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(9:00 a.m.)

CHAIRMAN:

Q. My solicitor can't see me, she says, so I got to -- well, good morning everybody. Before we start are there any preliminary matters? No? Well, this is -

GREENE, Q.C.:

Q. No, Mr. Chair.

CHAIRMAN:

Q. Okay. This is week two and of course, I guess I should do the introductions again. I'm Andy Wells, Chair of the Board, and on my left is Darlene Whalen, Vice-Chair, far right, Dwanda Newman, Commissioner, and James Oxford to my near right. Mr. O'Reilly is here for Nalcor and Mr. Johnson is the Consumer Advocate. So I guess I'll turn it over to -- I guess if there's nothing else, we'll go right to Mr. Martin, sir.

MR. MARTIN:

A. Thank you, Mr. Chairman, Commissioners, members of the public present, Consumer Advocate, Nalcor counsel. I welcome the opportunity to present a short presentation to the Board of Commissioners on a very vital

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matter to the future of the province and I understand that there will be further presentations today and I'm sure they will cover many of the issues that probably I would like to cover, but in the interest of not duplicating, I would like to concentrate on a couple specific items.

First, I want to talk about the price risk that's often associated with the thermal option. I guess the first thing we all have to concede is that forecasting oil prices is very challenging. This slide shows a relatively close correlation, I think, fair to say, between the NEB's November 11th 2011 projection of prices out to 2035 and what we see as the equivalent implied Nalcor forecast of crude prices. We've had to make some assumptions. The first number 178 dollars is in current dollars as of 2035 and when you convert that to 2010 and make the equivalent of moving from fuel oil prices to crude prices, you get about 135. So the long term price is approximately 17 percent higher than the National Energy Board. But I think one of the things I am pointing out is that both

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these estimates may prove out to be too high in the longer term, especially when we're dealing with 50 years given developments in the shale oil sector in the United States and really Mr. Chairman, I'd like the Commissioners to take judicial note or quasi-judicial note of the article in today's Globe and Mail that, you know, everybody is starting to focus in on this phenomena and, you know, right now, I think private sector investments are being made, for instance, maybe at Hebron in prices that go out maybe and assume maybe 90 to 100 dollars. So everybody is trying to be fairly cautious about what these prices will evolve into and we're in a period of obvious extreme change.

But I think there's a more fundamental point and that is even if they do turn out to be higher than Nalcor's or let's say the NEB's forecast, should we worry anyway? Because we are a significant oil producer, we have what we would call a -- what could be called an economic hedge to higher oil prices.

(9:15 a.m.)

If we compare the size of the Holyrood

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consumption per year against our oil production per year, we can see that, you know, we're much larger in the offshore than consumption at Holyrood and even if we doubled the present consumption of oil at Holyrood, it would still only represent two percent of our province's offshore oil resource and that's just in the Jean d'Arc Basin alone. So this graphic, it's a simple graphic representing the relative size and I think that in all our assumptions that we have to assume that Newfoundland is going -- Newfoundland and Labrador is going to continue to be a major oil exporter, up to and beyond 2041, the end of the Churchill Falls contract and to the end of the proposed Muskrat Falls 50-year take-or-pay contract.

So, the oil price risk in the thermal project or the thermal option, the high oil prices is not really the risk to the economic wellbeing of the province and its people prior to 2041. Ironically, low oil prices are, especially if consumers have to pay rates based on a 50-year take-or-pay contract for relatively expensive, I would say expensive,

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Churchill Falls -- or I'm sorry, Muskrat Falls power with all costs included, and at the same time, of course, under a low price scenario, we have a provincial government struggling under low oil revenues.

The essence of the risk in the thermal option, you know, it's been stated that the greatest risk to the Isolated Island case is unstable and possibly rising oil prices, but due to the oil price hedge that I've tried to describe in the previous two slides, three slides actually, there should be little, if any, actual oil price risk. If we do have high oil prices, we will also have high oil revenues and a provincial government with an ability to pay direct payments to the citizens who need assistance due to any high oil prices.

Turning to the risk at the Muskrat Falls. First point, I think, just as a point of clarification, I think it's fair to say that the 50 to 30 percent variation that we've heard about associated with the class four or DG2 cost projection does not measure the cost risks associated with the Muskrat Falls

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Project. That spread is merely a reflection of how preliminary the DG2 cost projections are. If a DG3 cost analysis and budget is approved and sanctioned by the province, then the true cost overruns from the sanction budget start to accumulate from that date. I would say that the largest true risk in the Churchill Falls case or the Muskrat Falls case is cost overruns and cost overruns on such large projects typically arise from changes during construction, including design changes, and owner's inexperience in managing contractors.

The elements of the oil price risk. As I said before, oil price projections are based on complex assumptions and projections as to future events. Geopolitical spikes, such as we're seeing perhaps today with Iran, though painful are of relatively small overall impact on a 50-year time scale. Key to the projections on the demand side are the economic rise of the BRIC countries and similar economies and these are already factored in all credible projections and I'm sure the projections that Nalcor are using.

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Key on the supply side is the rise of shale oil and I would have to say shale gas because there's a lot of fuel switching going on in places where shale oil is being developed, such as United States.

The connection between the shale oil revolution and oil prices. Rising shale production is already having a significant impact on crude oil prices in the central United States and analysts are just starting to study the wider and longer term implications of this trend. If you stand back and look at what's going on in the United States, and I have personal knowledge of that process through my business connections, investment and technology are flowing strongly into the shale oil sector which has the typical strong innovation and cost reduction character associated with a technology still in its very early developmental stages and I think that's really key. We have not seen the measure of this new development at all, although it's coming on so fast and so large already. The key to assessing this connection between shale oil and risk to future oil

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prices is the depth of this resource and its duration and you know, if it's a blip and it's going to be gone in ten years, it's bigger than a Tehran or some other geopolitical spike, but it doesn't affect that 50-year projection.

But I think the key point I'd like to get into is that it is -- how deep it is and how strong it is and that runs from the simple fact that organic rich shales which has this shale oil potential are common throughout much of the world. China, for instance, has 40 percent more resource in the shale oil and shale gas realm than the United States, but as Chinese officials themselves have stated publicly, they are probably ten years or so behind the United States. That's a short period when we look at a 50-year project like Muskrat Falls and frankly does pose tremendous problems of planning to say British Columbia LNG and Australian projects who may see their market being undercut severely before payout of their large projects occur.

So if we just look at that concept of how deep this is, with your permission just a few

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notes on where this shale oil is coming from. Basically, it comes from organic rich rocks called shales generalized. They're one of the most common rocks worldwide. When these rocks get buried, they get heated and their organic material is transformed to oil and gas. Some of that oil and gas gets expelled from the shale and that's why we have Hibernias and West Texas' and Saudi Arabias. But most of it, and this is the key part, this is the fact that its so hard to grasp and so revolutionary in its concept, most of the oil and gas generated stays in the shale, a rock that is very tight, has no permeability and this oil is locked in that formation.

I like to say that for years we've been - - since Colonel Drake drilled his first well in Pennsylvania in 1857, we've been living off the fumes of the gas tank and now the engineers have found a way of tapping into the gas tank itself. So let's try to see what that really means. This is a little triangle that I've developed to try to explain this. It comes from a talk I gave to a Tight oil conference in Denver last year. The total

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triangle represents all the oil and gas that's generated in the organic rich shales in a given basin. The small triangle at the top, in red, represents the oil and gas that's been exposed from that shale and which constitutes the conventional oil and gas resource base, the kind of base that we see at the Jean D'Arc, Terra Nova, Hibernia, White Rose, et cetera. The bottom part of the triangle is the quantity of oil and gas generated but not expelled and it represents it's still in the shale and it constitutes the unconventional resource base.

And the general rule, and obviously it varies with thermal regimes and quality of the organic material and a whole host of factors, but in general terms, on a basin wide analysis, there's ten times as much -- if you look at say West Texas, they probably have ten times as much unconventional resource base as their conventional, as large as it was, and this is the revolutionary part. That's the measure of the gas tank.

The technology, as with many breakthrough technologies, is very simple. You drill a

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well vertically in the old style and then you turn it horizontally. Ironically, a lot of that technology comes from the offshore oil industry, including Hibernia. Hibernia has been one of the laboratories and universities of directional drillers from all over the world. If you talk to people like Schlumberger, they rotate their people through here. It's been a big learning experience. Again, fields in the North Sea I guess where a lot of it came from.

Once you have drilled your horizontal lateral in the producing formation, in the shale that you want to fracture, you basically pump down water under pressure until the rock fails, opening up that very tight rock and flow back the water and the production of oil and/or gas starts.

The other factor is that in the United States, where this tremendous revolution is going on, that these oil shale plays are literally everywhere. The peak areas on this map represent organic rich shales that are now under development to various degrees. Originally, these were shale gas plays, but

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you know, there's been a shift into liquid rich gases for the petrochemical industry and oil. So it's -- and if I were to draw -- if I were to present a map here of China, you would see exactly the same pattern. If I were to present you a map of India, you would see the same pattern. Not many countries are like Canada, made up of mostly Canadian Shield. Most countries, South Africa, for instance, has enormous shale and oil and gas resources.

What's happened in the United States, as evidenced by President Obama's State of the Union address, is that this development, which was largely confined to the Western United States from North Dakota all the way down to the Mexican border, has now come east of the Mississippi, focusing on Pennsylvania and Ohio, and Ohio in particular is oil rich as opposed to Pennsylvania, which is in the eastern part, mostly dry gas. As a result, the policy makers in Washington have become more aware of this phenomena and are changing laws and getting behind it and in an extraordinary degree of unity, pushing the technology and the industry even further.

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When we look at just the last slide in this idea, this is a EIA, the Energy Information Agency in Washington, showing of the -- and this would be changed by now, but these were the sort of -- say a year ago, these would be the areas. You see even strange areas, southern Sweden, for instance, places that you would not normally associate with oil. So we have a big trend, a long trend and a worldwide trend and it has to affect oil prices in the longer term.

So we have this fracture -- what I call fracture enhanced hydrocarbon production. It's several times larger, to say the least, than the conventional base we've looked for. The United States is going -- they presently have probably 90 percent of the technology in this area and it's on this very steep learning curve and no one can catch you when you're on that. It's like a giant Silicon Valley. And this province cannot afford to remain isolated from that revolution.

With all due respect, Mr. Chairman, I would like to say that we need an adjusted process. We've heard that the preliminary --

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we've heard about the preliminary nature of the information that was available to Nalcor at DG2, which is a class four feasibility level study anyway, and we've heard that Nalcor has had to defer many questions presented to them at this hearing because studies were under way, information had not been obtained, but they would be done and ready for the more accurate DG3 studies. However, as the matter now stands, this Board of Commissioners in this process is supposed to base its analysis on these lower accuracy studies which are being reworked by Nalcor and its financial and engineering advisors.

(9:30 a.m.)

It is a fundamental principle of good public policy that the PUB should rest their conclusion on the same facts and the same calculations that Cabinet will be making its decision on. Otherwise, the PUB's advice on the reference question will not be informed. The PUB should adjourn -- it obviously has to seek the permission of Government, but the PUB should adjourn until Nalcor has finished its DG3 studies and has made a formal DG3

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recommendation to Government. The PUB should then have a second round of hearings on the final DG3 information before advising Government.

I thank the Board for your patience and your attention. Thank you.

CHAIRMAN:

Q. Turn it over to Mr. O'Reilly, I think, do we? Do you want to just have a brief -

O'REILLY, Q.C.:

Q. Yes, just a moment, Mr. Chairman.

CHAIRMAN:

Q. Sure.

O'REILLY, Q.C.:

Q. Thank you. Just a couple of brief -- one question, Mr. Martin, that's all. On the oil price risk you refer to, looking forward, what you're telling the Board is that in your view the PIRA forecast, the one that Nalcor has received on oil, oil prices going forward, that PIRA doesn't recognize or they haven't been -- the impact of shale gas, the revolution you say, that hasn't been recognized or factored into these forecasts by PIRA? Is that to my understanding?

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MR. MARTIN:

A. I don't know. I'm not speaking about the shale gas side.

O'REILLY, Q.C.:

Q. No, no, but the impact on the oil prices.

MR. MARTIN:

A. The shale -- no, no, on shale oil. I don't know of any study to date, except with one possible exception, a company called Bentec, which is a subsidiary of Platts, probably the premier oil forecasting company in the world out of New York City, oldest and most prestigious, their subsidiary in Colorado, Bentec, two weeks ago put forward, to my knowledge, the first study of the impact of shale oil on oil prices and in so far as the press material was concerned, basically warning policy makers that they have to start thinking about the impact of shale oil in the longer term before making serious large capital investments. So PIRA is no different from any other in everybody in the industry is playing catch up ball in this matter and I'll be leaving tomorrow to go to Houston to a conference and that's all everybody is going

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to be talking about is how do we factor in shale oil in our future oil price projection. So PIRA is not to be faulted for not incorporating this. It's coming on so fast and so large that I wouldn't criticize PIRA.

