MANITOBA PUBLIC UTILITIES BOARD

re:

MANITOBA EFFICIENCY

3-YEAR ENERGY EFFICIENCY PLAN

(2020/21 - 2022/23)

Before Board Panel:

Robert Gabor - Board Chairperson

Marilyn Kapitany - Board Vice Chair

Hugh Grant (by phone)- Board Member

Irene Hamilton - Board Member

HELD AT:

Public Utilities Board

400, 330 Portage Avenue

Winnipeg, Manitoba

January 20, 2020

Pages 2091 to 2321

APPEARANCES

Bob Peters	(np)	)Board Counsel
Dayna Steinfeld		)
Kate Hart		)
Jessica Schofield		)Efficiency Manitoba
Nicole Merrick		)
Byron Williams	(np)	)Consumer
Katrine Dilay		)Association of
Danielle Morrison		)Canada (Manitoba)
(articling student)		)and Winnipeg
		)Harvest
Antoine Hacault		)MIPUG
Jared Wheeler		)MKO
Markus Buchart		)
Carly Fox	(by phone)	) Assembly of
Emily Gugliemin	(by phone)	) Manitoba Chiefs
William Haight	(np)	) For Independent
William Gardner	(np)	) Expert Consultants

TABLE OF CONTENTS

LIST OF EXHIBITS

LIST OF UNDERTAKINGS

NO.	DESCRIPTION	PAGE NO.
17	Mr. Bowman to produce two (2) new versions of the chart at PUB 14, page 380, both incorporating the corrections to the chart that he accepts, one (1) with the Manitoba Hydro DSM amortization and one (1) without, and also incorporating what Mr. Bowman believes to be the most current approximation of export pricing	2320

--- Upon commencing at 9:03 a.m.

THE CHAIRPERSON: Good morning, everyone. Ms. Hart, do you want to take us through today?

MS. KATE HART: Thank you, Mr. Chair. Dr. Grant, can we just confirm that you can hear us?

(BRIEF PAUSE)

MS. KATE HART: Dr. Grant, can we just confirm that you can hear us this morning?

(BRIEF PAUSE)

DR. DARREN CHRISTLE: Hugh, can you check to see if your phone is muted? We think you're on the line.

(BRIEF PAUSE)

DR. DARREN CHRISTLE: Just two (2) minutes, Mr. Chair. We're sending a -- a message.

(BRIEF PAUSE)

BOARD MEMBER GRANT (BY PHONE): Are we good to go?

DR. DARREN CHRISTLE: Hugh, I'm assuming that's you?

BOARD MEMBER GRANT (BY PHONE): Yes, it is.

(BRIEF PAUSE)

THE CHAIRPERSON: Ms. Hart...?

MS. KATE HART: Thank you, Mr. Chair. So, on the schedule for today, the MIPUG witness panel will give direct evidence followed by cross-examination by Consumers' Coalition, Efficiency Manitoba, and Board counsel.

MKO has advised us that they will not cross-examine the MIPUG witness panel. AMC is on the line this morning and will advise us at a later time if they will cross-examine the witness panel.

Mr. Chair, Ms. Dilay has a brief housekeeping item.

THE CHAIRPERSON: Yeah. Ms. Dilay...?

MS. KATRINE DILAY: Good morning. This is just to file two (2) responses to undertakings --

THE CHAIRPERSON: Okay.

MS. KATRINE DILAY: -- on the record that were filed electronically with parties last Thursday. And so, the response to Undertaking number 15 will be Exhibit CC-20.

--- EXHIBIT NO. CC-20: Consumers Coalition's response to Undertaking 15

MS. KATRINE DILAY: And response to Undertaking 16 will be filed as Exhibit CC-21.

--- EXHIBIT NO. CC-21: Consumers Coalition's Response to Undertaking 16

MS. KATRINE DILAY: And paper copies have been provided to the panel members, as well. Thank you.

THE CHAIRPERSON: Thank you, Ms. Dilay. Mr. Hacault...?

MR. ANTOINE HACAULT: Yes, good morning, Mr. Chair, panel members, Dr. Grant, and all here. We once again thank the Public Utilities Board for the opportunity which is given to Manitoba Industrial Power Users Group to present evidence to it

in this inaugural hearing of the three (3) year plan approval for Efficiency Manitoba.

To my left is Patrick Bowman who has testified here before. And to his left is Dale Friesen. Mr. Friesen will be affirmed and Mr. Bowman will be sworn in. And then I'll proceed to introduce them more formally.

MIPUG PANEL:

DALE FRIESEN, Affirmed

PATRICK BOWMAN, Sworn

EXAMINATION-IN-CHIEF BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Thank you. With the Chair's permission, I'll briefly be going through some of the qualifications for Mr. Bowman and for Mr. Friesen.

Mr. Bowman's CV is marked as MIPUG 5-2. And first, Mr. Bowman, do you adopt the evidence filed as MIPUG 5 and all the answers to the IRs posed to you and, finally, with respect to the PowerPoint which will be marked as Exhibit 13 this morning?

MR. PATRICK BOWMAN: Yes.

MR. ANTOINE HACAULT: You've testified a number of times before this Board, but you've also

testified and given support to both utilities and consumers across eight (8) Canadian provinces, territories, and also have been involved in some international work in rate regulation and review?

MR. PATRICK BOWMAN: Yes.

MR. ANTOINE HACAULT: More particularly, you've appeared before this Board as an expert in General Rate Applications, revenue requirement reviews, the Needs For and Alternatives To hearing, depreciation, cost of service and rate design matters?

MR. PATRICK BOWMAN: Yes.

MR. ANTOINE HACAULT: And you've also assisted industrial power users with respect to assessing alternative rate structures, surplus energy rates, and demand side management initiatives, including curtailable rates and load displacement?

MR. PATRICK BOWMAN: Yes.

MR. ANTOINE HACAULT: I had mentioned that you had acted on behalf of utilities, but I believe I neglected to indicate that you've also acted on various -- on behalf of various municipal governments also?

MR. PATRICK BOWMAN: Yes, and provincial and territorial governments, as well.

MR. ANTOINE HACAULT: I'll now move to Mr. Friesen. Mr. Friesen, your CV is marked as MIPUG 6-2. Firstly, I'll ask you whether you adopt the evidence marked as MIPUG 6 as revised.

I understand that the revisions which were circulated this weekend have been marked as Exhibit 6 of MIPUG as revised, and I'll continue, as well as all answers provided by you in response to IRs on your evidence as well as the PowerPoint which we will be marking as Exhibit 14?

MR. DALE FRIESEN: Yes, I do.

MR. ANTOINE HACAULT: Now, Mr. Friesen, I understand that you're a professional engineer, correct?

MR. DALE FRIESEN: I am.

MR. ANTOINE HACAULT: And you've been a technical consultant and management advisor providing independent guidance and services related to the efficient, productive, and economic utilization of energy resources within homes, businesses, and communities for provincial, national, and international clients?

MR. DALE FRIESEN: Yes, I have.

MR. ANTOINE HACAULT: And your prior experience includes a thirty (30) year background with

Manitoba Hydro and its subsidiaries -- or its subsidiary, Meridian Power Inc., until about 2017?

MR. DALE FRIESEN: It's about twenty-six (26) years and five (5) in industry prior to that but, in general, yes.

MR. ANTOINE HACAULT: Okay. And you've been involved in those various capacities, demand side management, consisting of program planning, development, delivery, and promotion supported by customer account management, economic assessments, utility rate analysis, codes and standards development, energy efficiency regulation, and integration of consumer-sided renewable energy projects and distributed generation?

MR. DALE FRIESEN: Yes, I have.

(BRIEF PAUSE)

MR. ANTOINE HACAULT: And you anchor this expertise in the technical and commercial aspects of product development and business growth for new and emerging energy technologies?

MR. DALE FRIESEN: I have, yes.

MR. ANTOINE HACAULT: And some of your ongoing work includes being the chair of the CSA

Groups Stra -- Strategic Committee for performance, energy efficiency, and renewables?

MR. DALE FRIESEN: Yes.

MR. ANTOINE HACAULT: And this group holds a responsibility for the development of energy performance standards referenced as national standards of Canada for energy consuming equipment in buildings?

MR. DALE FRIESEN: That is correct. And that is within Canada.

MR. ANTOINE HACAULT: I don't propose to go through any further detail of their CVs, Mr. Chair. With that, the presentation will be broken up between Mr. Bowman, who will proceed first, and then Mr. Friesen, who will proceed second.

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

MR. PATRICK BOWMAN: Good morning, Mr. Chair, members of the panel. The presentation for today is Exhibit 13 and I believe has now been pulled up on the screens in front of us.

The outline of the presentation is -- will primarily focus on the recommendations that are contained in the pre-filed testimony. They have been -- perhaps we can go to the third slide.

My scope that I've been asked to review

in respect of this Hearing covers the PUB scope items 2, 7, and 8 which were on cost-effectiveness, evaluation of the plan, and EM's mandate and recommendations to government.

The direct will cover the same material as the pre-filed testimony, but it's been re-ordered somewhat to put these directives into -- or, the recommendations into groupings and to reflect some of the language, I'll say, terms that have been used before the Board since the -- the filing, such as those brought in by Daymark, to help bring a bit more common language and hopefully help with a bit of understanding. And my comments primarily address the electricity components of the program.

Moving to slide 4, as a general comment, I will note that I have experienced that there's a certain challenge to the PUB and Interveners in this proceeding, going through this for the first time: a wide range of topics, everything from broad policy and -- and questions of the ultimate objectives trying to be achieved, all the way down to -- on the verge of managerial questions regarding the ability to deliver budgets, reasonableness of -- of -- of program assumptions. That's a lot of topics to try to deal with in one (1) hearing and without a previous track

record of how to deal with Efficiency Manitoba.

But ultimately, my understanding is that the Board is going to have to deal with two (2) things out of this hearing: One is whether the Efficiency plan should be approved, approved with suggested amendments, or rejected; and the second is the broader question of the opportunity with recommendations to government pursuant to the -- to the Act and the regs.

It would appear to me -- based on reading those -- the PUB's Order, as well as the Act and the regs -- that this may be the only opportunity to weigh in for the next three (3) years, unless some other mechanism is created, at least before the PUB in a -- in a regulatory forum.

And I think that shapes a bit of the -- the context for what we have to deal with. And also, I think we are dealing with -- at least a challenge for me in terms what is meant by some of the terms in the -- in the legislation in terms of recommending approval of a plan versus an approval with amendments -- what is meant by approval.

EM's plan is, in many cases, directional or -- or not filled in, so is -- is approving a plan without detail mean that they must

stick to the plan or that there's room for -- for EM to manage within that? If -- if, you know -- if the Board, in its wisdom, determines that some aspects of the plan as written do not fulfill the public interest, how -- how much can be brought in through a recommendation of an amendment as opposed to saying that something requires a rejection, and what happens in the case of a rejection?

I think those are -- those are pretty substantial questions that, frankly, we're still mulling. You'll see I don't provide a clear direction to the Board in terms of approve with amendments versus reject, partially for the reason that -- the question of what could be put through an amendment is -- is, in -- in my reading, is a -- effectively, a legal question and will be dealt with by Mr. Hacault at the end of the hearing.

To slide 5 -- when we approached this hearing, we assumed that the review was broad and would include policy questions regarding efficiency in Manitoba generally. It is review of a plan, but it is also, in our understanding, a review of the context for the plan and the need for the plan as set out, as well as whether the plan is -- is ultimately in the public interest in the -- the -- the broader context

for what it's trying to achieve. I think that's somewhat different than Daymark's comments, and I reference from transcript 1469, where I would view their comments saying that -- that this is a hearing about oversight of Efficiency Manitoba and very much the question of, How does one put incentives and -- and -- and managerial bounds on Efficiency Manitoba as an entity?

This isn't the same as a regulatory hearing. The Board won't issue approvals. EM is not necessarily a regulated entity the same way the Board would regulate hydro or -- or other boards would regulate utilities. And for that reason, we thought the Board's role might be somewhat broader in terms of recommendations than -- than Efficiency Manitoba's own task.

And in that regard, I would -- I put down the comment that I think Efficiency Manitoba has fulfilled their -- their mandate to produce a plan and within the bounds that the Act tells them to produce a plan: find 1 1/2 percent electricity savings, spread it across the classes, and accept Manitoba Hydro's data. Within those bounds, I think Efficiency Manitoba has -- has done its job, and we can assess them against their job.

But there's a broader public interest question which, I think, is -- is before the PUB, and some of -- some of my comments may go, effectively, beyond the -- the -- the specifics of EM's own three (3) year plan. And I will say that it -- when we were asked by the clients to look at this, the clients' interests also go beyond just the details of -- of the programming in EM's plan.

Moving to slide 6, the -- the PUB scope 2 and 7 that I was asked to look at -- focus on cost-effectiveness and evaluation. As the Board has heard, EM primarily reports based on a well-known test known as the program administrator cost test, the PAC. It's consistent with the regulations.

The PAC Test needs to be understood that it is utility focussed, which is appropriate. It is -- other utility cost tests are also used, like levelized cost. It means that it's assessing what the programs look like from the person running the program. It's not bringing in, necessarily, a broader societal questions, and it's not necessarily bringing in the participants' own focus.

Those tests are also reported on a secondary basis, which is appropriate, and they can help in a lot of ways, but they're not as useful for

cost-effectiveness testing. When one is looking at -- at programs, the consolidated view, which would -- would bundle the utility and the customer view to a much broader societal-type test, can be things like the total resource cost test, which -- the TRC -- which has been referenced, or the societal cost test, and also somewhat Daymark's PMVT.

The consolidated test can be useful at an overall level for looking at what Efficiency Manitoba should pursue, but they can also be quite -- quite paternalistic in a sense that they're looking at whether these measures should be pursued in the first place from what is primarily an economic perspective, without considering whether many customers might want to pursue something that is not strictly in their economic interest, but for other reasons. And there's a lot of cases where people will adopt measures for -- for reasons beyond economics.

So I -- I can give more examples of that, but it's a good reason why -- why the total resource cost test or other broad tests are -- are not the driving factor in EM's plan and are also, as you've already heard -- are no longer tend to be the driving factor in -- in DSM programming within North America. They used to be. They -- they've been

downplayed.

The persis -- participant focussed tests such as payback are also useful for program design, but not as much for screening. And this is because participants may choose to participate in -- in -- in all sorts of things that don't -- don't pass EM's assessment of the participants' economic interest. So when you look at the participant, you know, they may have other reasons for pursuing -- pursuing efficiency measures.

And you also have to consider the interactive effects on the -- within the program. And I'm not sure that's been done to the level needed in some of the participant tests, and you've heard comments about how EM has modelled the interactive effects from the electricity side, effectively, as a gas effect, when, really, it's an electric effect.

And -- and that has to be considered in the participant focussed test. I'm going to give an example in the next slide so that you can see how these -- these various measures are -- need to work together in terms of cost-effectiveness.

The extra thing that's been brought into this hearing is Daymark's pure measure value test, which is pretty much a variant on -- on the TRC.

It's not traditional. It is interesting, and I will say, in -- in my own view, if you had to describe what the PMVT is doing, is testing if you're encouraging people or the -- the -- you know, broadly, to do things that are not in the collective economic interest.

And in terms of def -- defining the collective economic interest, it includes things such as water savings that are real but are questionable as to whether you'd have electricity ratepayers running programs that-- that primarily or substantially provide water savings to people and whether those programs are appropriately paid for through the electrical system.

Failing the PMVT --

THE VICE-CHAIRPERSON: Mr. Bowman, can I just as you a question --

MR. PATRICK BOWMAN: Yeah.

THE VICE-CHAIRPERSON: -- before you move on from --

MR. PATRICK BOWMAN: Yes.

THE VICE-CHAIRPERSON: -- there? So when you say participant focussed tests are useful for design but not screening, are you talking about the TRC?

MR. PATRICK BOWMAN: I'm talking -- well, so TRC is a -- is a broader test. It's sort of collective. It takes the utility perspective mixed with the customer perspective, and -- whereas participant focussed tests would be things like payback or the persistent cost test. The difference, fundamentally, is how you value the power. Broadly, the power is worth the marginal value to Manitoba Hydro, but if you're a participant, the power is worth the rates Hydro charges, and those two (2) values could be different.

So as a participant you might do something that saves you on your bill, but the power that you've given back to Hydro might be worth a very different amount than what you've saved on your bill. And I -- I'll deal with this in the next slide, and I'm happy to follow up when we put some numbers in front of us.

I was just going to finish this one by saying I -- I agree with Daymark that failing the PMVT should not be fatal to a measure or -- or to a bundle, but it's -- it's a -- it requires some serious consideration as to whether that should be part of Efficiency Manitoba's plan, because ultimately you're saying the cost of implementing the measure to --

collectively is more than the value of the power you get back. That's what failing the PMVT says.

Now, in this slide is a -- a table. We've now moved to Slide 7. This is a table that addresses a number of things I've put in words in my -- - in -- in my pre-filed testimony. It summarizes numbers that are in -- in all cases but one (1) already on the record. One (1) of them requires a simple subtraction, but to give an idea of -- of comparing some different programs and how they look from these different perspectives.

And at the top are the utility type considerations, in the middle is the collective considerations, and on the bottom is the participant considerations. So from the utility perspective in this example I've chosen four (4) electric bundles. They're at the bundle level, not the measure level, so you have to consider that there's lots of different things going on inside of these bundles, but it gives you an idea of how to -- how to make use of some of these numbers.

And the bundles there are the commercial and industrial, custom program, which is a very large offering. It's a very diverse offering. And in the three (3) year plan, it will save 70.6

gigawatt hours, summed over three (3) years.

The second one shown is the residential direct install, the third is the residential product rebates, and the fourth is the residential home renovation, which are three (3) programs I said show problematic economic perspectives, and hopefully this table will help explain why. And those save respectively 5.7, 34.7, and 15.3 gigawatt hours over the three (3) years of the program.

Just to give an idea of the size, the comparative size. Those are not lifetime, they're just simple sums over three (3) years.

To get an idea of the comparison of the cost, the PAC cost, which is the cost to run the program, is just over $8 million, almost $9 million for custom. You can see the rest, 1.62, 10.24 million, to run the other programs. That's the present value over the life of the program, so I'm not saying those two (2) are necessarily equivalent. They're just a way of -- of understanding the size of these programs.

The values that are equivalent and are comparable is the levelized cost. Levelized cost will take into account how much energy you're getting back on a present value basis over the life of the

programs, and now this brings in the fact that those measures may have different lives, and when you get down to looking at levelized costs you'll see that the commercial, industrial, custom program is reported at a levelized cost of 1.17 cents per kilowatt hour, so that's very low cost power for EM to achieve and to secure for -- for Manitoba Hydro's benefit.

The direct install is four (4) -- over four (4) cents, the product rebate is about three and a half (3 1/2), and home renovation is similar. So it gives you an idea of what it takes to acquire those kilowatt hours.

Now, they're not equivalent kilowatt hours either, because, for example, the industrial kilowatt hour is saved at a transmission level, whereas the others are saved at a distribution level. Distribution kilowatt hours are more valuable because they can save you costs on the distribution system as well.

They also have different profiles in terms of summer and winter and -- and the like. So when you want to see how much are these -- are these -- is this power worth, you look at the marginal value, and again these are reported directly out of the -- the -- Efficiency Manitoba's response to a PUB IR.

And the marginal value of the industrial program example given is 6.07 cents per kilowatt hour, lifetime, while for the middle two (2) residential programs are six three five and six-o-six and the home renovation is 10.65.

Now that's pretty striking. To me, just looking at that, the first thing I would note is that the two (2) middle columns, direct install and product rebates, are giving you a fairly low marginal value, particularly considering they would have a distribution component on top of what the -- the industrial custom is saving.

Likely the commercial industrial program is fairly high load factor, meaning fairly flat across the year, and so these are probably -- because you'd have to have a separate distribution added, their value at the bulk power level, once you've backed up into the system, is -- is probably quite a bit lower and they probably have a -- a less than ideal profile for when the power is saved.

But compare that to the residential home renovation, which all of a sudden has a huge jump in value, and that would be a function of its life, but also -- and -- and we have an IR on this, it's a function of the fact that it saves you a lot of peak.

It's a program that will save you a lot of -- of -- of -- of power at peak times, and that means it's going to save a lot of distribution costs, and -- and to some extent, transmission costs.

Now we don't get to see into the details of this but there is clearly a significant distribution benefit to the home renovation program, and as a result, when you move down to the PACT ratio, which again is reported from that PUB IR -- and it appears that Efficiency Manitoba calculates it based on comparing millions, but it works just as well comparing cents per kilowatt hours.

The PACT ratio, meaning utility's view, is that the commercial, industrial, custom program has a very high, very good ratio, 5.18. Home renovation at the other end is -- is pretty -- pretty good at 2.9, because that power is so valuable. And the middle programs are a lot more marginal, 1.53 and 1.74.

Over a lifetime, that would get you into some concerns about how the timing and distribution of those occurs, because they're -- they're -- they're not -- they're not necessarily achieving a -- a lot of margin above what you're investing.

The other side of this, though, is when we go to the Daymark test of the PMVT, the collective considerations. And remember, the PMVT is looking at whether, if the Utility had sent someone to do something, is -- are we collectively as a province further ahead having done that or not. You know, is this a measure we should be encouraging people to pursue?

And these are Daymark's numbers from Table 32. We don't get to see the detail of them just relying on the updated 32, the commercial, industrial, custom has 4 percent of the -- of the energy, is my understanding, failing the PMVT test. Direct install has 19 percent, product rebates has 9, and home renovation has 91 percent, which is a -- a pretty surprising number.

Remember those include water savings, so if you're looking here in terms of util -- of a -- of a electricity system, an electricity customer paying for these programs, you might think that they -- they would look even a bit worse if you really just focused on the electrical side, particularly for the residentials, which may have water savings involved in them.

And I'll -- I'll make one (1) separate

comment here, which is sometimes people talk about these as, you know, a way to deal with a customer and get in the home and otherwise do things that are -- are beneficial, and -- and one (1) of the questions that might arise is, okay, the electrical home renovation may not look that good, but the gas home renovation might look great, and the answer is actually, no, the gas one looks worse than the electrical one when you get into the details of it.

So now we go down to the participant side, and this will tie directly into some the recommendations that we have. When you're on the participant side of this, if you're running one of the commercial, industrial, custom programs, Efficiency Manitoba is making investments, is paying money up to about 1.1 cents on average to acquire power for you and they are requiring you to do other things on your side.

The things you have to invest on your side as a commercial, industrial customer, on average it will take 5.4 years to pay back.

If you look across the page, you'll see what the level of Efficiency Manitoba's investment in the other programs strives for payback for the -- the other participants. So direct install pays back in

less than a year, .77 years. Product rebates is 2.27, and home renovation starts to be back down near the -- the commercial, industrial customer, much higher payback. And that would be consistent with the idea that a lot of the things that were incenting people to do on their home renovation may not be economically advisable in -- in the first instance.

Now, one (1) more consideration down here which requires one to look at what is the value of power that Manitoba Hydro is receiving back, which is a reported value. It's the PACT benefit, the PV of marginal value.

How -- so how -- how much value of power comes from running this program and how much do we allow people to cut their bills or do we drive people to cut their bills by providing that power back? It's a sort of power acquisition side of this, looking at the lost revenue.

