you had with people at Husky?

DR. LOCKE: No, it would've been based on the work that we did for compressed natural gas. If you want me to refer to the specific studies I can refer to my –

MR. LEARMONTH: Okay, well, maybe later you can.

DR. LOCKE: Okay.

MR. LEARMONTH: Okay.

Were you aware that the Energy Plan dealt in some way with the issue of natural gas?

DR. LOCKE: Vaguely, yes.

MR. LEARMONTH: What is your recollection of the way that the Energy Plan dealt with that subject?

DR. LOCKE: I don't have a strong enough recollection to be able to answer that question, sorry.

MR. LEARMONTH: Okay.

Madam Clerk, could you please bring up exhibit P-00029.

THE COMMISSIONER: So you have to look at this one on your screen because it's not in your book.

MR. LEARMONTH: It's not in your book –

DR. LOCKE: It's on this, on the screen there?

THE COMMISSIONER: No.

DR. LOCKE: Okay. Okay.

MR. LEARMONTH: And then you go to page 36. Can you go down, please? Okay.

The paragraph under the heading Landing Natural Gas, the second paragraph, could you read that into the record? Starting with "The Provincial Government"

DR. LOCKE: "The Provincial Government understands the unique challenges of using this resource within the province, but there are also opportunities. To ensure these opportunities are fully assessed, the Provincial Government will request that companies provide detailed 'landing in the province' options prior to submitting a Development Plan. More information on potential natural gas development is found in Section 4"

MR. LEARMONTH: Were you aware of that?

DR. LOCKE: Vaguely. That's not something that would've been on the top of my mind, no.

MR. LEARMONTH: So vaguely, okay.

And then, Madam Clerk, go to page 38 of the same – 48 of the same Exhibit. Just read into the record the first paragraph Gas-to-Wire, Natural Gas-Fired Generation.

DR. LOCKE: "When natural gas is produced from our offshore it could be transported to customers, either as gas in a pipeline, as gas in a Compressed Natural Gas ... tanker, or as a liquid in Liquefied Natural Gas ... tanker. Landed in the province, it could be used to make electricity, which can be transported to domestic and external markets by transmission lines. This process is known as gas-to-wire. Natural gas-fired generation can be significantly more efficient than systems fuelled by coal or, like

Holyrood, heavy ... oil and produce far less GHGs and other emissions. If natural gas can replace these other fuels, it will yield significant environmental benefits. Section 3 of" – the environmental plan – "stated that the Provincial Government will request companies complete an analysis of landing gas options prior to submitting a Development Plan."

MR. LEARMONTH: Now, were you aware that that was in the Energy Plan released by the provincial government on September 7 – September 11, 2011?

DR. LOCKE: I would've read this plan, yes. So I would've been vaguely aware of it, yes.

MR. LEARMONTH: Well, did you give any weight to it? If you –

DR. LOCKE: No, and simply because it was not front of mind at that point in time. There's a long ways away from – there's no – my understating: there's no offshore liquefied natural gas facilities in order to be able to do that – a floating LNG is a technology that's a long ways away. So I don't know the technology –

MR. LEARMONTH: I just want to clarify.

DR. LOCKE: Yeah.

MR. LEARMONTH: Perhaps I hadn't made myself clear. I'm not talking about liquefied natural gas. I haven't been at all.

DR. LOCKE: Okay.

MR. LEARMONTH: I'm talking about natural gas.

DR. LOCKE: Yeah. Well, these are part of that paragraph though, right?

MR. LEARMONTH: Yeah.

DR. LOCKE: So you have experts like Mr. Bruneau, and you should talk to Mr. Bruneau about what's feasible and not feasible, and if Nalcor had an alternative that would fit into this category, then you should talk to Nalcor about their expertise. This is not my expertise.

MR. LEARMONTH: But you went on record as excluding it and on – as early as September 4, 2011. If it wasn't your expertise, why didn't you step back from making that comment?

DR. LOCKE: Maybe I was being naive. But –

MR. LEARMONTH: Okay.

DR. LOCKE: But that was my belief based upon everything I knew about it at the point in time.

MR. LEARMONTH: Okay. Fine.

And you mentioned Dr. Bruneau. Maybe we can just bring up his exhibit which is his presentation to the Harris Centre, which is P-00090 and go to page 14.

Have you got that – P-00090?

CLERK: It won't open.

MR. LEARMONTH: It won't open? Okay. Well –

THE COMMISSIONER: Here it is.

MR. LEARMONTH: Okay. 14.

CLERK: Sorry about that.

MR. LEARMONTH: No. This was information that Dr. Bruneau presented at the Harris Centre on March 28, 2012. So that was just a couple of months after your ...

DR. LOCKE: Sure.

MR. LEARMONTH: Were you aware of this information that Dr. Bruneau says supports the position that natural gas was soon to be available?

DR. LOCKE: I was not aware of it. Once I did my presentation and had the reaction that I had to it, I just said, basically, I'm done with this stuff.

MR. LEARMONTH: Okay.

DR. LOCKE: And so –

MR. LEARMONTH: But –

DR. LOCKE: I was aware Steve Bruneau did a – Dr. Bruneau did a presentation on Harris Centre in response to my first presentation, without a doubt.

MR. LEARMONTH: Yeah. But did Dr. Bruneau's presentation cause you to change your thinking about natural gas?

DR. LOCKE: I haven't thought about it since.

MR. LEARMONTH: You didn't think about it?

DR. LOCKE: Not since. No.

MR. LEARMONTH: Okay.

DR. LOCKE: And once we're done here today, this will probably be the last thing in this as well.

MR. LEARMONTH: So why did you stop dealing with Muskrat Falls issue after your presentation?

DR. LOCKE: Well, I've been vilified in the public, and it's had an impact on me psychologically, emotionally, mentally.

MR. LEARMONTH: Why? I don't want to delve into –

DR. LOCKE: I'm an emotional person who – if I could get you to like me, I would have you like me. And I probably don't have the character or the charisma to warrant those kind of reactions from people, so I get a lot of negative reaction about I'm an overweight guy, I'm a stupid guy, I should be fired from the university, all those kind of things, for trying to provide a – what I felt was an honestly portrayed assessment of what I felt were the benefits in terms of the least-cost options for this particular project and that this is the project to do.

It is amazing to see the amount of negativity, the amount of derision that this project has generated in terms of – it's not a matter of attacking the ideas. They're attacking the person. And I'm okay with people challenging my ideas, and I'll live with that. If I made a

mistake, I'll admit to making a mistake, and I'll try to correct it.

But you know, I worked hard at trying to be healthy. I've struggled with weight all my life; I don't think it's appropriate to be attacking me on a personal level. I'm not a politician, despite what people think. I've never been a politician. I've never worked for political parties. I answer anybody's question. I'll meet with people who want to meet with me. My nature is that I take things on face value until I don't need to take them on face value.

But you know, it – so if I had my time back, I would not have done this presentation either, because it has engendered such a negative response from people, and I don't understand why, right? I'm not a bad person. I try to be professional here. I'm trying to answer your questions as honestly as I can and will do the same for all the rest of your counsel. But it's been difficult, on a personal level, for me and for my family.

MR. LEARMONTH: Okay.

There's just a few other points I want to cover before I end my examination. Now, if you go to tab 10, Exhibit P-00375 –

DR. LOCKE: Yes.

MR. LEARMONTH: Now, this is a January 8 email that you sent to Dawn Dalley, Gilbert Bennett and Ed Martin at Nalcor the day after your presentation. You say: "Here is the presentation ... I gave last night.

"Good luck with your important project."

Why would you send such an email?

DR. LOCKE: I send out hundreds of emails every time we do something at the university to people on a mailing list. And I'm a firm believer in when I do something publicly, it should be publicly available to everybody. These are – just like the premier, these are people who are interested and should be interested in the presentation. But they wouldn't be the only people who would have received a copy of the presentation. We would have sent it out to everybody.

So if you're on my mailing list, we don't censor what we send out to you. We send out everything. And I'm sure, for those people who are on it, might not fully appreciate that, but we send out everything. And we're – this is what we believe we should be doing as part of being at the university – helping put forward publicly information that may be helpful to people to make better decisions about issues that are important to them from a public policy perspective.

And so these individuals who are helpful to me, in terms of – I don't know if I ever met with Ed Martin for this purpose, but you know, certainly Mr. Bennett and Ms. Dalley would not have been supportive and helpful if Mr. Martin wasn't aware of that, I'm pretty sure.

But they provided information; they answered questions. It is important that they at least understand what came out the other end. They don't have to agree with what came out the other end. I wasn't asking them to agree with it, but it's important that they understand. Same thing with the premier, same with anybody else.

MR. LEARMONTH: Okay.

Dr. Locke, you're on the public record as stating that when the projected capital costs of estimates for Muskrat Falls were \$9.1 billion, do you acknowledge that you were correctly quoted as saying that, quote, had we known these numbers at the start, we probably wouldn't be saying that it was a viable project? Do you acknowledge having said that? That's back on –

DR. LOCKE: I don't have a copy of that, but –

MR. LEARMONTH: – June 2016.

DR. LOCKE: I'm not disputing that, yeah. So that sounds like something I would say.

MR. LEARMONTH: Yeah. So –

DR. LOCKE: I haven't seen a copy, just so you know.

MR. LEARMONTH: Yeah. Well, I mean at what point – you – well, you don't want – do you support it – but you were not against Muskrat Falls when the capital cost estimate was

\$6.2 billion, excluding interest and AFUDC, right. You – we'll use the term: supported or were not opposed to it. Is that correct? You thought it was economically viable?

DR. LOCKE: I thought it was the best option for the province –

MR. LEARMONTH: Yeah.

DR. LOCKE: – based upon everything we saw, yes.

MR. LEARMONTH: Yeah.

So at what point does it become a project that is not economically viable? I realize that it in June 2017, you said that had we known these numbers at the start we probably wouldn't be saying that was a viable project. At what point does Muskrat Falls become a non-viable project in your view?

DR. LOCKE: Well, we're part way through this project now and so the issue is what would be the cost to continue on versus the benefits of continuing on. So, if you're asking what would the cost have been in 2000 –

MR. LEARMONTH: 2012.

DR. LOCKE: – 2012 –

MR. LEARMONTH: Yeah, the time of sanction.

DR. LOCKE: – I haven't done that analysis, but, you know, there is a price at which you might not have gone forward with this stuff, right.

So, I remember doing an interview with the paper, some guy in the paper a while ago, a little while ago now, talking about \$8 billion. So, again, you'd have to go back and redo the analysis, taking into account employment impacts, income impacts, issues around economic development potential for Labrador, greenhouse gases and all those kind of things. Take them all into account and decide which of these made the most economic sense.

But the higher is the cost and if the other alternative is not a higher cost, right. That's

what you got to remember, that you don't know what the (inaudible) is. What we don't know – what we know right now is there appears to be, based on public reporting from Nalcor, that costs are higher than they thought originally. We know from a presentation I gave at the Harris Centre at the university that the forecasts are different.

If I could, I want to make sure that people are aware of this. In October, 2017 I called for this Inquiry.

MR. LEARMONTH: Why?

DR. LOCKE: The reason I called for this Inquiry –

MR. LEARMONTH: Why?

DR. LOCKE: – is that the costs have gone up, right? And people were arguing that people were inflating, or using more optimistic cost numbers when they started off than they should have. The other thing was that the – right, just let me refer it rather than try to remember it.

MR. LEARMONTH: Just tell us what you're referring to and it's understood that if any of the parties want to see that or examine it after, I'll get a copy (inaudible).

DR. LOCKE: Well – yeah, without a doubt. It is something called the State of the Newfoundland economy: From Bad to Worse, and it was a presentation we gave on October 20, 2017 at the university.

MR. LEARMONTH: And what did that have to do with the Muskrat Falls question?

DR. LOCKE: Well, it was – the economy was doing poorly at the time, and Muskrat Falls was in the news all the time and it was all negative news. Okay? And there were cost differences, there were forecast differences and there was an issue – people were being scared into that the price that was gonna be charged for electricity was gonna be significantly higher. And it seemed to me that these are just going on and on and on.

And I think it's important, the work of your Commission, your Inquiry, is important because

it should help, at some point, understand what happened, how it happened and what we could do differently for things like Gull or other projects, in order not to make whatever mistakes we made with this – whatever they are – and I don't know. But I will read with interest your final report so I can understand – how – what conclusion you've come to, to help us understand what's happened here.

I don't know, but this was occupying a lot of our time and a lot of the government's time and they weren't able to focus, I don't think, on the issues that are really important for the province in terms of the economy.

So, what was happening was this was dragging things down; destroying confidence. And so, I don't know how you could not have had an inquiry at the point in time. But I'm happy to provide – and I think I provided this to you when we had our first interview – this particular report. This is available on the website, but anybody who wants it can have it. And it explains why I think it was needed.

MR. LEARMONTH: The Inquiry?

DR. LOCKE: The Inquiry, yes.

MR. LEARMONTH: Okay.

Now, I just – I'm almost finished, Dr. Locke, I just wanted to – you to turn to Exhibit 00313. Just tab 3, which is the economic impact analysis –

DR. LOCKE: Sure.

MR. LEARMONTH: – that you and Strategic Concepts prepared for Nalcor on December 10, 2010; revised January 23, 2010.

I don't wanna spend a lot of time with this, but could you give us a summary of the difference between an economic-impact analysis and a cost-benefit analysis?

DR. LOCKE: Sure.

MR. LEARMONTH: Go ahead.

DR. LOCKE: Okay.

What we do primarily – what I do over my career is kinda boring in some respect – is create economic impacts of various kinds of things. And all that means in simple terms is that we look at the expenditures for capital and operating, and if there's production involved, production as well, so that we can predict the amount of employment – direct employment, the amount of income, the amount of taxes, the impact on GDP associated with the operations and capital expenditures of the project and we predict direct, indirect and induced kinds of impacts.

And direct would be, for example, Muskrat Falls. Someone who's working for Nalcor in the office would be a direct employee. Someone who's providing cement so they can stick the poles in the ground is an indirect employee supplying goods and services and when they all go out to the bar to celebrate the Inquiry, that's induced employment. So as they have more income and they spend it in the economy – throughout the economy, the service economy, the restaurants, bars, whatever it is, that's induced.

And so that's, in a nutshell, what economic-impact analysis is. Cost benefit would say, okay, now, it's not simply the impacts of the cost on the economy you're interested in and so part of the benefits might be employment. If it's full employment, then we'd count those benefits less, we'd have to take an opportunity cost. So we have to deduct from the value of employment or income the value of the resources and the alternative uses. But you'd also take into account things like, for example, the reduction in greenhouse gases which would normally come into an economic impact or a cumulative present worth analysis, right?

And so, typically, you don't do a cost-benefit analysis for a hydro project versus a thermal project. So in typical form a hydro project would generate a kilowatt hour of electricity, a thermal project would generate a kilowatt hour of electricity. Your radio doesn't care whether it's thermally generated or hydro generated, it's the same.

So if you have the same amount of electricity, then doing cumulative present worth analysis – what is the least-cost way of getting that same

kilowatt hour of electricity? However, for Muskrat Falls, there are a couple of other things you had to take into account; one is that burning thermal – doing thermal – would generate greenhouse gases. That would have a negative consequence that you have to take into account on the environment. And if there's a carbon tax you'd have to take that into account as an actual cost, right? That would be part of the cost-benefit analysis.

There's extra electricity generated other than the 20 per cent needed for Nova Scotia and the amount that's required for Newfoundland over the time period. That could be sold. That would be a benefit you'd take into account on a cost benefit. It could be used to facilitate mining in Labrador, for example. So to the extent there are realistic mining opportunities that couldn't go forward without this additional electricity that would be a benefit you'd take into account through a cost benefit. So cost benefit means looking at all of the impacts, adjusting for any other associated cost and coming up with a net benefit.

MR. LEARMONTH: Okay.

DR. LOCKE: Yeah.

MR. LEARMONTH: Thank you.

So it's not a question of one being more – like a cost-benefit analysis being more or less sophisticated than an economic-impact analysis. I think the point you're making is that they're used for different purposes?

DR. LOCKE: Yeah.

MR. LEARMONTH: Is that correct?

DR. LOCKE: That's a correct statement.

MR. LEARMONTH: Okay.

Now, Madam Clerk, would you please bring up P-00254.

Yeah. Yeah.

Have you – just look on your screen, Dr. Locke, it's not in your book. Have you seen Exhibit P-00254 before today?

DR. LOCKE: I think this is when you had your hydro panel up.

MR. LEARMONTH: Yes.

DR. LOCKE: I think this was something that you showed them, yeah.

MR. LEARMONTH: Yeah.

And so you – is that the first time you saw it when you were reviewing the recording of our – the presentation made by the Nalcor persons?

DR. LOCKE: I don't know.

MR. LEARMONTH: Yeah.

DR. LOCKE: I was surprised that we were mentioned when this came up.

MR. LEARMONTH: Yeah.

DR. LOCKE: I was surprised we were mentioned in terms of the price as well but, obviously, the email from Dawn Dalley points it out. And when he said Strategic Concepts helped with this, I don't have a recollection of it, but I don't doubt that we did.

MR. LEARMONTH: Okay.

But did – so you have no recollection of having any input into the preparation of P-00254? Is that what you're saying?

DR. LOCKE: I don't have a specific recollection of it. I don't doubt that we did it. I mean, you know, if the individual said we did it or if we helped, I mean, over the years we would have provided support and helped people at Nalcor understand how to do this stuff so they could do it on their own at some point in time as well.

So whether or not – this is not something I specifically recall. It is something that would be the kind of nature in terms of the indirect and induced and impacts that we would have helped them with, yes.

MR. LEARMONTH: Okay.

So this looks to be, like, a document that would require an economic-impact analysis in order to be created?

DR. LOCKE: Oh, it would unambiguously require that.

MR. LEARMONTH: Yeah.

DR. LOCKE: Yes.

MR. LEARMONTH: It would what?

DR. LOCKE: Unambiguously require an economic-impact analysis –

MR. LEARMONTH: (Inaudible.)

DR. LOCKE: – for this to be created.

MR. LEARMONTH: Okay.

Now, we're at the break time. I'm almost finished. Can we take the break now and I'll be short after the break?

THE COMMISSIONER: All right.

So, yes, we'll take 10 minutes now.

Adjourn for 10 minutes.

CLERK: All rise.

Recess

MR. LEARMONTH: Yeah. Thank you.

THE COMMISSIONER: All right, thank you. You can be seated.

Mr. Learmonth.

MR. LEARMONTH: Yes, just a few more questions, Dr. Locke.

DR. LOCKE: Sure.

MR. LEARMONTH: Just before we took our break you outlined several things that ought to be included in a cost-benefit analysis, but not an economic-impact analysis. And can you just speak to opportunity cost?

DR. LOCKE: Sure.

Opportunity cost –

MR. LEARMONTH: Explain how that plays in these matters.

DR. LOCKE: Oh, it might or might not play in these matters but –

MR. LEARMONTH: Okay.

DR. LOCKE: So, for example, if we have employment, it is possible – so, for example, if we hire a fancy engineer. And hiring them on this project might mean they're not available for an offshore oil project. And so the fact that they may be paid \$200,000 on this project, if they forgo \$200,000 on the other and they're not replaced then we're – the opportunity cost us \$200,000, so the net benefit would be zero, right?

MR. LEARMONTH: Yeah.

DR. LOCKE: So opportunity cost – but if they are replaced, it would be the difference in the productivity. So if there's no loss of output, no loss of productivity –

MR. LEARMONTH: Right.

DR. LOCKE: – then there's zero opportunity cost. So you'd have to go down on a line-by-line basis for the impact to see whether or not you're forgoing something by doing this project.

MR. LEARMONTH: Yes, and what about the question of dividends that the government expected to derive from this – their equity investment? Can you speak to that in terms of opportunity cost?

DR. LOCKE: Well, no, I don't know if I could because I'm not exactly sure. Can you – maybe you can ask the question a little different way?

MR. LEARMONTH: Well, there are – there – do the dividends that the government indicated that it was expecting to get from this project, did – does that have anything to do with opportunity cost?

DR. LOCKE: Well, if you're counting the cost –

MR. LEARMONTH: Yeah.

DR. LOCKE: – of incurring the project –

MR. LEARMONTH: Yes.

DR. LOCKE: – so, for example, in your CPW will have –

MR. LEARMONTH: Yes.

DR. LOCKE: – cost.

MR. LEARMONTH: Yeah.

DR. LOCKE: So if you're counting those, then you ought to count the dividends that are derived as a benefit. Let's be clear, the choice they have available to them is to take a higher price and take the dividends, or take a lower price from the ratepayers –

MR. LEARMONTH: Right.

DR. LOCKE: – and take less dividends. That's a public policy issue. So long as they can pay off their debt servicing, they have some flexibility.

So in the presentation we gave to the Harris Centre we went through – if I could turn to that, I'm not sure what page that's on. If you – it's tab 7, it's Exhibit 00317 and ...

So on page – it looks like page 17 of your binder.

MR. LEARMONTH: Yes.

DR. LOCKE: It's called: Calculating the supply price. So when they did their calculation, they assumed a hundred per cent equity on – for funding, and that a 12 per cent rate of return would be required. And that's where you got the \$75.82 dollars per megawatt hour.

You could have chosen, for example, a 9 per cent or a 10 per cent. If you had chosen 10 per cent the price you would need, when returning your equity – the price you would need would be 59.39. So it's a policy decision about whether or not they take it as a price to ratepayers and,

therefore, have higher dividends, or they take it as lower dividends and lower prices. That's a policy decision on their part, so long as when they do that they don't violate the ability to fund part of the project by debt, right?

And so that was what Mrs. Dawn –

MR. LEARMONTH: Dalley?

DR. LOCKE: – Dalley's email was about, is that when she talked about going from 8.4 per cent down to 5 per cent and she talked about the price going from the 7.85 down to 4, that's a different number than what we got, but that's – the point is still the same is that ...

And she made a clarification, a caveat there that so long as you still could borrow, that would be a strategy, so long as you can borrow and cover your debt and servicing costs. And I have another slide there in the presentation to help people understand that, as well, about borrowing. And that's page 43 of the same exhibit.

MR. LEARMONTH: Okay

DR. LOCKE: And it shows you for various amounts of borrowed and various interest rates, how much you'd have to generate in order to pay off the interest in principal. And that's based upon something called a capital recovery factor, but it's basically – for the normal layman, that's just what you'd use to calculate your annual payment from a mortgage payment of a certain amount, a certain duration, a certain interest rate.

MR. LEARMONTH: Okay.

Now, on that question of dividends – just before we leave that – so we're speaking of, like – you know, comparing like the dividends that the government would invest in this project. But isn't it true that the government could have taken that money and invested and obtained dividends from other investments? And how does that play in the cost-benefits analysis?

DR. LOCKE: Sure. It could have, yeah.

MR. LEARMONTH: Yeah.

DR. LOCKE: Without a doubt. I mean, there's an opportunity cost to the funds –

MR. LEARMONTH: Yeah.

DR. LOCKE: – in some form –

MR. LEARMONTH: In some part.

DR. LOCKE: – some form or another.

MR. LEARMONTH: Yeah.

DR. LOCKE: So, yeah, I mean, one could look at whether or not there were other credible alternatives other than what was going on here, so long as they had a reasonable way of meeting the needs for electricity. Because that's what they're mandated to do, right, to provide –

MR. LEARMONTH: Yeah.

DR. LOCKE: – electricity so that they didn't run out of power at a certain point in time. My understanding of the load forecast was that if they didn't do something, they would run out of power.

MR. LEARMONTH: Right.

DR. LOCKE: Right? So –

MR. LEARMONTH: Okay.

DR. LOCKE: So conditional on that they were able to meet the needs at the most economic way possible, then money that went into this project could have went to this other project, yes. Or they didn't have to borrow as much, sure.

MR. LEARMONTH: Okay.

Okay, those are my questions. Thank you very much, Dr. Locke.

DR. LOCKE: Thank you.

THE COMMISSIONER: All right, the Province of Newfoundland and Labrador?

MR. RALPH: No questions, Commissioner.

THE COMMISSIONER: Nalcor Energy.

MR. SIMMONS: Thank you, Commissioner.

Good morning, Mr. Locke, I'm Dan Simmons and I'm the counsel for Nalcor Energy here. I won't be very long with you today.

Can I bring you first to your presentation P-00317 and back to page 5.

DR. LOCKE: Page 5?

MR. SIMMONS: Yes, please.

Mr. Learmonth asked you a number questions here about the information you disclosed about your other work that you'd done for Nalcor Energy. And, on this slide, what you disclosed here was that you directly or indirectly had been involved in work, benefits analysis that was used in the environmental assessment process, the presentation before the Joint Review Panel – I think that's what's referred to here; is it?

DR. LOCKE: Economic impacts.

MR. SIMMONS: Economic impacts.

DR. LOCKE: Yes.

MR. SIMMONS: Okay.

And my question is: Of the other types of work that you'd done for Nalcor Energy, up to this time, was this the particular work that was most closely related to the subject matter of your presentation and your analysis?

DR. LOCKE: This is the only kind of work we've done for Nalcor – so, yes.

MR. SIMMONS: So, were you satisfied then that when you made this disclosure that you were informing your audience of what your prior involvement had been in relation to the very things you were going to be speaking about in the presentation?

DR. LOCKE: I was satisfied, yes. And the reason it came up is because there was an ongoing campaign in the open- line shows and everything else that was going on at the time to discredit my reputation – not what I was saying, but discredit my reputation as being a spokesman for Nalcor, which I was not. I tried to

explain that in the presentation; I was spokesman for nobody but Wade Locke.

MR. SIMMONS: Good.

Can you go to page 21, please, of the presentation?

When looking at this slide, you were asked a number of questions about the PIRA fuel forecasts, which was for a 20-year period, I think, and then the extension of that forecast in order to do a longer analysis for the CPW –

DR. LOCKE: True.

MR. SIMMONS: – analysis and I have a note that you said that projections for oil prices are risky but necessary.

DR. LOCKE: True.

MR. SIMMONS: So my question is: Why are the necessary? What were you thinking of when you said that?

DR. LOCKE: Well, when you invest today in anything, whether it's hydroelectricity or oil, you have to have some understanding of not only the cost and the prices today but what they will be when you sell your output, and it is necessary in terms of it's risky, no doubt about it. So you're investing money now in order to extract revenue later.

In order to know what revenue you might expect later, you have to project prices. So if that's true for oil and gas projects, it's true for electricity projects.

MR. SIMMONS: So in projecting prices far into the future, I think you said that the farther ahead you look, the greater the risk that you're going to be wrong.

DR. LOCKE: You're going to be wrong no matter what, so that's not an issue. But the further in the future you go –

MR. SIMMONS: Okay.

DR. LOCKE: – the more likely you are to come up with a number that's different.

MR. SIMMONS: So, my question then is: In doing an analysis of projects like this where the comparison that was done was to compare the present value of all the costs associated with going the Muskrat Falls and transmission line route versus remaining an Isolated Island system and adding generation as needed from other sources, in doing that, is there some way to do that that doesn't require some kind of projection for what future oil prices are going to be?

DR. LOCKE: None that I'm aware of.

MR. SIMMONS: Can we look at Exhibit P-00427, please?

I don't know which tab that is.

DR. LOCKE: Okay. I know – P-00427.

MR. SIMMONS: That's the –

MS. O'BRIEN: Tab 16.

DR. LOCKE: Sixteen, okay.

MR. SIMMONS: Oh, I might have the wrong one.

Yeah, I've referred to the wrong one there.

DR. LOCKE: Which one do you want?

MR. SIMMONS: I'm looking for the email that had the excerpt from *The Telegram* article from the day after your presentation. I can probably ask you the question without referring to the message.

DR. LOCKE: Okay.

MR. SIMMONS: So my understanding is that you gave your presentation at the Harris Centre and the next day there was a Telegram newspaper report with quotes from you that Mr. Learmonth took you to in which you appeared to say I may have made a mistake; I might not have taken into account the cost of all the transmission aspect of the project.

DR. LOCKE: What I said was that I didn't include in my analysis –

MR. SIMMONS: Yes.

DR. LOCKE: – a price estimate for transmission.

MR. SIMMONS: Yes.

DR. LOCKE: Included in the analysis for the CPW was the transmission cost, because that's what Nalcor included. So, when I made that statement, Mr. Bennett did call me and say hey, by the way, that is in there. And I said: Oh, I'm sorry. And then I corrected that with – James McLeod, I think, was the reporter at the time.

MR. SIMMONS: Right.

So, had that been left uncorrected at the point where *The Telegram* article had been publicly made available, had that not been corrected, would the information left on the record have been that the transmission cost was missed in comparing the Interconnected Island case to the Isolated Island case?

DR. LOCKE: That's an inference people could draw –

MR. SIMMONS: Right.

DR. LOCKE: – and so I was happy to correct – I was embarrassed to have it pointed out to me.

MR. SIMMONS: Yes.

DR. LOCKE: I was happy to correct it –

MR. SIMMONS: Right.

DR. LOCKE: – because I think it's important when you're going to criticize something, you at least have full information.

MR. SIMMONS: So, my question then is: Were you surprised at all with someone from Nalcor would want to draw that to your attention to make sure that the public record was corrected?

DR. LOCKE: No, I would do the same thing. I mean if someone was using data that we had put out there –

MR. SIMMONS: Mm-hmm.

DR. LOCKE: – and they misinterpreted the data, I would help them understand that they misinterpreted it.

MR. SIMMONS: Right.

So, did you see anything at all improper with Mr. Bennett contacting you to bring that to your attention?

DR. LOCKE: I did not. As I said, it was embarrassing but – and I did apologize to everybody concerned, including the reporter. And I went and recalculated something and sent it off to Mr. James McLeod, and to David Cochrane at the time as well because we were doing an interview with the *On Point*, or whatever, the show he had at that point in time.

MR. SIMMONS: Yeah.

DR. LOCKE: And he did acknowledge that Dr. Feehan did recognize and did acknowledge that those numbers were in the CPW at the time.

MR. SIMMONS: Thank you very much.

I don't have any other questions.

THE COMMISSIONER: Concerned Citizens Coalition.

MR. BUDDEN: Good morning again, Dr. Locke.

DR. LOCKE: Good morning.

MR. BUDDEN: As you will recall, we spoke a few minutes ago. My name is Geoff Budden; I'm a lawyer for the Concerned Citizens Coalition and I have a few questions for you today as well.

I'd like to start with a comment you made to Mr. Learmonth – and correct me if I'm wrong but, in my notes, what I wrote down was – and he was asking about your January 2012 presentation and you said: As a general rule, any cost that Nalcor put forward publicly would have been taken as a given.

DR. LOCKE: In terms of capital and operating costs, yes.

MR. BUDDEN: Okay.

And, in other respects, with the Nalcor numbers that you worked with in the January 2012 presentation, did you take those numbers as a given?

DR. LOCKE: No, I mean I attempted to replicate their 7.85 number – 7.6 cents per kilowatt hour number based upon what they had indicated they had done. So if you could look at my presentation – I’m not sure what one that is, but if you go to my presentation, I go down through –

MR. BUDDEN: Where are you to?

