MANITOBA PUBLIC UTILITIES BOARD

re:

MANITOBA HYDRO

2023/24 and 2024/25

GENERAL RATE APPLICATION

Hearing

Before Board Panel:

Robert Gabor, KC - Board Chairperson

Marilyn Kapitany - Board Vice Chair

Carol Bellringer - Board Member

Hamath Sy - Board Member

George Bass, KC - Board Member

HELD AT:

Public Utilities Board

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Winnipeg, Manitoba

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Pages 686 to 886

APPEARANCES

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Sven Hombach	)
Brent Czarnecki	)Manitoba Hydro
Odette Fernandes	)
Deanna Hiebert	)
Byron Williams	)Consumers Coalition
Chris Klassen	)
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Emily Guglielmin	)Manitoba Chiefs
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William Haight (Np)	) Daymark Energy
Bradley McClelland	) Advisors

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--- Upon commencing at 9:01 a.m.

THE CHAIRPERSON: Good morning, everyone. I guess before we start, I don't know if there are any administrative matters to -- to deal with. I -- I notice a few items from Hydro. I don't know if there's going to be reference to it, or these are intended as exhibits or --

MS. ODETTE FERNANDES: Good morning, Mr. Chairman. I believe one of the ones you have in front of you, which is the CVs for the panel, was filed yesterday --

THE CHAIRPERSON: Okay.

MS. ODETTE FERNANDES: -- as Exhibit 29.

THE CHAIRPERSON: Thank you.

MS. ODETTE FERNANDES: But we do have a response to Manitoba Hydro Undertake -- Undertaking number 1 --

THE CHAIRPERSON: Yeah.

MS. ODETTE FERNANDES: -- which was asked of Ms. Grewal on the first day of the hearing regarding non-Indigenous employees and individuals falsely claiming to have -- sorry -- Indigenous identity.

So I would ask that that be marked as Manitoba Hydro Exhibit number 31.

THE CHAIRPERSON: Thank you.

--- EXHIBIT NO. MH-31: Response to Manitoba Hydro Undertaking 1

MS. ODETTE FERNANDES: And on one final note, I had a brief discussion with Mr. Peters this morning, and with leave of this Board, Mr. Gawne would just like to -- there was some discussion back and forth with Mr. Peters yesterday. So if you could indulge Mr. Gawne just to I believe clarify the record a little bit.

THE CHAIRPERSON: Certainly.

(BRIEF PAUSE)

MR. KEVIN GAWNE: Thank you. I'm bringing props to the discussion here. I just wanted to help the understanding of -- I wanted to help --

THE CHAIRPERSON: As long as it's not a gambling ad, we're okay. Okay.

MR. HAL TURNER: I think we know what engineers like to do in their free time now.

MR. KEVIN GAWNE: It's -- it's not a gambling act. So we had a fair bit of discussion yesterday about priorities and judgment involved by the operations planning engineers and how we consider these priorities.

So I -- out of -- by way of simple example, I'd like to try and clarify the regular process of going through time and updating water conditions and making these decisions, and specifically when operations become governed by reliability.

And we use that phrase in tab 5 of our Application at page -- at page 25, so we walk through how operations, you know, sort of occurred through the drought of 2021, starting with below-average snow melts. And -- and then conditions were observed and we started to reduce our exports and we started to increase our imports, and we eventually were projecting imports during the on-peak.

So, let's totally forget about all the complexities of the hydro system that I kind of started talking about 'cause I love to talk about it, but let's imagine we have one (1) generating station, one (1) reservoir, one (1) river flowing into that reservoir. And the Manitoba load is attached to that

generation station, and the export market is attached to both Manitoba load and the generating station.

So we have to make reservoir-release decisions every week. Even not changing the release of water out of a reservoir is a decision, so time is marching on and we have to plan the water accordingly.

So how does this work when we say economics? Well, it's -- it's a product of an optimization. We say, well, if I release water now, we can -- maybe we can export a little more and make some more revenues.

And the optimization, the objective of that optimization -- in -- in math, it's called the objective function -- the objective is to maximize net export revenues.

But it's not just that. It's subject to a whole raft of constraints; subject to we have to meet Manitoba loads, subject to we have to operate a reservoir within that max and min level, subject to the capability of the system of producing power. So that's an optimization.

And then, well, how do we deal with the fact that, you know, we have to plan the operation over an entire -- you know, months. There's a whole fiscal year. We have to plan our operation over the

whole year.

And we know we can't forecast flows accurately for that long duration, so the next -- you know, the next month or so we're informing our low forecasts with this hydrologic modelling that I was talking about.

So we have a decent view of where flows are for the next couple of weeks, and then what we do is we transition to a bunch of different potential flow cases in the future.

So imagine we've got this single reservoir system. Forget about the forty (40) years and the hundred years. Imagine we're only working with four (4) different flow cases, and there's -- here they are in front of us.

There's this really high flow case. It's full, pretty decent average flow case, a little bit lower than average flow case, and then there's this other flow case that's pretty empty, okay? And what we say is each one of these in the next eight (8) months -- let's say there's eight (8) months left to the fiscal year -- each one of these has a 25 percent chance of occurring.

So our -- right now, today, on Wednesday, our -- our energy operations planners are

meeting with our hydrologists and they're saying, what's the outlook for flows for the next couple of weeks? And, you know, looking at details and conditions, okay, here's our updated flow forecast for the next month or so and we're going to transition to case, you know, 1, 2 and 3 and 4, and the 4 is the -- the low flow case, and we're going to plan our operation and we're going to put this all into our optimization model.

And we're going to say how much water should we release this week to maximize the net export revenues. And, well, in this drought case, you should actually be not releasing more water. You should probably even be reducing your reservoir releases.

So, if you optimize it for this case, it's going to be, you know what, hold back water minus for the flood case. Well, if you hold on to water now, you're going to spill it later, so let it out. And, you know, these are intermediate cases.

So, the optimization's saying, well, you know, for this case let it all out, for this case hold it back. And what we do is we say, well, you know what, we're not -- we're not gambling. We're not betting on this or this or we're not hoping for this.

We're saying each one of these can --

can happen, we know that, what's the best expected decision this week. Okay. So, we met with a hydrologist on Wednesday. Friday we're going to go and meet with the whole group and talk about our decision.

And we say, you know what, the optimal case -- our optimal decision this week is to increase flows a little bit out of Lake Winnipeg. You know, the -- the best economic condition is to increase flows out of Lake Winnipeg, and we do that, and we execute that.

Then we get back into the cycle. And next week we update our flow forecast and we go through it again. And then the next week we rerun it again, optimize. Oh, you know what, conditions are starting to turn drier because I've used up my reservoir, and now these low flow cases are coming into play.

And they're saying, well, if you continue to operate at this amount of flow, you're going to end your horizon being kind of low on your reservoirs. And that's going to cost a lot of money in the future to -- to offset that because it's always about trading off energy from time now to the future when you're talking about hydro.

So, now we're getting into the zone where, you know what, our economic optimization says we should start to reduce flows because the cost of this scenario, and this scenario, the dry scenario and the extra dry scenario is starting to influence our decisions to reduce flows, so we reduce flows.

And that was kind of the case in the spring and when we were starting to have generation be below budget and we were starting to import a little more power in the off-peak and we are reducing our off-peak exports.

And then eventually, we get into July or June and we get to bullet 1, 2 -- the second last bullet on page 25 of tab 5 where we say we reduced reservoir outflows -- pardon me -- as dry conditions persisted.

So, now we're -- we've met with our hydrology folks. We've updated our flow forecasts. And we've said, you know what, our best expected decision is still to release water out of Lake Winnipeg because, you know, it could turn to a flood and, man, we'll do well if that happens. And actually, we'll avoid spilling in the future if we operate now and keep flows coming out of Lake Winnipeg. We'll avoid that lost revenue in the

future.

And the decent water conditions -- we still let more water out of Lake Winnipeg. And even in that low flow condition, you know, we can just hold flows right now, and that's the best economic case.

Weighed all these decisions by 25 percent, this drought condition is saying, no. It's continuing to say reduce flows, reduce flows.

But the point here is that, as we test each one of these cases, it may be that the economic weighted decision in that week was, you know, hold flows, hold flows out of Lake Winnipeg.

However, we test our case. And we say, okay, let's do that then. We'll hold flows out of Lake Winnipeg at, let's say, 30,000 cubic feet per second. That's economically -- using the equally weighted probability of doing all these things, we'll do that. But then we're going to test and make sure that we don't break this system for this low flow case.

So, we look at our -- well, if we do this now and we hold that outflow for a couple weeks and we come back and it's still really dry and we're still down this path of dryness, well, we can't undo what we did two (2) weeks ago. Now, we're governed by

reliability.

So, even if this isn't the most economic thing to do on an expected basis, we are protecting that storage so that we can make it through a drought and we can have enough storage available if that drought continues in the future.

So that's kind of how the optimization and the interplay between drought conditions occur in our operations planning.

I hope that's helpful to the Board in some understanding.

VICE CHAIR KAPITANY: I should ask Bob if I can ask a question.

THE CHAIRPERSON: I did ask Bob.

VICE CHAIR KAPITANY: Oh, did you?

THE CHAIRPERSON: I said to Bob, Can I ask a question?

VICE CHAIR KAPITANY: Well, then, you go ahead.

THE CHAIRPERSON: No, then you go ahead. It's phrased better.

VICE CHAIR KAPITANY: That was an excellent -- really excellent explanation and super helpful. So I have actually a couple questions.

One is I understand optimization very

well. And so, my question is you said that your starting point, though, is maximizing net export revenue. So that -- so that's the starting point.

And then, you optimize that, subject to a whole bunch of different conditions that you talked about. Was I correct in hearing that?

MR. KEVIN GAWNE: That's correct. That's how the problem's formulated. Maximize net export revenue.

Domestic revenue doesn't come into play in the decision because that's treated as a constraint.

VICE CHAIR KAPITANY: And that's whether you're in adverse water conditions or normal water conditions?

MR. KEVIN GAWNE: Correct.

VICE CHAIR KAPITANY: Okay.

MR. KEVIN GAWNE: Objective function.

VICE CHAIR KAPITANY: So my other question -- and this went back to a slide that you had showed in your presentation yesterday when you were talking about the expertise at Manitoba Hydro. And then, we talked later about drought being your biggest risk at the Corporation.

Do you have a meteorologist on staff at

Manitoba Hydro?

MR. KEVIN GAWNE: By profession, we don't have a meteorologist on staff. But we do have -- I'm going to get in trouble for saying this -- but on the floor where this hydrology group exists, I think we probably have -- I'm going to guess that we have the highest per square footage of post-graduate folks in the building.

So it's a high concentration of pretty high-end hydrology and water experts. So -- and some of those folks do have training in -- in meteorology.

You know, to answer your question directly, we don't have meteorologists on staff, but there is tons of meteorologic services out there that we rely on and tie our models into.

So we're using, you know, Environment and Climate Change Canada's models that they run and we -- that -- we ingest that information into our systems, so.

VICE CHAIR KAPITANY: So you contract those kind of services?

MR. KEVIN GAWNE: We...

(BRIEF PAUSE)

MR. KEVIN GAWNE: Sorry for the delayed response but... For the most part, the -- the information that we're ingesting in terms of the meteorology and the modelling, it's not contracted. It comes from Environment and Climate Change Canada and other forecast providers, I believe.

But you can imagine that there is a whole team of meteorologists and -- and they're trying to prepare these forecasts for use by industry, by, you know, safety organization, every -- you know, farming.

So we rely on that, what I assume is a massive team of people with huge servers and -- and models running, global circulation models and regional climate models that feed into -- that we -- we take that information in and put it into hydrology models.

And again, I think that's written up in -- in Appendix 5. -- 5.4 -- 5.4. And I believe there was some followup questions from the PUB asking about, Well, what's used in your forecasting? And we addressed those and I can --

VICE CHAIR KAPITANY: And you've got all those smart people on your floor too.

MR. KEVIN GAWNE: And we've got a lot of smart people on our floor. And some are here as

well.

VICE CHAIR KAPITANY: Thank you very much.

THE CHAIRPERSON: So, I -- I can see Ms. Fernandes' hand in this going, keep it really simple. That was -- that was very helpful.

The -- the question I have is, you know, you comment -- you -- you talked about meeting weekly and that and the decision going forward. I guess the question is: How is the decision made?

I mean, I understand the factors you're looking at, but is there a person who finally makes the decision? Is it a collective decision where there's a consensus made in terms of what happens with the reservoir or is there a per -- is there a -- a formula where, you know, at this point you drop it. I -- that -- that's what I'm interested, sort of in that area.

And then the second part is, when does Mr. Turner get involved? When does the -- when does the senior executive team hear about this, you know, instead of a, well, here's the report and we look at a bunch of reports. I mean, you -- you know, you're talking about sort of the spring time frame June, you know, and I don't know if Mr. Peters will -- will deal

with it and I'll come back after and talk about it.

I'm interested in sort of the -- as well as the summer time frame and what the decision making is -- is there, because all of a sudden, you know, there was the comment that by, you know, July, August, you knew it -- we're in a drought. It's -- we're not getting the rain. We -- we can't get enough.

I don't -- I'm just trying to figure out who makes the decision. Is it still at your level, Mr. Gawne, is it at the senior executive level, is it the CEO because the interplay with the PUB happened sort of in the September time frame. You know, we don't have an application until November.

So, anyways, I -- the only thing I'm asking right now is: Who makes the -- who makes the -- the weekly decisions? Is it you or is it specific people or is it sort of a -- a group decision?

MR. KEVIN GAWNE: It would help, Ms. Schubert, could we pull up the direct presentation -- or Manitoba Hydro's direct. Looking for just a slide to maybe help the discussion a little bit here. You can go to slide 6 please, Ms. Schubert.

So, thank you for your questions, Mr. Chair. Excellent questions. And I'll ask that Mr.

Turner help out with this certainly.

As far as the week-to-week decision making, we have a team of -- their titles are called Energy Operations Planning Engineers. They have a background in, like, civil engineering and energy optimization and water modeling.

So, ultimately they're -- they're charged with the decision of week to week, how much flow should be released out of these major reservoirs. And those decisions are made with information and input from all these experts across the organization as you can see here.

So that -- the idea is, here's our optimal decision. I -- the Operations Planning Engineers have considered these -- the priorities that we have and those decisions are reviewed with this team and if, you know, Indigenous Community Relations is aware of something going on, say at Pimicikamak Cross Lake and, you know, at -- we should -- we should delay a flow increase here because there's some festival or something going on. Like, it's that kind of feedback that happens there.

Or we're hearing concerns around here, how can we address that. Our fisheries experts are saying, you know what, it's spawning time on the Lower

Churchill River, can we, you know, does it make a difference volume wise when we get the water out of Southern Union Lake, but maybe we could do something here to help from a -- an environment perspective.

So that, that feedback is taken in, but ultimately the decision and the instruction on release -- releasing water is sent from that operations planning engineer to the generation dispatch kind of area.

However, and that's -- so that's saying, is that decision entirely at that level. Certainly, you know, I take responsibility for the -- the -- those decisions. When they're bigger decisions we elevate the discussion certainly.

But I think what's more -- it's not -- it's not a kind of freeform, one person's decision. We have these licences that govern our operations and these operating priorities that we operate to. So that is -- and those licences are the licences, but the operating priorities and our assumptions for drought, for instance, and our -- and our assumptions on what we're using for expert price forecasts, those are all reviewed at the Director and above levels.

So, they've got some kind of play-book, if you will, a guidebook and, you know, if we're

looking to stray from that, of course, we would be escalating any decisions around that.

Now, when it comes to really look -- I don't know how you make the case -- but large decisions or we're into drought or we're into a major flood, then we are engaging directly with Executive. We saw that in 2021. Our VP called a team of VPs together. I think the meeting was officially planned, like the notice was sent out in July -- but we in August -- the beginning of August, and -- and those folks got together.

So, with that -- and those decisions I -- how those decisions were made at that level, though, is like we -- I came to this team of VPs and said this is our agreed-upon planning criteria, this is our level of energy security we're planning for, and this is how the operation of the system is going to look for the next number of months and, you know, got that endorsement, let's say. It wasn't an approval request but we reviewed that.

It's not directed to increase flows or decrease flows or anything like this but -- so, that, hopefully how the decision-making gets made and, then, when to get Executive involved in the drought, you know, clearly, conditions were continuing to be dry

and -- and it's not my call to -- to decide whether a, you know, a hundred million dollar variance on our budget is material or not. That's, you know, that goes outside of our scope of involvement.

And, then, on the other side of the spectrum in term -- in flood, similarly, we're having, you know, the potentially major impacts on our projects or impacts on stakeholders and that's, you know, that's an extreme event that creates a whole different set of interesting discussions that, obviously, we're involving our Senior Executive, in those situations.

THE CHAIRPERSON: Thank you very much. Oh, sorry. Mr. Sy...?

BOARD MEMBER SY: Yeah. Okay. Sorry. Thanks, Mr. Gawne, for remember -- reminding me of the two (2) functions, back in my school days, but my question is about this operation planning process. It's very well, you know, put together.

We have been told, and you have mentioned, that drought is your biggest risk -- most significant risk, and we have been also informed that Manitoba Hydro is putting together an Enterprise Risk Management and, obviously, drought is going to be Number One.

So, once that Enterprise Risk Management is put in place, and drought has been identified as a potential risk, then this plan is put aside because, now, it's really how are you going to manage, you know, operations going forward knowing that we are at the beginning of what could be a potential drought.

Enterprise Risk Management is looking at, once a risk is identified, there are different processes that have to be -- that have to go through, including assessing it, planning, and acting on.

So, right there, back in February or March, there should be a team that will be going through estimating the impact of the drought in the whole system and -- and, assuming that it is what is going to happen, and then put a plan in place.

So, I guess what I'm trying to, you know, get is, once Enterprise Risk Management is put in place, Manitoba Hydro would be better suited to manage the drought, which is risk for this -- for its organization. Is that -- is that a fair assessment?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Thank you, Mr. Sy.

I'll -- I'll try to --

BOARD MEMBER SY: Mr. Sy.

MR. KEVIN GAWNE: My apologies, Mr. Sy.

BOARD MEMBER SY: That's fine.

MR. KEVIN GAWNE: Thank you for your question. It's an excellent question. Certainly we deal with uncertainty every day in our operations, so that immediately brings up the question of risk and how is risk assessed.

So to answer your question, will this be put aside, our process and our drought management plan, I don't -- I don't believe so. It will still be used to guide our operations.

But what -- like what we experienced for instance during the -- the '21 drought in bringing that team of vice presidents together -- and I think we've said this in our Application -- was the risk -- our risk program in action, or our risk management framework in action, so -- or, pardon me, the risk committee in action.

So we have an enterprise -- enterprise risk committee that will be -- or is in place as part of our enterprise risk framework, and if we were to experience a drought in '23/'24, we would be going to

that committee as opposed to striking this committee that we've talked about here.

Like that enterprise risk committee exists, and -- and that would be the committee where we would bring in front of them potential, you know, financial impacts of drought, for instance.

So -- and if how well that -- like what will change once the next drought happens and our enterprise framework is fully built out, I think in my mind what will -- it'll be a little more enterprise-wide uniform at our decision making and how it impacts for example the financial outcomes can be assessed based on a risk tolerance that's being consistently applied for other risks across risk tolerance or risk measurement, consistently applied across other areas of the enterprise.

So if that helps. Yeah, I don't -- I don't believe these processes are going to stop. I think they will inform the more formalized risk committee that will assist in these guiding our -- our operations through events like droughts.

THE CHAIRPERSON: Sorry. Mr. Peters...?

MR. BOB PETERS: Yes, thank you.

CONTINUED CROSS-EXAMINATION BY MR. BOB PETERS:

MR. BOB PETERS: Good morning to the witness panel Manitoba Hydro representatives, all that are present and those who are on the live stream.

Just a couple of points, Mr. Gawne, to follow up this morning. And while we have on the screen a slide 6 from Manitoba Hydro Exhibit 30, this page shows us that there are the -- I think your words were the operations team, if I -- if I've got it correct, is handling essentially the first -- the bullet about collaboration between experts across the enterprise. That's on your operations team to gather the data.

Is that what you -- what you were explaining to the Board this morning?

MR. KEVIN GAWNE: Yes. Our energy operations planning engineer is kind of chairing that meeting that involves these professionals from across the enterprise, so.

MR. BOB PETERS: And you're part of that?

MR. KEVIN GAWNE: They let me come to those meetings, yes. I -- I do participate regularly.

MR. BOB PETERS: I'm sorry, you do which?

MR. KEVIN GAWNE: Yes, I'm -- I'm an attendee at these meetings. That's -- sorry, I didn't answer your question directly. I'm a part of this group of people that meet, explained in that second bullet.

MR. BOB PETERS: We call that the -- you call that the energy operations team?

MR. KEVIN GAWNE: Okay. Yes. I manage the department called Energy Operations Planning, and those energy operations planning engineers who coordinate this meeting on a weekly basis report to me.

MR. BOB PETERS: All right. I understand your point. And you said to the Chair I think in one of your ques -- or answers this morning that at some point in time you elevated to the executive.