And under the commercial, industrial, custom, you'll see that Hydro gets back a present value of about forty-six million dollars ($46 million) worth of power. The customer who participates will have their bills cut, present value, by about -- or the customers collectively, by about $37.8 million, and as a result right from the outset when you look at

the value of power Hydro's getting back, 82 percent of that value is captured by the customer in bill savings, and the remainder would go to other -- other system benefits shared.

It's when you move to the middle two (2) programs you start to get a sense of -- of why, if -- were you to report RIM measures or others on these, they'll show some pretty negative effects.

The direct install hands back Hydro 2.482 million worth of power benefits, but the customers themselves will see their bills cut by 2.739 million, meaning they're capturing about 110 percent of the savings and, ultimately, the difference has to made up by other customers.

And remember that those revenue and bill changes are criticized because the rate increases assumed are lower than Hydro is presently forecasting in its IFF. So, those numbers would be higher if we put in more like the 3.9 percent that Hydro has tended to -- to save -- is coming rather than inflationary.

Product rebates has a similar profile, actually a little bit worse profile, and home renovation starts to look not bad for the -- from the -- the other customer side, actually better than any of the other programs here, because the -- the problem

is that we've put the costs onto the -- onto the consumer on the home renovation side with the lower -- longer payback.

But about 71 percent of the -- of the benefit is being captured by the -- by the consumer in lower bills. They're just having to pay a lot to install the measures, which is why their payback is lower. And the utility -- it -- it explains why the utility metrics are pretty good.

And there's some -- I've put some things down there to describe effectively the same thing that I've just said. Commercial industrial has a small EM investment, large savings, low cost, not -- not that great a program from the customer's side.

And the program design of looking at these metrics would say that the industrial customer -- custom program would have a lot more potential. It's being influenced by the fact that EM is capping its willingness to -- to meet the customer on this and they're driving the customer to have to make pretty large investments with pretty poor paybacks in order to participate and to get that power.

In other words, there -- just based on these numbers, there would be more room to think about doing something through that program that's cost-

effective. The middle programs and -- are -- are problematic. They're weak bundles.

The customers make out exceedingly well for participation. They're of -- they're dubious merit to EM. Also, they're quite short, so I have concerns with the RFP value which I'll talk about in a minute. And the home renovation is -- is very -- is interesting because it's very valuable power.

The co -- the -- the measures are costly. They're not easily cost-justified on the PMVT. There was also a pretty poor customer payback. The programs don't look bad for EM because of the valuable power.

But it raises another concern we're going to talk about in a minute, which is, if a significant amount of the benefit is coming from avoiding distribution system upgrades, avoided distribution marginal costs, one of the limitations of what -- what EM is doing and -- and the information Hydro's giving them is it will have a broad distribution measure which is -- is coarsely applied across the province.

And if you look into how that measure's derived, it will be done by looking at the fact that, in some places, there are distribution constraints.

And if we can get the peaks down, Hydro won't have to invest as much in distribution.

But it means that the distribution marginal values are very location specific. So, if -- if St. Vital is tight on -- on distribution capacity, avoiding load growth in St. Vital is hugely valuable because you can put off upgrades for a few years.

But if -- if Brandon has lots of distribution capacity, then avoiding upgrades in Brandon won't generate this ten point six five (10.65) in savings.

They just won't exist because you -- you won't get that distribution benefit if they're -- no one's planning distribution upgrades that can be avoided. That might be true because Brandon's transformers are being replaced, but they're being replaced for age and they're not being driven by load growth, for example.

That's the type of work that goes into setting a distribution marginal value. And -- and we don't have that information before us in this proceeding.

Board Member Kapitany, did that address the question?

THE VICE-CHAIRPERSON: (NO AUDIBLE

RESPONSE).

MR. PATRICK BOWMAN: Moving on to slide 8. This -- in -- in regard to PUB scope 8, which is the recommendations to government, I was going to just make a brief comment on the IRP side.

There's been some comments about whether this Hearing take an IRP-type outlook, and my view is it does not. The key difference is how 'need' is defined, and 'opportunity', and whether the ra -- the range of options being considered is -- is really integrated.

In this case, the need is prescriptive, 1.5 percent a year for electric and, of course, .75 for gas, and the range of options is limited to efficiency. This to me is backward. It's a mirror image of the criticism of NFAT where -- and probably worse, frankly, where in NFAT we said that the available solutions was excessively narrow.

At least there was a process to define 'need' and 'opportunity', but the range of options being considered was narrow because it didn't include efficiency. In this case, we're -- we're doing the other side of it.

Effectively, NFAT said you can do efficiency or don't do efficiency, it won't affect my

building plans. In this case, we're saying build, don't build, load forecast up, down, it won't affect my efficiency plans. It's kind of the same blinders problem.

Also, the IRP side is tied to the thoughts about cost-effectiveness. And, you know, Efficiency Manitoba has applied a PAC test. The PAC test has been correctly applied, from what I can see, and the -- it is a useful test for looking at the overall life as to whether the power you're acquiring is cost-effective and how it compares to other resources you could acquire. It -- it's an acquisition-type consideration.

What it's missing is wheth -- the question of whether we actually need to acquire that power. And if you're not in a need situation to acquire the power and you can't answer that question affirmatively, then you're into much more considerations of opportunity, what is the opportunity to do something that's -- that's beneficial.

And usually, the -- the type of questions we would be asked is should we bother to acquire this power because it'll make -- it'll make our -- our overall costs and rates lower.

And that would mean much more reliance

on the -- the RIM or LRI-type tests rather than the -- the PAC screening type tests.

And we haven't had the type of information needed in this Hearing to be able to understand the extent to which what EM is -- is achieving in power savings is in fact meeting a need deferring generation within a horizon that we have a reasonable prospect of -- of understanding and reasonable certainty on or whether it's more in the context of opportunity to do something and -- and whether that opportunity is worthwhile.

If it's about an opportunity to acquire some power we can sell to export markets but we're actually spending more money than that -- that power is worth and driving up our rates, then you -- I think you'd have a pretty significant question about whether that target is -- is in the public interest.

And the last broad initial comments I'll -- I'll touch on before I get into specific recommendations is about marginal values. Marginal values were -- are -- are clearly an important factor in this Hearing. The -- the Hearing is constrained.

And I don't -- I -- I think it's important to not address this as a -- as a sort of gripe session, if you like, but it's clear that in the

derivation of marginal values requires confidentiality on many aspects like export contracts being negotiated.

There's no doubt that -- that Hydro could be harmed by -- by, you know, excessive release of information when they're trying to negotiate something.

The other side is the regulations clearly limit the marginal values being used to those determined by Manitoba Hydro; that is the word. And -- and I'm not suggesting that we need to spend this entire Hearing or -- or any part of this Hearing trying to challenge whether Hydro has determined the values correctly, but it doesn't preclude the need to have an understanding of the basis of how they're derived and what those numbers really mean.

And I was giving a couple of examples here. You know, are the -- there's one (1) question I address here, is are the marginal values being used correctly. In order to know that, I think there's further information needed about the marginal values.

For example, Hydro's marginal values when we've been able to see their derivation going back many years, the last time they -- they were actually -- that information was made available, the

report we have, and, also, the way they've been described since then.

Manitoba Hydro relies on long-term resource planning, over thirty (30) or more years, to derive its marginal values. And it would -- what it will do is it will run a power resource plan that looks at the long-term, what we have to build, what we can commit, the exports we can make. And then it will change the load and rerun that plan.

And it'll say, as a result of changing the load, what is the overall economics, how much did the overall economics change. And they can change the load in different ways to test the way the economics change, but they're running it over a very long-term plan, to take a look at it.

If your -- EM's program is only five (5) to ten (10) years, does that savings -- is that savings being appropriately modelled if you're picking up a value that assumes that it's a very long-term change but the program you're running is only five (5) to ten (10) years. So that's a -- a concern about a possible mis -- mismatch in that.

In -- in support of -- of the -- my understanding that that is the way Hydro is doing things, there was a -- a comment that there's no on-

peak/off-peak values. Mr. Harper addressed this, and it's been confirmed in IRs that the energy is not valued differently at on-peak times versus off-peak times.

And that's because when you're running those long-term scenarios, that doesn't -- on-peak and off-peak doesn't matter much. They don't run resource plans at a level that is -- is going to look at what an on-peak kilowatt hour's worth versus an off-peak, because it ultimately assumes that you can do some balancing of that with your imports and exports and with your water. You can generate power at different times, turn -- turn your -- your generators, particularly hydraulic, up and down. And so over the long-term, on-peak versus off-peak power is not -- not that big a deal, if they're even able to get a visibility into it.

But over the short term, it's a very big deal, and we can see that in the SEP prices approved by this Board every week. The -- the value of a kilowatt hour used in the on-peak is very different than the value of the kilowatt hour used in off-peak, and particularly, when you're talking about horizons of -- that E -- EM is looking at for many of their programs, like five (5)n years. And so the

concern about the -- not understanding the -- what is the derivation and what's in the marginal values is that tho -- they -- Efficiency Manitoba may be misapplying them.

The other comment here is that when Hydro's deriving its marginal values, it's running them out of a power resource plan that's looking at need dates well into the future, and the power resource plan is ultimately about considering, When do I need to build something so the lights don't go out in Manitoba? And as a result, it has a lot of conservatism built into those -- those assumptions.

And people who were here for NFAT will remember things like import limits. Hydro will not run its power resource plan assuming it can import anything during the day during a drought or assuming it can exceed 10 percent of its -- of its load as imports during a drought. And it does that because you wouldn't want to be exposed to the market that much on a planning basis during a drought when you're thinking about when your next plan is needed.

In practice, when a drought occurs, they're going to take every kilowatt hour they can get. They will -- you know, the -- the resource plan will run Hydro's own gas generators, but if they can

pay someone else to run gas generators to either fulfill export contracts or to import the power during the day, during the night, any time, they'll take it, because they run the system on -- the most cost-effective way. And that is much more the operating or short-term planning context that would be relevant for some of the horizons of the type of programs EM is running.

The conservatism side means that Hydro's marginal values will tend to come out higher because they make assumptions about -- about what the system will require.

Now, if we were in a need date, where we were close to the horizon for needing a new plant and we were -- EM's programs were effectively deferring something in -- in the horizon in which the programs are running, then that would be relevant, because those conservatism is also built into the decision that you're making about bricks and mortar.

But if we're not in a need context, then the effect of EM's plans, particularly those that are -- that are shorter term, won't swing Hydro's long-term export contracts. It won't swing ten (10) year commitments to Minnesota Power or whatever. It will -- it will ultimately swing shorter-term export

transactions or change spill levels during a flood or change fuel usage during a drought. And those have -- those do have much more of an operating perspective on them.

Slide 10 is in the absence of having the -- the marginal value details, we also -- I don't have a -- a good summary here about what power EM is actually trying to achieve. They need to meet their one and a half (1 1/2), and they can be tested against the one and a half (1 1/2), but we don't -- and -- and -- and buried in the numbers will be some consideration of -- of the value of those one and a half (1 1/2). But we don't have a simple explanation about whether they're really trying to get winter energy or whether they're really trying to get peak or whether they're really trying to get energy any time of the year.

And because that's not as well understood and canvassed in this proceeding, we can -- we can get into discussions about things that -- that can easily get -- can lose the perspective of the value. And -- and a good example was the air source heat -- heat pump discussion. There is huge energy savings that can be gained by somebody switching from resistance heating to air source heat pumps. It's

just that the biggest of those savings will tend to be in November, March, warm days in December, January, February. And no one's going to deny those are kilowatt hours that are saved. It's just are they very good kilowatt hours?

Well, we just went through and saw how much value comes from a peak savings. That hu -- home renovation program was getting ten (10) cent kilowatt hours because it's saving you power when it's minus forty (40) outside and it's helping avoid transmission and distribution. That's -- those are the dates the air source heat pumps don't do anything for you. So you might end up saving a whole lot of kilowatt hours, but we don't have the assessment of what those are worth because we can't easily explain what -- what matters here, because we're missing the relative importance of the marginal values.

And the other -- the other example I gave was of the locational side. If you're going to run the home renovation program, you're going to say there's this average distribution savings, which is valuable, but we don't have a good assessment of -- of where that's valuable. So if you're running that program, it may be that that program really needs to be run in a targeted area of Manitoba where you get a

distribution benefit, and it'd be worth even more than ten point six five (10.65). But let's not spend a lot of time trying to run that program in -- in other areas. And -- and that's not uncommon. There are places that run -- run DSM programming that focus only on -- on certain areas where the -- where the transmission or distribution is key.

Moving to the recommendations, I had fourteen (14) recommendations that I have -- we're now at slide 12 -- that I've -- I've grouped to try to make things a bit more straightforward. Slide 13 addresses the question of 'approve, vary, reject.' As you -- as I addressed, I won't be giving the Board a stra -- a -- a strict view of the 'vary' versus 'reject' because of the concerns about what -- the extent to which the Board's report needs to follow the Act and what those terms mean and how they'll be implemented.

But in general, I think that there's no dispute that EM's actions will result in increases in rates. Those increases in rates could be significantly higher than reported by the LRI. I address this in -- in my direct evidence -- in my -- sorry, in my pre-filed testimony. EM's LRI shows a de minimis impact of 0.019 cents, which is about five

million dollars ($5 million) a year if you apply it across Manitoba Hydro's domestic load of about 25 terawatt hours.

Daymark shows that that captures too many kilowatt hours. If you only focus on the kilowatt hours relevant to when a program is running already, there -- the EM effect triples, and so instead of $5 million a year, it's more like $15 million a year on 25 terawatt hours.

When I take a look at it, putting any IFF-type lens -- Manitoba Hydro's integrated financial forecast type of lens on it, I think the impact will be much higher than that. EM plans to spend almost a hundred and fifty million dollars ($150 million). Those are amortized over ten (10) years. That's 15 million alone, just the amortization.

We haven't talked about the interest it costs that Hydro will have because it has to make those payments. We haven't talked -- and we haven't talked about the fact that in any measure, Hydro is seeing less -- or, more revenue loss than it is seeing revenue gain on the export side. So in the near term, 15 million to me is -- is -- clearly doesn't capture the -- the full impact.

I've -- I derived some numbers. I know

EM is taking concern about the -- the -- the scope of those in the rebuttal evidence. I'm happy to comment on that if -- if that's helpful. But in general, I think it should be understood that there's -- that -- that -- on -- in -- in the -- in a few minutes of arithmetic on the back of an envelope, someone can show that the -- the actual practical impacts in the near term -- just in the first three (3) years, much less Years 4, 5, when you layer on new EM plans -- will be considerably higher than suggested even by Daymark.

Slide 14, the -- I -- I think without the IRP framework, the Basic need for power has not been established beyond the government directive, and also we're in a context where we all understand rates are being driven higher by Keeyask. That will have its own effect on elasticities, customers conserving just in response to the price signal of higher bills. We know that Hydro has a low net income, which means it doesn't have the ability to absorb EM's costs easily without driving up increases in rates.

And as a result, my sort of conclusion or Recommendation 1 is the plan has not been justified in terms of cost -- cost-effectiveness in light of potential alternatives. And so I think my

recommendations to PUB is somewhere between 'vary' and 'reject', and I -- as I said, I'll leave that to -- to the -- to Mr. Hacault to address in his final comments.

Recommendation 12 was, I -- I believe, for the first few cycles, consideration should be given to targeting well below the 1.5 percent savings target, in part due to the things I've talked about and in part due to the fact that Manitoba Hydro's marginal values are likely to increase as you get closer to a need date, and so the justification for the programs would likely increase and EM's programs would look better in -- in future. So -- so there's rea -- room to balance the -- the 22 1/2 percent over fifteen (15) years.

Moving to slide 15, I -- I commented on three (3) programs that we went through earlier which have challenging metrics. I'm not in the -- the individual measures within the bundles to look at the metrics. Those are all blacked out for us. But the three (3) bundles that we talk about take 14 percent of EM spending, which only achieve 5 percent of the savings.

And we did have them run a scenario where they took out the entire bundle. I'm not saying

you would necessarily take out the entire bundle. You might look for measures within it that are not cost-effective. But taking out the entire bundle significantly improved EM's performance.

Levelized cost dropped from 2.24 to 2.12. The PAC increased from 3.44 to -- or to 3.44 from 3.27, and the portfolio still achieved 1.4 percent annual savings.

And just using that one example, I say there's room that you could reallocate program expenses away from higher cost programs, accept a somewhat lower target, or alternatively reallocate two (2) programs that are more cost-effective, and examples were such things as commercial, renovation or industrial, custom.

In terms of implementation details, I have two (2) recommendations that address the implementation, number 4 and 11. I say that there are some concerns about the critical details of the underlying Efficiency Manitoba economics, such as the appropriate use of marginal values, potential revisions to marginal values, and Hydro's next GRA.

We don't know the datedness of these values in terms of the assumptions compared to what Hydro is doing now, also confirmation of rate

pressures from Keeyask, which will have a significant effect on -- on efficiency and pressures on customers already, and on Hydro's strategic plan, which could materially affect the resource planning context for Hydro, and also it's a steep learning curve for EM.

And so I think on an implementation basis, some people have mentioned that maybe EM should get a one (1) year program run. I -- I haven't focused on the horizon as much because I didn't know that was an option to the PUB. I rated it as very much a three (3) year cycle, but that the budget should be proved on an interim basis, subject to revision if facts arise from a further Manitoba Hydro GRA that would suggest otherwise, and that that could be revisited.

Also on implementation, Slide 17, the -- - the -- EM's budgets and analysis suggests that there's a fair bit of effort going into targeting distribution savings. Those people who were here for Manitoba Hydro's last cost of service review will know that the -- that conclusion was made on the basis of evidence then given that DSM saves generation costs -- or generation and transmission costs. No DSM cost currently in Manitoba Hydro's system are allocated to the distribution system, even though distribution

savings are clearly becoming a driver of some of EFM's costs.

And so this is not an EM specific recommendation, but it's something that I believe the Board could put down that -- as a -- a comment to Hydro that in the next -- next GRA cost of service analysis we'll look at whether some of the DSM costs should be allocated to the distribution system where the savings are -- are -- are being targeted.

With respect to target setting, Slide 18 notes that there are five (5) recommendations about target setting. The first -- and they all fundamentally vary around the concept of the -- of the IRP analysis -- type analysis. The first is that EM's plans should be tested based on a resource acquisition model and cost-effectiveness compared to other supply options.

Moving to Slide 19, recommendation 3 was that EM's plan should be tested against EM's mandate, which is to mitigate the effect of rate increases and delay the point at which capital investment in new generation and transmission will be required. I think that is also effectively supportive of an IRP type framework.

Recommendation 5 is they should require

-- EM's future -- EM review should require appropriate IRP information.

Recommendation 10 is that the resource acquisition model should support lowest cost supplies being pursued as the primary objective regardless as to class. I know there's a consideration in the regulations that -- that EM should be attentive to distribution of -- of benefits, but we have to be really careful, I think, about how far down that road you go.

To say I should go acquire non-cost-effective power, power that's throwing good money after bad from a certain class just because I haven't been able to acquire any power from them recently, instead I'm acquiring beneficial power from other classes that's actually bringing rates down. I think that's an ill-advised strategy.

As a resource acquisition model, we'd expect EM or Hydro to be just as -- as cost-focused as we would in acquiring anything else. If Hydro is going to go buy some trucks, it should buy trucks from the lowest cost supplier based on a properly run RFP, from anybody who supplies trucks. It's not a -- it's not a benefit sprinkling or a type of consideration.

Recommendation 13 is that future review

should consider alternative levels of -- that should say DSM not DM -- DSM targets and their impacts, effectively all variations on the -- the concept of an IRP type analysis.

Moving to Slide 20, in respect of the legislation and the regulations, I have four (4) specific items on which I suggest the Board provide recommendations to government. Some of these I think are -- are already effectively being adopted by -- by EM in its implementation but they -- they would benefit from clarity.

I notice our screens are not keeping up, but I'm at Slide 20 for the benefit of those following on paper.

One (1) of the -- of the issues is -- is the regulations require application of a definition that EM has to make a material contribution toward certain measures or has to provide operational support toward certain -- certain actions in order for them to be able to consider it a savings.

I think that's probably a difficult definition to even think about, particularly with respect to something like codes and standards development, what is a material contribution.

Mr. Friesen is going to talk a bit

about how codes and standards are developed, and I think it'll help make it clear that -- that's -- it's not even a -- a meaningful type of discussion. If Manitoba Hydro is making rate changes and EM has to provide operational support in order for those rate changes to be considered efficiency, that doesn't make a lot of sense. I don't know what kind of operational support EM is going to provide in Hydro making rate design changes.

So I think they're of dubious relevance and also they very much go to this -- they could err someone into the idea that we're trying to put this -- put -- put the squeeze on EM through these processes, which I don't think is the point. I think the point is to figure out how to be -- how to achieve efficiency in the interest of the province, and as a result I think it's -- we should be moving on from those definitions.

THE CHAIRPERSON: Mr. Bowman, can you hold on for a second?

MR. PATRICK BOWMAN: Yeah, I can.

THE CHAIRPERSON: I know there's computer problems, but I'd like to get -- I don't know.

Yes, we'll -- we'll take a -- we'll

take a ten (10) minute break right now.

--- Upon recessing at 10:07 a.m.

--- Upon resuming at 10:21 a.m.

THE CHAIRPERSON: So, we're going to resume. Our apologies. We're having trouble with the government computers. So, if -- if necessary, we'll rely on hard copy which has been distributed. And Dr. Grant has access to the -- to the documents.

So, if you could continue, Mr. Bowman.

MR. PATRICK BOWMAN: Yes. Thank you. I believe we're on slide 21 and are nearly done. Slide 21 notes that some of the biggest achievements in conservation initiatives come from pricing effects and what we would call elasticity, customers responding to rate increases and price increases.

That could be due to changes in Hydro's costs or it could be due to actions of EM that actually drive up rates.

The -- at -- at times where the highest hydro rate increases are occurring, the incentives for efficiency will already be built into the pricing, in effect, and we're -- we're going through some of that now, and the ability for customers to absorb EM's

extra costs will the lowest.

EM's regulations permit EM to claim credits from a rate to which EM has made a material contribution, again noting whatever that means. It could be read as meaning a new rate design but not a general rate impact.

I suggest that the conservation effects of Hydro rate increases, rate changes, including elasticity effects, should be included in conservation when they are arising from customers conserving in response to price changes.

And it would -- if that were the case, it would have a complimentary impact that, if Hydro were to come in with large rate increases, you know, such as the round we saw recently where they were asking for 7.9 percent, for example, that may, therefore, mean that, in those years, EM need not run -- make a whole lot of additional investment and -- and drive a lot of additional rate impact because a lot of it's already being achieved by a pricing side.

And that would effectively be complimentary in buffering somewhat to Hydro's impacts, and it would still achieve the conversation objectives or more.

Rate design in particular should be

included and -- and EM should be encouraged to work with Hydro to put in place things like conservation rates, although I'm not sure how they make a material contribution to that.

Slide 22. I will say on slide 21, that is also -- at least from rate changes, those are things that -- that other utilities include as well in their -- in their targets, like -- like BC Hydro.

They don't deal with it with just general GRAS, to the best of my knowledge, but they do for other pricing impacts. Like, if -- if carbon taxes or other things are added to rates, those become a conversation effect that they can count.

Slide 22 is the recommendation 8. This one is one (1) that I believe has already been adopted by EM but isn't necessarily clear in the regulations. The regulations focus on savings from existing levels.