DR. LOCKE: I’m on 00317, Exhibit 00317, and I’m on page 7.

THE COMMISSIONER: Tab 7.

DR. LOCKE: Page 7? Yeah, page 7.

So these things here, the first, second, third, fourth, fifth, sixth, et cetera, was my attempt to use the information that I had available to me – that was publicly available information that I was aware of anyway. And I attempted to try to replicate that these indeed were the case, to get down to the number they said was the number – was for the generation, the 7.6 cents per kilowatt hour.

MR. BUDDEN: Okay.

DR. LOCKE: Right?

MR. BUDDEN: Okay.

You were aware at this point in January 2012 of Mr. Vardy’s Action Canada paper. You’re obviously aware of that.

DR. LOCKE: I was.

MR. BUDDEN: And you’re aware that he had raised concerns about some of the numbers Nalcor was using such as the demand projections for the Island future fuel costs. You were aware he’d raised those concerns in his Action Canada paper.

DR. LOCKE: I was aware but there was no analysis in Dr. Vardy’s paper with respect to that. It was just a statement.

MR. BUDDEN: Okay, but he had raised those concerns.

DR. LOCKE: He had made that statement, yes.

MR. BUDDEN: Yes.

And, Dr. Feehan, of course, had also presented a paper about a year before your presentation to the C. D. Howe Institute, as was referred to earlier. And he also raised some concerns about the economics, I guess, the numbers Nalcor was using.

DR. LOCKE: A year before?

MR. BUDDEN: Pardon?

DR. LOCKE: You said a year before?

MR. BUDDEN: Yes, his paper to the C. D. – or his presentation to the C. D. Howe Institute of January 2011, a year before your own presentation, he also had raised concerns about –

DR. LOCKE: Okay.

MR. BUDDEN: – some of Nalcor’s numbers.

DR. LOCKE: I don’t recall that paper but, okay.

MR. BUDDEN: Pardon?

DR. LOCKE: I don’t recall that paper but ...

MR. BUDDEN: Okay.

And you’re aware as well, of course, that the Joint Review Panel had concluded that the – Nalcor’s analysis that purported to show that Muskrat Falls was the least-cost option for domestic power production for Newfoundland was found to be inadequate.

DR. LOCKE: They had called for an independent review and their view that Gull was a more preferred option.

MR. BUDDEN: But, they, in dealing with Muskrat Falls – we can call up the exhibit but I'd suggest to you that that panel found that Nalcor's analysis of Muskrat Falls was found to be inadequate in terms of the information they relied on and the projections they made.

DR. LOCKE: Maybe you should call up the exhibit so we can have a look specifically at what you're referring to, please.

MR. BUDDEN: Okay, sure. It's Exhibit 00041, page 68.

Scroll down a little farther, please? Oh, I'm sorry, not that far, still on page 68.

Yes, what's in the boldface there, perhaps you could read that.

DR. LOCKE: This box?

MR. BUDDEN: Yes, the panel concludes.

DR. LOCKE: "The Panel concludes that Nalcor's analysis that showed Muskrat Falls to be the best and least cost way to meet domestic ... requirements is inadequate and an independent analysis of economic, energy and broad-based environmental considerations of alternatives is required."

Okay.

MR. BUDDEN: So I guess to repeat my question: You would acknowledge that the Joint Review Panel, some months before your own paper, had found that analysis to be inadequate.

DR. LOCKE: That's the statement there, yes.

MR. BUDDEN: Yes.

And you spoke a moment ago that you had – after this presentation you didn't wish to return to Muskrat Falls because of the reaction you received. But if I understand correctly you did at other presentations later in 2012, repeat to – perhaps to a lesser degree, but you did repeat your analysis and repeated that you found Muskrat Falls to be the least-cost alternative for Newfoundland. You recall that, I presume?

DR. LOCKE: I don't recall, but if you want to show me the presentation, I would be happy to react to it.

MR. BUDDEN: Okay, well, my understanding is that at MUN's reunion 2012, in August 2012 and Genworth Canada in December 2012. Do you recall those presentations?

DR. LOCKE: Not specifically but I'm not doubting I did them, yeah.

MR. BUDDEN: Okay.

And you do not recall that at those presentations you repeated your analysis that Muskrat Falls was the least-cost option?

DR. LOCKE: I would be surprised if I repeated my analysis in those presentations, but if you have a copy of it, I'm happy to have a look at it.

MR. BUDDEN: Okay. They have been entered as exhibits so we can move on.

DR. LOCKE: Okay.

MR. BUDDEN: But that's –

DR. LOCKE: I'm happy to see the exhibits if –

MR. BUDDEN: Okay, well –

DR. LOCKE: And react to them, if you want.

MR. BUDDEN: If necessary, we can go there.

DR. LOCKE: Sure.

MR. BUDDEN: A couple months after your presentation, but before these other – I would suggest these other presentations, you are aware that the Public Utilities Board had concluded that – quote: The information provided by Nalcor is not detailed, complete or current enough to determine whether Muskrat Falls or the Isolated Island Option represented the least-cost option.

DR. LOCKE: I was aware that they needed more time to complete their analysis, yeah.

MR. BUDDEN: Okay.

And perhaps we can go to Exhibit P-00014, Madam Clerk? And it's page 34 that I'm looking at, or wish to look at. This, for your benefit, Dr. Locke, is the Forensic Audit that has been completed by Grant Thornton and which was entered as an exhibit and the authors of it questioned about two weeks ago.

DR. LOCKE: Sure.

MR. BUDDEN: And I'm interested in the section: "Review of macro-economic inputs and other sources." And perhaps you can just read lines 4 through 7, just to set it up a bit.

DR. LOCKE: Sure.

"Nalcor applied numerous macro-economic variables within their econometric model, such as gross domestic product ('GDP'), personal disposable income ('PDI'), population and average housing starts" and there's a footnote there.

"We compared forecasts prepared by the CBOC, an independent and evidence-based group of experts in forecasting and economic analysis with Nalcor's forecasts prepared during the same time."

MR. BUDDEN: Okay, so as a starting point, you, as an economist, obviously would be familiar with the concept of macro-economic analysis and these particular indicia of future economic growth that are referred to here: CBOC and so forth.

DR. LOCKE: Yes.

MR. BUDDEN: Okay.

Well, perhaps we could scroll down to lines 10 and 11 and read those, please.

DR. LOCKE: Ten and 11?

MR. BUDDEN: Yes.

DR. LOCKE: CBOC, Conference Board of Canada, projected housing starts during 2027 to 2031 from 826 to 530 units – footnote 115 – a

36 per cent decrease respectively, while – what's respectively mean there? Okay.

MR. BUDDEN: Well, Nalcor –

DR. LOCKE: Oh, yeah. No, I get it. Okay.

MR. BUDDEN: Yeah.

DR. LOCKE: So (inaudible) so okay – while Nalcor had projected 1,505 to 1,230 units, 18 per cent decrease respectively.

MR. BUDDEN: Okay.

And the next one, lines 12 through 14, perhaps to save time I won't have you read it, but you would agree that in that –

DR. LOCKE: I'm not a fast reader?

MR. BUDDEN: Pardon?

DR. LOCKE: I'm not a fast reader?

MR. BUDDEN: You're doing just fine, but – ah, read it, read lines 12 to 14.

DR. LOCKE: The population projected from CBOC for the period of 2027 to 2031 decreased approximately 489,000 [sp 498,000] to 486,000, 2 per cent decrease respectively, while Nalcor maintained consistent projections approximately 513,000 population per year since 2018, footnote 118.

MR. BUDDEN: Okay, so both of these indicia, the Conference Board of Canada on the one hand and Nalcor on the other hand –

DR. LOCKE: Yes.

MR. BUDDEN: – you would agree that Nalcor's predictions for Newfoundland's housing starts and population were significantly rosier than were the more conservative CBOC figures.

DR. LOCKE: What I would agree is that they're different.

MR. BUDDEN: But surely you would agree that the more optimistic, you're anticipating

greater growth in housing, a greater number of housing starts, greater population growth.

DR. LOCKE: Well, the greater.

MR. BUDDEN: Yeah.

DR. LOCKE: Optimistic has a connotation to it –

MR. BUDDEN: Okay.

DR. LOCKE: – that we might not agree to, right?

MR. BUDDEN: Okay, well, if you're –

DR. LOCKE: So it is the case that there's a difference and the difference is that right now the Conference Board of Canada – I don't know the context of these numbers so you have to put that in context of when they did it and how they did it, what they took into account – is different and the numbers for Nalcor that were used, according to this statement, were higher, yes.

MR. BUDDEN: Mm-hmm.

In the context of –

MR. T. WILLIAMS: Mr. Commissioner, if I could, I'd have some concerns. I raised these on Fridays when we have a witness on the stand and they're being taken down different paths, other than the evidence they've submitted.

My understanding was that counsel call this witness for the purposes of his presentation before the Harris group and that's what the direct examination. We're now into an analysis of the Grant Thornton findings and if this is going to be permitted, then I just wonder what the scope of the examination of witnesses is going to be if we're now asking a gentleman who's not called on the Grant Thornton report to start commenting on those issues.

THE COMMISSIONER: Mr. Budden.

MR. BUDDEN: The next question was going to be to do with the fact that the – what I was actually saying when I was interrupted: Was this witness aware that these figures were being used to determine demand which, obviously, is a key

component of the figures that Nalcor was using to calculate their numbers which he has relied on. The point, obviously, where I'm going with this, is to examine what use he made of these numbers and how critically he examined them. I'm just about done this line of questioning.

THE COMMISSIONER: So, as I understand it, you're not asking him per se about the Grant Thornton report, what you're doing is you're presenting a context to him and now you want to ask him a question related to ...

Perhaps you could have done it a little quicker, but I'll let you go ahead and ask your question.

MR. BUDDEN: I'm trying. Yes, that is what I was doing.

So, I suggest to you, Dr. Locke, that these figures that are set out here in the Grant Thornton report are – were figures that Nalcor used. And if you read the whole thing it's obvious from the context to calculate demand projections for the Island of Newfoundland.

DR. LOCKE: That's my understanding. I don't know if these specific numbers were used but, yes.

MR. BUDDEN: And the demand projections in turn were a key element to determining other costs such as fuel costs, the whole bundle of factors that determine the cost of delivering future power needs to the Isolated Island of Newfoundland.

DR. LOCKE: If you're projecting higher demand, it will have implications for other factors, yes.

MR. BUDDEN: Okay.

And one of those – essentially, they would make the Isolated Island Option a more expensive option than it would be if you were projecting lower demand.

DR. LOCKE: We don't know that to be the case.

MR. BUDDEN: Did you deny that that's the case?

DR. LOCKE: I'm not denying or – I haven't done an analysis on it so I don't know that to be the case.

MR. BUDDEN: Okay.

DR. LOCKE: What you should be aware of, Counsellor, is that, well, this is not my evidence. When you have numbers that are different like this 825 – 826 to 530 versus 1,505 to 1,230, when you do your regression analysis was what they would have done, those differences would have been picked up in terms of the size of the coefficient.

So it's not at all clear whether or not these differences in absolute values would have been reflected in differences in actual demand. The estimated coefficient would have been different, right? So it may or may not be the case, you'd have to go back and look at it specifically and I haven't done that.

MR. BUDDEN: Okay, we can help you out a bit there. We've heard evidence from the gentleman who did these forecasts and his evidence was he relied on the GN numbers rather than on the CPOC numbers. And I'm suggesting to you that if there's a pattern here of Nalcor relying on numbers which would suggest a higher demand, that would result – that would carry through to make the Island Option a more expensive option. You would agree with me so far?

DR. LOCKE: No, I would not, Sir.

MR. BUDDEN: No?

DR. LOCKE: And let me be a little more clear with you: The fact that the absolute numbers – like 826 versus 1,505 – is a different number, doesn't necessarily imply that the estimated demand will be a different number, okay? It comes down to that the coefficient will adjust accordingly.

That's the problem when people do elasticity studies or projections. If you don't do it correctly what'll happen is that you'll get a number. It's no problem – we have all kinds of sophisticated software that will give numbers. They may not be – they may – you know, the fact that you can think through logically that,

you know, 826 is different than 1,505, when you put these things in and you estimate the differences and how the differences in the dependent variable change in response to the differences in the independent variable, these may or may not generate the same difference in demand, okay?

So it's not a straightforward answer. I get the logic. It's –

MR. BUDDEN: Okay.

DR. LOCKE: – not straightforward that these will necessarily translate into a higher or lower demand. It'll depend upon specifically what was done and what would have been put into the regression equation with – if we used the Conference Board or others, okay?

So that's a separate analysis that people at Nalcor could do for you or that your colleagues could do for you. There's lots of people who can do this kind of stuff, right? We're in a process right now at the department doing a full – a comprehensive economic analysis of the demand for energy in Newfoundland, including an elasticity study and doing it correctly.

MR. BUDDEN: So if you were to have seen these numbers and have seen that Nalcor was using the number that would suggest a higher population, more housing starts and consistently using those numbers, it would not lead you to have any concerns at all that the demand may be overstated?

DR. LOCKE: The individual who did the analysis, I'm comfortable with his qualifications. He's been doing this for years. If you have concerns with the numbers that the Department of Finance provided to Nalcor and that they may have biased, for example, the results, if that's your – if that's the insinuation you're putting forward or suggestion you're putting forward, then you should talk to the Department of Finance about what they actually did.

The logic that you're putting forward doesn't necessarily follow. It might be correct but doesn't necessarily follow.

MR. BUDDEN: Yeah.

DR. LOCKE: What you need –

MR. BUDDEN: That’s interesting –

DR. LOCKE: What you need –

MR. BUDDEN: – but you didn’t answer my question, not at all.

DR. LOCKE: Okay.

THE COMMISSIONER: So maybe you could ask –

DR. LOCKE: Well, please ask it again.

THE COMMISSIONER: Just repeat the question and –

MR. BUDDEN: Okay.

THE COMMISSIONER: – we’ll try to get an answer to the question.

MR. BUDDEN: My question is if you were to have seen these numbers, to see that Nalcor consistently chose numbers in their load projection forecast that would suggest a higher forecast, would that not give you a concern that these numbers might be overstated, the demand numbers?

DR. LOCKE: In a hypothetical context the answer is, yes, but there’s –

MR. BUDDEN: Okay.

DR. LOCKE: – nothing what you told me so far that would make that hypothetical correct.

MR. BUDDEN: Okay.

I’ve made you aware, to the degree you weren’t already, that a number of other individuals and institutions had looked at the Nalcor Muskrat Falls projections, and we’ve seen ourselves a pattern of selecting numbers to make a forecast on. And we’re not –

DR. LOCKE: (Inaudible.)

MR. BUDDEN: – talking here of individuals who are being disrespectful or anything. These, you would agree, are credible analysis –

analysts: Jim Feehan, David Vardy and so forth. I mean these are not the people that you talk about as making insulting comments; this is a very respectful debate to this point. You would agree?

DR. LOCKE: Sorry, you’re going to need to ask your question again because the first part I missed.

MR. BUDDEN: Okay, fair enough. I lost my thread.

What I’m suggesting to you is that the individuals who commented on Muskrat Falls in 2011 or thereabouts, David Vardy, Jim Feehan, raised concerns about the numbers, about the process Nalcor used. The Joint Review Panel had a similar concern a little later, so did the Public Utilities Board. What concerns did that give you about the veracity of the Nalcor numbers?

DR. LOCKE: I sat down with Mr. Goudie and Mr. Stratton, as part of a larger group, and I was comfortable, after they explained to me exactly what they did, how they did it, and I was okay with their analysis.

The fact that their forecast might be wrong, as we saw now, the numbers that are forecast now since Stan Marshall took over, are definitely lower than they were then. And that, presumably, is based upon different parameters they’re plugging into the value for GDP and PDI and all those kind of factors. So, obviously, if you use different numbers you’ll get a different result.

MR. BUDDEN: Yeah.

I’m confused. Earlier you said you took the Nalcor numbers at face value, now you’re saying you sat down with Mr. Stratton, the load forecaster and some of the other individuals – Mr. Goudie, his supervisor at the time, I believe – and walked through those numbers. Which is it?

DR. LOCKE: Well, it’s both.

MR. BUDDEN: Could you explain?

DR. LOCKE: Sure.

I wanted to make sure I was comfortable with what I saw. And I was, after talking to them and going through a lot of information with them. So, yeah, so on face value they're there and unchanged by me, but in order to be able to come to that conclusion, I sat down with them and many others at Nalcor to understand exactly what they did. I didn't assume at the start everything was fine.

MR. BUDDEN: So are you saying you subjected the Nalcor numbers to a critical examination?

DR. LOCKE: What I'm saying is that I sat down with them and tried to understand exactly what they did. And I was comfortable that they had the experience, and the professional expertise and the motivation to do the right thing in terms of providing as accurate a forecast as I could. That's what I'm saying to you.

MR. BUDDEN: Okay.

Perhaps we could turn, at this point, to Exhibit P-00315.

DR. LOCKE: That in my binder?

MR. BUDDEN: I believe it is but I'm not sure what tab it is.

THE COMMISSIONER: 00315.

MR. BUDDEN: Tab 5, Dr. Locke.

DR. LOCKE: Okay.

MR. BUDDEN: This, I understand, is an email you sent to Mr. Bown, the – not long after, just a few hours after, if I'm correct, that Dr. Vardy advised you that he did not wish to participate in the debate with you. Am I correct on that?

DR. LOCKE: Yes, it appears to be correct, yes.

MR. BUDDEN: Okay.

Why would you have sent this to Mr. Bown and what do you make of his reaction?

DR. LOCKE: Well, like most people one day understand that David Vardy was supposed to be involved in the debate and then chose not to be,

within – and this was the day after we had a meeting and, yeah, wow was the right response. It took me a while to appreciate what had happened there as well.

MR. BUDDEN: Who?

DR. LOCKE: But the reason I sent it to Charles Bown is that I would assume – I know Charles Bown quite well – I would assume that I wanted him to understand that because he was a conduit or someone who I would have spoken to in order to get access to people at Nalcor.

I wouldn't have had personal access to Ed Martin or to Gilbert Bennett or to Dawn Dalley for that matter. My exposure to Nalcor would have been through Strategic Concepts and they would have dealt with Nalcor, just so we get a sense of that. But when I took this on, even the debate with David, I needed to have – being able to talk to somebody down there. So when this was no longer going to be a debate I felt an obligation to let Charles know that.

MR. BUDDEN: So walk me through a bit, because I'm confused.

DR. LOCKE: Yup.

MR. BUDDEN: You – whose idea was it to have this debate with Mr. Vardy?

DR. LOCKE: Both mine and David Vardy's.

MR. BUDDEN: Okay, who proposed it? Was it you or David?

DR. LOCKE: I would've proposed it based upon his Action Canada report. As I said previously, I had done some work for Action Canada, so when another Action Canada report came out I thought, okay, that's interesting.

MR. BUDDEN: Okay.

DR. LOCKE: Then I read it and I knew the three authors that were there: one was Storey, one was Larry Felt and one was David. And I read it and it didn't accord with my understanding –

MR. BUDDEN: Okay.

DR. LOCKE: – of the project.

MR. BUDDEN: So walk me through the process that – you read the paper, you reached out to David. Between reading the paper and reaching out to Mr. Vardy, did you raise the prospect of a debate with Mr. Bown?

DR. LOCKE: Most likely, yes.

MR. BUDDEN: Okay.

So you would have read the paper, called up Mr. Bown – who was Mr. Bown at this time?

DR. LOCKE: He would've been deputy minister of Natural Resources, I think.

MR. BUDDEN: Okay, so you reached out to the deputy minister of Natural Resources, who you know quite well, and said: I'm going to debate David Vardy on the Muskrat Falls issue.

DR. LOCKE: I don't know what would've been said to him but that would be –

MR. BUDDEN: Something like that.

DR. LOCKE: It wouldn't be out of the realm of that, yeah.

MR. BUDDEN: And you proposed, or did he propose, that you then reach out to Nalcor to properly inform yourself to go into this debate with Mr. Vardy?

DR. LOCKE: I would have suspected I would have done that –

MR. BUDDEN: So you just called –

DR. LOCKE: – because that would have been the normal operating strategy for myself. But I mean, look, I wouldn't have had access – you know, despite what people think, I mean I don't have access to a lot of people.

MR. BUDDEN: Got access to the deputy minister.

DR. LOCKE: Oh yes.

MR. BUDDEN: Okay.

DR. LOCKE: He was a student of mine. But, I mean, as you saw from the exhibit there, we did a lot of work for mines and energy years ago and I would have known Charles quite well from that.

MR. BUDDEN: Okay.

Did you receive any remuneration whatsoever for preparing for or participating in this proposed date?

DR. LOCKE: No.

MR. BUDDEN: Okay.

You're certain of that?

DR. LOCKE: Hundred per cent certain of that.

MR. BUDDEN: Okay.

You have taken great offence to some of the things that people have said about you essentially being a spokesperson for Nalcor, you find that offensive.

DR. LOCKE: I wasn't a spokesperson for Nalcor. I didn't necessarily find it offensive. What I found offensive was some of the personal comments about me. And I was hurt by it but, you know, I've learned to live with it and, you know, move on.

MR. BUDDEN: Okay.

Do you believe – I mean at the time, this was a different time. We're looking at this from years later, which is hindsight and, you know, we're all fortunate, other than you perhaps, who are being examined on things you said and did in those days. But do you think in hindsight, perhaps, that you got caught up in advocating for something you believed, and in many ways became an advocate for the project?

DR. LOCKE: I wasn't an advocate for the project. What I did do is go through an assessment. And based on the assessment, my conclusion was that when I looked at everything combined, this appeared to be the least-cost one. As I said to people at the time, these are my honestly held beliefs. You don't have to agree

with them, okay? That's – you know, no one has to agree with me.

You can give it whatever way you want, including the zero. If you – like I say, if you got two hours and 10 minutes, go through the video. You'll see very clearly that I have been very clear with people about what weight they should attach to things. This is an attempt to do what I do – normally when a project – when things come up that I think are important for the public to know about is I will engage and do public presentations and provide that information publicly.

MR. BUDDEN: Okay.

You had a number of points and we received, as you know, background material for this, not all of which ends up in exhibits. But it's obvious and a number of public presentations you talk about, with real conviction, your sense of yourself as an economist, as a person with a certain duty to engage with the public, to inform the public about these complex issues that most of us don't understand. Do you think that's a fair assessment of how you saw yourself in these years?

DR. LOCKE: I see myself as a real economist and as someone who has a responsibility to provide some of my intellectual capital to help people understand issues better. And so, yeah, I feel privileged to be at the university. I used to work in the mines years ago and nobody in my family went to university; I was really privileged to get a job here.

MR. BUDDEN: Okay.

DR. LOCKE: And so having done that, I know I'm in a privileged position. And I think I have a responsibility, as part of that, to come here and testify, as well to provide for the public information that I've thought about as well as I can do, even if it's wrong, to provide – to help individuals make better informed decisions.

MR. BUDDEN: And every time you speak in public as an economist, you're essentially spending that intellectual capital. You agree with me there?

DR. LOCKE: I'm not spending it, I am investing in it. So every time we talk and I run into a lawyer like you and you challenge me on some things, I learn from that.

MR. BUDDEN: Okay.

DR. LOCKE: So that's part of an investment, but it's part of responsibility as well.

MR. BUDDEN: What have you learned from your engagement with the Muskrat Falls Project? I'm not talking about having to deal with the personal attacks – that's unpleasant – but what have you learned as an intellectual about your engagement with Muskrat Falls, how you analyzed, how you presented?

DR. LOCKE: Well, I'm okay with how I analyzed and presented. What I'm not okay with is the personal attacks that have come along, and how that sends a message to young academics at the university, so that unless you're going to be on the popular side, that's popular with a whole pile of people, you're going to be attacked.

So what you should do, if you're an academic at university, is address issues that will get you promoted and get you tenured. And those are not the kinds of issues that I've been spending my time on.

MR. BUDDEN: Okay.

DR. LOCKE: And so what I've learned is that if I had my time back I would not have got involved in this here because of the nastiness that's involved in this particular project, and that really is unfortunate. And that's true for all parties, not just true for a particular group. And so, if any, I learned is listen to my wife. She said: Don't do it. I shouldn't have did it.

MR. BUDDEN: You were, at the same time that you were doing these presentations on Muskrat Falls, I'm thinking 2011, 2012 – you're also advocating for an applied economic research institute for Memorial. I'm correct on that.

DR. LOCKE: Not advocating, we – the first session, the presentation was jointly sponsored by what turned into be CARE –

MR. BUDDEN: Yes.

DR. LOCKE: – but was ...

It took us a while to get an (inaudible) an accurate acronym because we wanted an acronym you could remember. CARE people can remember; applied research initiative is not something they would remember easily. So –

MR. BUDDEN: So it's Collaborative Applied Research of – and you're one of the administrators and always have been of CARE?

DR. LOCKE: I'm a principal investigator.

MR. BUDDEN: Sure.

DR. LOCKE: I'm not an administrator, no.

MR. BUDDEN: Okay.

And the Government of Newfoundland and Labrador is one of the funders of CARE, along with some private enterprises.

DR. LOCKE: The funders of CARE would be the university. I mean, CARE is in the second stage of funding right now, right? I was supposed to have a meeting with the Minister of Finance to talk about –

MR. BUDDEN: To answer my question –

DR. LOCKE: Okay.

MR. BUDDEN: – the Government of Newfoundland and Labrador was and is one of the funders of CARE.

DR. LOCKE: Was one of the funders. When Mrs. Bennett came into play she cancelled any funding we had, even though we had a contract. But –

MR. BUDDEN: Yes.

During these years, 2011, 2012 in particular – and please think carefully about your answer – were you requesting funding from either Nalcor or the Government of Newfoundland for this CARE – what became the CARE initiative?

DR. LOCKE: We have received funding from both, yeah. And I would assume that, yeah, we would have requested, yes.

MR. BUDDEN: Okay, so –

DR. LOCKE: So Nalcor would have given us the funding to grow the capacity to do research by our students and by our faculty. So if you wanted to go to an energy conference for oil and gas, there was money available for that, yes.

MR. BUDDEN: Okay.

So even as you're extensively participating in a debate – or participating in a debate, a public debate as an independent economist, you were, as you've said, receiving funding from Nalcor in your personal capacity for contracts you're doing, but also soliciting funding from Nalcor for this CARE initiative.

DR. LOCKE: No, I don't know if that's true or not. We –

MR. BUDDEN: In what respect is it not true?

DR. LOCKE: Well, I don't know when Nalcor was asked for funding for CARE. It may have been in 2012, it may have been before. I'd be surprised if it was during the debate, but I don't know. We would have requested funding – and people like CARE and it is something that we were happy to do.

MR. BUDDEN: Okay.

DR. LOCKE: Nobody received a salary from CARE, just so you understand that. It was meant to hire students and to facilitate research.

MR. BUDDEN: Okay. I have no further questions.

Thank you.

DR. LOCKE: Thank you.

THE COMMISSIONER: Thank you.

Edmund Martin?

MR. SMITH: No questions, Mr. Commissioner.

THE COMMISSIONER: Kathy Dunderdale?

MS. E. BEST: Good morning, Dr. Locke. I'm Erin Best, I'm counsel –

DR. LOCKE: Good Morning.

MS. E. BEST: – for Kathy Dunderdale.

I should only have one question for you this morning. Near the beginning of your testimony here today you described a meeting with Dave Vardy where you pointed out or suggested that he might need to clarify some of his arguments or citations. And then sometime after this meeting he withdrew from the debate, correct?

DR. LOCKE: The next morning, yeah.

MS. E. BEST: Okay.

So my question for you is: I wonder if you can recall which aspects of Dave Vardy's arguments required clarification?

DR. LOCKE: I cannot, I'm sorry.

MS. E. BEST: Okay.

Okay, thank you.

THE COMMISSIONER: Former Provincial Government Officials '03 to '15?

MR. T. WILLIAMS: Good day, Dr. Locke.

Tom Williams, I represent the former government officials for the period of 2003 to 2015 – I should say elected officials and with the exception of former Premier Dunderdale who Ms. Best represents.

So we've talked a lot about your report and your analysis at that point in time. I'm just wondering, given your closeness to this topic, are you able to offer any opinion as to what you see are the benefits to the province from your analysis of this project in terms of either direct benefits, indirect benefits, spin offs from the Muskrat Falls Project?

DR. LOCKE: Well, there would've been employment, there would've been income, there would've been taxes, as well as dividends to be

paid. And if the numbers that were available at the time were accurate, it would've meant that they would've been able to provide the electricity at a lower price, as well as sell or make available electricity for economic development. It would've been meant that there's a reduction in greenhouse gases. So all those things – specifically, I can't tell you what the numbers are.

MR. T. WILLIAMS: Okay.

DR. LOCKE: Because if I had known that was a question, I would've prepared for it. But I'm prepared for the questions I thought were coming, but that's not what I prepared for. But there would've been these kinds of impacts.

MR. T. WILLIAMS: And would you – in your – having looked at numbers previously, would these be of a significant nature?

DR. LOCKE: Sure. I mean, right now, if you didn't have Muskrat Falls for the last little while, you would've had a huge increase in unemployment here in the province, and that would've had consequences for everybody concerned.

MR. T. WILLIAMS: There's been some discussions with respect to the difference of opinions that's between you and Dr. Feehan in respect to this project and I would just like to touch on base. He has recently been attributed with a comment stating that the Muskrat Falls Project wouldn't pass a test at a second- to a third-year economics level. What's your reaction to that comment?

DR. LOCKE: That has no meaning. I mean, that's just a statement designed to – I don't know what it's designed to do. It has no meaning.

We don't test Muskrat Falls at the introductory level, at the intermediate level and at the senior level in economics so it's a vacuous statement. It's designed to – well, I don't know what it's designed to do. You'll have to ask Dr. Feehan when you see him this afternoon.

MR. T. WILLIAMS: Okay.

And as the head of the economics department at Memorial University, would you attribute any weight to a comment like that from an individual?

DR. LOCKE: I think it's a reckless comment but, you know, people are entitled to make their comments.

MR. T. WILLIAMS: Okay.

DR. LOCKE: It's a matter of an opinion.

MR. T. WILLIAMS: With respect to – there's been some evidence called with respect to your past company's project history and work in contracts. Have you done work for other governments, other than the Progressive Conservative government at the time?

DR. LOCKE: Yes.

MR. T. WILLIAMS: And when would they have been? Because the exhibit that put up was very selectively – was between 2003 and 2015. I think we only had six months of 2016. So there's another 150 months; so it was just one period. Have you done work for other administrations, previously?

DR. LOCKE: Yes.

MR. T. WILLIAMS: Do you do a wide range of economic analysis for a number of groups?

DR. LOCKE: Yes.

MR. T. WILLIAMS: As a professional, would you allow your opinion to be weighed or swayed by the fact that you were doing work for a particular client, whether you were hired by that client or not?

DR. LOCKE: No.

MR. T. WILLIAMS: Do you continue to work in the province as an economist?

DR. LOCKE: Not now.

MR. T. WILLIAMS: And you say not now, I trust you had some negative comments. I shouldn't say negative comments, you had some very personal comments about the negative

comments that have been made with respect to your involvement in this project, and I found –

DR. LOCKE: (Inaudible.)