Have I got that correct?

MR. KEVIN GAWNE: Yeah. Yesterday we explained reporting on water conditions is a routine thing. It goes up at least monthly, and as -- as conditions get further and further let's say on one end or the other, flood or drought, then the communications start to increase.

And this is becoming an issue, so -- so

elevating to the executive level was through discussions through my director and VP about this -- about the conditions that were continuing to occur.

MR. BOB PETERS: That elevation, though, to the executive resulted in an executive being part of those meetings starting in August of 2021?

MR. KEVIN GAWNE: Yes. The -- the meetings were called by our executive of asset planning and delivery at the time. The meeting notice I believe went out in July, and we met first on August 4th officially.

MR. BOB PETERS: And before that, it would have been your energy operations planning team that would have been doing the meeting and sending the reports as they -- as they decided?

MR. KEVIN GAWNE: Well, sending the reports as they consistently do on a monthly basis, yes, but there's -- you know, there's standard reports with spaghettis and calling up the -- our leadership to inform them about changing conditions and stuff like this. That happens kind of outside of those routine reports.

So it's -- those communications were happening certainly, and as conditions continued to be

dry, the -- the frequency of those communications was increasing.

MR. BOB PETERS: All right. Thank you. And...

(BRIEF PAUSE)

MR. HAL TURNER: Mr. Peters, maybe I'll just add, remembering I -- I came in in November, but the energy operations team and the experts, they all meet. And then, after that meeting, we'll get together that group of executives and they'll share with us, you know, their perspectives on potential actions or -- or things we should do to try and manage the risk.

So the -- the executives are not in with all the experts while they're having those conversations. We're having a conversation after the fact where the experts have sort of aligned on some options, and then we'll provide our perspectives on -- you know, they may come to us with a recommendation: we think we should do some hedging or we think we should adjust our flow this way.

And then we have the right group of executives in the room to think about all those

upstream and downstream implications of those decisions and share our perspectives.

MR. BOB PETERS: And, Mr. Turner, that didn't start until August of 2021. And I recognize you weren't in the room at that time, but that was the time line.

MR. HAL TURNER: That is my understanding, yes.

MR. BOB PETERS: All right. Thank you. Yesterday, Mr. Turner, we had some discussion about a quarterly report. It was found on page 29 of Board counsels' book of documents, Exhibit PUB-19-2 -- not that I need to necessarily go there.

But, Mr. Turner, these quarterly reports are regular occurrences, correct?

MR. HAL TURNER: Correct.

MR. BOB PETERS: And does Manitoba Hydro executives stick to a time line for the completion of the quarterly reports? And I'm thinking specifically of the time line that is set out in the Crown Corporation's Act, and maybe Ms. Schubert could locate that and -- okay.

I'm just drawing to your attention, Mr. Turner, a section about quarterly reports being prepared within forty-five (45) days of the end of the

quarter. Is that a time line that you adhere to?

MR. HAL TURNER: My area doesn't not prepare -- sorry, does not prepare the quarterly report, so I -- I think Mr. Tess is going to have to speak to that.

MR. BOB PETERS: All right. All right. Let's turn to a different topic but related to Manitoba Hydro's actions in the drought.

And -- excuse me -- is it correct, Mr. Gawne, that one of Manitoba Hydro's responses to the drought was to place financial hedges related to the imports of electricity and also for the natural gas that might have to be used in the Brandon turbines?

MS. CHERYL SANCLEMENTE: Yes, we placed financial hedges for the power portion and physical hedges for the gas portion.

MR. BOB PETERS: Sorry, Ms. Sanclemente. I -- you placed financial hedges for the electricity portion and physical hedges on the gas portion, meaning on the gas side you physically purchased -- you signed contracts to purchase gas that would be delivered to Manitoba?

MS. CHERYL SANCLEMENTE: We purchased gas that had a firm -- firm transport component, so, yes.

MR. BOB PETERS: But the electricity hedges were financial derivative products?

MS. CHERYL SANCLEMENTE: That's correct.

MR. BOB PETERS: Which meant that you could settle them financially without ever having to take delivery of electrons?

MS. CHERYL SANCLEMENTE: Correct.

MR. BOB PETERS: Now, Ms. Sanclemente -- and I want to be very cautious that we are on the public record and I am not soliciting from you any non-confidential evidence.

Are you comfortable with that?

MS. CHERYL SANCLEMENTE: I think so.

MR. BOB PETERS: All right. We'll have an opportunity I think later this week to get into some of those questions.

On -- on page 32 of the Board counsels' book of documents, again, Volume 2, would it be correct to interpret Manitoba Hydro's hedging was akin to an insurance policy to try to protect Manitoba Hydro's net income?

MS. CHERYL SANCLEMENTE: Yes, that's correct.

MR. BOB PETERS: And when hedging, Ms.

Sanclemente, Manitoba Hydro would lock in the exact price it'll pay for the electricity or the gas on the day that is included in the hedge?

MS. CHERYL SANCLEMENTE: Yes, that's correct.

MR. BOB PETERS: And there's a margin price on top of that for the cost of placing the hedge, as well, correct?

MS. CHERYL SANCLEMENTE: No.

MR. BOB PETERS: There's no -- there's no premium on top of the purchase?

MS. CHERYL SANCLEMENTE: There is not. It's -- it's a fixed price. So, whatever the price is of the contract, it is fixed.

MR. BOB PETERS: And if there is any premium, it would be included in that fixed price?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: And would you agree, Ms. Sanclemente, that the market price on the day the hedge relates to is almost certainly going to be different than the hedge price?

MS. CHERYL SANCLEMENTE: I'm not sure I understand your question.

MR. BOB PETERS: When Manitoba Hydro places a hedge, it doesn't know with any certainty

what the market price is going to be on the day that the hedge is going to mature.

MS. CHERYL SANCLEMENTE: (INDISCERNIBLE). Is that what you mean?

MR. BOB PETERS: Pardon me?

MS. CHERYL SANCLEMENTE: I'm sorry. Do you mean that when we place a hedge from a forward perspective, we don't know what the actual price will be the day that that energy is delivered or purchased?

MR. BOB PETERS: That's my question rough -- still clumsy, but that was try -- what I was trying to get at.

MS. CHERYL SANCLEMENTE: Yes, that's correct.

MR. BOB PETERS: You don't know in advance whether the market price is going to be higher or lower than the hedge price?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: Sorry, can you repeat the question, please.

MR. BOB PETERS: When -- I think I asked you that -- just to follow up on our discussion, that on the day that Manitoba Hydro places the hedge

for some future date, Manitoba Hydro just doesn't know in advance what that market price is going to be on that future date?

MS. CHERYL SANCLEMENTE: Yes, that's correct.

MR. BOB PETERS: What Manitoba Hydro knows is exactly how much it's going to have to pay on that future date because that's the price locked into the hedge?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: And that's regardless, Ms. Sanclemente, as to whether the market price is lower than the hedge price or higher than the hedge price, Manitoba Hydro will pay the hedge price?

MS. CHERYL SANCLEMENTE: It is a fixed price, yes.

MR. BOB PETERS: And then after the hedge is settled Manitoba Hydro can calculate whether the hedges have saved Manitoba ratepayers money or whether they have cost Manitoba consumers money?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: And I'm hoping you don't divert me to Mr. Tess, with no disrespect to him, but would the -- would the results of the hedging show up in the fuel and power purchases line of the

financial statements, or do you know?

MS. CHERYL SANCLEMENTE: I'm going to say I'm -- I'm not exactly sure where that will end up. I -- I'm not sure. But the results of -- yeah, I'm not sure.

MR. BOB PETERS: All right.

(BRIEF PAUSE)

MR. BOB PETERS: I might come back to that, Ms. Sanclemente, and ask you to accept something subject to check, but that gives you homework, not me.

So, in terms of these hedgings, by the time that Manitoba Hydro witnesses appeared before the Board in December of 2021, at the last interim rate application, Manitoba Hydro had already placed some hedges. Are you familiar with that?

MS. CHERYL SANCLEMENTE: What was the date of the meeting?

MR. BOB PETERS: The first testimony I believe was December 10th --

MS. CHERYL SANCLEMENTE: Then, yes, we had. Yes --

MR. BOB PETERS: -- 2021.

MS. CHERYL SANCLEMENTE: -- we had --

we had put additions on, yes.

MR. BOB PETERS: Now, I want to be careful, Ms. Sanclemente. We understand Hydro wants to keep the exact timing and the exact volumes of the hedges confidential so other market participants, such as counter parties, don't use that information against Manitoba Hydro. Is that fair?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: Right. That applies to both the timing and the volumes?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: All right. So, then we might talk about some of that a little bit in -- in the CSI session. But staying with what's publically available, on page 35 of Board counsels' book of documents we've got some forward price curves.

You're familiar with those, Ms. Sanclemente?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: And Manitoba Hydro hasn't disclosed any public dates of its hedges, but I guess just under that, on page -- sorry, on that same page under that chart, Manitoba Hydro's indicating that the hedges were placed in the late summer or fall of 2021.

And you're comfortable with those parameters?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: Now, with this chart, Ms. Sanclemente, the months on the horizontal 'X' axis is -- relates to 2021, for November 2021, December 2021. And then it shifts into January of 2022, for February and March of 2022?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: And so, what you're showing the Board is that you certainly wouldn't have all of this information available at the same time, but you've overlaid the different times that you get forward price curves, correct?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: All right.

(BRIEF PAUSE)

MR. BOB PETERS: So, let's speak hypothetically only, Ms. Sanclemente.

If Manitoba Hydro placed hedges in let's say August of 2021, you would be using the dark blue solid line as the price curve, and that would tell you the prices that would have been available had

Manitoba Hydro placed hedges in August of 2021?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: Yes, that's correct.

MR. BOB PETERS: And the same would apply if you waited until September of 2021. You'd have the prices that are put on the red line on the chart?

MS. CHERYL SANCLEMENTE: Yes.

MR. BOB PETERS: And it follows then, if you waited until October 2021, the prices that would be available would be on the green line?

MS. CHERYL SANCLEMENTE: Correct.

(BRIEF PAUSE)

MR. BOB PETERS: Does it follow, Ms. Sanclemente, then that the later in the fall of 2021 that the hedges were placed, the more expensive the hedged energy would cost?

MS. CHERYL SANCLEMENTE: Yes.

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: I'd like to add, that -- I mean, that's not necessarily a rule. This is what we're looking at or what occurred in 2021, but that's not necessarily how the markets always unfold in this time period.

MR. BOB PETERS: Okay.

MR. NIKHIL KARANWAL: If I could add, Mr. Peters, I think we have to go back and look at the circumstances when we were in that time frame. Just a year before, we had the excess freeze, so that was one (1) other thing.

On top of that, the macro environment in terms of geopolitical situation was changing. Russia was cutting down gas for Euro.

And what we are also seeing at the bigger level is that the power sector in North America is getting -- is actually connected to gas, and so there was -- it was a very volatile environment at that time.

And I think Ms. Sanclemente, on her presentation, slide number 19, I believe, showed how volatile the environment was looking at that time because of the fact of excess freeze the year before and how the things were shaping up in the geopolitical situation.

And that's the reason as we were going from August to September and October what we were seeing is how volatile the power sector could be in wintertime as we were getting it.

And plus, as we know, that January and February could have been pretty, like, frozen months for us, we were lucky that it didn't turn out that way.

So, the -- the whole spectrum, that was evolving month to month. And we were watching how the prices are evolving in the export markets. We were watching what was -- the situation of our water was in the system. And that's the reason as these hedges were placed they were not rushed, but they were very thought through.

I hope that provides you some more context around what -- where we were at that time and how we were looking at the future. Thank you.

MR. BOB PETERS: Thank you, Mr. Karanwal. Ms. Sanclemente, if Manitoba Hydro placed hedges in August of 2021, they -- they could have locked in to the monthly prices that show up on the blue line.

MS. CHERYL SANCLEMENTE: That's correct. Prices go up and down. So, in this case,

yeah, if we -- if we had perfect information, we could have walked in in August and -- and we would have paid less for our hedges. But we don't know where prices are going to go. We know where they have been historically, but we don't know where they're going to go in the future.

What -- what might seem like a high price today could actually be a very good price two (2) weeks from now. Especially with how volatile power prices can be.

So what we do is we don't take a price view -- we do -- we do two (2) things. We look at our hedges from a mechanistic perspective and a gradual perspective. Mechanistic being we don't take a price view. We -- we put positions on slowly over time. Gradual -- we want to do it gradually because we're not completely certain on what our water situation is going to be.

So if we go, let's say, in August and -- and purchase a whole bunch of energy but then, all of a sudden, it rains in September, October and now we have too much of a commitment from the purchase side.

So slowly, over time, we put small -- small positions on to -- to make sure we're meeting that -- the water perspective or the water situation.

As well as we don't take a price view. We -- we put positions on from a price perspective solely over time too.

MR. KEVIN GAWNE: Thanks for your help. Sorry, just --

MR. BOB PETERS: And you can, Mr. Gawne. But Ms. -- Ms. Sanclemente, you're -- the last phrase tailed off a little bit in my ears here.

You do take a price view at some point or not at all?

MS. CHERYL SANCLEMENTE: We do -- do not.

MR. BOB PETERS: Okay. Thanks.

MS. CHERYL SANCLEMENTE: Slowly over time, we put positions on because we don't know where prices are going.

MR. BOB PETERS: Sorry, Mr. Gawne, I cut you off.

MR. KEVIN GAWNE: I just thought I would add a little bit about -- Ms. Sanclemente mentioned the water variability. And we still don't know.

So if we go back to page 41 of the Board counsels' book of documents, had that blue -- if we look to August 2021 and that blue cloud, had it

been very narrow or one line, for instance, then the water and energy operations folks could have went to Ms. Sanclemente's team and said, Listen, we're -- we're certain we're going to need whatever number of gigawatt hours of energy this -- this winter so it's guaranteed.

Well, that's still not the case. We don't have that certainty. Even because we can have rain in August and we can have rain in September and October. And so, there's still uncertainty in the volume requirements for the winter.

So the -- the approach is to, you know -- as we're going towards the, you know, end of that water year, we're starting to get more -- more certainty in the range of outflows and the range of volume requirements, either for export or import, and we're providing that information to the trading team.

And then, they're able to use that distribution of imports, if you will, to help inform the decision on when to -- when and -- and to start and how to continue to pace in and layer in these hedges as -- as the rain season comes to a close.

MR. BOB PETERS: All right. Thank you for that -- for that.

Ms. Sanclemente, I take it then that

the weather forecast will inform the volume of hedges that are being considered?

MS. CHERYL SANCLEMENTE: In -- in the forward time frame that we're taking those hedges. So we're putting hedges on in the -- like -- like you had said, between the end of --

MR. BOB PETERS: Again, I don't want to bring any information that shouldn't be on the public record. So please be guided by that.

MS. CHERYL SANCLEMENTE: You mentioned end of -- end of summer into fall.

MR. BOB PETERS: Sure.

MS. CHERYL SANCLEMENTE: And -- and I'm comfortable with that.

You -- you don't know where weather is going to impact. You don't know exactly what -- what weather is coming your way.

MR. BOB PETERS: Ms. Sanclemente, when you are looking into that future, does Manitoba Hydro assume it's going to be the warmest winter on record and, therefore, the volumes will need to reflect that?

MS. CHERYL SANCLEMENTE: The volumes we're provided with from Mr. Gawne's group is based on median weather. It could be -- it could be higher, it could be lower. But it's -- it's median weather.

(BRIEF PAUSE)

MR. BOB PETERS: As we see on page 36 -- oh, I'm sorry.

(BRIEF PAUSE)

MR. BOB PETERS: Ms. Sanclemente, I'd like to turn with you to page 36 of Board counsel book of documents.

This is a public disclosure of Manitoba Hydro's hedging performance, correct?

MS. CHERYL SANCLEMENTE: Yes, that's correct.

MR. BOB PETERS: And the results show that the hedging resulted in electricity costing Manitoba Hydro $19.8 million more than had Manitoba Hydro not hedged, correct?

MS. CHERYL SANCLEMENTE: Yes, that's for gas and electricity both.

MR. BOB PETERS: All right. Thank you for that clarification.

MS. CHERYL SANCLEMENTE: I'd like to also point out though that that is the financial loss. But when we purchase hedges in the market, while they

are financial from a -- from the power perspective, it was financial. There is a benefit, from a physical standpoint, of -- of securing those hedges.

MR. BOB PETERS: All right. I'm going to need you to help -- explain that to me.

You're suggesting that by having a derivative instrument of an electricity forward hedge, that can assist the operations planning team in terms of what has to happen with the water in Manitoba?

MS. CHERYL SANCLEMENTE: Correct.

MR. BOB PETERS: Okay. Then I -- I think I have your point.

And the point you also made is that the numbers that are before the Board on page 36 of Board counsels' book of documents are for natural gas, as well as -- physical natural gas, as well as the electricity?

MS. CHERYL SANCLEMENTE: Correct.

MR. BOB PETERS: All right. And Ms. Sanclemente, I'm going to push you on this one again.

You couldn't tell me whether this $19.8 million financial loss was expensed against fuel and power purchases in 2021.

MS. CHERYL SANCLEMENTE: It -- it was.

MR. BOB PETERS: You're now sure it

was? Okay.

And so, put another way, Manitoba Hydro's net income in the year in which this Board gave an interim rate increase was reduced by $19.8 million from what it otherwise would have been had there been no hedges.

MS. CHERYL SANCLEMENTE: That -- that's correct. I think I want to point to -- if we can go to Daymark-AMC-112 in the IRs, the Daymark IRs?

I think what I want to get to is this is a -- this -- this was a cost and there is a cost to hedging.

But right here, in the response, it's -- it shouldn't be looked at as a result of -- of lost money. It's more of a charge for the insurance. And the $20 million charge that occurred could have -- could have paled in comparison to the negative consequences to Manitoba Hydro.

MR. BOB PETERS: Thank you. I've got your point.

That $19.8 million, to your knowledge, was not recorded in the 2022/23 fiscal year financial statements, it would have been reported in the 2021/'22 financial statements?

MS. CHERYL SANCLEMENTE: Yeah, Mr.

Peters, I think that's a question for the Revenue Requirement Panel.

MR. BOB PETERS: Okay. Please remind us later, Ms. Fernandes, so we don't forget.

I think that's as far as I'm going to go on the hedging at this time. I want to turn to precipitation forecasting and go to page 39 of the book of documents.

Mr. Gawne, you had mentioned in your comments yesterday that you were aware that this Board had some concerns about long-term precipitation forecasting capabilities at Manitoba Hydro and whether any improvements could be made.

And they also, on that same page at the bottom, were wanting to look at that forty (40) year flow record compared to a hundred and eight (108) year flow record. You're aware of those, right?

MR. KEVIN GAWNE: Yes.

MR. BOB PETERS: And the upshot of it on page 40 of Board counsels' Book of Documents, was that in response to a review and vary application, Manitoba Hydro took the position that it was perhaps premature for the Board to -- to go to get expert evidence on the topic of drought forecasting options because Manitoba Hydro had more information that it

could provide to the Board.

You'd agree with that, sir?

MR. KEVIN GAWNE: Yes, that's what's written here.

MR. BOB PETERS: And Manitoba Hydro, you don't disagree with that, sir?

MR. KEVIN GAWNE: No.

MR. BOB PETERS: And, in this application, this General Rate Application, Mr. Gawne, Manitoba Hydro did present additional information and evidence and that was found, as you pointed out in Appendix 5.4 as an example.

MR. KEVIN GAWNE: Yes, Appendix 5.4 was largely developed to assist the Board in having the details and the tech -- technical information behind the hydrology forecasting.

And we -- we also engaged with our -- our peer in -- in the industry in -- in the industry of hydrology, Dr. Rene Roy. And that's -- that expert has appeared before this Board in the past, and -- and NFAT hearings I believe was here, pardon me, maybe it was Keeyask. Yeah, it was an NFAT hearing where he assisted the -- with discussions on climate change, I believe.

Yeah, so Dr. Roy provides a pure

assessment of our hydrology piece at -- at the very end of Appendix 5.4. And it's -- it's quite a heavy read, but I think he does well to try and summarize it.

And I do want to, on the record, thank Dr. Roy for his -- I'm going to say, Dr. Roy, pardon me, and -- and I'm -- I -- 'cause the translation is not going to work well with my French pronunciation, but Dr. Roy provided this assessment. We engaged with him and the -- the review that he did was done out of interest to help the science.

I -- I'll -- I'll share that I had an engage -- when we first called him up and -- and this is an individual we've worked with for decades, our hydrology team. And asked, well, how are we going to compensate you for your work here? And he said, no. I don't think I should be paid anything 'cause this is -- he's thinking of it as a research peer review.

So he accepted no -- there's no -- he's not a consultant. He's an independent peer reviewer and -- and he is -- his interest is to better the science. And his -- his resume is an impressive one if you think about it. He was the lead for the hydrology forecast team at Hydro Quebec, which is, by some measures, the second largest hydro producer in

the world. And he's advised, you know, the federal government on climate change matters and stuff like this.