When you have a new industrial customer arrive, that industrial customer will have the issue of what technology to put in their plant, what -- what conversation measures to built into their plant, and those can be effected as a conservation measure, but it's -- they're not against a baseline of previous use because they never installed the inferior technology in the first place.

And my understanding is EM's already intending to count those type of initiatives, but the regulations may be less than clear as to how you would count those initiatives.

And -- and certainly in cases like BC, where you have a tariff supplement 74, it will say things, like, the savings due to customers implementing a technology that's -- that's better than would have reasonably been expected is -- is a conservation savings.

And -- and I think that's -- that's the same type of thing that I understand EM is pursuing. And -- and I'd just be concerned that the rates are -- are consistent with that.

And the last one is slide 23 which says:

> "As part of implementing the IRP framework, the -- there should be -- be flexibility in the timing of savings to permit prioritization analysis."

And I also note that, in terms of dealing with industrial customers, the type of savings one can achieve are often quite lumpy, that you may find that -- and -- and this has arisen, sometimes

there is very large savings available in one (1) year because a customer is doing a capital upgrade and you can work with them and come up with some -- some, you know, big numbers.

The need to be able to respond to that, to have some contingency funds to address that because sometimes those will be -- have to -- decisions to be made on quite a short horizon, and also to be able to include that in an overall averaging of a plan is -- is quite important, as is the flexibility to say, in some years, when -- when we're dealing with an -- an IRP framework that's -- that's not saying there's quite as much need, the -- the 1 1/2 percent would be -- would not need to be targeted and it can be made up in a later year.

Now, that's assuming that the 22.5 percent policy target is meant as the sum of the fifteen (15) years of savings. And as I read the legislation with a mathematic hat on, not a legal hat, I can't see any other way to read it other than I will add up a series of 1.5s or thereabouts to try to come up to 22.5 and that the 22.5 will not try -- take into account persistence or -- or programs dropping off.

And it's not meant to be cumulative because, if it was, it wouldn't be 1.5 for fifteen

(15) years. You'd have a -- you -- you would already have a compounding effects that would be in that.

So, the only way I can make sense of the 22.5 in the -- in the regulations is it's meant to be a sum of -- of the savings each year. And -- and not -- notwithstanding that that's not consistent with the idea of quite of -- of an IRP framework, where you get to the end and you haven't necessarily achieved a load 22.5 percent lower than it would have been because of things like persistent effects.

But assuming that the read is -- is correct, that it's a sum of fifteen (15) years, across those fifteen (15) years, EM should have a fair bit of flexibility to balance, to take into account major new initiatives that can occur or major new customers, particularly on the industrial side, who provide them opportunities, and that -- that 1.5 need not be achieved even on a planning basis in full as part of each annual plan.

And that's the end of the -- the recommendations that are in the -- in the pre-filed testimony.

We'll -- I'll be handing it off to Mr. Friesen now if there's no other questions at this time.

THE CHAIRPERSON: I'll ask the panel if they have questions now, Mr. Bowman. Dr. Grant, do you have any questions of Mr. Bowman?

BOARD MEMBER GRANT (BY PHONE): No. I'm good. Thanks.

THE CHAIRPERSON: Okay. I have a question. Mr. Bowman, could we go to page 21? Thank you, Kristen. You made the recommendation, bullet point number 3. And the -- the recommendation at the -- the bottom refers to:

> "The incentives for efficiency will already be built into pricing if there's higher hydro rate increases."

And then at the bottom you said, "When Hydro imposes large rate changes." You made reference earlier to the previous application of Manitoba Hydro where they request a 7.9 percent.

What's a large rate increase? I mean, what -- what sort of level would you envisage where you get the -- the incentive just as a result of the -- of the rate increase?

MR. PATRICK BOWMAN: Well, you get it at any level. But I think something -- you'd probably want to build into this the consideration of -- of

some degree of a real price change. So, changes above inflation, for example, might -- might be where one would start to pay attention.

But, in general, the idea that efficiency arising from, you know, a hydro rate change, if -- if there's -- if there's a 2.9 percent or something and in -- inflation is 2, the additional .9 would -- would be something that -- well, all of it is something customers would see on their bills, but the additional .9 would be something that they would see a real effect of incentive for conservation, the same way a code and standard is but probably even broader because it affects everyone, and you would achieve some -- some savings out of that.

So, I think it could be considered for any real price changes, but I don't think -- it would be pretty -- pretty small or de minimis unless you're dealing with some cases where you're dealing with, you know, many years of -- of, you know, 4 percent or 7.9 percent, you know, should -- should such a scenario arise again.

THE CHAIRPERSON: But -- but as I understand it then, the principle is that it would be the difference between the rate increase and inflation. That's -- that's the number that we would

deal with?

MR. PATRICK BOWMAN: Yeah, I -- I think that's re -- I think that's reasonable.

THE CHAIRPERSON: Okay. Thank you. Thank you very much, Mr. Bowman. Mr. Friesen...?

MR. ANTOINE HACAULT: Sorry to interrupt, but I'd just like a little bit of direction so that Mr. Friesen knows, we started a bit late. We had a break. I -- we had a schedule. I'm not too sure how -- where we are on this now. We tried to limit it to about --

THE CHAIRPERSON: Yeah, I -- I don't want to limit Mr. Friesen's testimony. We -- we did start late. The -- the -- we need to -- we need to finish around 2:15 this afternoon because Dr. Grant has to catch a flight home, but just -- just go ahead, Mr. Friesen.

MR. DALE FRIESEN: Thank you, Mr. Chair. I want to thank the Board and all the representatives from the various organizations, including Efficiency Manitoba and the Interveners.

I'm privileged to present to you today and very open to questions from the Board during the course of my presentation, so please feel free to interrupt. I'm going to try to move at a reasonable

pace given some of the interruptions we've had to our schedule.

Slide 2 gives you an idea of the -- the presentation overview. I'm going to address conclusions and recommendations that I found in reviewing the Efficiency Manitoba plan.

This presentation, for the most part, it addresses information that was -- been previously filed direct evidence with some additional information related to natural gas programming that I was unable to include in the previous filing primarily due to the time constraints between the receipt of IR responses and the filing deadline for evidence.

And I've also included some information related to codes and standards which has become a topic of fairly significant discussion over the course of these proceedings in an area that I have some knowledge and expertise in.

Slide 3. On the -- what you have here is the table that outlines the industrial programming offered by Efficiency Manitoba. And I want to state that the -- the offering is fairly comprehensive and provides a range of options for most industrial sectors in Manitoba, including consideration for both processes and facilities.

And that programming is augmented by some additional features which are very helpful to the fulfilment of the objectives of those programs, including screening studies, the energy management -- manager initiative, and the strategic energy management cohorts.

Those are measures that have proven in many jurisdictions to provide very valuable assistance in meeting savings targets.

There is, you know, kind of the elephant in that table, and that is the load displacement program.

And my concern is that the -- the magnitude of those savings and the fact that you only have to deal with a few customers to achieve those savings may de-emphasize effort to capture savings that are applicable to a larger cross-section of industries and represented in the other aspects of that program, including the custom program, as an example.

In respect to additional opportunities that might not be addressed by the plan as filed, the performance optimization program, which is an industrial program, is noted as being applicable to motor-driven systems.

In the past, Manitoba Hydro expa -- expanded the boundaries of the performance optimization program to include things like process heating, process treatments, things that aren't motor-driven but still consume a fair amount of energy. And I would encourage Efficiency Manitoba to continue to do that.

And -- and then we also look at heating and drying processes. On the emerging technology side, electro -- electric heating and drying technologies are beginning to emerge in the market to replace natural gas heating or fossil fuel-based heating process which are quite interesting, at this point, quite expensive, but they are emerging.

We have things like permanent magnet motors which provide greater efficiency, more speed capability which allows you to optimize the process that's driven for greater efficiency, as well as offering size advantages.

We also have behavioural change things -- programs related to in-situ codes and standards that allow -- such as a benchmark energy factor, energy at risk, concepts that support better design, operation, and maintenance of industrial systems. And finally, there's the opportunity to look at things

like quality rework, waste minimization. It takes energy, obviously, to produce product. If that product has to be reworked or it has to be scrapped because it doesn't meet quality standards, that's energy that's wasted, and there are opportunities within industry to improve quality and thereby reduce energy.

Moving to slide 4, this is a similar table for the natural gas bundle under the industrial portfolio, and similar to the electric, it's fairly broad, fairly comprehensive, and again, provides opportunities to address both processes and facilities. And it's augmented by some of the same measures that I mentioned previously for the electric program.

In respect to -- in respect to -- you know, most of the savings come from the custom program, again. But in contrast to the load displacement program, the custom program for natural gas is really applicable to a very large cross-section of industrial companies and therefore very useful in -- - in reaching out to a wide variety of different applications and provides a very comprehensive mechanism to engage -- engage industry in Manitoba. And given the diversity of Manitoba and the sub-

sectors in the Manito -- Manitoba industrial market, this is very appropriate.

In terms of additional opportunities, one (1) of the things that's coming to the forefront in -- across North America is the concept of beneficial electrification. And in -- you know, in very brief form, what benerf -- beneficial electrification is about is converting fossil-fuel-based uses of energy to electric, and it's done for four (4) main purposes: to save consumers money over time; to benefit the environment, reduce greenhouse gas emissions; improve product quality or consumer quality of life; and foster a more resilient and robust electric utility grid.

So the application of electricity to activities that would otherwise consume fossil fuels and where doing so satisfies at least one of the four (4) conditions I've described without adverse -- adversely affecting the others: that's referred to as beneficial electrification.

And I think there's significant opportunity, particularly in the emerging-technologies aspect of the industrial sector, to -- to -- and the heating -- process heating, which is a common use for natural gas -- to look at beneficial electrification

and how it can complement the GHG emission goals as well as the natural gas saving goals.

One (1) of the challenges, though, we have is that the way this Act and regulation are written, it doesn't really address positive electric load growth. And that absence is glaring. And it really is counter to what we want to achieve in terms of economic growth and increased competitiveness and environmental performance within our industry. So that's -- that's a point I would raise.

Moving on to slide 5 -- sorry. What we have here are two (2) tables that really reflect the spending by program in each of the bundles, and I won't go into detail other than to provide that for information.

But the point I want to make is that this is the spending that was being proposed by Efficiency Manitoba, and in order for Efficiency Manitoba to realized its objective and its savings targets, there's going to be a considerable amount of spending required on the part of industry. And that number, broadly speaking, is going to be in the range of 60 to $75 million, and, you know, respectively, we're looking at about 51 to 65 million on the electric side and about 9 to 11 million on the natural

gas side.

This is money that customers have to allocate, customers have to justify, and if the metrics and the approach used by Efficiency Manitoba doesn't align with the priorities and the methods of justica -- justification used by industry, we're going to have a disconnect.

And if industry isn't willing to invest this money, the savings that Mani -- Efficiency Manitoba hopes to realize will not materialize. And that's a very simple fact. And so anything that Efficiency Manitoba does is required through pure -- you know, pure common sense will have to align with how industry justifies its capital spending.

And that speaks a little bit to the metrics. The PACT test, which is mandated by regulation for determining cost-effectiveness, really only deals with utilities' spending. It doesn't account or consider consumer spending or the rationale behind consumer spending.

The TRC is a better indication because it includes both the customers' investment and the utility investment. The pure measure -- value measure test proposed by Daymark -- again, quite interesting -- is a little bit more reflective even than the TRC of

the discussion that a customer will have when they're justifying their investment.

But we also have the -- the participant customer cost test, and we have the customer payback. And while methods used by customers in -- in the industry to justify their expenditure may not align perfectly with either the -- the PC test or the CP test -- the customer payback test -- they do provide an indication, and I think they are, in some respects, a better gauge of whether or not industry will engage these programs than the PACT test is.

The PACT test really doesn't speak to the motivation for customers to participate. It only speaks to the motivation for the utility, and -- and that's, again, a disconnect and one that I think we have to consider when we look at these programs and their ability to achieve their savings.

None of the test do, however, address customer concerns over lost production or downtime required to make efficiency improvements, which is a major concern for our client base and -- and often represent one of the strongest barriers to moving forward with efficiency projects. Production is king, and if you interrupt production, the benefits of energy efficiency will never outweigh the lost -- the

lost production. They'll always be much, much smaller.

And then there's the perceived risk of implementing new technologies, even similar technologies, but more energy efficiency technologies. Industry has a tendency to continue to do what it has learned works, and energy efficiency is sometimes -- the benefits are not large enough to change that viewpoint. And that's something that we need to keep in mind.

Slide 6 -- one (1) of the challenges we had in Efficiency Manitoba's initial filing was that the commercial, agricultural, and industrial sectors were bundled, in -- in many respects, in how the plan was presented. So we didn't really have an understanding of what the industrial load in Manitoba was like. And that made it a problem to analyze the expectations that were being placed on the industrial sector.

Fortunately, Efficiency Manitoba responded to an IR request, EM-1 -- I-7, which provided us with the nesh -- necessary information to evaluate the relative size of the industrial load in Manitoba and thereby gin -- begin to valuba -- evaluate the reasonableness of the savings anticipated

to arise from the sector. And what you have there is the table that I used, based on the information provided by Efficiency Manitoba, to determine the share of industrial load.

And it -- you know, it was broken out by SCC code and industry sub -- SIC code, sorry, and industry sub-sector, which proved useful in this exercise. And from that, we could determine that industrial load accounts for about 35 percent of the total domestic load.

It also allowed us to examine the impact of customers or sectors that are unable to participate in -- in the Efficiency Manitoba programs, and that occurs, basically, for two (2) reasons. Sometimes, the magnitude of the investment that's required to improve efficiency in certain industries is simply beyond the scope and capability of Efficiency Manitoba. I'll use the pipeline industry as an example.

The efficiency of a pipeline is basically determined at the time of construction, and it's based on the size of the pipe, the viscosity of the fluid, the rate at which you're pushing fluid through that pipeline, and the pumping requirements. Because of the volume of ener -- or the magnitude of

the energy requirements for pumping, those pumps are already very, very efficient. Changing a pipeline is exceedingly expensive, and to be frank, just outside the scope of anything Efficiency Manitoba really has the financial capability to impact. So we're talking billions of dollars in this case. So that's an example of an industry that consumes quite a bit of energy in Manitoba and really doesn't have a lot of opportunity to participate in this plan.

So moving -- moving on to slide 7, this is an illustration of the actual targets that are being imposed or anticipated to be achieved by the industrial sector, and I'll just refer to the right-hand-most column. And you'll see that the percent of load targets ascribed to the industrial sector are in the range of about 1.6 percent in Year 1 through to 1.76 percent of load and 1.72 percent of load in Years 2 and 3, respectively. So the targets are already above those prescribed in the legislation and -- and are more aggressive or higher than you see with the other sectors.

Again, I mentioned the influence of the load displacement program. That is a substantive program, provides a large num -- a large amount of savings equal to about 1.25 percent of load. So what

I did is I looked at the impact of the other programs and the reasonableness and achievability of the other programs. So if you remove the load displacement and you look at the tables below that, you'll see that the percent of load targets for the non-load-displacement programs are in the range of about point five (.5) percent.

We view these targets to be reasonable, achievable, with the programming and funding available in the plan. And I think our sector, the industrial sector, and our client, MIPUG, would agree with that statement and -- and say they are reasonable.

The larger target of 1.7 percent is achievable with the inclusion of the load displacement savings in the way that Efficiency Manitoba treats those savings. If we are talking about a cumulative target, then the one point -- where efficiency sav -- or, load displacement savings would only be counted in the first year they occurred and wouldn't be counted in successive years, then that one point seven (1.7) target would have to be reduced substantially for it to be reasonable and achievable. So the way we count savings is very -- very fundamentally important to the statements that I make in this slide.

Moving on to slide 8, what you here --

have here is a representative comparison to -- of savings targets to the other sectors, primarily the commercial, residential, and agricultural sector. What I did in this analysis is I removed codes and standards savings. The rationale behind that was that I was attempting to compare incentive-based programs in all sectors.

The indust -- Efficiency Manitoba does not ascribe any savings to the indu -- or, any codes and standards savings to the industrial sector, so all the programming in the industrial sector is incentive based. And if you do an incentive-based program comparison, you'll see that the commercial sector has a target in the range of about 1.35 percent. The residential sector has a target of about point two five (.25), point three (.3) percent, and the industrial sector is -- or, sorry, the agricultural sector is in the range of about 1.5 percent, give or take a little bit.

So when we do this comparison, we see that the industrial sector target for incentive-based programs is substantially greater than the commercial and residential sector, but we still feel that it is achievable with the funding that's available in the plan.

Moving on to slide 9, this information was not included. It relates to natural gas and was not included in my direct ev -- evidence, as I indicated at the start. But the approach I used is very similar to the approach that I used for the -- the industrial sector, the electric programs that I described in the previous slides.

So it should be noted that MIPUG members are -- our client -- are not major -- generally, major users of natural gas, either due to the nature of their processes or as a result of natural gas not being available at their location. Many of our customers are rural -- our clients are rural based or northern based and do not have access to natural gas.

We do have a significant amount of natural gas consumption arising from one (1) MIPUG member, which accounts for a large portion of the total gas consumption in Manitoba as a feedstock for their process. This amount was not included in the target setting, and we deem that to be an appropriate exclusion.

The -- the natural gas that's consumed by this -- this client is used as a feedstock. It's used as an input in to producing their product and --

and, therefore, should not be included in the efficiency target setting. So we agree with the treatment that Efficiency Manitoba uses in this regard.

Consumption of natural gas in Manitoba is dominated by mid to large industrial users, using natural gas for process and space heating. Significant opportunities exist for these companies to pursue greater efficiency in their use of natural gas, and the natural gas optimization program provides that opportunity.

Moving on to Slide 9 -- or sorry, Slide 10. Unlike the electric bundle for the industrial sector, no one (1) opportunity dominates the market in the way that load displacement dominates the electric savings. A large portion of the savings are ascribed to one (1) program concept, but the -- the variety and diversity of the measures that are applicable within that one (1) program concept, or measure concept, are quite varied, so there's a lot of opportunities there.

Because there are many more customers involved in -- in the achievement of the natural gas savings target, Efficiency Manitoba will require a broad -- more broad and comprehensive outreach to many industrial sector companies. While not unreasonable,

this will require greater effort and a more broad outreach in order to achieve the targeted savings.

One (1) caution in respect to natural gas is that the price of natural gas is extremely low, and that presents a challenge when you're looking at justification for energy efficiency projects. And it's not a new challenge, it's a challenge that's been around for a long time, but it is a significant challenge that we experienced when I was at Manitoba Hydro and I'm sure Efficiency Manitoba will continue to experience going forward.

Slide 11 draws a similar comparison to the other sectors that was shown for the -- shown for the electric portfolio with one (1) minor difference. Again, I removed codes and standards savings to provide an incentive base versus incentive-based comparison, but I also determined the targets without accounting for interactive effects, or by accounting for interactive effects but saying that, as an example, in order to achieve .75, Efficiency Manitoba is going to have to achieve greater savings, maybe somewhere in the order .9 percent, to allow for the deduction that occurs from interactive effects.

And that's an important exception, because the industrial program does not have any

interactive effects ascribed to it, so I was looking at a direct comparison of the cost of acquiring savings, gross savings, not net savings after interactive effects.

This -- you know, this comparison illustrates the savings objective prior to reductions for interactive effects, indicating the true savings required to achieve Efficiency Manitoba savings targets.

While interactive effects and codes and standards savings for the industrial sector are not included in the plan, the PUB should consider whether the Efficiency Manitoba interpretation of net savings, gross savings minus interactive effects, is reasonable.

Another approach could be to apply the .75 percent target to consumption gross -- growth arising from interactive effects in future years.

What we have right now with the incorporation of inter -- interactive effects, is a higher target than the legislative mandate prescribes, and we need to contemplate that and whether that's appropriate to it.

I also need to point out one (1) error in the -- in the material that I provided you. If you

look at the -- sorry, no, that -- yeah. Yeah, sorry.

At the top it says "Electric savings targets." That should be "Natural gas." And the error actually I wanted to point out is in a later slide. Sorry about that.

So overall natural gas portfolio savings for the other sectors are again somewhat lower than the industrial sector. The industrial target is about .82 percent, where the commercial and residential targets, in the range of about .775 and in the range of about .25 to .3. So that again illustrates that the industrial target is higher and that is a result of the fact that there's cost-effective opportunity within the industrial -- industrial sector.

Overall, the natural gas savings portfolio savings are heavily dependent on codes and standards savings in the commercial and residential sector.

Moving on, Slide 12. I'm going to speak a little bit to the timing and the flexibility of Efficiency Manitoba's activities and how that may impact the participation by the industrial sector.

MIPUG members operate large facilities with continuous processes that consume large

quantities of ener -- energy. Upgrades to these critical production processes can be disruptive and costly with a high degree of perceived risk.

Energy costs vary considerably between industrial sub-sectors, from as low as 8 percent to as high as 65 percent of total operating costs.

So energy is important. It varies in importance, but I would feel quite comfortable in saying that it's important to every MIPUG member and to most industrial customers in general.

Having said that, the timing for processes improvements are generally driven by factors related to market conditions, equipment life, productivity, quality, et cetera. They're not related to energy efficiency. The cost of lost time, or lost production time, is simply too high and can dwarf energy efficiency related cost savings.

So if you look at this slide, energy efficiency gains alone are often unable to motivate capital spending priorities or drive project time lines for major changes to production processes.

Incremental costs for improvements to existing processes are often significantly higher than those considered during program design. Typically, program administrators look at incremental equipment

costs, they may have some small accounting for retrofit where you have to pull old equipment out of service, put new equipment into service, but they don't generally look at risk and they do not generally look at production losses or production shortfalls that occur as a result of that activity.

There also is a tendency in industry to look at things beyond energy. So if there is a process that increases energy consumption, but has a favourable production outcome, they'll accept the increased energy use, and that's counter to the way the legis -- again, the way the legislation and the -- and the -- the regulation is written, and represents a barrier to how we address load growth within the plan.

So if an efficiency improvement results in a lower per unit cost and as a result that customer becomes more competitive and increases their production, it may actually increase energy consumption despite the fact that that customer has become more efficient.

Moving on to Slide 13. Speed to market is a critical concern for industry operating in a competitive global economy. The technologies that are used in industry are generally available throughout the world, so you want to be first to market and

therefore take advantage of any competitive opportunity that -- that exists out there.

So if the design and con -- construction delays -- or if design and construction delays caused by excessive demand for analysis, documentation, and approvals are too great, industry will simply move on. They won't accept that time line slip or that delay in obtaining approvals from Efficiency Manitoba.

This is particularly true for new construction where time lines are often very short, carrying costs are very high, and industry wants to get product out the door as soon as possible, and it makes it challenging at times if you're not engaged at a very, very early stage in the design process, to make changes later because the in -- the customer will assume that those changes are going to delay the process or delay the construction time line and -- and therefore will really just not pay attention.

We also need to recognize that capital is limited and prioritized for mandatory regulatory improvements for production related needs. A production project may actually be eligible for a completely different set of justification criteria in an energy efficiency project. So it may be much more

rigorous for an energy efficiency project than for production process because the production project adds more value to the company, and that's something again that we have to -- to consider.

The -- the other thing is that, as Patrick mentioned, industrial projects tend to be larger, they produce a very lumpy savings pro -- profile, and that may not necessarily match well to preplanned savings targets and budgets.