MR. T. WILLIAMS: – those of interest

DR. LOCKE: Sorry. Let me be clear. The last project I did was on Statoil's project. So, yes, I am still doing some work but it's minimal.

MR. T. WILLIAMS: Now, some of the critics of this project have been out in the press on numerous occasions speaking of fear and intimidation to speak out. And I thought your comments were very interesting this morning, that you being an individual who has analyzed this project – and correct me if I'm wrong – I think on the, on your cross-examination you said you wouldn't be a proponent of the project, you were just somebody who analyzed it. Is that correct?

DR. LOCKE: That is correct.

MR. T. WILLIAMS: And even a man of your stature, who has been in the community so long, did you feel somewhat intimidated by speaking out with respect to what you saw as a legitimate analysis of this project?

DR. LOCKE: I am not easily intimidated. I'm easily hurt.

MR. T. WILLIAMS: Yeah.

DR. LOCKE: And to the point I was trying to impress to the counsel, who was asking at the point in time, was that I have been hurt and my family has been hurt. That doesn't mean that I feel so intimidated I won't come to something like this to explain what I did, how I did it and why I did it; or to other kinds of things.

I'm not interested in talking to the media any more with respect to this stuff. You know, people will form their own opinions no matter what. I have been honest and forthright with everybody on what I've done and how I've done it and why I've done it because I think we have a responsibility to do it. But intimidated? No.

MR. T. WILLIAMS: Yeah.

DR. LOCKE: I'm not easily intimidated and – but hurt, yeah.

MR. T. WILLIAMS: Okay.

And the hurtful comments, who would these have been asserted by?

DR. LOCKE: I'm not going to get into individuals, but, you know – you don't need to go very far to see a lot of these comments. I'm not here to attribute anything to anybody else except what I've done.

MR. T. WILLIAMS: That's fine. I respect your comments.

Thank you.

THE COMMISSIONER: Thank you.

Julia Mullaley and Charles Bown.

MR. FITZGERALD: No questions, Commissioner.

THE COMMISSIONER: Okay.

Robert Thompson.

MR. COFFEY: My name is Bernard Coffey. Dr. Locke, you and I, of course, know each other. I represent Robert Thompson and I just have a couple of questions.

DR. LOCKE: Okay.

MR. COFFEY: The publicly – I'll begin with making an assertion. Both yourself and Dr. Feehan are trained and experienced economists.

DR. LOCKE: That's a true statement.

MR. COFFEY: On the public record, has been canvassed with you today, for the reasons you have stated publicly in the past, you felt that the Muskrat Falls Project was a more advisable choice than the Isolated Island Option.

DR. LOCKE: I think that's a reasonable characterization, yes.

MR. COFFEY: And you in doing so did acknowledge, did you not, that there was or

would be a significantly higher initial cost associated with that project?

DR. LOCKE: I'm pretty sure that's in the presentation, yes.

MR. COFFEY: Higher initial capital cost and lower operating costs.

DR. LOCKE: Yes.

MR. COFFEY: And conversely, the Isolated Island Option, if so chosen, was lower initial costs and higher operating costs over time?

DR. LOCKE: Yes.

MR. COFFEY: And would it be fair to characterize Dr. Feehan's position, publicly, as advocating for a more incremental approach than taking on a large project such as Muskrat Falls? He was a piecemeal –

DR. LOCKE: My understanding of what he's presented is, yeah, that would be a reasonable characterization, yes, but you have to talk to him about that.

MR. COFFEY: Yes, and we will be hearing from him, I think, this afternoon.

What I'm getting at is this, is that you're two gentlemen who have the same basic background in terms of your training and experience – on subject matters.

DR. LOCKE: Well, one of my areas of speciality was econometrics – Jim's area, and public finance. Jim's area is public finance and trade.

MR. COFFEY: Yes.

DR. LOCKE: So it's not about destroying the competition.

MR. COFFEY: Yeah.

DR. LOCKE: But Jim and I have worked together in the past as well, just so you know that.

MR. COFFEY: Sure. But as economists, you're both trained economists.

DR. LOCKE: We are. We both have an earned degree.

MR. COFFEY: And not only a degree, but a significant amount of experience.

DR. LOCKE: Yes.

MR. COFFEY: In relation to that, though, it's self-evident is it that both of you, being as trained as you were, could come to significantly different views on what was in the public interest.

DR. LOCKE: That's true for a lot of economics.

MR. COFFEY: Yes.

DR. LOCKE: As we say on one hand and on the other hand.

MR. COFFEY: Okay.

DR. LOCKE: That's why we do – don't have three-handed economists, is the wording we have (inaudible).

MR. COFFEY: And following on, and just the point you just made, that if there was a third or even a fourth economist who had delved into this you might have had a third and fourth different views.

DR. LOCKE: Sure.

MR. COFFEY: Now with respect to elasticity, because you have been asked about that, okay, and I think if not explicitly certainly implicitly in your presentation in January of 2012 –

DR. LOCKE: Yes.

MR. COFFEY: – it was referred to. I believe this morning even, you referred to a coefficient of elasticity of about 0.25?

DR. LOCKE: That was the implicit number that would have been in the C.D. Howe study.

MR. COFFEY: Yes.

And, as well, I think the Commission has heard here in evidence suggestions of, for example, 0.3 or somewhere – 0.35 anyway, in that vicinity.

DR. LOCKE: Mm-hmm.

MR. COFFEY: Right? Do you –

DR. LOCKE: That would be the number that Nalcor would've used at the time, yeah.

MR. COFFEY: Yes.

And as you pointed out in your January 2012 presentation, and as you, I think, reiterated here this morning, that one of the differences in positions you took with Dr. Feehan's analysis was that you felt that in order to achieve a 20 per cent reduction in demand there would have to be an 80 per cent increase in price, using a 0.25 coefficient of elasticity.

DR. LOCKE: Twenty per cent with what you're trying to get, you'd have to have an 80 per cent increase in price, yes.

MR. COFFEY: And I believe – and, in fact, on one of your slides you pointed out if there was an 80 per cent increase in electricity prices that there might be no need for more – for Holyrood. I think –

DR. LOCKE: For Muskrat Falls.

MR. COFFEY: Muskrat Falls and, in fact, I believe (inaudible).

DR. LOCKE: (Inaudible) at that point in time. And, Mr. Coffey, if you refer to the email from Dawn Dalley, I'm not sure what one it is, but we can get that –

MR. COFFEY: Yes.

DR. LOCKE: – you'll see that she goes – I ask her about what is the price elasticity or what price would be needed to flatten out demand and she does talk about 75 per cent over what they're projecting –

MR. COFFEY: Yes.

DR. LOCKE: – for the Muskrat Falls option.

MR. COFFEY: Was – as an economist, in late 2011 and early 2012, in that era, that time frame, was any – did you give any consideration to, or do you know if anyone gave any consideration to the idea that there might be a tipping point in terms of demand for electricity? There might be – because it's one thing, like a 10 per cent increase, a 2½ per cent drop, 20 per cent increase, a 5 per cent drop, that kind of thing, that's a linear relationship.

Was there any thought given to the idea that there might be a tipping point either – like an actual number tipping point?

DR. LOCKE: Other than the question I asked Ms. Dalley and her response, no, but I will draw to your attention, and to the counsels' attention, and the Commissioner's attention, that the expectation was that the price of Muskrat Falls in the long-term would be lower –

MR. COFFEY: Yes.

DR. LOCKE: – than the price of the thermal option. And so, if the (inaudible) was going to come, it would come from the thermal option not from the hydro option.

MR. COFFEY: And on that point, it would be lower – as you pointed out – into the projections, but as well associated with it that there would be certainty in terms of the price. I mean, whatever – when the capital costs were all paid – came in –

DR. LOCKE: Sure.

MR. COFFEY: – whatever they might have been, there'd be certainty associated with it.

DR. LOCKE: There would be more certainty associated with it, not certainty –

MR. COFFEY: Not complete certainty.

DR. LOCKE: But more, yes.

MR. COFFEY: But certainly you would know how much you had to pay the bondholders.

DR. LOCKE: You had more control over what the prices would be, yes.

MR. COFFEY: My final question relates to – is following on that because you've raised this, which is the aspect of this relating to the payment on equity.

DR. LOCKE: Sure.

MR. COFFEY: And you pointed out this morning that depending upon the percentage that one decides is the return on equity, the amount that has to be paid for that varies.

DR. LOCKE: It's indirectly related. The higher the return on equity –

MR. COFFEY: Yes.

DR. LOCKE: – the higher the prices, right?

MR. COFFEY: And it's within government's purview, is it not, to – as they are the beneficiary of the dividends – to forego that.

DR. LOCKE: It could have, up to a point, because there's limits to that simply because if you're borrowing, you have to be able to pay back the interest and principle that you borrow. So –

MR. COFFEY: And at this time who's the they? Who's –?

DR. LOCKE: Well, in this case, it would be from the project. So, unless we do some mitigation measures, it'd be from the project.

So, there was an intent – there was always an intent to borrow. The analysis was done based on 100 per cent equity. And so when we talk about going from 12 to 8 or whatever number, or 8.4 to 5 –

MR. COFFEY: Yeah.

DR. LOCKE: – or those kind of numbers, it was ignoring debt. And so, if you had to pay back debt, then that's what you can borrow at.

MR. COFFEY: Yes.

DR. LOCKE: And so there is a – there is some flexibility. So you have a choice of either subsidizing, for example, you can subsidize the consumption of electricity here. So, in other

words, you can say, look, we don't need any dividends, we'll just keep the price low. Now, that's going to be paid for someday.

MR. COFFEY: Yes.

DR. LOCKE: Right?

MR. COFFEY: Now, at that time – the time of your presentation in January of 2012 – you were aware of that. In fact, you've pointed it out.

DR. LOCKE: I did.

MR. COFFEY: Didn't you?

And although I know you focused on – Commission counsel's questions to you this morning have focused on your January 2012 presentation and other things related to that, the idea of government of the day – whatever government it is or was or will be – foregoing dividends. That was known, wasn't it?

DR. LOCKE: Yes.

MR. COFFEY: Back at the time that you were doing this.

DR. LOCKE: Yes.

MR. COFFEY: And, in fact, I'm going to suggest to you that almost at the end of 2012, when the project was sanctioned, that, in fact, the Minister of Finance of the day publicly said that. You wouldn't be surprised if that's the case.

DR. LOCKE: I wouldn't but I don't know what he said.

MR. COFFEY: You don't know – I won't bring it up here right now.

In particular, for anybody who wants to look, Tom Marshall's comments to the House of Assembly on December 20, 2012, he refers to just that, okay?

But the point being that the idea existed and you're aware of it and presumably – and you would've assumed that others who were informed would've been aware of that?

DR. LOCKE: Well, anybody who read my presentation would be aware of it for sure.

MR. COFFEY: And the figures in question – just before I leave this topic. Back then the figures – what was your understanding of – not so much at the time you made the presentation, but in the immediate period afterward. The year afterward, the dividends that Nalcor might pay the Government of Newfoundland and Labrador projected – they then were from Muskrat Falls – were about \$22 billion? That figure sound –

DR. LOCKE: I don't know.

MR. COFFEY: You don't know, okay. You don't –

Thank you, Commissioner.

THE COMMISSIONER: Thank you.

Consumer Advocate?

UNIDENTIFIED MALE SPEAKER:
(Inaudible.)

DR. LOCKE: I'm just trying to kill time here so that I don't look like I'm sort of lost.

MR. HOGAN: Dr. Locke, my name is John Hogan, I'm counsel for the Consumer Advocate.

DR. LOCKE: Good morning.

UNIDENTIFIED MALE SPEAKER: Excuse me, Mr. Commissioner, I was wondering if the witness could speak a little closer to the mic. It's sometimes difficult to hear him.

THE COMMISSIONER: Okay.

DR. LOCKE: Okay, is that better?

I've never been accused in the past of not having a loud enough voice. But I guess the intimidation of being amongst a whole pile of lawyers sort of makes me soft-spoken, I guess. But I'll try to speak up for you.

THE COMMISSIONER: Go ahead, Mr. Hogan.

MR. HOGAN: Dr. Locke, Mr. Learmonth this morning asked you about what's in your presentation that you've been on the record as supporting Muskrat Falls prior to preparing that presentation for the Harris Centre, and he took you to NTV interviews, which is at P-00314, which is dated September 4, 2011.

I just want to, Madam Clerk, if you can bring up P-00229.

MR. LEARMONTH: Tab 4.

DR. LOCKE: Okay.

MR. HOGAN: This is an article from *The Telegram*, which is November 25, 2010.

DR. LOCKE: Oh, this side different?

MR. HOGAN: (Inaudible.)

MR. LEARMONTH: (Inaudible) you referring to (inaudible).

THE COMMISSIONER: Tab 4.

CLERK: 00229.

MR. HOGAN: 00229, I have.

What's the problem?

MR. LEARMONTH: No, it's not a problem. It's not in these document.

MR. HOGAN: Okay.

MR. LEARMONTH: But you can still refer to it.

MR. HOGAN: Sure.

DR. LOCKE: Okay.

MR. HOGAN: It's on your screen there.

DR. LOCKE: Okay.

MR. HOGAN: So this predates what Mr. Learmonth asked you about, so if you just turn to the second page, the third-last paragraph.

DR. LOCKE: Okay.

MR. HOGAN: You said: "The benefits of this particular project for Newfoundland, for the region, for the country should be sufficient motivation for the federal government to make this go forward."

Above that a couple of paragraphs, you say: "There's a new sense of confidence in this province that wasn't" here "before".

So do you recall making these comments in 2010?

DR. LOCKE: The specific, no. I mean, are they things I would have made? Yeah.

MR. HOGAN: Okay.

So it's not, I mean, are you on the record in 2010, I guess, is my question, that you thought this project was a good idea?

DR. LOCKE: This is 2010, and this is what I said, yes.

MR. HOGAN: Okay.

DR. LOCKE: These are not statements I wouldn't have made, right?

MR. HOGAN: So my question really – no, I understand that, you made those statements, you're not arguing that. But a couple questions I have is you hadn't done any analysis at this point in time, so why would you be on the record as making the statements that you think Muskrat Falls should proceed?

And my second question is you talk about the benefits of the project –

DR. LOCKE: Yeah, that would be the –

MR. HOGAN: – and this was touched on a little bit this morning.

DR. LOCKE: – the employment and income and taxation benefits of the province.

MR. HOGAN: Okay, so was your position that it should proceed on that basis that there's economic spinoff and benefits from the Muskrat Falls Project? Is that why you supported the project pre-2012?

DR. LOCKE: No, my understand, it was the lowest-cost option as well. There was a \$2.2 billion –

MR. HOGAN: Okay, but you hadn't done that analysis in 2012.

DR. LOCKE: No, I had not, but, I mean, that was the information that was available publicly as well –

MR. HOGAN: Okay.

DR. LOCKE: – right? So what I had done, was I had done economic impact analysis and all those things pointed to that this was a good project in terms of what it meant for the general economy.

MR. HOGAN: So I understand that – I'm continually sort of confused as we go through this Inquiry – that the economic benefits are a great thing, nobody is going to say that's a bad idea but you even said this morning that there's two simple questions: do we need it and is it the least-cost option.

DR. LOCKE: That's correct.

MR. HOGAN: So I would take the position that the government and Nalcor presented this project as the least-cost option, but there's a lot of talk about: we should do it – Mr. Williams even asked you about it this morning – we should do it because of the economic benefits.

So I want to know, is it your position that we should do it because it was the least-cost option, or because there was economic benefits to the province?

DR. LOCKE: Well, benefits and least-cost option are not unrelated, right.

MR. HOGAN: No, but they are exclusive though.

DR. LOCKE: No, I'll answer your question. I just ...

So, least-cost option means that you get the ability to have electricity at a lower cost. That's a benefit. So the difference in cost, the 2.2 billion present-value terms is a benefit, right. So,

also having the employment impacts and income impacts is a benefit, in a sense that it contributes to the economy. The taxation that come along with that is a benefit in terms of it contributes to the Treasury.

The potential of economic development in Labrador for mining, for example, or for other things is a potential economic benefit as well. So everything I saw at the time pointed in a particular direction. And the answer in my mind would be that this was the best option.

MR. HOGAN: Yeah, but it could be greater economic benefits than the next least-cost option, but it could also be economic benefits and not the least-cost option.

DR. LOCKE: Sure.

MR. HOGAN: So I understand why it could be confusing and a government may make a policy decision, and say: listen, this isn't the cheapest one, but the economic benefits are such that we're going to go with it.

DR. LOCKE: Yeah they could. I don't know that they did that but they could, sure.

MR. HOGAN: Okay.

DR. LOCKE: Now are you taking into account everything, when you're doing this stuff? So cumulative present worth –

MR. HOGAN: I'm just going to cut you off, because that's not what you said. You said there was two questions to be asked –

DR. LOCKE: Sure.

MR. HOGAN: – is demand there – is it needed, and is it the least-cost option? You didn't have a third –

DR. LOCKE: For my –

MR. HOGAN: Just one second now –

DR. LOCKE: –for my presentation –

MR. HOGAN: – Dr. Locke, you didn't say there was a third option, or a third question to be

asked, is what is the total benefit? And that's why I'm asking these questions.

DR. LOCKE: In terms of my presentation, I asked three questions, right? Do we need the power, can we avoid the need, and what's the least-cost alternative?

MR. HOGAN: So economic spinoff is not one of the questions asked at your presentation.

DR. LOCKE: No. No.

MR. HOGAN: Okay.

If we can just turn to your presentation at P-00317, page 8.

MR. LEARMONTH: Tab 7.

DR. LOCKE: Yeah, okay.

Yup.

MR. HOGAN: The last bullet point there: "If the additional power, the difference between the Nova Scotia 20% commitment and the island needs at the various points in time, is sold for industrial needs in Labrador or for export through the maritime link"

Were you aware of any contracts in place for the export at this point in time?

DR. LOCKE: No.

MR. HOGAN: Okay. So why was that being discussed as –

DR. LOCKE: Because it was an option, it was a possibility.

MR. HOGAN: There was nothing in place at the time for the sale of extra –?

DR. LOCKE: No.

We had a whole pile of work – just so you know – for all the mining activities in Labrador; IOC, LabMag, Labrador Iron Ore Mines – a number of projects where there was real consideration for expanding the mining industry. And there wasn't sufficient power in Labrador to do that.

So having knowledge of the mining potential in Labrador, that's what that's about.

So if you could –

MR. HOGAN: Oh hold on now. The Maritime Link was not for any production for electricity in Labrador.

DR. LOCKE: No, no. But the –

MR. HOGAN: Let's just get back to my question then. I mean do you think it was wise to proceed with the Muskrat Falls Project without any export contracts in place?

DR. LOCKE: I'm not a person who can give that answer to you.

MR. HOGAN: Okay. But you put it out there as a benefit.

DR. LOCKE: No, what I said – let's – if we can read the thing. It says: if the additional power – the difference between what they required in Nova Scotia and the Island needs at various points in time – is sold for industrial needs in Labrador or exported through the Maritime Link, right, then that's an additional benefit to the province.

MR. HOGAN: But you're unable to say whether it should have proceeded despite the fact that those contracts were not in place? You can't answer that question?

DR. LOCKE: I was not aware if there was any contracts in place. If, you know – if this occurred, this would add to the benefits. That's what it says.

MR. HOGAN: Okay. And we can just turn to page 9 or slide 9 I guess.

DR. LOCKE: Page 9 or slide 9?

MR. HOGAN: I guess they're one and the same.

DR. LOCKE: Okay, same thing – okay, sure.

MR. HOGAN: All right.

So this is talking about load forecast. You start off by saying, “In my assessment, the assumptions that went into this forecast and the methodology are reasonable and the technical people who performed this assessment are certainly technically competent”

So you didn’t do your own assessment. Is that correct?

DR. LOCKE: I met with them to talk about what they did.

MR. HOGAN: So who would they be?

DR. LOCKE: There’d be – I mean there’d be lots of people around the table.

MR. HOGAN: Okay. We’ve got time.

DR. LOCKE: But –

MR. HOGAN: Let’s hear some names.

DR. LOCKE: As I explained earlier, I don’t – wouldn’t have all the names. But I do remember meeting with – as part of that group – with Paul Stratton and with Steve Goudie who were responsible for this kind of stuff. And my discussion with them – and my understanding of their credentials – was that they understood what they were doing.

MR. HOGAN: Your assessment was the people as opposed to the actual load forecast?

DR. LOCKE: I had no reason to believe they were doing anything other than their job.

MR. HOGAN: No, I understand that, but that was the assessment you made, that they were doing their job?

DR. LOCKE: Yeah.

MR. HOGAN: Okay.

Just in conjunction with the next page – page 10 – that sentence there starts: “The Island load is forecast to grow from 7,600 ... per year in 2010 to 10,500 ... in 2041.”

Those two graphs, and the graph on page 9, go all the ways out to 2066.

DR. LOCKE: Okay.

MR. HOGAN: I just wanna know – first of all, was it – I think you’ve been asked this about oil forecast – was it prudent to forecast all the ways out to 2067?

DR. LOCKE: That’s an engineering question. You could talk to the engineers about that.

MR. HOGAN: Any reason we wouldn’t just predict – or they would project to 2041? We all know it’s a bit –

DR. LOCKE: I presume –

MR. HOGAN: – (inaudible) here.

DR. LOCKE: – that had to do with the life of the assets – of some asset or another – that went out that far.

MR. HOGAN: Okay.

DR. LOCKE: But again, that’s a question for Nalcor; not for me.

MR. HOGAN: Oh, but you didn’t ask that question to Nalcor?

DR. LOCKE: I did not.

MR. HOGAN: Okay.

DR. LOCKE: I took that as a given. Like I said to you before, I took the prices and those kind of things as a given.

MR. HOGAN: If you look at the slide on page 10 – the Isolated Island Component.

DR. LOCKE: Yup.

MR. HOGAN: It has colour codes down there, and one of the coded for light blue is wind?

DR. LOCKE: Yup.

MR. HOGAN: But I don’t see any wind references or wind colours in the graph. Is that correct?

DR. LOCKE: I don't see them there either. So either they're so small they don't show up – but I don't know.

MR. HOGAN: But you didn't do any – ask any questions about that or do any –

DR. LOCKE: No.

MR. HOGAN: – analysis on that? You're familiar with *The 2007 Energy Plan*? I think someone walked you through it this morning.

DR. LOCKE: Yeah. I'm familiar with it, yes.

MR. HOGAN: Okay. And you're familiar that that does talk about wind development?

DR. LOCKE: Again, this is an engineering question you need to talk to Nalcor about. You'll have a chance to speak to Mr. Bennett when he comes by.

MR. HOGAN: So you didn't question about, you know –

DR. LOCKE: I did not.

MR. HOGAN: – the value of the wind?

DR. LOCKE: Did not.

MR. HOGAN: How much energy we can get through wind? Why is it included in the Isolated Option? None of those questions were asked?

DR. LOCKE: No.

MR. HOGAN: Okay.

If we can turn to page 15, please? The second bullet point, Dr. Locke: “NL electricity costs are forecast to increase by 21.2 % between 2011 and 2016 because of oil price effects.”

Is that the only reason electricity costs are going up?

DR. LOCKE: I don't know.

MR. HOGAN: Okay. It was your sentence though.

DR. LOCKE: I know.

MR. HOGAN: So who would know the answer to that question?

DR. LOCKE: I'm pretty sure that the price of (inaudible) would go up 21 per cent. Now, whether or not it was due to only to oil prices, I don't know that to be the fact; that's right.

MR. HOGAN: Theoretically, I know – we'll talk about forecasting and we have already today. If oil prices are going down then –

DR. LOCKE: (Inaudible.)

MR. HOGAN: – electricity cost would've went down?

DR. LOCKE: If oil – yeah sure. But oil prices weren't going down then.

MR. HOGAN: No, I understand the forecast, but that's – that makes sense, right?

DR. LOCKE: Yeah, sure.

MR. HOGAN: Okay.

So if you could just turn to slide 20, which I think talks about oil forecasts, in the book.

DR. LOCKE: Slide 20?

MR. HOGAN: Yeah, you say – and just to confirm – “while the Isolated Island is \$2.2 billion ... more expensive, the difference is driven by fuel costs.”

DR. LOCKE: That's my understanding.

MR. HOGAN: Okay.

And slide 21, the first paragraph about halfway down you said: “The NALCOR forecasts were provided by a reputable agency” – and this is oil forecasts – “which does this for a living and the forecasts do not appear to be widely off from other forecasting groups.”

Is that the group you mentioned this morning?

DR. LOCKE: PIRA?

MR. HOGAN: PIRA.

DR. LOCKE: That's my understanding, yes.

MR. HOGAN: That's your understanding. Was it your understanding at the time, or it's your understanding now?

DR. LOCKE: At the time.

MR. HOGAN: Okay. I just wanna ask, do you remember if there was range that they supplied?

DR. LOCKE: I don't know.

MR. HOGAN: You don't know?

DR. LOCKE: No.

MR. HOGAN: Did you do any sensitivity analysis regarding the oil prices, what they could be, like you know, if it's 133 or 120 or 115 and what the effects are?

DR. LOCKE: No, the – what we did do was see what would be the implication of – how much would we have to reduce the price in order to make these equivalent, and it had to be about a third.

MR. HOGAN: Okay.

DR. LOCKE: So that's the only sensitivity we would've done.

MR. HOGAN: Okay.

DR. LOCKE: We compared the forecast to other sources and they were similar, although never identical.

MR. HOGAN: I mean, you say, too, it's not in the cards for oil to go to 50 to 60 but –

DR. LOCKE: That was my opinion.

MR. HOGAN: At the time, I understand that.

DR. LOCKE: But that's a long-term price, right? It's not any given year.

MR. HOGAN: Mm-hmm.

So did you do any analysis yourself to check in the commodity prices or anything like that, or did you just rely on what Nalcor gave you?

DR. LOCKE: No, I checked what was publicly available, and in the presentation you'll see where issues around oil prices come from, and all the prices were similar for all the publicly available forecasts.

MR. HOGAN: They were all going up?

DR. LOCKE: Without a doubt.

MR. HOGAN: Okay.

Just on that – the financing part. Mr. Coffey just asked you about the financing and dividends and things like that. The \$5-billion financing, at the time, who was going to borrow that? Do you know?

DR. LOCKE: I don't know. It would've been – I presume Nalcor at whatever their borrowing rate happens to be, but –

MR. HOGAN: You presume Nalcor.

DR. LOCKE: I presume Nalcor, but it could be the government. I didn't do an analysis with the debt in there.

MR. HOGAN: I'm just gonna turn to your conclusions at page 46, please.

DR. LOCKE: Okay.

MR. HOGAN: So the first bullet point you say: "On the balance of probabilities, it seems reasonable to assume that the Muskrat Falls is the best option for the province." So you've mentioned a couple of times there's a lot of lawyers in the room, and we – in the legal world that's a term we use, balance of probabilities, and I think most of us probably understand it. I was a bit surprised to see it in there from an economist perspective. Can you tell me what it means as an economist – what the balance of probability means?

DR. LOCKE: Taking everything into account – and whatever risk were implicit in all these kind of things that I could understand. Taking everything into account, it looked like this was the least-cost option.

MR. HOGAN: But isn't that just the mathematical calculation as an economist, so

shouldn't you say I conclude that this is the least-cost option. Why are you saying on a balance of probabilities?

DR. LOCKE: I'm saying it can be wrong, okay?

MR. HOGAN: Okay.

DR. LOCKE: It's not a certainty. It's not definitive, not deterministic.

MR. HOGAN: Yeah.

DR. LOCKE: All of these things, no matter what you're doing here, would have some probability density function associated with them. So – and I think your accountant showed you some of those kinds of issues with respect to tactical risk.

MR. HOGAN: Okay.

Now, you've been – we've been through this that you've sort of taken Nalcor at its word when –

DR. LOCKE: For the cost.

MR. HOGAN: – and you – for the cost – and then you put those numbers in. And you said that when Dr. Vardy came out with his report, you sort of stepped back and said: hmm, I need to look at this, 'cause he's saying something different than I thought.

My question is if you used Nalcor's numbers, and Nalcor publicly said that this is least-cost option, how do you think you would have ever come to a different conclusion than Nalcor when that's all you're talking to?

DR. LOCKE: Well, I don't know what I thought about it at the time. It wasn't a conscience effort to say okay, I should use some other numbers –

MR. HOGAN: But –

DR. LOCKE: – to see if I can change that so –

MR. HOGAN: – how would you come to an independent analysis only using one side's numbers who've already told you what their

conclusion is? Unless you're checking their math.

DR. LOCKE: I would have checked some math as well. I would have gone and looked at all the information that was available publicly. I would have talked to people who were involved in this project and made an assessment, on the basis of that, that this was the least-cost option. Bearing in mind that if the forecast were wrong or the oil prices were wrong, then you would have to modify this stuff. That's why it's not definitive, that's why it's on the balance of probabilities. I didn't believe that the price would fall.

MR. HOGAN: No, I understand that. But you said you talked to all kinds of people, so – and you've said this is a very political issue and obviously –

DR. LOCKE: It is a political issue, even today.

MR. HOGAN: Who on the other side of this project would you have talked to before you did your presentation – opponents of it? You've talked to Nalcor and the government who are the proponents.

DR. LOCKE: I would have spoke to Mr. Vardy.

MR. HOGAN: Okay, who else?

DR. LOCKE: I don't know. I'm not sure. I mean, look, I don't have notes on who I spoke to.

MR. HOGAN: Did you recall speaking to other opponents other than Mr. Vardy – Dr. Vardy?

DR. LOCKE: I would have spoken to Dr. Feehan.

MR. HOGAN: Okay.

DR. LOCKE: Yeah.

MR. HOGAN: Did you approach Newfoundland Power to talk to them about their demand forecast or anything like that?

DR. LOCKE: No, my understanding is that wasn't – those are short-term forecasts in any event.

MR. HOGAN: Theirs are short-term –

DR. LOCKE: Yeah.

MR. HOGAN: – as opposed to Nalcor’s?

DR. LOCKE: Yes, yeah.

Because their focus is something different.

MR. HOGAN: Okay.

How – what’s – where did you get that understanding?

DR. LOCKE: I don’t know where I got that. That’s just in the back of my mind.

MR. HOGAN: Have you done any analysis on similar megaprojects before? Any megaprojects?

DR. LOCKE: Yes.

MR. HOGAN: Such as?

DR. LOCKE: Every oil project in the offshore, I would have done. We’ve done work on aluminum smelters. I’ve done work for Hydro One. We’ve done work for Aboriginal groups. We’ve done work for a variety of companies. We were engaged to help the Government of Russia understand fiscal regime, so yeah –

MR. HOGAN: Bit of experience?

DR. LOCKE: – billion dollar projects, yeah.

MR. HOGAN: Billion dollar projects? Okay.

DR. LOCKE: Yeah.

MR. HOGAN: So you’re aware there’s typically cost overruns and we heard from an expert earlier in this Inquiry that talked about overruns.

DR. LOCKE: I – not even aware of it. I acknowledged it in the presentation.