So, I just wanted to thank him for that contribution and, you know, if you get lost in the sixty (60) charts that precede his review, I -- I do encourage the Board to take a -- take a read of -- of his summary assessment.

MR. BOB PETERS: Mr. Gawne, would it be fair to say that if Manitoba Hydro had reliable precipitation forecasts, as early as possible, it would make better decisions going forward?

MR. KEVIN GAWNE: Sorry, do you mean -- can you help me with the -- as early as possible?

MR. BOB PETERS: Well, if Manitoba Hydro had a better sense of what precipitation was coming, then that would assist in determining what your operations team would do with holding back water or releasing water; that follows, does it not?

MR. KEVIN GAWNE: Yes.

MR. BOB PETERS: From reading the appendices that you've directed the Board to, Manitoba Hydro is not convinced that that expertise exists to allow it to have the certainty of precipitation forecasting in advance that would make that operations

decisions easier.

MR. KEVIN GAWNE: Yes, when we're looking at making operating decisions considering the entire horizon, that we have to make plan for, those long range precipitation forecasts are not accurate enough to rely on. But this short term forecast, as -- as I mentioned, we are using now in our hydrologic forecasting and factoring that into -- to our operations.

MR. BOB PETERS: Mr. Gawne, that -- that leads us to page 43 of Board counsels' Book of Documents and a matter you and the Vice Chair were talking about earlier this morning with your water bottle props.

And, I'm not going to disagree with you on the record that Appendix 5.4 was a heavy read, but this chart that Ms. Schubert has put before us breaks down the forecasting period into what I assumed was four (4) time frames, but I only want to focus on the first two (2) with you.

Are you comfortable with that, sir?

MR. KEVIN GAWNE: Yes.

MR. BOB PETERS: And the first two (2), one of them is called the near term, which is the zero (0) to sixty (16) days of forecasting, correct?

MR. KEVIN GAWNE: Correct.

MR. BOB PETERS: And that's the solid blue line. And we see a -- a vertical line that's labeled now, so let's pretend that's where we are.

And so going forward from now, for the next sixteen (16) days, there is a solid blue line that exists, correct?

MR. KEVIN GAWNE: Yes, that's correct. And just, by the way, this is a schematic. This is not actual, it's just for illustration purposes.

MR. BOB PETERS: Oh, I know if the engineers got a hold of it, it would be a lot more lines, but let's -- let's just stick with the few that we have.

That blue line is based on computer modeling of actual measurement results. Is that -- have I got that right?

MR. KEVIN GAWNE: It's -- yes, but not all of it. It's based on computer modeling results that account for actuals that have occurred up to time now, essentially, the conditions in the basin that -- soil moisture and these sorts of things are modeled based on information that was collected in history.

And then for the sixteen (16) days of that solid line, that is -- it's called a

deterministic forecast, but it's based on short term climate and -- global and regional climate modeling.

MR. BOB PETERS: And Mr. Gawne, that solid red line for the -- for the next sixteen (16) days that we're talking about, this first zero (0) to seventeen (17) days, that reflects the statistical method of regression analysis, again, of past actual flows. Is that your understanding?

MR. KEVIN GAWNE: That's correct.

MR. BOB PETERS: And the purpose is to result in a single flow projection?

MR. KEVIN GAWNE: No, the -- the purpose here is to generate a series or a -- of -- of forty (40) different flow cases. And, sorry, that's -- there's not forty (40) lines here, but eventually you want to have forty (40) different traces of flows over which you can plan the operation, as I was explaining.

So, instead of four (4), we want -- we're using forty (40) different cases. And the reason why there's a statistic trace there is -- the reason why there is a statistical trace for that red line that you see, the solid red line leading up to sixteen (16) days is to have enough history to go back in time to have at least four (4) years of

record.

The most recent thirty (30) years is informed by this physical based hydrologic modelling so. We're -- we are still using the statistical method for the early ten (10) years of that forty (40) year series to construct a flow scenario.

If you can -- maybe it will help the Board. I realize this is quite a complex chart but I'll try. There's one. This is just for, say, one little -- one tributary on our system, say it's a river in -- in the Winnipeg River Basin, where we have our new hydrologic modelling set up to do physical-based in-flow forecasting.

So, we have this trace of flows for that solid blue sixteen (16) days and those expand out into multiple different flow scenarios, based on all the different historical climate conditions that have occurred, and we create this individual chart of flows that could occur for that tributary, however, we only have 30 days -- 30 years, pardon me, of historic climate data to drive those models.

So, we also have this red line, which is based on the traditional regression based flow forecasting that we've explained to this Board before, and that's used to constr -- to create additional flow

scenarios, and you can see that -- that -- let's look at the top trace, at the top of this whole thing. You've got one red line that's broken, and that's the extension of your statistical flow forecast, and, then, it ties into what's called historic flows.

So, it -- it merges into that -- or it blends into that green line -- green dashed line, but, for that historic year we had enough data -- we had the data in place, and we have the hydrologic modelling. So, we're using that hydrologic modelling, which is the blue broken line, to blend into historic flows for that particular year. So, it's a flood year.

So, actually, that high red broken line doesn't get used in our -- in our planning. It gets tossed, but, if you go to the bottom -- the bottom red broken line, it's going along and it, eventually, merges into that historic drought year. So, it merges, kind of, before April 1st, 2023, into a broken green line.

But, for that scenario, we don't have the historic climate record to drive our hydrology models. So, we actually don't have a physical-based hydrologic model scenario run for that particular case, so we're hanging on to the statistical driven

case, so that we have a full set of forty (40) years to work with. There's a lot of information in that chart.

MR. BOB PETERS: Thank you for your review of that, Mr. Gawne. The point you made with the Vice Chair was that the meteorological data that is used for precipitation across your watershed, that occurs in the first 16 days on this chart, does it not?

MR. KEVIN GAWNE: Perhaps I'll clarify that. So, the first sixteen (16) days, that solid blue line, starting at time now, and those are the models that the folks who are running back at the office today, on Wednesday -- or providing that information, those are based on the hydrologic models, so, modelling that hydrologic cycle with the near-term precipitation forecasts, and it's driving those models.

And, then, beyond that 60 (sic) days, things start to fan out, into different trades of flows, and those are based on actual historic climate data that's driving the hydrologic model. So, you can imagine the -- the top blue line -- the top blue line of the fan of blues that starts after sixteen (16) days. How is that constructed? Well, our hydrologic

model is set up. It's got -- it's reflecting the amount of soil moisture that's there. It's reflecting the amount of snow that's on the ground, and, then, we take that model and we say, okay, I want -- I want to model forty (40) different years so I'm going to use the climate data, the temperature and the precipitation data from, say, 1992, and I'm going to force that into my hydrology model.

So, I'm going to -- so, it's an input. So, it rained this amount, put that into my hydrologic model and that's how the -- the basin's going to respond with that historic climate data.

So, it's not a historic flow record. It's a flow projection, based on historic climate drivers, measured precipi -- pardon me -- measured precipitation back in the 1992 or whenever that was. I hope that helps.

MR. BOB PETERS: It does and, thank you, Mr. Gawne. The other issue that we took from that Board Order was the Board wanted to understand better the results of the 40 year flow records compared to the 100 year flow records. Correct?

MR. KEVIN GAWNE: Correct.

MR. BOB PETERS: And, on page 45 of Board counsels' book of documents, Manitoba Hydro has

plotted both the hundred (100) year and the forty (40) year, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah. Those are the net extra-provincial revenues simulated for -- I believe that's fiscal year '23/'24, if you scroll down a little bit.

MR. BOB PETERS: It is. On Figure 3 at the top I think it'll tell you that.

MR. KEVIN GAWNE: Yeah. So fiscal year '23/'24 simulated using either the forty (40) year -- recent forty (40) year record or the hundred and ten (110) long-term flow record.

MR. BOB PETERS: It uses both, right? The forty (40) year is based on the blue and the hundred (100) plus year is the green line.

MR. KEVIN GAWNE: Correct.

MR. BOB PETERS: Manitoba Hydro did not do a retrospective analysis of which one is more accurate, did it?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'm sorry, Mr. Peters. Can you please restate the question?

MR. BOB PETERS: Just asking whether or not Manitoba Hydro has done a retrospective analysis to see which of those two (2) methodologies resulted in a more accurate forecast.

MR. KEVIN GAWNE: For '23/'24 --

MR. BOB PETERS: Sorry.

MR. KEVIN GAWNE: -- so you're talking about during the '21 drought?

MR. BOB PETERS: No. Let me -- let's not have regard to the year at the top of the page.

MR. KEVIN GAWNE: So in general?

MR. BOB PETERS: Pardon me?

MR. KEVIN GAWNE: In general, what's --

MR. BOB PETERS: Yeah.

MR. KEVIN GAWNE: -- more accurate?

MR. BOB PETERS: In general, which is more accurate, the hundred (100) year or the forty (40) year?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I think, Mr. Peters, we -- we did address this question in PUB-159 -- 1-59.

We -- we did review with the Public Utility -- Utility (sic) Board's independent expert consultant the issue of the forty (40) year versus the hundred (100) year and -- and, you know, how much it would make a difference on the -- like the sensitivity of our net export revenue projection and -- and the reasons why we are using forty (40) year record versus a hundred and ten (110) or a hundred (100) plus.

And I don't have Daymark's words in front of me here but, you know, the assessment was it was appropriate. Dr. Roy also reviewed that practice, I believe, in a section of 5.4.

So whether it was a formal retrospective analysis, I think I'll have to lean on what we had responded to or how we --

MR. BOB PETERS: All right. Well, let's -- let's turn, Mr. Gawne, to page 46 of Board counsels' book of documents.

The -- the right-hand side of this page, which was -- was forecasting total hydraulic generation, the dark blue bar in the 2021/'22 time frame, that was based on a forty (40) year flow record, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yes. So that range was based on the forty (40) year record.

MR. BOB PETERS: And the -- the chart was suggesting that Manitoba Hydro's total hydraulic generation would come in somewhere between 28 and 40 terawatt hours using the lighter shaded pink, if I may, rectangular box, somewhere between 28 and 40 terawatt hours?

MR. KEVIN GAWNE: That's correct.

MR. BOB PETERS: And that was using the forty (40) year flow record?

MR. KEVIN GAWNE: It was -- yes, it was using the approach where we transitioned to forty (40) year flow record, yeah.

MR. BOB PETERS: And Manitoba Hydro got it wrong on this chart, page 46?

MR. KEVIN GAWNE: In what way did we -- sorry -- we got it wrong is in our hydro generation came in...

MR. BOB PETERS: Came in about 1.5 terawatt hours lower than the lowest range derived from the forty (40) year forecast?

MR. KEVIN GAWNE: One (1) second.

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'm going to ask Ms. Schubert to pull up our direct evidence presentation, please.

(BRIEF PAUSE)

MR. KEVIN GAWNE: Slide 16, please. So I think this is where we're -- the area we're talking about, just shown in a different view. If -- if we're looking at fiscal year 20...

MR. BOB PETERS: '21/'22 would be the year I was talking to you about.

MR. KEVIN GAWNE: ...'21/'22 -- yeah. Actually, this doesn't help us because the range estimate that was prepared in your book of documents was using a forecast that was produced earlier than these ones shown. My apologies. So --

MR. BOB PETERS: All right. Mr. --

MR. KEVIN GAWNE: -- so the range -- the range of outflows -- or the hydrologic record that was used to produce that range resulted in a minimum of about twenty (20) -- yeah, 28 terawatt hours, and our actual production, if I remember correctly, was twenty-six point six (26.6) -- twenty-six point five (26.5) or twenty-six point six (26.6).

MR. BOB PETERS: So the forty (40) year flow record results didn't capture what was actually happening?

MR. KEVIN GAWNE: The range estimate we provided didn't capture -- there's other factors to consider beyond hydrology, Mr. Peters.

And as I was explaining yesterday in talking about the severity of that drought, had we even used the hundred and ten (110) record, we wouldn't have had, you know, the precipitation conditions that existed in 1894 or '97 or whenever that was that were experienced ultimately in 2021 in the Winnipeg River.

So the range estimate that we show here, the hydrology that ultimately occurred was different than the hydrology used here, but there's other factors like outages to generation and ice restrictions affecting hydro -- hydro generation through the winter of 2021/'22 that ultimately results in the annual hydroelectric generation on the system.

MR. BOB PETERS: Mr. Gawne, Manitoba Hydro hasn't done a retrospective analysis, I take it, and the IR you referenced doesn't indicate to me what the result would be. But Manitoba Hydro doesn't want to do that retrospective.

Would that be fair?

MR. KEVIN GAWNE: I -- I think I can tell you right now that if we had used the full hundred and ten (110) flow year record to prepare the range estimate that's shown here, the -- the bottom end of that light shaded red box would be lower. I don't need to do a retrospective. We -- you know, we don't need to do a retrospective to determine that.

But what we did do was a retrospective of our operations through '21 and looking at, well, had we not gone with -- had we not employed our physical based inflow forecasting and the approach of using these multiple flow scenarios in assisting our decision-making through that period, instead gone back to the previous approach of using the long-term flow record purely and the regression-based flow forecasting approach to design our critical drought, our operations would not have been any better and we would not have been restricting flows earlier.

So, you know, trying to test and -- and do a postmortem on our operations, the use of the forty (40) year record through our operating horizon was superior to the previous methods of using purely regression-based flow forecasting.

MR. BOB PETERS: Yeah, Mr. Gawne,

regardless -- and I'm not criticizing the operations and what -- or what was or wasn't done, but isn't the objective to get the best forecast possible, and that would be of your net export revenues that you -- your -- your group is responsible for?

MR. KEVIN GAWNE: Yes, the objective would be to get -- of our net export revenue projections, certainly we're wanting to provide accurate forecasts to the extent we can with the information that we have in front of us.

And I think we went through this at great length in the 2021 interim rate application why use of the forty (40) year record is superior to the long-term record. We're able to reflect the storage conditions in the Winnipeg River basin because it's a higher resolution data set.

We're able to use this physical-based inflow forecasting to prime the system, if you will, or reflect the basin conditions.

So, having that higher resolution shorter record allows us to better operate. And -- and in our analysis that's summarized in -- in appendix 5.4 and subsequently reviewed by both Dr. Roy and Daymark, that the use of the forty (40) record provides a suitable range for the purposes of

budgeting and is -- the benefits that it provides in our ability to account for water in the Winnipeg River basin, you know, justify its use over the full long-term record.

And there's other reasons, stationarity or the climate change effects and the like, and that's reviewed quite extensively by Dr. Roy -- Roy.

And ultimately, we are providing an average -- we're not using average flows. We provide to our financial teams the average revenues and average costs of that net export revenue equation that we showed on yesterday based on a range of flow conditions.

And I think the delta between the two (2) cases -- we had it up here on the distribution -- is in the order of 10 or $15 million on a -- on a year where we're producing power with revenues of the 2 to $3 billion range.

I'm not saying $16 million isn't significant but, sir, I would -- I would maintain that there is a lot of other factors that play into our long-term financial forecasts. And I think the -- the benefits that using that shorter record provide outweigh the -- the costs of a slightly different projection depending on which record we're using.

MR. BOB PETERS: Does that forty (40) year record --

MR. HAL TURNER: Mr. Peters, sorry, if I -- if I could just add. Ms. Schubert, could you bring up DEA number 2, please, and turn to page 20 and 21.

(BRIEF PAUSE)

MR. HAL TURNER: Thank you. So, Daymark was involved in extensive discussions with Manitoba Hydro staff. And they've done a great job on pages 20 and 21 speaking to the forty (40) year flow record versus the hundred and ten (110) year flow record.

I'm not going to read it all now, but if we could go to page 21. And if we go down to the last paragraph, I'm just going to repeat what they said. So:

> "We find that the Manitoba Hydro's justification for this change is satisfactory. There are significant benefits to the spacial and temporal data granularity in the forty (40) record and as discussed above."

And that above is the two (2) pages. So, there's an excellent summary of the benefits of this model on these two (2) pages that would help the Board. Thank you.

MR. BOB PETERS: Mr. Gawne, is that forty (40) year flow record going to grow year by year; it's going to rolling forward?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'll have the team behind me help out with the reference, but we haven't made that determination, Mr. Peters. I think, as time progresses and we can hang on to this higher resolution data that I talked about that can feed our hydrologic models, we may extend the horizon.

It's kind of a function of a number of factors, computational power and all these things, so we -- we'll continue to look at that. And -- and we've committed to -- or explained, sorry, in tab 5 of our application an initiative underway right now called the Corporate Flow Record Improvement Initiative, CFRI, where we are looking at their historic record and the suitability and duration appropriate for operations.

What I do want to add here though is, although we're using that forty (40) record for our operations planning and for our budgeting, we haven't -- we're not ignoring our most severe drought, so our -- our reliability planning and our long-term system planning.

Our long-term system planning is still recognizing the full record of hydrology. So, the '40/'41 critical drought year is still a part of our long-term planning and our reliability operations.

MR. BOB PETERS: In the relative few minutes I have before we have a morning recess I want to turn, please, to page 54 of the book of documents. Mr. Karanwal, this might be something for you to discuss with me.

On page 54, at the bottom of the chart on the 2023/'24 test year and the '24/'25 test year, it suggests to this Board -- if we can just see it a little bit more, the surplus -- system surplus line. I'll ask Ms. Schubert to try to bring that... Yes. Thank you.

We see 164 megawatts in the '23/'24 test year, Mr. Karanwal?

MR. NIKHIL KARANWAL: That's right.

MR. BOB PETERS: And 153 in the next

text year, '24/'25?

MR. NIKHIL KARANWAL: That's right.

MR. BOB PETERS: You said yesterday you're out trying to sell that?

MR. NIKHIL KARANWAL: We're in discussion; that's right.

MR. BOB PETERS: You haven't sold it?

MR. NIKHIL KARANWAL: We are in discussion yet.

MR. BOB PETERS: And you know that the financial forecast before this Board assumes you're going to get exactly zero dollars for that capacity?

(BRIEF PAUSE)

MR. NIKHIL KARANWAL: So, Mr. Peters, if you look at it, and this is the winter peak capacity we're talking about, and it's a very tense river. And what we're looking is to find an opportunity for a similar capacity instead.

MR. BOB PETERS: All right. So, you're telling the Board that the 164 for the 2023 year is restricted to winter capacity, and you think that's too small to go out and sell?

(BRIEF PAUSE)

MR. NIKHIL KARANWAL: I think Ms. Sanclemente will provide some more clarity on that. Thank you.

MS. CHERYL SANCLEMENTE: Okay. So, the 2023/'24 year, there -- the -- we -- there's no ability to market that energy -- or sorry, that -- that capacity, and the reason why is because the markets are already closed. We would have had to have had that committed before the end of 2022.

MR. BOB PETERS: All right. What about the -- the next test year, Ms. Sanclemente, the '24/'25?

MS. CHERYL SANCLEMENTE: That -- I mean, that amounts a sliver of capacity available. And -- and there's a fair amount of uncertainty in Manitoba load for that time period.

MR. BOB PETERS: So I'm interpreting, from that answer, that neither you nor Mr. Karanwal are out there trying to sell that winter capacity because it's too small.

MS. CHERYL SANCLEMENTE: It's -- it's quite small. We are always in conversations with our counter parties and -- and if we see an opportunity

and it does -- we're willing to take that risk. We certainly will look at it.

But -- but that is a very small portion of capacity. And -- and Manitoba load can change significantly in that time frame. So we -- we need to be careful to protect Manitobans that we -- to make sure that we can serve the load of Manitobans first.

MR. BOB PETERS: So you're holding it back for -- for reserve purposes?

MS. CHERYL SANCLEMENTE: We're still looking at opportunities, but for the most part, it is a very small amount. And Manitoba load can change, so we -- we have to consider that in our assessment.

(BRIEF PAUSE)

MR. BOB PETERS: Ms. Sanclemente, on page 51 of the Board counsel book of documents, we see that Manitoba Hydro has capacity sales, including to Basin Electric, that are under -- that are small in volume and that -- those contracts could be met out of the surplus that's available in the forward test year.

MS. CHERYL SANCLEMENTE: Yes, it's -- it's definitely an opportunity. I'm not saying that we wouldn't pursue smaller capacity sales. But we do

have to -- in -- when we took these positions, we -- it was a different scenario. We -- we felt we could protect Manitoba load or have enough for Manitoba load on our system.

Now, as we go forward with these commitments in place, we're looking at whether we should take on more in that time frame.

MR. NIKHIL KARANWAL: Mr. Peters, I could build up a little bit on that.

The question really comes in and we have limited capacity left in the wintertime. How much risk are we willing to take and how much we want to push it.

MR. BOB PETERS: Mr. Karanwal, on page 61 of Board counsels' book of documents, you're actually quoted in a news article. So congratulations. You're the only one of the panel, I think, that is. You were quoted in saying:

> "Manitoba Hydro is here to help out our friends in Minnesota."

Correct?

MR. NIKHIL KARANWAL: That's right.

MR. BOB PETERS: And in light of what Ms. Sanclemente -- I'm sorry, in light of what Ms. Sanclemente -- apologies -- told us, how are you going

to help Minnesota if you don't have any capacity that you're -- you're able to sell?