O'REILLY, Q.C.:

Q. No, and I didn't intend to -- no, I didn't expect you would, but your point is that this revolution of additional sources of gas now is going to decrease, it's going to impact oil prices going forward because it's a great abundance of this other source. That's your point?

MR. MARTIN:

A. Yes, but it's not -- excuse me, it's not gas. It's oil.

O'REILLY, Q.C.:

Q. I know, the price of oil.

MR. MARTIN:

A. Yeah, I mean, at one time when the focus was on shale gas, I mean, up until literally two or three years ago, most people didn't believe that you would be able to apply this shale gas technology to the oil side because the oil molecule is quite significantly bigger than

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the methane which is being developed and the relative permeability that you need to increase to get the oil out was considered too much. So as a result, there was -- when the Eagle Ford play was developed in southern Texas, all of a sudden they realized that they could do it. They could transfer the technology. They piled billions and billions of dollars into that play and as a result, we have a technology that can be transferred literally around the world. So no, no one has put -- neither PIRA, nor the NEB, nor the EIA for that matter in the United States, has managed to capture this new fact of life.

O'REILLY, Q.C.:

Q. I think that's really all the questions that I have of the witness, but I would make the observation that with respect to the comparison between EIA price and the NEB future prices for oil, Nalcor has presented Confidential Exhibit 69. You have that before you and I think it contradicts the position that there is a discrepancy in the two prices between nominal and real prices for oil. I think they're pretty well the same and we

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dealt -- Mr. Goudie dealt with that somewhat during his presentation.

The other thing is that I would make the observation as well, contrary to what Mr. Martin is suggesting, that the MHI study contradicts the position that the estimate, DG2 estimate is a preliminary estimate. They said it's a good estimate, a good DG2 estimate.

Those are the only two things that I would like to leave, and we'll be addressing this in our final submissions to the Board. Thank you.

CHAIRMAN:

Q. Mr. Johnson, do you have any?

MR. JOHNSON:

Q. I have no questions for Mr. Martin.

CHAIRMAN:

Q. Do you, Madame Greene?

GREENE, Q.C.:

Q. I have no questions for Mr. Martin. Thank you very much, Mr. Martin. But I did have one comment in relation to the comments of my learned friend, Mr. O'Reilly.

With respect to DG2, MHI did find and did

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-- actually the report was a review of cost estimates as of DG2, which Nalcor's evidence is that at DG2, project definition is approximately five to ten percent of the project at that time and as a result of Mr. O'Reilly's comments, I wonder if Mr. Martin would like to further expand his last slide, which was a need for an adjusted process? Because I had assumed Mr. Martin was concerned about the preliminary nature of the project definition at DG2 versus DG3 and the project definition is approximately 40 percent. So I wonder, Mr. Martin, in light of Mr. O'Reilly's comments, would you be able to speak to that, please, on your last slide?

MR. MARTIN:

A. Thank you, Ms. Greene. I would -- this is not my area of real expertise, if I have any, and I hope there will be other presenters along those lines. But when I did talk about DG3 numbers and reflecting, it's not just that the DG2 numbers are preliminary, and you are correct in your statement. My suggestion is based on a more fundamental principle, that it is if the Government of Newfoundland wants

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this Board to advise it about a decision that its going to make and so call inform the reference question, by definition, the Board must be looking at the same information that the Cabinet is looking at. Otherwise, it's an impossibly illogical situation and I would say that the Board has gone out of its way to share this process with the public of Newfoundland, with its webcast and in other ways, and I would make the second step of saying that that examination should be via a public hearing and I can't see why Nalcor would not be more than happy to agree to that, in the interest of good public policy.

GREENE, Q.C.:

Q. Okay. Thank you, Mr. Martin.

CHAIRMAN:

Q. Commissioner Newman?

COMMISSIONER NEWMAN:

Q. No questions, thank you very much, Mr. Martin.

COMMISSIONER OXFORD:

Q. No, Mr. Chairman.

VICE-CHAIR WHALEN:

Q. No. Thank you, Mr. Martin.

CHAIRMAN:

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Q. Mr. Martin, you mentioned a Nalcor internal oil price. So what you're saying there is that Nalcor, in its oil investments, like in I guess Hebron, is it?

MR. MARTIN:

A. Hebron.

CHAIRMAN:

Q. They would be party to the internal oil price that the partners in that would be using for their capital budget projections?

MR. MARTIN:

A. How oil companies -- one of the most closely guarded secrets in an oil company is its investment assumptions, including oil prices, and I'm not quite sure about how the dynamics of the particular Hebron operating committee is working. I'd base the 90 to 100 dollar investment range on personal communication with very, very reputable oil economists and a person who's working closely with all the major oil companies and their reaction to a study which they -- a worldwide study they did about threshold economics and price assumptions. So I'm fairly confident that that's -- you know, I can't say that Exxon is

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using 90 to 100, but I would be shocked, quite frankly, if it were even that much or certainly if it were higher. I'd say that they probably -- that someone is conservative or they were prudent as Exxon, that they're probably in the 80 to 90 range.

CHAIRMAN:

Q. I don't know if that would be -- would that number be available to the Board? What internal number is Nalcor using therefore for its participation in these projects? I mean, it's participating with Exxon in Hebron.

O'REILLY, Q.C.:

Q. We don't know the answer to that.

CHAIRMAN:

Q. Can you -- can we, can the Board get that information or can you find out whether it's available?

O'REILLY, Q.C.:

Q. Can we take the question under advisement?

CHAIRMAN:

Q. Oh sure, absolutely, yes. No, no, I don't want it answered now.

O'REILLY, Q.C.:

Q. I'd like to take the question under

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advisement.

CHAIRMAN:

Q. Sure. The EIA, I think I saw -- do you know whether the EIA has said that it considers -- the Energy Information Agency, this is the research agency of the US Department of Energy, but I thought I read somewhere, I got it out there in a file, that they expected 80 percent of the new electrical generation in the United States in the next 20 years is going to come from gas. Do you know if that's true?

MR. MARTIN:

A. Well right now, all new incremental -- virtually all new incremental capacity in the United States is oilfield -- I'm sorry, gas fuel, shale gas fired.

CHAIRMAN:

Q. And that's -

MR. MARTIN:

A. And as coal plants come to their retirement date and sometimes even before, they're being replaced on the firm capacity side as well.

CHAIRMAN:

Q. And if you got a BTU price, you multiple it by

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six to get the BOE equivalent, barrel of oil, is that how that works?

MR. MARTIN:

A. Yes. I mean, when you see in the paper that the Henry Hub price for gas is $2.50, you multiply it by six and you get $15.00 oil. So consumers in the United States today are heating their homes with the equivalent of $15.00 oil and last year, I think the electrical prices in the United States were cut in half. I think the most striking -- and sometimes when you're seeing all these numbers and seeing all this activity, you need kind of a little -- some example to sort of put it in perspective.

There's a company out of Vancouver called Methanex and Methanex is one of the most successful companies in the petrochemical business and they dominate the manufacture around the world of methanol and their business strategy is very simple. They would go to a place like southern Chile, down at the very boot near Tierra del Fuego, where Chile had found some non -- totally uneconomic gas with no plausible customer and they would buy

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that gas at the cheapest possible price, just enough -- just high enough to keep the company in business and make a small profit, and they would use that gas, lowest cost gas in the world, to manufacture methanol. They did the same in other places around the world, including New Zealand. Methanex is now dismantling a plant in Chile and moving it to the United States.

CHAIRMAN:

Q. Your analysis, did your analysis take in -- I mean, I just saw an article the other day now on what's called super fracking technology. Does this analysis contemplate this most recent development?

MR. MARTIN:

A. The speed at which the United States is developing this technology is absolutely astounding. You know, if you're away from that sector for say three months, you know, there's been so much change, you can hardly fathom it. For instance, last year, Schlumberger came up with a new fracking technique. It was relatively simple improvement. Instead of a constant pressure

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on the rock, they pulsed the pressure and they could get 25 percent more production out of a given well at lower cost and so the rates of return that they're enjoying in these projects are just fantastic. Meanwhile, there's a whole bank of shale gas in reserve and shale gas will -- I mean, that'll gradually -- over time, that will be used as prices come up to four dollars or five dollars, but the bottom line for us is that in the United States, eastern United States, the long term electrical price is in the five or six cent range and that's a number that we have to look at. I mean, we don't want to be the highest electrical cost area in -- or one of them, in North America, you know. We don't want -- we want to see how we can fit in. So I would -- I don't want to trespass on the terms of reference, but -

CHAIRMAN:

Q. And I saw also in the paper last week that they say out in British Columbia, there could be an oil and gas field out there the size of Tabacon. Do you have any knowledge of that geology?

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MR. MARTIN:

A. Well, the Duvenay (phonetic) formation does have good oil. I mean, basically if you look at the fact that Alberta had a large -- wherever you see around the world a place that had a large conventional oil and gas reserve, you know that the shale is still there that that oil came from, so you have to go back and work out and it's very much a working out process. So, the amount of -- I think the Chinese -- I saw an article recently as just last week that the Chinese are now recognizing the tremendous lead that the United States has over them on the technical side. They thought they could literally buy the technology, but they can't buy this hyped up innovative thing that the Americans are capable of. Silicon Valley comes -- that mentality.

The most striking thing about going to a conference on shale oil and shale gas is the tremendous number of young people being involved, young men and women, young engineers, and they're so enthusiastic, and that's the energy the United States is tapping into. So yes, super fracking is just one

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aspect. I mean, they've actually taken the MRI technology out of the hospital setting and applied it to the examination of shales where they're talking about nanodarcys. Now a darcy is not a big thing, but a nanodarcy is really -- and they use scanning electron microscopes to see these little tiny, tiny holes in the rock.

So right across the board, it's quite a remarkable thing. I mean, and I was lucky enough to -- bumping into an old friend from Port aux Basques down in Houston seven years ago, I became engaged in it and it has been the most fascinating single thing that I've -- and as I go around the conferences, I pick out the older people with the grey hair and you know, I've been in the business for 40 years and I say "have you ever seen anything like this before in your career?" and everybody to a person says no, this is the big one.

CHAIRMAN:

Q. I saw another article where one of the guys, one of the key players in Tabacon says he could have, in his company alone, 24 billion barrels of oil.

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MR. MARTIN:

A. That would be the total Tabacon, yes.

CHAIRMAN:

Q. That's the total, is it?

MR. MARTIN:

A. Yes, and I think -- and this is the other problem that's going on is that there is a big discrepancy between the well-founded -- I mean, everybody is playing catch up. The United States geological survey had to develop a brand new way of calculating reserves. I mean, their old methods did not work for this new technology, so they tend to be -- most of those official reserves that you see tend to be very much on the conservative side. I mean, you're talking about -- I think Mr. Hann, is it?

CHAIRMAN:

Q. I think that's his name.

MR. MARTIN:

A. Yeah, Mr. Hann of -

CHAIRMAN:

Q. Continental.

MR. MARTIN:

A. - Continental, you know, who I've heard speak. I haven't met him, but I mean, he's very respected in the industry, and that number would be a number that would be very much supported by his colleagues in the industry.

CHAIRMAN:

Q. So at 250 million barrels a year, that's a lot of oil. That's what the US consumes, I think I read that. Anyway. I think that was -- yeah, and I think Commissioner Oxford had a question.

COMMISSIONER OXFORD:

Q. Mr. Martin, have you given any thought to what time frames would be involved to be able to bring this new technology, deliver fuel to the Province of Newfoundland and Labrador and be able to put it into production? Have you given any thought to the time frame of that?

MR. MARTIN:

A. Well, I don't think I'm allowed to talk about the importation of liquified natural gas. That's outside, as I understand outside the terms of reference. If I were allowed to talk about it, I'd say we could do it right away.

CHAIRMAN:

Q. I think that's a pretty good answer, isn't it?

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Any further questions? Anybody else?

GREENE, Q.C.:

Q. No, Mr. Chair. I believe that concludes the questions for Mr. Martin.

CHAIRMAN:

Q. Thank you, Mr. Martin.

MR. MARTIN:

A. Thank you.

CHAIRMAN:

Q. Now, well, we're keeping to our schedule pretty good. Next we have Mr. Vardy and Mr. Penney, Dave Vardy and Ron Penney. Mr. Penney, are you the chairman of your contingent or are you co-chairs?

MR. PENNEY:

A. We're co-chairs, equal co-chairs.

CHAIRMAN:

Q. Equal co-chairs. Who's speaking first?

MR. PENNEY:

A. I'll be speaking first.

CHAIRMAN:

Q. Okay, sir.

MR. PENNEY:

A. And I hope I don't lapse into your honour or your worship.

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CHAIRMAN:
Q. Please don't.
MR. PENNEY:
A. Mr. Chair and Commissioners, it's a great pleasure for us to be here today and we very much appreciate the opportunity to present to the Board.