MR. HOGAN: Mr. Coffey was asking you about the elasticity studies.

DR. LOCKE: Yes.

MR. HOGAN: So it wasn’t included in your presentation, is that correct?

DR. LOCKE: No.

MR. HOGAN: And should it have been?

DR. LOCKE: Not in my opinion, no.

MR. HOGAN: Not to your opinion, okay.

Because you said to Mr. Coffey: Muskrat is cheaper than thermal if no one leaves the electrical system.

DR. LOCKE: Did I say that?

MR. HOGAN: Yes.

So that’s the point – my understanding: the point of the elasticity study is what happens if people leave the system and they can if it gets too expensive. So should that have been considered in your presentation?

DR. LOCKE: The email from Ms. Dalley, addressed that issue – that you needed in excess of not only the forecast price, but you needed 75 per cent over and above what the forecast price was before people started leaving the system. That, during that time period, wasn’t considered to be reasonable or realistic.

If you’re going to do an elasticity study, as I understand Dr. Feehan has done, there are technical ways of doing stuff. We’re in the process of doing our own (inaudible) now – own studies on demand for energy. We will release that in due course, but when we’re comfortable that it’s done correctly. And people will judge that for what it’s worth.

MR. HOGAN: Okay, but at the time of January 2012 –

DR. LOCKE: At the time, no.

MR. HOGAN: – you didn’t feel it was necessary to put that in the presentation.

DR. LOCKE: No. I did not.

MR. HOGAN: Because it wasn't a necessary piece of information. Not that you intentionally left it out.

DR. LOCKE: I hadn't thought about it.

MR. HOGAN: You hadn't thought about it.

Are you aware of the water management issue with regards to Nalcor – or as regards to Muskrat Falls?

DR. LOCKE: No. I mean, I'm aware that it's an issue, but that's not something I would have any expertise thinking about.

MR. HOGAN: And no thought about including that –

DR. LOCKE: No.

MR. HOGAN: – in the presentation or anything like that?

You mentioned that – I think it's in your presentation, well, it's there on the screen: "Not extending the PUB public review creates an air of suspicion that can be avoided." So your position is it should go to the – should've gone to the PUB.

DR. LOCKE: That they should've been given the time they needed to analyze the project so everybody can be comfortable this is the least-cost option.

MR. HOGAN: Did you tell anyone at Nalcor that that was your position?

DR. LOCKE: No.

MR. HOGAN: Did you –

DR. LOCKE: As I recall.

MR. HOGAN: And do you recall.

DR. LOCKE: Yeah.

MR. HOGAN: Did you tell anyone at the Department of Natural Resources that that was your position?

DR. LOCKE: Not that I recall.

MR. HOGAN: Not that you recall.

DR. LOCKE: I mean –

MR. HOGAN: I'm not trying to catch you up.

DR. LOCKE: No, no, no, I'm just trying to say to you, it would've been my understanding that this report would've been publicly available to people once I said it. That was put in deliberately because that was a concern that people were raising.

MR. HOGAN: Mm-hmm.

DR. LOCKE: And if this is a good project, if it's the best project, then you shouldn't artificially (inaudible) an analysis.

MR. HOGAN: If that was your opinion though – and just from the documents I've seen and you've been asked about today, you seem to have easy access to, specifically, the deputy minister of Natural Resources. You flipped him an email from Dr. Vardy –

DR. LOCKE: I did.

MR. HOGAN: – about the presentation. I mean, like, if you have that access and that's your opinion, why didn't you say to Mr. Bown that maybe you guys should send this to the PUB?

DR. LOCKE: It wasn't my place to say that.

MR. HOGAN: Okay.

DR. LOCKE: But I made this a part of the public record that this should be done. But, again, nobody was consulting me on this issue saying should we do this or should we do that. I can imagine that they weren't happy with this particular position, I can get that.

This was my honestly held belief that, you know, I believe this to be a good project and I believe it would stand the test of scrutiny. And there's no reason to artificially restrict people's decision. And, you know, if it takes three months to do it and they get the DG3 numbers, that reduces some uncertainty. It reduces the ability of people to be critical of you not doing it. So I don't know why it wasn't done but I wasn't asked on that.

MR. HOGAN: Okay.

And I know you said you sat in the room with people at Nalcor to talk about the gathering of information.

DR. LOCKE: I'm sure many meetings.

MR. HOGAN: No, I understand that. Specifically, with regard to this presentation prior to you giving it, did you discuss it with Ed Martin?

DR. LOCKE: No.

MR. HOGAN: Did you –

DR. LOCKE: Not that I'm aware of.

MR. HOGAN: Not that you –

DR. LOCKE: Yeah.

MR. HOGAN: Well, you would be aware.

DR. LOCKE: Yeah, I don't recall –

MR. HOGAN: Okay.

DR. LOCKE: There'd be no easy way for me to do that.

MR. HOGAN: No. Well, you sent it to him by email though.

DR. LOCKE: After it was done, yes.

MR. HOGAN: Did you discuss it with Gilbert Bennett?

DR. LOCKE: The presentation?

MR. HOGAN: Yeah.

DR. LOCKE: No.

MR. HOGAN: Okay.

DR. LOCKE: I would discuss issues that I'm trying to put together for the presentation.

MR. HOGAN: Did you discuss it with Jim Keating?

DR. LOCKE: Not that I'm aware of.

MR. HOGAN: Did you discuss it with any elected officials or Cabinet ministers, other than Jerome Kennedy?

DR. LOCKE: I didn't discuss the presentation with Jerome Kennedy, just so we know.

MR. HOGAN: Okay, so you tell me exactly what you discussed with Mr. Kennedy.

DR. LOCKE: He wanted to discuss natural gas and he wanted to show me some forecasts he had to appraise, and that's what I talked about. I talked about the general process, in terms of the presentation, nothing that I've seen so far changes my mind and that he needed to understand that Henry Hub is not the same thing as gas delivered to Muskrat – to Holyrood.

I'm happy to meet with ministers or with premiers or with officials of government or with officials of the Opposition. And I've done that on a number of occasions and will continue to do so.

MR. HOGAN: Can I just turn to that – the notes from that meeting at P-00316, please.

THE COMMISSIONER: Tab 6.

MR. HOGAN: These are Minister Kennedy's notes, from what I understand. Is that your understanding?

DR. LOCKE: I have no idea whose notes they are, but I – that wouldn't be surprising.

MR. HOGAN: Okay.

DR. LOCKE: So P-00316?

MR. HOGAN: Yes.

DR. LOCKE: All right.

MR. HOGAN: You said you talked about natural gas with Minister Kennedy. Just, yeah, right at the bottom of that page, actually on the screen, it says: Basic message, Muskrat Falls is – something – the best project.

So he says the basic message, so is he conveying that to you in that meeting?

DR. LOCKE: No, he's reporting what I said to him.

MR. HOGAN: So you tell him the basic message of your presentation is that it's the best project.

DR. LOCKE: Lowest cost option –

MR. HOGAN: Okay.

DR. LOCKE: – by 2.2 billion.

MR. HOGAN: Okay.

It says the best project. Below it, to be fair, it says 2.2 but it says the best project, right? So that's your message to Minister Kennedy.

DR. LOCKE: That's my message as part of the presentation as well.

MR. HOGAN: Okay.

And if we can just go to page 2, yeah, right there it says: What people have to understand. So was this your message to Minister Kennedy or is he giving direction to you?

DR. LOCKE: I took no direction from Minister Kennedy –

MR. HOGAN: Okay.

DR. LOCKE: – just for the record. These are his notes and you should talk to him about these notes.

MR. HOGAN: So I'm asking you your memory of the meeting, I guess, and using the notes to try to jog it.

DR. LOCKE: My memory of the meeting is that – I had forgotten about it until the counsel for the Commission had mentioned it to me. I have a lot of meetings with a lot of different people but, you know, I do recall this meeting and the meeting was in the evening and it was to discuss natural gas.

And when I went there he showed me, along with one of his employees – a guy by the name of Walter Carter – some analysis he had done on electric prices with and without Muskrat Falls. And I thought: well, gee, that's a good piece of information to put forward. And I said to him – I said: If you make it public, I'll include it in the presentation. And that is in the slide. It shows you what the prices are according to their calculation and the source is the Government of Newfoundland and Labrador.

MR. HOGAN: Okay.

DR. LOCKE: Okay?

But I want him to understand, as part of this meeting, that the Henry Hub price that people were talking about is not the price of having fuel at Holyrood. It's not the same thing.

MR. HOGAN: Okay. We've heard evidence about that from Dr. Bruneau.

DR. LOCKE: That's fine.

MR. HOGAN: Yeah.

DR. LOCKE: And Dr. Bruneau is an expert and he can tell you about that.

MR. HOGAN: You've been asked probably a few times this morning already about the work you've done, the contracts you've had with Nalcor, department of resources, I think you mentioned Department of Justice as well.

DR. LOCKE: I did.

MR. HOGAN: Yeah.

Were these contracts – did you apply for these? Were there open competitions for these?

DR. LOCKE: No, I don't think they were open. I think when we did the work for Justice, for example, they were having trouble with a moose-vehicle case and they came to me and asked me could I help. I said, well, give me a couple of days to look at it.

MR. HOGAN: Mm-hmm.

DR. LOCKE: And they did. I looked at it and I said, well, there's some problems with this and came back. The same thing with the – all issues were like that. I mean, like, in terms of the mining study, for example – and there were a number of people involved in that – but we had expertise and knowledge and information the provincial government wouldn't have had.

MR. HOGAN: No.

DR. LOCKE: And so we would have provided expertise, so nobody has hired me for political reasons.

MR. HOGAN: That's not what I asked.

DR. LOCKE: No, no, I get it, but –

MR. HOGAN: So I'm not going to ask –

DR. LOCKE: – I want it on the record that –

MR. HOGAN: I'm not going to go through –

DR. LOCKE: Yeah.

MR. HOGAN: – every job contractor on those pages.

DR. LOCKE: Right.

MR. HOGAN: But, generally speaking –

DR. LOCKE: People come to me, not the (inaudible).

MR. HOGAN: – the government and/or Nalcor would come to you.

DR. LOCKE: And private firms as well.

MR. HOGAN: Yeah, I understand that. But, generally, they – you were approached for any and all of these contracts that you did for Nalcor and the government.

DR. LOCKE: I don't recall applying for any of them.

MR. HOGAN: Don't recall applying for any of them.

Fair enough. Okay.

DR. LOCKE: Right.

MR. HOGAN: Did you solicit work?

DR. LOCKE: Did I solicit work?

MR. HOGAN: Yeah, from the government or from Nalcor?

DR. LOCKE: No, not that I recall.

MR. HOGAN: Okay.

DR. LOCKE: I was busy enough during this time period that I didn't need to be soliciting work.

MR. HOGAN: Okay.

DR. LOCKE: I was turning work down.

MR. HOGAN: And, Dr. Locke, you mentioned, I think, maybe once or twice today that you weren't an advocate for the project.

DR. LOCKE: I wasn't an advocate for the project or for Nalcor; I spoke only for Wade Locke.

MR. HOGAN: Yeah. I understand that.

So if we could just turn to Exhibit P-00425, page 2, please? These are speaking notes from Premier Kathy Dunderdale at DG3, October 30, 2012, okay?

DR. LOCKE: Okay. Yeah.

THE COMMISSIONER: This is at tab 15?

DR. LOCKE: Fourteen.

THE COMMISSIONER: Fourteen, sorry.

MR. HOGAN: So the fifth paragraph down on page 2; I understand these aren't your words and you didn't write the speech or give the speech. She said you weren't an advocate. Premier Dunderdale says: "Their expertise" – and she's referring to Nalcor – "has been analyzed and validated by MHI, Ziff, Navigant and Dr. Wade Locke."

And I put it to you as well, in *Hansard* I looked at that some of the Members of the House of Assembly actually said similar things. That this project has been analyzed by Dr. Wade Locke and therefore – they're relying on that to say this is the least-cost option, this is the best project.

So, as someone who's not an advocate, how do you feel about the premier and Members of her government, at the time, relying on your opinion to eventually proceed to sanction?

DR. LOCKE: People can write, we're a democracy. They can write what they want. I had a gossip blogger recently say that I should be flogged, right? So, you know, I can't deal with those kind of things. So I wasn't asked whether they could put my name in this. I wasn't asked whether my name should be included in *Hansard*, as you said.

You know, I'm happy that people think that my opinion is highly valued and that they should reference it, but I've done what I said I've done.

MR. HOGAN: Now this is different than people talking about personal attacks. This is talking about your work.

DR. LOCKE: Right.

MR. HOGAN: And your reputation is important to you; you made that clear –

DR. LOCKE: It is.

MR. HOGAN: Right.

So, you're comfortable with the premier having done this. I'm not saying she's right or wrong. I just wanna know your comfort level with her and her government Members relying on your presentation, essentially, to support the project.

DR. LOCKE: I am.

MR. HOGAN: You're comfortable with that?

DR. LOCKE: Yes.

MR. HOGAN: Did you review the 2011 Energy Plan before you did your – prepared your Harris Centre presentation?

DR. LOCKE: I would have looked at the 2000 Energy Plan – 2011 Energy Plan – but reviewing it for this purpose, no.

MR. HOGAN: Did you have any participation in review of the Progressive Conservative's Blue Book for the 2003 election?

DR. LOCKE: I would have read their Blue Book, and would have said – and I think this is public knowledge, as well – I would have said that I thought that was a good strategy, and then CBC came back and challenged me on that, and I said I would read the Liberal one as well. And I did that too.

MR. HOGAN: Who did you read it for?

DR. LOCKE: I guess it was Lorne Wheeler sent that to me and asked me what my opinion was of it.

MR. HOGAN: Who's Lorne Wheeler?

DR. LOCKE: He was someone in Danny Williams's office.

MR. HOGAN: So you read it on behalf of a request from the Progressive Conservative Party?

DR. LOCKE: I read it because I was asked for my opinion on it. I gave my opinion. Just like when the NDP or the Liberals ask my opinion on something, I give that as well.

MR. HOGAN: Were you paid for that opinion?

DR. LOCKE: No.

MR. HOGAN: Okay.

Have you donated to political parties over the past 10 years – you personally?

DR. LOCKE: Never.

MR. HOGAN: Do you know if Strategic Concepts has donated?

DR. LOCKE: You'll have to ask Strategic Concepts.

MR. HOGAN: You don't know.

DR. LOCKE: I don't know.

MR. HOGAN: Okay.

DR. LOCKE: I'm not affiliated with Strategic Concepts, except I'm an associate with them, so that when – they sub-contract me sometimes; I sub-contract them sometimes.

MR. HOGAN: (Inaudible.)

DR. LOCKE: I have no connection in terms of ownership or anything else with them. Nor do they ask my opinion about what they should be bidding on or who they should be supporting.

MR. HOGAN: This is my last question.

Mr. Coffey put to you that if you have three or four economists on an issue, you could have three or four different opinions. That's –

DR. LOCKE: Same with lawyers.

MR. HOGAN: Yeah. You might get eight opinions from four lawyers, I don't know.

DR. LOCKE: Well, (inaudible). But, look, I mean –

MR. HOGAN: No my question is –

DR. LOCKE: – people have different opinions. And you can have legitimate opinions that differ based upon your interpretation of certain kinds of things.

MR. HOGAN: Sure.

My question is this though, I mean, he – Mr. Coffey put to you that Dr. Feehan's approach was more along the lines of doing smaller projects to offset the demand that we have, along with the pricing changes which would affect that.

Would – you advocated for the one project, Muskrat Falls. Now, part of the problem I see in that is that you had to forecast out for so long, and you even said there's risk in that. Would there be less risk in doing a number of smaller projects – sort of diversifying your portfolio – as opposed to doing one big project where, hey, if oil goes down to 50 or 60, we're wrong?

DR. LOCKE: I haven't done an analysis of that so, you know, and you can talk to Dr. Feehan about what his proposal was and how it compares to mine. Now, I looked at what was being considered now, and I don't know that a big project would necessarily imply less risk than a whole pile of smaller projects, in terms of what might happen to cost, for example.

MR. HOGAN: Okay.

DR. LOCKE: But, you know, I haven't done that analysis so it's hard for me to answer your question.

MR. HOGAN: Okay.

That's all the questions I have. Thank you.

DR. LOCKE: Okay, thank you.

THE COMMISSIONER: And Former Nalcor Board Members?

MS. G. BEST: Thank you, no questions.

THE COMMISSIONER: Okay. I don't believe MHI is here. No.

Okay. Thank you, Doctor, you can step down.

DR. LOCKE: Thank you, Sir.

THE COMMISSIONER: All right. We'll take our break here. We're late, obviously, it's 10 to 1. So we'll come back still for 2 o'clock, if we can.

CLERK: All rise.

Recess

CLERK: All rise.

This Commission of Inquiry is now in session.

THE COMMISSIONER: All right. Mr. Learmonth?

MR. LEARMONTH: Thank you. (Inaudible) –

THE COMMISSIONER: Put your mic on there.

MR. LEARMONTH: Yes. Before we call the first witness this afternoon, I'd like to have some exhibits entered. They are P-00321 to 00326 and P-00372 to 00414. Could they be entered, please?

THE COMMISSIONER: Okay. All right.

Those will be entered as numbered.

MR. LEARMONTH: Thank you.

THE COMMISSIONER: Next witness?

MR. LEARMONTH: Yes. Dr. James Feehan. Jim Feehan, I believe you prefer to go by? Dr. Jim Feehan.

THE COMMISSIONER: All right. And, Sir, do you wish to be sworn or do you wish to be affirmed?

DR. FEEHAN: I'll be sworn.

THE COMMISSIONER: Okay. Stand up, please? Please place your right hand on the Bible.

CLERK: Do you swear that the evidence you shall give to this Inquiry shall be the truth, the whole truth and nothing but the truth so help you God?

DR. FEEHAN: I do.

CLERK: Please state your full name for the record.

DR. FEEHAN: James Feehan.

CLERK: Thank you.

THE COMMISSIONER: You can be seated, Sir.

Mr. Learmonth?

MR. LEARMONTH: Dr. Feehan, what is your occupation?

DR. FEEHAN: I'm a professor of economics at Memorial University.

MR. LEARMONTH: Yes.

Tenured?

DR. FEEHAN: Yes.

MR. LEARMONTH: Yeah.

And am I correct that in addition to your duties at Memorial, you provide fee-for-service consulting services for entities outside your work at Memorial?

DR. FEEHAN: From time to time, yes.

MR. LEARMONTH: From time to time.

Please state your educational background after high school?

DR. FEEHAN: I have a Bachelor's of Arts degree from Memorial University in mathematics and economics. After completing my degree at Memorial, I went to London School of Economics, and I have a master's degree in – Master of Science degree in economics from London School of Economics.

MR. LEARMONTH: And when did you get that?

DR. FEEHAN: I got that in 1978.

MR. LEARMONTH: Okay.

DR. FEEHAN: And then – I worked for a time, but then I also have a Ph.D. in economics from Carleton University in Ottawa.

MR. LEARMONTH: When did you receive your Ph.D. from Carleton?

DR. FEEHAN: That would've been 1987, I believe.

MR. LEARMONTH: What did you do after you got your Ph.D.?

DR. FEEHAN: After I got the Ph.D., I was at Memorial University.

MR. LEARMONTH: Okay.

You were at Memorial before you got your Ph.D.?

DR. FEEHAN: For a time – before I got the Ph.D., and after I finished my master's, I worked with the provincial government for three or four years. And then I went with Memorial University under the condition that I would complete a Ph.D.

MR. LEARMONTH: Okay.

So during what years did you work for the provincial government and in what department?

DR. FEEHAN: I worked with the provincial government from 1978 until late in 1982, and I was an economist there working in Cabinet Secretariat.

MR. LEARMONTH: All right.

When did you join the faculty of Memorial?

DR. FEEHAN: That would've been in 1982 initially, yeah.

MR. LEARMONTH: And then – okay.

And you've worked at Memorial as a teaching professor since then?

DR. FEEHAN: Yes, I've – for the most part. There's been times when I've been on leave. For example, I've taught as well at the University of Western Ontario, at Carleton University's School of International Affairs and at Mohyla Academy in Kiev in the Ukraine.

MR. LEARMONTH: Okay.

In addition to your teaching duties I understand that you have over the years prepared a number of scholarly papers?

DR. FEEHAN: That's correct.

MR. LEARMONTH: Yeah.

Is that something you continue to do at this stage in your career?

DR. FEEHAN: Yes so.

MR. LEARMONTH: Yup.

Please explain the approximate period of time when you became interested in the Muskrat Falls Project.

DR. FEEHAN: I think really from the very beginning. Actually, pre-Muskrat, I had done a little work related to the Lower Churchill actually, way back when I was with the provincial government.

But in terms of my research work, I was initially interested in Churchill Falls, and so I sort of followed through on that. But with Churchill Falls I had done a – joint work with Melvin Baker who holds a Ph.D. in history from Western Ontario, and we wrote a paper on the Churchill Falls contract that was published in the *Dalhousie Law Journal*.

And after that then I wrote another piece related to Churchill Falls and the power corridor through Quebec and the whole debate about that during the Smallwood era. That was actually published in a journal called *Acadiensis*, the journal of Atlantic Canada history, so it's a history journal.

So that was sort of my background in doing academic research in issues related to the, let's say the Churchill River and hydro development. And naturally, when the whole Muskrat issue and the Lower Churchill issue became in play, I was interested in that as well, and I did some academic research on that point.

MR. LEARMONTH: Okay.

I believe one of your scholarly publications was in the *Dalhousie Law Journal*, is that right?

DR. FEEHAN: That was the paper on the Churchill Falls contract, particularly with a focus on the renewal clause.

MR. LEARMONTH: And when was that?

DR. FEEHAN: I believe that was published around 2007.

MR. LEARMONTH: All right.

Now, I'm gonna ask you a question that we've asked all the witnesses, so it's a – you've

generally opposed the Muskrat Falls Project, is that correct?

DR. FEEHAN: When it was first announced I was neither for or against. I thought it was an interesting idea given that the province would've had – Nalcor was having such difficulty getting acceptable terms for the development of Gull Island because that would mean having to go through Quebec. And that appeared to be a major obstacle, to be able to get it through Quebec on terms that would make it feasible to do.

And so initially, when Muskrat Falls was announced, I was not against it. I wanted to see more numbers and to know the plan. I went – I was invited to the initial announcement, which was held at a hotel here in St. John's –

MR. LEARMONTH: That would be November 18, 2010 –

DR. FEEHAN: I believe –

MR. LEARMONTH: – with a term sheet with Nova Scotia.

DR. FEEHAN: Yes, it was sometime in November.

MR. LEARMONTH: Yeah.

DR. FEEHAN: I don't remember the exact date. And I remember going through a briefing asking some questions, but I was really just interested, I'd say, at that point.

MR. LEARMONTH: Yeah.

It was after that that you – after your reviewing it that you reached the opinion that –

DR. FEEHAN: Yeah, I would say that was – the announcement was – was it 2010?

MR. LEARMONTH: Yes.

DR. FEEHAN: November 2010. So I would say it was sometime in 2011 that I – as I got a little more information, started thinking it through, that I became a little bit skeptical about how this would work, what it would cost and whether or not there were better alternatives.

MR. LEARMONTH: Okay.

And so – and you have spoken out against the project since you completed your research. Is that correct?

DR. FEEHAN: Yes. Initially, I was raising concerns. The C.D. Howe paper that I had published, I suggested that proceeding at that point was maybe – was premature and imprudent, and that consideration should be given further to other alternatives.

MR. LEARMONTH: Okay. Now –

DR. FEEHAN: And it just – as the project, of course, became more and more expensive, I became more and more concerned that this was not the appropriate way to go.

MR. LEARMONTH: Okay.

Have you, at any time, been concerned that there could be repercussions or problems for you in your career as a result of your speaking out against the position taken by the Government of Newfoundland and Nalcor respecting the Muskrat Falls Project?

DR. FEEHAN: No. At the time I was a full professor with tenure and I really didn't give that any thought.

MR. LEARMONTH: All right. Thank you.

The first exhibit I would ask Madam Clerk to bring up is Exhibit 00321, which is a January 11, 2012, paper you prepared for the C.D. Howe Institute entitled, Newfoundland electric – “Electricity Options: Making the Right Choice Requires an Efficient Pricing Regime.” And that's at tab 1 of your – the documents before you, Professor Feehan.

First, what is the C.D. Howe Institute?

DR. FEEHAN: It's a long established think tank that focuses on policy issues in Canada. So it has a fairly large staff of economists, and it mostly publishes from economists across the country who contribute to them and publishes on – on anything to do, really, a broad area of economics in Canada with a focus on economic policy.

MR. LEARMONTH: Okay.

And we know that for scholarly papers there's a process called peer review. And I want to ask you just to explain, in a very short way, what peer review is; and, second, whether the papers C.D. Howe Institute publishes are peer reviewed.

DR. FEEHAN: Peer review applies particularly to academic research. So publishing in journals, in academic journals, for instance, I would always have to – you would submit an article or a manuscript, and it would be reviewed by experts in the field selected typically by the editor of the journal.

My normal experience has always been that the referees that are picked are kept anonymous. So the writer of the manuscript doesn't know who's doing the comments. Comments go to the editor and, based upon that, the editor goes – talks to the – or responds to the person who's made the submission of the manuscript and says that either it has to be revised, or it's not acceptable, or it's in error, and that sets up the process. You may have to revise it or you may have to deal with the fact that it's not going to be accepted because the experts who've done the peer review have said no, it's not acceptable.

MR. LEARMONTH: And isn't it true that often in a peer review process, the people who are conducting a peer review don't even know the name of the person that submitted the paper?

DR. FEEHAN: Yes, that's what's called a double-blind peer review process.

For example, I'm the editor of a journal, *Newfoundland and Labrador Studies*, that's based at Memorial, and when a submission is made to me, I, as editor, will find experts – people with expertise related to the submission. I will send the paper to them. I won't tell them who the author is. I'll remove all evidence of the author's name.

MR. LEARMONTH: Okay.

DR. FEEHAN: And then they will give back their reports and I will send the reports, my decision, to the authors so they – no one, neither side –

MR. LEARMONTH: Knows.

DR. FEEHAN: – knows the identity of the other.

MR. LEARMONTH: Okay.

Now, is there such a review process followed by the C.D. Howe Institute? Do you know?

DR. FEEHAN: Not all think tanks do the same thing with journals, but the C.D. Howe Institute apparently does. It did so in my case.

MR. LEARMONTH: Right.

DR. FEEHAN: So all I was told was this paper was going to be reviewed by – I think they said leading electricity researchers.

MR. LEARMONTH: Okay.

DR. FEEHAN: Leading Canadian electricity researchers, I think. And, of course, the person handling at the time was also – was Ben Dacus, who is a – holds a master's degree from the London School of Economics. So we had an economist who was acting as sort of the editorial guidance there; but, again, their referees were unknown to me.

MR. LEARMONTH: All right.

Okay. Just – thank you for providing us that background information.

Now, turning to Exhibit P-00321. Why did you prepare this paper and send it to the C.D. Howe Institute?

DR. FEEHAN: Well, I think by that time, having learned more about Muskrat Falls – you know, the Joint Review Panel was underway. There was more and more information coming out. I became more and more concerned that this may not be the best project, and I thought that – well, what motivated me was the sense that I should contribute somehow to the debate. And as an economist, one of the key things we teach in microeconomics is this importance of economic efficiency in getting pricing right.

And what I thought was: well, you know, we have to look at our starting point and see if the

prices is right; that the price of the electricity is right. Maybe there's ways we can handle this issue without having to make a massive investment.

And so I thought by putting it through the C.D. Howe Institute and having peer review and having the standing of the C.D. Howe Institute behind it, it would have more of an impact – assuming they would go ahead and accept it and publish it – that it would have more of an impact than if it was just me by myself, you know, speaking on radio or in the media or writing something in *The Telegram*. I thought this would carry some weight and might have some particular influence on policymakers in the province.

MR. LEARMONTH: It was a contribution to a public debate. Would that be a fair way to put it?

DR. FEEHAN: That's essentially it. I wanted to get that in there in the debate.

MR. LEARMONTH: All right.

Now, the background is set out on page 2, and the first part of page 3 under the chart there.

I'd like you to deal with this – with the matters that you discussed under the heading: "Inefficient Pricing Leads to Waste" and you can refer to the document. But can you explain to the public what this issue involves?

DR. FEEHAN: This, again, goes back to the key notion of economic efficiency. There's a cost on the margin of producing things. People want them, there's demand for something, and if the market is working properly then for the last unit produced it should be at least of the value that covers the cost of producing it.

If that quantity is not coincident with that condition, then something is being wasted, you're producing too much. So the people who are consuming it value it, for example, at less than the cost of making it. Well, that's going to be a waste. If I value something at, you know, 10 cents a kilowatt hour and the true cost of making it is 50 cents a kilowatt hour, well there's 40 cents of waste gone in there somehow.

And so the idea is to get efficiency – economic efficiency in the economy – we tried to aim for this notion of not having any waste. So if the price is too high or too low, it's going to result in a waste of resources.

MR. LEARMONTH: Okay.

Now, you're – the position that you've taken in this paper and elsewhere about inefficient pricing leads to waste. Is this some theory that you, Prof. Jim Feehan, has developed yourself? Or is it based on research in the field of economics?

DR. FEEHAN: Oh, this doesn't come from me. I mean, I'm a voice that's communicating it but this is – there's a whole branch of economics called electricity economics and there's been tremendous literature and contributions in this area over time. So you can find other publications in journals, from the C.D. Howe, from economists who I would – it's very fair to say that the – strong consensus among economists working in this area is to push towards marginal-cost pricing when it comes to electricity.

Electricity is complex because of its nature and the engineering challenges, but the fundamental principle – which is out of microeconomics and which is echoed by most people working in electricity economics – is the goal of achieving marginal-cost pricing.

MR. LEARMONTH: Okay.

I'd like you to go to page 3 and just take us through – you've explained how this principle works, can you explain or apply it to the situation we face here with Holyrood?

Just starting at the bottom of the page and carrying on – if you could just explain how that principle applies, in your opinion, to our situation here on the Island of Newfoundland.

DR. FEEHAN: Okay.

The idea, then, was – our starting point was we have Holyrood, it cost – the fuel costs then are given – are shown in this chart on the same page – figure 1. But basically, with rising oil prices, the cost of producing a megawatt of electricity at

Holyrood would rise because it's a plant that uses bunker C fuel. But what we had was a situation where the price – or the cost of producing electricity there was, you know, going up to maybe \$130, \$140 a megawatt hour. But at the time, people – regular customers, retail customers and others were paying a price for their electricity much less than that, even though there had to be markups for transmission and distribution and so forth.

So the idea there was, well, on the margin, if you turn up your heat or turned on a light in your house, and that will cause more oil to be burned at Holyrood and the costs would be, say, a \$140 – to pick a round number – a megawatt hour; whereas, you're paying maybe a hundred. So the true cost is 40 per cent of what you're paying. So if you knew the true cost – if someone said to you: No, your electricity bill is gonna reflect this larger amount. You're not going to use the same amount of electricity; it might even affect your decision as to whether to convert your house from an oil furnace to electric heat.