MR. NIKHIL KARANWAL: So my remarks regarding that is about summer capacity. Not necessarily winter capacity, sir.

MR. BOB PETERS: All right. So just for the -- for the record, on page 56 of our book of documents, we see the summer capacities listed and they are close to 500 megawatts. Although, I guess, the first test year has already closed.

And so, you've got nothing for the first 2023/24 test year, correct?

MR. NIKHIL KARANWAL: That's right.

MR. BOB PETERS: And so, now you're looking at the 2024/25 test year, where you have approximately 496 megawatts of summer capacity available, correct?

MR. NIKHIL KARANWAL: That's right.

MR. BOB PETERS: And under the MISO rules, summer capacity sales are -- are now permitted. They don't have to be year round, correct?

MR. NIKHIL KARANWAL: That's right. This is a construct. Yeah, that's right.

MR. BOB PETERS: My last topic, with the Chair's indulgence, will be to turn to -- let's go

to page 65 of Board counsels' book of documents. And this relates to solar energy prices. And I believe this panel volunteered to speak to that; although, Ms. Fernandes is giving me a look that might -- I might have that incorrect.

MS. ODETTE FERNANDES: We'll let you start and then I'll see how many times I hit the button.

MR. BOB PETERS: Thank you.

CONTINUED BY MR. BOB PETERS:

MR. BOB PETERS: In addition to Manitoba Hydro's imports from MISO, Manitoba Hydro also buys domestically, correct?

MR. KEVIN GAWNE: Yes, we purchase the surplus power off of (INDISCERNIBLE) energy resources off -- sorry, behind the metre solar power.

MR. BOB PETERS: Ms. Schubert, if we could go to Manitoba Hydro's slide presentation, Exhibit 30, and slide 25 for just a minute. Something came up.

In discussions with your president, I had suggested that Manitoba Hydro imports electricity almost daily. Was I wrong, Mr. Gawne or Ms. Sanclemente?

MS. CHERYL SANCLEMENTE: I can answer that. It -- it really depends on our water situation. The tie lines are being used in one direction or the other for sure, but it does depend on whether we're importing on a daily basis --

MR. BOB PETERS: The importing is a regular occurrence though?

MS. CHERYL SANCLEMENTE: Again, it depends on the water situation.

MR. BOB PETERS: All right. And if you import from MISO, you're getting whatever generation mix is online in MISO when it ships the electrons?

MS. CHERYL SANCLEMENTE: That's correct.

MR. BOB PETERS: You don't stream clean electrons versus dirty electrons?

MS. CHERYL SANCLEMENTE: There is no mechanism to do that.

MR. BOB PETERS: All right. And this chart shows us that 66 percent of MISO is thermal based, correct?

MS. CHERYL SANCLEMENTE: Correct.

MR. BOB PETERS: And when we talk about Manitoba energy, there are commercial wind farms

in Manitoba and there are also customers that are putting on solar behind the metre, would that be correct?

MR. KEVIN GAWNE: That's correct, Mr. Peters.

MR. BOB PETERS: And Manitoba Hydro used to have programs related to the installation of solar panels, but now that's over at Efficiency Manitoba. Also correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah, the programs are run by Efficiency Manitoba.

MR. BOB PETERS: And is it correct that it's Manitoba Hydro, not Efficiency Manitoba, that sets the rate that is paid to customers for their excess energy?

MR. KEVIN GAWNE: That's correct.

MR. BOB PETERS: And in the book of documents, on page 65 -- Board counsels' book of documents, Exhibit PUB-19-2 -- there is some information that was provided in an Information Request as to what those rates have been historically.

And if we can turn to page 66, Ms.

Schubert, we see that the current rate, at the bottom of page 66, is that Manitoba Hydro's excess energy price is six-point-five (6.5) cents -- oh, it's six-point-five (6.5) cents per kilowatt hour. I'm sorry, the decimal points --

MR. HAL TURNER: Mr. Peters, I'm sorry. I'm just going to interject for a second.

I -- the market sets the price for the excess energy. Not -- not -- Manitoba Hydro obviously participates in the market, but if you think about solar energy, you know, it's not a dispatchable (phonetic) resource. It's there when the sun shines.

You know, in our climate, if we're in spring, it's my -- you know, one of my favourite times of year. I think we all -- you know, in March and April, you can feel the heat of the sun. And you feel that in July and August.

You don't feel the heat of the sun so much in January and February, right, when we really need that capacity net energy.

So it's a product that is -- the value that we pay reflects the value that that product reflects. And so, it's a market-based price.

We -- we generally take that excess solar energy -- we get most of it when we have lots of

energy in the spring and the summer. And so, what typically happens is that energy gets sold on the export market as a opportunity sale. And so, the price that we pay reflects that.

So I would -- I would suggest that the market sets the price for the excess energy.

MR. BOB PETERS: Well, I'm not sure I agree with you, Mr. Turner. And the reason I say that is, on the sheet that's in front of you on the screen, a solar customer will be selling their surplus energy back to Manitoba Hydro for basically the next year at six-point-five (6.5) cents a kilowatt hour, correct?

MR. HAL TURNER: That's correct. And I believe --

MR. BOB PETERS: It's not based on the forward part --

MR. HAL TURNER: I believe that -- I believe that price is the average price from the previous year.

MR. BOB PETERS: Okay. But it's a historic view, not a forward view.

MR. HAL TURNER: Correct.

MR. BOB PETERS: All right.

MR. HAL TURNER: So the historic market has set that price.

MR. BOB PETERS: All right.

MR. KEVIN GAWNE: If I could just -- sorry, if I could just add. So yes, Manitoba Hydro doesn't calculate or doesn't clear the market. The market clears as it does and the historic pricing is the underlying information that forms this average.

Manitoba Hydro -- Manitoba Hydro's use of this excess energy price is set based on the value that that wind, or pardon me, that solar is pushing back into our system. So, it's the -- it's the -- it's the process that Manitoba Hydro is setting. It's not the actual price. That's a product of the historic market clearing.

MR. BOB PETERS: You're saying, Mr. Gawne, that Manitoba Hydro does the math with the benefit of the rear view mirror.

MR. KEVIN GAWNE: Do the math and -- and we stand by the evaluation of what that product is that's coming on to the -- our grid.

MR. BOB PETERS: And why doesn't Manitoba Hydro use Manitoba Hydro's marginal cost of generation?

MR. KEVIN GAWNE: That -- it's a -- it's a good question, Mr. Peters. There are some -- the -- Manitoba Hydro's marginal cost of generation

is, for one thing, it's a sensitive -- sensitive data commercially sensitive information, so there's that dimension to it.

Secondly, it's based on a forecast. It's not to say that that's not a good forecast, but it's based on forecasts. And whereas this approach provides a, you know, information that's based publicly available information that's reflective of the value that that resource, or that type of technology and -- is providing to the Manitoba Hydro system.

MR. BOB PETERS: Manitoba Hydro could also use the surplus energy program, Mr. Gawne, for determining the price for their solar?

MR. KEVIN GAWNE: Are you suggesting that surplus energy program be used because it's reflective of -- of the short run marginal value of energy? Is that where you're going, sir?

MR. BOB PETERS: Yes. It's a public document, I believe.

MR. KEVIN GAWNE: It is a public document, yes. That -- and it's also, you know, a product of water conditions in Manitoba. It's a product of the various things that go into the determination of what that surplus energy price is.

And -- subject to check, I believe that surplus energy price does include a component of -- distribution, pardon me, so that -- that's where things might kind of fall apart a bit, as far as connecting the -- the dots with -- with solar surplus putting -- put onto our grid versus what the surplus energy program is.

And -- like, just in summary the -- the surplus -- or the excess energy price that Manitoba Hydro pays for this energy that's being put on our system is reflective of the value that that electricity provides to Manitoba Hydro, and therefore, all our customers.

It's set with -- that's the foundational principle is -- what -- what is this product, what's the features of this product that we're taking on to our system and what is its value and we will, you know, pay for that product appropriately according to its value.

MR. BOB PETERS: I think we agree, Mr. Gawne, that it just -- it's a lagging indicator is what Manitoba Hydro would be using. Correct?

MR. KEVIN GAWNE: Yes, that's correct, sir.

MR. BOB PETERS: And what we see on

page 71 of Board counsels' Book of Documents, is that Manitoba Hydro's price that it's currently offering is in -- in excess of the energy charge.

For example, charge to -- to some general service customers that aren't paying the distribution. We see the balance of kilowatt hours at 4.4593 cents a kilowatt hour.

And Manitoba Hydro will be paying customers in excess of that amount. Correct?

MR. KEVIN GAWNE: I see those numbers and, yes, according to the pricing --

MR. BOB PETERS: All right. Mr. Chair, I've run up against my time and I do want to thank Manitoba Hydro's witness panels for their responses. Those conclude my questions of them.

I also would like to thank my friends across at the Assembly of Manitoba Chiefs for allowing me to tread a little bit this morning longer. I hope it hasn't too much interfered with theirs and I'll leave it to Ms. Fox and Ms. Guglielmin after the break to -- to deal with that. Thank you.

THE CHAIRPERSON: Okay. Thank you. We'll -- we'll adjourn until 11:00 a.m. and then -- Ms. Fox, will you be doing the cross -- Ms. Guglielmin will be doing the cross. Okay.

The only thing I would ask is consider where you would want a break for lunch, because I think you're going to be going over the -- sort of, over one (1) hour. So, just think in terms of your -- of your cross, because I don't want to -- to upset it. So you may want to pick a natural point.

So, anyways, we'll adjourn until 11:00. Thank you.

--- Upon recessing at 10:50 a.m.

--- Upon resuming at 11:06 a.m.

THE CHAIRPERSON: Thank you. Ms. Guglielmin, please start.

CROSS-EXAMINATION BY MS. EMILY GUGLIELMIN:

MS. EMILY GUGLIELMIN: Hello. My name is Emily Guglielmin, and I'm here with my colleague Carly Fox, and together we represent the Assembly of Manitoba Chiefs. I'll be asking all the questions during this panel.

My questions are for anyone on the panel. I'm not directing them to anyone in particular. And I also want to note that I will be asking high-level questions about export markets and

export forecasts, but I'm not intending to ask any questions that would result in Manitoba Hydro divulging commercially-sensitive information.

I'm going to start off with some high-level questions. Do you agree that Manitoba Hydro's export activities play a material role in determining rate increases both in this Application and through the forecast horizon?

MR. KEVIN GAWNE: Agreed.

MS. EMILY GUGLIELMIN: And I think I heard Mr. Turner say yesterday that, in most years, Manitoba Hydro customers have excess electricity available that can take advantage of market prices.

Is that correct?

MR. HAL TURNER: Correct. Manitoba Hydro has excess electricity, not necessarily our customers.

MS. EMILY GUGLIELMIN: And can you confirm that this means that Manitoba Hydro's assets are currently overbuilt for domestic consumption?

MR. HAL TURNER: I -- I can't confirm that. This is probably a question better for Mr. Gawne, but I'll give it a shot.

As I spoke about in my opening remarks, we need to be able to provide electricity to our

customers under all weather conditions. So our system is designed for those abnormal conditions such as a drought or a winter polar vortex.

So I would suggest it's not overbuilt. It's built appropriately for the constraints that we need to operate under. When we don't have those abnormal weather conditions, there is excess energy available.

MS. EMILY GUGLIELMIN: That would be during average flow conditions?

MR. HAL TURNER: During all flow conditions better than abnormal.

MR. KEVIN GAWNE: If I could just add to Mr. Turner's response. It's not only the water supply conditions, but it's -- it's at time of peak load. So, we have to worry about capacity as well.

MS. EMILY GUGLIELMIN: Do you agree, if Manitoba Hydro's assets are undervalued in neighbouring markets, it would shift a greater percentage of costs to Manitoba Hydro's total asset base, and then that would be shifted to Manitoba Hydro ratepayers?

MR. KEVIN GAWNE: I wouldn't frame it that way. I think it would result in a lower amount of export revenues to subsidize or to the benefit of

domestic customers. So the customers' embedded costs would -- would have to be -- more of those embedded costs would have to be covered by our domestic customers because we would have less export revenue coming in to help pay for those costs.

MR. NIKHIL KARANWAL: If -- if I may add, the export revenue that brings in actually subsidizes the rates for Manitobans by over 20 percent.

MS. EMILY GUGLIELMIN: And reducing the costs to ratepayers through export revenues, do you agree that would have a significant impact for vulnerable ratepayers that struggle to pay their bills?

MR. HAL TURNER: I'm sorry. Would you mind repeating that? Mr. Gawne and I were discussing something and I missed the beginning. I apologize.

MS. EMILY GUGLIELMIN: Do you -- do you agree that reducing the costs to ratepayers through export revenues will have a significant impact for vulnerable ratepayers that struggle to pay their bills?

MR. HAL TURNER: I think it would impact all of our customers.

MS. EMILY GUGLIELMIN: I'd like to

turn to Exhibit AMC-2-10, and down to the response.

So to summarize, this Information Request indicates that Manitoba Hydro conducted a current state analysis of existing export contracts to identify revenue optimization. And Manitoba Hydro concluded that these contracts continue to provide value and do not need to be further optimized.

Is that correct?

MR. NIKHIL KARANWAL: That's right. So we conducted a -- we conducted a study, and what we found is that our top six (6) or seven (7) of these contracts are above market price, and they continue to provide value for Manitobans.

MS. EMILY GUGLIELMIN: I did hear you say earlier this morning net export revenue is the starting point for all flow conditions, and then it's adjusted for other priorities.

So when we talk about revenue optimization, are we talking about extracting the most possible value from Manitoba Hydro's assets in neighbouring wholesale markets and then adjusted for those other priorities?

MR. KEVIN GAWNE: I'm sorry. I think you might have to break that question down for me a little bit.

MS. EMILY GUGLIELMIN: I'm just getting at what is revenue optimization. When we're talking about optimizing export contracts, are we talking about extracting the most possible value from Manitoba Hydro's assets in neighbouring wholesale markets, and then understanding that there's other priorities along with that?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Hopefully this answers your question, but we're trying to optimize the -- optimize the value of our system which ultimately may result in export revenues, and those export revenues benefiting our customers and our domestic customers.

So, as I introduced in our original slides and our direct evidence, we -- we look at things from the system perspective, and being a hydro system, those neighbouring markets are a very large part of how we balance supply and demand.

So we're -- we're trying to optimize how we operate in the operating time frame to -- to achieve as much and best net export revenue as possible to subsidize our domestic customers,

essentially.

And when it comes to the long-term contracts, those contracts are evaluated using, again, those same long system analysis that considers those other priorities of reliability and energy security and adheres to those constraints.

And if there's a contract that shows value, then those contracts would be considered economic and -- and benefit our overall finances and ultimately lower our projected revenue requirements coming from domestic rates.

MS. EMILY GUGLIELMIN: And has Manitoba Hydro ever engaged a third party to review its optimization of export activities?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Well, firstly, it was a lot of work, but it was a -- a good engagement with Daymark Energy Advisors. We didn't engage with them, but they did review our operations and planning and the tools we use. So that would be the most recent review, I think.

And I'm -- I'm certain there's a number, and I'm not remembering them all, but

definitely in 2010 there was a -- what I would call a mega-hearing -- I believe it was 2010, and I'll be corrected if I'm wrong -- where we had Manitoba Hydro engage with KPMG to review our operations.

I think prior to that -- or an optimization in exports. Prior to that, ICF was engaged to review our risk practices, I believe.

And outside of those two (2) reviews of our optimization and export activities, there was other consultants engaged by the Public Utilities Board. Their independent expert consultant was a couple of fellows by the name of Kubursi and Magee.

In 2010, they reviewed our operations, and it involved again them coming into our shop and us showing them all these models and reports and what we do, and they produced a report for the Public Utilities Board at that time.

MS. EMILY GUGLIELMIN: So for this hearing, Daymark was the only third party that reviewed it.

Would you agree that they did not perform a systemic review of how Manitoba Hydro is managing all of its assets in relation to export markets?

(BRIEF PAUSE)

MR. HAL TURNER: Can you expand on what you mean by that systemic analysis, please?

MS. EMILY GUGLIELMIN: Yes. What I'm getting at is that -- was it a fully in-depth and systemic review of export forecasting and how all of Manitoba Hydro's assets are being managed in relation to export markets?

MR. KEVIN GAWNE: Daymark Energy Advisors's scope of work included twelve (12) items, and among them was a -- in terms of the export price forecast, I think the -- the given was that they're -- export price forecasts are -- are assumed to be a given, and that wasn't tested.

However, they were asked to identify if there's anything worthy of further investigation or concern. I apologize, I forget the specific words. And they didn't identify any concerns with our export price forecast.

They did review in quite -- I would -- I would characterize as quite significant detail how we go about forecasting net export revenues in the process and the modelling work that goes into that as, you know, this involved us sharing -- is it over

fifteen hundred (1,500) electronic files, and many of those were data type files that go into ultimately forming our financial forecast, so the export revenue projections that go into that.

They did not -- they were not asked to review our asset management, if that's where you're going with your question, or anything like that. It was more our operations and our forecasts of export revenues.

MS. EMILY GUGLIELMIN: Thank you. I'd like to turn to Exhibit AMC-2-1. Okay.

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: Go ahead. Okay. Manitoba Hydro has indicated here that one (1) area of risk identified as being a top risk in previous risk reporting which has now potentially declined in both impact and likelihood is the potential for reduced excess to export markets.

Is that correct?

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: The bottom of

page 1, sorry.

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: Can you scroll down, please.

(BRIEF PAUSE)

MR. HAL TURNER: So, I think I spoke about it in my -- not I think. I know I spoke about in my opening remarks how the economic regulatory and political climate of the US is something that impacts our price uncertainty.

And so, I think what we're saying here is that the -- we're talking about access to the US market and -- and a reduction in risk in that political climate.

So, yes, we believe that -- that we -- the risk of not having access to that market is reducing.

MS. EMILY GUGLIELMIN: So, is it fair to say then that Manitoba Hydro's assessment is at risk from export markets has actually declined compared to Manitoba Hydro's assessments prior to this

application?

MR. HAL TURNER: I -- I think it's fair to say that the -- that specific risk we were speaking to about having access to the market is declined. The overall risk I'm not sure we're saying it would decline. There's many factors, many things that we'd have to consider when we look at the overall risk.

MR. KEVIN GAWNE: If I could add. I think in our application we speak to the volume of opportunity, energy where we do not have fixed price contracts in place. So, that volume of opportunity is going to continue into the future, and we don't have a certainty on the price.

And -- and there is -- I think the view of the evolving mix of resources that are in the neighbouring systems is such that there is greater downside price risk perhaps relative to previous hearings and previous forecast just with that massive build out of variable renewable resources.

MR. NIKHIL KARANWAL: If I could add some more colour. I think, as you're not aware, the Inflation Reduction Act that came last year, I think that is really affecting the renewables which are coming into the US.

And the business model that Manitoba Hydro had over the last decade or two (2) decade, that needs to be evolve because the market around us are evolving.

And that presents a unique skill -- risk for us, as well, because we are not only the game in the town that is renewable but to see an influx of solar, wind, and other things coming in. Thank you.

MS. EMILY GUGLIELMIN: Thanks. I'll turn now to Exhibit AMC-2-16. Just to the, yeah, start of the response.

In this response, it's my understanding that Manitoba Hydro's position is that internal constraints on its system are limiting Manitoba Hydro's ability to sign long-term export contracts.

Is that correct?

(BRIEF PAUSE)

MR. HAL TURNER: I'm not sure I would characterize it as constraints on our system. I think what we're -- we've talked about, and -- and, again, I spoke to that yesterday in my opening remarks, is we anticipate that we're going to more closely lead the demand -- the change in demand in Manitoba.

So, we anticipate more frequent smaller increment -- incremental additions to our system.

Now, in the past, we would -- we have built large hydro. And that means we've had a significant amount of time to grow into that load, and we don't see that happening in the -- in the future.

So, it's more about how we see our system evolving per se than constraints from the existing system.

MS. EMILY GUGLIELMIN: So, the constraint is supply, basically?

MR. HAL TURNER: Correct.

MS. EMILY GUGLIELMIN: And is it also correct to say that Manitoba Hydro is not assuming any form of medium or long-term export contracts for energy once the current contracts expire?

(BRIEF PAUSE)

MR. KEVIN GAWNE: That's correct. Our financial forecast scenario as part of this GRA doesn't assume that there'll be contracts in place. So, what we're showing in our financial projections included in this application is contracts that are signed.

If -- if we did have contracts in place, or term sheets, those would be included in our financial plan.

MS. EMILY GUGLIELMIN: So, beyond 2025, is Manitoba Hydro assumed to be selling all of its excess energy on spot or day-ahead markets?

(BRIEF PAUSE)

MR. NIKHIL KARANWAL: So, as we had discussed before that, because of system construct and because the way that energy mix is evolving in the MISO market, there might be a requirement for the new type of products on the market, which is not very clear at this point.

But we are frequently in touch with our partners to see what that could evolve like. And if there's an opportunity, we will try to grab it.