We are two retired public servants with long experience in public service which involved providing advice to governments on many complex public policy issues. We have been accused of having an agenda and in fact, that is true. We do have an agenda, but our only agenda is to ensure that this issue, which in our view is the biggest public policy issue ever to have faced the province, gets the most thorough and rigorous review possible.

We are not opposed in principle to the project. Our main concerns are with the process and whether Muskrat Falls is the best option either now or later. We recognize that the Board is severely constrained by both the Terms of Reference and by the refusal of a government to give the Board the time it needs

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to do the job it was asked to do, but the bigger problem with this process which seems to have been forgotten is the fact that the Muskrat Falls Project has been exempted from the normal regulatory process which applies to all regulated utilities in the province and requires that all significant capital expenditures be approved by the Board. This is what has recently occurred with respect to an application by Hydro on a transmission project which was disallowed as part of the PUB's annual review of Hydro's capital expenditures.

We note that this exemption was granted by a previous administration, so there's lots of blame to be shared about this particular decision. But it is important to note that the exemption order could have been lifted by the present administration, but hasn't been. Neither the previous administration nor the current administration has provided reasons for this exemption. I ask the question -- we ask the question, how can there possibly be any justification for distinguishing between relatively small capital projects and the

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largest capital project ever undertaken in our history.

On May the 5th, 2011, Dave and I wrote the Minister, the then Minister of Natural Resources, Shawn Skinner, asking that the exemption be lifted. In our letter, we stated the following: "This is one of the most important public policy issues ever to face the province and it is imperative that the choice made by Government be subject to independent review. The Muskrat Falls Project may well be the best public policy choice, but the people of Newfoundland and Labrador need to have that choice tested by the Board which is set up for that purpose. We are requesting that Government reconsider its decision to exempt the project from the jurisdiction of the Board in light of the magnitude of the project and the necessity to ensure that it is the best option, not only to meet our energy requirements, but to mitigate financial risk to the province."

On June 17th, 2011, the Government announced that the Board would be asked to conduct a review which wasn't what we

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requested, but an important step nevertheless. The Minister wrote us on June 22nd formally responding to our letter and saying the following: "as a Government, we felt it important to independently engage the PUB's expertise on this fundamental question as the Muskrat Falls development is the most significant electrical generation and transmission project undertaken by the province in 50 years. This review is just one of the elements of Government's strategy to ensure that this project is subject to input from various sources prior to sanction and will further enhance our goal to engage the people of the province and ensure confidence about a decision to move ahead and sanction this project."

We do appreciate the respectful and thoughtful way in which the former Minister, the Honourable Shawn Skinner, responded to us. This was somewhat encouraging, but as events unfolded and other alternatives have come to the fore, it is clear to us that the Terms of Reference are far too narrow. By limiting the Terms of Reference and the time given to the

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Board, there is a real question as to whether the Government has done what it said it would do in terms of engaging the people of the province in an open public debate. We also note that one of the casualties of the decision not to extend the deadline for the Board's report is the inability of the Board to conduct its plan of technical conference, which has meant that there's no opportunity for Newfoundland Power and its parent, Fortis, to provide its effective (phonetic) island project and question the technical experts, which no doubt would have added greatly to the process, but we do urge Fortis to make its views publicly known. We think that's very important for this process.

O'REILLY, Q.C.:

Q. Mr. Chairman, I'm trying to follow the outline that was filed by Mr. Penney and Mr. Vardy and there were six points that are noted, we got those on Friday, and I'm going to try to find out where - probably he can help me where we are in his outline. Which of the six areas?

MR. PENNEY:

A. I'm very close.

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O'REILLY, Q.C.:

Q. You're very close to the first one?

MR. PENNEY:

A. Yes.

(10:00 a.m.)

O'REILLY, Q.C.:

Q. Well, the only thing, Mr. Chairman, if we have a limited amount of time, there were a number of people, I presume, who read the very clear statement of area of inquiry, and I'm sure this is all very interesting, but it doesn't seem to inform the process that the Board is involved in and its mandate and the reference question to be dealing with these sorts of things. I mean, I'm sure there's a forum for that. I question whether or not this is the one and if there are others that had a similar elastic view of what the Terms of Reference encompass, then probably they might respond accordingly and ask to speak at this thing as well, but, you know, I just find that this seems to be far afield from what the reference question is and more particularly going to the points that were raised in the file as the basis for the issue this morning.

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CHAIRMAN:

Q. Well, I - Mr. Penney, I mean, we've allowed, well, to 11 o'clock for your presentation and are you - you're going to be within that time frame, are you?

MR. PENNEY:

A. And if you'll wait until my very next sentence, you'll see that I'll be starting on the particular - on the Terms of Reference.

CHAIRMAN:

Q. So those remarks were what you might call preambletory.

MR. PENNEY:

A. That's right.

CHAIRMAN:

Q. Okay.

MR. PENNEY:

A. If I may continue then, the decision to embark upon this project is a major public policy decision that will impact on future generations. The PUB has been asked to provide their recommendation as to whether we need additional power and to choose between two alternate options. We all know that the choices which must be made are, in fact, more

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complex. There are many options to be considered, not just two. A decision to proceed with Muskrat at a later date is a realistic option, but not one which is posed by Government. We note that the Board's review is limited to examination of those two options; the Muskrat Falls project, and the isolated island development scenario. The review will not address alternatives such as wind power, natural gas, the role of energy conservation and demand side management, or environmental concerns, or the impact on electrical rates to end users.

I am a lawyer by profession and a former Deputy Minister of Justice with the province. I also recently retired as a City Manager of St. John's where I spent 17 years. I bring considerable experience from my role as City Manager on the financial risk of cost overruns on major projects. While those projects were not of the same magnitude as a multi-billion dollar Muskrat Falls project, the City did construct large projects in an era of tremendous increases in materials and labour costs, which continues to be the case now. I

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am, as a result of my job with the City, familiar with cost estimating processes and the various stages which you go through. As you go further along, I know that this process is meant to more accurately estimate the cost of a project as detailed designs are completed and tender documents are prepared leading to the final pre-tender estimates.

The City, of course, just as Nalcor is doing, followed those processes utilizing outside engineering consultants and our own internal expertise, but we found inevitably that the actual tenders results and final cost did significantly increase the final cost of large projects, such as the construction of the Civic Centre and the harbour clean-up project. In a project of this magnitude there is great potential for large cost increases, particularly when this project if sanctioned will be undertaken at the same time as other large construction projects are underway, such as the Hebron oil and gas project. We also note that the last major hydro project constructed by Hydro, Cat Arm, came in significantly over estimated costs, and

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perhaps the Board might consider asking Hydro to provide the initial estimate and the final cost of the Cat Arm Project as part of its processes.

There is also one aspect of risk management which I don't think has been addressed or at least the sharing of risk, and that is the possible use of the Lower Churchill Development Corporation, a joint federal/provincial body which was set up years ago to construct the Lower Churchill. LCDC is owned 49 percent by the Government of Canada and 51 percent by the Government of Newfoundland and Labrador. This Act is still in existence and we think that serious consideration should be given to using that Corporation to construct Muskrat Falls if it is sanctioned rather than doing it on our own. I note that the City and the Province used a similar mechanism, a construction board, consisting of City and Provincial representatives, together with representatives of Destination St. John's, to manage the construction of the Civic Centre and to share the risk.

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Just turning now to reliability issues. We note the questions about reliability have been an important focus of the work of Manitoba Hydro at the hearings last week. Given that the Avalon Peninsula, and particularly the North East Avalon, will be very vulnerable when Holyrood is closed down under the interconnected option, this issue is of vital importance to this part of the province, and it's actually one of the reason why I became interested in this public policy issue. As we well know, the Avalon Peninsula is vulnerable to disruptions anywhere along the line. Power disruptions under the interconnected option might occur in Labrador, along the Strait of Belle Isle, along the Long Range Mountains in Central Newfoundland, or of course on the Isthmus of the Avalon. We do agree that the Maritime link does provide some added security, but if a disruption occurs on the transmission lines crossing the Isthmus of Avalon, then the most effective back up power has to be on the Avalon Peninsula. The interconnected option calls for Holyrood to be decommissioned as a generating plant. Having

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Holyrood so close to the St. John's urban region provides this area of the province with considerable energy security.

We also note that the MHI Report raises serious concerns about how the reliability issue has been addressed by Nalcor. We acknowledge again that the connection to Nova Scotia may provide us with access to power in the event of a loss of supply, depending on where the problem occurs. For example, the location of a loss of transmission line matters for this to work, and the capacity of EMERA, the suppliers, will be affected by where and when the loss of power occurs. If it happens during the late winter or early spring, which is our time of maximum risk, Nova Scotia would also be in a high demand situation at the same time as they may have lost power from Muskrat Falls. Should the Board's report make recommendations on this matter, we believe as well that the Board should be given the opportunity to review any further work which is being done on this part of the project sanction process.

I now turn it over to my colleague, Dave

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Vardy, who has a lot more expertise in this, given that he was on the Board of Hydro and is, of course, the Past Chair of the Board of Commissions of Public Utilities.

MR. VARDY:

A. Good morning, Mr. Chairman. My name is David Vardy. I'm by training an economist and by career a Senior Executive with various government agencies in the province, the Chair of the Public Utilities Board from 1994 to 2001. When I served as Secretary to the Cabinet from '78 to '85 under Premier's Frank Moores and Brian Peckford, I was a member of the Board of Newfoundland and Labrador Hydro. In August of last year, I wrote a paper for Action Canada on the Muskrat Falls Project, and I'm tabling a copy of this paper dated August 31st, 2001, in order to place it on the record for this proceeding.

I will deal with the following issues; risk mitigation, the MHI Report, the end of the Churchill Falls Power contract, capital structure, cost of service, water management, conclusions.

The mitigation of risk is a key issue to

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be addressed in this hearing. There is risk associated with all options, not just one. Some of the risks are controllable; some are not. Some can be anticipated and known; others are unknown. We can never be assured that all risks have been identified and minimized. However, we must attempt to ensure that system planning takes all risk factors into account. We believe that in a project of this magnitude, all available expertise and information should be mobilized. The major risks as we have identified them are as follows; capital cost overruns, volatile oil and gas prices, over-estimation of load growth, under-estimation of load growth from emerging new industrial users of electricity, volatile electricity prices in potential export markets for electricity produced in Newfoundland and Labrador, changes in demography which may impact upon load growth, decline in family formation and new home construction, and changes in the usage of electricity, and finally, physical risks such as storms and icebergs scouring on the Strait of Belle Isle.

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The historical advantage of hydro electric power is that while capital costs may be high, the operating costs are low. Once it is built, the project runs itself, and if fossil fuel energy costs are rising, then capital intensive hydro projects will stabilize the cost and over time the low and stable cost will be its advantage. Such was the case with the Bay D'Espoir Project, which has been an enormous asset. If energy prices behave unpredictably and start to decline, then this hydro electric project could turn into an albatross. We cannot predict accurately what can happen. We must exercise prudence and then make a decision. The shale gas revolution is causing uncertainty in energy markets and we are well advised to recognize its impact, not only on oil and gas prices, but also on electricity prices throughout North America.

The isolated island alternative contains a series of smaller projects which allow Newfoundland Hydro to move forward and supply power, maintain system reliability, and thereby provide ample time to mitigate the

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risk associated with Muskrat Falls and to explore other options. The Muskrat Falls Project is of such a scale and nature that once a decision has been made, there is no turning back. We cannot make piecemeal adjustments. The cost of Muskrat Falls is all up front and inescapable.

Our recommendation is that Government take short to medium term energy decisions which will allow sufficient time for the province to complete its due diligence on Muskrat Falls. The Joint Environmental Review Panel established by both levels of Government to review the EIS for the Lower Churchill had a full two years to do their job, and that panel raised serious questions about the merits of Muskrat Falls. Now the PUB is being rushed to finalize its recommendation by the end of March. While the Government filed the reference in June, the submission from Nalcor was not received until November, and the MHI Report was not completed for the Board until the end of January. In light of this, we believe that this tight deadline is patently unfair to the Board, as was the Government's

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refusal to allow the time requested by the Board.

(10:15 a.m)

Nevertheless, we welcome this opportunity to voice our opinions. Is the current timing right for the project for Muskrat Falls; it is the best of times and the worst of times, to quote Charles Dickens. Interest costs are low and money is available to finance a major project. Loan guarantee financing may be available from the Federal Government. Oil prices are high. The economic environment is uncertain. Signs of a buoyant economy are emerging in the United States, and the Eastern economies such as China and India are surging. On the other hand, unemployment has risen in Canada and even in Newfoundland and Labrador. Europe is in turmoil with Greece and Italy tottering toward bankruptcy. New shale oil discoveries are dramatically changing the energy landscape. While there are risks associated with Muskrat Falls, there are also advantages to removing our historical electrical isolation on the island. There are inherent benefits to electrical integration

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for an island based system. Power can flow both ways, so it can benefit from being electrically connected not only with Labrador, but also with the rest of North America. The issue for us is whether we have undertaken a comprehensive assessment of the risks as well as the options available to us.