MR. LEARMONTH: Okay.

So now, just turning on to page 4, I want you to refer to what you've written here that with the Holyrood – second paragraph, first full paragraph: "With the Holyrood plant either not operating or operating at very low levels, little or no price change is needed during this time. For the coldest months, December to March, Holyrood operates continuously and at times peak demand pushes it to its limit. A higher price – one that reflects Holyrood's production cost – is required during this season." And then – and so on.

Can you just explain that a little, in the simplest terms as you can?

DR. FEEHAN: Okay.

Well, over the course of the year our demands for electricity will vary. It varies by the day, because of course we sleep at night; we don't use electricity very much. It also varies by the season, because of course as we approach winter it gets darker, so lights are on more, and in particular it gets colder, so people turn up their heat or – and have to use their heating more. And so when we have electric baseboard heating

or any electricity fuel heating, then the demand for electricity and overall consumption of electricity will go up.

That's unlike, maybe, July or August. So in those months, those warmer months, we may not be burning much or any fuel at Holyrood, particularly back then. And so the actual price or cost of producing the power is much lower because it's produced from hydro sites. But once you hit the winter months the demand on the system has to be met and it's – the increased demand is beyond the capacity of our hydro resources to meet it. So all the increase in demand, pretty much, with integration with the hydro sites – but incremental demand largely has to be met by burning more fuel at Holyrood.

And the point there about time-of-use rates, I believe – or seasonal rates, is to say: Well, if we had implemented something where the price went up during the season where it's coldest, where the demand is highest, then we would put less demands on the plant, reducing the chances of blackouts and things like that. But also it would save money because the fuel at Holyrood is expensive; it emits greenhouse gases and other pollutants.

And so by properly pricing the electricity to reflect its true cost at that time, people would consume less of it and, as a result, we would have a better use of our resource because it's not really useful to be burning oil that costs 150 or more megawatt – dollars a megawatt hour to burn, when people are paying or valuing it at only at, maybe, \$100.

MR. LEARMONTH: Yeah.

So – and this is connected to the principle of time pricing, that you have different – just explain how that works.

DR. FEEHAN: Well, this actually – the idea of time-of-day use – charging electricity according to the time of day goes way back, I think, to 1950 in France, where a utility economist there at their big utility company, Électricité de France, tried to – began trying to implement time-of-day rates and marginal-cost pricing.

And the idea was, if they varied the rates where the demand was highest, they could take out the

spikes, let's say, and the fluctuations. The spikes and the fluctuations in electricity is a real challenge because when there's a spike you need enough capacity to handle the highest spike or peak demand, even though, on the average, demand might be a lot less. But you still have to put in enough capacity to handle those periods where demand and consumption is very high, otherwise there won't be enough electricity in the system and you get blackouts and problems like that.

MR. LEARMONTH: Okay.

So does this – I just wanna give an easy to understand example and tell me whether I'm off base or not.

With this time pricing and, you know, acknowledging that the peak demand hours are, say, from – I'll say at night – 5 p.m. to 11 p.m. Would that encourage people, if they're paying a higher price during that period, to perhaps turn their baseboard heat down and perform functions such as washing their clothes, and so on, at a time outside this 5 to 10 or 11 o'clock time when the prices are high? Is that how it works?

DR. FEEHAN: That's how it's – that's the basic idea behind it, yes, to just get the people to shift their consumption to avoid peak demands being as high as they might've been in the past, and this is something that's used in many jurisdictions now.

MR. LEARMONTH: Can you give us some idea of what about how common it is, both in, you know, in North America and in Europe?

DR. FEEHAN: I believe it's being used in Ontario now. I think it's used in many jurisdictions, but I don't have any idea of the numbers.

MR. LEARMONTH: Right.

DR. FEEHAN: And certainly there's a push in this direction. There's even a push towards real-time pricing as electric metres become smart metres, because then they can monitor consumption in homes –

MR. LEARMONTH: Well, how does that work? Real-time –

DR. FEEHAN: – on a real-time basis.

MR. LEARMONTH: How does real-time pricing work?

DR. FEEHAN: Basically it's the same sort of idea. Like, as you mentioned in your example, maybe consumption goes way up between 9 and 11 p.m. in the daytime, but this would be more real time. It would be – for the people whose consumption goes up, the system would be able to measure it instantaneously.

That's more of a challenge. And there's literature on real-time pricing, but it's not something that I would've suggested here, 'cause I think our fluctuations are more to do with the seasons rather than time of day; our challenges in the – our seasonal months where it gets cold and dark and the consumption of electricity goes up.

MR. LEARMONTH: And that's because there's a tendency in this province for people to use baseboard heat – heaters rather than –

DR. FEEHAN: Yes.

MR. LEARMONTH: – oil-fired or other types of heating systems?

DR. FEEHAN: Yes, there's been a pronounced shift away from oil-fired furnaces towards electric, baseboard heating, not only in new homes, but in existing homes, there's been conversions.

MR. LEARMONTH: As an economist would you be able to provide any reason for that?

DR. FEEHAN: One of the reasons would be relative prices. That people are looking at the price of electricity and they're looking at the price of their furnace fuel and they're making the switch. There may be other factors in play as well, but you know, if you look at other provinces, generally what you find is provinces like Quebec and Manitoba, and to some degree New Brunswick, that have relatively low electricity prices, they have pretty extensive use of electric heat in homes.

If you look at other provinces where that's not the case, in terms of the price of electricity being low, you find a reliance on electric heat is much less, sometimes because there's an alternative like natural gas, but even in a province like PEI where there isn't natural gas, you find that electric heat is not widely used.

MR. LEARMONTH: Is there a high rate of oil-fired heating systems in PEI?

DR. FEEHAN: Yes.

MR. LEARMONTH: Yeah. Thank you.

Now, I'd like you to turn to tab 2, Exhibit three – P-00322. Have you got that before you, Dr. Feehan?

DR. FEEHAN: Yes, I do.

MR. LEARMONTH: Can you advise us what this document is?

DR. FEEHAN: This is an article that I wrote for *The Telegram*. Once I had done the C.D. Howe paper and it, you know, the news was out about it and at least some people had seen it, I thought that, you know, it – I don't know that it had much impact, but what I wanted to do was still to contribute to the debate. You have to remember, at this point, the project had not yet been sanctioned. And the purpose of the C.D. Howe commentary was to try to have some input into the public policy and to make sort of a – what I thought was a useful contribution to identify another alternative.

So then I thought that I would do this article because it would focus on a broader audience. The C.D. Howe thing would be, you know, more – for more technical people, for policy makers – and certainly some members of the public. But I thought that this would have further reach. So again, I did this contribution to *The Telegram* mainly as a way of just reaching out to the public and saying well, look, let's consider alternatives here before we fully jump into Muskrat Falls.

MR. LEARMONTH: Is this article compatible with the C.D. Howe presentation that we've just referred to?

DR. FEEHAN: Yeah. It's a bit broader in one sense, because what I do towards the end of it where I talk about reduction and demand – which is on the back page – I do talk about something equivalent to efficient pricing, which is to impose a tax on people that consume relatively large amounts of electricity. I used the example of residential consumers, but you could do it for any type of consumer. And –

MR. LEARMONTH: Was – oh, sorry.

DR. FEEHAN: And sometimes in economics what we'll do, we'll say okay, if there's a deviation of price from marginal cost, one way of fixing it is to fill in the gap either with a tax or subsidy depending upon the circumstances. And so that idea of imposing this tax on high levels of consumption of electricity was the same sort of idea of adjusting the price, the tax-inclusive price, to try to move to something that was more consistent with the notion of economic efficiency.

But there were other things in here, as well, that I wanted to focus on, both on the alternatives on the supply side as well as trying to have conservation through – on the demand side.

MR. LEARMONTH: Okay.

And was this article written 100 per cent by you?

DR. FEEHAN: Yes.

MR. LEARMONTH: Okay.

And can we consider this article as an accurate statement of the views you had on alternatives to the Muskrat Falls Project on August 11, 2012, the date that this article was printed?

DR. FEEHAN: Yes.

MR. LEARMONTH: Okay.

Now, let's just go through this article, and I'd like you to – in the first column on the left, sixth paragraph it says – “As costs are being re-assessed, now is the appropriate time to compare Muskrat Falls to a better alternative. The Isolated Island Option as currently” – designated

– “is a bit of a straw man. There are” many “ways to make it more competitive. I can suggest five.”

That’s what you’re introductory comments were.

DR. FEEHAN: Yes.

MR. LEARMONTH: Can you take us through the five alternatives – the first being cleaner fuel.

DR. FEEHAN: Yes.

With the Isolated Island Option it would’ve involved keeping Holyrood in operation, and of course, Holyrood did have a lot of discharge of particulates and other emissions, which were an environmental problem. And of course, what economists would argue is that the marginal cost of running that plant would include not only the cost of fuel and operations but also a cost of the carbon emissions.

But to get to this point, my idea was, well, rather than under the Isolated Island Option, the plan was to spend several hundred million dollars on putting in scrubbers at the plant. But I pointed out that it wasn’t clear that these scrubbers were necessary because the plant had already used – moved to a cleaner fuel, and the cleaner fuel didn’t cost that much more, and in addition, another even cleaner fuel was available.

So I made the point that if you looked at the plant, the particulates were down – you see the top paragraph of the second column.

MR. LEARMONTH: Yes.

DR. FEEHAN: You know, particulates were down 75 per cent, and you back up a bit, you find that the other emissions were also down quite substantially.

And they were down for two reasons. One was less demand was being placed on the Holyrood mill, because the newsprint mill in Grand Falls had closed down; Stephenville was closed down. So demands on Holyrood had actually declined somewhat at the time. Plus the fuel that Newfoundland Hydro was using was a cleaner fuel.

And so my argument was don’t spend these hundreds of millions of dollars on a plant that has a finite life when at a much cheaper price you could simply buy cleaner fuel. So I thought cleaner fuel would allay the environmental impact, plus it would avoid having to spend these hundred of millions of dollars, and that should be therefore removed from the cost of the Isolated Island Option.

R. LEARMONTH: But that would be an improvement; it wouldn’t be a final solution, but it would be an improvement to the existing facility at Holyrood.

DR. FEEHAN: Yes, that by itself wouldn’t be enough, perhaps, to fill in the gap that –

MR. LEARMONTH: Nope.

DR. FEEHAN: – Nalcor had claimed was there. But it was still a significant amount and it was upfront spending because it would have to be spent fairly early on in the process.

MR. LEARMONTH: Right.

Now, that’s the first point. The second is around the middle of the second column – or middle column on the first page of this article: Better use – it should be – of the power we have. Can you take us through your position on that topic?

DR. FEEHAN: This had come from particular circumstances around that time where there had been a lot of spill. There had been a lot of water in Newfoundland Hydro’s reservoirs that was spilling over the dam. So it wasn’t – couldn’t be used for electricity generation. Now, it was an exceptional year. There was a huge amount of spill compared to other years, but –

MR. LEARMONTH: You’re not suggesting this year is a typical year, it’s –

DR. FEEHAN: No, no, it wasn’t a typical year. I think at some point it says that in there. But, in any case, I would freely admit that it wasn’t a typical year by any stretch.

MR. LEARMONTH: Yes.

DR. FEEHAN: But it did give me the idea that, hey, if we have reservoirs out there and at any

time they're spilling, then you should look at what measures you could take to reduce the spill. Maybe it's building higher walls around your reservoirs, maybe it's a better management system – they already had a system for managing spill, I'm sure.

MR. LEARMONTH: Just for people that don't know, can you explain why spilling water is a waste. Like, why is that a wasteful –?

DR. FEEHAN: Well, if you didn't spill the water over the dam – if it didn't have too much water in it – that water could be held in reserve. So when electricity is needed, it could be used – that water could be used to run through the turbines at the hydro plant. And the plant could only run so fast, but also, reservoirs can only stay so high. And so the more water that's in the reservoir, the longer lasting you can, say a big run through of water through the turbines.

So having – it's like having, in a sense, more fuel, and water is free fuel. It still wouldn't increase maybe the maximum capacity at a point in time that could be produced at a hydro plant, but it would provide more water so it could continue operating at its maximum capacity for a longer period of time.

MR. LEARMONTH: Yeah, and that's one of the features of the Upper Churchill, it has one of the biggest reservoirs in the world, the tenth biggest lake in Canada. It is – that's one of the features of (inaudible).

DR. FEEHAN: Yes, having huge reservoirs are always good for hydro sites because it allows the optimum use of that water and they can integrate it. Hydro-Québec has a big system of reservoirs as well and it gives them great advantage in generating electricity.

MR. LEARMONTH: Okay, well, I've caused you to digress a little bit.

DR. FEEHAN: Okay.

MR. LEARMONTH: Now maybe I'll ask you to go back to what I diverted you from.

DR. FEEHAN: Okay. So, but that was my main point about the use of our existing water in the system, if we could conserve more, or reduce the

amount of spill. It was very difficult and I couldn't put a quantification on this, I know that year was an exceptional year.

MR. LEARMONTH: Okay.

DR. FEEHAN: But –

MR. LEARMONTH: Okay, fine.

So, then the third is in the right column of page 1 is: More wind –

DR. FEEHAN: Mm-hmm.

MR. LEARMONTH: – is the third point. Can you discuss that point, please?

DR. FEEHAN: The Isolated Island Option did include some allowance for additional wind. But my argument was that you could do better. Wind technology is improving, and a relatively small amount of wind is currently being used for electricity generation in the province. I actually – I think the amount at this time in 20 – at the time of writing of this paper, I think, in 2012, I think the amount of wind generation then – the capacity for wind generation is probably unchanged today.

So my argument here was, well, add some wind to the system, and whenever the wind is blowing that takes pressure off burning oil at Holyrood, as well.

MR. LEARMONTH: So wind can work with a reservoir, I take it, in the sense that when the wind is blowing, you don't have to run the water through the turbines, and you save it for a day when the wind isn't blowing? Is that correct, in a very general sense?

DR. FEEHAN: Yes, and you could run into a problem where demand is so high that you may have to run all your water through a turbine – run your wind turbines and then still have to burn some fuel, depending upon what the overall demand is.

But, even if you're in a situation like that, to the extent that you're running your wind turbines at all, it does take the pressure off burning fuel.

MR. LEARMONTH: Okay.

Okay, is that an adequate –

DR. FEEHAN: Mm-hmm.

MR. LEARMONTH: – explanation for point 3?

DR. FEEHAN: Mm-hmm.

MR. LEARMONTH: Okay. Thank you.

Now, we'll turn onto page 2 and point 4 is entitled: Bring in smaller hydro. Could you expand on that point, please?

DR. FEEHAN: Well, again, the Isolated Island Option did have three small hydro facilities included as potential sources of energy if Muskrat Falls wasn't done, but, you know, there had been a study done by a number of faculty members in the engineering department that had identified a tremendous amount of potential on the Island for more hydro development.

And as the paper points out here, you know, there's always environmental issues; whether you're talking a small hydro site or a big one. But, you know, there are so many sites available. Some in facilities that have already been developed. They might be add-ons, for example, to the Bay d'Espoir system.

So the point of this was to say: Well, let's look at those additional sources of hydro on the Island that are not developed, beyond the three that was in the Isolated plan – Isolated Island Option – and see if there's not a few more – well there are many more, but of the many more, try and find the ones that are perhaps the most economic, and at the same time, the least environmentally contentious, and just see what can we add to that system.

You know, can we add a couple of more or several more? How much electricity would it generate? What would the benefits be? And I didn't have a good idea of that number, but I knew there were a lot out there because of the publication that came out of the, I believe, engineering department at MUN.

MR. LEARMONTH: The fifth point you make in your article is – the heading is: Reduce

demand. Could you take us through that topic, please?

DR. FEEHAN: Yeah. The previous four items were really were focusing on adding to supply or displacing the supply that would've come from Holyrood, so our reliance on Holyrood would go down. But the other way of causing reliance on Holyrood to go down would be to get people to consume less.

And, you know, we're in this era of conservation and being concerned about the environment, so reduce demand may be called for; particularly when you consider that people were making decisions on electric heat and installing electric heat in houses based on a price of electricity that didn't reflect the cost of producing electricity at Holyrood. So, therefore, I go back to that notion of time-of-use pricing, like time-of-day pricing, which would require new technology like smart metres.

The second action was to impose a tax on higher consumption of electric heat, say, beyond 3,000 kilowatt hours. And that was a suggested number. You know, people can pick other numbers. You can do some analysis to find what might be best or most effective. But that price was meant to – that tax was meant to, of course, affect the price to people, to get the price to what economists would call the efficient price.

And then, of course, you could go ahead with conservation measures, which might entail subsidies to consumers to install heat pumps or other sources of heat or – I said heat pumps here, but it could be other things. It could be installing more insulation, weather-proof doors, triple-glazed windows.

UNIDENTIFIED MALE SPEAKER:
(Inaudible.)

DR. FEEHAN: Anything that would reduce people's consumption of electricity or heat in general.

MR. LEARMONTH: Yes.

So the – so that's the second point, second – just reading from the middle column.

DR. FEEHAN: Well, I think the three were the time of use pricing, the –

MR. LEARMONTH: Demand side –

DR. FEEHAN: – the tax. Yeah, all within – there were like three subcategories within reduced demand.

MR. LEARMONTH: Okay, so what is the third one?

DR. FEEHAN: Again, energy savings program, the conservation.

MR. LEARMONTH: The third one –

DR. FEEHAN: Yes.

MR. LEARMONTH: – demand side (inaudible) –

Can you explain in as simplest terms as you can this concept of elasticity of demand?

DR. FEEHAN: The concept is fairly straightforward. It's – whenever the price of something goes up, people will generally consume less of it. Elasticity is meant as a measure of how much people cut back. So if the price goes up 10 per cent, we can be reasonably assured that people won't buy more. They'll probably, in all likelihood, buy less.

They may buy a little less or a lot less. If it's a little less, our index of elasticity would say, well, that's fairly inelastic or small. If the 10 per cent increase in price causes people to consume a lot less, then we'd say, oh, that's elastic or it's – in other words, demand is very sensitive to the price. So it's just a measure of how people react to a price change.

MR. LEARMONTH: So this concept of demand elasticity is not reserved for electricity use. It's a –

DR. FEEHAN: No.

MR. LEARMONTH: – concept that applies to all commodity consumption? Is that correct?

DR. FEEHAN: That's right. Price elasticity of demand would be defined for every commodity that there is.

MR. LEARMONTH: So if you put the price –

DR. FEEHAN: Any commodity has a price.

MR. LEARMONTH: If you put the price of beef up –

DR. FEEHAN: Yeah.

MR. LEARMONTH: – people will buy less beef.

DR. FEEHAN: People will cut back.

MR. LEARMONTH: (Inaudible.)

DR. FEEHAN: And generally, you know, it's more elastic or people will cut back more to the extent that there's more readily available alternatives around. When it's a necessity and there's very few alternatives, then people may only cut back a little bit. But the more alternatives, the more scope people have to cut back.

MR. LEARMONTH: Now, is there any rule of thumb or guideline or accepted principle that you can apply to demand elasticity for electric consumption? In other words, is there any documentation that say that if you cut back the price of electricity – if you increase the price of electricity by X per cent, then it'll lead to a corresponding Y per cent decrease in consumption? Are there any rules or rules of thumb or guidelines that apply in that situation?

DR. FEEHAN: Well, there's a wide range of estimates. And actually, depending upon a point in time, depending on expectations and depending on where you are, the elasticity could be quite different. So if you live in a very nice climate where the summers are nice and warm but not really hot, so you don't use air conditioning much, and the winters are very mild so you don't have to use heating very much, then if your electricity price goes up a bit, it may not matter because you're not consuming much electric heat or air conditioning, which uses heat.

Whereas if you're in different circumstances, you may find that people would react to a price change by doing something quite extensive. For example, I suppose if you're in a jurisdiction where natural gas is available and the price of electricity goes up, you might decide that you're taking out or just turning off your electric baseboard heaters and you're going to get the gas company to come and install gas heating.

So the elasticity, I wouldn't say there's a rule of thumb number because it varies so much depending upon time and jurisdiction.

MR. LEARMONTH: And climate and –

DR. FEEHAN: Climate.

MR. LEARMONTH: – people's use –

DR. FEEHAN: Geography.

MR. LEARMONTH: – of electricity, yeah, so there isn't. It just depends on – each jurisdiction is unique, although the principle applies in some way to every jurisdiction.

DR. FEEHAN: Yes.

MR. LEARMONTH: Yeah.

DR. FEEHAN: And I would add it would vary with time because in the short period of time you can only do so much in response to a price increase; whereas if that price increase is long lasting and you believe it's going to be long lasting, then your reaction to it might be quite different over time because you can take other actions.

MR. LEARMONTH: Yes.

Now, you refer in a column – the second-to-last paragraph of column 2 of Exhibit 00322 – to offshore natural gas and imported liquefied natural gas.

Did you do any research in that or are you just mentioning those because you know that those alternatives are possibilities that are out there?

DR. FEEHAN: Yeah, I had attended Prof. Bruneau's talk on natural gas and, you know, it was a very professionally done presentation I

thought, and I saw no reason why we should rule it out when someone with some knowledge had suggested that it should be considered as a possibility.

MR. LEARMONTH: But you don't –

DR. FEEHAN: But I didn't have any –

MR. LEARMONTH: – you don't profess any experience –

DR. FEEHAN: No.

MR. LEARMONTH: – or qualifications to comment on natural gas beyond what you've just said, is that correct?

DR. FEEHAN: That's correct.

MR. LEARMONTH: All right.

Now, in the last part on page 3 of Exhibit 00322 you say, I'm gonna quote, that: "Muskrat Falls is a much riskier project because it is one enormous investment at one point in time, whereas the Isolated Island Option is a set of diverse smaller projects spread over time."

Can you just expand on that thought, Prof. Feehan?

DR. FEEHAN: Well, I guess this is something anyone who talks to an investment advisor or has done a course in investing, university or elsewhere, often hears, and the idea is when you're investing you diversify because it's a way of reducing risk.

And so, when you put everything or a huge amount of your resources or money into a single, big irreversible project, that means you have diversified; you've put a lot of weight on one thing. Whereas, with an improved Isolated Island Option or even the options that was in existence, that was proposed, you still had the advantage of adding to capacity over time. If indeed consumption went up, you could add a small hydro site, you could add more wind turbines and it wouldn't take a lot of time. You could adjust price. You could have conservation programs.

So, you could adjust to demand on an incremental basis and you could do it over time. And, of course, you could spread your risk because you'd have a variety of projects. Maybe some would not go too well; maybe some would go very well. But you've diversified both over time and space, if you want, over the type of projects. So, that tends to be a risk-reducing strategy. That's why we often hear advisors say: diversify.

MR. LEARMONTH: Is that what you refer to as the integrated approach?

DR. FEEHAN: Yeah, that's part of the integrated. And the idea here was that none of one of these, say, five themes that I had here, no one might be sufficient; but if you have an integrated plan where these are all put together, so you do have conservation pricing, modest – more wind, cleaner fuel being burned, you start doing all these things, the cumulative effect may be to reduce the consumption, take the demands of Holyrood, and not expose yourself to the huge risk associated with building a multi-billion-dollar, irreversible project.

MR. LEARMONTH: And it's for those reasons why you preferred the Isolated Island with this integrated approach to the Muskrat Falls Project?

DR. FEEHAN: Well, even with this article, at the end of it you'll see that – you know, I'm not saying you have to rule out Muskrat – in the third page – basically, I'm saying, well, come up with a better Isolated Island alternative, compare it to Muskrat and see if it's still better, or see which one comes out.

So, it's not like I'm saying absolutely don't do Muskrat. What I'm saying is come up with the best possible Isolated Island alternative you can, consider that it's lower risk and then compare the two.

So I'm still, in this process, trying to, I guess, contribute to the debate by getting these ideas out there and, hopefully, people will think about them before the decision, or the sanction decision, was put in place.

MR. LEARMONTH: And that would include an examination of a natural gas option, would it?

DR. FEEHAN: Yeah, I think that would have to come into play as well. I mean, I couldn't speak to it –

MR. LEARMONTH: No.

DR. FEEHAN: – but Prof. Bruneau spoke to that.

MR. LEARMONTH: Okay. Thank you.

Now the next exhibit I want to take you to is P-00323, if that can be brought up, Madam Clerk. That's at tab 3, Professor Feehan.

DR. FEEHAN: Mm-hmm.

MR. LEARMONTH: It's an article which you prepared for Atlantic Institute of Market Studies, November 2013: "*Electricity Market Integration Newfoundland Chooses Monopoly and Protectionism*." Could you just in – by referring to this paper, take us through the main points that you attempted to make in this document?

DR. FEEHAN: Well, the 2012 contributions that we just went through were really trying to expand the debate over options and the decision to go ahead with Muskrat Falls. But Muskrat Falls was sanctioned in December of 2012.

MR. LEARMONTH: Yeah.

DR. FEEHAN: And with that sanctioning, there was also legislation that went with it, which was I think at the time, the government said designed to support Muskrat Falls or words to that effect. And this piece was in part a reaction to that because now that the project was going ahead, the – let's say the supportive legislation to me was a signal to doubt the project even more.

Because the supportive legislation at the time of sanction entailed eliminating the scope for any competition in – for electricity in the market, despite the fact that for the first time the Island of Newfoundland would be connected to the North American grid. It imposed pretty strict – strong restrictions on the capacity of anyone to import or export. It gave Newfoundland Hydro basically the right to be the sole supplier and buyer of energy in the province, at a certain level.

There were – Newfoundland Power had to buy from them. Industrial customers were grandfathered to the extent that they could use generating capacity that they had already installed, but no industrial customer could now self-generate, add to their generating capacity. So this was a signal to me that they wanted to greatly increase the monopoly power of Newfoundland Hydro within the Island market.

And they certainly didn't want competition from either independent power producers on the Island or from outside. And this, to me, was a signal that they were going to have to raise the price to what might be considered a non-competitive price, compared to outside the province, in order to pay for Muskrat. It was something that I thought was a signal that this project would be very costly.

MR. LEARMONTH: All right.

And so why is a monopoly – why are monopolies and protectionism bad things when we're talking about electricity?

DR. FEEHAN: Well, it's particularly bad things for consumers because if you want to enhance monopoly power – typically a monopoly will raise the price well above marginal cost in order to maximize profit, and economic efficiency says, well, price and marginal cost should be coincident. But if we're going to create a monopoly situation, not allow competition, not allow independent power producers, say, to use an open-access tariff to sell power, say, to Newfoundland Power, but Newfoundland Power would have to buy all its power from Newfoundland Hydro, couldn't self-generate any more than – from its existing capacity, couldn't add to it, the industrial customers couldn't decide that they were going to self-generate, they would have to buy from this one seller. And if you're an independent power producer you couldn't sell it to Newfoundland Power, you'd have to sell it to Newfoundland Hydro and then they could sell it where they chose to.

So it was a signal to me that if they were going to control the market in such an extreme way, that they must have needed such an extreme control of the market. And why would they need

an extreme control of the market? For the money.

MR. LEARMONTH: Would you please turn to page 4 of Exhibit 00323 in the right-side column, the second full paragraph down where you speak of the Federal Energy Regulatory Commission, FERC, and the OATT being the Open Access Transmission Tariffs. Can you give a brief explanation about how those two things, FERC and OATT, combine to create a system?

DR. FEEHAN: Well, the – FERC is the – a US agency. And since, I think, probably the early 1990s the trend in the United States – as in other countries, but in the United States – has been to move towards more competitive wholesale markets to increase competition. And FERC has required that any utility selling power across borders have an open access tariff and the more – it has jurisdiction over that area.

And the idea is if I have electricity to sell and you own the transmission lines, you could potentially keep me off those lines because you want to sell in the market I want to sell into. Well, now the Open Access Transmission Tariff says: No, there has to be open access; everybody has to have equivalent or equal access as long as capacity holds.

So there's scope for electricity to go from one market to another and that enhances competition. And a general result of competition is it tends to bring price down to something coincident with marginal cost, which is the motivation behind the reforms in the United States to increase economic efficiency in the electricity sector.

So what happens in Canada, of course, if any Canadian province is selling into the United States because it's sending electricity over state lines, it's expected that it will have an open access tariff as well. It can't be imposed legally because, of course, it's a different country, but in order to access the market this tends to apply.

MR. LEARMONTH: So if you're just selling within Canada, you don't have to be FERC compliant obviously, but if you want to export to United States you have to be FERC compliant.

DR. FEEHAN: You have to be.

MR. LEARMONTH: And you make this point –

DR. FEEHAN: Well, you should be FERC compliant. Then it's a question of whether someone, I suppose, in the states complains that you're not.

MR. LEARMONTH: So you expose yourself to that possibility.

DR. FEEHAN: You expose yourself to that possibility. And if you're not selling in the United States, it's not really a concern for you.

MR. LEARMONTH: Okay.

You point out that in this article, November 2013, and the top – and the page is 5, top left-hand – on the left – the first left-hand column: “As a result, all major transmission owners in every province except Newfoundland and Labrador currently have OATTs” et cetera.

And I don't want you – I don't want to – I just want to mention that – or ask if you're aware that there was legislation passed by our House of Assembly, received Royal Assent on May 31, 2018, that deals in some fashion or manner with open access.

DR. FEEHAN: Yeah, I understand the Legislature passed legislation or an amendment to the electric –

MR. LEARMONTH: Yeah.

DR. FEEHAN: – Electrical Power Control Act –

MR. LEARMONTH: Yeah.

DR. FEEHAN: – to allow for and –

MR. LEARMONTH: Yeah.

DR. FEEHAN: – institute an Open Access Transmission Tariff.

MR. LEARMONTH: Yeah and that's Exhibit P-00413, by the way. Yeah.

DR. FEEHAN: And someone else who's an expert in this area would have to speak to it. I don't know that that would go so far as to remove, for example, the ban on self-generation by industrial customers. Plus, I don't know if it's changed the legislation as it affects Newfoundland Power as being the only source of electricity for industrial customers and retailers and the only entity that can buy electricity from any independent power producers on the Island. So they still maintain their market power in that degree. I say may because someone who is an expert in the legislation can –

MR. LEARMONTH: Yeah.

DR. FEEHAN: – can look and see how much scope that this gives.

MR. LEARMONTH: So, would you be content to leave this piece of legislation aside on the basis that you haven't reviewed it in detail and you –

DR. FEEHAN: Yes, that's fair. I haven't gone through it and read it in conjunction with the previous legislation.

MR. LEARMONTH: Okay.

Well, we'll leave it on that basis then.

The next article I want to ask you to consider is at tab 324 – excuse me, tab 4, Exhibit 00324, which is an article in *Canadian Public Policy* entitled: “Connecting to the North American Grid: Time for Newfoundland to Discontinue Inefficient Price Regulation.” This was done in December, 2016.

By the way, what is *Canadian Public Policy*, if you could just give us a brief comment on that?

DR. FEEHAN: *Canadian Public Policy* is a journal. I would think it's fair to say an academic journal that focuses on public policy issues in Canada. I believe it's currently – its editorial office is at the University of Calgary. I'm not 100 per cent on that. Its office moves around somewhat, depending upon who the editor is. But it's an academic journal, it's a peer-reviewed journal.