MR. HAL TURNER: Sorry, I'll just add one (1) thing. I think the SPC contracts extend past 2025. I'm trying to look to Mr. Nikhil for a head nod. The SaskPower sales. So, they are some contracts that extend past 2025.

MS. EMILY GUGLIELMIN: Okay. And I think this is basically what you were just speaking

to, which is that:

"The continued option of -- adoption of zero marginal cost resources [so that's largely wind and solar] in the wholesale market will put downward pressure on spot and day-ahead energy prices in the future."

Is that correct?

MR. KEVIN GAWNE: Yes, that's correct.

MS. EMILY GUGLIELMIN: So, I would turn to Exhibit AMC-6-4.

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: And -- oh, I think it's the AMC-Daymark Information Request. There we go, yeah.

So, in this response, to summarize, Daymark highlighted the reality that while energy prices are likely to decline, the value of capacity is expected to increase.

Would you agree with that summary?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'm sorry, I'll have to ask, too, that you state your question again, sorry.

MS. EMILY GUGLIELMIN: My question is: Basically, while energy prices are likely to decline, the value of capacity prices are expected to increase. Is that correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah, I -- I think -- I don't want to get into any sensitive information about capacity price forecasts, but I think the -- the view is that energy prices have downward pressure because of those renewable energy resources coming online.

So on a relative basis, it's -- capacity may be more valuable relative to the average energy price, if that helps.

MS. EMILY GUGLIELMIN: Thank you. And I think Mr. Peters discussed the short-term capacity values.

But can you confirm that Manitoba Hydro is including no capacity value in its longer term future net export revenue forecast for this

application?

MR. KEVIN GAWNE: So, of course, there's the capacity revenues that we're receiving now and will be under our long-term contracts that are in place right now. So there's -- there's significant capacity revenue associated with those contracts.

But in terms of any surplus capacity, I think Mr. Karanwal spoke of a sliver of capacity available in the winter. There's no -- there's no capacity revenue associated with -- with that -- with that amount. I think we're talking in the range of 130 megawatts. There's no -- no capacity assigned to that because there's no contracts.

MS. EMILY GUGLIELMIN: Okay. And for the purposes of this application, is Manitoba Hydro considering or estimating any form of revenue from annual capacity auctions in either the MISO or Ontario markets?

MR. KEVIN GAWNE: No.

MS. EMILY GUGLIELMIN: So I emailed two (2) documents in advance of today. The first document I'd like to bring up is the 2022 Annual Planning Outlook for MISO, which, I believe will be Exhibit AMC-7.

And I also indicated in advance that we

were just looking at page 44, which is PDF 45, I believe, of this document. And -- sorry, just the paragraph above the graph.

And essentially, what I'm looking at is this outlook calls for the need for thousands of megawatts of new capacity even if all current assets remain in place. Do you agree with that summary?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: Yes, it appears they're forecasting a summer deficit.

MS. EMILY GUGLIELMIN: So in summary, would that mean that Ontario's likely facing capacity deficits in the short to immediate term at least?

MS. CHERYL SANCLEMENTE: That -- that's correct. It's important to mention, if we're going the direction of Manitoba selling into this market or there's a capacity or an amount -- there's an amount of energy or capacity that we can sell, the Ontario market -- we -- we can only, from our side of the province or from our province, can only sell a total of 50 megawatts into this market.

But even with the 50 megawatt sale into this markets, there is a number of, I guess,

uncertainties around transacting in this market from a capacity standpoint.

MS. EMILY GUGLIELMIN: Thank you. The second new document I provided was MISO's 2022/23 Planning Resource Auction Results. And that will be Exhibit AMC-8.

And page 9 of that document, it shows that the risk of load shedding is possible in zone 1, which I understand to be the Minnesota zone.

Is that an accurate summary?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: Can you go to page 6 of this document, please.

So on the right-hand side of -- of this -- this page, you'll see a chart that shows zone 1 through 10. And you can see that, in zone 1, the dot -- the green, which is committed capacity, is above the line of capacity that needs to be met.

So what that means is there isn't a deficit in zone 1. The actual deficit exists in zone 4. And -- and ultimately, some of the -- the other zones will deliver or be committed to deliver into zone 4 to -- to capture that deficit.

So ultimately, in zone 1, we are not -- that zone is not short capacity.

MS. EMILY GUGLIELMIN: Thank you for the clarification. Could we turn to Exhibit PUB-17-8.

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: And so, here at response 'A', Daymark concludes that the most recent MISO load forecast does not anticipate that the northern MISO annual peak will occur in the winter at any point over the twenty (20) year forecast horizon.

Do you agree with Daymark's opinion?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Maybe while Ms. Sanclemente is -- is verifying, I could help. If we could have Ms. Schubert pull up PUB-MH-1-48A. If we...

(BRIEF PAUSE)

MR. KEVIN GAWNE: So if you look at this table here, There's a discussion. The question -- the original question was about explaining -- I

believe it was related to details on higher winter planning reserve margins in MISO and how that affects Manitoba Hydro.

So all power systems are planned such that they have enough capacity to meet firm load in their system, plus a planning reserve margin. And that's determined, as necessary, to reliably operate the power system.

So MISO has gone and looked at their system and their role as, kind of, overall looking at the system of their balancing area and saying, We've looked at the characteristics of our supply, and in the winter, seven (7) of the last fifteen (15) emergencies we've had on our system have occurred in the winter. So we've got an issue here.

And part of it relates to the type of generation that's in there and -- you know, I won't go into the details. But there's been issues in winter and -- and particularly in the MISO north -- north regions.

So, having issues in the winter, we're now going to a seasonal market. We're going to look at how much planning reserve margin we require in each season. And our analysis has indicated, they need a 41.2 percent planning reserve margin to be able to

reliably operate the system. So, that's 41.2 percent times their system peak demand.

So, you don't usually just plan to have enough capacity to meet the actual, you know, measured metered electrical load at the customer level, you need to have a certain amount of margin above that to reliably operate.

So, that's the total capacity you need. And, in this instance, you can see here, in the summer 2023, the analysis indicates they needed a hundred and forty-three thousand (143,000) megawatts to reliably operate through the summer.

And, in winter, projecting the need is a hundred and forty-six thousand (146,000) megawatts, to deal with these things that I spoke of where they're having challenges in the winter.

So, in fact, looking at total demand on the system, their winter capacity demand is higher now than in the summer.

So, you know, we don't dispute with -- with the -- the statements that Daymark's indicated that looking at the actual load, there's -- there's still summer peaking.

But when you look at how do we reliably operate the system and plan to have enough capacity to

be able to keep the -- literally, keep the lights on through the winter. You need more margin and -- and it's the -- it's the -- it's the total that you have to look at when you have these discussions, I think.

MS. EMILY GUGLIELMIN: Thank you. But, can you confirm that Manitoba Hydro will have surplus capacity and energy in the summer months over the forecast horizon?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Do we have the surplus summary capacity agreed, energy becomes a more complicated question to answer.

So, if -- if we're looking at a -- at a summary capacity sale, you have to understand it -- well, how much energy do we have -- do we need to have in place to deliver on that capacity sale, 'cause ultimately it's the -- it's the energy that's, you know, running people's toasters.

So, we need to have that there as well and -- and so if -- if Mr. Grenwal (phonetic) or -- or Ms. Sanclemente come to our resource group and say, you know, we have this summer sale we might be able to do and we've -- showing that we have this hundreds of

megawatts, couple hundred megawatts of surplus capacity for the summer.

Well, we'll look at that, but we'll evaluate the -- the economics of that and our ability to supply the energy that has to go with that capacity sale, so it's -- you have to look at it from a system perspective. I don't know, we should do a word count on how many times I've said system, so far, but hope that helps.

MS. EMILY GUGLIELMIN: And I guess what I'm getting at, is there the opportunity over the longer term forecast for Manitoba Hydro to enter into some capacity sales to fulfill that summer demand in the -- in the MISO region?

MR. KEVIN GAWNE: We're showing there's surplus summer capacity that we should continue to engage with our counterparts in the -- in the MISO region and try and leverage the value of that surplus, surplus to Manitoba needs.

MR. NIKHIL KARANWAL: And just to put more clear on that. We are having discussions regularly what can be done about that.

MS. EMILY GUGLIELMIN: Thank you. So, move on now to Exhibit PUB-9-19. To the response. Yeah.

And, basically, what I got from this one, I think scroll down a little further. Essentially what I'm looking for is -- it's my understanding that Manitoba -- oh, there we go, right there.

That Manitoba Hydro has concluded that a seasonal capacity auction in MISO or Ontario is not an alternative to firm sales. Is that correct?

MS. CHERYL SANCLEMENTE: Would you be able to re-frame that question, please?

MS. EMILY GUGLIELMIN: M-hm. Well basically what I -- what I'm wondering is has Manitoba Hydro concluded that a seasonal capacity auction in MISO or Ontario, is not an alternative to firm sales?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: There -- there's other factors and circumstances that we would need to explore before we could come to that conclusion unfortunately -- CSI. So we would have to have that discussion on Friday.

MS. EMILY GUGLIELMIN: Okay. Thank you. And, I think this wouldn't be CSI. It's just a confirmation, but Manitoba Hydro has, for the purposes

of this application, assumed it would not sell seasonal capacity for the purpose of forecasting.

MR. KEVIN GAWNE: That's correct. Okay. Mr. Turner consulted me here, I -- I think we haven't assumed capacity revenues associated with those surpluses.

We're not saying that we will not try and, you know, explore opportunities to -- to again maximize value out of that system so.

MS. EMILY GUGLIELMIN: Okay.

MR. HAL TURNER: And -- and if I could just add maybe, Ms. Schubert, if you could pull up Daymark 2, page 38, but then scroll down just to the last sentence there in the second last paragraph.

There's lots of uncertainty with these seasonal capacity sales and so, and Daymark did a great job summarizing it. Basically saying it's impossible to form a monetary value for potential new products for any participants, including Manitoba Hydro.

So, we're not assuming that we won't sell the product, it's just impossible to value the product at this time.

MS. EMILY GUGLIELMIN: And I just wanted to turn to Exhibit PUB-4-46A and at that -- the

bottom of page 3, oh, yeah, right there that -- yes.

So, in this response, Manitoba Hydro discusses some challenges it sees with the summer seasonal capacity markets. I think that's sort of what you were getting at right? Yeah.

Can you confirm that MISO uses an effective load carrying capability or ELCC when determining the value of capacity by different resource types?

MR. KEVIN GAWNE: Okay, I think we can agree, in general, with that statement, but understand that they're looking at their capacity market and -- and there's white papers coming out even a few weeks back, so there is an evolution going on, I think, in MISO's treatment of capacity.

MS. EMILY GUGLIELMIN: Okay. And ELCC is in its simplest of form, the amount of capacity a resource can provide when power is most needed.

Is that correct?

MR. KEVIN GAWNE: Yes, that's correct. So, ELCC just effective load carrying capability just so we're on the same page.

MS. EMILY GUGLIELMIN: Okay, so, as an example a solar panel provides little or no out peak during peak demand hours, so its ELCC would be low, is

that correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: My understanding is MISO assumes, for new solar installations or new solar projects, 50 percent of the installed capacity as -- as summer capacity value for those solar farms.

And then, after that, I think when there's operating history, it's based on its performance. That isn't to say, though, that that's an ELCC study-based value.

I think, as we see higher volumes of solar penetration, as with other renewables, as you get more saturated in those types of resources, the effect of load-carrying capability declines more and more of that resource that you add on to your system.

MS. EMILY GUGLIELMIN: Thank you. That was actually my next question.

MR. KEVIN GAWNE: Okay. Did I answer it?

MS. EMILY GUGLIELMIN: Yeah. So -- so, I can skip ahead a bit, which is just to ask that, since Manitoba Hydro has an asset that can provide its full amount of stall -- installed capacity, during

peak demand hours, it has a relatively high ELCC.

Is that correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: So, I think the question was: Is it a high value per our hydro units, and, yes, it is.

MS. EMILY GUGLIELMIN: And do you expect that to change materially from its current level?

MR. KEVIN GAWNE: I -- I think, you know, what affects the ELCC on a -- any generator is its performance and how you study that performance.

So, if -- if it was such that you performed a -- a study to determine what's -- or update our effective load-carrying capability of our hydro units, for example, and inform -- information used in those studies are the forced outage statistics of that generation and if our forced outage rates were to go up, for instance, then, effectively, you know, the load-car -- carrying capability of those resources would decrease.

MS. EMILY GUGLIELMIN: Okay. But, otherwise, it would?

MR. HAL TURNER: If -- if I may add, I think, you know, we're making an assumption. We -- I spoke about this yesterday. We're assuming that our existing assets are going to continue to perform.

One of the key enablers of that is that we're able to invest appropriately to deal with our aging assets. So, if we don't invest enough, then the ELCC could drop -- or their capacity -- the ability to provide capacity when we need it most could drop. So, it's very important that we continue to invest.

MS. EMILY GUGLIELMIN: Thank you. So, would you agree that the combination of declining ELCCs for solar resources, as more and more come on, due to current tax incentives and, then, the status quo ELCC for Manitoba Hydro's assets, if we assume that performance will remain the same, do you agree that, all else being equal, this will increase Manitoba Hydro's capacity value in the future?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'm sorry. I think we'll have to ask that you re-frame the question.

MS. EMILY GUGLIELMIN: Sure. I think I can shorten it up. So, we just discussed the

likelihood that as solar resources come on, the ELCC will decline. If all else remains the same, Manitoba Hydro's ELCC should continue to remain relatively high.

And so, what I'm asking is, all else being equal, given these two (2) scenarios, do you expect that Manitoba Hydro's capacity value will increase in the future?

MR. KEVIN GAWNE: Okay. So, when we're speaking of solar and the declining ELCC of solar, we're talking about solar and the neighbouring markets, correct?

MS. EMILY GUGLIELMIN: Yeah.

MR. KEVIN GAWNE: We're not talking about solar --

MS. EMILY GUGLIELMIN: Yeah, sorry.

MR. KEVIN GAWNE: Okay. So I understand.

MR. HAL TURNER: I just have a clarifying question. You said the value of our capacity will increa -- or our capacity value increase.

So, are you talking about the amount of capacity or what it's worth?

MS. EMILY GUGLIELMIN: What it's

worth.

MR. HAL TURNER: Okay. Thank you.

MR. KEVIN GAWNE: Okay. All else being equal, if there's a higher demand for capacity in the market because whatever the resource mix is and its ability to produce capacity then, yes, the value of capacity will increase.

But will the value of capacity, increasing in the MISO market, for instance, affect Manitoba Hydro? Well, that depends if we have capacity to sell into that market. So, of course you need a megawatt number to multiply it by a price.

And -- and if -- as we're showing in our direct evidence, we have a need for capacity potentially in the early 2030, so that's surplus capacity. On an annual basis, it's not necessarily there for use to sell.

MS. EMILY GUGLIELMIN: Okay. I wonder if this is a good time to go for a break?

THE CHAIRPERSON: Certainly. Do you know approximately how much more cross you have?

MS. EMILY GUGLIELMIN: Like -- I'm hoping no more that fifteen (15) minutes.

THE CHAIRPERSON: Well, did you want to finish it now?

MS. EMILY GUGLIELMIN: Sure.

THE CHAIRPERSON: And then we'll break for lunch after you're finished.

CONTINUED BY MS. EMILY GUGLIELMIN:

MS. EMILY GUGLIELMIN: So, I'll turn to Exhibit PUB-9-56. And I believe, yes, this is information from Manitoba Hydro that it is expanding the capacity of the Pointe du Bois Renewal Energy Project.

Is that correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: So it -- yeah, the pre -- the Pointe du Bois Renewable Energy Project, or PREP, involves adding eight (8) units to that station, which would increase the capacity, relative to where it is today.

But I -- I would add that there's a lot of units that are not in service there now, so it's less of an increase relative to what the station was putting out when all those units were available and running.

MS. EMILY GUGLIELMIN: Is that project

being used explicitly to sell into neighbouring markets to offset costs?

(BRIEF PAUSE)

MR. KEVIN GAWNE: So, we -- we operate -- or Pointe du Bois and the PREP Project will be a part of the overall system, right. So, it'll add to the total, but it's not that the megawatts coming out of Pointe du Boise are painted and sent to our neighbours south, or west, or east.

So, it's a part of the integrated system. The energy from that project, a portion of that will be opportunity energy, so it'll be there in decent water years, but not in drought. So, that opportunity energy will go into that bucket of surplus above Manitoba's needs and will be valued at the export energy price.

And in the interim period while we have this sliver of surplus before 2030, you know, we -- there'll be that marginal amount of extra capacity available from Point du Bois.

I think there -- I -- maybe I could get some help from the back, but there was an IR response because the PREP project is in our base assumption.

It's in our base case existing -- existing system capacity supply and demand analysis that was submitted as MFR-43. But...

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah, I -- I apologize. I lost my train of thought. So, had -- had we not assumed that PREP would be part of our supply system, the need date for new capacity would be earlier. I think we would have been telling this Board that we have deficits starting in 2027 -- in 2027. Then we get back into the black. And then I think our need date would have been 2029 for capacity.

So, with the addition of the PREP project, it's -- as a starting point, our -- our potential need date for capacity is 2030.

MS. EMILY GUGLIELMIN: Oh, thank you. To a different topic, Daymark has suggested that Manitoba Hydro's using a conservative approach in its export planning.

Do you agree with Daymark's suggestion?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Can you -- can you help us and just take us to that portion of the report.

MS. EMILY GUGLIELMIN: If we could go -- I -- I'll just bring the IR, Exhibit AMC-6-8. Or it might be a little bit quicker to...

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: Maybe I have the -- oh, yeah, so it's just at the bottom end. Although your assumptions are reasonable, it is conservative.

MR. KEVIN GAWNE: I -- I think -- and I will speak in general terms. I think they agreed that our assumptions are reasonable and appropriate for the use in financial forecasting. And they encouraged Manitoba Hydro to find value for existing assets and -- and potentially pursue summer export sales.

MS. EMILY GUGLIELMIN: Do you agree it's -- that your outlook has been conservative?

MR. KEVIN GAWNE: I don't believe our outlook on net export revenues is conservative. I believe it's appropriate and reasonable and based on

the best information that we have available to us.

If we were to assign value or premiums to the surplus energy or some value of capacity for what little surplus capacity we're showing as available, that would be nice to show that, but that would be hoping for a revenue that we can't be assured is going to materialize.

And I don't think that would be appropriate for financial forecasting. So, I think what we put forward is -- is reasonable, and that was agreed to by -- or I believe, in general, confirmed by Daymark as being a reasonable forecast.

MS. EMILY GUGLIELMIN: And sort of on the flip side of that scenario, if net export revenue turns out to be above Manitoba Hydro's current forecast, do you agree that taking a conservative position today would be likely to result in current ratepayers overpaying compared to future ratepayers?

MR. HAL TURNER: I think that question would be better posed to the Rate Requirement Panel.

MS. EMILY GUGLIELMIN: Okay. And maybe this would, also.

But essentially, a conservative forecast today, it would result in potential for higher than necessary rates for customers?

MR. HAL TURNER: Again, I think that would be better served by the other panel.

(BRIEF PAUSE)

MS. EMILY GUGLIELMIN: And I just want to turn -- I only have a couple more questions -- turn to Exhibit AMC-6-14.

In this response, Daymark indicates that Manitoba Hydro's hedging strategy could benefit from an updated or formalized approach.

Do you agree with that suggestion?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: Manitoba Hydro acknowledges Daymark's recommendation. And there is work being led by the enterprise risk management division related to enterprise risk and tolerance, enterprise risk manage -- or enter -- excuse me -- enterprise risk appetite and tolerance.

And we're working too from an energy trading perspective. And they're looking at shaping what the outcomes will be. So, we are definitely working on it, and we do take their -- their point

seriously.

MS. EMILY GUGLIELMIN: Okay. Thank you. And my last question, it relates to Exhibit PUB-4-20. And in this response, Manitoba Hydro indicated that:

> "Rate increases of 1.4 percent annually could reach the 80 percent debt target but would fail to meet the 70 percent debt target by 2039 and beyond."

And I'm not asking you if that's correct because I understand that's not. But as a summary of this, do you agree that's what's written there?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'm sure you summarized it well.

MS. EMILY GUGLIELMIN: My question is: Do you agree that this is assuming a very conservative or negative view on export revenues that Manitoba Hydro may earn over the forecast horizon?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I -- I think -- I don't think we can comment specifically around these details. It is best put to the Revenue Requirements Panel.

But as I said earlier, I think they forecasted net export revenues, which is prepared by folks on this Panel and their teams, as -- as reasonable and appropriate for financial plan.

MS. EMILY GUGLIELMIN: Thanks. Those are all of my questions.

THE CHAIRPERSON: Thank you. We'll adjourn until 1:05. Thank you.

--- Upon recessing at 12:08 p.m.

--- Upon resuming at 1:02 p.m.

THE CHAIRPERSON: Thank you. Mr. Williams...?

CROSS-EXAMINATION BY DR. BYRON WILLIAMS:

DR. BYRON WILLIAMS: Good afternoon, members of the panel. Mr. Turner, I'm not going to ask you many questions. I hope you won't be hurt, but let's start off with you just with one.