The Joint Environmental Panel on the Lower Churchill Generation Project identified a number of key risks which need to be mitigated. We will speak later about how much progress has been made to address these concerns. We would like formally to enter the joint panel report into evidence before the PUB, and we would appreciate the advice of the Board with regard to what we need to do to place it before the Board.

Now I turn to the major findings of the MHI Report. The MHI Report contains much that is useful. We would have liked to have seen more analysis with regard to the actions that could be taken to reduce peak loads, such as side agreements with major industrial users or the use of unpeak pricing. This is an area in which more research is required. We also

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would like some commentary on other supply options as well as the timing of Muskrat Falls in light of MHI's qualified support for the project.

Mr. MHI Report concluded that the DG 2 capital cost estimates were equivalent to a Class 4 estimate, which is a feasibility estimate and its a range of accuracy of + 50 percent to -30 percent. The information provided by Nalcor and reviewed by MHI was generally current as of the fall of 2010 and was used by Nalcor in making its DG 2 decision. Nalcor did not generally provide information on the detailed engineering or financial work completed after DG 2. The capital cost information is therefore a year out of date and it has the potential for cost overruns of 50 percent. We had expected that the cost estimates would be beyond feasibility estimates in their confidence limits at this stage of the project. MHI's comments on the load forecast are organized around domestic customers, small general service, and industrial customers. For domestic customers, the load forecast has been generally reliable,

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presumably helped by the work of Newfoundland Power in forecasting the load of its own customers. MHI noted that for the domestic forecast the load is consistently under-forecasted by 1 percent per year. They suggested that end-use modelling techniques would improve the accuracy of the forecast. The general service forecast has been quite accurate. The industrial load has been over-estimated as a result of the closure of two pulp and paper mills, and also the remaining mill has adjusted its operation so that it purchases much less from Hydro and is close to meeting its needs from its own Deer Lake Hydro Facilities.

MHI points out that the addition of a large industrial customer could have a large impact on the projected load. While Nalcor's forecast into the future may appear to be conservative, Nalcor has tended in the past to over-estimate its future load growth. Nalcor's submission to the Board in November, 2011, projects a high level of housing starts, even when population is static. The submission states as follows, "As depicted in

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Figure 4", which I would ask Mike to put up before you, "As depicted in Figure 4, the number of domestic customers has continued to grow despite the province's declining population. This has occurred because household and consumer formation are naturally more related to the subset of population that is 25 years and older. This is the age subset which predominantly forms households and drives the demand for housing. Changes in real disposable income have also been historically linked to customer growth".

Now I turn to the next chart, which is a chart of provincial population and - sorry, I'm getting ahead of myself. We have three observations to make on these data on load growth. One, the continued growth of the older population subset cannot be predicted to continue indefinitely. We have to look at the numbers in the age group, 24 to 45, which are responsible for new family formation and for most of the housing starts. This age cohort is already showing signs of slower growth as shown in the chart below, which I'd like to be put up next, which is the one that's before

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you now. This shows the - the red line shows the 25 to 44 year old people. That reached a bulge in the early 90s and is now starting to decline. So this group has been declining. Secondly, as the population grows older with little natural increase, it projected that there will be more senior citizens. As you'll see from the blue line, the blue line shows those who are 65 and higher. These senior citizens are likely to have lower incomes than the younger population and to live in smaller spaces, thereby requiring less space heating. The blue line in the chart shows the projected increase in the number of senior citizens, 65 years and older, of whom I am one. Third, we note that the provincial forecasts go only to 2029, which raised the question of attempting to forecast so far into the future as 2067, for which period we do not have demographic projections. While we appreciate Nalcor's point that low growth continued in the post moratorium period when there was an outflow of population, and we have to recognize the demographic outlook is virtually flat.

Turning to the reliability studies, we

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note that MHI refers to the system reliability studies and observes that Nalcor should rely more heavily on probabilistic criteria as to other utilities in Canada. We note as well that integration studies will not be completed until March, 2012. MHI report that good utility practice requires these integration studies be completed as part of the project screening process in DG 2. MHI considers this a major gap in Nalcor's work to date. These integration studies must be completed prior to the project sanction. MHI suggests that the generation engineering and cost estimation is in a better state of readiness than the transmission component of the project. MHI report as well that Nalcor currently does not comply with North American Electrical Reliability Corporation Standards, NERC standards. A majority of utilities in Canada have adopted the definition of good utility practice that incorporates adherence to NERC Standards. Also should the Maritime link proceed and Nalcor participates in the electricity marketplace, NERC Standards will ultimately apply. MHI recommends that Nalcor

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complete a self-assessment and prepare for full compliance to NERC Standards, with or without the Maritime link. Nalcor has selected a 1 to 50 year reliability return period, a basis for design loading criteria for the HVDC transmission line, which is inconsistent with the recommended 1 to 500 year reliability return period outlined in the international standard. Nalcor has stated that the additional capital cost increase for the 1 to 150 year return period for the transmission line would be 150 million. In the latter case, Nalcor should also give consideration to an even higher level reliability return period in the remote Alpine regions. MHI recommends that Nalcor adhere to these criteria for the HVDC transmission line design.

We believe that Nalcor should include the additional capital cost for the 1 to 150 year reliability return period, and for the even higher 1 to 500 standard in the higher and more remote regions. Since achieving the 1 to 150 year return period adds 150 million to the capital cost, we presume that the higher

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standard recommended by MHI would cost somewhat more. A high standard of reliability on such a distant source is crucial and this expense should be added to the reference case for the Muskrat Falls calculation of CPW and all the sensitivity analyses performed on that reference case.

We also note that the isolated island option includes 582 million dollars capital expenditure for pollution abatement, but during the time since that expenditure was called for in the 2007 Energy Plan, Newfoundland Hydro has been successful in abating sulphur dioxide and particulate emissions by using low sulphur fuel. Also the 2007 Plan was prior to the closure of the Grand Falls Mill, which was not anticipated, but a side effect of which was to free up a large amount of hydro electricity. With availability of that clean energy and the use of cleaner fuel, there will be much less emissions to abate and, therefore, the benefits of the capital expenditure will be much less than we thought in 2007. We emphasize that we support a pollution

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abatement, but are pointing out that other measures have substantially addressed the problem. Moreover, we understand that the abatement equipment will not reduce greenhouse gases. Therefore, the present value of the 582 million should be removed from the CPW calculation for the reference case; namely, the isolated island option.

A few comments on the end of the Muskrat Falls Power Contract -

MR. PENNEY:

A. Churchill Falls.

MR. VARDY:

A. The Churchill Falls Power Contract. The 2007 Energy Plan identifies the year 2041 as a landmark year for access to electric power from Churchill Falls. This is the year when the 1969 Power Contract expires, and Nalcor Energy as the majority shareholder in CF(L)Co will have access to the facility and the energy. The Energy Plan, Focusing Our Energy 2007, states on page 22, "We will maintain our focus on 2041, when the Upper Churchill Contract expires and the province is in a position to receive the full benefit from this

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resource. Between now and 2041, we will carefully plan and make decisions to ensure Upper Churchill's success in the future, as well as organizing our current and future energy resource developments to maximize benefits, while minimizing fluctuations in our economy". In this context, it is surprising that Nalcor's planning does not rely upon Churchill Falls power in the years from 2041 to the end of the planning period in 2067. In the response to MHI-Nalcor 3, the question is posed as follows, "What consideration has been given to the excess power capacity that will become available associated with the termination of the Upper Churchill Falls Agreement in 2041". The answer in part is as follows, "There is inherent uncertainty around guaranteeing the availability of supply from Churchill Falls in 2041 because it is difficult to determine the environmental and policy frameworks that will be in place 30 years out - 30+ years out. There are other issues surrounding the Churchill Falls asset with respect to Hydro Quebec, as Nalcor is not the sole shareholder of the Churchill Falls

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operation".

We find this response surprising and incredible. The least uncertain event for the energy future of this province is that the Churchill Falls contract expires in 2041; we even know the exact day of the expiry. The Winter Availability Contract also expires in 2041, as does the Shareholders Agreement between CF(L)Co and Hydro-Quebec. The reservoir, dams, turbines, and related facilities are in place with no construction required. Under the interconnected plan, Nalcor does include Churchill Falls power starting in 2057, yet we are told that 2041, some 16 years earlier in time is too uncertain to consider Churchill Falls as an option.

The only uncertain element about Churchill Falls is whether the current litigation in the Quebec Court that challenges the contract might result in access to the power sooner than 2041. If this materializes, then the Province might well be advised to maintain its flexibility to benefit from such an outcome by holding off its decision to commission the Muskrat Falls Project.

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In the period 2041 to 2067, Nalcor's isolated island system includes 12 thermal plants and two wind turbines, all at a cost of 5.5 billion in current dollars. The Labrador infeed system includes six 50 megawatt CT units at a cost over the same period, 2041 to 2067, of just over 1 billion dollars. The difference in nominal or current dollars is 4.5 billion. Does this create a bias in favour of Muskrat Falls? We raise that question for the Board's consideration.

Nalcor's analysis assumes that the consumption of energy is the same in every year under both options, but in the isolated island option, especially in the later years, there is a substantial price difference for rate payers. This is the essence of the Joint Panel's recommendation 4.3 to adopt integrated resource planning, which reflects the impact of rate changes upon demand and the associated revenue requirement.

If under the isolated island option rate payers pay higher rates, then their consumption will be less. This means less need for capacity and less fuel consumption.

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Nalcor should be requested to adjust the CPW of the isolated island option reference case to reflect this likelihood under the integrated resource planning framework, as recommended by the Joint Panel.

In Nalcor's submission of November, 2011, they indicate that they have included Churchill Falls power beginning in 2057 and reaching 500 gigawatt hours in 2067. However, there's no indication of Churchill Falls as being considered under the isolated island option. In light of the strong commitments in the Energy Plan of 2007 relating to Churchill Falls, it is ironic that Churchill Falls was screened out of the analysis in Decision Gate 2.

In its recommendation 4.2, the Joint Federal Provincial Environmental Panel describes the Terms of Reference which should be covered by an independent analysis of alternatives to meeting domestic demand. We are citing these recommendations here in the understanding that this inquiry by the Public Utilities Board constitutes the independent analysis recommended by the Joint Panel, and

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the Joint Panel asks, "Why Nalcor's least cost alternative to meet domestic demand to 2067 does not include Churchill Falls power, which would be available in large quantities from 2041 or any recall power in excess of Labrador's needs prior to that date, especially since both would be available at near zero generation cost", recognizing of course that there would be transmission costs involved. The Joint Panel recommends this question should be included in the Terms of Reference of the independent analysis, along with the following questions, which I will pass over in the interest of brevity.

We recommend that the Board accept the advice of the Joint Panel to adopt the principles of integrated resource planning which places more weight on demand side management than on least cost supply planning.

I want to turn for a few moments to the capital structure, the cost of service and the power purchase agreement. The capital structure of public utilities is carefully calibrated in order to minimize the cost of capital. Typically the balance of debt and

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equity is tilted toward debt, recognizing the opportunity cost of debt capital is deemed by regulators to be lower than the cost of equity capital. Regulators, of whom I used to be one, use the long term, 30 year or longer Government of Canada Bonds borrowing rate for bonds as the risk free proxy for the cost of debt capital. To that risk free rate is added the risk of equity which is less secured than is debt capital. Bond holders demand that shareholders make a significant contribution by injecting a meaningful measure of equity. The financial strength of a privately owned utility is often measured by the absolute size of shareholder equity and by its relative size, compared with debt. A typical capital structure would be 70 percent debt, 30 percent equity. A strong infusion of equity provides potential lenders with confidence that the company is financially strong. This will normally reduce the cost of debt capital. Much has been written on the subject of the optimum capital structure.

Mr. Chairman, at the hearing last week you raised the issue of the optimum capital

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structure for a Crown owned public utility. You asked whether a capital structure with a 95 percent debt might be preferred to one with 75 percent debt, in light of the lower cost of debt capital, and the fact that Nalcor is a provincially owned Crown corporation, whose financial position is grounded in the credit standing of the Provincial Government.

Nalcor, an unregulated company, will be the builder and owner of Muskrat Falls. Nalcor will sell the power to Newfoundland and Labrador Hydro, a regulated subsidiary of Nalcor Energy, through a power purchase agreement. The capital structure in Decision Gate 2 has been established at 100 percent equity. This is unusual in two respects. One is the fact that it places all the risk on the province. An equity contribution would not qualify for a federal loan guarantee. Second is the fact that the imputed cost of capital will be higher than it would be under a balanced capital structure. The response to 20 states, "For analysis, Nalcor has assumed the Labrador-Island Transmission Link was financed on a regulated cost of service basis

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with 75 percent debt and a 10 percent return on equity. The Muskrat Falls generating facility was assumed to be financed with 100 percent equity with a cost based escalating rate established to provide an 8.4 percent internal rate of return based on sales to the Island".