I think I've probably published in it three or four times; this probably is the fourth time. And it's peer-reviewed just like standard journals so it's a – I believe, a double-blind peer-review process.

MR. LEARMONTH: Okay.

And why did you write this article in – that was published in December, 2016?

DR. FEEHAN: Well, I think – well, my motivation has always been to try and contribute to public policy debate in the province, and I find that I – my belief was, that if you published through peer-reviewed journals in your area of expertise, it does enhance the credibility of what you're saying because experts have to look at it. They have to say it was acceptable. They had – they may have forced you to make changes, to make it more precise or to improve it, or to remove things of doubt.

And so – and it comes out through a credible medium like a journal like *Canadian Public Policy*. And, given that, of course by 2016, the Muskrat Falls decision had been long made – the plant was being built, the power lines were being built – this was more of a paper to reflect on where we should go, given that Muskrat Falls is being built.

So, in part it does review the issue about whether or not it ought to have proceeded, but the focus of this paper is to say, okay, now that we're going to build it, what should we do. And it's back to this point that we should at least still get pricing right, now, and that means to price according to marginal cost, and that creates problems because the plant is so expensive, the project is so expensive – that may not be enough revenue to pay for the full thing, so you have to look at other ways of, probably, paying for the Muskrat Falls Project.

So, that was the focus of this, and it was an attempt to give some options and to point out some ways to go.

MR. LEARMONTH: Now, I just want to ask you to consider some of the things that you've written in this article on the Energy Access Agreement with Nova Scotia.

DR. FEEHAN: Mm-hmm.

MR. LEARMONTH: And have you reviewed the Energy Access Agreement?

DR. FEEHAN: Not in some time.

MR. LEARMONTH: Okay.

DR. FEEHAN: Sorry to say. It's been a while since I've gone through it. I mean, I know the gist of it but –

MR. LEARMONTH: You don't hold yourself out as a person who can give a definitive statement (inaudible) –

DR. FEEHAN: No, I mean – you know, it is a complex agreement. There's many caveats in there about situations where, you know, if Nalcor or one of its subsidiaries responsible for delivering power to Nova Scotia isn't able to provide the minimum amount – there's all sorts of caveats, exceptions, and arrangements so – it is a complex agreement and lawyers would have to, I guess, work through the nitty-gritty, but the thrust of it is something I'm familiar with.

MR. LEARMONTH: Okay. Please turn to page 4 of this – of Exhibit 00324. The left – in the left column there's a paragraph, I'm just going to read out about the Energy Access Agreement which, just for the record, was signed on or about November 26, 2013 in order to achieve compliance with a condition set by the UARB in Nova Scotia. Is that correct?

DR. FEEHAN: That's correct.

MR. LEARMONTH: Yup.

Anyway. Just read this out: "These two agreements are highly beneficial to Nova Scotia. Combined, they give ratepayers in that province access to a minimum of 45 percent of Muskrat Falls energy until 2041. That will allow a substantial reduction in fossil fuel generation in Nova Scotia and permit" – Nova Scotia Power – "to achieve the renewable energy standards set by the Nova Scotia provincial government. NSP and its ratepayers' cost exposure is limited to the Maritime Link, the capital cost of which is an estimated \$1.56 billion."

And I want to emphasize the following part: Also, the Energy Access Agreement is risk-

mitigating with respect to – regard to price. Under the Energy Access Agreement, Nova Scotia Power “... does not have to buy additional power from Nalcor. Moreover, if it chooses to accept a Nalcor bid, then, as discussed later, the price will be a competitive wholesale one. Although not of similar benefit to Newfoundland ratepayers, the two agreements will have far-reaching implications for setting the post-interconnection wholesale price of electricity in Newfoundland. That is the subject matter of the following section.”

I’m not gonna ask you to take it and – can you just explain how that works – that Nalcor has to offer the power to, we’ll say, Nova Scotia. I know it’s not Nova Scotia, but we’ll say to Nova Scotia – but Nova Scotia doesn’t have to take it. Can you tell us how that works, or your understanding of how that principle applies?

DR. FEEHAN: My understanding is that: each year – sorry, excuse me – each year, Nova Scotia Power, or one of its subsidiaries, would call for – bid for a block of power. And under this agreement, Nalcor would effectively have to offer a minimum of 1.2 million megawatt hours for that year, and can offer them up to a maximum of 1.8. Nova Scotia Power, of course, could accept that bid with the prices associated with it, but it could be an open bid, and other parties could compete with Nalcor in the process.

MR. LEARMONTH: Because Nova Scotia is not required to take the bid price. Is that right?

DR. FEEHAN: No. It’s a bid. They solicit a bid, and if they don’t like the bids, they don’t have to take any. And if they get one bid, they don’t have to take it.

MR. LEARMONTH: But Nalcor has to make it?

DR. FEEHAN: Nalcor has to make a bid every year, and whatever happens, they cannot be paid more than price cap, and that price cap – the circumstances change. The main option for the price cap is the wholesale price that’s – prevails

in the New England market – wholesale market – what they call the day-ahead price.

MR. LEARMONTH: Okay. Now I want you to turn to page 8 of Exhibit 00324. I’d like you to read out the last paragraph in the left-hand column. Could you please read that into the record, please?

DR. FEEHAN: This is the one beginning –?

MR. LEARMONTH: Nalcor’s actual bid.

DR. FEEHAN: Yeah.

MR. LEARMONTH: Yeah.

DR. FEEHAN: “Nalcor’s actual bid will be less than that upper bound because the NSP solicitations will be open to competition. One potential bidder is Hydro-Quebec, but others, such as an Emera affiliate or New Brunswick Power, might also be interested and capable of meeting the requirements.”

This would put pressure – I guess on Nalcor – or “... would pressure Nalcor to bid less than the New England price. A similar outcome would arise even if NSP decides not to call for a solicitation or not to accept a Nalcor bid. Nalcor’s alternative markets would still be New England or areas in which New England prices hold sway, but transmission costs, line losses, and other transactions costs would cut into the sale price. The result would be a price that is related to but likely less than the New England price. This prediction is consistent with recent experience, as illustrated in Table 1.”

MR. LEARMONTH: Okay.

So if someone were to suggest to you that, under the Energy Access Agreement, Nalcor will always be entitled to receive the New England ISO price from Emera if it sells the energy – if Emera takes the energy. What would your response be?

DR. FEEHAN: Well, that price would be the maximum.

MR. LEARMONTH: Yeah.

DR. FEEHAN: That would be the maximum. The actual price they would receive would be that or less. And if at any point in time the – because this is pre-arranged a year in advance. It's a one-year deal, each year repeating. If – my understanding is that if the New England price spiked up, well, that would be not to the advantage of Nalcor, because they still would've had to put in a bid that was lower than their – what they expected the price would be.

In addition, there's no minimum price. Nalcor doesn't get a minimum, right? It's limited in terms of how much it receives, but there's no limit on how little it may receive. I guess it's similar when it comes to the quantities it has to offer. On the Nova Scotia side, they don't have to accept any quantity of power.

MR. LEARMONTH: So is it correct then to say this: That Nalcor has to make an offer or a bid. Nova Scotia can say, well, thank you for your bid, and then look around to see if there's a better deal out there. And then if Nova Scotia gets a better deal, they can either renegotiate with Nalcor or simply say, Nalcor, we don't want your power this year – or electricity. Is that a fair way to put it?

DR. FEEHAN: I'll retreat to my caveat at the beginning that, you know, I'd have to go back and check everything. But my understanding is that it's not quite that. It's –

MR. LEARMONTH: Okay.

DR. FEEHAN: – they would call for solicitation, so all the bids would go in at the same time.

MR. LEARMONTH: Okay.

DR. FEEHAN: So it's not like they would get a bid from Newfoundland Hydro – or rather Nalcor – and then say okay, we're gonna look around and see if we can find someone who would –

MR. LEARMONTH: Okay.

DR. FEEHAN: – offer a lower price. They all have to make a bid, I think, at the same time.

MR. LEARMONTH: Okay.

DR. FEEHAN: And you know, maybe there will only be one bid. But it has to be at the same time.

MR. LEARMONTH: Yeah.

And you're giving your understanding. You stand to be corrected by some expert in interpreting the Energy Access Agreement if it differs from your evidence, is that correct?

DR. FEEHAN: That is correct, yeah.

MR. LEARMONTH: Okay.

Okay, there's two other exhibits that – tab 5 and tab 6. I'm gonna leave that to – one – the last one is the long term – long-run price of electricity of demand, which was done for the Consumer Advocate on July 31, 2018. That deals with elasticity, which you've touched on earlier, is that correct?

DR. FEEHAN: That's correct.

MR. LEARMONTH: Well, I'll rest on the questions that I've already made, and I'll turn the matter over to the other counsel who will have questions for you.

Thank you very much, Dr. Feehan.

THE COMMISSIONER: Okay, and before we do that –

DR. FEEHAN: Thank you.

THE COMMISSIONER: – we perhaps will take our afternoon break then for 10 minutes.

CLERK: All rise.

Recess

THE COMMISSIONER: All right.

Province of Newfoundland and Labrador?

MR. RALPH: No questions, Commissioner.

THE COMMISSIONER: Okay. Nalcor Energy?

MR. SIMMONS: Thank you, Commissioner.

Dr. Feehan, I'm Dan Simmons, I'm counsel for Nalcor Energy. There's a few things I want to ask you about this afternoon.

First of all, you are familiar, I guess, with the manner in which utility rates, electricity rates are regulated in this province?

DR. FEEHAN: Yes.

MR. SIMMONS: Generally so that there's the Public Utilities Board is in place that Newfoundland and Labrador Hydro, which has some retail sale of electricity, but mainly wholesales to Newfoundland Power, applies to the Public Utilities Board and the Public Utilities Board determines both the amount of rates and the structure in which rates are charged. Correct?

DR. FEEHAN: Correct.

MR. SIMMONS: Yeah. And then it's Newfoundland Power in turn applies to the board and the board determines the rates that are charged to consumers in different classes, categories and also the means and manner by which those rates are charged.

DR. FEEHAN: Yes.

MR. SIMMONS: And this is a, you know, this is a complicated area of regulation, a very specialized area and there's a lot of people with specialized expertise involved in it.

DR. FEEHAN: Yes.

MR. SIMMONS: Yeah.

Do you follow these matters at the Public Utilities Board here?

DR. FEEHAN: Yes, I do.

MR. SIMMONS: Okay, good.

So, in order to implement a policy like the one you advocate, which is to send strong price signals related to the marginal cost of electricity, I think. Does that generally describe the policy you are advocating?

DR. FEEHAN: Yes, that's fair.

MR. SIMMONS: In order to do that, how would you see that would have to be done, procedurally? Who are the players who would have to be involved in it? Who would make the decisions? How would that work?

DR. FEEHAN: I think as elsewhere you would have to look towards government. Regulatory framework would have to be changed. There would have to be enough scope, I think, for the Public Utilities Board to implement such a policy, and they're governed, of course, by existing legislation. So they would need the latitude to do that. I would expect they would also need some – a policy direction from government, and so most of what I was putting forward when it came to marginal cost pricing, and the demand side, particularly, was aimed at government policy makers to try to get them to think about –

MR. SIMMONS: Right.

DR. FEEHAN: – how things should be changed.

MR. SIMMONS: So it's not so much the participants in the regulatory work of the PUB, the Newfoundland and Labrador Hydro, the Newfoundland Power and so on, that your comments were directed towards, as the government that sets the overall policy direction for these things.

DR. FEEHAN: Yeah, like the title of one of the papers said, it's, you know, it's – I talked about regulation. It really is at the regulatory level. In rough terms, you could say the rules of the game have to be changed in order to allow this type of policy to be implemented.

It's just like you've had reforms in the United States with FERC and open-access transmission tariffs and so forth. It has to come from a regulatory authority but that authority has to have the legislative mechanisms to actually proceed. It can't go more than the legislation governing it allows.

MR. SIMMONS: And I think you said that these aren't new ideas that you're bringing

forward. These are fairly well articulated, established principles that are out there –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – in the utility regulatory field.

DR. FEEHAN: Yes, I mean, there's wide, I think a widespread consensus among electricity economists that this sort of direction is the way to go.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: Driven to make it closer to what would have happened if there had been purely competitive market.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: And so, yes, I agree, it's really – that body of knowledge is out there and most economists would subscribe to that direction.

MR. SIMMONS: So do you know if over the last number of years, or even prior to 2012, if these ideas had been in play in proceedings before the PUB, either brought forward by other participants or if this is something that – would this had been a surprise in 2012 to anyone involved in rate regulation in this province, to read your submission and say: Well, there's a new idea, I never heard tell of that one before.

DR. FEEHAN: I don't think they would say it's a new idea because it is around in utility economics. You'd have to be very isolated not to have heard –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – the idea.

MR. SIMMONS: Yes.

DR. FEEHAN: Also, if I recall correctly, the PUB has had some consultants, I think, review pricing policy between Newfoundland Hydro and Newfoundland Power.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: I believe one of the consultants – I forget his – his last name is Wilson – and the idea there was to try to send a marginal price signal to Newfoundland Power, but that was only from Nalcor, or Newfoundland Hydro rather, to its customer, Newfoundland Power, and of course my focus is on the end user –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – and Newfoundland Power is not the end user.

MR. SIMMONS: Right. So in 2012, do you know if there actually were some of those price signal provisions in place between Newfoundland and Labrador Hydro and Newfoundland Power for the wholesale sale of power?

DR. FEEHAN: As I recall, yeah, there was sort of a two-part arrangement where a certain quantity of electricity would be sold to Newfoundland Power at a much lower rate and then a – I guess it's fair to say, the bulk would be then sold at a higher rate to reflect marginal cost –

MR. SIMMONS: Yes.

DR. FEEHAN: – and that was in place. But, again, my issue then would still be the end consumer.

MR. SIMMONS: Right. Right.

DR. FEEHAN: But, yeah, that point in the chain, let us say, I understand there was attempts to impose a marginal cost price signal between those two entities.

MR. SIMMONS: And would you have known that in that provision that the higher-price block, would you have known if that was tied to the use of Holyrood and the higher-price energy that was coming out of the Holyrood plant versus the hydro system?

DR. FEEHAN: I think that was the intent.

MR. SIMMONS: Yes.

DR. FEEHAN: Like, that was the intent. It was certainly to move more towards that sort of marginal –

MR. SIMMONS: Right.

DR. FEEHAN: – cost reflective of Holyrood.

MR. SIMMONS: Right. And do you know if there were any other elements in the rate-setting system that incorporated some of these ideas and values that you've spoken of?

DR. FEEHAN: I'm not sure what exactly –

MR. SIMMONS: Okay.

DR. FEEHAN: – that you're meaning there.

MR. SIMMONS: Nope, fine.

So then – so I presume we can take from that, if there was at least some element of price signalling built into it, that at least we can presume that this was a live issue before the PUB in that they would've been aware of it 'cause it was partly incorporated into the system, at least.

DR. FEEHAN: Yes, it was incorporated in the system, and certainly, some consultants had raised the importance of marginal cost.

MR. SIMMONS: Okay.

Now, I've got a question for you about the price signalling, because it's a fairly new idea to me, and I don't –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – understand it very well, so this is kind of a conceptual thing that I was thinking about.

If I understand correctly, the idea is that the consumer should always pay the price for the last bit of power generated, because the price – in our system, the lowest priced power comes from the hydro plants, Bay d'Espoir in particular, and that's what Newfoundland and Labrador Hydro uses to supply the load whenever they can. And it's only when the provincial load gets higher – demand gets higher

– such as in the winter, with heating load and other demands, that they have to use the more expensive power from Holyrood to meet the higher demand.

Okay, so you're nodding your head, so –

DR. FEEHAN: Yeah.

MR. SIMMONS: – I'm getting that right, I think.

DR. FEEHAN: Yes.

MR. SIMMONS: Okay.

And the idea is that in the summertime, when it's only Bay d'Espoir power being used, everyone pays just the price for the Bay d'Espoir power, and as other, more expensive oil-fired generation comes on, the price for that extra power incrementally will get higher, and they'll pay higher rates as the province as a whole uses more power.

DR. FEEHAN: Yeah.

MR. SIMMONS: Right? Okay.

So in that system – now, I think you've described that as being a means of achieving economic efficiency for the system?

DR. FEEHAN: Yeah, 'cause at each point in time –

MR. SIMMONS: Mmm.

DR. FEEHAN: – the price would reflect marginal cost.

MR. SIMMONS: Okay.

DR. FEEHAN: So we have – what you're suggesting is sort of a seasonality in pricing.

MR. SIMMONS: Yeah.

So is the idea that, overall, you find the point where the cost of the system is where you're operating the system most efficiently. So you're getting the most power out of it for the least cost to service the needs of consumers.

DR. FEEHAN: Well, you are – the needs, or the consumption level, of course, would be determined in part by price –

MR. SIMMONS: Yes.

DR. FEEHAN: – so it's an interactive system you have there.

MR. SIMMONS: Yes.

DR. FEEHAN: But basically, yes, you would look at your marginal cost in each season and look at demand in that season, and then you would price accordingly. So it would – given the way our operation of Holyrood has been going, it would call for some sort of seasonal pricing.

MR. SIMMONS: Yes.

And so the theory, then, is that as prices rise at those times –

DR. FEEHAN: Mmm.

MR. SIMMONS: – of the year that people are using more power, and they start having to pay more for the power in those times –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – the elasticity theory says they will start to reduce their use of it as their cost of the power goes up.

DR. FEEHAN: Yes, I think in a system where people understand that this is going to be in play –

MR. SIMMONS: Mm-hmm

DR. FEEHAN: – that what would happen over time if it was announced that, you know, your rate in the summer would be a certain amount; when we hit these months, because of reliance on Holyrood, your rates are going to be a lot higher.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: It would, I think, have a significant impact upon people's decision as to whether to install electric baseboard heating –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – as opposed to, say, heat pumps or furnace oil.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: And so you would see that would have an impact of reducing consumption in the winter months and, therefore, saving on fuel, saving on –

MR. SIMMONS: Right.

DR. FEEHAN: – greenhouse gases and other emissions.

MR. SIMMONS: So in the short run I realize, my gosh, my January bill is going to go way up because now I'm paying a high price. I'm going to turn down my thermostat. That's a short-term measure?

DR. FEEHAN: Right.

MR. SIMMONS: And in the longer term, it's going to cause me to think twice that if I'm building a new house, I might not put in electric baseboard heat.

DR. FEEHAN: Exactly. If your scope in the short run –

MR. SIMMONS: Right.

DR. FEEHAN: – is very limited, plus if you don't know this is going to be a persistent pricing mechanism –

MR. SIMMONS: Mmm.

DR. FEEHAN: – you may not believe it until after several seasons of always getting the higher price in the winter. And then eventually, if you come to believe that this is the way it's going to stay, then you're going to think about the long run and say: should I have an alternate heating source?

MR. SIMMONS: So a couple of questions, then, related to that.

Is this a system that then finds kind of a natural balance where what it's doing is it's seeking the

level where there's a balance between what people are paying and how much power has to be produced?

DR. FEEHAN: Yes. It's like trying to replicate a competitive market.

MR. SIMMONS: Yes.

DR. FEEHAN: You can't quite do it because of the peculiarities of the electrical system and there only being one, you know, transmission system and so forth. But yes, your point is correct, that you're trying to do that.

MR. SIMMONS: So if the objective is to let the system find its own natural balance, that works. If the objective work is say, we have a limit on how much capacity we have, and we cannot go over this limit, does the system work the same way then?

DR. FEEHAN: Essentially, yes, because your pricing and your investment in and capacity are interrelated.

MR. SIMMONS: Mmm.

DR. FEEHAN: So you get to a point where maybe your capacity is being pushed, then the question is at how high a price would you have to charge –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – in order for consumption to be no more than your capacity limit.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: That price will be a signal as to whether or not a new addition to capacity would be worthwhile to add.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: If the price isn't high enough to support, say, the cost of adding 10 per cent more capacity, then you're better off just charging a higher price and rationing that way.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: Whereas if the price is so high, given demand, that an increment in capacity would easily be paid for at that price or a somewhat even lower price, then it would be worthwhile to go with the investment.

MR. SIMMONS: So –

DR. FEEHAN: This actually – I don't know how relevant it is, but in my *Canadian Public Policy* paper, one of the references – if I could take just one second to go to it. One of the references is to – on page 13 of it – is to Harberger. And it shows the – that article shows the interaction – it's called "Marginal Cost Pricing and Social Investment Criteria for Electricity Undertakings."

THE COMMISSIONER: What tab are you on there now, please?

DR. FEEHAN: It's tab –

MS. O'BRIEN: Tab 4, P-00324.

DR. FEEHAN: – 4.

THE COMMISSIONER: Thank you.

DR. FEEHAN: It's page 13 of that tab. On the right-hand side, you can find Harberger.

And so that was the whole point of – and he's sort of a world leader in this area. And you see that paper is about the interaction between marginal cost pricing and investment criteria. They're tied together –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – which goes back to some of my earlier work or comments about efficient pricing. You've got to get the price right before you start making investment decisions.

MR. SIMMONS: So a couple of questions then coming out of that. One is that it sounds like that this has to be a long-term plan, that this mechanism needs to be in place for some period of time before you can use it to actually influence those investment decisions in a meaningful way. Is that right? Because investment decisions in –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – electric generation are long-run. You have to plan well ahead. They can be expensive.

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: So the – this sort of price-signalling system – say in 2012, would it have had to have been in place for some time prior to that for the theory to work the way that you are proposing in 2012?

DR. FEEHAN: Well, I think it depends on a lot of circumstances such as –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – you know, if this is implemented and it's a credible policy and people believe it's going to be in place.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: If the price of electricity goes up a lot tomorrow, and people don't believe it's going to stay up, well, they're not gonna do much. But if it's gonna go way up, and people believe it's gonna stay up, then their actions will be quite different.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: And of course, to do any reform like this, you do have to allow for that transition period. So in the United States, you know, they went with FERC; they went with open access tariffs. They've had these progressive reforms to try to make their markets – wholesale markets – closer to something competitive.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: So you could argue that you've got to make the first step, otherwise you would never do it.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: And I think that's the case here.

You know, also in our case, you have to go back – in 2012, and even to this day, our reliance on

Holyrood is not as high as it was, say, in 2000 to 2003. So it's not as if it was about to burst at the seams. It was under much more pressure about 15 years ago than now. So there was some room, I believe, to add incrementally to capacity, and this gets back to the supply side and so forth.

MR. SIMMONS: Yeah, we'll talk about the supply side –

DR. FEEHAN: Sure.

MR. SIMMONS: – in a moment.

So in 2012, we know that there were some elements of price signalling built into the system, but I agree with you, nothing very significant and probably wasn't finding its way to the consumer.

DR. FEEHAN: It wasn't finding its way to the end consumer.

MR. SIMMONS: Right.

So at that point, in your presentation, were you advocating – what were you advocating for at that point, for the wholesale change in the price regulation system to be made then? And how would that then play out in influencing the decision that was on the table at that point, that Nalcor and government were considering for Muskrat Falls, given that it takes time for the effects you're talking about to play out and find this natural kind of balance between pricing and the need for power generation?

DR. FEEHAN: Well, I think in 2012, what I was just trying to get out there was this notion of efficient pricing. Designing a system of transitioning –

MR. SIMMONS: Mmm.

DR. FEEHAN: – to that sort of pricing was not something I was doing. I was just saying, let's at least look at this.

MR. SIMMONS: Mmm.

DR. FEEHAN: And the next step, of course, would be to do something like that, to say how can we transition to this? Some things would not have been very difficult to do.

For instance, it would not be very difficult to implement seasonal pricing. You know, at the retail level that could have been done pretty quickly. And you would have some idea – I’m sure Newfoundland Hydro would have had a pretty good idea of the cost of running the system in the, let’s say, the warmer months and then in the colder months as well.

So some things could have been implemented, I think, fairly quickly. Now, you could give consumers some time to adjust. And there’s other ways of implementing it, too. I think I might have – I don’t know if I alluded it to – to it in one of the papers, but I think it was in – the idea in *The Telegram* that if you, for instance, had increasing block rates so that the first thousand kilowatt hours a month was at a certain price, and then the remainder would be at a much higher price as Newfoundland Hydro implements in some of its isolated areas.

So you could have implemented something like that, which would have a seasonality factor, because anyone who has electric heat probably wouldn’t go much beyond a thousand in the warmer months, but they’d know that electric heat would drive them well over that in the winter months. So something like that would’ve maybe taken the sting out of non-electric heat customers and it would’ve been implementable, I think, in a fairly short period.

So it would be possible to do some of these things, but, obviously, a lot more thought would have to go into the whole process.

MR. SIMMONS: Right.

From your knowledge of the way rate utility regulation has worked in this province in the years prior to 2012 – and I guess even to now – would you agree that one of the principles that’s been applied to it has been that there’s a value given to rate stability and to avoiding the kind of fluctuations in rates that result from variable costs of fuel at Holyrood, from seasonable variations and so on, so that the people who are paying for their heated home are not hit with high bills one month and low bills another, and to the point where – you’d be familiar – there’s a rate stabilization plan in place, which the whole point of that is to smooth all these rates.

DR. FEEHAN: Yes, but I would have concern with that.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: Let’s go to our neighbours who have oil furnaces.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: Their rates go up, go down.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: They have to cope with it.

People who go to the supermarket to buy vegetables, their rates go up, go down.

MR. SIMMONS: Well –

DR. FEEHAN: Let’s think about gasoline prices, the same sort of thing.

So an efficient price is not necessarily a stable one. In fact, keeping it stable may actually, in the long run, be costly, because, you know, if people think it’s gonna be stable they’ll make decisions accordingly. And so I don’t know that stability – I know as a customer, some people will actually want to pay a fixed amount every month.

MR. SIMMONS: Hmm.

DR. FEEHAN: But for the system as a whole, I don’t know if that type of stability is necessarily a good thing.

MR. SIMMONS: So for the individual person who’s paying for oil heat because they’ve got a furnace, yes, the amount they pay will vary depending on changes in the price of oil. It doesn’t mean that they like that, and –

DR. FEEHAN: Oh, I’m sure they don’t.

MR. SIMMONS: Yeah. So – and it seems to me that would be one of the reasons why people would have chosen electric heat sometimes over oil because of the volatility in the price of oil. So –

DR. FEEHAN: I think it would also – just to carry through with that point. It would also be the case that electricity price, relative to the price of oil, has been on a downward trend.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: So you see that in, again, this Exhibit 000324.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: On page 5 there's a chart, and you see that there's this ratio of electric heat customers, or all electric customers, to people who are not all electric – so presumably they have oil or wood or something – that's upward trend. You see the downward trend, that's the price of electricity relative to the price of oil, that's going down. It's bumpy. It's reflecting your –

MR. SIMMONS: Yeah.

DR. FEEHAN: – bouncing of the price of furnace oil.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: But that's going down. So the other aspect of people moving to electric heat is that, relatively speaking, the price of one source of heat, even though it's driven by oil at Holyrood –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – is not keeping pace with the price of furnace oil, which is, of course, driven by the price – which reflects the price of oil.

MR. SIMMONS: Right.

So if the price of the alternative, furnace oil, is rising, and if what you do – if what is done is to increase the cost of electricity in order to decrease the burden of electricity generation on the system, is the end result not that overall consumers are paying more for their heat? Because their oil price is going up and you're putting a higher price on electricity.

DR. FEEHAN: Consumers may be paying more, it depends on, you know, whether they're oil or electric.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: The system as a whole, though, may be gaining because, of course, you're consuming less bunker C at Holyrood. The higher price, of course – you'd have to remember, Nalcor's a Crown corporation. If it's the beneficiary of the higher price and its profit is going up, then that essentially goes back to the province, or can go back to the province.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: So measures can be taken to help out low-income people, as was the case before when we used to have the residential home rebate, I think it was called.

So the revenues that are collected as people are paying more can be used to benefit people in another way, whether it's reducing the – I don't know, the HST or giving subsidies for energy conservation or targeting low-income people. So it's – you have to think about what's happening with that higher amount that they're paying. It may come back to them through some other mechanism.

MR. SIMMONS: So in 2012, as today, the reality in the Newfoundland home heat market is that there is a fairly high proportion of electric heat, as you've said.

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: Which are houses that don't have furnaces and aren't outfitted for furnaces. So if increasing prices for electricity is intended to drive people away from electric heat towards other sources of heat, than the primary alternative is oil heat for them in this province.

DR. FEEHAN: Oil –

MR. SIMMONS: Or it has been traditionally.

DR. FEEHAN: Oil traditionally – I guess it could be mini-splits because they've become far more popular these days. They still use electricity, but ones for our cold climate, if you

get the right ones they're – they can be pretty efficient.

MR. SIMMONS: Right.

In either case, there's a capital cost for the consumer –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – that's not a public capital cost, the way a hydro plant is, but there's a capital cost for the consumer to buy a furnace, install piping, install ductwork –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – renovate the house to make –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – it all fit if they're gonna move away from the current electric heat demand. Does that capital cost factor into the theory you're putting forward here that the prices individual people pay and the fact that they have to bear those costs personally?

DR. FEEHAN: Yes, it does because the price signal is being sent to them so they can make the correct decision.

MR. SIMMONS: Mmm.

DR. FEEHAN: The correct decision is: Is it worthwhile for me to continue with electric baseboard heating or does switching to an alternative pay? Well, in order to calculate that personal investment I've got to try and figure out – I've got to have the right price. What is the price? And if I've got the correct price, the – what economists call the efficient price, then I can make the calculation.

Now, that means I do have to spend money –

MR. SIMMONS: Yes.

DR. FEEHAN: – and, you know, there's no escaping that. But on the other hand, the system as a whole may gain because if I do that we don't have to buy as much bunker C for Holyrood, we don't have problems of demand

pushing capacity at Holyrood; it may, in the long run, reduce the need to add to capacity to the system.

MR. SIMMONS: Yeah.

Does it also expose more individual consumers to the uncertainty of the variable cost of home heating fuel over time?

DR. FEEHAN: Well, I suppose that depends on whether they go to a heat pump or they're actually going to fuel. But, you know, many people still have fuel, so they do accept that reality.

MR. SIMMONS: I just had a question for you on the time-of-day rates.

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: Because you've spoken about seasonal variations but if you – and if I understand correctly the time-of-day rates is to say that most electricity is used at suppertime – charge more at suppertime so people put the dishwasher on at 9 o'clock rather –

DR. FEEHAN: Hmm.

MR. SIMMONS: – than at 7. And I understand how that can affect or reduce the peak load, so it reduces the amount of capacity, the number of generators –

DR. FEEHAN: Mmm.

MR. SIMMONS: – generating units that you need, and maybe reduce the capital you have to invest in the system on combustion turbines or something like that.

But it doesn't really change the overall energy that's required, you know, and, you know, when we talked about the difference between capacity –

DR. FEEHAN: Yeah, it's –

MR. SIMMONS: – and energy.