And this becomes a problem if the target has been met or appears to be met with a existing activity and a new large industrial project emerges, and with the focus that the regulation and the act put on annualized targets versus accumulative targets, you have a tendency to say we've hit our target this year. We don't need that savings, and as a result we lose an opportunity that may not come back to us for decades, and -- and that's -- that's an important consideration that we need to -- to pay attention to.

The prime opportunities for achievement of low cost savings in industry occur during new construction or expansion projects since costs for equipment removal are not incurred and installation costs are generally not incremental to the efficiency

project because they were going to install equipment anyway, and that provides for a very low cost opportunity at those locations, and the Efficiency Manitoba plan should be willing to accommodate those, and I believe that is their intent based on the testimony provided by Mr. Stocki.

But there is concern, if you move to Slide 14, that Efficiency Manitoba may not have the budget flexibility and the timing flexibility to support that kind of industry need, particularly with the way the act and the regulation are written.

It is our view, or my view, that the achievement of savings targets should have a longer-term focus. If we're going to have a net effect at the end of the fifteen (15) years, we need to have a target for that net effect and that target needs to relate to the IRP requirements that are -- are developed in concert with Manitoba Hydro.

The current act and regulation, the way they are written and the way the EM plan is -- is presented, has a very annual focus to it, a very short-term focus. Re-investment isn't considered for technologies with a ten (10) or eight (8) or five (5) or fifteen (15) year life cycle. IRPs are done on twenty (20), thirty (30), forty (40) year basis.

There's no consideration for reinvestment in this plan.

We should be considering reinvestment, we should be adopting a long-term approach to energy efficiency, and that is something that we need to -- we need to carefully consider in the recommendations that are provided by the Public utilities Board in its final order.

I've mentioned productivity improvements, and -- and I won't repeat that, but I think that's an important consideration, how do we do -- deal with electric load growth in this plan and in the context of how we set targets and how we -- you know, how we evaluate what a reasonable target is.

I'd use a new construction plant as an example of that. A new customer comes to Manitoba, decides to build a new plant here, they work with Efficiency Manitoba, they develop a very efficient plant. Those savings are built in at the beginning but the load hasn't materialized yet. So in subsequent years, we have the load of this new plant and we're continuing to apply savings targets to an already efficient load.

The same opportunity doesn't exist with that load, and does that mean we're unfairly

penalizing those projects on the back side after we've incented them on the front side? It really doesn't appear to be logical or practical.

We also have some con -- or I have some concerns about the use of the contingency fund to support large projects with cost-effective savings to minimize lost opportunities and lose access to cost-effective savings.

We need to clarify the definition in the regulation of what emerging opportunities means. Based on the testimony provided earlier by Mr. Stocki, I achieved the understanding or obtained the understanding that a new large industrial project would not be seen as an emerging opportunity if there are existing programs that could address it.

But what happens if those existing programs have spent their budget or the targets have been met? Does that mean the contingency fund isn't available to support that project? And we will lose the opportunity to achieve very low cost savings and benefit to the economy.

So, I believe that we need to -- to enable the use of the contingency fund for that purpose, and that needs to be reflected in the regulation and the recommendations that we provide to

-- to the Province in that regard.

And finally, incentive commitments. Industrial projects often are multi-year projects. If a project commences in year 3 of the plan but the customer isn't aware of what the next three (3) year plan will look like and there's no certainty in regarding the availability of incentives, they'll simply move on and they won't consider the incentives that Efficiency Manitoba can provide.

So, I would argue that Efficiency Manitoba needs some flexibility to make commitments beyond the three (3) year planning horizon and approval window that they are currently provided in order to give large industrials the assurance that funds will be available in years 4, 5, and 6 as they complete their projects.

Moving on, slide 15, policies. I mentioned the importance of speed to market. There need to be clearly documented policies for obtaining approval, for the criteria for obtaining approval for large projects that require incent -- incen -- substantial incentives.

You know, these policies must considers -- consider actions and exceptional circumstances, such as a situation where the annual target has

already been met but a large low-cost opportunity arises and existing budgets have been depleted with prior projects.

If that approval process takes too long we'll lose the opportunity. Is that our desire? I would argue that it's not principally because these are very cost-effective savings.

So, those policies need to be well ecsta -- well established. There needs to be a plan in place that is clearly articulated that can be used to demonstrate to industrial users that their concerns and their priorities are being met.

Moving on to slide 16. Achievement of Efficiency Manitoba's objectives is heavily dependent on the suc -- its success for inquiring anticipated industrial savings at a relatively low acquisition cost.

If we -- if we look at this table, we'll see the 39 percent of the saving -- electric portfolio savings arising from the industrial sector while only 20 percent of the available budget is dedicated toward the acquisition of these savings.

Therefore, the success of this save -- this portfolio, or this plan, is critically dependent on industrial programming for achievement of cost-

effective -- for savings.

Table 3.15, which is at the bottom, highlights the low first year acquisition cost for savings from the industrial bunder -- bundle. First year spending is an important metric for establishing the magnitude of the initial Efficiency Manitoba expenditure required for acquiring savings.

Moving to slide 17, we have a comparison to the acquisition cost of the other sectors. And if you go back to slide 16 briefly, you'll note that the -- the acquisition costs range between about point five five (.55) cents and about point seven five (.75) cents.

And if you look at slide 17, you'll see the acquisition cost without codes and standards for the commercial, residential, and agricultural sector are in the range of fifteen (15) through to thirty-eight (38) cents, substantially higher.

What the -- table 319 at the bottom of the slide illustrates is, again, how extremely cost-effective codes and standard savings are. We need to capitalize on every single codes and standards savings we can because it contributes to a cost-effective plan and achievement of savings targets.

As I pointed out previously, in some

sectors, codes and standard savings are very, very critical to the overall achievement of the target.

Sorry, I'm just trying to catch up here for a second. And again, as I pointed out when I showed the savings percent of load savings targets, this focus in -- on this slide is on incentive-based programming.

The Public Utilities Board in its IR to MIPUG, MIPUG-9, asked me to remove load displacement savings from the analysis that I conducted in res -- in regards to acquisition cost comparisons.

So, if you look at the table at the top, the green boxes highlight the new costs and the new savings -- annual savings targets for the industrial group of programs, or the industrial bundle, without load displacement.

And, as you will see in the right-hand most column, the acquisition costs do go up. They go up into the, you know, range of just about fifteen (15) cents per kilowatt hour.

That's an interesting comparison, and it shows that those programs are more in line, for instance, with the commercial program, which is slightly higher than that amount.

But if you look at the table below, I

kind of added a new metric or a new comparison in the right-hand column which compares the percent of savings, the percent of total savings, to the percent of total budget, and it gives you a little bit of a savings to cost ratio.

And you'll notice the savings to cost ratio of the industrial measures without load displacement is still quite favourable in comparison to the savings to cost ratio fo the other sector programs.

Again, if you look at the load displacement in the codes and standards line, you'll see how -- how favourable those programs really are and how important they are to maintaining a cost-effective electric portfolio for Efficiency Manitoba.

In some respects, you could argue that the fact that these programs are so cost-effective enables or facilitates Efficiency Manitoba's ability to spend more to acquire savings from the commercial and residential sector.

We have to determine whether that's appropriate. I think when you look at an IRP, one (1) of your objectives is to occur the -- the resource, the savings resource, at the lowest possible cost, as mentioned by Patrick. So, that's -- you know, that's

a consideration that I think the PUB should consider as it makes its recommendations.

Slide 19. Even despite the higher first year acquisition costs of industrial savings without load displacement, other metrics used by EM continue to show the clear advantage that industrial programs, such a custom program, provide for obtaining savings.

And what you'll see there is a levelized cost at the top of the table highlighted in yellow of one point one five (1.15). And if you compare that to the levelived -- levelized cost of other measures in -- both in the industrial sector and in other sectors, you'll see that it's -- even though its first year acquisition cost is quite high, the levelized cost is still very favourable and among the lowest in the resource portfolio.

Slide 20 effectively provides a similar comparison to the one (1) I just gave you for the electric portfolio, and it shows some of the same things.

Thirty percent of the savings target with 11 percent of the budget is ascribed to the industrial sector, again, a large portion of the savings at a quite diminutive portion of the budget

and again speaks to the importance of the industrial programming to the success of nat -- of the natural gas plan.

If you go to slide 20 -- sorry, go to -- back to slide 20. And if you look at the bottom, you'll again see that comparison of acquisition costs. And we're looking at a number that's in the range of forty (40) to fifty (50) cents per cubic metre.

There is an error in this chart. Where you see dollars per kilowatt, that should be dollars per cubic metre. I apologize for that. I didn't catch it until after I had sent the email last night.

Moving to slide 21. Before I start again, I'd like to point out one (1) error. In the -- in the top table, the commercial sector acquisition cost table, the second line, year 2021/'22 has an incorrect value for the anticipated budget. I dropped a zero. That should be 5.86 million.

And that changes the numbers in the anticipated budget column, the third column, and it changes the number in the right-hand most column, and that point one six six (.166) becomes a dollar sixty-six ($1.66).

But what you will -- again, all the references to kilowatt hour should be replaced by

cubic metres, as well. Again, my apologies.

So what this comparison does show is that natural gas savings from industrial programming have first-year acquisition costs that are about one-quarter (1/4) of those for incentive-based programming in the commercial sector and one-sixth (1/6) of those in the residential sector. And again, similar to the electric portfolio, codes and standards savings are shown to be highly cost-effective and should be maximized to minimize the cost for acquiring the natural gas savings resource.

Moving to slide 22, again, we illustrate that the levelized cost for the custom program, at two point five three (2.53) cents per cubic metre, is very favourable and compares very positively when you look at the other programs in the other sectors and the acquisition cost for those. And this comparison was taken from MIPUG/EM-I-11A.

Slide 23 -- I'm now going to talk a little bit about how we can maximize savings within the resource portfolio and do so in a cost-effective manner. Increased activity within the industrial sector can achieve load cost savings to the benefit of all ratepayers, as it reduces the overall costs of savings acquisitions and reduces rate impacts arising

from spending to achieve mandated targets.

Industrial programs are extremely competitive in terms of their acquisition costs, and generally, if you look beyond the Efficiency Manitoba plan and you look at reinvestment, industrials have a tendency to replace like with like at end of use. So if an efficiency measure has been installed, there's a very high probability that that same equipment or better equipment will be installed at end -- at the end of life.

So those savings really do have a long-term benefit to Efficiency Manitoba in the achievement of future savings and also to Manitoba Hydro in terms of the IRP and how those savings are integrated into the IRP. So those are -- are important facts.

The opportunity to increase incentives is highlighted by the custom program example shown in this slide. If you look at the -- the bottom portion of that slide, I drew some information from EM-I-11A, which, if you look at the custom program, indicates a simple payback of five point four one (5.41) years for the participant payback metric. That doesn't align with how industry makes its decisions. A five point four one (5.41) years -- year payback would generally be deemed to be unacceptable in industry. So we have

a clear lack of alignment here between the metric used by Efficiency Manitoba for establishing incenting -- incentive levels and that used by industry for approving projects, which goes back to my earlier slide where I talked about the investment that's required from the industrial sector.

You know, a further examination shows that this metric is also considerably lower than many commercial and residential programs with significantly higher level -- levelized acquisition costs and lower PACT ratios. So why is that? I think in part, that's because the industrial programs contribute a smaller incentive relative to the total cost of the project than many of the residential and commercial programs, so less of the cost is covered by Efficiency Manitoba in the industrial sector than it is for the other sectors.

We may have the opportunity here by increasing incentive levels in the industrial sector to still have very cost-effective savings and increase participation and thereby acquire more savings, to the benefit of all ratepayers and to the benefit of the achievement of the -- of the targets. And I believe that's something that needs to be considered in -- in both the PUB's examination of the program portfolio

and the measures that are included within it and the way the industrial sector is addressed by the Efficiency Manitoba plan.

The participant cost metric shows -- shows the metric of a one point six five (1.65), which is really a ratio that divides the benefits by the costs. And what that shows you is that -- with that metric being among the lowest in the electric portfolio, with the exception of the emerging technologies, it shows you that there's probably some room there to increase incentives and still have very cost-effective programs.

I apologize that I do not have a slide to illustrate these differences, but if you want to examine those in greater detail, they're identified in the EM response to PUB/EM-I-11A, and in particular, the tables for participant costs, which is page 4 of 11 of that IR response, and participant payback, which is on page 5 of 11 of that response.

Looking at slide 24, a white paper written by Cory Welch and Denise Richard -- Richerson-Smith of Navigant Consulting and UNS Energy Corporation, which is referenced in my direct evidence on page 40, highlights the benefits of catch -- catching -- capturing additional savings from low-cost

programs. The report highlights the pitfalls of applying strict caps on incentives for low-cost programs, which is a feature of EM's program incentive structure, and the op -- and the opportunity exists to reduce overall spending by maximizing savings obtained from lower-cost programs by providing these programs with higher incentives.

We're not asking for incentives that -- levels that make these programs -- that ruin their cost-effectiveness. We -- we're looking at prudence. We're looking at reasonable incentive increases. We're looking at reasonable measures to address caps that may be restricting participation.

We're not asking for metrics that are comparable to higher-cost programs. What we're saying is there's space within these programs to increase incentives and increase participation and thereby increase savings that are obtained from these.

We also feel that emiss -- in doing this Efficiency Manitoba could draw additional benefit by using its investment in screening studies, energy manager initiatives, and strategic energy management cohorts to expand savings obtained from the industrial sector with strategic enhancements to incentives. So there is an opportunity. Efficiency Manitoba has the

mechanisms in place to find those opportunities. We just need to act on it and view low-cost savings as being a priority for this plan.

Moving on to slide 25, I'm now going to talk a little bit about the impacts of energy efficiency and the benefits that they provide. As, though, I've noted in my evidence, industrial op -- companies operate in a competitive environment regionally, nationally, and globally. Efficiency is important. Revenues in these industries are often tied directly to commodity markets or long-term contracts where pricing is based on factors that are entirely unrelated to energy efficiency or energy cost. They're based on demand.

So while energy costs as a share of total costs vary significantly between industrial sub-sectors, they remain an important priority for the entire sector. Industrial operations in Manitoba compete both externally against other companies around the globe, but also internally with their own organizations for both capital and production allocations.

As I mentioned, industrial companies are large consumers of energies that -- energy that create a stable consumption base for supporting the

costs of generation, transmission, and distribution of energy incurred by Manitoba Hydro. So load growth is not a bad thing when it comes to rates. It allows us to amortize costs over a larger volume of energy.

And if you look at the RIM test -- one of the reasons we look at the RIM test is because the volume of energy that's available to absorb these costs is decreased by energy efficiency. My view is that the Act and the regulation in some way should address the acquisition -- or the positive acquisition of energy-efficient load growth, and this plan should accommodate it, and the Act and regulations should accominate it -- accommodate it.

The efficient use of energy contributes to a competitive industrial sector that can grow the economy and generate economic benefits through job creation and other means. Energy efficiency savings achieved through industrial program are generally very cost-effective with strong persistence. So this is a good way to grow our economy, and Efficiency Manitoba programming supports that, and we would -- in -- in that aspect -- we would be strong supporters of it.

Moving to slide 27, the question, Why are rate impacts of energy efficiency programming important, particularly to our client, MIPUG?

Low energy rates have and continue to be a key competitive advantage for Manitoba industry, although it is evident from recent pro -- rate proceedings that this advantages is eroding, and if you speak to MIPUG members, and hopefully we'll have a few here at the end of the week, they will tell you that Manitoba is not their low-cost energy provider in some instances. Despite the fact that our rate structures look to be the lowest in North America, the opportunities in rate structures within other utilities provide very competitive electricity rates for the -- for plants that these customers have in other jurisdictions.

In one (1) instance, a company that has about ten (10) to thirteen (13) plants across North America and the globe will tell you that Manitoba's energy costs are in the middle of their entire portfolio.

So there are -- there are concerns about rate impacts and are -- the MIPUG base is very concerned about rate impacts.

Again, as I mentioned, not all industries can take advantage of energy efficiency program or upgrading major infrastructure, as it is often cost prohibitive, and to ensure that rate

impacts are reasonable, the cost benefits of energy efficiency for Manitoba Hydro must be clearly demonstrated or efficiency programming will result in unacceptable rate increases.

I would argue this hearing has been challenged by a lack of detail within the -- within the application and restricted access to information. It hasn't -- as Patrick pointed out, it hasn't enabled us to determine strong programs from marginal programs because we do not understand the cons -- construct of marginal value and how it benefits Manitoba Hydro, and we also haven't really had insight into how these impact the integrated resource plan, which affects the long-term costs of Manitoba Hydro, so that has been a challenge. Savings targets should be based on demonstrated need and ability to mitigate costs for all consumers, both participants and non-participants.

I also want to speak to new companies. Industrial companies seeking new locations, energy rates are a significant part of that decision-making process, and that citing process. They're looking for predictability, stability in rates, they're looking for gradualism. If those things aren't present, they know they can construct a plant of the same efficiency anywhere in the world, so

whether it's installed in Manitoba or whether it's installed in South America or Ontario or British Columbia, the same technology can be used in every one of those locations. So rates ultimately do provide a deciding factor in their decision, or make -- become a deciding factor in their decision.

So rates are important and that's why we have expressed the concern that we have about rate impacts, short-term views versus long-term views, annual targets versus cumulative targets and how that impacts the IRP.

Efficiency Manitoba's programming does not address rate structures directly which are available in other regions for optimizing energy costs, and this is an area that we continue to work with Manitoba Hydro, and it would be good to see cooperation between Efficiency Manitoba and Manitoba Hydro on that aspect.

So moving on to Slide 27, Potential Studies. Potential studies provide insight into the saving of opportunities and the capacity to support future savings targets and conservation objectives. The last convers -- conservation potential study done in Manitoba was based on information acquired in the 2010/'11 time frame, nearly ten (10) years ago. The

market has changed.

We're talking about an energy market and opportunities for energy efficiency that didn't exist in 2010/11. We have the maturity of LEDs, we have solar -- mature so -- solar photovoltaic technologies, we have other technologies achieving wide-scale acceptance maturity that simply weren't in the market in 2010/11.

We also have rapidly evolving technologies pertaining to energy storage, electric vehicles, high-performance net zero buildings, heat equipment with higher coefficients of performance, along with concepts such as beneficial electrification, that all were not in the market in 2010/11.

And we also have regulated and non-regulated codes and standards that are focused on outcome-based objectives versus, you know, the current approach, which is objective-based in that the current codes use very prescriptive terms to try and predict future outcomes or achieve future outcomes. Outcome-based codes require you to measure those codes and valid -- those code savings in standard savings and validate them and maintain them on an ongoing basis to ensure that you have persistence.

There is a considerable amount of work going into this area right now, and you're starting to see the term outcome-based objectives integrated into the energy efficiency regulation and you're starting to see it more recently in ener -- building energy codes and performance-based approaches to achieving energy efficiency in buildings.

We also have government policies and consumer demand changes that are heavily influencing equipment manufacturers to expand the marketing and availability of energy efficiency equipment, providing greater opportunity for consumers to reduce their energy consumption and manage their demand on the utility grid.

You or I can walk into Home Depot and we have a vast array of products available to us that were not there in 2010/11. For those reasons, it's important that we have a solid understanding of consumer behaviour in respect to energy consumption, procurement, and the environment, and that -- that viewpoint within the market has evolved considerably, leading to significant market changes. We need to have that perspective going forward.

Key aspects of a load potential study include setting of attainable energy savings targets,

quantifying available energy efficiency resources, determining funding levels for delivery of energy efficiency programs, designing programs to achieve the most cost-effective long-term potential, and assessment of energy efficiency opportunities as requirements and targets evolve.

(BRIEF PAUSE)

THE CHAIRPERSON: Yeah, I was going to -- Mr. --

MR. DALE FRIESEN: Yeah. I -- I'm --

THE CHAIRPERSON: -- Mr. Hacault was giving you the hook just before I was.

MR. DALE FRIESEN: Yeah. So I --

THE CHAIRPERSON: If you've got codes and standards, we need it summarized --

MR. DALE FRIESEN: That's where --

THE CHAIRPERSON: -- because --

MR. DALE FRIESEN: That's where we're at.

So's if you look at Slide 28, I made a few observations and recommendations which I'll quickly go through with you.

First of all, codes and standard

savings exist and provide the same benefits attributable to incentive-based savings. We've talked about that previously in this hearing. Manitoba Hydro has been actively involved in codes and standards development at the national level for more than twenty-five (25) years, acting as one (1) of the highest per capita provincial contributors in Canada. During that time, both financially and through in-kind contributions from subject matter experts.

Manitoba Hydro had probably the most extensive team of knowledge experts of any utility or energy efficiency agency in Canada over the last five (5) years, and that was used to great extent in the codes and standards process by CSA Group. So Manitoba Hydro has been extremely influential, both in funding and in knowledge -- providing knowledge and expertise.

Regulated codes and standards form a comprehensive package that covers a broad array of equipment as demonstrated by the federal Energy Efficiency Act, which has undergone sixteen (16) amendments since it was up initially approved in 1993. These standards include residential, commercial, industrial equipment of various types, including electric motors and transformers commonly used in the commercial and industrial sectors, which continue to

provide savings today.

Similarly, building energy codes developed federally, adopted provincially, and imti -- implemented municipally, provide a progressive framework of ever-increasing energy efficiency requirements that have progressed and will continue to progress going forward. We are now working on co-energy codes for the mid-20s.

And so there is a -- a plan, and that plan shows some aggressive savings targets through codes and standards that will continue to be there through the fifteen (15) year mandate provided to Efficiency Manitoba. We need to capitalize on that in how we count and how we tabulate savings.

So when we look at claiming versus reporting of codes and standards savings, I want to highlight that multi-party corporation -- cooperation is required to fund and develop codes and standards and facilitate their implementation. That makes it rather awkward for any one (1) party to suggest their contribution is material to the achievement of the related energy savings.

This isn't a one-man show or a one-person show or a one-company show. We need to understand this is a collective effort. The process

for claiming savings based on material contributions does not align with the processes that recognize the impact that codes and standards have on energy consumption. We need to align those two (2).

The absence of any one (1) party can cause the process to fall or become ineffective, as well. So, full and cooperative funding and participation is required from all parties and should be mandated in the Efficiency Manitoba regulation.

It shouldn't be an option for Efficiency Manitoba to participate in codes and standards. We've demonstrated they're cost-effective. We've demonstrated that they provide a large magnitude of savings. Why do we even make it an option?

They don't -- the only incentive they need is to be told to do it. They don't need a savings claiming method as incentive; they just need to be told. Crown corporations are usually pretty good at that.

Such a mandate does not create undue hardship for ratepayers as codes and standards participation is the lowest cost initiative available to Efficiency Manitoba, accounting for only about 1 percent of total expenditures. One (1) more slide.

Reporting savings rather than claiming

savings will maximize the contribution of codes and standards to the savings targets and thereby decrease the overall cost for achieving those targets.

And for these reasons, it is preferable to report savings rather than attempt to apportion or claim savings based on the respective contributions that are difficult to evaluate objectively.

I feel pretty strongly about this. It's a mantra that I've kind of stuck to throughout my involvement in codes and standards which now extends to nearly thirty (30) years. And I think it's important we recognize the collaborative effort and that we simply report these.