Nalcor Energy has proposed that prices be set independently of cost when Muskrat Falls comes on stream. The standard approach to public utility pricing - rate setting is that they be based - rates be based on the cost of service. The cost of service is subject to confirmation by the Public Utilities Board and normally the Board approves rate changes based on changes in the cost of service, and these cost of service studies are done on an annual basis. Certainly they're done in advance of rate hearings, general rate applications. The cost of service approach is normally applied to public utilities that are regulated entities. Nalcor Energy will be developing Muskrat Falls, and Nalcor is not a regulated entity and will be selling power to a power purchase agreement between the public utility,

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Newfoundland and Labrador Hydro, and Nalcor. As a non-regulated entity, Nalcor is outside of the full scrutiny of the Public Utilities Board.

In the present case Nalcor intends to follow a different pricing regime, modelled along the lines of Bruce Power and one which is not based on cost of service in single years. Under this model, the cost of service is recovered over the life of the project. The departure from cost of service pricing has been chosen on the grounds that this would lead to excessively high prices, creating "rate shock" and imposing too high a burden on consumers in the early years. The consumption of power at that time would be about 40 percent of capacity and consumers would have to absorb the cost of all 100 percent of the power in a cost of service model.

Under the Bruce Power model, the shareholder, government, will subsidize the power in the early years and recover the subsidy in later years. They will forego a return in the early years and seek a higher return in later years. Effectively, the cycle

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of foregoing income in the early years and receiving it later is tantamount to a subsidy at the front end, offset by a surcharge at a later time. If it does not involve inter-generational transfers, one has to assume that the reduced rates in the early years are financed by taxpayer subsidies.

The bulk of expenditures under the interconnected options are being assessed outside of cost of service methodology, while the isolated island option is assessed through traditional cost of service rate-making. We ask is this a concern of the Board?

There has been discussion of the costs and prices of Muskrat Falls power. The pricing regime proposed is unusual and unclear to many. The result is that there is a lack of clarity on the issue which should be absolutely clear, and that is the cost of power produced from Muskrat Falls. The Board should consider asking Nalcor to prepare a document that clearly indicates; (a) the cost of power, and (b) the rates charged to customers for each year. This distinction between cost and price is important.

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The point we are making is that Nalcor has not been clear with regard to what is the cost of serving the energy requirements of the island. The energy is confusing. Compounding this is the fact that there appears to be subsidy in the early years when rates are set below cost of service. Any subsidy of this nature will have the effect of stimulating demand and will lead to a different load growth than is assumed in the isolated island option.

Finally, if indeed the Muskrat Falls generation is to be financed by equity, then the escalating supply price should reflect that. Specifically, the supply price should be determined by a 10 percent internal rate of return, which Nalcor states is the cost of equity rather than the 8.4 percent used by Nalcor. Doing so will result in a new price that reflects the cost of using taxpayers' money for equity financing. Nalcor should determine that price and adjust the CPW accordingly.

(10:30 a.m.)

Before giving our conclusions and

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recommendations, I want to make a few comments on the water management issue on the Churchill River. The optimization of energy production at Churchill Falls depends upon integrated management of the Churchill River. The evidence on hydrology is extensive, including CRE 28, Revision 1, but we've not found evidence relating to the Churchill Falls Power Contract itself. We understand that Hydro Quebec controls the flow of water under the 1969 contract and that they were not a party to the 2009 Churchill River Management Agreement. We refer, for example, to Article 4.2.1(ii) of the Power Contract which reads as follows, "Hydro Quebec may require deliveries which have the effect of varying the amount of water to be carried in storage at any time provided that in so doing sufficient water is left in storage so that minimum capacity", which is a defined term, "can always be maintained".

We have asked Nalcor to advise how it proposes to achieve water management to optimize Muskrat Falls production in the absence of a formal agreement with Hydro

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Quebec. We're not comforted by the response that the management agreement in place is the panacea. Nor are we comforted by the plethora of hydrological studies which make no reference to the control exercised by Hydro Quebec through the power contract. While the pattern of production at Churchill Falls may match well with the power demands for Muskrat Falls, the Province requires greater certainty with respect to the management of water. We are asking the Board to probe this issue in their examination of Nalcor Energy and MHI.

I now turn the presentation back to my colleague, Mr. Penney, for the conclusion of our conclusions and recommendations.

MR. PENNEY:

A. Thank you, David. Just to take a few minutes, we are confident that the Board will weigh the evidence laid before it and make appropriate recommendations to the benefit of all rate payers and the people of Newfoundland and Labrador. In particular, we commend to the Board a thorough review of the work of the Joint Federal Provincial Review Panel, which made a number of recommendations which we

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believe continue to be valid. While the Board has to make an uncomfortable choice between only two options, it is our hope that the issue of the right timing will be addressed.

We recommend that Government consider the following options. That they take short to medium term energy decisions which will allow us to complete our due diligence on Muskrat Falls. This means that we should commission one or more small energy projects to allow Government to assess other options, including accessing Churchill Falls power in 2041 or before, conversion of the Holyrood Plant to natural gas, purchase of power from suppliers outside the province, incentives to save electricity by installing other forms of space heating, such as heat pumps and use of time of day pricing, and commissioning Muskrat Falls at a later date. That the Government consider the use of the Lower Churchill Development Corporation as a model for developing Muskrat Falls in the interest of sharing risk with the Province. We recommend that the Board consider the following; that the Board take into evidence the report of the Joint Panel,

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that the Board take into evidence Mr. Vardy's Action Canada paper, that the Board accept the advice of the Joint Panel to adopt the principles of integrated resource planning, that the Board carefully examine the demographic profile in the province to question the assumptions with respect to new home construction up to 2067, that the Board also investigate the potential load tapering that may be associated with the growth of new technologies, such as heat pumps, which are more energy efficient, along with energy saving practices such as time of day pricing. We recommend that you review the high capital cost of the Holyrood plant associated with ESP and scrubbers, in view of the higher quality fuel now being used. We recommend that the Board accept the higher reliability standard for the transmission lines, particularly those in higher elevations and remote locations. Should the Board's report make recommendations on this matter of reliability, we urge the Board, and we ask the Government really, to give the Board the opportunity to review any further work which is done to improve

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reliability. In assessing the interconnected and isolated options, the Board should recognize the higher risk exposure and the potential threat to reliable service on the Avalon upon decommissioning of the Holyrood generating plant. That the Board review the proposed capital structure proposed by Nalcor. That the Board consider asking Nalcor to prepare a document that clearly indicates the cost of power and the rates changed to customers -

MR. VARDY:

A. Charged.

MR. PENNEY:

A. For each year and for each option. That the Board examine any constraints that may exist to water management on the Churchill River arising from the contract. We also recommend that you give consideration to the supply options based on Churchill Falls as committed in the Energy Plan. The Joint Panel also recommended that other supply options be considered, such as natural gas, along with conservation and demand side management. We support this recommendation. Finally, we

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recommend that the choice between the interconnected and the isolate option be qualified to allow for consideration of Muskrat Falls to proceed at a later time, allowing for fuller assessment of the options, including the greater and earlier access to Churchill Falls power.

Finally, we want to thank Nalcor for their professionalism and commitment throughout this process. I note that they reached out to Dave Vardy and I early on in the process and invited us in for a comprehensive briefing, and we appreciate that very much. They have supplied us and interested parties with considerable information with courtesy and integrity, and we thank them for that. We also wish to thank again the Board for the opportunity to make this presentation, and we wish you very well in your deliberations and you have a very important job to do. Thank you.

(10:45 a.m.)

CHAIRMAN:

Q. Mr. O'Reilly, I guess you want a few moments to contemplate.

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O'REILLY, Q.C.:

Q. Yes, that would be appreciated. I see we're quarter to, and the break, according to the timing and I appreciate that there is some elasticity in that, probably what we could do, I don't know if the panel members are going to hang around, probably we could have the break now a little early. Would that work - would that work?

CHAIRMAN:

Q. Sure.

O'REILLY, Q.C.:

Q. I don't know how we're going to deal with - some of the things there may be no questioning, but I'd like an opportunity of discussing the materials and - this is the first time we've seen it.

CHAIRMAN:

Q. Oh, yes, absolutely. Mr. Penney, and Mr. Vardy.

MR. VARDY:

A. By all means, no problem.

CHAIRMAN:

Q. You're ordered to stick around.

MR. VARDY:

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Q. We're going to be around here, and the other thing I should say to you is that a printed version of our remarks will be circulated, is available.

CHAIRMAN:

Q. So what we can do is break for - Madam Greene.

GREENE, Q.C.:

Q. Yes, I was going to comment on the schedule. As you know, the schedule for today was posted on the website on Friday. We do have some changes in the schedule. We are scheduled now for half hour break. The presenter for 12 o'clock unfortunately had a family emergency and has requested to be rescheduled. So the 12 o'clock presentation will not go ahead. We are trying to move up the other two that were slated for following that, so I wanted to point that out. The other thing is that we are working with the individual who needed to reschedule for 12, plus another party, and there may be additional presentations on Thursday. We will know that later today and we'll also post it on the website when it is finalized. So right now, Mr. Chair, if we could take the break -

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CHAIRMAN:

Q. And we'll reconvene at 11:15.

GREENE, Q.C.:

Q. Yes, thank you.

O'REILLY, Q.C.:

Q. That's fine.

CHAIRMAN:

Q. Okay, thank you.

(RECESS)

(11:25 a.m.)

CHAIRMAN:

Q. Make me look 15 years younger, will you?

GREENE, Q.C.:

Q. Only 15?

CHAIRMAN:

Q. That's how - that's how bad it is, right, I'm happy with 15. I believe, Mr. O'Reilly, we're ready, we're back to you, sir.

O'REILLY, Q.C.:

Q. Thank you, Mr. Chairman. We don't want to engage in a discussion on this with the panel. Nalcor thanks them for their presentation and the work they've obviously put into the materials and so on, but there are, however, a few things that I just - when the Board is considering the presentation that they make, there are a few things I would like to draw to the Board's attention with respect to what Nalcor has already filed. So you'll want to - as you work through their presentation, and of course the work that you're doing in this review process, and the first one deals with the - I've had a chance to look at the written presentation, page 10. I think this was Mr. Vardy's, when he says, "It is surprising", I'm just taking a section of it there, you get the drift of it, "In this context, it is surprising that Nalcor's planning does not rely upon Churchill Falls power in the years from 2041 to the end of the planning period in 2067", and then he refers to MHI-Nalcor 3, the question is posed as follows, "What consideration has been given to the excess power capacity that will become available associated with the termination of the Upper Churchill Falls Agreement in 2041", and then he quotes part of the answer, as follows, "There is inherent uncertainty around guaranteeing the availability of supply from Churchill Falls in 2041 because it is

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difficult to determine the environmental and policy frameworks that will be in place 30 plus years out". Can we just flip to MHI-Nalcor 31 - I'm sorry, 3. Go down to the bottom of the - line 17 and - page 3, is it? Page 3, yeah, okay. You'll see beginning at line 17, it says, "In comparison to the interconnected island scenario, the deferred interconnection is not economically justified as the CPW premium for deferral over the interconnected scenario, that is construction of Muskrat Falls Labrador-Island Transmission Link is 1.3 billion dollars". So there is - that has been factored in as part of it, so I'd just draw that to your attention, to the fullness of the response in Nalcor 3. So the entire response needs to be considered and read by the Board in its deliberations. The other question raised, and I don't - I think again Mr. Vardy probably, that Nalcor's position is that there is no - it is Nalcor's position that there is no inter-generational inequity in the recommendation being put forward, the position by Nalcor being put forward. I think Nalcor's position, to the

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contrary, the project benefits the future generations. The basis for this, we submit, is seen in the comparisons between the alternatives in RFI-KPL 27, Revision 1, and I think that was filed just recently and was discussed in the evidence, a very thorough discussion of that in the evidence last Wednesday, which the Board can find at pages 16 to 36 of the transcript of last Wednesday's proceedings. Of course, it stands with reason that the interconnected alternative leaves, of course, the future generations with a long term asset that the isolated island alternative will not. So I think that's something that we want to draw to the Board's attention as well.

GREENE, Q.C.:

Q. Excuse me, Mr. Chair. This morning, which gave me leeway to all of the parties, I would just like to point out that the last two points appeared to be more in the nature of submissions that would be addressed by Nalcor in their final argument, and I'm not sure - Mr. O'Reilly now introduces another element as to whether he wishes any other party to also

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address these issues from a legal argument perspective. There are no questions for the panel from Nalcor, but -

O'REILLY, Q.C.:

Q. That's what I told them, that's what I said to the panel, and I'm just drawing to the Board's attention for the fullness of the response that when they're saying that I want to get the full - when the Board is considering that, this will be part of the Board's consideration. It will be addressed as well in our response.