MR. HAL TURNER: I've got pretty thick

skin, so --

DR. BYRON WILLIAMS: Okay.

MR. HAL TURNER: I think I'll be okay.

DR. BYRON WILLIAMS: When Manitoba Hydro refers to the export market, you're referring to the marketplace for electrical power beyond the borders of Manitoba, whether that's our American friends through the mid-continent system operator or neighbouring Canadian markets in Saskatchewan and Ontario, agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: And when supply exceeds Manitoba customers' needs, the ability to access and sell into the export market provides Manitoba Hydro with revenues that are key to its finances, correct?

MR. HAL TURNER: I would just offer a slight tweak on that. It's when supply exceeds our firm commitments. So sometimes that may exclude firm export customers as well, but other than that, agreed.

DR. BYRON WILLIAMS: Okay. I'll accept that slight tweak. And when Manitoba internally is experiencing drought or emergency conditions, the ability to access and buy from the ex -- export market makes an essential contribution to

the reliable provision of power in Manitoba, agreed?

MR. HAL TURNER: Agreed.

DR. BYRON WILLIAMS: Mr. Gawne, I'm not sure I want to take any of us back to 2017/'18, but at a high level, you remember the public hearing into Manitoba Hydro's '27/'18 (sic) and 2018/'19 General Rate Application?

MR. KEVIN GAWNE: Yes, I recall that, but not every detail.

DR. BYRON WILLIAMS: Well, I want to take you forward from that and -- and look at some changes. And -- and one (1) of the changes since that time I'll suggest to you is that Manitoba Hydro has completed the Manitoba-Minnesota Transmission Project, or MMTP, agreed?

MR. KEVIN GAWNE: Agreed. That came into service in June of 2020.

DR. BYRON WILLIAMS: And when we talk about the Manitoba-Minnesota Transmission Project, it would be fair to say that it is a major 500-kilovolt transmission line that interconnects Manitoba Hydro with Minnesota Power's Great Northern transmission line, agreed?

MR. KEVIN GAWNE: Agreed.

DR. BYRON WILLIAMS: And it would be

fair to say that Manit -- the MMTP, or Manitoba-Minnesota Transmission Project, has been critical to Manitoba Hydro's ability to interconnect with the MISO market, agreed?

MR. KEVIN GAWNE: Yes. It's a significant component of our interface to the MISO market, yes.

MR. BOB PETERS: And that connection between the Manitoba-Minnesota Transmission Project and the Great Northern transmission line significantly increased Manitoba Hydro's ability to import more energy, agreed?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah. The -- the construction of MMTP provided another 700 megawatts of firm import capability, essentially doubling our firm import capability.

It's not to say it's something that can be done in all hours. Back to the supply-demand balance that we talked about on -- in our direct, you're either pulling power into the province or you're pushing power out of the province. You can't do both at the same time.

So to the extent we have obligations to push power out of the province and -- and deliver on our firm contracts, as Mr. Turner was alluding to, we can't pull power in on that same line at the same time.

DR. BYRON WILLIAMS: So in essence, of course, you're agreeing that it doubled the import transmission capability of Manitoba Hydro, correct?

MR. KEVIN GAWNE: Correct. And, sorry, pardon me, on the US interface.

DR. BYRON WILLIAMS: On the US interface, and I apologize for the imprecision.

And it also led to opportunities for firm transmission coming north at times of need, agreed?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yes. Manitoba Hydro has the use of firm transmission, up to 1,400 megawatts, but we don't necessarily have capacity contracts up to that amount which involves someone dedicating capacity on their system to back up that import.

DR. BYRON WILLIAMS: But that number

of firm transmission up to 1,400 or 1,398 megawatts is a -- is a key factor in terms of imports for Manitoba Hydro, agreed?

MR. KEVIN GAWNE: Agreed.

DR. BYRON WILLIAMS: Mr. Karanwal -- and if I mispronounce your name, you'll -- you'll correct me. Okay. Thank you.

You're aware that as a consequence of completing and being -- and committing to and completing the Manitoba-Minnesota transmission line, Manitoba Hydro was also able to enter into a 250-megawatt system power sale to Minnesota Power, agreed?

MR. NIKHIL KARANWAL: That's right.

DR. BYRON WILLIAMS: And the MMTP, or Manitoba-Minnesota Transmission Project, enables other energy sale, energy exchange agreements with -- with Minnesota Power, correct?

MR. NIKHIL KARANWAL: That's right.

DR. BYRON WILLIAMS: Mr. Gawne, the -- the availability of firm or dependable transmission capacity is important to Manitoba Hydro for reliability and -- and planning purposes, agreed?

MR. KEVIN GAWNE: That's correct.

DR. BYRON WILLIAMS: And it would be fair to say that because of that dependable import

capability of the MMTP, Manitoba Hydro is more resilient today in the face of drought or emergency than -- than it was prior to 2020, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Mr. Williams, all else being equal, the increased firm capacity is adding to the reliability, yes. Other things have changed, of course, since we last met in 2017.

DR. BYRON WILLIAMS: I agree that I was much better looking, for example, at that point in time. And I'm not sure who this goes to, but another major milestone that Manitoba Hydro has achieved since that GRA a -- a few years ago is the completion of the Birtle Transmission Project, correct?

MR. KEVIN GAWNE: That's correct.

DR. BYRON WILLIAMS: And that was completed sometime in 2021; agreed? March, if you're looking.

MR. KEVIN GAWNE: I'm going to say March 2021.

DR. BYRON WILLIAMS: Thank you.

MR. KEVIN GAWNE: March 29th.

DR. BYRON WILLIAMS: Oh, very precise.

And with the additional transmission, just to back up a second, the Birtle transmission project would be a 230 kV transmission line and it runs from a bit south of Birtle to the Saskatchewan border where it connects with the SaskPower system, agreed?

MR. KEVIN GAWNE: Yeah. That line is 230 kV and it runs from Birtle, Manitoba, to their Saskatchewan Tantallon station.

DR. BYRON WILLIAMS: And by "their", you're referring to Saskatch -- SaskPower, correct?

MR. KEVIN GAWNE: That's correct.

DR. BYRON WILLIAMS: And with the additional transmission capacity provided by Birtle, that transmission project, Hydro was able to enter into a 215 -- one five (15) for the reporter -- megawatt sale to Sask -- SaskPower Corporation, correct?

MR. KEVIN GAWNE: That's mostly correct, Mr. Williams. 190 megawatts of that was made possible through the construction of the Birtle Tantallon line, but there's a 25-megawatt component of that SPC sale for delivery at the north interface of Saskatchewan.

DR. BYRON WILLIAMS: So just so I'm clear, the -- the new transmission line enabled the --

about 190 megawatts, and you're saying that the rest of it was delivered through another -- would have been deliverable through another line.

Is that what you're saying?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I understand that the Birtle Tantallon line provided an additional 90 hundred (sic) megawatts -- 90 to a hundred megawatts prior to the two fifteen sale. Just hold on one (1) sec, sorry.

DR. BYRON WILLIAMS: I can probably help you with that, sir. You want to talk about --

MR. KEVIN GAWNE: I'm looking for --

DR. BYRON WILLIAMS: -- sale as well. Okay.

MR. KEVIN GAWNE: Well, there was -- there's a hundred megawatt sale to Saskatchewan that existed prior to the commencement of the two fifteen sale. Just one (1) moment, please.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: Figure 510 is a

good one to look to.

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah, my apologies. I was -- I was getting a little tripped up with numbers. So, the SaskPower hundred sale terminates in 2040. And so, the incremental capacity that the Birtle Tantallon line provides provided that additional export capability to deliver on 190 megawatts of the 215 megawatt sale.

DR. BYRON WILLIAMS: And so, just to be clear, and I apologize if my questions were a bit confusing.

The Birtle line has obviously been a key playing in enhancing access and -- and getting that dependable sale to Saskatchewan Power of 200 some megawatts, agreed?

MR. KEVIN GAWNE: Yeah. It was -- it was necessary to have that additional SPC sale. It's not providing the import capability. It's -- it's a different --

DR. BYRON WILLIAMS: Yeah.

MR. KEVIN GAWNE: -- situation than the MMTP line.

DR. BYRON WILLIAMS: And just in terms of the two (2) contracts with Saskatchewan Power, one (1) is a hundred megawatt sale running from 2020 to 2040, correct?

MR. KEVIN GAWNE: Yes, that's correct. And Daymark's -- well, sorry, is this the book of documents? Daymark's report at page 50 includes a summary of those contracts.

DR. BYRON WILLIAMS: And the second sale is the 250 (sic) megawatt sale which is actually running from June 2022 upwards of thirty (30) years or to -- as much as thirty (30) years, agreed?

MR. KEVIN GAWNE: I think, Mr. Williams, you said 250, but that's 215.

DR. BYRON WILLIAMS: I hope I said 215 but, if not, I -- I would appreciate the correction. Thanks. And are you confirming the 215?

MR. KEVIN GAWNE: Confirming, yes.

DR. BYRON WILLIAMS: Mr. Karanwal, as -- as compared to opportunity sales, these long-term dependable sales to Saskatchewan on average provide additional value to Manitoba Hydro, agreed?

MR. NIKHIL KARANWAL: That's right.

DR. BYRON WILLIAMS: And they also provide value, I'll suggest to you, in terms of price

stability and certainty as compared to opportunity sales, correct?

MR. NIKHIL KARANWAL: That's right.

DR. BYRON WILLIAMS: And the big picture and in the face of dynamic market conditions, these sales provide an important and long-term hedge against revenue uncertainty, agreed?

MR. NIKHIL KARANWAL: That's right.

DR. BYRON WILLIAMS: I wonder if we can turn in tab 5 of Manitoba's materials to figure 5.15. Ms. Schubert, as always, is ahead of me. And I'm not sure who this should be to, but if it's Mr. Gawne or Ms. -- Ms. Sanclemente, I'm -- I'm happy with either of you, but let's start with Mr. Gawne.

Mr. Gawne, yesterday you spoke to Mr. Peters regarding the 2003/'04 drought, and you discussed its significant financial impacts on Manitoba Hydro. Do you remember that, sir?

MR. KEVIN GAWNE: Yes.

DR. BYRON WILLIAMS: And, Mr. Gawne, you were around during that time and -- with the Corporation.

And -- and you have, at a high level, some familiarity with those events?

MR. KEVIN GAWNE: Yes, I'm quite

familiar with those events. I was around. I had hair then.

DR. BYRON WILLIAMS: I thought you were. And I think -- sir, I'll say -- I'll suggest to you, as well, that since '03/'04, Manitoba Hydro, without asking you to elaborate, but has spent a lot of time trying to learn from the experience of the '03/'04 drought.

Would that be fair, sir?

MR. KEVIN GAWNE: Yeah, I think Manitoba Hydro's continued to learn and that was an experience that we learned from.

DR. BYRON WILLIAMS: And one (1) of the challenges during the '03/'04 drought, of course, was, when Manitoba Hydro wanted to import power from its American friends, the import of that power was -- was very expensive, agreed?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: I'll -- I'll attempt an answer to that. Since 2003, a lot of things have changed. It was -- in 2003, it was primary a bilateral market.

Now, with the emergence of the standard

markets, we've come across a lot -- or been able to enjoy a lot more flexibility.

So, we can -- instead of being required to purchase from counter parties directly on the -- on the south side of our transmission line, we're able to -- to go and purchase from an overall market that can supply us, which is -- and provided a large amount of flexibility.

The other -- the -- the other point is, when you go and you purchase from counter parties, they require more of a fixed -- a fixed schedule. So, they'll sell 50 megawatts to us seven o'clock through twenty-two o'clock at night.

And -- and in the markets, we can actually go to the markets and purchase whatever megawatts are economic in whatever hour, so -- so that was a huge advantage.

And then, in addition to that, in 2003 we owned -- we did not own the firm transmission on the southern part of our line. But over time, since 2003, we worked with our counter parties and, also, purchased from our transmission owners firm transmission.

So, we have ownership of the firm transmission and we have access to the markets on our

own, which has been a huge change.

DR. BYRON WILLIAMS: Thank you, Ms. Sanclemente. And -- and hopefully your lawyer won't chastise me for this. You're sharing pearls of wisdom, and I just might move the mic a little bit just to make sure the court -- court reporter catches all your words. So, thank you for that. And -- and that is very helpful.

And just to go back to my original question which you answered the spirit of, but I just want to go back for a second.

One (1) of the realities of the '03/'04 drought experience was Manitoba Hydro had very -- very expensive cost of imports in -- in part due to the lack of flexibility in the market and that you had to buy directly for your partners, agreed?

That was one (1) of the big financial consequences -- challenges of the '03/'04 drought, correct?

(BRIEF PAUSE)

MS. CHERYL SANCLEMENTE: The purchase prices were definitely one of the contributing factors to 2003 and the cost of the drought.

An actual comparison, I think we'd have to go back and -- and look at --

DR. BYRON WILLIAMS: Not necessary. I just wanted to get a high level look. And thank you for -- for your -- your answer.

And just to finish this particular thought, so one of the strategic objectives of Manitoba Hydro since that '03/'04 drought, was to enhance import capability including through -- one element of that was securing firm import transmission service through enable reliable economic imports. Agreed?

MS. CHERYL SANCLEMENTE: Yes, both for exports and imports, agreed.

DR. BYRON WILLIAMS: And again, recognizing that it is for exports and imports, the MMTP was also very important by increasing import transmission capacity, agreed? For the purposes of drought resilience, correct?

MR. KEVIN GAWNE: I would agree with that, Mr. Williams.

DR. BYRON WILLIAMS: Thank you. And Ms. Sanclemente, I think it's you, but it -- it'll be whoever it is on your panel.

If we direct our attention to figure

5.15 -- and I know Mr. Peters has discussed this with you so I'll try not to trench on where he has gone. But if we're looking for the levels of off-peak imports, that will be in the colour yellow, agreed?

You're nodding your head. Is that a "yes"?

MS. CHERYL SANCLEMENTE: Yes.

DR. BYRON WILLIAMS: And on-peak imports are in red, correct?

MS. CHERYL SANCLEMENTE: Correct.

DR. BYRON WILLIAMS: And if we look on the 'X' axis, we can see the monthly physical exports and imports as measured in gigawatt hours, correct?

MS. CHERYL SANCLEMENTE: Yes.

DR. BYRON WILLIAMS: Okay. And if we look at the 'Y' axis, that is just the particular month of the time period running from April of 2021 through to August of 2022, agreed?

MS. CHERYL SANCLEMENTE: Yes.

DR. BYRON WILLIAMS: And, of course, this captures the -- the drought period and beyond it that Manitoba experienced in -- Manitoba Hydro experienced in 2021/22, agreed?

MS. CHERYL SANCLEMENTE: Yes, agreed.

DR. BYRON WILLIAMS: And if -- just to

get a sense of this -- by August of 2021, in terms of on-peak imports, Manitoba Hydro was looking at a little less than 200 gigawatt hours that month.

Would that be fair?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I think that's correct, sir.

DR. BYRON WILLIAMS: And similarly, we're looking at a bit less than 200 gigawatt hours per month for on-peak imports in -- in August of 2021, agreed?

MR. KEVIN GAWNE: Correct.

DR. BYRON WILLIAMS: And by its peak on or about -- well, in January of 2021, (sic) as we move along to the right, Hydro was relying upon off-peak imports for over 400 gigawatt hours that month, agreed?

MR. KEVIN GAWNE: Mr. Williams, I think you may have said January '21, but --

DR. BYRON WILLIAMS: January '22. Thank you for correcting me. My apologies.

MR. KEVIN GAWNE: Yeah. So our off-peak physical imports in January of '22 were, yeah,

slightly in excess of 400 gigawatt hours.

DR. BYRON WILLIAMS: And if we want to look for the high month for on-peak physical imports, we're probably looking at November of 2021 in excess of 300 gigawatt hours, is that right?

(BRIEF PAUSE)

MR. KEVIN GAWNE: That's correct. Where we're -- I just want to be precise in the discussion here and it's -- the chart is prepared by -- sorry, was prepared using net -- or pardon me -- using physical transactions. So the -- the axis is monthly physical exports and imports.

We'll see where it goes, but there is -- as we were speaking of this morning -- hedging.

DR. BYRON WILLIAMS: You don't have to worry about the hedges. That's --

MR. KEVIN GAWNE: Don't have to worry about the hedges, okay.

This is physically going in and out of -- or pardon me -- physical transactions being scheduled in and out of the province.

DR. BYRON WILLIAMS: And at times during the drought, Manitoba Hydro was running that --

that import capacity full out, right up to thirteen-ninety-eight (1,398), agreed?

MR. KEVIN GAWNE: At times. It's not always possible to load that line up.

DR. BYRON WILLIAMS: Now, Mr. Gawne, as we reflect upon the drought, at a high level, obviously, this large volume of imports was there to assist Manitoba Hydro in -- in meeting reliability needs in the face of reduced hydraulic generation, agreed?

MR. KEVIN GAWNE: Agreed.

DR. BYRON WILLIAMS: And again, the availability of these imports -- including through MMTP -- played both an important reliability and financial role for Manitoba Hydro during the '21/'22 drought, correct?

MR. KEVIN GAWNE: That's correct.

DR. BYRON WILLIAMS: You're far more resilient than you were in the face of the '03/'04 drought, in part because of the -- the import capabilities and the flexibility in the marketplace, agreed?

MR. KEVIN GAWNE: Well, the flexibility in the marketplace, I don't know if we can get into details. But from an economic perspective,

it provided value because we had more options to purchase power from an open market as opposed to bilaterally.

Physically, you know, the -- the lines were there in 2003/04, but now we've added MMTP, so we have that ability to pull more power in.

But there have been things -- like, that's twenty (20) years ago, Mr. Williams. And Manitoba load has grown since then and there's, you know, other aspects of our system that have changed since 2003/04, so.

But on a, you know -- in a hypothetical, all else being equal, having the MMTP line provided security and additional firm energy during the drought.

DR. BYRON WILLIAMS: And moving from the hypothetical to the more mundane reality of -- of the financial results, for '21/'21, having that import capability also meant that Manitoba Hydro did not have to use more expensive thermal generation from Brandon, for example, right?

(BRIEF PAUSE)

MR. KEVIN GAWNE: So, sorry. It was

more economic to import and gave us access to more off-peak energy that was more economic relative to our combustion turbines.

Is that the essence of your question, Mr. Williams?

DR. BYRON WILLIAMS: I wish I would have asked the question that well, sir, but that's a great -- if you're saying, Yes, agreed, that's a great anser.

MR. KEVIN GAWNE: Okay. Yes. I'll answer yes to my own question.

DR. BYRON WILLIAMS: Thank you. And --

MR. KEVIN GAWNE: But -- but Mr. Williams, the combustion turbines, although they did not run very much, I think it was -- I'm -- this is top of my head -- 30 gigawatt hours that -- that winter -- that year even -- they did provide a role. They backstopped against the loss of import capability other contingencies that were certainly plausible.

So, it's just -- you don't want to just look at the output of a station and assume that if there was no output, it didn't have a role, it had a very important role.

MR. BYRON WILLIAMS: Thank you for that. Mr. Karanwal, the US energy marketplace remains

important to Manitoba Hydro. Agreed?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: And energy markets are dynamic entities, correct?

MR. NIKHIL KARANWAL: That's right and becoming even more dynamic now.

MR. BYRON WILLIAMS: And it's really important for your team to be nimble in responding to the dynamics of the American marketplace. Correct?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: And you have to be responsive to dynamic market realities on a daily, monthly, and long-term basis. Agreed sir?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: And with -- without asking you to elaborate, I'll just ask you to confirm that an important part of Hydro's relationship with the US market, historically, has involved the sharing of seasonal capacity with various US partners. And -- and by that, I mean, sir, sharing your surplus summer capacity with their surplus winter capacity.

Agreed?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: And, historically, and today, the advantage of seasonal

diversity exchanges has been to defer the need of incremental capacity both for Manitoba and for its MISO partners. Agreed?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: And as you've discussed probably twice today already, as we sit here today Manitoba Hydro has surplus summer capacity looking out -- out to 2040. Agreed?

MR. NIKHIL KARANWAL: For a long term -- that's right.

MR. BYRON WILLIAMS: And we can expect all other things being equal, to quote Mr. Gawne, that that summer capacity will grow as dependable sale agreements expire in '24/'25 and around '29/'30.

Agreed?

MR. KEVIN GAWNE: That's true, the summer surplus capacity numbers will increase as those contracts expire.

MR. BYRON WILLIAMS: Thank you. And Mr. Karanwal, I'm not asking for a lengthy answer here, but I'm just asking for you to -- to confirm without elaborating, that there currently are ongoing challenges in the US market that make it more challenging to -- to achieve the sale of surplus seasonal capacity. Agreed?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: And you said yesterday, that Manitoba Hydro, despite these challenges, is pursuing replacement seasonal diversity arrangements and noted that success in finding replacements would mean deferring the need for additional capacity resources for several years.

Do you -- do you recall saying something to that effect?

MR. NIKHIL KARANWAL: That's right.