Manitoba Hydro includes the impact of energy performance codes and standards in its load forecast. The process of removing those impacts is at best imprecise and runs the risk of under reporting the impact of codes and standards when they are later claimed by Efficiency Manitoba.

It is likely that savings will removed incorrectly and claimed partially at a later date, particularly for some of the older standards that Daymark was referring to.

Standard savings are applied to load forecasts in layers with each successive improvement

to a regulated code or standard, further reducing consumption relative to the prior standard.

Prior savings are locked into the load forecast by regulated codes and standards, ensuring their persistence into the future. There isn't an option for these savings to drop off, so why would we subtract them is the question I have in regards to Daymark's recommendation.

All -- new energy sta -- or codes and standards mandate higher performing products. Prior -- - lesser performing products are removed from the market and incremental savings are claimed annually for purchase and installations of the higher performing products.

So, there's no double counting here, and that was one (1) of the concerns expressed by Daymark. All energy savings derived from the adoption of energy performance in codes and standards should be included within the savings target mandate -- man -- target mandated for Efficiency Manitoba.

To do otherwise runs the risk of confusing the load forecast developed by Manitoba Hydro with partial savings claims made by Efficiency Manitoba. This process becomes needlessly complicated, difficult to manage, and more costly than

necessary to administer.

I believe that Efficiency Manitoba's well positioned to lead this pro -- the process for facilitating the development and implementation of codes and standards applicable to Manitoba and it should work closely with Manitoba Hydro to ensure that the load forecast aligns with savings targets reported by Efficiency Manitoba.

There is room for a lot of cooperation between the utility and the efficiency agency in this case and we should maximize that cooperation through our recommendations to the Province.

And with that, I had -- there are a few additional slides, but I am providing those for -- for information. I'm open to questions on those, but they provide some background to the codes and standards process.

I hope the Board has the opportunity to review those and develop a greater understanding of how the codes and standards process works. I apologize for taking a little bit longer, but I felt that some of these messages were important to our clients and to the industrial sector generally.

And I open to que -- I'm open to questions from the Board.

(BRIEF PAUSE)

THE CHAIRPERSON: Dr. Grant, any questions?

BOARD MEMBER GRANT (BY PHONE): No questions. Thanks.

THE CHAIRPERSON: Okay. Thank you. Ms. Dilay...?

MS. KATRINE DILAY: Thank you, Mr. Chair.

CROSS-EXAMINATION BY MS. KATRINE DILAY:

MS. KATRINE DILAY: Good morning, members of the MIPUG panel. As you know, my name is Katrine Dilay. I'm a lawyer with the Public Interest Law Centre representing the Consumers' Coalition in this proceeding.

Based on my review of your evidence and what I've heard this morning, I think most of my questions will be directed to Mr. Bowman. However, Mr. Friesen, if you feel that you are best placed to answer the question, please do so.

Mr. Bowman, at a high level, you'll agree that the implementation of the efficiency plan

2020/'23 has the potential to lead to rate increases for Manitoba Hydro ratepayers?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And is it your understanding that these rate increases would be applied to all customers whether they participate in energy efficiency programs or not?

MR. PATRICK BOWMAN: Yes. I wouldn't see where Hydro would have the discretion to distinguish.

MS. KATRINE DILAY: And so, for customers who do not participate in energy efficiency programming offered by Efficiency Manitoba, those customers would see the rate increase on their bill but would not see any direct bill reductions from energy efficiency upgrades to their homes or businesses, correct?

MR. PATRICK BOWMAN: Yeah, you -- you use the word 'programs'. There's also the codes and standards impacts. But, overall, yes, a customer who did not have any benefit as a result of -- of EM's work in programs or codes would not -- would -- would only see the -- the rate impact, they would not see a bill reduction.

MS. KATRINE DILAY: And those

customers that we're talking about could include low-income residential customers and other customer groups who may be -- who may be vulnerable due to other barriers because not every single customer will participate in energy efficiency programming, correct?

MR. PATRICK BOWMAN: Correct.

MS. KATRINE DILAY: I'd like to go through with you a few potential advantages of energy efficiency programming generally.

You'll agree generally that one (1) advantage of a well-designed energy efficiency plan can be the reduction of wasted energy through reduced greenhouse gas emissions?

MR. PATRICK BOWMAN: Well, yes, I -- I'm not going to split hairs about -- about whether reduced hydro consumption which is generated from -- from water is necessarily about greenhouse gas emissions, but, generally, yes, reduce of -- of wasted energy, yes.

MS. KATRINE DILAY: And you'll agree that another positive impact of a well-designed energy efficiency plan is that it can lead to reduced capital expenditures over time --

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: -- as well as

increase energy available for export at a high level?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And at a high level, you'll agree that residential customers specifically can benefit from energy efficiency programs?

MR. PATRICK BOWMAN: Customers who participate in the program ca -- can benefit through having less usage, if that's what you mean, yes.

MS. KATRINE DILAY: Thank you for that clarification. And I'd like to go through some more specific potential benefits. So, I think you just alluded to this, but one (1) benefit could include having more control over their energy bills, correct?

MR. PATRICK BOWMAN: Sure, I accept that, yes.

MS. KATRINE DILAY: And you'll agree that energy bills will often take up a larger proportion of total income for consumers with limited income?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: So, as a result, having more control over energy bills can disproportionately impact consumers with a limited inco -- income?

MR. PATRICK BOWMAN: Yes, I think that's acce -- that's -- that's -- that follows, yes.

MS. KATRINE DILAY: And another benefit from energy efficiency programs for residential customers who participate could be increased comfort in their homes?

MR. PATRICK BOWMAN: Yes. That's -- that's the type of considerations in the total resource cost test and the like, non-energy benefits, yes.

MS. KATRINE DILAY: And one (1) example of increased comfort could be, for example, if windows or insulation are replaced and the house is less drafty as a result?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: Could another benefit for residential customers who participate be improved indoor air quality --

MR. PATRICK BOWMAN: Yes, that's possible, yes.

MS. KATRINE DILAY: -- as well as improved lighting quality?

MR. PATRICK BOWMAN: That's a possible outcome, yes.

MS. KATRINE DILAY: And could another

benefit include increased property value depending on the improvements that are made, of course?

MR. PATRICK BOWMAN: That's -- that's possible, yes.

MS. KATRINE DILAY: Reduced maintenance costs could also be a potential benefit of energy efficiency upgrades?

MR. PATRICK BOWMAN: That's possible, yes.

MS. KATRINE DILAY: And, in some cases, energy efficiency upgrades could also lead to lower water consumption, correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And energy efficiency programming can also promote waste reduction through certain appliance recycling programs?

MR. PATRICK BOWMAN: I -- I guess the -- one (1) of the -- some -- occasional criticisms of energy efficiency programming is encouraging people to upgrade things sooner than they would have, and it's offset by the fact that you end up with a lot more waste because people will retire dishwashers or something, less efficient dishwashers and install new ones, and you actually generate a lot of -- of waste

from -- from things that would have been still in service and are no longer in service.

So, I -- I think I -- I'd be cautious about going too far on that one with you.

MS. KATRINE DILAY: Understood. But you'll agree that one (1) program that Efficiency Manitoba's proposing to offer is the appliance recycling program, correct?

MR. PATRICK BOWMAN: Yeah, those are -- that -- that is -- I saw that on the list, and those are usually sort of necessary mitigation measures from the side that -- that -- that Efficiency Manitoba may be causing a lot more -- a lot more surplus appliances.

MS. KATRINE DILAY: Thank you for that, Mr. Bowman. You'll agree that in order for a residential customer to participate in an energy efficiency program, they have to know about the program?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And they have to be able to afford to participate if there is an up-front cost associated?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: They would also

have to be able to access the application process, whether it be online, in person, or otherwise?

MR. PATRICK BOWMAN: If there's an application process, yes.

MS. KATRINE DILAY: And they would also have to be able to physically access the product or service that they want to have installed to improve the energy efficiency of their home, correct?

MR. PATRICK BOWMAN: Yeah. If -- if -- if there's a customer physical participation aspect required, they'd have to be able to -- to meet that requirement.

MS. KATRINE DILAY: And at a high level, you'll agree that there exist some barriers for low-income customers to participate in energy efficiency programs that may not exist for other customers?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And one (1) barrier may be that low-income customers may not have sufficient income to pay the up-front costs for energy efficiency upgrades?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And this is where a financial incentive to assist consumers in investing

in energy efficiency programs can help to remove or at least alleviate that barrier?

MR. PATRICK BOWMAN: It can help. It may not be enough, but yes.

MS. KATRINE DILAY: And would another barrier stemming -- sorry, excuse me. Another barrier may stem from a large proportion of low-income customers being renters?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And when you -- referring to low-income customers being renters, would that be because of the split incentive?

MR. PATRICK BOWMAN: Yes, and to explain that, it would be -- there are many times, this -- the -- the costs and the savings may not accrue to the same party between the renter and the -- and the landlord.

MS. KATRINE DILAY: And generally -- and recognizing there are, obviously, exceptions to this -- you would agree that lower-income customers are more likely to live in older homes located within older neighbourhoods?

MR. PATRICK BOWMAN: I -- I think that's generally true. I'm not a particular expert on that, but that -- that -- I've heard that, definitely,

claim made, and I would think it follows.

MS. KATRINE DILAY: And older homes may be in higher need of energy efficiency improvements.

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: Turning to a slightly different topic, Mr. Bowman, you've appeared before regulatory tribunals in many different provinces, correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And at a high level, you're aware that the regulatory art is a difficult one involving the balancing of many competing interests?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And you're aware that Efficiency Manitoba is a Crown corporation.

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And is it your understanding that Efficiency Manitoba is subject to requirements under the Crown Corporations Governance and Accountability Act?

MR. PATRICK BOWMAN: I would not have a particular expertise in that area.

MS. KATRINE DILAY: Thank you, and

that's fine. Through the Efficiency Manitoba Act, the Manitoba legislature has given energy -- sorry, Efficiency Manitoba an important public policy mandate, correct?

MR. PATRICK BOWMAN: Yes, they've added it to the list of considerations.

MS. KATRINE DILAY: And of course, the plan proposed by Efficiency Manitoba is currently being reviewed by the Public Utilities Board?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And based on your experience in Manitoba before the Public Utilities Board, you're aware that the PUB considers the public interest in its regulatory function?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And as an expert in utility regulation who is preparing evidence in the context of a particular legislative scheme, it is important for you to understand the purpose and objectives of the legislation at a high level?

MR. PATRICK BOWMAN: Without getting into sort of the legal definitions, I will read them as an -- as someone trained more in economics than in the law.

MS. KATRINE DILAY: Understood. Thank

you. And so Mr. Bowman, taking that answer, in preparing your evidence, you took the opportunity to review the energy -- the Efficiency Manitoba Act and regulation, correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And that review included a consideration of the purpose and objectives of Efficiency Manitoba?

MR. PATRICK BOWMAN: Generally, yes.

MS. KATRINE DILAY: And I'd like to just take you to a few -- a few sections.

Ms. Schubert, if we could turn to the Efficiency Manitoba Act, Section 4(1).

And if we look at Part (a) under "mandate", do you see there that the mandate of Efficiency Manitoba includes:

> "To implement and support demand side management initiatives to meet the saving targets and achieve any resulting reductions in greenhouse gas emissions in Manitoba."

Correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And is it your understanding that the reduction of greenhouse gases

has been identified as a primary way to fight climate change?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And Ms. Schubert, if we could turn to Section 4(3).

Mr. Bowman, you see there that:

"In fulfilling its mandate, Efficiency Manitoba may aim to provide initiatives that are accessible to all Manitobans" --

-- under Part (c)?

MR. PATRICK BOWMAN: Yes, I see that's something they may do.

MS. KATRINE DILAY: And if we look, Ms. Schubert, under Section 11(4).

(BRIEF PAUSE)

MS. KATRINE DILAY: And here you see that these are mandatory considerations that the PUB must consider in reviewing an efficiency plan?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And if we look at Part (b), that includes:

"The benefits and cost-effectiveness

of the initiatives proposed in the plan"?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And Part (c): "Whether Efficiency Manitoba is reasonably achieving the aim of providing initiatives that are accessible to all Manitobans." Correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And if we could look to the Efficiency Manitoba regulations.

(BRIEF PAUSE)

MS. KATRINE DILAY: And under "additional factors to be considered by the PUB," you'll agree that this includes, under Part (b): "Whether the plan adequately considers the interests of residential, commercial, and industrial customers"?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And under Part (c):

"Whether, if it is practical to do so, at least 5 percent of Efficiency Manitoba's budget for demand side management initiatives is allocated to initiatives targeting low-income or hard-to-reach customers"?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And if we look to Part (g), there:

"The PUB must consider the impact of the efficiency plan on rates and average customer bill amounts"?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And then finally, part (j):

"Whether the efficiency plan adequately considers new and emerging technologies that may be included in a future efficiency plan."

Correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And so having gone through these -- some of these factors, you'll agree that under the Efficiency Manitoba Act and

regulations, there are multiple factors that the PUB must consider in reviewing an efficiency plan.

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And given that there are multiple factors, the PUB must achieve some level of balance between the factors it is being asked to consider.

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: I just want to take you to Section 12 of the regulation, which is already there before us.

And you'll agree this is where the regulation sets out how to determine the cost-effectiveness of the portfolio of demand side management initiatives?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And just to summarize, if we look to the electric portfolio, which is under 12(1), this is to be done by comparing the levelized cost to Efficiency Manitoba of the electrical energy ne -- energy net savings resulting from those initiatives with the levelized marginal value to Manitoba Hydro of the net savings resulting from those ini -- initiatives.

Would that be a fair summary of what

the regulation says?

MR. PATRICK BOWMAN: That -- that's what it says there.

MS. KATRINE DILAY: And is this -- is it your understanding that this definition in the regulation refers to the program administrator cost test?

MR. PATRICK BOWMAN: Generally, yes. This definition doesn't say that you're necessarily limited to which horizons you consider, for example. So we will see, Efficiency Manitoba and -- and Daymark both considered the program administrator cost test looking at horizons of -- of a shorter term versus a longer term. You know, lev -- levelized is a -- is a -- a factor that -- that implies that it can be done over the entire life, but not -- but it wouldn't necessarily have to be.

The other thing is that you'd have to think about the relevance of the -- the three (3) year plan and the actions in the three (3) year plan to persistence or renewal. And, for example, there was some comment about -- about the life of -- of measures and whether one can reasonably expect those measures -- or, the benefits to be achieved in a subsequent generation.

For example, if someone -- if you incent an industry to put in a -- an energy-efficient motor, you may get a -- let's say it has a five (5) year life, to pick a number -- you may get a five (5) year life out of that. But if that's what they've now installed, there's a pretty good chance in Year 6 when they replace it, they'll put in the same technology or better because that's -- that tends to be the way that people have done things once they're designed.

So if your program caused them to -- to meet a higher standard, you'd need to think about whether you've actually achieved those -- those additional horizons. So there -- there -- there are different ways to look at -- at the horizon and to measure over what period and what -- what -- what generations of assets you consider levelized cost, but the general test is, yes, a Program Administrative Cost Test.

MS. KATRINE DILAY: That's helpful. Thank you, Mr. Bowman.

If we turn to PDF page 232 of the Efficiency Plan, just at a high-level you would agree that this is the formula that Efficiency Manitoba used for determining the program bundle and portfolio PACT ratio?

MR. PATRICK BOWMAN: Right, and they -- they tended to apply it over the entire life of the measure as they -- as they determine, but yes, this is that formula.

MS. KATRINE DILAY: And the PACT or PACT ratio as described by Efficiency Manitoba is a benefit cost ratio of the DSM program from the perspect -- perspective of the entity implementing the program and administering the incentives?

MR. PATRICK BOWMAN: It is a benefit cost ratio from the perspective of the administrator, yes.

MS. KATRINE DILAY: And so if the ratio is greater than one (1), is it your understanding that the benefits included in the calculation of the PACT ratio are greater than the costs?

MR. PATRICK BOWMAN: Over the -- the -- over the horizons in which was considered and -- and with the constraints that I mentioned earlier, yes.

MS. KATRINE DILAY: Changing topics a little bit, I'd like to turn to EM/MIPUG I-3, Ms. Schubert. Thank you.

And so this was a question in Information Requests from Efficiency Manitoba to

MIPUG, and if you look to the response here you see there that you elaborated on relevant metrics that you believe should be used to evaluate the inclusion of income qualified or Indigenous programs, and that would be in the second paragraph here.

MR. PATRICK BOWMAN: yes.

MS. KATRINE DILAY: And so your answer includes that -- and this is actually at the beginning, the first paragraph:

> "When offering DSM programming to the noted targeted customers, the PUB has a broad public interest mandate that has previously been concluded to include special consideration for specific populations."

Correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And then the second paragraph we see:

> "Given issues of affordability are targeted topics for low income and Indigenous customers, the metrics for these programs are likely tied to effects on affordability and

extent of access or uptake."

Correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And so you'll agree that in Efficiency Manitoba's plan, the income qualified customer segment would be for those customers who qualify as LICO125?

MR. PATRICK BOWMAN: I didn't spend as much time reviewing the threshold for that, but that is my understanding.

MS. KATRINE DILAY: And I'd like to just take you to a few places in Efficiency Manitoba's plan where they talk about those thresholds. And so if we go to the plan at page 314, and if we go to the very bottom of the page there, you see that Efficiency Manitoba has indicated that:

"The income qualifier is defined by the low income cut-off, or LICO, as estimated by Statistics Canada for urban centres with more than five hundred thousand (500,000) residents."

MR. PATRICK BOWMAN: Yes, I've seen that. Yes.

MS. KATRINE DILAY: And then if we go

on to the next page, the program then adds:

> An additional 25 percent of the LICO qualifier to increase the number of Manitoba customers who are eligible for income qualified offers."

Correct?

MR. PATRICK BOWMAN: That is what it describes here in describing the program.

MS. KATRINE DILAY: And then do you see there that Efficiency Manitoba indicates that:

> "Based on the 2017 residential end survey, there are approximately a hundred and fifty-nine thousand (159,000) homes in Manitoba that fall below the LICO125 threshold."

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And is it your understanding, based on your review of the plan, that the income of customers applying for income qualified programming would be verified in order to confirm their eligibility?

MR. PATRICK BOWMAN: That wasn't an aspect of the plan that I spent any detail on.

I also didn't address how Efficiency

Manitoba would implement these as opposed to design the plans and how they might adapt them if they're not seeing the -- the success and -- and penetration that they expected.

MS. KATRINE DILAY: Understood. And so I'd like to, just recognizing that we went through what the LICO qualifier -- or the income qualified eligibility would be, I'd like to take you to the Statistics Canada's low income cut-off, and I've provided Ms. -- Ms. Schubert with the -- the link.

And you can confirm that I did give you a heads up that I would -- that I may be referring to this in my questions today?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And if you look to the right-hand column, you see there that the latest data available is from 2017?

MR. PATRICK BOWMAN: The latest data in this table is from 2017.

MS. KATRINE DILAY: And if we look at the bottom of the table, that's where the population for five hundred thousand (500,000) and over is located.

And as we saw, that's what Efficiency Manitoba is using in their plan, correct?

MR. PATRICK BOWMAN: Right. And these are -- these are national values. I haven't gone into whether there's a different measure that they use that's Manitoba specific, for example. I just did not, in that level of detail.

MS. KATRINE DILAY: Right.

MR. PATRICK BOWMAN: I'm not saying if it's right or wrong. I just can't confirm that.

MS. KATRINE DILAY: Thank you. And so if we look here, we see that for -- if you look population five hundred thousand (500,000) and over, and then we see the row that says one (1) person, and we go all the way to the end under the 2017 data, you see there that the LICO would be twenty thousand nine hundred and ninety-eight dollars ($20,998)?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And then if we add 25 percent to that amount, which Efficiency Manitoba indicated they would do, that would be roughly twenty-six thousand (26,000)?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And if we look to the family size of two (2) persons, the LICO would be twenty-five thousand five hundred and fifty-five (25,555)?

MR. PATRICK BOWMAN: yes.

MS. KATRINE DILAY: And if we add 25 percent to that amount, that would be roughly thirty-two thousand (32,000)?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And just looking to one (1) more number, let's look at the four (4) person household, the LICO would be thirty-nine thousand seven hundred and one (39,701)?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And if we add 25 percent to that amount, that would be just under fifty thousand (50,000), correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And so keeping these numbers in mind, you'll agree that there are undoubtedly individual customers or households in Manitoba that could fall just over the LICO125 threshold?

MR. PATRICK BOWMAN: Absolutely, yes.

MS. KATRINE DILAY: And then according to the definition that Efficiency Manitoba uses, those customers would not qualify for the income qualified programming, correct?

MR. PATRICK BOWMAN: Well, they

wouldn't be included in the program design hat Efficiency Manitoba has filed. As I said, I don't -- I don't know the details of -- of -- of implementation and how they might -- might adapt or -- or deal with that as time goes on, for example, if -- if they're looking at uptake or the like, but there -- there are customers who would be -- who would be 26 percent above LICO and wouldn't otherwise be in the program design, yes.

MS. KATRINE DILAY: And for those customers who may fall just over LICO125 threshold, it is possible that those customers don't have a lot of disposable income available to them?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And so it is possible that such customers could have difficulties affording energy efficiency upgrades?

MR. PATRICK BOWMAN: Yes. We also talked about this may be a cohort that has a -- a greater likelihood of living in -- in buildings where -- rentals or the like where there would also be a landlord effect in terms of programs able to be accessed, or -- or even without programs, there may be -- you know, as Mr. Friesen mentioned, these technologies may be on the shelf at Home Depot and

available and cost-effective to implement in any event.

MS. KATRINE DILAY: Thank you. That -- that's helpful. And for the Indigenous customer segment, is it your understanding that those -- the -- programs under -- offered to that customer segment would be available to customers residing in Manitoba's sixty-three (63) First Nations?

MR. PATRICK BOWMAN: I can't comment on that. I haven't looked at that at all.

I -- I'd also mention that there is an aspect to the savings that's very cost-effective and it applies to anyone doing -- doing the -- you know, part -- in Manitoba system, arising from codes and standards where customers benefit from having, you know, ill-advised products locked out of the market because they're -- they're -- may appear cheaper on the face of it, but are -- but are ultimately not energy efficient and are not -- not cost-effective to install, and -- and any customer who's -- who's, for example, living in a rental home where the landlord has now had the -- a new code installed, is required to not put in a -- a standard efficiency furnace because it's not available.

MS. KATRINE DILAY: And you -- you

read my mind about codes and standards. So I'd like to take you to one of your IR responses, PUB/MIPUG 12, and page 5 of that IR.

So under part (d) here, you state that:

"The aim" --

Right at the beginning of part (d):

"The aim of accessibility to savings can be achieved with codes and standards which affect all customers and low cost education initiatives."

Correct?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And so you'll agree that when we refer to codes, that refers primarily to building codes?

MR. PATRICK BOWMAN: Codes is -- as use of the terms, usually codes would be building codes and standards would be, like, appliance standards or efficiency standards.

MS. KATRINE DILAY: And so, energy efficiency is an objective contained within building codes, correct?

MR. PATRICK BOWMAN: It -- it can be, yes.

MS. KATRINE DILAY: And building codes

apply to new constructions as well as major renovations?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: So, in order to access savings from codes, customers would have to be buying a new construction or undertaking major renovations to their homes or, if they're a renter, have their landlord undertake a major renovation?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And to your knowledge, a building code does not provide a rebate or a discount to a customer who is purchasing a new construction or undertaking renovations, correct?