GREENE, Q.C.:

Q. And I certainly understand that, but I guess my question for the panel then would from a process perspective, if we are entertaining argument, legal argument, with respect to any issues at this time, they may wish the other counsel as well, but in my view, the last two comments by Nalcor have been more in the line of final legal argument or submissions, and I did not think that was the purpose of the process this morning.

O'REILLY, Q.C.:

Q. Right. Well, you know, I mean, a certain

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degree of leeway necessity has been built into this, and I think that it's fair, for example, if a presentation is made, as Mr. Vardy refers to MHI-Nalcor 3 and quotes from that, I think it's only reasonable that we should have the opportunity of showing to the Board that there is a full - you have to read the fullness of the RFI. If you're referring to a part of it, I think it's reasonable to invite the Board to consider reading the whole text of the thing to get the accuracy of it.

GREENE, Q.C.:

Q. And again I'm repeating myself, I am not taking exception or objection in any way whatsoever to Nalcor having that opportunity to point out additional issues or concerns that the panel should take into account when reviewing any presentation. My question goes as to the appropriate time to do that, and my understanding of the process today was the presenters would have the opportunity to make their presentation and to be asked questions by Nalcor. If you wish to go further and to point out additional considerations, that opportunity should be given to all of the

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counsel here. So I'm raising the issue of the appropriate process to be followed, given the time constraints that we have as well with the other presenters who are here waiting.

O'REILLY, Q.C.:

Q. Okay. Well, I take the objection - I think it is an objection. It is an objection, and if there's an objection to be taken to pointing out these two or three things that we wanted to draw to the Board's attention, I guess we'll have to abide by the ruling of the Chair on that and incorporate them in our final submission.

(11:30 a.m.)

CHAIRMAN:

Q. But you will not be precluded in making these comments in your final submission.

O'REILLY, Q.C.:

Q. Oh, no, I realize that, I realize that.

CHAIRMAN:

Q. Okay.

O'REILLY, Q.C.:

Q. I thought it would be -

CHAIRMAN:

Q. How much more have you got to ask, I mean,

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now?
O'REILLY, Q.C.:
Q. You know, just to point out to the Board that the presenters concerns with respect to water management are dealt with in Confidential Exhibit 26. That's another thing we just want to draw to the Board's attention, and that the issue of cost overrun for both expansion plans are contained in Exhibit 99. That's the only comments we really have to say. We will be responding, of course - not responding, but we will be making a detailed presentation and final submissions at the end of this when these points to the extent that they have to be also fortified and addressed will also be presented.
CHAIRMAN:
Q. So you don't - you have no further questions?
O'REILLY, Q.C.:
Q. I have no further questions of the panel. I said that at the beginning and thanked them for their presentation.
CHAIRMAN:
Q. I don't want anybody to feel that they're being procedurally shortchanged. I wouldn't

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be able to stand the criticism. Mr. Johnson, do you have any questions of Messrs Penney or Vardy?
MR. JOHNSON:
Q. No. I just wish to thank them for their presentation, but I don't have any specific questions to ask of these gentlemen.
CHAIRMAN:
Q. Does our -
GREENE, Q.C.:
Q. No, Mr. Chair, no, thank you.
CHAIRMAN:
Q. Just one question. I don't know if you guys can shed any light on it, but heat pumps, they're supposed to be quite energy efficient. Is that your understanding?
MR. VARDY:
A. I can speak with some - not authority, but with some casual knowledge of this because I have a son who has a heat pump, and I'm not selling heat pumps, but I know he's saving a lot of money, and I think that there's - my sense is that the Newfoundland construction industry is so overheated today that people are building houses just replicating existing

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houses, they're not being very innovative, looking at and doing things differently. I think there's a need for education, more education, so that the consumers are aware of other possibilities. Instead of installing electric heat, they should be aware of what the possibilities are, and I think that there various different kinds of heat pumps, but my understanding is you can save considerable amounts of money, economically it's a good investment, but people that are investing in homes are having a difficulty in getting the downpayment and so anything that adds to their capital cost is a deterrent. So it might be a good long term investment, but they can't afford to make that long term investment because they can't afford the downpayment, and I think it's as simple as that. Do I know anything about the technical aspects of heat pumps; not really.
CHAIRMAN:
Q. There's a - I read, like, it's called Jevons Paradox. Did you ever hear of that?
MR. VARDY:
A. No.

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CHAIRMAN:
Q. He was the first energy economist and he pointed out that increasing energy efficiency doesn't necessarily lead to less consumption. So is your son's electrical bill dropped because he's using a heat pump, or has he bought two more TVs?
MR. VARDY:
A. No, he's - it's simply because he doesn't have to pay as much for heating his home.
CHAIRMAN:
Q. Okay, because that's usually what - I've read it happens, people save on one aspect of their energy consumption to efficiency, but they consume it by adding more gadgets to the household lineup.
MR. VARDY:
A. That's what economists call elastic demand.
CHAIRMAN:
Q. Elastic demand, yeah.
MR. VARDY:
A. The price goes down, consume more.
CHAIRMAN:
Q. The only other question I had or comment was on the demographics. I mean, people say

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demography is destiny, and we're only out to what, 2025 there with the -

MR. VARDY:

A. 2029, I think it is.

CHAIRMAN:

Q. 2029, was it? Do you know what the - what the replacement population ratio is for Newfoundland?

MR. VARDY:

A. I presume it's the same as anywhere else.

CHAIRMAN:

Q. Well, it varies see.

MR. VARDY:

A. 2.1, I think is the -

CHAIRMAN:

Q. 2.1 is the - what you need to keep the show on the road, right?

MR. VARDY:

A. Yeah, exactly.

CHAIRMAN:

Q. But are we below that?

MR. VARDY:

A. We're well below that. I can't give you the number, but we're -

CHAIRMAN:

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Q. Well below.

MR. VARDY:

A. We're well below that, yeah.

CHAIRMAN:

Q. And that's - I mean, that's very difficult to change. I mean, that's a long - once you're on that track, it's difficult to - you know, if you look at it like Japan, I mean, Japan is finished, you know.

MR. VARDY:

A. It's a lifestyle issue, I guess, but, I mean, if you believe that the current boom - oil and gas boom is going to continue into the future, it'll attract more people in here over the long run. So it's very difficult to do these long term demographic projections. All the projections I've seen done by the Newfoundland Statistical Agency, or the Newfoundland and Labrador Statistical Agency, are virtually level. They're just small changes, and do I believe that; I'm not so sure if I believe that our population is going to be - my sense is that our population is going to go down or it's going to go up significantly because of what's happening in the St. John's region, or

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the Avalon Peninsula area, but obviously the statisticians are very cautious about anything that's going to happen, and I think that, you know, as - and this is the driving force, you know, the biggest factor here when you look at all the sensitivity analysis is load growth, and clearly the number of people in our province is a key factor, and do we believe our population is going to continue to be level or - because if it does, then we will become increasingly less important in this country because the national growth rate is higher, we're becoming an increasingly smaller part of Canada, but in any event, nobody seems to know. We need to do more research on our demography and what are the factors that are going to grow our economy. There were some people, of course, years ago, Parsible Copes (phonetic), who felt we'd all be better off if we had half the number of people that we have now, and even though Parsible Copes was a mentor of mine, I don't particularly subscribe to that point of view.

CHAIRMAN:

Q. He didn't have a happy end here, did he?

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MR. VARDY:

A. He didn't.

CHAIRMAN:

Q. Like, the other thing I find with forecasting generally, I mean, aside from something like demographics because that's like - it's kind of fixed, I mean, your population ratio is difficult to move. It's kind of like building a hydro project, once you got it built, you have certitude, and I think there's a lot of certitude in the demographic reality, but with respect to other forecasting, I mean, it's very difficult to get beyond five or six years in terms of economic forecasting. Would you agree with that or -

MR. VARDY:

A. Absolutely. I mean, the thing about it is anybody who can forecast the price of oil in a years time will make a million dollars, an enormous amount of money because forecasting is an extremely difficult thing to do, and demographic forecasting is probably less difficult because people's patterns change very slowly, people procreation patterns change very slowly, but, of course, some of

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these factors are very volatile. I would say demography is less volatile obviously than oil prices. It's probably one of the most stable factors in our society is our demography, and it hasn't changed an awful lot. It's interesting how, as Mr. Bennett points out, you know, that even after the moratorium, the consumption of electricity didn't go down, but that's partly because of the fact that a lot of people maintained their homes in rural Newfoundland. They go off to Alberta, but they're continuing to heat that home because they know that if they leave that home, if the power is disconnected, they're going to have to get it reinspected and it might not pass inspection, so they keep the power on. So the result of that is you got a lot of homes in rural Newfoundland that are heated, the lights are kept on, but the people are somewhere else. How long is that going to continue? It's very difficult to predict.

CHAIRMAN:

Q. The only other comment I'll have is hind-casting, I would like to be able to take all these economic forecasts and put a model and

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run them backwards to see if they could predict what actually happened. I know in climate change, the models that the IPPC are using, they couldn't predict temperatures that actually happened, so, I mean, what reliability can you have on them for the future. I don't know if that's true generally with economic studies or not, but - anyway.

MR. VARDY:

A. Don't know.

CHAIRMAN:

Q. Thank you very much then.

MR. VARDY:

A. Thank you.

CHAIRMAN:

Q. Now who is next?

GREENE, Q.C.:

Q. Mr. Chair, with respect to the schedule, the next presenter is Ms. Walzthoni, who is here this morning. Our presentation at 12 o'clock has had to be rescheduled, but Mr. Winsor, our 12:30 presenter, is available and will come on directly after Ms. Walzthoni. So we will just carry on.

CHAIRMAN:

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Q. Okay, sure. Good morning.

MS. WALZTHONI:

A. Thank you very much for your time and letting me present. I'll be very brief.

CHAIRMAN:

Q. Probably you could officially identify yourself for the record.

MS. WALZTHONI:

A. My name is Tracy Walzthoni, and I live in about a two kilometre radius from the Holyrood Thermal Generating Station. I also have been sitting on the Community Liaison Committee with the station for a number of years.

I don't have a lot of technical stuff. I'm just presenting as a consumer and as someone who lives next to the station. I've lived in the house there since 1990. I have a beautiful piece of property there, and as a child, my parents had a cabin there. So from 1970 on spent a lot of time there. There's been a lot of changes, and I'll give credit where it's due, I have seen a lot of changes for the better in living next to the plant.

I can remember when I was younger and when the generators would cut in, there would

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be a problem, you know, the whole cabin would actually shake, and there was a lot of pollution that came out and you saw it a lot more than you do today. Sitting on the Community Liaison Committee, I see a lot, I guess - I saw Hydro and the station as the enemy when lived there - when I started living there because of all the pollution that was coming out, there's no - there's no pollution capture equipment at all, but what I've seen is that they're willing to work with the community and hear our concerns and try and make changes to make things better.

There shouldn't be any doubt that living there has had an impact on my life. I have a beautiful view of CBS, I have two huge trees on this side, so the view of the plant is usually blocked. I'm on higher ground and I sit probably about the same level as the base of the stacks. So in the summer, I experience at least six weeks usually of quiet emission free enjoyment of where I live. It's been considerably longer in recent years due to the loss of Stephenville and Grand Falls, and those major industrial consumers, and I guess

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there's more effective management of the hydro power that's on the island too, which is making a difference.

(11:45 a.m.)

So ever since we purchased our permanent residence there, I certainly longed for the day when I wouldn't have to look at the smoke coming out of the stacks any more. So I have lobbied Government in the past to make improvements and choose greener alternatives that might eventually eliminate the plant. I've also gained a greater understanding of what that means, like, with regards to wind power, it's not there on demand, it's not something that can be totally relied upon as reliable power source, and I understand that a lot better now than I did at the time.

When the plant is operating, it's a nuisance. I've often questioned the possible effects it could have on my family's health. I've done a little bit of research on the effects of sulphur dioxide emissions and other chemicals that are emitted totally unfiltered from the stacks. So there's nothing really healthy that comes out of the stacks. There's

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been studies on sulphur dioxide in, like, St. John, New Brunswick, and Sudbury, done by Health Canada and it's been correlated to decreased lung function and especially have greater impacts on certain people who are more sensitive with regards to asthma and other breathing difficulties.

I've also read some of the material safety data sheets on some of the other chemical emissions like vanadium pentoxide and it's kind of scary when you look at those things and know that they're coming out. So some examples of negative experiences, the aesthetics - like, in the summertime, as I drive in on the by-pass road, I see the large pink clouds, they float out from the stack and they go all the way across Bell Island. So it creates some stress. On windy days in the winter when all three units are operating, I have experienced - like, if the wind is blowing it down on us and where we're up high, an acidic taste in my mouth and coughing spurts, and things like that where you would go in, or I would turn off my air exchanger. So there's also been some property damage as a

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result of some soot excursions in the past. Thankfully that hasn't been an issue in the last couple of years, but it was always alarming, you know, to come out in the morning and see little pieces of ash all over your vehicle and, you know, wonder - it would actually create some pitting in the paint, so you wonder, okay, if it's doing that to the paint of the car, what is it doing to me and my family.