MR. BYRON WILLIAMS: Thank you. And, sir, recognizing that the potential for some of the northern utilities within MISO to evolve into winter peaking utilities, would it be fair to suggest that Manitoba Hydro might have to look farther afield within MISO to achieve those seasonal diversity exchanges?

MR. NIKHIL KARANWAL: I think it really depends where the opportunities comes from.

MR. BYRON WILLIAMS: And sitting here today, sir, and recognizing how nimble your team is, are -- are you -- optimistic about the opportunities for seasonal diversity exchanges in the evolving MISO marketplace?

MR. NIKHIL KARANWAL: Mr. Williams,

I'm optimistic and I'm hopeful, but as you know, hope is not a strategy. So, we continue to have discussion with the partners.

MR. BYRON WILLIAMS: Thank you. Mr. Gawne, just to finish up with -- with -- with you, you recall an extensive discussion with Mr. Peters yesterday regarding the impact of operating planning decisions on long established operating priorities, such as safety, supply, the environment and economics.

MR. KEVIN GAWNE: I do.

MR. BYRON WILLIAMS: And you entertained us this morning with your -- with your water bottle discussion as well.

Do you recall that, sir? Your prop.

MR. KEVIN GAWNE: My props, I do recall that, yeah. I don't know if there's water bottles to file as exhibits, but I do recall the discussion.

MR. BYRON WILLIAMS: We contemplated that, sir, but I think we can -- we can -- just keep the visual image.

MR. KEVIN GAWNE: We'll keep the water for generation.

MR. BYRON WILLIAMS: In both those conversations you talked about licences governing your

operation. Do you recall that, sir?

MR. KEVIN GAWNE: Yes.

MR. BYRON WILLIAMS: And among those licences, would be licences for Lake Winnipeg regulation and for the Churchill River diversion.

Agreed?

MR. KEVIN GAWNE: Agreed.

MR. BYRON WILLIAMS: And Mr. Gawne, obviously as we've discussed previously, you've been a -- an employee of Manitoba Hydro for quite some time, twenty-five (25) years or so, sir?

MR. KEVIN GAWNE: Sure.

MR. BYRON WILLIAMS: And you're now making decisions on a weekly basis in terms of flows out of Lake Winnipeg. Agreed? With your team.

MR. KEVIN GAWNE: Yeah, that's a responsibility of our team. Yeah.

MR. BYRON WILLIAMS: If we back up a step and think of the Lake Winnipeg Regulation Project, as a whole, a key purpose of that project was to increase outflows from -- from Lake Winnipeg.

Agreed?

MR. KEVIN GAWNE: Agreed. The part -- it was a multi-purpose project, if you will. There was impacts in the '50s of flooding around Lake

Winnipeg, so part of the arrangement to -- and have use of that lake has, for our power production purposes, was to increase the outflow capability in the summer and the ability to manage floods and reduce high water level impacts around Lake Winnipeg. So, it's a dual-purpose reservoir.

MR. BYRON WILLIAMS: And would it be fair to say that the Lake Winnipeg Regulation Project significantly increased the maximum volume of outflows from Lake Winnipeg?

MR. KEVIN GAWNE: Well, putting evaporation aside, the same amount of water is going to come out regardless of how we change the outlet, eventually, through time --

MR. BYRON WILLIAMS: But at --

MR. KEVIN GAWNE: -- correct.

MR. BYRON WILLIAMS: -- at any point in time, sir.

MR. KEVIN GAWNE: Yeah, the intensity of outflow can be higher for lower levels of Lake Winnipeg through the excavation of the outlet channels at the north end of Lake Winnipeg.

So, for a given water level on Lake Winnipeg, we can operate the Jenpeg station and the spillways there to -- to pass more water out of Lake

Winnipeg than if those channels weren't there and Jenpeg didn't exist, the water levels at Lake Winnipeg would have to go higher and -- before that level of discharge could be achieved.

MR. BYRON WILLIAMS: And the increased outflows from Lake Winnipeg, within the context that you've discussed, is integral to the optimizing of power generated from Manitoba Hydro. Agreed?

MR. KEVIN GAWNE: So there -- there's a few elements to that question. And it's our ability to -- Manitoba Hydro's ability to operate for power purposes and that provides some storage to weather through a drought.

And a -- a big major aspect of the Lake Winnipeg Regulation Project was the excavation of those channels increasing the outflow capability of Lake Winnipeg during the winter.

And it's prior to the project that, you know, ice would form and essentially clog up the outlet and we need that water during the winter, particularly, to generate when Manitoba's load is highest.

MR. BYRON WILLIAMS: And you would have no doubt that there are downstream consequences on the people, lands and waters from that -- those

increased outflows, Mr. Gawne.

MR. KEVIN GAWNE: Agreed.

DR. BYRON WILLIAMS: And without going into great detail, you're also familiar with the operations of the Churchill River diversion, sir?

MR. KEVIN GAWNE: Yes. Yes.

DR. BYRON WILLIAMS: And the Churchill River diversion project contributes to the optimization of power generated on the Nelson, by diverge -- diverting much of the flow from the Churchill River, through the Burntwood, into the Nelson. Agreed?

MR. KEVIN GAWNE: Agreed. It's at op -- I guess, optimization of the development of hydro in Northern Manitoba, as opposed to constructing dams on the Churchill River -- the lower Churchill River. I believe the economics of the project of the day was to divert water towards the Nelson and to -- thereby, concentrating where development could occur.

DR. BYRON WILLIAMS: And those, sir, increased outflows from the Churchill River diversion, onto the Nelson, are critical to both the reliable service and financial well-being of Manitoba Hydro?

MR. KEVIN GAWNE: The diversion being critical to the reliable service to Manitobans?

DR. BYRON WILLIAMS: The increased flows. Yes.

MR. KEVIN GAWNE: Yes. I would -- we just got to be cautious that we're not talking about a scenario where, had the CRD diversion not been constructed, we would have been in -- in an unreliable state today. There would have been something built by the planners and planned years ago, because they know if they didn't get that water from the Churchill, they would have to come up with another development scenario.

So that, as we're sitting here today, or a couple of years ago, when we were in a drought, instead of getting 30 -- 34,000 cubic feet per second in the winter from the Churchill River, we would have had an alternative supply to help serve Manitobans.

DR. BYRON WILLIAMS: And, just to conclude, would it be fair to say that the joint operation of Lake Winnipeg reg -- reg -- regulation and the Churchill River diversion has profoundly altered the downstream environment, through both increased flows and by changing seasonal flow patterns?

MS. ODETTE FERNANDES: Yeah, Mr. Williams, I'm failing to see how this is relevant to

the application before the Board.

DR. BYRON WILLIAMS: But, if -- if the witness is declining to answer, that's fine, but the point we were trying to make is that the weekly op -- ultimately, these operations have profoundly altered the environment in a very significant way and that, ultimately, Manitoba Hydro, through its licensing, picked -- made ec -- made economic choices instead of environmental choices. If the witness has declined to answer the question, though, that's okay.

MR. KEVIN GAWNE: Sorry, Mr. Williams, there's more in that summary than the original --

DR. BYRON WILLIAMS: Let me -- let me just put it this way. It --

MR. KEVIN GAWNE: The water regime --

DR. BYRON WILLIAMS: You --

MR. KEVIN GAWNE: The water regime has changed downstream of Lake Winnipeg --

DR. BYRON WILLIAMS: And it's had profound effects on the people at Ransom waters. Those folks were downstream. That's been a profound environmental effect.

MS. ODETTE FERNANDES: Again, this is not an environmental hearing. We are looking at the rate increase applications before this Board. So,

again, I fail to see how this is relevant to the application.

DR. BYRON WILLIAMS: It's -- the question's been asked, Mr. Chair. You've heard our reasons why we think it's relevant, in the sense that we -- we're saying that Manitoba Hydro has told us they've got a priority, and at the bottom are economic reasons, although it's a more nuanced discussion, we're just trying to point out the inconsistencies with that. We don't need an answer, sir. That's fine for us.

THE CHAIRPERSON: What? Sorry, I don't think I need to make a decision, because Mr. Williams has just said he doesn't need an answer, so.

(BRIEF PAUSE)

DR. BYRON WILLIAMS: We -- we have no further questions, if Manitoba Hydro's declining to answer it.

THE CHAIRPERSON: Ms. Fernandes, are we okay? Mr. Williams has just concluded his cross-examination.

MS. ODETTE FERNANDES: Yes. Thank you.

THE CHAIRPERSON: Okay. Thank you. Mr. Hacault...?

CROSS-EXAMINATION BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Good -- good afternoon, members of the panel. I, unfortunately, won't be able to entertain the crowd with jokes. I'm not good at them. I'm later in the afternoon and everybody is going to fall asleep, but I've to get through this and I appreciate the coor -- cooperation of the witnesses to help me get through this, please.

The first document I'll be going through is the Supply and Demand tables. It's MFR-43. And I'll start at that page 2 of 4 and just to get a couple things cleared up with this table.

Firstly, we're dealing, as indicated, by the title of that figure with winter demand, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: And it's also a table that assumes no new resources. We can see that in the title, and the third line down from the -- the

centre titles there, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah, that's correct. Mr. Hacault, as I had mentioned earlier before the lunch break that there is projects that underlie the supply, so the PREP Project is in the supply, but no new resources, correct.

MR. ANTOINE HACAULT: Thank you. Now, this is a demand table, correct?

And I'd like you to explain what that concept is, as it applies to this table. For example, is it just the top minute in -- in each year, or is it a design minute? Is it based on certain temperatures, certain times of days?

Could you provide answers to how 'demand' is defined or arrived at in this table?

MR. KEVIN GAWNE: Okay. So, it's a supply and demand table, but the demand that's shown is the -- what I would say the normal weather peak hour demand -- peak -- peak demand on the system, so.

We could have higher electrical demand in the Province in Manitoba than what's shown here and -- but that's addressed through the planning reserve

margin that we protect for, so. So, it's a -- a peak hour analysis essentially.

MR. ANTOINE HACAULT: A peak hour analysis based on an average of yours or a -- a historical peak?

MR. KEVIN GAWNE: An ave -- in -- a normal weather year, let's say that. We know it gets super cold in the winter, but this isn't the minus 39 that happens at the peak hour of consumption.

This is the minus 32 that happens, for example, and I'm just throwing the numbers out there. So, when we have our load forecast, and I think it's included as appendix 5.1 to our application.

On a forecast basis that's kind of a normal weather peak hour load. And then we have a planning reserve margin that we assign as 12 percent of our -- that peak load. And that planning reserve margin of 12 percent accounts for two (2) things: weather effects on the peak load, so extreme cold. It just so happens it happens to be at the Monday when people are all doing their thing, so that's that aspect of planning reserve margin.

And then there's -- the other component of planning reserve margin is to address forced outages on our system. And so, in simple terms it's

kind of a normal weather peak. I mean, you can have it really cold. Like we had our -- we had our highest load ever we recorded in Manitoba in -- in 2019, January, when it was minus 39.8 degrees Celsius.

And I think that's not a normal peak hour temperature.

MR. ANTOINE HACAULT: Help me understand that just a bit more then. If you get that highest peak that you've just talked about, do you work back from that to say, okay, I need a 12 percent reserve and is my average high enough with that reserve to meet that peak so that all the lights stay on.

I'm just trying to understand what we're trying to achieve as a target when we're looking a these tables, and how it's calculated.

MR. KEVIN GAWNE: Okay. Maybe -- maybe if it's -- if it would please the Board, if we could go to our direct-evidence presentation, and I'll have to find the slide number.

(BRIEF PAUSE)

MR. KEVIN GAWNE: Slide 27, please.

(BRIEF PAUSE)

MR. KEVIN GAWNE: Yeah. Sorry. I thought we would pull up the chart here just to maybe help with the discussion. So this chart on the left is capacity. It's kind of the graphic comparison to the table that we were just at, and the planning -- so we say Manitoba demand, and that's like a normal weather peak that you could expect, we call it -- I think you could call it a P50, 50 percent probability of achieving that peak load.

So what does that mean? Well, 50 percent of the time, you know, weather might occur on that -- that hour of the year in January where all the businesses are operating and all the lights are on. Oh, but then there's a chance that it's going to be colder than normal at that time, so then you get a load that's higher than that P50 peak.

So we're -- we're planning in those tables for the -- that -- that normal weather low, and then we need to have a bit of margin on that -- and we call it planning reserve margin here -- to account for the fact that we know that it can be -- well, it's never normal weather. It can be colder than normal, and that's consistent with utility practice and

capacity planning.

Resource adequacy studies, you're looking at your peak load condition and factors such as forced outages on your generation combined -- or statistically the chance of that happening at the same time. You have, you know, a weather condition that's such that your load is above the P50 load. That's what we're trying to show here in the supply and demand table.

MR. ANTOINE HACAULT: Okay. So it's normalized, but it's a peak hour. It's not just like fifty (50) of the peak hours or --

MR. KEVIN GAWNE: Correct.

MR. ANTOINE HACAULT: Okay. Thank you. If we go back to MFR-43 on page 2, at the bottom we'll see what you were talking about, sir. There's the second last line at the very bottom, and my eyes are having problems, too, but it says, "Planning reserves at point of supply."

Is -- is that the type of number that you were talking about in planning reserve? If we look on top, we see a total of peak demand at point of supply, and then there's a number of five hundred and fifty-one (551) there for the planning reserve. This is a demand table.

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: Okay. Now, if we go to this table, there's something called existing non-utility generation. That's under the second set of headings under supply. You go five (5) line down -- five (5) lines down and it says, "Base supply power resources," and another three (3) lines down, "Existing non-utility generation."

Do you see that, sir?

MR. KEVIN GAWNE: I do.

MR. ANTOINE HACAULT: Okay. And could you explain is that wind and solar, or is it just wind, like Latelia (phonetic) and St. Leon?

MR. KEVIN GAWNE: The existing non-utility generation shown in this table is just the wind farms.

MR. ANTOINE HACAULT: Yeah.

(BRIEF PAUSE)

MR. KEVIN GAWNE: So if you were to look at that table for the summer period, Mr. Hacault, there -- there will be a fraction of a megawatt, I believe --

MR. ANTOINE HACAULT: Okay.

MR. KEVIN GAWNE: -- to account for the solar farm where we purchase output from Fisher -- I believe it's Fisher River Solar Farm.

And so there's a little bit of capacity there that is appropriate to account for in the summer, but that farm is not producing megawatts and the sun's not up when we achieve our peak in the winter, so there's no megawatts associated with that in this table.

MR. ANTOINE HACAULT: Thank you for that explanation. Now, the one (1) think I notice if I go right across the table on that line, non -- 'Existing non-utility generation', we slowly go down from an existing capacity resource of 52 megawatts down to ultimately at the right zero.

Can you explain what's happening there? And it comes down in chunks. The first chunk reduces by twenty (20) -- twenty-six (26) slash twenty-seven (27) reduces from 52 megawatts to 31 megawatts.

MR. KEVIN GAWNE: Yeah. Those step changes that are associated with the wind PPAs having different expiry times.

MR. ANTOINE HACAULT: Okay.

MR. KEVIN GAWNE: So it's mainly on wind farmed PPA.

MR. ANTOINE HACAULT: So this financial forecast is assuming that there will not be any renewals -- or continuation of that wind farm after the purchase power agreement has ended.

Is that what you're telling us?

(BRIEF PAUSE)

MR. KEVIN GAWNE: The supply/demand scenario that's included in our financial forecast does not assume that Manitoba Hydro will extend or continue to purchase wind from those farms. It's not to say that those discussions won't happen, but there's been no -- no contracts or term sheets signed of any nature.

So, you know, this -- the -- in terms of capacity, what you see here is what underlies the -- the financial forecasts.

MR. ANTOINE HACAULT: So am I right in understanding what you want to communicate to the Board is that -- or at least as I see it -- is that it's a conservative outlook, assuming that you're going to have zero percent chance of renewing any of those contracts or extending them.

Is -- is that what the assumption is?

MR. KEVIN GAWNE: I don't -- wouldn't frame it that way, Mr. Hacault, because there will be a cost associated with contract extension.

So if you -- if we were to show a number including -- like say let's hold 52 megawatts into perpetuity, assuming that the wind producers were to replace their turbines or whatever they have to do to keep those contracts flowing, there would be a cost associated with that. And we would have to put that into our financial forecast.

So -- and we -- as I showed in our direct, we had wind farms coming in in the 2033/'34 time frame as a proxy energy resource. We accounted for the capacity that would come from that scenario, so that -- that's costed into our plan, and, you know, whether it's coming off St. Joseph or St. Leon or another farm, I don't think it makes a -- I don't think it impacts the -- the financial --

MR. ANTOINE HACAULT: You might have jumped forward to another slide that I was going to bring you to, the Appendix 5.6. It's the --

MR. KEVIN GAWNE: But -- and if I -- if I can just finish --

MR. ANTOINE HACAULT: Yeah.

MR. KEVIN GAWNE: -- I don't believe

that this is in any way a conservative assumption because we're not extending -- we're not showing those contracts continue because we would have to come up with a price to make that happen.

And -- and so who's - you know, we don't know if that would be -- what that price would be 'cause there's no contract, so we can't just show the wind farm output continuing into perpetuity without assigning a cost to that is -- is my point.

So, I don't think it's conservative if -- if -- I think -- I think if -- no, I'll just leave that at that. I don't think the -- the assumptions around our wind -- wind farms are conservative in our financial plan.

MR. ANTOINE HACAULT: But if we go to appendix 5.6, this is where you say you start adding wind. So, on page 1 of 2 of appendix 5.6, we'll see that, if we go across the top, and we have to go total new wind, the first number I see in 2033/'34.

Do you see that, sir?

MR. KEVIN GAWNE: I do, yeah.

MR. ANTOINE HACAULT: You're adding capacity value of 20 megawatts, correct?

MR. KEVIN GAWNE: That's correct, yes.

MR. ANTOINE HACAULT: And at that

time, if we go down to the existing contracts, we've got 31 megawatts of existing power for wind, correct?

MR. KEVIN GAWNE: That's correct. And I'll just remind that -- the Board that the -- the addition of those wind farms shown for this scenario, where we see that new wind in 23/34 (sic), that was added primarily for energy purposes. But as a consequence of those farms being there, we'll account for the capacity they would provide.

MR. ANTOINE HACAULT: And that capacity continues to increase for new builds from 2033/'34 up to and including 2041/'42, correct?

MR. KEVIN GAWNE: New power resources. We've assumed a power purchase agreement, so just to be clear, they're not new builds by Manitoba Hydro. The assumption is wind -- wind would be purchased through a PPA.

MR. ANTOINE HACAULT: Okay. And at the same time, when you reach at the end of this table, being 2041/'42, you've built up PPAs, as you refer to them, up to 161 megawatts.

And you've assumed no renewals of existing PPAs and farms for wind, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Mr. Hacault, we -- we -- whether it belongs under line 3 of total new wind or -- or it's an extension of the existing wind farms, it's providing that it would be providing energy into the future.

There would be a cost to -- obviously, to extend the existing contracts. The -- the source of the costs for the PPAs are based on publically available wind energy prices.

So, presumably -- like, I can't speak to how this would be procured in the future. This is decades away. And this is a placeholder for our GRA. Pardon me. This is a proxy energy resource for the purposes of this GRA.

We haven't committed to entering into new PPAs at farms located in Greenfield locations. We haven't made those sorts of decisions yet, so.

But the underlying cost for those resources are based on, I would think, information that anyone willing to, or interested into, either building or maintaining wind farms in this province would -- would be looking to -- to achieve in a contract with -- with Manitoba Hydro.

MR. ANTOINE HACAULT: Thank you for that answer. I'm going to need to move on because I'm

not going to get into further questions about the difference between having new windmills built and doing PPAs with existing windmills, all that. That would be a too detailed discussion.

But one thing I want to get back to is with respect to MFR 43, page 2 of 4, being the winter demand. The shortfalls start coming in 2030/'31, correct?

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: And in terms of utility planning, that is pretty quick, right? If we had to build, we'd have to start right now.

Do you agree with that, sir?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I think the time to put some certain resources is shorter than the -- the seven (7) years out that we have, but that is not that long away from a utility planning perspective. I would agree with that.

MR. ANTOINE HACAULT: Okay. And we also see contracted exports are declining. And Ms. Grewal, in her testimony, indicated that there's assumption of no new capacity backed exports coming

online. Can you confirm that? And that doesn't have to be you. It can be Mr. Karanwal.

(BRIEF PAUSE)

MR. KEVIN GAWNE: The financial plan doesn't assume placeholder capacity --

MR. ANTOINE HACAULT: And on this chart we also see -- and it's past the halfway mark under the demand. There's, three (3) lines down, "2021 Curtailable Rate Program option A forecast."

Do you see that, sir?

MR. KEVIN GAWNE: Yes, I do.

MR. ANTOINE HACAULT: Okay. And we see, if we go to the right, that the Curtailable Program benefits end in about three (3) years from now, 2026/2027, correct?

MR. KEVIN GAWNE: This table, the benefits that you're mentioning of ending in 2026/'7, so the $160 million -- or pardon me, 162 megawatt reduction, yeah, they -- they cease in '26/'27, and so too would the costs -- or the credits paid to those customers of that program in our -- in our base case.