DR. FEEHAN: Yeah, yeah, it's –

MR. SIMMONS: Because if I'm –

DR. FEEHAN: It's mostly to affect –

MR. SIMMONS: – gonna use, you know, 500 watts of power to wash my dishes at 7, or 500 at 9, I'm still using 500 and the system still has to deliver 500.

DR. FEEHAN: Yeah, any affect I think on the actual total consumption would probably be pretty modest.

MR. SIMMONS: Yeah.

DR. FEEHAN: You know, if I don't turn on my outside lights 'til a little bit later to save a bit of money, well I'm not gonna turn them on in the morning when it's light out just to break even on it. So there's some cases where there might be a little savings, but I think you're right. It's mostly to avoid the peaking problem, which of course is a big problem –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – whenever there's any limits on capacity, you know, so there is a big gain in that. My – but in the – my suggestion had also been seasonal rates because that really takes some of the load off.

MR. SIMMONS: Hmm. Okay.

I had a couple of questions for you arising out of the article you did for the – or the report in *The Telegram* – or the article you did in *The Telegram*, which is P-00322. We don't need to go to it as there's – I just had some questions arising out of the generation alternatives that you described in there. Because there were five suggestions you had –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – the first four were alternative ways of producing more power out of the system.

DR. FEEHAN: Hmm.

MR. SIMMONS: And maybe just as a guide what we might do is if we could go to Exhibit P-00161, please. I don't know if it's in your book or not.

DR. FEEHAN: No, I don't believe it is.

MR. SIMMONS: Okay.

It's a single page, we can probably bring it up on the screen and you may recognize it from work you did back in – okay.

So this is the Isolated Island Option as it was set out back in 2012. Does this look familiar at all?

DR. FEEHAN: Yeah. It's a long time since I've looked at it –

MR. SIMMONS: Yes.

DR. FEEHAN: – but I think this is –

MR. SIMMONS: Yeah, okay. And one –

DR. FEEHAN: – what was laid out – early, yeah – years ago.

MR. SIMMONS: And one of the things you've said earlier is you considered that there would be ways to improve on the Isolated Option – Island Option, which may make it more attractive than the one that was put forward in 2012. Did I understand that correctly?

DR. FEEHAN: Yes.

MR. SIMMONS: So let me first ask you: In order to evaluate the other generation alternatives, what sources of information or expertise did you go to? How did you go about developing the suggestions that you included in *The Telegram* article?

DR. FEEHAN: Well, it was – I recall that the Natural Resources Canada had suggested more wind could go in the system than had been proposed.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: I'm no expert on wind but since there were – I think I had read somewhere else, but I certainly recall the Natural Resources Canada report suggested more wind could go into the system.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: So wind seemed to me to be the place to put some emphasis. Similarly when it came to small hydro, I know that Prof. Andy Fisher, and others at MUN, had identified a large pool of potential small hydro sites on the Island. So I had looked through that and said: Okay, well, I'm no expert in these things but there seems to be a lot of sites here.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: Similarly, Prof. Bruneau had suggested natural gas.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: I'm no expert in natural gas, but he has expertise in engineering, and natural gas and the offshore. So from those sorts of observations I just was saying: Well, look at those in more detail.

MR. SIMMONS: Hmm. So this was like a collection of ideas that you were suggesting should need some further looking into?

DR. FEEHAN: Yeah. Based on –

MR. SIMMONS: Yeah.

DR. FEEHAN: – various sources, those were a collection of ideas. My main thing – and of course, the thing that I emphasized at the very beginning, through the C.D. Howe Institute – was pricing.

MR. SIMMONS: Yes, right. So that (inaudible) –

DR. FEEHAN: Which reflects my –

MR. SIMMONS: – so –

DR. FEEHAN: – economics background.

MR. SIMMONS: – yeah. So we'll just talk about the supply – the four supply suggestions –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – here now.

So I gather from it that that's not something that you did any great depth of research into. These

were ideas you were aware of through various sources and they seemed reasonable to you to put them into –

DR. FEEHAN: Yeah.

MR. SIMMONS: – as suggestions in the article.

DR. FEEHAN: Other people had written it –

MR. SIMMONS: Yeah.

DR. FEEHAN: – and it seemed to be professionally done to me, so I figured, well, let us all know –

MR. SIMMONS: Okay.

DR. FEEHAN: – a little bit more about these things and don't – and maybe they'll work, maybe they won't.

MR. SIMMONS: Did you look for any expertise? Did you go to talk to anybody? Did you make any inquiries? Did you send any emails to anyone at Nalcor to ask about any of these things or to Natural Resources at government? Or call anyone up on the phone and say: I've got an idea about this, what's your take on it? Is this gonna work?

DR. FEEHAN: What I would've done, I think, I would've looked online for previous reports about wind, so I remember looking up things from wind companies, Siemens and others, that make wind turbines. I looked online for things like this –

MR. SIMMONS: Mmm.

DR. FEEHAN: – I wouldn't say it was extensive research, but it was trying to acquaint myself with those possibilities.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: In terms of emailing somebody, I don't recall. I know there was emails to various people about the project and so forth, but I think most of what I would've looked at would've been what I saw written, and from those three sources I've mentioned, plus I would've gone online and looked at some material.

MR. SIMMONS: Okay.

So we heard this morning – I don't know if you heard Mr. Locke's testimony this morning.

DR. FEEHAN: No.

MR. SIMMONS: No. Okay.

Well, we heard from him that he – when he was preparing for his Harris Centre presentation that he submitted questions to people at Nalcor, he went in and met with people at Nalcor as part of the, kind of, investigation that he was doing on that. So you didn't engage in any of that sort of investigation, did you?

DR. FEEHAN: I certainly was in touch with Nalcor for data and things like that. For instance, I pretty regularly asked Nalcor for – or Newfoundland Hydro for consumption levels –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – generation peaks –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – I asked for data on wind turbines, and how they were producing and how many megawatt hours a year they were making. I wasn't really looking for advice, but I was looking for information –

MR. SIMMONS: Yes.

DR. FEEHAN: – related to wind and consumption. I also asked for information about emissions from Holyrood and did that on a fairly regular basis.

MR. SIMMONS: Okay.

And would – in relation, though, to the plan – the Isolated Island Option plan, did you make any inquiries about the reasons for the way the plan was structured and whether some of your other suggestions had been already considered – whether they might have been incorporated or not incorporated and what the reasons were and why?

DR. FEEHAN: I don't recall. I know, from time to time, I was talking to Hydro people –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – but I don't know that I was questioning their plan at that stage.

MR. SIMMONS: Well, okay, well –

DR. FEEHAN: I was questioning to the extent –

MR. SIMMONS: By 2012 –

DR. FEEHAN: – that I was doing what I was –

MR. SIMMONS: By 2012 –

DR. FEEHAN: Yeah.

MR. SIMMONS: – when you did your C.D. Howe article –

DR. FEEHAN: Yeah.

MR. SIMMONS: – and your article in *The Telegram*, had you done anything to put these suggestions to Hydro or to Nalcor to get their response before you published?

DR. FEEHAN: No, I think I was contributing to the public policy and –

MR. SIMMONS: Oh, I'm not questioning that.

DR. FEEHAN: Yeah, and I don't think I – well, it was a long time ago, but let me back up a bit. I do recall in April of I think 2011, I, with some others, had a meeting – we were invited, I think, to a meeting at Hydro and I did – and it was talking about the project and it was – at one point in the discussion I said: Well, you know, what about marginal cost pricing? You know, we really should be looking at things like that.

I believe David Vardy was there at the meeting, a former chair of the PUB, and he expressed agreement that yes, marginal cost pricing is a way to go.

MR. SIMMONS: Mmm.

DR. FEEHAN: So, there was that meeting at Nalcor – Newfoundland Hydro for sure. And again, then there was probably some follow-up

emails, but there was also just me generally asking for data on their electricity output and –

MR. SIMMONS: So the first, sort of, supply option that you deal with in your article is suggesting that use of cleaner fuel at Holyrood would mean that we don't have to install the expensive scrubbers and precipitators –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – in the stacks in order to remove particulate and –

DR. FEEHAN: Mmm.

MR. SIMMONS: – other pollutants from the stacks. What sort of investigation did you do into the technical feasibility of that suggestion as to whether the lower – buying more expensive even sulphur fuel than was being used, which was 0.7 I think per cent at that time?

DR. FEEHAN: Yeah.

MR. SIMMONS: – whether that would be sufficient in order to deal with the pollution problems and mean that Hydro wasn't going to have to go to those lengths to put in that anti-pollution equipment?

DR. FEEHAN: I would have gotten that information I think from a planning document produced by Newfoundland Hydro –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – which I think is updated every now and then. I don't recall the (inaudible), but it's a planning document and what it had said was that by moving to cleaner fuel –

MR. SIMMONS: Yes.

DR. FEEHAN: – you know, particulates and so forth had gone down. I – again, it's a long time ago. I'd have never thought that I'd end up years later –

MR. SIMMONS: It's all right, yes.

DR. FEEHAN: 'Cause I didn't take notes on these things. But I thought I then asked them about well, what would the price of the lower –

sorry the lower sulphur content fuel be, if you wanted to go down to it. Because I had a number at some point that's, you know, would be this much more expensive per barrel.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: So I could have only gotten that number from Hydro. But again –

MR. SIMMONS: Did you –?

DR. FEEHAN: – back then I wasn't documenting all these interactions.

MR. SIMMONS: I understand. But in 2012 did you – you know, before you did your article, did you contact anyone at Hydro and say if you do go to the lower sulphur fuel, can you actually avoid putting in scrubbers?

DR. FEEHAN: No, I didn't ask anyone that particular question. But as I pointed out as well, if other measures are taken to reduce the reliance on Holyrood –

MR. SIMMONS: Had reduced emissions, yes.

DR. FEEHAN: Yeah.

MR. SIMMONS: Yeah.

DR. FEEHAN: It would naturally reduce emissions because you are reducing the amount that you're burning there.

MR. SIMMONS: Right, okay.

But the fact that emissions had been reduced in the past doesn't necessarily lead to the conclusion that you could avoid taking these measures with the scrubbers and the precipitators in order to (inaudible).

DR. FEEHAN: No, it was just a, you know –

MR. SIMMONS: (Inaudible.)

DR. FEEHAN: – a natural sense that if the fuel was available, it wasn't that much more expensive and it had less sulphur you would –

MR. SIMMONS: Yeah.

DR. FEEHAN: You know, it was just sort of my own conclusions, a non-specialist, but hey, that may be worth trying.

MR. SIMMONS: Yeah.

DR. FEEHAN: It's like this whole set of things I was putting forward over this time is I was saying well, what about this, what about this.

MR. SIMMONS: So the – so your suggestion about avoiding spill at the hydroelectric facilities, does that kind of fall into the same category as an idea, or is that something where you were aware of any kind of investigation into the feasibility of the kind of capital costs that would be necessary to increase the size of reservoirs on the Island?

DR. FEEHAN: I didn't check the cost of increasing reservoirs. I did get some information from, I guess, the quarterly reports that Hydro had given, provides to the PUB.

MR. SIMMONS: Yeah.

DR. FEEHAN: Plus I had also gotten from emails, requests – I sent emails requesting information on spill from – and I did that from time to time. But no, the cost of actually increasing the size of reservoirs –

MR. SIMMONS: Mm-hmm.

DR. FREEHAN: – and what to do, I couldn't speak to that. All I was saying is let's look into that. Maybe there's something worthwhile there.

MR. SIMMONS: Yeah.

DR. FEEHAN: That's why in that article I wasn't saying – I was just saying try to make a better Isolated Island alternative.

MR. SIMMONS: So, and you've mentioned in your direct evidence here that this wasn't a regular thing that there was a large amount of spill. This had been an exceptional year I take it, that you would look at –

DR. FEEHAN: Yeah, that would be exceptional. Yeah, yeah.

MR. SIMMONS: – at that time. So it would be a question of how much value can you get out of that extra water versus how much capital cost is it going to take to actually increase the capacity of reservoirs on the Island.

DR. FEEHAN: Yes.

MR. SIMMONS: Yeah.

DR. FEEHAN: Yep.

MR. SIMMONS: And the principle reservoirs are the Bay d'Espoir reservoirs. You'd be –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – familiar with that.

DR. FEEHAN: Yes.

MR. SIMMONS: And are you – do you know anything about how they're set up? About how many dikes there are or control structures, or any idea about what would have to be done to increase the height of the reservoirs?

DR. FEEHAN: Not in any technical detail, no. I know it's a complex system because –

MR. SIMMONS: Yes.

DR. FEEHAN: – it's not – let us say it's not really high above sea level, so it's a very integrated system – I know that. But again, the point was look at that; is there a possibility there.

MR. SIMMONS: Right.

DR. FEEHAN: It wasn't, like, I've been to prove –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – that this is the case.

MR. SIMMONS: Yeah. So it could very well be that someone would be able to say – give a rational explanation as to why the cost would outweigh the value and that that would be acceptable.

DR. FEEHAN: It's certainly possible, yes.

MR. SIMMONS: Sure. Okay.

And you spoke also about more wind, and maybe this is where I'll just refer you to P-00161 here. So this, we understand – it's kind of a timeline going on two levels. It's the top one continues on the bottom one. And it shows where the planned additions or removals from the electricity generating system – it's the one on your screen.

DR. FEEHAN: Oh, I'm sorry.

MR. SIMMONS: Yes – where the planned additions and deletions are over time in the Isolated Island system. So if you start at the upper left, you come over to 2015. You see that?

DR. FEEHAN: Yeah, the top left?

MR. SIMMONS: Top left.

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: The line moves over to 2015.

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: And you'll see on the top it says: "New CT 50 MW." We've heard evidence that's a combustion turbine –

DR. FEEHAN: Yes.

MR. SIMMONS: – that would be added. And at the same time it says: "New Wind 25 MW." So wind would be added. And if you follow along kind of on the bottom part of that line, you'll see wind added in 2015, in 2020, in 2025, in 2030.

So, there was a plan in the Isolated Island Option to add a considerable amount of new wind. Were you aware of that when you did your analysis in 2012? (Inaudible.)

DR. FEEHAN: Yeah, and I saw in the – Nalcor's submission to the PUB – they did the (inaudible) comparison if you're adding wind and so forth –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – and the sensitivity analysis.

MR. SIMMONS: Yeah.

DR. FEEHAN: So I was aware of that, but I also thought through the – looking online and looking at where – what percent a system might be able to hold wind –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – and looked at some of the just general reports about how the technology was progressing.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: And I think also the Natural Resource Canada report that was suggesting more wind could go into the system. Now, I'm not a wind expert. All I was doing, again, here was to say: Hey, let's look at more wind. And I think in the end when the government made the decision, there was a report out that looked at wind as a replacement for Holyrood entirely. But, you know, that was probably not worth doing in the first place because of the problems of intermittency. But all I was saying here is, hey, this – there's – it looks like there's a possibility here that there's more scope for wind. Maybe that's worth looking at before you make such a big investment.

MR. SIMMONS: Were you aware that there had been technical studies done to look at the maximum amount of wind that could be put into the Island system as an isolated system, not connected to the grid on the mainland, for what the technical capacity was to be able to absorb wind, 'cause wind is variable. Wind –

DR. FEEHAN: Yeah.

MR. SIMMONS: – is – it's only there when the wind's blowing.

DR. FEEHAN: Yup.

MR. SIMMONS: You can't control it.

DR. FEEHAN: Yeah, you can disperse wind turbines to reduce that issue, but you're right. I mean, there's times when the wind's not gonna blow.

MR. SIMMONS: Right, but so were you aware that there were issues such as – concerning the control of voltage on the system or the frequency on the system, technical reasons why there was kind of a cap on how much –

DR. FEEHAN: Yeah.

MR. SIMMONS: – wind could go in?

DR. FEEHAN: Yeah, I'm sure there had to be a cap.

MR. SIMMONS: Yeah.

DR. FEEHAN: The question I was posing was on the margin –

MR. SIMMONS: Yeah.

DR. FEEHAN: – could you do a little better or somewhat better –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – or significantly better, then fine.

MR. SIMMONS: So it was a suggestion, but at that time, you didn't have any reason to be able to say you can do better, it's – the question was, can we?

DR. FEEHAN: Yeah.

MR. SIMMONS: Yeah.

DR. FEEHAN: Yeah, I think that's – if you look at that *Telegram* report, I mean, you look at the last line, basically, it's – “any cost advantage has to be” – this is the very last line of the thing – “has to be over the truly best alternative, not some highly-constrained option.”

So all I was trying to do was say, look, if this is gonna be a better project –

MR. SIMMONS: Yup.

DR. FEEHAN: – convince me that –

MR. SIMMONS: Yup.

DR. FEEHAN: – and others that these options –

MR. SIMMONS: Yup.

DR. FEEHAN: – really don't pay.

MR. SIMMONS: So this Isolated Island Option that we see illustrated on the screen there in P-00161, did you have any reason to think that that was a highly constrained plan?

DR. FEEHAN: Well, I think if I – if you looked at all of these things –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – the cumulative things – because, again, I would go back to the PUB report with the sensitivity analysis that was in there. It was always these peer-wise comparisons. There was never a comparison of say, you know, adding – I think there was a comparison there about adding wind or the impact of aggressive conservation, and you looked at the cumulative present worth of the two options, but there was never a case where it was wind and conservation and pricing as an integrated option.

And all I was trying to say here is, well, let's do an integrated option, let's integrate all of these things, do pricing right, and of course, if the pricing is set right, the amount of capacity you'd need here to add to the system would be different.

MR. SIMMONS: So yeah, and I take what you're saying about the pricing, but I – the – I'm gonna suggest that this Isolated Island Option integrates various elements into it. If you look at the first – right after the 2015, the three small hydro plants are used first: Island Pond, Portland Creek and Round Pond. See those?

DR. FEEHAN: Yeah.

MR. SIMMONS: And there was wind being integrated at various times. So it is kind of an integrated-generation approach.

DR. FEEHAN: Yes, there's an integrated approach, but I'm talking about, let's say, a more integrated approach in the sense that you would have pricing –

MR. SIMMONS: Right.

DR. FEEHAN: – in there.

MR. SIMMONS: To incorporate the pricing into it as well.

DR. FEEHAN: You'd look at natural gas. You know, what about on the margin, with pricing –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – in there you may not need the refurbishment. It may come later. But if you put a bit more wind in, it was the cumulative thing that I was looking at.

MR. SIMMONS: Right.

DR. FEEHAN: And I'm saying, well –

MR. SIMMONS: Yeah.

DR. FEEHAN: – let's look at this before we make an investment that's going to be multi-billion dollars and irreversible.

MR. SIMMONS: But we had some evidence about how this – these generation plans are generated and how the –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – inputs are used and so on. Did you follow any of that, or do you know anything about the processes that are used to generate this kind of a plan?

DR. FEEHAN: I'm sure it's a complex process, but no, I –

MR. SIMMONS: Okay.

DR. FEEHAN: – wasn't involved in that.

MR. SIMMONS: Yeah. And a question for you: the fourth generation source you'd mentioned was small hydro. And I take it you mean other than the Island Pond, Portland Creek and Round Pond?

DR. FEEHAN: That's right.

MR. SIMMONS: And –

DR. FEEHAN: Or in addition to, I guess.

MR. SIMMONS: In addition to that. So those would be even smaller hydro plants, and you're referring to there being a study done by – or a paper done by some university professors –

DR. FEEHAN: Yeah.

MR. SIMMONS: – identifying –

DR. FEEHAN: Yeah.

MR. SIMMONS: – other opportunities.

DR. FEEHAN: Yes.

MR. SIMMONS: Yeah. And you'd acknowledge there would be things like environmental considerations to take into account at every one of those small developments.

DR. FEEHAN: Just like at Muskrat Falls.

MR. SIMMONS: Yes.

DR. FEEHAN: Yeah.

MR. SIMMONS: Yeah. And – but it would be in numerous locations and in various places?

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: And you're aware also that there was actually a government policy that had been in place for some time –

DR. FEEHAN: Yeah.

MR. SIMMONS: – that said that – you know, that prohibited these –

DR. FEEHAN: Yes.

MR. SIMMONS: – sorts of small hydro developments?

DR. FEEHAN: Yeah, I think I mentioned that we have – I suggested, well, that's a constraint there –

MR. SIMMONS: Yeah.

DR. FEEHAN: – so maybe have some flexibility on that, 'cause if you're going to do a

huge river in Labrador, which is part of the province –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – why can't you do a – dam a small river that's on the Island and much closer to where people consume the electricity.

MR. SIMMONS: So from the point of view of the people doing the planning for, like, this Isolated Island Option, there'd have to be a government policy change before they could take that into account?

DR. FEEHAN: Or they could inform the government, and then the government could decide whether to change the policy or not. But if they accept it as a constraint, then of course, they'd have to live with it. My point in this was maybe we shouldn't accept that constraint.

MR. SIMMONS: Mm-hmm. Okay.

Couple other questions for you. You've given a little bit of evidence but – actually not very much on FERC and the open access –

DR. FEEHAN: Mmm.

MR. SIMMONS: – tariffs and so on, and I take it that Mr. Learmonth was careful to have you point out that you're not an expert in that area.

DR. FEEHAN: That's right.

MR. SIMMONS: So I presume you would defer to others who would be better placed to say whether the provisions of the *Electrical Power Control Act* are of any concern at all, concerning whether the province will meet FERC requirements?

DR. FEEHAN: Yeah, I haven't looked at the legislation well enough, and I'm sure there's experts that know a lot more than me about tariffs.

MR. SIMMONS: And you also, in one of your articles, commented on the Energy Access Agreement in place between Nalcor and Emera –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – for some of the power sales to Nova Scotia. Similarly, do you regard yourself as being in a position to interpret that agreement and provide, you know, interpretations of what the effect of that may be, or is that outside the area of your expertise? Where do you see yourself in that?

DR. FEEHAN: Well, I think, as I've said, it's been a long time since I read it.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: I know the thrust of it and worked through some of it but that's been quite a while.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: So it would be someone, I think, who understands. It's essentially a contract, I suppose.

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: Really, ultimately –

MR. SIMMONS: Yeah.

DR. FEEHAN: – would be a legal question.

MR. SIMMONS: And do you understand the Energy Access Agreement to be one standalone agreement or a part of a larger suite of agreements that were entered into?

DR. FEEHAN: Well, there are many agreements, and I think, of course, the approval of the Maritime Link –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – was conditional on there being this – what we now call the Energy Access Agreement.

MR. SIMMONS: So I'm gonna suggest – you can agree or disagree or not comment if you want – that in order to put in context the operation of the Energy Access Agreement and the rights and obligations under it, you also have to look at the complete package of agreements and see what the rights and obligations of the parties are in the whole set of agreements –

DR. FEEHAN: Mm-hmm.

MR. SIMMONS: – in order to evaluate and judge what the effect of one of those alone would be.

DR. FEEHAN: Well, you can look at the effect of one alone –

MR. SIMMONS: Mm-hmm.

DR. FEEHAN: – but you do have to look at it in a broader picture. I agree.

MR. SIMMONS: Yeah. Okay.

Okay, thanks very much. That's all my questions.

Thank you, Commissioner.

THE COMMISSIONER: Thank you.

Concerned Citizens Coalition?

MR. BUDDEN: Good afternoon, Dr. Feehan.

As you know from our conversation earlier, my name is Geoff Budden. I just have a couple of questions for you today.

Pricing signalling, which you and Mr. Simmons discussed, that's just one aspect of conservation and demand management, commonly known as CDM. I'm correct in that, am I?

DR. FEEHAN: Yeah.

MR. BUDDEN: Okay.

And there are many other aspects of CDM such as government subsidized programs to upgrade insulation in homes, install mini-splits and so forth?

DR. FEEHAN: Mm-hmm.

MR. BUDDEN: And would you agree that a robust, sophisticated CDM program would have the potential to significantly reduce the demand on the Newfoundland – the Island of Newfoundland power system?

DR. FEEHAN: Well, I certainly – before you do a multi-billion dollar project, I think you would want to try something very aggressively along those lines. I might note, for instance, in Nova Scotia they developed a separate entity, Efficiency Nova Scotia, separate from its utilities, aimed really at helping people make decisions as to how to use electricity, how to heat their homes and so forth.

And, you know, one thing to have looked at would've been their success and what they were doing to help inform people and assist people in terms of reducing their consumption of electricity.

MR. BUDDEN: Are there similar programs on that scale in Newfoundland – Newfoundland and Labrador?

DR. FEEHAN: I don't think so. I think Efficiency Nova Scotia, for instance – or at least the policy of the government there included things like subsidies for heat pumps, if I'm correct. I'd have to check that.

MR. BUDDEN: Sure.

DR. FEEHAN: But, you know, in a stand-alone organization, not being tied to any public utility, just solely with a mandate of trying to reduce consumption and help consumers make the best choice for themselves, but also for the entire – let's say electrical grid for the province, we don't have anything like that here.

MR. BUDDEN: Okay. Thank you.

THE COMMISSIONER: Edmund Martin?

MR. SMITH: No questions, Mr. Commissioner.

THE COMMISSIONER: Kathy Dunderdale?

MS. E. BEST: Good afternoon, Dr. Feehan.

DR. FEEHAN: Hello.

MS. E. BEST: I'm Erin Best, counsel for Kathy Dunderdale.

How much does it cost to convert an average home from electric baseboard heat to oil heating in Newfoundland?

DR. FEEHAN: I don't have the number offhand, but if you go to the Efficiency Nova Scotia site, as well as showing the annualized cost of the two systems, they also give you estimates of the capital cost. I don't remember the numbers offhand, but it's on their site.

I think initial installation of baseboard heating might be a couple of thousand dollars, furnace might be – was substantially more than that, but they're available on Efficiency Nova Scotia's site.

MS. E. BEST: Do you know the range? I just want to know because –

DR. FEEHAN: Yeah.

MS. E. BEST: – it must be an important factor in your calculations.

DR. FEEHAN: Yeah, it is. I mean, actually, if you look at the Nova Scotia Efficiency site, they'll do two things; they'll show the annualized cost difference between electric heat and oil heat – so that's essentially your fuel costs.

MS. E. BEST: Yeah, I'm just talking about actually making the change. So ripping out your baseboard –

DR. FEEHAN: Yeah.

MS. E. BEST: – heaters and putting in the –

DR. FEEHAN: Yeah. Their site will – in addition to the annualized cost savings, their site will also then show the difference in the installation cost installing electric – let's say a furnace versus installing electric heat. And, of course, it varies under a lot of circumstances. I mean I can think of a house I had. It already had a furnace and then it was switched to electric heat.

MS. E. BEST: Right.

DR. FEEHAN: So switching back to a furnace wouldn't have been such a big deal, so it really

depends upon the circumstance. But, again, I think if you look at the price differential, it's probably several thousand dollars. It's probably up to 10,000 or so.

MS. E. BEST: Okay. If you could –

DR. FEEHAN: But if your annualized savings is 2,000 or 3,000, your payback period can be fairly short.

MS. E. BEST: Okay, I was just actually asking about the transition. So if you could provide me with that citation after, I'd appreciate that.

DR. FEEHAN: Okay.

Uh-huh.

MS. E. BEST: Thank you.

I'm wondering in your Telegram article – we don't need to go to it but it's at P-00322 – your five suggestions there, how do they improve Newfoundland and Labrador's negotiating position for 2041?

DR. FEEHAN: They weren't designed with any thought to improving our negotiating position with respect to 2041.

MS. E. BEST: Okay. Thanks.

And how do they create redundancy in the system in terms of, you know, if there was – say, instead of connecting to the Canadian grid?

DR. FEEHAN: I'm not sure I understand your question.

MS. E. BEST: Well, I'm just wondering, since we have the Muskrat – sorry, the Maritime Link does create some redundancy in the system; in fact, we can bring in power through that link if needed. So I'm wondering if you considered that advantage at all when you were making your five suggestions.

DR. FEEHAN: I didn't see it as – I mean I know it had been put forward as a possibility that we, if we ever ran into trouble and, I suppose, the power was available in the middle of the winter there and we had a blackout here,

they could bring in power. So it did have some beneficial effect there.

But, you know, we were getting – whether or not it was accessible and available exactly when we were having a difficult situation, that remains to be seen.

MS. E. BEST: Okay.

DR. FEEHAN: We also had the power then from Muskrat Falls anyway, or would have it and we'd have Holyrood, so I don't know if it was a big advantage, but I'm sure it was some sort of advantage to actually have an extra plug-in somewhere.

MS. E. BEST: Okay.

I wonder about electricity forecasting. So I think we know you're not an expert in electricity forecasting, right?

DR. FEEHAN: No.

MS. E. BEST: No, thanks.

So in or around 2012 when you were putting together your paper and, you know, what led you to the conclusion – what exactly led you to the conclusion that the forecast that was generated by Nalcor was not within reasonable limits?

DR. FEEHAN: I don't recall saying it wasn't reasonable – within reasonable limits. What I said was – and what I was trying to get across in the C. D. Howe paper – is the actual consumption, of course, is a function of many things including price, which is very important. And if we got the pricing right, consumption would be different.

MS. E. BEST: Okay.

So just keeping in mind that the forecast itself wasn't known by you to be incorrect and at that time we believe we needed more power to meet peak demand, now – and keeping that in mind and you're describing these five suggestions in your Telegram article, but you're describing implementing them incrementally as needed. But, realistically, wouldn't we have needed to

implement them all concurrently or else risk the inability to meet peak demand?

DR. FEEHAN: Peak demand doesn't change dramatically. I mean it's not as if we were going to go from a certain level of consumption of electricity to a much higher. That would have gone up incrementally as well.

MS. E. BEST: But –

DR. FEEHAN: So you could add to the projects incrementally and you could price so the consumption wouldn't go up as much. So I think that is something that could be easily handled.

MS. E. BEST: So I just want to get this straight. So I think one of the main parts of what you were suggesting was that we undertake these smaller projects incrementally over time, right –

DR. FEEHAN: As needed.

MS. E. BEST: – as needed. But don't we run the risk, like a serious risk then, of not being able to meet peak demand, which in 2012 was forecasted to be needed? There was going to be an increase in peak demand coming up pretty soon.

DR. FEEHAN: Well, that peak demand forecast may not have been quite right.

MS. E. BEST: But you didn't think that –

DR. FEEHAN: We're betting billions of dollars on it.

MS. E. BEST: So what exactly leads you – led you to the conclusion in 2012 that it might not have been quite right?

DR. FEEHAN: Well, my point at the time would have been, if we had proper pricing, we had time-of-day rates, we had seasonal pricing, consumption would change quite dramatically. If you had these other measures, such as incremental increases in supply as needed and conservation, then we could've handled the increasing demand or consumption –

MS. E. BEST: Okay, so let's –

DR. FEEHAN: – if there was any increase to handle in an incremental way.

MS. E. BEST: So let's look at that.

So you're talking about decreased demand when price – when cost increases. So in the winter, when demand is at its peak, what real data did you rely on to show that people would in fact turn down their thermostats in Newfoundland?

DR. FEEHAN: Well, it's a basic tenet of economics that if the price goes up, people will find ways of substituting a way to something else.

MS. E. BEST: Okay, so your answer is you didn't rely on any real data?

DR. FEEHAN: There's published papers that show different elasticities for price –

MS. E. BEST: In Newfoundland, actual numbers?