MR. PATRICK BOWMAN: It does -- it doesn't provide that. What it provides is -- is the lockout of -- of en -- energy inefficient products so they can't be installed.

MS. KATRINE DILAY: And I think you referred to this, but standards would refer to specifications for an item, material, component, system, or service?

MR. PATRICK BOWMAN: I -- I didn't use those words but, generally, yes.

MS. KATRINE DILAY: And I think you referred to appliances as one (1) example?

MR. PATRICK BOWMAN: I gave an example but, yes.

MR. DALE FRIESEN: I'll interject here for a second in respect to codes. You're correct in noting that current energy codes apply to new construction or renovations that are designated as being similar to new construction, so major renovations.

What should not be ignored is that there is considerable effort occurring at both the national and provincial level to develop energy codes that are applicable to lesser renovations.

And this is being evidenced by new BC codes, step codes that require anyone under -- drawing a permit to undertake any type of renovation to, based on the level of renovation, implement some energy efficiency improvement.

And that is an initiative -- that BC initiative is being looked at quite closely nationally by the Federal Government. And code developers is something that could be implemented more broadly across Canada.

So, that -- that is an initiative that we see on the horizon to address retrofits or minor renovations.

MR. PATRICK BOWMAN: I -- I also just wanted to touch on -- there's -- there's also this concept of market transformation which is not irrelevant to -- to DSM programming, which is that, as a result of programming being offered, or codes or standards or any combination thereof, availability of product, cost competitiveness of product, availability of -- of installers familiar with product, availability of service people to repair products, all of those things can be changed, which can have an -- an impact on the opportunity for any customer to install these various more efficient options even if that customer is not otherwise strictly caught by a code compliant upgrade or something of the like.

MS. KATRINE DILAY: Thank you. And our client definitely appreciates this information from both witnesses. And just one (1) final question regarding standards specifically.

To your knowledge, a standard by itself does not provide a rebate or a discount to a customer to purchase a new appliance, correct?

MR. PATRICK BOWMAN: Yes.

MR. DALE FRIESEN: Again, I would like to interject and -- and explain that federal and provincial authorities, before they regulate a

standard and the associated energy performance levels, are required to undergo fairly rigorous assessments of the cost-effectiveness and the benefits.

And, generally speaking, the -- the regulated energy efficiency Acts that are applicable to Manitobans would not consider measures for regulation that have insufficient benefits or not cost-effective.

It's -- we're talking about mature technologies that are in the -- readily available in the marketplace generally have a fair amount of competition, multiple suppliers, those kinds of things.

So, the codes and standards process is not -- does not disregard consumer economics; it's actually quite considerate of consumer economics.

MR. PATRICK BOWMAN: I -- I just wanted to also note the -- the extent to which the idea of -- of programming driven for low-income, for example, by the -- the need to -- to assist the customers is, in some -- in some measure, influenced by the extent of -- of rate impact you're otherwise having.

If Efficiency Manitoba could go off and -- and run programs that is -- is causing notable rate

decreases, you'd be in a very different position about -- about needing to address impacts on -- on customers than if they're otherwise causing rate increases to nonparticipants.

And I think something like the 5 percent measure in the Act needs to be read -- you know, it's -- it's actually fairly weak language, but I haven't seen any objection to it here, but it needs to be read in light of the overall rate impact you're having.

And if Efficiency Manitoba's actions are having an upward driver on rates, I think you need to be even more cognisant about the fact that -- that that is leaving nonparticipants behind. And you need to do a lot more to ensure that you're paying attention to people who are -- who are, not by their own choice, nonparticipants.

If you're -- if you're in a place where -- where -- were attentive to the rate impacts and were -- were having neutral or positive rate impacts, then the -- the incentives might be a little bit different.

I think the 5 percent's still necessary and -- and probably, frankly, a bit low, but -- but it may not be the same considerations if you're having an

upward driver on rates.

And I think that's why the first test really needs to be do you need the power and -- and, if you don't need the power, then -- then why are you -- why are you driving up rates in order to pursue some -- some idea of -- of opportunity to -- to acquire power for export markets where it's worth less than selling it here.

MS. KATRINE DILAY: Thank you, Mr. Bowman. Mr. Chair, I have two (2) -- two (2) sections left that will be relatively brief.

Mr. Bowman, if we turn to page 6 of your pre-filed testimony. And I just want to confirm there recommendation 11.

And so, that recommendation is, the next time Hydro's cost of service study is updated, DSM costs should be functionalised to generation and transmission and distribution in proportion to the marginal values used to justify the programming or approximately 75 percent, 10 percent, 15 percent respectively.

That's your recommendation 11?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And we don't have to go there, but you acknowledge later in your report

that in 2016 the Public Utilities Board found that DSM is a generation resource in that it avoids generation costs rather than the costs of transmission and distribution, correct?

MR. PATRICK BOWMAN: That is what the Board found. And I think the evidence that's before the Board today should convince them that that is in fact not a correct finding and that there is savings to a distribution system and -- and in fact to transmission and where we'd have the marginal values.

I could -- I could show you more clearly how that arises but, nonetheless, it is -- we know it's included.

MS. KATRINE DILAY: And the -- the PUB decision you referred to from 2016 was PUB Order 164/16?

MR. PATRICK BOWMAN: I think that's correct. I was trying to find the reference in my -- in my evidence, but it was the -- it was the cost of service proceeding.

MS. KATRINE DILAY: And we can -- the -- the order number we can take subject to check.

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And this can be subject to check, as well, but, at a high level, the

Public Utilities Board found that DSM reduces overall domestic energy consumption, peak demand, or both?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And their finding related to demand side management was made after a public hearing process, including evidence from both Manitoba Hydro and Interveners, correct?

MR. PATRICK BOWMAN: Yes, although the -- let -- let's remember that the substantive debate there was about two (2) options for how you treat DSM programming.

One (1) option which Manitoba Hydro was advocating was DSM programming should be assigned to the class that participates because it's fundamentally about customers saving on their bills.

So, if you spend money helping residentials save on their bills, residentials should pay for it. The alternative view is DSM was about system benefits, and it was about marginal value. And -- and that path tended to talk about -- generation, I think, is the generic concept because it's fundamentally more generation than it is distribution, and -- and that's still true.

So, I think the -- the Board's finding should be read in light of we mean path B, system

value, not path A, customer value. Now that we're down the road of system value, I think all we're saying is the refinement of that is, in fact, it's not all generation, it is -- it is spread across the function in system value.

MS. KATRINE DILAY: Thank you, Mr. Bowman. And my last questions have to do with integrated resource planning principles. And I just have a few clarification questions for you.

So, if you turn to page 5 of your report just to put this into context. So, rec -- recommendation 5 is that:

> "Future three (3) year Efficiency Manitoba reviews should required appropriate integrated resource planning information, including testing of resource plans, supply options, and marginal values."

Do you see that?

MR. PATRICK BOWMAN: Yes, I see that.

MS. KATRINE DILAY: And we don't necessarily need to turn there, but you can confirm that in PUB/MIPUG 13 you provided additional information on how this recommendation could be implemented?

MR. PATRICK BOWMAN: It -- it's possible. I don't have that in front of me, but I -- I'd accept that I was -- I know I was asked an IR on it, and I provided some more information. I wouldn't mind the opportunity to supplement that if -- if you permit.

MS. KATRINE DILAY: And I believe it's -- it's in front of you here, and yes, go -- go ahead.

MR. PATRICK BOWMAN: I was just going to say that when -- when this was prepared, you know, we were dealing with a lot of uncertainty about what this Board's role could be, how different processes were going to unfold, what the jurisdiction was, when it would next be triggered. And I think there's still some uncertainty on that, but definitely some more options have been discussed since -- since I prepared this document.

I was viewing this through a lens which said the Board -- and this is my own, perhaps, misreading or bias, what -- whatever -- this Board's only going to have a role with Efficiency Manitoba every three (3) years, and when it does, it's only going to be reviewing the plan and providing recommendations. And the scope of that may be limited to dealing with more managerial aspects of EM.

The Board also will have a role with Manitoba Hydro, usually triggered by Manitoba Hydro needing rate increases, so we're not even in the -- driving the bus, necessarily, whether those will occur. And somehow within that, those tools available to the Board, I was imagining you want to add in in IRP consideration.

If -- some other thoughts have come up where people are saying, Well, maybe the Board should give a one (1) year approval. They should recommend to the government that EM's got to come back somehow. I -- I -- I didn't have those options in my head or -- or maybe this -- the IRP process should be something initiated that's got its -- its own path that brings it back to the PUB. I -- I wasn't thinking of those options either at the time.

I was thinking of limits of every three (3) years, a recommendation-based EM review, and every once in a while, a Manitoba Hydro GRA, and within that, how do you achieve these objectives? And my recommendations, I think, flow from that, and I think it -- it wouldn't be hard for someone to -- to read into the principles I was concerned about.

And if -- if there was a different conclusion on when this Board would be triggered and

what jurisdiction it'll have and what processes it may be looking at, I think the -- the principles could still be extended to that.

MS. KATRINE DILAY: That's very helpful. Thank you. And so I think Part (a) here, I guess at a -- at a high level, that recommendation was that the framework for future Efficiency Manitoba reviews should include an integrated resource planning based assessment of alternative supply options and alternative savings targets to inform recommendations to government.

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And so I take it that generally, you agree that in developing future efficiency plans, Efficiency Manitoba should develop alternative portfolios to the one it is proposing?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And these alternative portfolios should provide different options that meet less or more savings than the legislative sa -- legislated savings targets?

MR. PATRICK BOWMAN: Yes, and may also re-balance priorities in a different way.

MS. KATRINE DILAY: And so I think that's what you're alluding to, but just to clarify,

does that mean that Efficiency Manitoba should also provide alternative portfolios that meet the same level of savings but with a different configuration of programs and initiatives?

MR. PATRICK BOWMAN: Yes, and different -- or different thoughts about -- about distribution across classes or caps, for example.

MS. KATRINE DILAY: And these alternative portfolios, at a high level, would allow parties and the Public Utilities Board to see tradeoffs associated with the proposed plan while meeting the same target?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: And switching gears a little bit, but in your view, would it be helpful if Efficiency Manitoba had a central repository of all the options and initiatives and measures it considered for inclusion in its Efficiency plan?

MR. PATRICK BOWMAN: Central repository's an interesting term, certainly, because as soon as we get into detail of actual measures or -- or sub-measures, if you like, you start to run into the question about whether you can actually see the data associated with those due to confidentiality

reasons.

Certainly, there should be a sense of what's available as measures, you know, what the potential is. On -- Mr. Friesen commented on the fact that potential studies can be -- can be relevant and may need to be updated, but I -- I don't -- so I don't have any objection to that.

I would think the -- the -- the -- Efficiency Manitoba should be able to provide that, but I know that you'd -- you would run across certain limits on information and also a certain caution that you can't always pick one from Column A and one from Column B if you have to think about how programs work together in -- in bundles to access customers and -- and how marketing works.

MS. KATRINE DILAY: Thank you for that. And would you agree that it would be helpful if Efficiency Manitoba clearly documented and reported on all the objectives underlying the development of a preliminary portfolio?

MR. PATRICK BOWMAN: Yes.

MS. KATRINE DILAY: As well as the condi -- considerations underlying the final selected portfolio?

MR. PATRICK BOWMAN: I think that's

fair, yeah.

MS. KATRINE DILAY: And those are all my question for the MIPUG witness panel. Thank you very much for your responses this morning.

THE CHAIRPERSON: Thank you very much, Ms. Dilay.

Mr. Wheeler, I'm advised by Ms. Steinfeld that MKO has no cross-examination. Is that correct?

MR. JARED WHEELER: That's correct.

THE CHAIRPERSON: Thank you. Ms. Fox, are you on the line, or counsel for AMC on the line?

MS. EMILY GUGLIEMIN (BY PHONE): Hello?

THE CHAIRPERSON: Hello?

MS. EMILY GUGLIEMIN (BY PHONE): Hi, can you hear me? This is Emily.

THE CHAIRPERSON: Yes, hi, Emily. I understand from Dayna -- from Ms. Steinfeld that AMC does not have any questions for cross-examination. Is that correct?

MS. EMILY GUGLIEMIN (BY PHONE): Yes, that's correct.

THE CHAIRPERSON: Thank you very much.

MS. EMILY GUGLIEMIN (BY PHONE): Thank

you.

THE CHAIRPERSON: Ms. Schofield...?

MS. JESSICA SCHOFIELD: Mr. Chair, did you want me to start, or is it possible for us to take a ten (10) minute recess?

THE CHAIRPERSON: To take a ten (10) minute break, I guess the question is we're -- we're running into a time crunch, and quite frankly, I'm prepared to go right through the -- the lunch hour if need be. We have a problem in relation to Dr. Grant, who's in Regina and has to catch a plane. That's why we have to stick to sort of the 2:15 end time. And I -- I -- and included in that some re-examination, if Mr. Hacault has re-examination.

So the -- we can give you fifteen (15) minutes if you want to go through. I'm going to need to know how long you think you're going to need for cross-examination.

MS. JESSICA SCHOFIELD: So my only thought had been that we were supposed to start at 12:30, so that if we took ten (10) minutes right now, we would be exactly on schedule. I do hope to be a little quicker than the time that I had allotted.

THE CHAIRPERSON: Okay, how long would you like?

MS. JESSICA SCHOFIELD: Right -- for a break?

THE CHAIRPERSON: Yeah.

MS. JESSICA SCHOFIELD: Ju -- just ten (10) minutes.

THE CHAIRPERSON: Ten (10) minutes, okay. We'll break for ten (10) minutes. Thank you.

MS. JESSICA SCHOFIELD: Thank you.

--- Upon recessing at 12:21 p.m.

--- Upon resuming at 12:34 p.m.

THE CHAIRPERSON: Ms. Schofield...?

MS. JESSICA SCHOFIELD: Thank you, Mr. Chair.

CROSS-EXAMINATION BY MS. JESSICA SCHOFIELD:

MS. JESSICA SCHOFIELD: Good afternoon. I expect that most of my questions will be for Mr. Friesen, but I will have some questions for Mr. Bowman at the end.

So, Mr. Friesen, you testified this morning in your -- and in your pre-filed evidence, that industrial energy savings may be lumpy, correct?

MR. DALE FRIESEN: Correct.

MS. JESSICA SCHOFIELD: And this is as a result of the large size of some industrial projects, correct?

MR. DALE FRIESEN: That's correct.

MS. JESSICA SCHOFIELD: And the quantity of the industrial projects of this magnitude are relatively few compared to the total number of commercial, agricultural, and residential projects, correct?

MR. DALE FRIESEN: Yes.

MS. JESSICA SCHOFIELD: In the event that a large industrial energy conservation opportunity arises at a point where Efficiency Manitoba has spent its industrial program budget for that year, what would you recommend as to the application and use of the contingency fund?

MR. DALE FRIESEN: My suggestion would be that the contingency fund be available, particularly in instances where those savings would be otherwise lost, and by 'lost' I mean if a -- if a customer would not proceed with the energy efficiency initiative, the result would be the construction of a less efficient facility or process, and the likelihood of that process being returned to for energy efficiency would be in the long term, not the short-

term.

So generally, industrial investments and processes and facilities are quite large and with long lives, so if such an instance occurred, it would not be unusual that that process would not be returned to for a period of ten (10), fifteen (15), twenty (20) years before a major undertaking could be had, in which case those savings would be lost.

So I would look at the cost-effectiveness of the measure. I wouldn't suggest the use of the contingency for measures that are not cost-effective, but I would suggest that for cost-effective lost opportunities, it should definitely be used.

MS. JESSICA SCHOFIELD: Thank you. I believe a few times today you've referred to a concern when the annual savings target has been met and lost opportunities in that regard.

You would agree that even where that 1.5 percent has been met, Efficiency Manitoba still receives a benefit in terms of meeting the cumulative fifteen (15) year target, correct?

MR. DALE FRIESEN: Yes, subject to some qualification around the term "cumulative" and how it is determined. There is a significant amount of evidence put on the record by Daymark in regards to

the relationship between the annual target and the cumulative target and how that could be interpreted. Patrick spoke to that earlier today as well.

In an IRP concept, cumulative would re -- would refer to the long-term impact, and that doesn't align with the way the regulation is written. So I agree with or I -- I confirm my -- my agreement with your statement but, you know, there is some ambiguity around what cumulative means in the context of this plan and the regulation.

MS. JESSICA SCHOFIELD: Thank you. Now, you've raised a concern in your evidence with respect to the level of flexibility that Efficiency Manitoba has as it relates to industrial fun -- funding, correct?

MR. DALE FRIESEN: Correct.

MS. JESSICA SCHOFIELD: And have you had the opportunity to review Efficiency Manitoba's evidence during this hearing with respect to the level of flexibility that they have and intend to employ?

MR. DALE FRIESEN: I believe I've reviewed most of it. I may not have reviewed all of it, but I attempted to keep up with the transcripts.

MS. JESSICA SCHOFIELD: And did this evidence address your concerns in this regard?

MR. DALE FRIESEN: In part it did. As I understood the evidence from Mr. Stocki, he indicated that there was some flexibility in moving the budget and the savings acquisition within the three (3) year period of the plan, so that may result in maybe under achievement in one year and over achievement in the next, and assuming that the cash flow follows that under achievement and over achievement. That was a partial -- partially addressed my concerns and it did -- it did provide some comfort in understanding that the focus wasn't purely annual, that there was, you know, a little bit of a longer term.

The areas that it did not address were the lost opportunities for large saving opportunities that might exceed the target for the three (3) year period or the fact that if year one and year two have been achieved and spent and a project originates in year three, there may not be a lot of budget flexibility remaining or target flexibility remaining within that scope of that three (3) year plan, or if a project extends across two (2) three (3) year plans, those would be instances where I would have concern with the way the regulation is written and the way the plan was presented as to whether Efficiency Manitoba

has the flexibility under those circumstances.

I spoke earlier about the ability to commit to incentives beyond the three (3) year period. That is a necessity for large industrial projects that have multi-year planning and construction time lines.

MS. JESSICA SCHOFIELD: And you -- you would agree that the regulation would need to be amended to address that -- the counting of those savings, correct?

MR. DALE FRIESEN: I think there's a combination of potential amendments that may be required and also some clarifications regarding definitions of the language used in the regulation.

MS. JESSICA SCHOFIELD: Thank you.

MR. PATRICK BOWMAN: Can -- can I just add I think one of the challenges that we both faced was if Efficiency Manitoba filed the documents, says our plan is to do this but we think we have flexibility, and the PUB says we approve your plan, what does it mean in terms of the flexibility, and when you come back and they've done something different, have they followed the plan or have they, you know, made use of the flexibility that was always inherent in the plan or have they varied the plan. You know, those bounds I think are -- are -- we're all

still figuring out where those resides.

So I think Mr. Friesen just wanted to underline that -- that that flexibility -- whether you call it approving the plan or amending the plan, that flexibility is -- is important and you wouldn't want to see it -- it lost because somehow now the plan has been approved and the plan is to spend on "X," not "Y."

MS. JESSICA SCHOFIELD: Thank you, Mr. Bowman. You heard Mr. Stocki's evidence with respect to the funding cap for industrial users, correct?

MR. DALE FRIESEN: I did and I believe I recall most of it.

MS. JESSICA SCHOFIELD: And do you agree with his evidence that this funding cap provides Efficiency Manitoba with flexibility to ensure that it can achieve its mandate?

MR. DALE FRIESEN: My interpretation of that comment was slightly different. My interpretation of his comments regarding the cap were that it ensures that any one (1) project doesn't monopolize the budget or a small number of projects monopolize the budget. So the -- what the caps effectively do is provide Efficiency Manitoba with the opportunity to spread that available budget across a

larger number of projects.

Doing so is maybe desirable, but it does run the risk of reducing participation in the industrial sector and thereby limiting saving opportunities for cost-effective or low cost acquisitions.

MR. PATRICK BOWMAN: Can I just add, the word "cap" has been used a couple of times and I'm -- I'm a little bit concerned it might mean two (2) different things.

There is a question of sort of a cap by class and whether you could reallocate within a class, but, you know, have you capped it so that you don't reallocate among classes, for example.

It is also a very specific issue that within certain -- certain programs, and I'm looking at the response to MIPUG/EM 1-1H attachment, which you don't have to pull up because it's quite a little microfiche document of numbers, but it is explaining specifically the industrial and commercial custom measures, and within those measures there is a separate thing that's called the cap on custom measures and it says that I will come to the table with an industrial customer and I'm willing to help fund them to do -- to do actions, but I won't pay more

than 50 percent of the incremental costs on that program.

There's lots of other programs here where Efficiency Manitoba will pay a hundred percent of incremental costs for other -- other measures, and in this case, you know, industrial customer may be saying it -- it cost very little to do the initiative, it cost me a heck of a lot in lost production and I can deliver you a ton of energy for -- you know, for the -- this cost of installing a -- you know, a widget or a doohickey, to be technical, and the cost of the widget or doohickey is quite low, and the most Efficiency Manitoba will come to the table with is 50 percent of the cost of that widget or doohickey because they wrote way down in this table we won't go over 50 percent, for -- for no apparent reason why they won't go over 50 percent if the cost is still down around 1 cent a kilowatt hour.

So the cap in -- in the program design of the specifics of individual programs and -- and particularly the industrial custom program is one that we were referring to. And -- and I was worried that we're using the -- the same word for two (2) different things, so.

MR. DALE FRIESEN: And Mr. Bowman

raises an interesting point with regards to the definition of the word 'cap'. In previous times at Manitoba Hydro, we had a similar cap to the one described in the Efficiency Manitoba plan, but we also had a hard cap on the total investment available.

And exceeding that was an extremely onerous and time-consuming pro -- process because we had to go through our executive and, depending on the amount, to our Board. And that process resulted in lost opportunities at various points.

So, caps can mean multiple things. The Efficiency Manitoba plan is silent on a hard cap. There's no mention of it in the plan, so I'm assuming that there is not one (1), but there may, but there's no clarity in the plan on that either.

MS. JESSICA SCHOFIELD: Thank you. And I believe Mr. Stocki's evidence was that that was a general rule and that there would be exceptions that could potentially apply.

So, moving on to codes and standards very briefly. You may have heard Ms. Kuruluk testify that Efficiency Manitoba has taken a conservative approach to the estimation of savings from equipment standards.

Would you agree with that assertion?

MR. DALE FRIESEN: I recognize that statement, yes.

MS. JESSICA SCHOFIELD: And energy efficiency measures have varying measures li -- measure lives, correct?

MR. DALE FRIESEN: That's correct.

MS. JESSICA SCHOFIELD: And in -- for some customers, they may have had efficiency measures installed as far as ten (10) years ago, in the case of insulation measures, for example.

And they would still be receiving savings on their energy bills today from that measure, correct?

MR. DALE FRIESEN: That's correct.

MS. JESSICA SCHOFIELD: I just have one (1) final area of questions for you, Mr. Friesen, and that relates to air source heat pumps. As you may be aware, Mr. Neme testified last week with regards to the topic of cold climate air source heat pumps.

You would agree that one (1) way that the performance of a heat pump is rated is something called a coefficient of performance, or a COP, correct?

MR. DALE FRIESEN: That's correct.