There's noise pollution. Sometimes when there's problems and things have to kick in quickly, it's quite loud. It's not like when I was a child and everything shakes, but it's still very alarming if that kind of thing happens at 2 o'clock in the morning.

I've also noticed when fuel delivery happens - I didn't quite correlate it with what was happening, but I did call a couple of times and express that there was this really acidic odour. So what I discovered was that it's from when they get fuel delivered and it's the venting of the fuel tanks, and that lasts a long time, however long the refuelling - like, sometimes it's been an entire day.

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So the impacts to me, I guess, and I think it's a cost, I guess, is stress, curtailing outdoor activities, as I said turning off my air exchanger, having to wash vehicles, and in some cases siding, being startled by the sudden loud noises. So those costs of creating stress for people in the area and the possible sulphur dioxide emissions harming people, like, for me, I guess, I get most of the nuisance because I'm so close, so I actually see the big pieces falling down, but the very fine particulate matter that floats down CBS, you know, it impacts a lot of people and I don't think they see it. It's not in their backyard, so they don't even think about it. I think if it was sitting in the middle of St. John's, there would have been something more done a long, long time ago.

So the reason I'm here basically is I'm willing to pay whatever cost - if my electricity bill increases. I've seen it increase anyway because of the price of oil, but I believe, I guess, that it's a greener option to develop Muskrat Falls, it's a vision

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for the future, it'll make us less dependant on oil, and I think for a long term solution, whatever it costs, I think it'll most certainly be worth it.

That's really all I have to say.

CHAIRMAN:

Q. Thank you. Does anybody have any questions?

MR. JOHNSON:

Q. No questions, Mr. Chair.

CHAIRMAN:

Q. Thank you.

MS. WALZTHONI:

A. Thank you very much.

GREENE, Q.C.:

Q. Mr. Chair, the next presenter is Mr. Fred Winsor.

MR. WINSOR:

A. My name is Fred Winsor. I am the Conservation Chair with the Atlantic Canada Chapter of Sierra Club Canada. The Sierra Club Canada, or the Sierra Club, generally is the oldest environmental non-governmental organization in North America. It was founded in 1894 by John Muir out in San Francisco. The club itself has some very basic objectives and principles;

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the main one being habitat protection. We are essentially - that's generally our major focus, and in the last 15 to 20 years with the rising awareness of greenhouse gas emissions and climate change and global warming, our main goal is to reduce greenhouse gas emissions. That's the one thing that we focus on above everything else. So for us in Newfoundland, reducing greenhouse gases, what we have found out nationally and internationally it's primarily a local issue, reducing greenhouse gases, and an example of that is in North America in the past 10 years, 40 of the largest cities in North America have all met and surpassed their KYOTO targets of reducing greenhouse gases, and they've done it all locally in the cities mainly by public transit, coming up with all kinds of energy efficiency, doing all kinds of things to reduce greenhouse gas emissions. So it's something that never came out in all these discussions of Durban (phonetic) of saying how North America was going in one direction. It's not the - the municipalities have actually gone in the opposite direction. They

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have actually reduced greenhouse gases.

So in terms of here in Newfoundland, we have two major goals. One is to close down Holyrood because of the greenhouse gas emissions coming out of there, and Holyrood produces between 800,000 and 1.2 million tons of greenhouse gases annually, and it's done that for the last 30 years. One of the by-products of greenhouse gas emissions that we've discovered over the last 15 years with research is the presence of ocean acidification. That greenhouse gases when they're emitted, when they come back, they get absorbed by the ocean, so this warms up the ocean, but the other thing it does is it forms carbonic acid, and carbonic acid finds its way into eroding the shells of crab and lobster, shell fish. This is well documented and it's a major international crisis, but for here we see Newfoundland being such a rich - such rich fishery and potential for rich fishery when it recovers, and it will recover, that we need to get a handle on reducing greenhouse gas emissions particularly for our ocean environment. This is just a little background

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on the activities of the Sierra Club. Regarding Muskrat Falls, or the two options I should say, the Sierra Club itself has been opposed to large hydro developments for, I would say it's about 75 years now. In the United States, there is an ongoing program to decommission hydro dams and it's mainly associated with the huge amounts of habitat destruction that they've witnessed there from constructing hydro dams. In the past 100 years, there's been over 1,000 dams decommissioned in the United States. So the Americans do not consider -- most American governments do not consider hydroelectric electricity as green energy and I think that's a point that we need to make. It's -- they don't consider it that. They don't consider it in New York for sure, and California for sure, and lots of other States. So it's a -- for them, it has major destruction of habitat and they've got lots and lots of evidence to support it. So on that point alone, we're opposed to Muskrat Falls.

Regarding keeping Holyrood open to 2067, again the greenhouse gas emission is again --

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it's totally unacceptable for us. I know myself before I was associated with Sierra Club, we had numerous committees trying to do something about reducing emissions coming out of Holyrood aside from greenhouse gases, sulphuric acid, the mercury and cadmium, heavy metals, that sort of thing, and I mean, it's -- you're up against a stone wall, I mean, really, but the greenhouse gas emission thing is the biggest and that really has -- and none of that will be solved with any kind of filters or whatever at Holyrood and it will not be solved with natural gas either because natural gas produces 50 percent of the greenhouse gases that oil produces. So instead of 800,000 to 1.2 million tons of greenhouse gases, we'd be looking at between 400 to 600,000 tons annually and so, that's not really -- that's not a green solution.

(12:00 p.m.)

So with those situations, I mean, we're -- you know, but we're not trying to be -- but our presentation today is not meant to be negative. We've come here with options and I think we need to be looking at options and

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that's one of the problems that we see with the current process that you've been asked to deal with is that you're given two options that we would consider to be -- neither one of them are really very good, but are there other options out there? We think there are lots of other options out there and lots of very good and proven ones and so that's what we'd -- we'd like to send the message that we'd like to see those options examined. I mean, you know, discounting of the relevant factors, such as energy efficiency, environmental concerns, off peak rates, demand side management, other energy products and options, I mean, I think on the government side, not only your side, because you're just implementing what they're asking you to do, but I think it reflects very poor judgment and an absence of essential critical thinking needed to properly assess our future energy needs and that's a -- I mean, globally these days, energy production is -- well, they're having a renaissance. That's the only way I can describe it. The changes in the technology, the changes in methods of

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production, the decentralization of electricity production, it's quite astounding actually. I mean, myself being somewhat associated with it, because over the years I've had to write a number of papers on energy policy, it's quite amazing the breakthroughs in technology, again stemming originally coming out of Germany, but it really has gone quite global. I suppose in the computer world they call it viral, but anyway.

But locally, you know, in Newfoundland, individuals, municipalities, community organizations and businesses have all expressed interest in becoming involved in electricity production. We've had -- just this weekend I was reading in the paper, they're looking for somebody -- looking at proposals for biogas, you know, from farmers. And farmers, I should say, really have been some of the leaders worldwide in terms of small scale energy production. They have been just huge leaders of it in an awful lot of countries, just little aside.

But we need to look at other models. That's our position is we need to look at

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other models of energy production. We have some -- well, we're not allowed to talk about wind power, but we'll mention it. We have incredible wind energy in Newfoundland, even blows -- I hate to use that analogy, but it's quite startling the amount of wind energy that we have here compared to other parts of North America, compared to other parts of the world for that matter. But there's just a report came out, I only got to see it on the weekend, done here locally by four engineers at the Engineering school, where they identified that the wind energy capacity in Newfoundland is over 100 times the energy consumed, the electricity consumed in Newfoundland in 2006, 100 times. I mean this is a major, major energy source that should not be ignored in these kind of deliberations.

When we're talking about spending 4.4 billion dollars, I think we should be starting to have some serious looks at other options, and other options that are -- I mean, I know this is a political decision by Provincial Government, and we've written the Provincial Government asking for them to look at these

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things, but nobody seems to -- it seems to be the elephant in the room that nobody wants to talk about. But it's the -- the evidence is just -- you know, it's a kind of energy production that should be supported because it's benign. It has -- you know, it doesn't have any greenhouse gas emissions. It doesn't have any stacks and it doesn't need a fuel source. I mean, all you're doing is putting up turbines. The fuel is blowing by all the time. As far as -- you know, I know that oftentimes I hear engineers with hydro projects complaining "oh, we'll have to spill water if we go to wind energy or any other energy source." Well, we spill wind every day. Every single day, we're spilling all kinds of wind. So it's not a -- as far as the energy source is concerned, you have to think a little bit different about it, but it's there and I mean, we're sitting right in the middle of it. It's quite remarkable.

But the other effect that going this direction, in terms of an industrial development model, is that you're building an industry, not a mega project, and you know,

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and from the research that we've done, where you're into building an industry of various kinds of renewable energies, that has a much greater multiplier effect on the economy and it's a longer lasting one. Mega project, you have work for four or five years and then basically it's -- everything is shut down and then after that, it's shut down and you just got a few people running it. Whereas if you've got small green renewable projects dispersed all around the place, it creates long term employment. So I think that's something that needs to be considered.

And of course, with any of these energy projects, these small scale energy projects, the tipping factor has always been the ability to sell the surplus on the grid. That is the key and this is something that, again, you know, could be a very good -- we can see it's a very positive alternative to Holyrood and it can happen here. We don't need to build a transmission line. We can do the -- we can build the capacity here and we'll get away from all of that large scale getting here, so it's tied up into a large project which may or

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may not be viable or feasible, depending on all kinds of other factors. This way you can just build it slowly, expand it slowly.

As far as dispatchable power, we have lots of hydro power on the island that we can use as dispatchable power, but you have to have a significant amount of alternate sources of power. I heard somebody talking earlier about geothermal. Yes, geothermal works very well in Newfoundland and it's something that should be considered. Energy efficiency has been completely neglected in the province from what we can see. It's given a little bit of lip service, but really there hasn't -- we haven't really gotten into serious energy efficiency. I don't think we have any kind of even idea of how many buildings have been retrofitted. You know, that's another thing. We're not looking at it as a -- because you can save an incredible amount of electricity from energy efficiency programs, but that's not -- we're not in that ballgame at all here, not that I've -

And the other thing about small scale energy production is that if you have a set

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price for your product and if you have access to the electricity grid, guaranteed access, financing can be private and is often private in most other jurisdictions. So, you know, this is a -- so we're not again depending on governments to finance or subsidize these sorts of things.

And the other thing is who should benefit from all this electricity production? Who are going to be the beneficiaries? Who should profit from it? Should it be the shareholders of Emera? Should it be Nalcor? Well, Nalcor is going to make money on it anyway because they're going to be operating the electricity grid. So they can't lose. Should it be the Provincial Government? Well, the Provincial Government, if we -- you know, they could possibly get something out of it, some tax money. Or should it be the citizens of the Province who can generate electricity and sell it locally and we can have a different model of development? That's how we see it, that we can do -- there are other models out there and then we should be looking at really other kinds of energy to the table. Thank you.

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CHAIRMAN:
Q. Do you have any questions, sir?
O'REILLY, Q.C.:
Q. We don't have any questions.
MR. JOHNSON:
Q. No, Mr. Chairman.
O'REILLY, Q.C.:
Q. No, we don't have any questions.
GREENE, Q.C.:
Q. No, no questions, Mr. Chair.
COMMISSIONER NEWMAN:
Q. No questions.
CHAIRMAN:
Q. Are you aware of -- when you say wind is benign and green, are you aware of the energy content that's involved in making wind turbines? The consumption of steel, the consumption of concrete. You're talking about habitat destruction. Are you aware of the content of the hardware earth elements that go into making a wind turbine?
MR. WINSOR:
A. Yes.
CHAIRMAN:
Q. And you still maintain it's green?

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MR. WINSOR:
A. Compared to the other options, yeah.
CHAIRMAN:
Q. I'd like to see your study that shows that.
MR. WINSOR:
A. I mean, well -- I mean, it's one of a number of other products. I mean, you don't have -- just well, a couple of things. Once it's built, it's there. Usually steel is not the -- - they're going more to fibreglass these days than steel.
CHAIRMAN:
Q. It doesn't matter what you use. What I'm saying is that anybody who makes the claim that wind is a green source of energy, you got to start with the basics. We had the same -- I had the same discussion with Mr. Bennett. When they did their GHG calculations, they took into account the construction of Muskrat Falls and if you're going to talk about wind, you've got to look at the fact that these -- whether they're made from fibreglass or steel or whatever, you've got to start from the beginning and look at the energy content that is used in the manufacturing.