But in our resource scenario, and I'm probably jumping ahead to where you want to go, we're

assuming those Curtailable Rate Program amounts of 162 megawatts at -- will continue into perpetuity in our underlying plan.

MR. ANTOINE HACAULT: So, do you have any explanation for this Board as to why you're capping that value of 162 megawatts in this table as of 2026/2027? That affects the rest of the table and your -- your capacity calculations.

(BRIEF PAUSE)

MR. KEVIN GAWNE: So, just so we're clear, this is the kind of no new resources, that scenario that we're looking at here. It's not -- what underlies the GRA scenario in the financial plan is the subsequent table that shows the Curtailable Rates Program continuing into the future.

I think your question was, it's -- is it -- why are we showing a cap of 162 megawatts? Was that --

MR. ANTOINE HACAULT: And then stopping it because it affects the rest of your table. The rest of your table would have a corresponding adjustment of 162 if that's what you're doing for the basis of the application.

It's not consistent, correct?

MR. KEVIN GAWNE: This is not -- like, this table here is not the basis of the application. The basis of the application is -- and appendix 5.6 to our GRA, which includes the CRP --

MR. ANTOINE HACAULT: I think we can move on. I'll go to slide 24 of Exhibit 30, which was the presentation by your Panel.

This is consistent with the table we were looking at. It's a winter capacity profile. And it shows the same need date of 2030/'31, correct?

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: And around 2027/'28 there's a spike in the Manitoba demand.

Why would that be so?

MR. KEVIN GAWNE: That would be because the assumption in this table is that's the CRP program extends through to '26/'27. And then goes to zero (0).

MR. ANTOINE HACAULT: Okay. That -- I was trying to understand, but -- so when you say CRP, the Curtailable Rate Program that we just looked at in the first table, MFR-43. Those ending at that date.

So that's why we -- we see that the Manitoba demand increases fairly significantly at that

point.

But would you've also explained is that that -- we shouldn't look at that for purposes of the Application. The Application for the rates actually assumes that CRP -- so the Curtailable Rate Program -- will continue and that will lower the capacity requirement in Manitoba. Correct?

MR. KEVIN GAWNE: Yeah, we would not -- like, this information was assembled for explanation of -- primarily of -- related to our existing export contracts. When Mr. Karanwal walked us through us -- we would not come to this Board with a twenty (20) year financial scenario that was assuming we would not have enough capacity for the second half of that scenario. That wouldn't be a prudent thing to do.

We wouldn't -- we wouldn't come to the Board and say, You know what, we -- we're just going to assume that the red line can fall below the -- our firm capacity. So this is not -- this -- this piece of information doesn't underlie the financial scenario that we're looking at.

MR. ANTOINE HACAULT: Okay. And as has been discussed, and is put on this slide, there's two (2) sales to Saskatchewan shown on this slide, correct? SPC --

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: -- is the acronym. And one -- the 100 megawatt sale goes to 2040, correct?

MR. KEVIN GAWNE: Correct.

MR. ANTOINE HACAULT: And the 215 megawatt capacity sale ends in 2052, correct?

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: And the -- if we go back to MFR-43, page 2, at the bottom -- and this is where we see a shortfall.

By the time we hit that crossroads, we're seeing a 370 megawatt shortfall, correct? That's in 2033/34?

MR. KEVIN GAWNE: That's correct.

MR. ANTOINE HACAULT: That basically -- that shortfall -- if we didn't have the Saskatchewan sales, there really wouldn't be much of a shortfall at all, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: So there's -- there's a shortfall shown here in '33/'34 of 370 megawatts. And if we were to take all our SPC sales -

- sorry, were you asking about all SPC sales?

MR. ANTOINE HACAULT: Yeah.

MR. KEVIN GAWNE: So totalling 315 megawatts. Then we would still have a shortfall of 55 megawatts, but we would also not have the -- you know, the revenues associated with those SaskPower sales, which are included in our financial scenario.

MR. ANTOINE HACAULT: All right. Mr. Chairman, I just want to take thirty (30) seconds to look at my questions because I really expected my cross-examination -- and some questions go a lot quicker than I thought and I have to pare down and -- to be able to -- to finish soon, within my time allotment.

So if can just have thirty (30) seconds, and I'll decide what I'm going to conclude in asking.

(BRIEF PAUSE)

MR. ANTOINE HACAULT: Sir -- sorry, I'll -- I've decided where I'm going to try to go to finish as quickly as possible.

What -- I'll provide just a little bit of background before I -- I ask my question.

In NFAT demand side management was not shown as a resource and that was commented on by the panel, that it should be shown as a new resource that's available.

In the tables, you'll agree that DSM -- the demand side management -- is not shown as an new resource, but rather as a reduction in demand, correct?

MR. KEVIN GAWNE: For the no new resources table?

MR. ANTOINE HACAULT: For both of them.

MR. KEVIN GAWNE: No, I --

MR. ANTOINE HACAULT: In the -- in the -- yeah. Five-point -- five-point-six (5.6). And even -- so if -- in both tables, even with resources, we go down and Efficiency Manitoba is under the 'demand' heading in the second half of the table. Not under the 'new resources' or 'resources', correct?

(BRIEF PAUSE)

MR. ANTOINE HACAULT: You see, in the top left-hand side, we have 'new resources', we have 'new hydro' --

MR. KEVIN GAWNE: Correct.

MR. ANTOINE HACAULT: -- we have 'new thermal', 'new wind', 'new non-utility generation'.

And then, we go down halfway through the table where it says 'demand', and the second line says, 2020 Efficiency Manitoba demand side management forecast.

So it's treated as a -- as a reduction in demand in your tables, correct?

MR. KEVIN GAWNE: That's correct. And -- and I apologize if I confused demand response with DSM here. I've been known to do that.

But we do show demand response -- like, new demand response starting in '28/'29, and that's helping supply and demand add up. So that's a few rows down.

MR. ANTOINE HACAULT: Okay. Those are both under 'demand'.

Now, the one thing that Manitoba Hydro has not done in these tables and that we had done in previous hearings, they showed different levels of demand side management as -- as different resource levels. If you invest so much, you can get 1 1/2 percent, if you invest so much, you can get 2 percent.

Hydro has chosen not to treat DSM as a

resource in this Application, correct?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I'm not -- I'll have to say at the outset, I'm not that familiar with the tables and showing different levels of DSM and whether that was the place -- that was the way these tables were presented when -- when PowerSmart or demand side management programming was under the responsibility of Manitoba Hydro. I may be wrong.

Like, I honestly don't know whether -- whether they were broken out before Efficiency Manitoba took over, but -- took that role.

You know, but this -- you know, this demand side management forecast is included for the purposes of this scenario. It's not a referred development plan that we're looking at here, Mr. Hacault. This is a scenario -- this is our best information that we had at the -- available to us to present to this Board to assist in -- in the Rate Application for the test years we have.

MR. ANTOINE HACAULT: One last question on this. Are you able to tell the Board whether you asked Efficiency Manitoba for more than

one estimate on it being a resource with respect to capacity and/or energy?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Sorry for the delay, Mr. Hacault. We do want to provide good answers to the -- to your questions and perhaps we should take that one away and consult with others to assist in the response of what -- what was discussed.

And maybe you can rephrase the question or restate the question and we'll take that back.

MR. ANTOINE HACAULT: No, you can undertake to advise whether or not Manitoba Hydro in creating its application asked Efficiency Manitoba to provide different estimates of the resources it could provide with respect to demand side management, related to demand and related to energy.

THE CHAIRPERSON: Sorry, could I ask a supplementary question to that?

The second line that Mr. Hacault referred to 2020 Efficiency Manitoba Demand Site Manager Forecast. I just want to confirm that that number came from Efficiency Manitoba.

Are those numbers going -- those

projections came from Efficiency Manitoba?

(BRIEF PAUSE)

MR. KEVIN GAWNE: I think we'll undertake to provide the best response we can to that question.

MR. ANTOINE HACAULT: Okay --

THE CHAIRPERSON: -- and that will be part of Mr. Hacault's undertaking. That -- that will be the second undertaking to you. Okay.

MR. ANTOINE HACAULT: Yes, okay. Thank you.

--- UNDERTAKING NO. 4: Manitoba Hydro to advise whether or not Manitoba Hydro in creating its application asked Efficiency Manitoba to provide different estimates of the resources it could provide with respect to demand side management, related to demand and related to energy

--- UNDERTAKING NO. 5: Manitoba Hydro to confirm if in the 2020 Efficiency Manitoba

Demand Site Manager Forecast that the numbers came from Efficiency Manitoba

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Could we go to -- Book of Counsels' Book 6, Tab 4 at page 36. Yes, at the bottom, that's fantastic. Thank you, Ms. Schubert.

With respect to the value that's shown for 2022 at $5.80, is there an energy component and demand component built in that number?

Sorry, it's 5 cents .8 right? It says dollars on top, but --

MR. KEVIN GAWNE: Sorry, I was -- Mr. Hacault, I was trying to find the -- the document. This is PUB page 36 of which Book of Documents?

MR. ANTOINE HACAULT: Oh, this is a -- a book of documents that was compiled by --

MS. MELISSA BEAUMONT: For the rates --

MR. ANTOINE HACAULT: -- Book 6.

MS. MELISSA BEAUMONT: -- cost of service panel.

MR. ANTOINE HACAULT: Not for this -- it -- it was part of -- I just located it in the documents that were prepared by the PUB.

MR. KEVIN GAWNE: Okay, sorry, so we'll have to get you to restate your question. Just a bear with me one second.

Okay, so please, yeah, restate your question.

MR. ANTOINE HACAULT: Okay, I had asked, with respect to this table directing your attention to the bottom right-hand corner at the 5.80, that's cents per kilowatt Canadian. Correct?

MR. KEVIN GAWNE: Correct.

MR. ANTOINE HACAULT: And I asked whether there was an energy component and a demand component built into that number.

MR. KEVIN GAWNE: I believe so, yes.

MR. ANTOINE HACAULT: Okay. And with respect to the energy component, is it tied to long term exports or short term?

(BRIEF PAUSE)

MR. KEVIN GAWNE: The energy component is tied to our marginal value of energy over that horizon. So that's -- just hold on one second.

MR. ANTOINE HACAULT: I don't want you to get into CSI.

MR. KEVIN GAWNE: Yeah, that's where I'm concerned. I just --

MR. ANTOINE HACAULT: But -- but if -- if you're able to answer generically whether it's tied into long term import/exports or short term exports, that would suffice.

MR. KEVIN GAWNE: I'd say tied not to our existing long term export commitments, it's based on opportunity exports.

MR. ANTOINE HACAULT: And -- and that's...

Mr. Chairman, I'm looking at the time and I've passed my allocation. It may be that I can deal with this with another panel and have some off-the-record discussions because it seems that questions I didn't -- didn't think would take very long, such as this last one, are taking two (2) or three (3) minutes to answer. So, maybe it's better to have a discussion.

THE CHAIRPERSON: Well -- well, Mr. Hacault, your allocation and my allocation are different numbers. According to mine, you've got eighteen (18) minutes left.

MR. ANTOINE HACAULT: Okay.

THE CHAIRPERSON: So --

MR. ANTOINE HACAULT: Okay.

THE CHAIRPERSON: You -- you know, if -- if you want to stop now, that's fine.

MR. ANTOINE HACAULT: No, I want to -- I thought I was finished.

THE CHAIRPERSON: The -- the concern I have with the interaction of Hydro is, I think they're trying to give you the answer as best as they can, but they're getting close to the CSI line. I don't know, that's sort of my interpretation. If -- if they can give you a simple answer to -- to satisfy you, but, you know.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Are you able to give me an answer?

MR. KEVIN GAWNE: So, there's an energy component to that 5.8 cents per kilowatt hour and there is a capacity component to that.

And -- and that's based on the marginal value of capacity over that thirty (30) year horizon. And so, I don't know if that answers your question, sir.

MR. ANTOINE HACAULT: But, okay, so it's a long term. 'Cause I was just trying to --

because the table shows thirty (30) years so -- if you're going out to --

MR. KEVIN GAWNE: It was --

MR. ANTOINE HACAULT: -- thirty (30) years, I would have assumed that it was some kind of a long term number. I -- that was my intuition, but --

MR. KEVIN GAWNE: Yes.

MR. ANTOINE HACAULT: -- I don't know if you can give me more detail than what you've already done.

Now, if I go to -- perhaps we can get a little bit more detail on this through a publicly filed document on this issue. It was in the 2017/'18 and 2018/'19 GRA. It was a response by Manitoba Hydro to PUB Round II question 77.

And this is a IR that was posed with respect to marginal values and how Manitoba Hydro changed its methodology in 2017 for the generation capacity marginal value.

And I direct your attention to the paragraph that starts with the words, "The 2017 update includes a change in the methodology". I'd ask for the record that this be marked as Exhibit 12.

--- EXHIBIT NO. MIPUG-12: 2017/'18 and 2018/'19 GRA

IR response by Manitoba Hydro to PUB Round II question 77.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: And then once you've had a chance to read that paragraph, I'll ask you a couple questions.

(BRIEF PAUSE)

MR. ANTOINE HACAULT: Now, in this response, it indicated that the generation capacity marginal value was based on the deferral of a peaking type natural gas combustion turbine built in 2030/'31, but what part of that answer still holds true today?

Is it everything, except for the date?

MR. KEVIN GAWNE: I believe it's the...

(BRIEF PAUSE)

MR. KEVIN GAWNE: Sorry, Mr. Hacault, it's the -- based on, yes, deferral of value of a peaking type gas combustion turbine, the lesser of

that or the capacity raised forecast.

MR. ANTOINE HACAULT: And that's the CSI stuff, is the capacity forecast pricing?

MR. KEVIN GAWNE: Actual --

MR. ANTOINE HACAULT: That's what we see blocked up.

MR. KEVIN GAWNE: -- actual value for that.

MR. ANTOINE HACAULT: Okay, and, continuing on in this response, and it -- sorry, on the same page, Ms. Schubert, but in this paragraph, the next...

(BRIEF PAUSE)

MR. ANTOINE HACAULT: Are you able, without getting into CSI, to say which of the two (2) hydro has chosen, because you've given two (2) options?

MR. KEVIN GAWNE: The less -- the lesser of the two.

MR. ANTOINE HACAULT: Yeah. That's what you said. You said it was the lesser --

MR. KEVIN GAWNE: -- and which one came out --

MR. ANTOINE HACAULT: -- of the capacity marginal value is based on the deferral of a peaking type natural gas -- gas combustion turbine built in 20/31 (sic) or '30/31 or you said the capacity value, the lesser of the two.

Are you able to put on the public record which of the two (2) you've chosen, as Manitoba Hydro?

MR. KEVIN GAWNE: Sorry, Mr. Hacault, I don't think we can provide that in public.

MR. ANTOINE HACAULT: And when did this new approach arise or when was it created aft -- was it just for this hearing or was it shortly after the last GRA of 2017/2018?

MR. KEVIN GAWNE: Sorry, sir. The information I have in front of me doesn't tell me when that occurred. You -- all I can say is I don't think it was done specifically for this GRA but I can't say in what year that -- that addition of the lesser of the two (2) was implemented in our marginal costs -- marginal value.

MR. ANTOINE HACAULT: If -- if you're able to provide a public response to that, I'd appreciate if you would take it back and see whether it's possible. If you can't, then you'll just

respond, sorry, we couldn't provide a --

MR. KEVIN GAWNE: Okay.

MR. ANTOINE HACAULT: -- a public -- public response to it. So, I have, for the record, that Undertaking?

MR. BOB PETERS: Mr. Hacault and Mr. Chair, if the Panel is not able to put that answer on the public record, on behalf of the Board, I would ask them to file it as confidential information, so the Board would have it, depending on the submissions that you'll make relative to that, Mr. Hacault.

MR. ANTOINE HACAULT: That would be appreciated.

MS. ODETTE FERNANDES: That's fine.

--- UNDERTAKING NO. 6: Manitoba Hydro to advise which of the two it has chosen and if the answer falls under CSI, to file a response under CSI.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Now, continuing to kind of understand that a bit better, is the generation capacity tied to the deferral, because we're talking about the next marginal cost, to the

deferral -- deferral of a Manitoba based generation source?

MR. KEVIN GAWNE: So, the lesser of the two (2) would be the -- the assumption of the referral would be a combustion turbine built in -- in Manitoba.

MR. ANTOINE HACAULT: Okay. And then -- I'm trying to think this out with all these pressures of net zero and everything else.

Given the increased pressure to achieve net zero and eliminate GHG, emitting natural gas turbines, can you comment on the appropriateness of still using a natural gas turbine as next available resource as a marginal cost?

(BRIEF PAUSE)

MR. HAL TURNER: I'm going to take a crack at this. I think the short answer is, yes. At this point there is no regul -- regulations federally or provincially that would preclude this type of resource.

Our mandate is to be -- provide reliable electricity at the lowest cost. This is the lowest cost capacity resource. So, I believe it's

appropriate to use. If at some point in the future regulations change or something like this is precluded, then of course we would consider something else.

But given our mandate, I think the answer is, yes, it's appropriate.

MR. ANTOINE HACAULT: I'm also trying to better understand, without getting into CSI the market value, because you said the capacity value going forward.

I don't know if I'm misunderstanding the evidence, but from a Manitoba perspective, the capacity -- the ability to sell capacity and the value of that is pretty minimal right now.

Am I right in understanding that?

MR. KEVIN GAWNE: I think what we've seen is there's not a lot of surplus capacity for year round. So, in terms of the quantity of capacity that's available to enter into new contracts, there's not a lot of quantity for annual capacity.

Does that answer your question?

MR. ANTOINE HACAULT: Yeah, so I'm -- call me the dumb guy on the street. I'm just trying to connect the dots here. If we're trying to say, well, we'll tie it into the value of capacity and we

can't sell capacity really, because we've got none left and it's minimum value, how can we even do it?

MR. KEVIN GAWNE: Well, I -- I -- sir, it's based on the lesser of the capacity cost, the deferral of new capacity in Manitoba and -- or the capacity price forecast. It's not to say that we would -- you know, the -- is that a capacity import that's being driven by that marginal change in load.

So, it's a -- it's a value of capacity in the market produced by our five (5) consensus forecasts and we're -- we're taking the lesser of the two.

MR. ANTOINE HACAULT: That's probably as far as I can take it without getting to CSI. Thank you.

THE CHAIRPERSON: Sorry, Mr. Hacault, you've -- you're -- you've got five (5) minutes left.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: But you would agree with me then that given your evidence that natural gas turbine is the lowest cost capacity resource, capacity would get more expensive if we couldn't use that lowest resource as a option.

MR. KEVIN GAWNE: I think that's a

fair statement.

MR. ANTOINE HACAULT: Now, going back to Board book of counsel, page 36. Now, could you confirm that when these numbers get converted, it's based on 100 percent load factor?

If you could go to the next page, Ms. Schubert, I think it'll confirm this for the witness, top of the table.

MR. KEVIN GAWNE: Confirmed.

MR. ANTOINE HACAULT: Okay. And we see all the redacted values which are confidential, but can you give any indication on the public record of the relative marginal values between summer versus winter? Is one higher than the other, and which one? I think you can do that without CSI.

MR. KEVIN GAWNE: Yeah. I would -- I can share that winter would be higher than summer.

MR. ANTOINE HACAULT: Yeah. And can you give us any -- any indication of the relative marginal values of capacity versus energy, which one's higher?

(BRIEF PAUSE)

MR. KEVIN GAWNE: Sorry, Mr. Hacault,

I'm not comfortable answering the question at this time.

MR. ANTOINE HACAULT: Okay. Okay. Can we do the same thing as last time? Can you undertake to look to provide that answer? If you can't provide a public answer, provide a CSI answer that can be viewed by the Board?

MR. KEVIN GAWNE: Yes, we can undertake.

MR. ANTOINE HACAULT: Okay. So, for the record, undertaking so we can pick that up.

--- UNDERTAKING NO. 7: Manitoba Hydro to provide an indication of the relative marginal values of capacity versus energy, which one's higher. If it falls under CSI, to file a response under CSI.

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: I have another question. If winter has higher marginal values, has there been consideration of designing domestic rates to reflect the seasonality such as higher rates for the four (4) coldest months to better reflect marginal

costs and rates? If not, why not.

(BRIEF PAUSE)

MR. KEVIN GAWNE: Sir, if we could hang on to that question for the rates panel, I'll -- I think that --

MR. ANTOINE HACAULT: Will do.

THE CHAIRPERSON: Okay. Does the Panel have any questions? Re-examination at all?

(BRIEF PAUSE)

MS. ODETTE FERNANDES: No, there's nothing. Thank you.

THE CHAIRPERSON: Thank you. It's been a long day. I want to thank the panel and I want to thank Ms. Fernandes.

We're going to adjourn until nine o'clock tomorrow morning, and according to my schedule, tomorrow morning we will be hearing from Daymark for public evidence. So thank you. Have a good evening.

--- Upon adjourning at 2:50 p.m.

Certified Correct,

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Wendy Woodworth, Ms.