MS. JESSICA SCHOFIELD: And would I be

correct in defining the COP as the ratio of the useful heat provided by a unit divided by the energy input to the unit?

MR. DALE FRIESEN: No. The ratio is the useful heat or the output of the unit divided by the electrical input, not the total energy input. If you look at something like a ground source heat pump or an air source heat pump, a large amount of the input energy is derived from the heat in the ground or the heat in the air.

That is not included in the coefficient of performance calculation. It is -- only includes the electrical input in the denominator.

MS. JESSICA SCHOFIELD: Thank you for that clarification. The efficiency of a cold climate heat pump varies with the change in outdoor temperatures, correct?

MR. DALE FRIESEN: The coefficient of performance varies with the heat of the outdoor -- or the temperature of the outdoor air. And I -- I'm cle -- I want to be clear about that when I say the coefficient of performance, not the efficiency.

I notice Mr. Neme interchangeably used the word 'efficiency' and 'coefficient' of performance in his testimony. Those are not the same thing. One

(1) is the ratio we just described. The other is the conversion efficiency of the total energy output divided by the total energy input from all sources.

So, efficiency is a different metric than coefficient of performance.

MS. JESSICA SCHOFIELD: Thank you. So, once the outdoor temperature drops below minus 15 Cel -- sorry, Celsius, heat pumps are unable to transfer energy from the outdoor to the interior space, correct?

MR. DALE FRIESEN: That would have been true with technologies that were in common use over, let's say, the last decade, the last decade and a half.

There have been considerable advances in air source heat pump technologies. And there are -- there is equipment in the market today that can provide up to 60 percent of the rated capacity of an air source heat pump at temperatures down to about minus 30 degrees Celsius, so the technology has advanced considerably.

The challenge we have in using that technology is that it is ver -- the effectiveness of that technology and the capability to deliver that capacity is very dependent on the quality of the

installation and the design of the installation.

I -- in -- in their evidence, Efficiency Manitoba indicated that they felt the market, the delivery, the distributor, the installer at this point in Manitoba was not adequately trained or capable to deliver the proper design and installation, and I would share that concern.

(BRIEF PAUSE)

MS. JESSICA SCHOFIELD: Thank you, Mr. Friesen. I just have a couple of questions for Mr. Bowman now.

(BRIEF PAUSE)

MS. JESSICA SCHOFIELD: Ms. Schubert, if I could have you pull up transcript page 2,083.

(BRIEF PAUSE)

MS. JESSICA SCHOFIELD: Mr. Bowman, do you recall Board Member Hamilton's question to Mr. Neme with respect to diesel communities?

MR. PATRICK BOWMAN: Yes.

MS. JESSICA SCHOFIELD: And you've appeared at a number of Manitoba Hydro rate applications that in part addressed rates and service to diesel communities, correct?

MR. PATRICK BOWMAN: I have. But I've -- I've also done a lot of work with diesel communities across Canada's north and in -- and rural Newfoundland and the like, probably most of the diesel communities in Canada, frankly.

MS. JESSICA SCHOFIELD: Thank you. And you're aware that Manitoba Hydro provides residential electrical service in those diesel communities but those loads are subject to a service limitation of 60 amps, correct?

MR. PATRICK BOWMAN: Yes.

MS. JESSICA SCHOFIELD: And you would agree that Manitoba Hydro has the servi -- service limit criteria to provide sufficient electrical capacity for lights and household appliances to operate, correct?

MR. PATRICK BOWMAN: Yes.

MS. JESSICA SCHOFIELD: And it's my understanding that this service limit does not allow sufficient electrical capacity for electrical space heating in the residence?

MR. PATRICK BOWMAN: That -- that would not be possible within the limits that are -- that are there. You can't do heating on that level of service.

MS. JESSICA SCHOFIELD: Thank you. And you would agree that the conversion of residential heating load from oil to heat pumps could significantly increase the electrical load on Manitoba Hydro's distribution system and diesel generating facilities in those communities, correct?

MR. PATRICK BOWMAN: Yes.

MS. JESSICA SCHOFIELD: And such a load increase could result in a significant increase in the quantity of diesel required to generate electricity, correct?

MR. PATRICK BOWMAN: It would increase the diesel fuel. It would drive material investment in diesel capital of units. It would increase the risk in the communities of what happens when a diesel plan does things that sometimes they want to do, like burn down, which -- a few of which I've dealt with.

They -- it's -- it's a good idea not to expose your heating in the community to the diesel -- diesel generated electricity.

MS. JESSICA SCHOFIELD: Thank you, Mr.

Bowman.

(BRIEF PAUSE)

MR. PATRICK BOWMAN: Not to mention the greenhouse gas impacts.

MS. JESSICA SCHOFIELD: Thank you, Mr. Bowman. Those are my questions, Mr. Chair.

THE CHAIRPERSON: Thank you. Ms. Schofield, I see on our desk this document which I believe is yours. Do you want to put it in as an exhibit?

MS. JESSICA SCHOFIELD: We don't need to mark it as an exhibit. I'll take it back. Thank you, Mr. Chair. We had intended to ask questions about it, but --

THE CHAIRPERSON: Okay.

MS. JESSICA SCHOFIELD: Thank you.

THE CHAIRPERSON: That's good. Thank you. Ms. Steinfeld...?

(BRIEF PAUSE)

MS. DAYNA STEINFELD: Mr. Chair, we are now about thirty-five (35) minutes ahead of

schedule. I'm happy to -- to proceed. I don't require an hour and fifteen (15) minutes, I don't expect, but if you --

THE CHAIRPERSON: Why don't we proceed?

MS. DAYNA STEINFELD: Okay.

CROSS-EXAMINATION BY MS. DAYNA STEINFELD:

MS. DAYNA STEINFELD: Good afternoon, Mr. Bowman, Mr. Friesen. My questions today will probably jump between the two of you. I'll try my best to direct it to the intended person, but if you feel that a question has been asked of the other witness that you feel you'd like to provide a response, please do so.

Because of the questions asked by Ms. Dilay and -- and Ms. Schofield, as well as your comprehensive presentations this morning, I have reduced the questions that I planned on asking, which may seem -- result in it seeming like I'm jumping all over the place, but that's just because everything has been so thorough so far.

Mr. Friesen, just briefly, you touched on, in your direct evidence, load displacement projects. Were you able to review the transcript

where I identified with Mr. Stocki projects that we referred to as Project 1, Project 2, Project 3? Does that ring a bell?

MR. DALE FRIESEN: It does ring a bell. I believe that I've reviewed most of it. I may need some clarification, but go ahead and ask the question.

MS. DAYNA STEINFELD: Certainly, and if I refer to the project that is obtaining 99 gigawatt hours of savings per year as Project 1, will that work for you?

MR. DALE FRIESEN: Yes, it will.

MS. DAYNA STEINFELD: And is it your understanding that the savings from that Project 1 are re-earned by Efficiency Manitoba in each year or counted towards achieving the savings targets in each year?

MR. DALE FRIESEN: Yes. The annual targets, yes.

MS. DAYNA STEINFELD: And in an Information Request response, I believe that you identified that if those savings were not re-earned in each year, you would have a situation where future years would have incentive costs with no corresponding benefits. Is that correct?

MR. DALE FRIESEN: Correct. So Project 1, as I understand it, has ongoing incentive payments beyond the three (3) year plan, and the question arises whenever you're reconciling savings to budgets that if those savings are only counted in Year 1 and you have ongoing costs, how will future budget reconciliations and evaluations of Efficiency Manitoba's spending be dealt with in a fair an objective manner? And the fact that we're providing discrete three (3) year approvals makes it appear a little awkward.

So I understand the desire on Efficiency Manitoba's part to be able to present savings in relation to the expenditure that's provided in each of those years. So there's a logical rationale as to why Efficiency Manitoba adopted the approach they did. It makes things a little com -- confusing when you're talking about achievement of a cumulative target and what that cumulative target means.

As Mr. Bowman indicated in his evidence, the only way you could interpret the current definition of 'cumulative' in the regulation is that it is the sum of 1.5 percent fifteen (15) times. That doesn't necessarily reflect the actual impact on the

Manitoba Hydro system at Year 15. So there's some -- there are some challenges there.

MS. DAYNA STEINFELD: Is it your view, Mr. Friesen, that the Project 1 savings are incremental savings in each year of the plan?

MR. DALE FRIESEN: Based on the information I just provided, I would not suggest that they are incremental. I would prefer the -- to use the term 're-earned.'

MS. DAYNA STEINFELD: And why is it that Projects 2 and 3 -- that's the projects that are in the plan in Years 2 and Year 3 of the plan, respectively -- why is it that the savings from those plans are not re-earned, or should -- should they be?

MR. DALE FRIESEN: I don't have all of the detail. Obviously, I wasn't able to review the working papers of Efficiency Manitoba and establish exactly how the costs and benefits flowed in respect to those projects.

I am being somewhat speculative in my response thus, for that reason, and suggesting that it probably has something to do with the way the cash flows towards support of those projects.

MS. DAYNA STEINFELD: Am I right that you've identified in you evidence that there may be

potential for additional load displacement projects?

MR. DALE FRIESEN: I think there are opportunities for additional projects. Some of them, potentially, could be larger than Project 1, but I think the caution I would put in that statement is that the economics of those projects may be substantially different than the economics of Project 1.

We shouldn't make the assumption that future projects will have the same economics as Project 1. They could be substantially different due to the circumstances of why equipment is or is not available to support those projects, and that relates to existing infrastructure that was installed for other reasons.

In -- in certain cases, customers are required to install facilities to meet process requirements that are very easily adapted to generation. In other cases, that's not -- that's not the -- the reality. So in those cases, you would be installing a completely new set of equipment, and that would change the cost structure.

MS. DAYNA STEINFELD: Thank you for that clarification.

And I'll just remind anyone that's

calling in on the line to please moot -- mute your phones so that we're not hearing background noise in the room. Thank you.

I think we're still hearing background noise from the phone line, so again, if -- if you could please just mute your phone.

Sorry for that, Mr. Friesen. With respect to additional load-displacement projects, with the caveat you mentioned about economics, if those kinds of projects proceeded and the savings from those projects were re-earned in each year, is the -- is it conceivable that a majority of the savings target would be met without any new savings being implemented or installed?

MR. DALE FRIESEN: If those projects proved to be economic and delivered the magnitude of energy that I anticipate they could deliver, what you're saying is correct, and if not a majority, a substantial portion of the total annual savings could be met.

MR. PATRICK BOWMAN: If I -- if I might just add, though, I would think that would be exactly the type of consideration that would allow the Board to say, You should revise the target.

MS. DAYNA STEINFELD: And would it

also, Mr. Bowman or Mr. Friesen, illustrate the point you've made about the cumulative savings targets, that in those circumstances, you may be meeting the savings targets but not necessarily reducing consumption year over year?

MR. DALE FRIESEN: That's correct, and if you looked at the evidence -- not the evidence, the question -- sorry, I don't have the actual IR -- that MIPUG directed to Daymark where I asked Daymark -- or I gave Daymark a scenario of five (5) three (3) year plans similar to the current plan that is being proposed, and I came to a conclusion that the cumulative savings that would be achieved at the end of fifteen (15) years through five (5) applications of the current plan -- successive applications of the current plan would be about 10.8 or 10.9 percent, in that range.

And they agreed. Their analysis showed the same thing. I think that clearly illustrates the difference between actual cumulative and an arithmetic cumulative.

MR. PATRICK BOWMAN: I -- I would just add, the load displacement is one (1) place where we see, effectively, a persistence of one (1) year, the way it's modelled. It's not the only thing that's--

that's in the plan that has persistence effects that are dropping off before you get to Year 15, and -- and Daymark showed a -- a table. It was at page 82 of their direct, if -- if anybody -- we don't have to pull it up, but it was 82 of their direct, and it showed the effects that in -- in each year, some aspect of -- of old programs would -- would drop off, effectively, and -- and lead to the twenty-two and a half (22 1/2) not being -- not being cumulative inclusive of the impacts of persistence.

It's cumulative -- I was describing it as -- it's like -- it's like a measure of the water you put in the bucket even if the bucket has leaks. It -- it is -- it -- the Act reads and the reg -- regulations read as, You must add twenty-two and a half (22 1/2) to the bucket, not, You must end with twenty-two and a half (22 1/2) in the bucket -- to use 'bucket' an entirely different way than it's been used in the rest of this hearing.

MS. DAYNA STEINFELD: Thank you for that, Mr. Bowman. And Mr. Bowman, staying with you, at slide 21 of your direct evidence presentation, you discuss incorporating the price elasticity effects arising from the electric rate increases.

Just in respect of your recommendation

number 7 here on the screen, is this a recommendation that you suggest be incorporated into the current plan or something that Efficiency Manitoba should do in subsequent plans?

MR. PATRICK BOWMAN: I think it should be reported on in subsequent plans. We don't have necessarily the -- the rate impacts going forward, we don't know what Hydro is going to apply for, but as you're considering whether -- whether Efficiency Manitoba is achieving conservation and whether they indeed need to, you know, spend significant amounts to achieve conservation at the same time as there are major rate impacts, you know, assuming major rate impacts are rising, that we're already driving conservation, I think it should be taken into account.

MS. DAYNA STEINFELD: Would another option be for the independent assessor to take those rate increases into account to the extent that actual rate increases are -- are known at the time of the assessment?

MR. PATRICK BOWMAN: It -- it could be and you'd need to measure it somehow. We use elasticity numbers from Hydro which we all know they're -- they're more than one (1) estimate and -- and they vary by class and they vary by, you know,

type of -- of rate increase. Elasticity estimates effective across a 1 percent rate increase aren't necessarily the same as they would because a 5 percent rate increase, and -- and actually there's pretty poor information about elasticity when you get to -- to large rate increases that we don't tend to see in Manitoba.

But, yeah, the assessor could take it into account. I think it's -- it's -- it's relevant to saying, you know, if we -- if we saw a drought and huge rate impacts over the next two (2) or three (3) years, I think the next time Efficiency Manitoba comes back there'd be room to yield on their 1.5 because some degree of natural conservation has already occurred and some degree of -- of tolerance among customers to pay higher rates would be -- would be reduced because we've already taken that up in the rate increases.

MS. DAYNA STEINFELD: In terms of incorporating elasticity effects into the next plan, would you suggest that Efficiency Manitoba use an IFF provided by Manitoba Hydro for the plan years, or is it -- is it better to do the alternative of using the actual rate increases at the time the independent assessor looks at things?

MR. PATRICK BOWMAN: I -- I -- I -- you know, this is a -- a directional recommendation. In terms of implementing it, I would tend to be backward looking. I would tend to say that if they bring the next plan and rate increases have not been significant, then keep targeting one and a half, but if rate increases have been very large, don't fault yourself for bringing in 1.2 in order to save money.

MS. DAYNA STEINFELD: This recommendation expressly references Hydro. Does it also apply to natural gas rates?

MR. PATRICK BOWMAN: Yeah. Almost all of the work that I did was starting from the perspective of electricity. I think is probably true for natural gas rates, although we all know that they have a tendency to move up and down, which can -- can confuse matters, and also could be much -- much shorter term variability due to the quantity price.

So I think one would need to think about that further. I -- I haven't turned my mind to it, but I would think the principle would apply, particularly if you had sustained directional change.

MS. DAYNA STEINFELD: At a high level, Mr. Bowman, if you were taking into account the elasticity effects for rate decreases, is the result

increased consumption?

MR. PATRICK BOWMAN: That's how elasticity works, yeah. It can go both ways.

MS. DAYNA STEINFELD: And so if elasticity effects were taken into account by Efficiency Manitoba, rate decreases on the natural gas side, for example, would require Efficiency Manitoba to have additional programming or somehow achieve additional savings.

MR. PATRICK BOWMAN: It -- it could lead to that -- that -- that outcome, yeah. I think -- I don't -- and I don't think that's -- you know, that's surprising. If you have rate decreases, there's a bit more ability to absorb the -- the rate impacts of -- of EM's plans and there's a bit more need for -- for efficiency offerings because you're not getting the same degree of -- of savings on the pricing side.

Of course Efficiency Manitoba's job will be harder because they're trying to incent people to -- to save money at a time where the -- the bill impacts look a little smaller.

MS. DAYNA STEINFELD: And on the natural gas side, are you aware that this Board recently approved a 19 percent billed rate decrease

and 6 percent base reet -- rate decrease for Centra's small general service cost rates just this past November?

MR. PATRICK BOWMAN: I -- I'm aware that there were changes in that direction. I don't know the numbers.

MS. DAYNA STEINFELD: And are you aware that at a high level and in a historic view, gas rate changes are volatile, tend to change from quarter to quarter?

MR. PATRICK BOWMAN: Yes.

MS. DAYNA STEINFELD: And so do I take it from your earlier answer that from a elasticity effect perspective you wouldn't necessarily account for those kinds of volatile changes, you would look more at sustained rate increases or decreases over time?

MR. PATRICK BOWMAN: I think that's fair and I think, you know, gas is more challenging for that reason, but -- yeah, I think that's fair.

MS. DAYNA STEINFELD: On Slide 20, Mr. Bowman, your recommendations 6 suggests that savings achieved by other parties other than Efficiency Manitoba should count towards the savings targets, correct?

MR. PATRICK BOWMAN: Yes.

MS. DAYNA STEINFELD: Are you able to provide the Board with more information about how that would work in practice?

MR. PATRICK BOWMAN: Well, I think that how it would work in practice is someone would take out the words "material contribution" or "operational support" or that type of thing from -- from the regulations and we'd stop -- stop trying to think that -- that this is about holding Efficiency Manitoba's feet to the fire, and instead we're trying to achieve overall conservation.

If we come here in three (3) years and one of the big debates is do they attend enough meetings to claim credit for the code -- new code on dishwashers, I think that'd be a real unfortunate waste of time.

If someone agrees there's a new code on dishwashers and it's saving a lot of energy, did they provide material contribution? I'm not sure what that means in the context of how many parties have to get together to implement that.

MS. DAYNA STEINFELD: And how, in your view, would Efficiency Manitoba become aware of savings being generated through the actions of other

parties?

MR. PATRICK BOWMAN: Well, I think it would be the -- the obvious examples of things like codes and standards and as to whether they provided a material savings or not. There'd be things like if Hydro brings in conservation rates, I don't think we need to sit around and say did -- did Efficiency Manitoba send them enough emails telling them they should implement conservation rates.

If -- if we can get on and do that, then I think those savings should be counted. I think those are probably the -- the two (2) biggest examples.

You know, if there's some notable program being run, you know, if -- if the City of Winnipeg water runs a major program to save on water that conversely also saves on electricity, maybe you'd pay attention to that, but -- but generally I think it's probably the -- the types of things that are already in their plan. It's just that this -- this idea of -- of sort of attribution that is -- is challenging.

MR. DALE FRIESEN: To follow up in terms of becoming aware, if you look at, for instance, federal regulations which are probably the most

substantive body of codes and standards work in -- in Canada, there's a very defined notification process and an amendment process that requires industry consultation, and it's very easy to become involved in that process and be informed of the various stages that that process is at.

So I don't think it would be a significant challenge for Efficiency Manitoba to become fully aware of initiatives related to codes and standards that are in progress.

MS. DAYNA STEINFELD: Mr. Friesen, staying with you but shifting gears slightly, at Slides 28 and 29 of your direct evidence presentation with respect to codes and standards, you discuss the difference claiming versus reporting.

Can you just clarify, are you suggesting that there would be no discounting or accounting for free ridership?

MR. DALE FRIESEN: No, that's not what I'm saying. What I'm saying is, rather than implementing the process that Mr. Bowman talked about where Efficiency Manitoba has to demonstrate material contribution, that we wouldn't change the way technically that codes and standards savings are determined.

We just wouldn't assign a right to claim or not -- or -- or take away a right to claim. We would simply do as Manitoba Hydro does in that it incorporates all codes and standards savings that are applicable to Manitoba in its load forecast, and in a parallel way, Efficiency Manitoba would report those savings as contributing to the savings target.

So it takes away this concept of trying to claim savings and just simply reporting them, recognizing that those savings provide the same benefits that incentive-based saving -- savings provide and recognizing them in the achievement of the target.

MR. PATRICK BOWMAN: It was also referenced in relation to saving expiring, that -- Daymark made the comment that you need to think about some attrition on codes and standards savings in order to keep Efficiency Manitoba's feet to the fire to go find the next one, and I think that -- that is back to this idea of -- of somehow it's -- it's -- it's this attribution game that -- that seems unnecessary.

MS. DAYNA STEINFELD: Mr. Friesen, in your direct evidence and also in your pre-filed testimony, you spoke about the concept of -- of like for like replacements or -- or reinvestment, correct?

MR. DALE FRIESEN: Correct.

MS. DAYNA STEINFELD: To make sure that I understand this evidence, I'd -- I'd like to take you through an example. So, in this example, I'd like to assume that Efficiency Manitoba has a program for LED light bulbs and the measure life for those light bulbs is three (3) years.

Will you go with me on that hypothetical?

MR. DALE FRIESEN: Sure, although I think all of us hope their LED light bulbs last longer than three (3) years, but I understand what you're saying.

MS. DAYNA STEINFELD: That's why it's a hypothetical. And so, in this example, will you assume with me that a customer installs a light bulb under the Efficiency Manitoba program in year 1 of the plan? Will you -- will you go with that?

MR. DALE FRIESEN: Sure.

MS. DAYNA STEINFELD: So, the light bulb is lasting for the three (3) plan years and Efficiency Manitoba gets to count the benefits from that light bulb for the three (3) plan years, correct?

MR. DALE FRIESEN: Correct.

MS. DAYNA STEINFELD: But the way that

Efficiency Manitoba measures cost-effectiveness, they would not count any benefits for that light bulb beyond the end of the measure life.

So, in this example, the benefits would stop at the end of the three (3) plan years, correct?

MR. DALE FRIESEN: As I understand the life cycle methodology used by Efficiency Manitoba, that is correct.

MS. DAYNA STEINFELD: And in this example, because Efficiency Manitoba doesn't yet have a second three (3) year plan, we don't know if there's going to be another light bulb program in year 4?

MR. DALE FRIESEN: That is correct.

MS. DAYNA STEINFELD: So, with this example, is it your evidence that it should be assumed that the customer will replace the light bulb with another LED light bulb in year 4 even without an Efficiency Manitoba program?

MR. DALE FRIESEN: My evidence is not that it should be assumed, but it should be assessed as part of the plan. So, if you have a program with a specified measure and you have, you know, an assumed life of that measure, let's say it's ten (10) years, and you can with reasonable probability assert that either the customer is likely or highly probable to

replace that measure, life like for like, and you can with reasonable certainty demonstrate that, yes, you should include the savings for the subsequent installation.

If you cannot demonstrate that, then I think you should not that, indicate why you assume that that will not happen and present, I believe, some commentary as to what future options may be.

One (1) of those options could simply be a new regulated energy efficiency standard. And if you already know, as we do in many cases, years in advance of future energy codes that are being developed through the amendment process, for instance, that's put forward by Enercan and the Federal Government, you can predict whether a lower efficiency product will be available at the time that that measure expires.

And if that code and standard removes lower performing product from the market, then you have reasonable certainty that that measure will continue.

And -- and I think the point I was trying to raise is that reinvestment is a sound principle, and it's one (1) that should be part of the planning process, particularly if we want that process

to align with the IRP process and examine the life of savings over ten (10), twenty (20), thirty (30) years.