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MR. WINSOR:
A. Okay. Yeah, okay.
CHAIRMAN:
Q. And with respect to concrete, concrete is highly energy -- high consumer of energy. So to make the claim that somehow wind is green is simply economically not true. I can document that.
MR. WINSOR:
A. Well once -- so you're talking about in terms of the actual technology itself, just building the infrastructure?
CHAIRMAN:
Q. I'm starting from point A.
MR. WINSOR:
A. Okay. So you -
CHAIRMAN:
Q. Right through. You build the thing, you put it up and you start operating it. Once it's operating, well, maybe it's -
MR. WINSOR:
A. Well then, yeah, once it's operating, the fuel is free.
CHAIRMAN:
Q. Are you aware of the -- like in jurisdictions

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that got a lot of wind, are you aware of what the kilowatt -- what the cost of electricity is? Do you know -- like Denmark for instance got I think the highest wind penetration per capita in the world. They're paying 30 cents a kilowatt hour.
MR. WINSOR:
A. Right.
CHAIRMAN:
Q. For their energy.
MR. WINSOR:
A. That's right. And then as that fixed cost becomes paid off, the price of their energy will drop.
CHAIRMAN:
Q. Well, you better -- again, I can -
MR. WINSOR:
A. The other thing that's happening is that the cost of wind turbines is also dropping. You can buy a one megawatt wind turbine now for 1.3 million euros and that's down from about four or five million euros a few years ago. Same is true with solar panels. Solar panels, their prices are dropping quite rapidly.
CHAIRMAN:

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Q. The Energy Information Agency says the cost of wind energy is rising; the cost of solar energy is rising. I mean, I make my -- I don't want to take up a lot of time here, but I mean, much of what you've said about alternative energy does not stand the test of economics because all these alternative energy sources are -- they don't have any density and that's the problem you got with wind. It doesn't -- it's not dense. It can't provide much energy for the inputs that go into it. Whether it's biomass, biogas, ethanol, wind, it's not energy efficient, aside from the fact that wind is not power. How is wind power? In what sense is wind power? Wind is energy but in what sense is it power? What do you mean by -- when I use the term power, I mean, I turn the switch on, it's the electric switch, the electricity is there. I can raise it up and down.

MR. WINSOR:

A. Well, you have to convert it to electricity, yes.

CHAIRMAN:

Q. But it's never there when you want it. You

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can't rely on it. Would you like to run your pacemaker on wind energy?

MR. WINSOR:

A. You run it with a -- you have a mix of energy sources and many people are operating quite well these days with this mix of energy sources.

CHAIRMAN:

Q. Anyway, I was just told to be -- not argue with presenters. Thank you. But I really think that the Sierra Club, on a lot of these issues, I mean, it just hasn't done the basic research to make their claims. I mean, on ocean acidification, I mean, that simply, from what I've read, is not true. But anyway, I'd like to see your study on that matter.

(12:15 p.m.)

MR. WINSOR:

A. I can provide you with all kinds of peer review studies on that.

CHAIRMAN:

Q. Sure.

MR. WINSOR:

A. That's not a question of that whatsoever. But the other side of it is there is a lot of junk

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science out there kicking around, trying to deflect what's happens, what's actually happening elsewhere and there's no doubt about that.

CHAIRMAN:

Q. I've looked at wind in Germany, in France, in Denmark, in England, and I can't see where you can run a modern energy system with any kind of a major component of wind energy. It is simply economically, and in terms of energy security and grid stability, impossible. But anyway, I guess it is debate that should be had. I mean, I do agree with you on one point, that these issues have never been properly debated and I think it's time for a debate. I don't guess I'm going to be involved in it, but it's something that should be debated. What is green and what is not?

MR. WINSOR:

A. Well, maybe if we can round up enough money, we'll be able to bring in Paul Gipe from California, who is the world wind energy expert and he could talk to you seriously about the subject.

CHAIRMAN:

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Q. And are you aware of what's happening in California with energy?

MR. WINSOR:

A. Well, California hasn't bought into -

CHAIRMAN:

Q. Anyway.

MR. WINSOR:

A. We're not going to get into that one.

CHAIRMAN:

Q. No.

MR. WINSOR:

A. Except that California hasn't bought into feed in tariff legislation yet.

CHAIRMAN:

Q. No, and -- well, that's the only right decision they've made probably with respect to energy supply.

MR. WINSOR:

A. That's your opinion, sir.

CHAIRMAN:

Q. It is. Anyway, thank you.

MR. WINSOR:

A. Thank you.

GREENE, Q.C.:

Q. Thank you, Mr. Winsor. Just for the record,

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for clarity around the terms of reference, the Terms of Reference presented to the Board relate to the two identified options and as noted -- stated in the notice, the public notice for this hearing, other supply options are not part of the mandate before the Board. So while there well may be discussions around wind and its potential in Newfoundland, it is not part of the mandate and I just wanted to ensure that that was clearly understood by everybody who's watching and listening.

CHAIRMAN:

Q. Okay. I'm chastened.

GREENE, Q.C.:

Q. Definitely didn't mean to do that, Mr. Chair, but just wanted to -- I would never do that to the Chair, but for the people who are watching this on the webcast as well, the Terms of Reference, as we have posted on the website and as pointed out in the notice, give very specific terms and one of them is that other sources of supply are not to be considered within the Terms of Reference, only the two options as outlined in the Terms of Reference and I just wanted to clarify that.

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CHAIRMAN:

Q. I think next is Mr. Carter. Is that correct?

GREENE, Q.C.:

Q. Yes, Mr. Chair.

CHAIRMAN:

Q. Mr. Carter, sir.

MR. CARTER:

A. Thank you, Mr. Chairman. I appreciate that predictions are very difficult, especially about the future. If the Nalcor people were all astrologers, I would treat them with scorn, but if they believe in this global warming and hazards of carbon dioxide, I'll merely treat them with pity.

Fork over six billion dollars or the lights will go out. That seems to be the message that it sends. That's the kind of language blackmailers use.

Has to do with closing down Holyrood Thermal Generating Station. While it's true that that facility is past its best before date, the problem is that people who believe in carbon dioxide poisoning, I think are so far out to lunch that it's not worth much more comment. Carbon dioxide is an essential

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ingredient for plant life. It has nothing to do with global warming. Somehow the environmentalists are persuading us that it must be limited.

Water vapour is a far more effective heat trapping agent and without it, the temperature of the earth would be below freezing. But the environmentalists seem to have carried the day. It's distressing that some of the proponents of Muskrat Falls Project have been sucked in. Among them are graduates with more degrees than a thermometer. Lower orders must not dare to disagree.

The problem I have is that if they're wrong about the danger of carbon dioxide, they could well be wrong about other things. So we can't believe anything they say, you know. If you tell me it's raining, I'm going to have to check it out. It's too bad, but I just don't agree with you.

The big problem I have is with the transmission line. Sure, I think Muskrat Falls could be -- a generating station could be built there with very little difficulty, some expense, of course, but bringing that

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power to -- well, where do you bring it to? Holyrood, I suppose, where there's a proper distribution centre. Anyone -- now, I'm nearly 80 and I've seen a lot of bad weather in my time, including the sleet storm of '58 when the power was out for some weeks, and my mother was born in Tilt Cove, mining town there, and lived there until she was a teenager and she said that three-day storms were not at all unusual, and can you imagine trying to send out repair crew in weather like that? It's just not feasible.

Now it's tragic, but this is the 100th anniversary of the Titanic disaster and if that iceberg had come down the Straits, it would have carried all before it, you know. So I can't see that you can reliably get power across the Straits, and once you do, if you do, then you've got to bring it down the Great Northern Peninsula, either on the west side in which case it would face the hazard of salt spray, or if you bring it down the east side, you've got storms, and of course, got storms in both areas.

And you know, I don't feel very happy

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about having my source of power so remote from me. I don't think it's reliable and I have the experience to evaluate that. So I'm not satisfied to be dependent on such a distant source of power and I'm not alone. You know, the power has to traverse the Straits of Belle Isle, known as iceberg alley, and undersea cable and down the Great -- it's just too much to -- can you imagine a repair crew trying to repair a downed line in such conditions? So much for the security of supply.

We have an effective distribution system in place. Why jeopardize this? Why can't -- if Holyrood is past its best before date, let's put in another unit in there. You know, you just slip in another. The cost could be great. It could be a billion dollars, but you're not paying for any transmission line and the transmission line, I think, you've already admitted that it's two billion dollars. You'd buy an awful lot of oil with two billion dollars, an awful lot, and we heard in a previous presentation that fracked oil, or whatever they call it, is going to be much cheaper. So, I think we should, if

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nothing else, hold off on developing Muskrat Falls for these very reasons.

I don't know whether the public have cottoned on to the fact that the six billion dollars is not a grant, but it's something that we have to go out and -- it's a loan and we have to pay interest on it and the interest on six billion dollars, I haven't done the math carefully, but it's something like 400 million a year, something like that, certainly nothing less. And that will -- you know, that's going to use up all our oil money, be impoverished.

Now it's also impossible to get inside the minds of the Nalcor people, but I would suggest, and I'm tempted to think, that being in charge of a six million dollar -- six billion dollar project is inclined to puff out of your chest and make you feel very important, and it's not six million, but six billion, six thousand million, six thousand million. Where have we heard that kind of talk before?

So, I think we can fall back on Shakespeare. He said it best "better to bear

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the ills we have than fly to others that we know not of." So there's my -- those are my thoughts and whereas you might want to develop Muskrat Falls, I'd say wait. Wait and try the other option by renovating Holyrood. And as for the danger of greenhouse gas, that's just so much rubbish and anyone who suggests that needs to have their head examined, as far as I'm concerned. So there it is. Any questions?

CHAIRMAN:

Q. Thank you, sir. Anybody have any questions of Mr. Carter on this?

MR. JOHNSON:

Q. I have no questions for Mr. Carter, thank You.

CHAIRMAN:

Q. Thank you, sir.

O'REILLY, Q.C.:

Q. Mr. Chairman, if I just might make one comment and that's all, and it's really directed a bit to the tone of the presentation. You know, this is supposed to be a respectful process and has been and will continue to be, I'm sure, under the watchful guidance of the Commission and its counsel, but I think I

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would be remiss if I didn't take exception on behalf of my client to the use of innuendo contained in the first sentence, and I think that if this process is going to work, with all the lumps and bumps that we've accredited to it, being respectful of one another's views I think is an important aspect of getting to the truth of the matter. So that's the only thing I do want to say.

MR. CARTER:

A. Well, if you're going to tell me that the moon is made of green cheese, I'm going to show pity and I'm going to disagree. The fact that somehow it's gotten into some people's heads that greenhouse gases, carbon dioxide, is a danger, I say to you that every day you're pumping out two kilograms of carbon dioxide yourself. So if you want to stop the production of carbon dioxide, my suggestion to you is that you stop breathing.

O'REILLY, Q.C.:

Q. Good advice.

CHAIRMAN:

Q. We take your point, sir, and we take Mr. O'Reilly's point too as well.

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MR. CARTER:
A. I don't mean to be insulting, but I'm being insulted by this greenhouse gas nonsense.
CHAIRMAN:
Q. Thank you, sir. What's next, Madame?
GREENE, Q.C.:
Q. In terms of the schedule, Mr. Chair, we are actually finished for today, in terms of the presenters.
CHAIRMAN:
Q. Okay.
GREENE, Q.C.:
Q. We do have a change in the schedule for tomorrow. The revised schedule will be posted on the Board's website. Unfortunately, Ms. Yvonne Jones who was scheduled to start the presentations tomorrow is weatherbound in Labrador and cannot make it for early tomorrow morning. But hopefully will be in and will be joining us in the afternoon. So tomorrow, we will begin the day at ten a.m. with a presentation by Mr. Dumaresque. The presentation by Ms. Jones has been moved to after the break in the afternoon, so it will be two p.m. for Ms. Jones tomorrow afternoon.

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The other presentations are as on the original schedule, but a revised schedule will be posted. So we start tomorrow morning at ten a.m. with a presentation by Mr. Dumaresque, followed by one from NOIA at 10:30 and then two individual members of the public at 11:30 and 12 -- actually three members of the public, another at 12:30, and then Ms. Jones at 2:00 in the afternoon for tomorrow.
There's still some uncertainty as to whether we will need to have a scheduled time for Thursday and we are working coordinating with those individuals to try to finalize that this afternoon.
CHAIRMAN:
Q. So if that is satisfactory, we'll adjourn until 10:00 tomorrow morning. Thank you.

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CERTIFICATE

I, Judy Moss, do hereby certify that the foregoing is a true and correct transcript of a hearing of the Muskrat Falls Review, heard before the Board of Commissioners of Public Utilities on the 20th day of February, A.D., 2012, in St. John's, Newfoundland and Labrador and was transcribed by me to the best of my ability by means of a sound apparatus.
Dated at St. John's, NL this
20th day of February, 2012
Judy Moss
Discoveries Unlimited Inc.

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