DR. FEEHAN: Well, I did get an old number from Newfoundland Hydro of minus 0.3, I think, for the elasticity.

MS. E. BEST: Right and that's considered to be inelastic, right? Because we'd –

DR. FEEHAN: It would be inelastic but you have to remember if only 20 per cent of your power is coming from Holyrood, the price goes up 10 per cent and people cut back, let's say, 3 per cent, disproportionately that's going to come out of Holyrood.

MS. E. BEST: So, I'm just thinking if we had relied on theoretical papers with respect to the elasticity of demand for power in Newfoundland, specifically during peak times, instead of the actual data, I mean isn't that a bit reckless. Imagine if we had done that, and on that basis we decided not to increase our capacity, and then it turns out people here don't turn down their thermostats and we had to revert to rationing power. I mean, what do you think the people of Newfoundland would think of that?

DR. FEEHAN: I don't think we ever rationed powers. So I don't know if we'd revert to it, but,

at the same time, we had a forecast, that wasn't the data, the data was there to make a forecast but the forecast isn't data. Data is what we actually consume now. So let's look at what our consumption is now compared to then.

MS. E. BEST: Okay. So, forget about rationing power then. Imagine that we simply weren't able to meet peak demand in the middle of winter. Do you have any insight about how the public of Newfoundland would react to that?

DR. FEEHAN: Yeah. DarkNL.

MS. E. BEST: Yeah.

DR. FEEHAN: DarkNL happened.

MS. E. BEST: Okay.

DR. FEEHAN: We couldn't meet it 'cause we didn't add properly. We could've added incrementally and probably not had DarkNL, particularly, if consumption was lower.

MS. E. BEST: Thank you.

Those are my questions.

THE COMMISSIONER: Former Provincial Government Officials '03-'15?

MR. T. WILLIAMS: Good afternoon, Dr. Feehan.

DR. FEEHAN: Good Afternoon.

MR. T. WILLIAMS: My name is Tom Williams. I represent the group of former elected government officials from 2003 to 2015, exclusive of former Premier Dunderdale.

I just want to touch on a point that was raised by Mr. Budden in his examination, I think he finished off on, and it's something that I think you've been attributed with having some concerns with respect to energy efficient initiatives by government. Would that be a fair comment?

DR. FEEHAN: I guess it goes back to the point that I was thinking perhaps about Nova Scotia and how they had Efficiency Nova Scotia, so they were – had an institution that was very

focused just on that. Obviously, there's been programs here but I don't think they've been as aggressive as in Nova Scotia.

MR. T. WILLIAMS: Okay. And the reason I ask, in your interview with Commission counsel that you gave only months ago, you quoted as saying: There was never anything about reform or pricing or – to induce people to consume at any different time – at different times – to reduce peak consumption or to induce people to conserve or to switch to alternatives.

Do you stand by that statement?

DR. FEEHAN: Well, I think that I would have to qualify the latter part of the statement, but the initial part about pricing and – I'm sorry, I didn't – perhaps I should look at –

MR. T. WILLIAMS: I'm more interested in the energy efficient issues. You say there was never – that's the – your language, not mine.

DR. FEEHAN: Well, I guess that was an overemphasis because, I mean, there were some efforts, but I didn't see in the plan that was put out to the board, the PUB, in, I guess, November 2011, I didn't see a plan there for conservation. They did have something in there about aggressive conservation but they didn't have a system –

MR. T. WILLIAMS: Have you done much –

DR. FEEHAN: – of how they would –

MR. T. WILLIAMS: – research in this area in terms of government's initiatives in this area?

DR. FEEHAN: I've looked from time to time, I wouldn't say I've published research in the area, but I've looked through – at different places and different times what government sometimes, or utilities sometimes do.

MR. T. WILLIAMS: Okay.

Were you aware that on July 13, 2005 government had an action plan announced to establish an energy use reduction target on government buildings to promote energy efficient –

DR. FEEHAN: Yep.

MR. T. WILLIAMS: – and public employees? You were aware of that?

DR. FEEHAN: Yes, I was.

MR. T. WILLIAMS: Okay. But you didn't make mention of that, I trust, in your interview.

DR. FEEHAN: Well, it was just in – not in that, and it was, you know, for government buildings.

MR. T. WILLIAMS: Okay.

DR. FEEHAN: So it wasn't, like, it was a (inaudible) –

MR. T. WILLIAMS: But they're an energy user, government buildings –

DR. FEEHAN: Yeah, they are –

MR. T. WILLIAMS: – and I would suggest a large one.

DR. FEEHAN: Yeah.

MR. T. WILLIAMS: Okay.

DR. FEEHAN: Yes.

MR. T. WILLIAMS: You're aware on September 6, 2005, that the minister of natural – of Energy at the time had made public statements encouraging residents of the province to lower thermostats, setting back thermostats and hot water boilers, availing of conservation measures such as caulking of windows – things of that nature. Do you remember that?

DR. FEEHAN: Was that just – was that a public statement, or –

MR. T. WILLIAMS: Yeah –

DR. FEEHAN: – was that part of –

MR. T. WILLIAMS: – that was a public statement –

DR. FEEHAN: – the plan?

MR. T. WILLIAMS: – to release; public statement.

DR. FEEHAN: Okay, so it wasn't a document. It was just a public statement.

MR. T. WILLIAMS: No, it was – it was an advisory to the public and recommendation by the minister of Energy encouraging energy efficiency.

DR. FEEHAN: I don't recall that. That was a long time ago and I don't know in the context whether it was because there was a problem at the time with supply or whether it was a long-term –

MR. T. WILLIAMS: Okay.

DR. FEEHAN: – thing.

MR. T. WILLIAMS: What about on November 22, 2005, government announced a \$6.9 million Residential Energy Efficiency Program whereby they gave \$200 grants for furnace testing, \$1,000 top-ups for new federal energy guide programs for low-income families and real-time metres were installed in three – over 3,000 homes.

Were you aware of that?

DR. FEEHAN: No, I don't recall that.

MR. T. WILLIAMS: Okay.

So you didn't make any mention, or your research didn't show anything along those lines.

DR. FEEHAN: No, that was 2005, so of course it was well before the Muskrat Falls debate.

MR. T. WILLIAMS: Okay.

Well, why don't we move up to 2007, when the Energy Plan came out, and that there was a commitment under the government Energy Plan – an initial investment of \$5 million to energy conservation and energy efficiency program. You were aware of that?

DR. FEEHAN: I think I was, yeah.

MR. T. WILLIAMS: Okay. But you didn't make mention of that.

DR. FEEHAN: No. It was just – I think it was a small program.

MR. T. WILLIAMS: Okay. A \$5 million program was small?

DR. FEEHAN: I think when you're talking about energy efficiency across the entire province, that's not an especially large number.

MR. T. WILLIAMS: What about the next year, March 6, 2008. They made another \$2.3 million allotment to make government buildings more energy efficient. Do you – were you aware of that?

DR. FEEHAN: I don't recall that, no.

MR. T. WILLIAMS: Okay. And no mention of that.

On November 8, 2018, government announced a residential wood pellet rebate program of some half million dollars to promote purchasing low-energy, wood pellet alternatives. Were you aware of that?

DR. FEEHAN: I don't recall that, no.

MR. T. WILLIAMS: Okay. So – and you did find that in your research?

DR. FEEHAN: I mean, I looked at wood pellets and I know that the wood pellets are used in Nova Scotia, and they looked at the cost of it, so I'm aware of –

MR. T. WILLIAMS: The reason I say it –

DR. FEEHAN: – that, but –

MR. T. WILLIAMS: – is that you –

DR. FEEHAN: – not that –

MR. T. WILLIAMS: – said you've done –

DR. FEEHAN: – particular announcement.

MR. T. WILLIAMS: – online research, and these are all available from the government webpage. Are you aware of that?

DR. FEEHAN: I expect they would be there if they were announced, yes.

MR. T. WILLIAMS: Did you ever look at the government webpage to see what energy initiatives they ever have?

DR. FEEHAN: Not energy initiatives pre-Muskrat, no.

MR. T. WILLIAMS: But these are not just pre-Muskrat. We're talking Muskrat came out – we're talking 2003. We're now 2008.

I continue, May 20, 2009. Government announced another 262,000 to assist local industry with integrated management systems to reduce energy. Hear of that one?

DR. FEEHAN: How much money, 200,000?

MR. T. WILLIAMS: Another 262,000.

DR. FEEHAN: Two hundred and sixty-two.

MR. T. WILLIAMS: Yep. Another public announcement.

DR. FEEHAN: Yeah. And I'm sure there were many announcements, but –

MR. T. WILLIAMS: Hmm.

DR. FEEHAN: – you know, again, it's a question of what the magnitude and sort of impact that would have.

MR. T. WILLIAMS: Okay, well, what about the 2009 provincial budget, and you're talking about magnitude, had more than \$10 million in energy efficiency in homeowner programs. Were you aware of that one?

DR. FEEHAN: I think I recall that.

MR. T. WILLIAMS: But you didn't make any mention of those in your testimony or your –

DR. FEEHAN: No.

MR. T. WILLIAMS: – (inaudible).

DR. FEEHAN: I was – in my testimony, I was looking forward and thinking what things could

be done, what new initiatives, what sort of major plan could be undertaken. I wasn't really looking back at what had been done.

MR. T. WILLIAMS: But as recently as three months ago, you stated government made no – government is never – your (inaudible) –

DR. FEEHAN: Well, never is –

MR. T. WILLIAMS: It's trying to share an –

DR. FEEHAN: Yeah.

MR. T. WILLIAMS: – opinion on –

DR. FEEHAN: Well, again, that probably is not the best choice of – it is not a good choice of words. Never is – can go back –

MR. T. WILLIAMS: That's fine. Would you agree with me in this –

DR. FEEHAN: – obviously forever.

MR. T. WILLIAMS: – that that's not a very balanced approach in terms of this topic?

DR. FEEHAN: Again, those were really major – those were programs prior to Muskrat Falls, and I don't know that any one was a really major effort. I mean, it was government buildings, it was targeted in certain areas.

MR. T. WILLIAMS: Homeowners.

DR. FEEHAN: But not a –

MR. T. WILLIAMS: Residences. You don't think all of these are significant enough for mention?

DR. FEEHAN: Well, the question became – I guess becomes: Was it enough to be all-province encompassing? And what was the intent to reduce consumption? How much would it take out of Holyrood? These were all fine initiatives, but, again, I don't know that they would've had much to do with the Muskrat Falls debate.

MR. T. WILLIAMS: But nothing worthy of mentioned in your mind?

DR. FEEHAN: I – quite honestly, I didn't think of them 'cause I was thinking forward and not at previous policies.

MR. T. WILLIAMS: Okay. We'll move on.

Dr. Feehan, you've also publicly asserted that Nalcor Energy and government were pretty much focused on the Muskrat Falls Project only and didn't look much beyond that. And I refer to your comments as recently as two weekends ago when you stated it was a damn-the-torpedoes, full-speed-ahead approach, and the fact that the project – this wouldn't pass a test of second-year or third-year economics.

Given the fact that many elements of this project have been reviewed and analyzed by consultants – international consultants I would suggest: Hatch consultants, Navigant consulting, Ziff Energy, Wood Mackenzie, Pan Maritime and Maritime hydro – none of which I know are going to be called here at the Inquiry, but there's also been financial analysis – detailed financial analysis I would suggest – done by Nalcor Energy, by provincial Government of Newfoundland, by the federal Government of Canada, by banking institutions such as the bank of Nova Scotia, the Royal Bank and any number of bond agencies.

I would put to you – are you suggesting to the Commissioner that to the extent that your opinion differs with these experts, that he should accept your opinion on this?

DR. FEEHAN: Let me put the damn-the-torpedoes expression in context. I think I did mention that this came from Philip Smith's book on *Brinco: The story of Churchill Falls*. And, of course, BRINCO, when developing Churchill Falls, had tremendous advisors. They had international experts; they had leading financial people in the UK such as the Rothschilds.

They had top engineers; their staff were expert in excavation and mining which was very important for Churchill Falls. And, still, as Philip Smith said, after they were able to get a letter of intent from Hydro-Québec, they ended up in a situation where management took what he described as a damn-the-torpedoes approach. And so he said during this period between the letter of intent and the final contract, BRINCO

found – or CF(L)Co, it's subsidiary, found that there was cost escalation in the project.

They had to do more work because of a problem with the reservoir. They had to – there was escalation just because of inflation. They were running out of money and the bank bridging funding was becoming more and more exhausted. They were trying to get Hydro-Québec to finalize a deal but Hydro-Québec was still looking for a US –

MR. T. WILLIAMS: I'm not trying to cut you off but –

DR. FEEHAN: What I'm saying is there were –

MR. T. WILLIAMS: – (understand) the focus on that, you know (inaudible) focus on that.

DR. FEEHAN: – there were a lot of torpedoes between that time period and in the end they ran out of money. And they tried to do an equity issue and many things went wrong and they ended up with the Churchill Falls contract.

MR. T. WILLIAMS: So do you stand by the comment that you made or do you –?

DR. FEEHAN: Now my point is analogous to this because once Muskrat Falls had been sanctioned or even before, I guess, when it was announced, but let's say even from sanction, there were, in a sense, a lot of torpedoes or obstacles. First, the Joint Review Panel, which looked at the project I think for about three years, came out with a study saying they weren't convinced it was in the long-term interests of the province. That was an obstacle or a signal.

That was followed by the PUB report that said it couldn't determine that was this was the lowest cost option.

MR. T. WILLIAMS: Yeah. So could I just go back to my questions?

DR. FEEHAN: That was followed by –

MR. T. WILLIAMS: If I could just focus –

THE COMMISSIONER: Sorry, no, no, let him answer – Mr. Williams, in fairness to him you have posed a question to him, let him

answer. I'm very interested in hearing this answer myself, so go ahead.

DR. FEEHAN: So those were two torpedoes, you had two independent groups, not hired consultants as you've listed, but people with expertise whose interest was in public policy, both of which were saying they weren't convinced that this was the lowest cost option. In fact, I think, the Joint Panel went further; they made a comment about it they weren't convinced that the evidence presented to them meant that the project was in the province's long-term financial interest.

Then there were other, if you want, torpedoes or obstacles, along the way. For instance, the concern was raised about the North Spur and its stability. There was that study about methylmercury and the community concerns and the protests. There were – then, of course, just after – as we move from announcing the project to – well, term sheet to actual sanctioning, we saw the costs go up by about 20 per cent before any work release significantly was done. And then after that, shortly after sanction, I think it was in April or May that SNC-Lavalin had done a risk assessment report and it didn't come out – the facts about that didn't come out till more recently, but they warned of potential cost overruns, I think, in the \$2.4 billion or more.

Then, of course, in the following year there were cost overruns, one set of overruns and then another, and then the Astaldi problem and the concrete forms falling down. And then there was a cost estimate increase again and again until it went to the most recent number of 12.7 which has stabilized now since Mr. Marshall, I think, has taken over.

So there were a lot of, in a sense, torpedoes and this is what I had in mind. I was thinking of all the problems that beset Churchill Falls, as sort of torpedoes or obstacles and I was thinking, well, this is sort of a parallel here. There was a lot of things that went wrong and now we have a 12-point-billion-dollar – \$12.7 billion dollar project. So that was my point about –

MR. T. WILLIAMS: Yeah. Are you –

DR. FEEHAN: – the torpedoes.

MR. T. WILLIAMS: Are you aware that Grant Thornton have filed a report – an expert report with the Commission?

DR. FEEHAN: Yes.

MR. T. WILLIAMS: Have you had a chance to review that report?

DR. FEEHAN: No.

MR. T. WILLIAMS: Okay.

Well, I'm going to just suggest to you that in that report, Grant Thornton have reviewed in detail an extensive number of options that Nalcor considered. So, as opposed to damming the torpedoes on just Muskrat Falls, they acknowledge that there was natural gas studies, wind turbine studies, wind studies, turbine studies and another list of options, we won't go through all. They did raise issues with respect to some, I certainly want to acknowledge.

But their approach was that there was reasonable consideration given to the majority of these options that were put forward and appropriately dismissed. What's your position in answer to that?

DR. FEEHAN: I haven't read their report so I'm –

MR. T. WILLIAMS: Okay, that's all right.

DR. FEEHAN: – not going to comment on their report.

MR. T. WILLIAMS: So, I guess, getting back to the original question that I asked, was that where your opinion differs with the experts that have been – that have reports filed, would you suggest that the Commissioner should accept your evidence where it contradicts or is in opposition to those experts?

DR. FEEHAN: That's for the Commissioner to –

MR. T. WILLIAMS: Okay, all right.

DR. FEEHAN: – to give whatever weight he wants to my evidence. It's not for me to tell him what to do.

MR. T. WILLIAMS: Okay.

In terms of the full debate – and there has been some discussion about full debate on these issues. And, obviously, I think you’ve acknowledged that you have serious concerns over this issue. Would you agree with me that in order to have full debate you need to hear from all sides?

DR. FEEHAN: Yeah, that’s fair.

MR. T. WILLIAMS: And so we know Dr. Bruneau has been called as a witness. And he’s not an expert, but he’s given opinion with respect to natural gas. And you’ve been called today and you don’t profess to be an expert, I suggest that, in the area of economic – energy economics. You’re not holding yourself out nor have you been presented as an expert in this area.

DR. FEEHAN: I don’t think I’ve been presented as an expert –

MR. T. WILLIAMS: No –

DR. FEEHAN: – in any –

MR. T. WILLIAMS: – and in fairness to you.

DR. FEEHAN: Yeah.

MR. T. WILLIAMS: And I understand that Mr. Penney, Mr. Vardy, without putting words in their mouth I don’t think they’re going to be presented as experts in any particular field.

DR. FEEHAN: I can’t speak to –

MR. T. WILLIAMS: Okay.

DR. FEEHAN: – how they’re going to be presented.

MR. T. WILLIAMS: Would you think it would be right to hear from experts who have analyzed considerations in respect to many of the factors taken into consideration in moving forward with the Muskrat Falls Project?

MR. BUDDEN: I don’t see a point of this question to this witness (inaudible).

THE COMMISSIONER: I’m not quite sure myself but I think that there is evidence coming. Mr. Williams, I think you’re mischaracterizing where we’re going with the –

MR. T. WILLIAMS: I’m just asking if he –

THE COMMISSIONER: What’s –

MR. T. WILLIAMS: The witness has indicated –

THE COMMISSIONER: What’s –

MR. T. WILLIAMS: – now, I’m just asking him: Do you think it would be reasonable to hear from such experts?

THE COMMISSIONER: Well, I don’t really want –

DR. FEEHAN: I –

THE COMMISSIONER: Excuse me.

DR. FEEHAN: Sorry.

THE COMMISSIONER: I don’t want you to answer that question. I’ll decide that.

MR. T. WILLIAMS: Okay.

Okay, if we can turn to Exhibit P-00326, please. And go to page 3 on P-00326.

THE COMMISSIONER: Tab 6.

MR. T. WILLIAMS: Tab 6. And if we can go to page 3, Madam Clerk?

THE COMMISSIONER: Mm-hmm.

MR. T. WILLIAMS: And if I could bring you to line 23, please.

DR. FEEHAN: Yup.

MR. T. WILLIAMS: And I’m just looking. Okay, if we could – I’m sorry. Maybe we could scroll up to page 2? I may not have the right – okay, yes, thank you. And if we could – I’d just like to read – I’m sorry – from line 23 here.

DR. FEEHAN: I'm sorry. Do you mean page 2 on the top of the page?

MR. T. WILLIAMS: Yeah, I think it's page – I'm sorry, let me go down there – I don't want to have you mixed there. If we could just scroll down and I can see what page number we're on here? Oh, we're on page 2. Yes, I'm sorry, it's the red page 2.

DR. FEEHAN: Red page, yeah.

MR. T. WILLIAMS: On top. And this is a report that was submitted to the Public Utilities Board, is that correct?

DR. FEEHAN: That's right.

MR. T. WILLIAMS: And can you just give me a very brief history of how that came to be?

DR. FEEHAN: This actually stems – this is quite recent – this stems from the general rate application that Newfoundland Hydro's put in.

MR. T. WILLIAMS: And this was requested by Mr. Browne, the Consumer Advocate, I trust?

DR. FEEHAN: That's correct.

MR. T. WILLIAMS: (Inaudible.)

DR. FEEHAN: Yes.

MR. T. WILLIAMS: And in this report on line 23 you say, "Practically all the potential more-than-100-percent increase in the domestic consumer price would be due to the increase in Hydro's cost structure resulting from its Muskrat Falls commitments."

So I read from that that you are attributing that the rate increase that we are going to see, 100 per cent is attributable to Hydro's cost structure from the project as to its current state. Would that be correct?

DR. FEEHAN: Yeah, I would think that would – that most of it would be. The current price is 11.4. I think Mr. Marshall had come up with this number of 23 cents.

MR. T. WILLIAMS: Okay.

DR. FEEHAN: And basically he was saying that rates would change to something like that (inaudible).

MR. T. WILLIAMS: And would you agree with me that any rate increases would have to take in to consider ongoing costs to be incurred such as the development of a new transmission line from Bay d'Espoir to the Avalon Peninsula, a new combustion turbine in Holyrood, maintenance of existing assets – that's usually an annual cost and expense – increased costs of oil at Holyrood as the price rises now to close to \$80 a barrel, if not more, and increased operating costs at Newfoundland Power – are they not all factors that are worthy of consideration in any rate increase?

DR. FEEHAN: Yeah. You have to remember, the 23 cents, as I understand it, though, is – reflects the impact of the project. So I think – and I may be wrong on this – maybe Nalcor may correct me, but my understanding was that was under the assumption that, for instance, Newfoundland Power didn't get any rate increases up to then. It was just to show their impact.

So it was like this is the impact of our project; this is what's gonna happen. It doesn't guarantee the price is going to be 23, because we don't know what's going to happen, for instance, to some facility somewhere else that might break down and might have to be replaced. And we don't know what's going to happen to Newfoundland Power's rates when they go for their next rate increase. So that means the 23 might be higher, as well as the 11.9 – they're both going to go up.

MR. T. WILLIAMS: When you read that line –

DR. FEEHAN: I read it –

MR. T. WILLIAMS: – in isolation, as you've written it there, without consideration of anything else, it certainly appears to the reader that 100 per cent of rate increases, going forward, are going to be as a result of Muskrat Falls – which is not a necessary truth, is it?

DR. FEEHAN: It may not be the case; it may well be the case. Both of those prices will probably be going up.

MR. T. WILLIAMS: They would've probably have gone up in any event to a certain degree, more or less.

DR. FEEHAN: Yeah. So it is a question of what the gap is between them, sure.

MR. T. WILLIAMS: Okay.

If I could go to Exhibit P-00378. That's my last line of questions – I know we're probably passing overtime, Mr. Commissioner.

THE COMMISSIONER: 00370?

MR. T. WILLIAMS: P-00378.

DR. FEEHAN: I don't know if I have that.

THE COMMISSIONER: Okay, that's not in the booklet, so we'll just get that. Just look at your screen, Sir. It'll be on your screen.

MR. T. WILLIAMS: Yeah, we can go to page 3 of that exhibit – 00378, I think. That's 00370 I think you have up. And if we could scroll down to page 3.

Okay, that's good, thank you. And if we just scroll up a little bit further. And this was an exhibit entered through Mr. Wade Locke, which was brought up this morning as from David Vardy to Wade Locke. And it mentions here that Mr. Vardy had indicated that he was no expert in the area of energy economics.

Do you have any comment? I mean, this is pretty strong language from a gentleman who's a major opponent to this project, and this is pretty strong language. I just wonder what your reaction is to something –

THE COMMISSIONER: (Inaudible.)

MR. T. WILLIAMS: – that says I am not, and we can read it out –

THE COMMISSIONER: Excuse me, Mr. Williams. Like, that's a question I think you're going to have an opportunity to ask Mr. Vardy himself. I don't think it's fair to ask this witness how that's being interpreted. There may be various reasons why that letter was written the

way it was, and I see no reason why at this point in time this witness should answer that question.

MR. T. WILLIAMS: Okay. Maybe if I could ask one final question.

THE COMMISSIONER: Go ahead.

MR. T. WILLIAMS: And not directly. Do you consider Mr. Vardy an expert in energy economics or any other energy field?

DR. FEEHAN: I consider him an expert in electricity; he's been chair of the PUB for many years and he has graduate qualifications in economics. So I think he well understands electricity economics.

MR. T. WILLIAMS: And you understand the term – what expert means?

DR. FEEHAN: Well –

MR. T. WILLIAMS: You know, there's knowledgeable and there's expert.

DR. FEEHAN: Well, again, if there's a legal distinction between here it's not for me to call someone an expert or not. It's (inaudible)–

MR. T. WILLIAMS: Okay. You know you just did and that's why I qualified you.

DR. FEEHAN: Well, I meant it – I didn't – I suppose there's a capital E expert for the purpose of an event like this. And it's not my place to say that.

MR. T. WILLIAMS: That's fine. That's all the questions I have.

Thank you.

THE COMMISSIONER: Yeah, mindful of the time, but I will just see how we're going to go here.

Julia Mullaley, Charles Bown.

MR. FITZGERALD: No questions.

THE COMMISSIONER: Robert Thompson.

MR. COFFEY: No questions.

THE COMMISSIONER: Consumer Advocate – can you give me an idea, when you get to the microphone, how long you think you’re going to be?

MR. HOGAN: (Inaudible) Dr. Feehan, my name is John Hogan. I’m counsel for Consumer Advocate. I just have a couple of quick questions. I won’t be very long.

THE COMMISSIONER: Okay.

MR. HOGAN: I just want to ask – Mr. Williams, I think, mentioned Bay d’Espoir in his questions to you then. Are you familiar with – and you talked about add-ons to the small hydro projects – can you comment or are you aware of how that would work and how we can get the transmission from these proposed smaller hydro developments that are banned now onto – for the customers here on the Avalon, let’s say?

DR. FEEHAN: Well, as I understand, some of these small hydro projects are sort of within the very broad Bay d’Espoir area, so they might be able to be integrated with an existing framework. Some might be more isolated. But my argument about small hydro really was based on that report that was done by people at the engineering department at MUN, which identified a great number of rivers and their potential. And my sense was well, let’s look at some of the best ones in terms of their capacity and in terms of their cost of development, and also look at minimizing environmental impacts to try to come up with what set of them would be the best.

And, of course, part of that would be a consideration to how close they are to existing transmission lines or generation – or existing generating facilities.

MR. HOGAN: So the closeness of it is a factor, as opposed to Muskrat Falls which is not close, obviously?

DR. FEEHAN: Yeah, I mean if you can – it’s I guess, like, any generating unit, whether it’s a small hydro or a wind turbine, if it’s close to where people consume, you save an awful lot on transmission. And, as a result, the project might have high operating costs – might in that sense – it might only been a small river producing a little

and have high operating costs but because you don’t spend much on transmission and it’s pretty close to where people are consuming, there’s less environmental impact.

Just to follow through, I understand, for instance, the transmission line right down through Labrador and across the Island, I mean, that takes up thousands and thousands of acres that had to be cut, and I heard at the symposium that was held at Memorial a couple of weeks ago that to keep that clear, all sorts of pesticides – and some I think related to Agent Orange, I was told, but I don’t – can’t verify it – some pesticides are used extensively to keep those lines from being grown over.

MR. HOGAN: Okay.

You did some – gave some evidence about some legislative provisions in Nova Scotia. I’m wondering if you’re aware of any legislative barriers in the United States for selling power from large hydroelectric projects.

DR. FEEHAN: I don’t think there is – I don’t know of any barriers, if there’s a large – do you mean Canadian –

MR. HOGAN: Yes.

DR. FEEHAN: Oh, there is some debate in the United States, and I don’t know if legislation’s been enacted, but it’s certainly been a big political debate in the United States and the New England area in particular as to whether a large hydro site in Canada would count towards their definition of renewable energy because of the concerns about the environmental impact of large hydro.

So it’s certainly a debate in those areas, but I don’t know if there’s actually been a limitation because of it, but –

MR. HOGAN: It’s an issue?

DR. FEEHAN: It is an issue.

MR. HOGAN: It’s an issue

DR. FEEHAN: It is an issue for sure.

MR. HOGAN: So we've heard evidence about this: this is a green project and a clean project. It may very well be, but the issue that you're raising in New England is that some people or states may not consider this green enough to export it in from Canada, is that fair to say?

DR. FEEHAN: It's my understanding there's a debate along –

MR. HOGAN: A debate.

DR. FEEHAN: – those lines there, but I'm not up-to-date enough on it to –

MR. HOGAN: Okay.

DR. FEEHAN: – to say much – anything more precise.

MR. HOGAN: Okay.

And this is the last point I wanna raise: You've talked about the reservoir at the Upper Churchill River –

DR. FEEHAN: Mmm.

MR. HOGAN: – and we've heard some evidence about water management issues. Do you have any information about that that you can give the Inquiry about any issues with regards to how that water –

DR. FEEHAN: Oh yeah, well, I think if you went back to – I was going through my list of torpedoes regarding the Upper Churchill, and I was a little rushed to get through them all with the –

MR. HOGAN: This is a (inaudible).

DR. FEEHAN: – Muskrat Falls. But yeah, I mean, I – another torpedo, let's say, was, I guess around 2013 or so, a group of lawyers raised this issue – and I think maybe Mr. Bern Coffey might've been a major participant in that – raised the issue about whether or not the flow of water going down to Muskrat Falls would be fully under the control of Nalcor or whether Hydro-Québec would control it, and that would have implications for the amount of water going through the plant when needed, and implications

for the amount of energy that could be produced when needed.

So there is that whole water management issue which you consider is another complication or obstacle.

MR. HOGAN: So I know you're not an engineer –

DR. FEEHAN: Mm-hmm.

MR. HOGAN: – or a lawyer. Do you have any opinion on that from an economics standpoint or no?

DR. FEEHAN: All I can tell you is: when I did that paper for the – well, from an economic point of view, of course, it reduces the value if you don't have optimum control of your water.

But I also did that paper in the *Dalhousie Law Journal*, and as part of my research for that, I did come across the evaluation that Hydro-Québec did regarding the actual Upper Churchill – the Churchill Falls contract and how they'd improved their position relative to the letter of intent. And one line in there – one section says: with regard to the reservoir, our position has improved to the point where it's as if we own it. So that was Hydro-Québec's assessment.

Now, there's different legal opinions on it, but all I can say is that was Hydro-Québec's assessment at the time of the contract. To their mind, they were telling their government: it's as if we own the water.

MR. HOGAN: Those are all the questions that I have.

Thank you.

DR. FEEHAN: Thank you.

THE COMMISSIONER: Former Nalcor Board Members?

MS. G. BEST: No questions.

THE COMMISSIONER: Okay.

So I believe that's it, Sir. Thank you. You can step down.

Sorry for being late today, but I think it was worthwhile finishing up this witness. So we'll start off tomorrow – Ms. O'Brien?

MS. O'BRIEN: No questions (inaudible).

THE COMMISSIONER: Okay. Good. All right.

See you tomorrow morning at 9:30.

CLERK: All rise.

This Commission of Inquiry is concluded for the day.