MR. PATRICK BOWMAN: Can I just also address the idea? You said whether it counts. And I think there are two (2) different ways we can think about that, as well, which is, if you go an industrial customer and you -- you work with them to replace a motor and let's say the motor is a hundred units -- a hundred kilowatts, whatever, and you replace it with a 75 and that motor may have a measure -- may have a life, pick your three (3) year example, although I certainly hope the motors can last more than three (3) years in the industrial plant.

Once they've had that installed and they've -- they've designed the rest of their electrical system around that, when they go -- when that motor burns out and they go to replace it, they're probably not going to go back to a hundred kilowatt motor that's going to do the same job and now have to upgrade their electrical system just to put in the -- the cheaper, older technology, for example.

So, if you're sitting there and designing a PAC test or a -- or a TRC or running any of your metrics on that, to say that it's only going to last one (1) measure life, and then the -- poof,

the -- the benefit I got is gone, that will -- will undervalue the -- the savings in the long -- particularly in the long-term, on that type of measure.

And I think that part we really have to be attentive to. What it does in terms of the 1 1/2 percent, which is the other way to count, I think that's a -- that's a bit of a different question. And I -- I don't want to go too far down that road. That's definitely a generation 2 or generation 3 question for Efficiency Manitoba.

But the critical thing is we should recognize that, in respect of some types of upgrades, and I think this is particular true for the industrials, Efficiency Manitoba's metrics right now undervalue them because they don't assume that they have an enduring value into generation 2, and particularly for industrials, I think they do.

MS. DAYNA STEINFELD: And I -- I don't want to get too far down this road either, Mr. Bowman, but sticking with my example, if you did an assessment and determined that you could include the benefits of the re-investment of the light bulb in year 4, wouldn't it also be the case that Efficiency Manitoba could not count the savings achieved from that light

bulb towards the savings targets in the fourth plan year?

MR. PATRICK BOWMAN: Well, and then you get into sort of a mathematical game of, if in year 4 they had a program, are they going to double count the savings if -- what if there was a code in-between? Are they not going to be able account for the code because they already -- you know, pulling it as a result of the -- of the first measure of the program that they ran?

Tho -- that's why it gets trickier when you think about the 1 1/2 percent side for sure. But -- but particularly when you're looking at the cost-effectiveness of the measure, you should be thinking about whether you've actually affected people's behaviour for a longer term.

You know, ca -- calculating the 1.5 is definitely something a bit trickier, but it could lead into problems, as you talked about.

MR. DALE FRIESEN: And to build on that, I think one (1) of things we have to recognize, that does not mean there would be no future codes and standard savings.

If you look at incentive-based programs and the impact they have on the market, they rarely

achieve a hundred percent participation. As a matter of fact, the participation rate for most incentive-based programs is quite small relative to the total market opportunity.

And what codes and standards attempt to do once a product reaches maturity is to expand the participation rate. So, there would be incremental products in this -- installed in the market through the codes and standards initiative that would not have been installed initially through the incentive-based -- - prior incentive-based project.

So, you have to recognize the purpose of a code and standard is to expand participation and -- and which is also the purpose of the incentive-based program, but it operates at a -- generally operates at a much smaller scale than a code or standard.

MS. DAYNA STEINFELD: Thank you, Mr. Friesen. Turning just for reference, I suppose, to your slide 23. One (1) of -- one (1) of the areas you discuss in your evidence is the consideration of whether incentives for industrial programming may -- may be -- may need to be increased.

In your experience, how often does it occur that a measure is not taken up because the

incentive is not high enough? Is that fairly common?

MR. DALE FRIESEN: I don't have an exact number for you. I can relate my experience. And I have worked with incentive-based programming in the industrial world for twenty (20) plus years.

Comments that I have often heard, are the incentives not large enough for the amount of time this is going to take, so I'm not going to worry about it, the energy savings aren't large enough to address all the additional design time, et cetera.

So, when you look at things as -- take simple payback as an example, it's not uncommon for commercial enterprises, by, "commercial," I mean industry and commerce, or commercial sector customers, to look at energy efficiency measures in the context of a very short payback period. So, by that, I'm talking about one (1) to two (2) years.

And if a measure has three (3) to five (5) year payback, you know, when you look at rates of return, when you look at common thinking around capital investment, you would say that's still pretty favourable, but those measures do -- often do not move forward.

So, the simple payback can be changed quite quickly with varying levels of incentives. So,

a customer that may not proceed with a three (3) year project might proceed with a project if the incentive was higher and that payback was one (1) -- one (1) or two (2) years.

So, like I said, I can't give you an exact frequency or the amount of times it happens, but it is fairly frequent, and particularly when a company is capital constraint or is focussed on production needs and has to allocate capital; it -- it's a very common occurrence.

MS. DAYNA STEINFELD: How would you recommend that Efficiency Manitoba approach circumstances of a particular customer being reluctant and should the incentive be increased or is it a need for timing flexibility?

What, in your view, is the best way for Efficiency Manitoba to address those different considerations?

MR. DALE FRIESEN: Could you repeat that question?

MS. DAYNA STEINFELD: Yeah, it wasn't asked very well. But you've -- you've identified a few things to help with increasing industrial participation, one (1) being increasing incentives; another that you reference is flexibility around

timing of -- of projects.

Do you have a recommendations as to when one should be pursued over the other? How does Efficiency Manitoba approach that decision-making?

MR. DALE FRIESEN: I think I was referring to two (2) different circumstances in my comments. The changes to the level of incentive is primarily a -- primar -- primarily related to the economics of a project, and it's simple payback. It's rate of return. It's a financial decision.

The flexibility that I was referring to in regards to timing is a different matter. It relates to the ability to commit to incentives; to commit to large incentives, particularly for new construction projects; the ability for Efficiency Manitoba to manage budgets or reallocate budgets across time frames. So I wouldn't view those as being an either/or. I think they address different circumstances.

MR. PATRICK BOWMAN: I -- I -- I'd just add from my experience working with industrial customers, timing trumps incentives. If a customer only takes a shutdown every second summer and you need to do a program that has to occur during a shutdown, there's no amount of incentive that's going to

convince them to take a fall shutdown this year just to deal with the incentive. You're waiting till the next second summer shutdown.

And so incentives can't fix a timing problem. You have to be flexible on the timing and ready to move and -- and agile, and then the incentive can help make it happen or not. But it's not going to be the reason for an industrial customer to shift their timing.

MR. DALE FRIESEN: As I mentioned, energy efficiency rarely drives large industrial projects. There are other factors that drive the timing of those projects, and energy efficiency programming has to respect that timing.

MS. DAYNA STEINFELD: So I take it from this discussion that you would recommend that Efficiency Manitoba work closely with Manitoba Hydro's key and major account employees, for example.

MR. DALE FRIESEN: Yes, definitely. And to -- to add to that, economic development agencies, the province. The province, and through its economic development initiatives, often finds out about projects even before Manitoba Hydro does, so, you know, there's a variety of agents that engage these large projects at an early stage.

MR. PATRICK BOWMAN: And -- and if I can just emphasize that on that point, from the moment that the MIPUG was read the recommendation out of the PUB about creating a new agency, their number 1 comment every time they go into this is, Don't -- don't slow us down. Don't divide -- don't take industrial to EM. Don't divide what the key account reps do, because you -- we have to be agile and we have to deal closely with people and we have to be ready to move.

And our -- our needs are different. They're unique. They're customized. They often have highly confidential information related to technology, and we're already dealing with Hydro's key account reps on that.

And so, yes, absolutely, EM has to deal closely with -- with Hydro on that and maybe even turn over some of those functions to Hydro to keep the circle of people dealing with it small and agile.

MR. DALE FRIESEN: And I will say with a great deal of certainty that Mr. Stocki has a tremendous amount of experience in that engagement process. He -- he managed those staff while I was at Manitoba Hydro and did a very good job, so he understands the key incoun -- key accounts process and

is very familiar with it and recognizes its value. So I believe that Efficiency Manitoba is aware of the benefits of doing that.

MS. DAYNA STEINFELD: In your experience, Mr. Friesen, was Manitoba Hydro sufficiently flexible with year-to-year variation in DSM plans and programming for industrial customers?

MR. DALE FRIESEN: I think Manitoba Hydro had different criteria. So we didn't have a mandated savings target. Our budgets -- while they were reviewed at various points by the Public Utilities Board, there was a different framework, a different flexibility. We had the ability to take large projects to our senior management, and that was a decision we could address internally.

The challenge I think we had at Manitoba Hydro at various points was the willingness to act, and the -- the -- the timeliness of those actions were -- were problematic. But it was different circumstances, different regulations, so in many respects, not comparable.

MS. DAYNA STEINFELD: You had a discussion earlier with Ms. Schofield about your experience with caps at Manitoba Hydro, and I just want to be clear on the -- the different types of caps

you're discussing. You mentioned that for one (1) type of caps, exceeding those caps was very onerous. Was that in reference to incentives for particular programs?

MR. DALE FRIESEN: Not sure I quite understood when you said I mentioned it was very onerous.

MS. DAYNA STEINFELD: You discussed an internal process that involved, essentially, kind of going up the flagpole --

MR. DALE FRIESEN: Okay.

MS. DAYNA STEINFELD: -- and needing approval, and I wasn't clear from your discussion what type of cap you were referencing.

MR. DALE FRIESEN: So I was retur -- referring to a hard cap. So let's say a hard cap was established that no funding of greater than two hundred thousands dollars ($200,000) was allowed for any particular project, and a project arose where the required incentive, if it was determined purely on the energy savings, might be three (3) or four hundred thousand dollars ($400,000).

That process of gaining approval for the additional one hundred (100) or two hundred thousand dollars ($200,000) could become very onerous,

particularly if there was resistance to higher spending or higher levels of approval were required. By that, I mean senior executive or the board of Manitoba Hydro. The timeline for that would get longer. More questions, obviously, would be asked.

And I would say what contributed to that would be -- was a lack of very rigorously defined policies around how those issues would be dressed. Each one was a little bit of -- you know, of a separate exercise, and that made it challenging.

MS. DAYNA STEINFELD: And do those concerns for you apply to the 50 percent incentive cap that Efficiency Manitoba has for some of its industrial programming?

MR. DALE FRIESEN: If exceeding the 50 percent resulted in having to go through a whole range of approvals and, you know, as I just mentioned, it would concern me. But as I mentioned in my -- in my presentation, if there was good policy definition and good processes in place to address that, I think that could be minimized.

MR. PATRICK BOWMAN: I just wanted to make sure the record was clear on that. The custom program that I was referring to, and this was in MIPUG/EM-I-1H attachment, is a table, and you can

scroll down and see that incremental costs to the customer to participate in efficiency programming is often -- you go down a list of -- of -- of programs, and they're almost all at 100 percent for every other class.

When you get to the custom, not only is it capped at the calculated energy value, which is -- that's -- that's probably reasonable, although the other classes don't always have that ca -- that measure, it's also capped at 50 percent of project cost or 100 percent of incremental cost in order to reduce the payback time to ten (10) years. And I wouldn't encourage anyone to be thinking that you're going to incent customers to do things at a ten (10) year payback time, particularly an industrial customer. Just to emphasize how constraining those -- the caps are in that one (1) program compared to all others.

MR. DALE FRIESEN: I'll give you a larger copy. It's painful watching you try to read it.

MR. PATRICK BOWMAN: Teamwork.

MS. DAYNA STEINFELD: I believe Mr. Stocki testified that while there's a 50 percent cap on those incentives, that Efficiency Manitoba would be

prepared to provide a higher incentive if necessary to have a customer participate.

Does that address your concern?

MR. DALE FRIESEN: In principle, yes. My concern would be how lengthy that process is, how complicated that process is, how well the policies are defined around that process, and the proc -- and the general processes defined, because as we mentioned, timing is king.

MR. PATRICK BOWMAN: And -- and also, why are we putting in place an extra hurdle for power that's being acquired at one (1) cent?

MS. DAYNA STEINFELD: Thank you, Mr. Bowman and -- and Mr. Friesen. Mr. Bowman, I -- I wanted to just conclude my questions with some questions of you on your rate impact analysis.

And I think for reference, Ms. Schubert, we can bring up PUB Exhibit 14, Board counsel's Book of Documents at page 380.

(BRIEF PAUSE)

MS. DAYNA STEINFELD: Mr. Bowman, did you have an opportunity to review this table in Board counsel's Book of Documents, which is an advisor

summary?

MR. PATRICK BOWMAN: Yes.

MS. DAYNA STEINFELD: And are you satisfied that at least for the lines on the top part of this table, that the calculations reflect your evidence?

MR. PATRICK BOWMAN: Yes, the lines showing on the screen through line 11 are consistent with what I provided in -- in MIPUG Exhibit 5. Yes.

MS. DAYNA STEINFELD: And at line -- lines 12 and 13, there's one (1) minor correction that the advisors propose in this table, which relates to what the advisors have identified to be a calculation error.

Have -- have you reviewed that correction?

MR. PATRICK BOWMAN: I -- I have not, but I -- I see on the screen, and I would -- would take a minute to -- to check it if it's helpful, but I -- I would accept it for the moment.

MS. DAYNA STEINFELD: Certainly. And if -- once you have a chance to look at it more closely, if you determine that that calculation is not acceptable, perhaps you could have Ms. -- Mr. Hacault advise the Board.

MR. PATRICK BOWMAN: I'm -- I'm pretty sure it -- it's correct. I just haven't gone back to actually do the math.

MS. DAYNA STEINFELD: Thank you. And at line 15, the advisors have added a residential bill impact number.

Do you agree with -- with that number, I guess subject to check the calculations?

MR. PATRICK BOWMAN: Well, I -- I don't, because there is a -- there is an issue that arises when you -- when you make the leap from an average overall bill impact to what it will do to any specific bill. And -- and for example. the 37 million at row 11 is -- is a pretty quick calculation of the -- - of a potential impact. I -- I think it's low, frankly, and in -- in coming up with it, I've made it somewhat more conservative, and didn't update the -- the point one-seven (.17), number, which is why the error arose.

But the 37 million were to be included in -- in Hydro's cost of service, it would depend on where it shows up in Hydro's cost of service for which classes it affects. So if it's -- if it's in there and it effects all the classes equally, so they see the same increase, then I -- then yes, I'd be fine

with those -- those rate impact percentages.

But, you know, if -- if there was a -- because some of it's related to peak, and some of it's related to energy, and it flows to the cost of service in different ways, it -- I think this is where you heard -- heard caution from people, saying when you -- you leap a certain bound, you -- you get a directional sense, but you don't want to be too precise with what the numbers show.

MS. DAYNA STEINFELD: Thank you, Mr. Bowman. And -- and so In terms of this calculation, we need to take it only as a -- a high level directional calculation that doesn't account for the ways that these numbers would move through Hydro's cost of service study.

MR. PATRICK BOWMAN: There -- the -- that -- it's also, you know, it's -- it's reported as a three (3) year impact, but, you know, some of these might end up being midyear values. We're not sure when Hydro would make the payment, so when the interest cost would start to arise, for example.

There's a -- a whole bunch of -- of details in that, but I think it's indicative of what the first three (3) year plan would do, and then other three (3) year plans would get layered on top of that.

Because there's -- there's very little in this analysis that will -- will stop when you go forward, until you hit the tenth year, when -- when the balance is finally amortized off, so.

MS. DAYNA STEINFELD: And at a high level, the analysis that you did in your evidence is strictly looking at -- at the impacts of Efficiency Manitoba's plan and not any other factors that would affect Manitoba Hydro's rates, correct?

MR. PATRICK BOWMAN: Correct.

MS. DAYNA STEINFELD: And so --

MR. PATRICK BOWMAN: Well -- well, no other factors than those directly attributable to EM's plan. So we have the cost of EM's plan, and the fact that when Hydro pays those bills, it will have to account for them in some way.

I make the assumption they will amortize over ten (10) years, but I -- we haven't had an EM bill come before the Board in respect of Hydro's plan, and I think there's probably -- there's probably going to be room for some direction from this Board in respect of Hydro accounts for it.

If Hydro does its own DM spending -- DSM spending, it may be very easy to amortize over ten (10) years. If they're writing a cheque to EM, there

may be different IFRS considerations, for example, as to whether they even could amortize over ten (10) years. So I have made the assumption that's still the case.

The other thing is it's -- it's got lost export revenue in here, which is not an EM cost. It's -- it's the -- the offset of the EM cost, and it's in there, an assumed export rate of four point four (4.4) cents which is, frankly, pretty high compared to what we've seen in -- in SEP rates lately, and I'm happy to show you that on the latest of the SEP orders.

But as a result, if Hydro did not, in fact, achieve as much export revenue as it says here, the -- the effects would be higher. But they are -- they are -- are -- they're -- they're direct impacts of EM. They're not necessarily just EM's bills.

MS. DAYNA STEINFELD: But in other words, you're -- you're trying to isolate the rate impact associated with Efficiency Manitoba's activities and Plan, with all else being equal?

MR. PATRICK BOWMAN: Right. There is no Keeyask in here, for example, or anything of that sort. There is also no -- assuming -- because it's assuming that outside of the export change, within any

reasonable horizon, there's no other material impacts on -- on Hydro's, you know, plans of -- Keeyask is still going to come online. The DSM costs from ten (10) years ago are still going to be finished -- amortized off, and -- and get written off. All of those factors are there.

The only criticism I -- I noted in the rebuttal evidence of EM is I didn't take into account that Hydro would have run programs anyway. So you -- you there was the suggestion that maybe the baseline should be Hydro running the DSM programs and compare EM's to them.

I -- I'm not finding that a compelling argument, because I think either way, we'd want to be assessing whether the -- whether the program should be run. So I've -- you know, this is run against an assumption of -- of no DSM, if you will.

MS. DAYNA STEINFELD: Your analysis, though, does not tell this Board the amount of the rate increase that Manitoba Hydro will seek in the general rate application after the Plan is implemented?

MR. PATRICK BOWMAN: It -- it doesn't, because Hydro also has the choice as to whether it might do this another way. But in my experience,

based on where Hydro is going to be when it next comes before this Board, it's not going to have a lot of ability to absorb a 37 million or larger impact in net income, for example. It's just not -- it's just not in their IFF when they're busy observing Keeyask, for example.

So I think that it's reasonably likely that you'll see this type of number come up on the cost side, and that it will probably have to flow through rates and -- and numbers that are -- are, you know, in this range.

MS. DAYNA STEINFELD: I think in your direct evidence presentation earlier, you described your rate impact analysis as being a coarse estimate. Is that correct?

MR. PATRICK BOWMAN: Yes. And the -- the biggest coarse in this being the -- the assumption about what export revenue they can get from this.

I -- I'd also, just in fairness, I would also want to point out we -- we constantly talk about EM's actions at least in the near term, and maybe into the medium term as being affecting Hydro's export revenue, but we always have to remember that Hyd -- Hydro's finances are not a picture of the Utility -- an average one. They're an average picture

of the Utility at all water conditions.

And so when Hydro would run an impact, yeah, under a lot of scenarios, that would come out of the export -- you know, expert revenue. But if we're in a drought, EM's power would avoid running brand new turbines, which are way more expensive than -- than export revenue. And if we're in a flood, it might -- EM's actions might drive a spill.

So while we use short-term export, or something as -- as a measure, and also as a term, we have to remember that new factors -- there are these varying conditions.

MS. DAYNA STEINFELD: In terms of Efficiency Manitoba's rebuttal evidence, one (1) of the things they raise is the amortization of DSM expenditure as being essentially an offset to rate impacts.

Are you -- are you generally familiar with that evidence?

MR. PATRICK BOWMAN: It -- it -- the -- I'm generally familiar with the evidence. And what I understand the point you just said is that the DSM activities from ten (10) years ago are now stopping being amortized, because they're fully amortized, and that's a beneficial impact that I didn't consider if -

- if that's -- you know, we -- are we on the same --

MS. DAYNA STEINFELD: I -- I -- my understanding, and -- and you can tell me if it's not your understanding, is that Efficiency Manitoba is suggesting that there will also be amortization of the programs that it puts in place over the -- the time period of the three (3) year plan.

MR. PATRICK BOWMAN: Well, and -- and that's, in fact, what we're doing here. You'll see that the -- the DSM amortization cumul -- at line 4 is -- is -- the amortization that we're spending, and cumulative is at line 5, to allow you to allow you to calculate a deferred balance for the purposes of figuring out the financing.

But -- so it -- it is amortizing them.

MS. DAYNA STEINFELD: And if we were only looking at the amortization of programming under Efficiency Manitoba's Plan, this chart would be telling us what the end result is after three (3) years, because we see that there is amortization in the first year, correct?

MR. PATRICK BOWMAN: Yes, it's -- it's the impact after three (3) years. So they're -- they're pretty evenly spread, though, so, you know, the first year would be about -- about a third (1/3)

of that.

MS. DAYNA STEINFELD: And do you accept that that's an appropriate adjustment to make to your evidence to account for the amortization of the programs put in place by Efficiency Manitoba?

MR. PATRICK BOWMAN: My evidence already was based on the amortization of Efficiency Manitoba, so I -- I don't think it's an adjustment at all. I think it's exactly what I did.

(BRIEF PAUSE)

MS. DAYNA STEINFELD: If we scroll down in this chart, we see a further adjustment identified here as alternate adjustments. And I believe this is what you referenced earlier, Mr. Bowman, in terms of Manitoba Hydro DSM amortization ceasing after ten (10) years.

Do you see that there?

MR. PATRICK BOWMAN: Yes.

MS. DAYNA STEINFELD: And am I right that that's what you were referencing earlier in terms of the amortization of prior Manitoba Hydro DSM programming?

MR. PATRICK BOWMAN: Right. There --

there is no doubt that there is Manitoba Hydro programming -- programming from ten (10) years ago that will stop being amortized, and that -- that is a -- an effect on Hydro's IFF.

My simple assertion is it's an effect on Hydro's IFF no matter what. It's -- it's my -- my economics bias of you analyze something with and without, and when you look at EM's programming, regardless as to whether you have it with EM's programming or without EM's programming, the ten (10) year old stuff is going to be fully amortized.

MS. DAYNA STEINFELD: So you do not accept the -- incorporating into this rate impact analysis the offset effect of the amortization ceasing of Manitoba Hydro DSM programs?

MR. PATRICK BOWMAN: No.

MS. DAYNA STEINFELD: You also referenced earlier the benefit of increased export revenues. Am I right that you did not include in your analysis the avoided cost benefit of reduced investment and transmission and distribution?

MR. PATRICK BOWMAN: I didn't. And the main reason is, in a three (3) year horizon, you're not going to see much in the way of avoided investment.

Those are -- if Hydro's got a distribution system that's overloaded and it's -- it's got to start planning for that -- that, you know, improvement, designs are being done, equipment's being ordered, you know, the capital plan is -- has been laid down, so you won't see that type of -- of deferral in -- in the type of time horizon's we're talking about.

And, in fact, if you were to -- if you were think about, you know, adju -- adjusting EM's program to look at location specific benefits, you wouldn't even want to look at somewhere that's -- that's at its limit now because you're not going to be able to effect that enough to actually defer capital investment.

You're going to be looking at somewhere that at its limit in five (5), six (6), seven (7) years from now so that you can actually shift the -- that investment from year 6 to year 10 or something. That's where you'd really see the benefit.

MS. DAYNA STEINFELD: One (1) final, I think, small correction is that Efficiency Manitoba provides the annual load as being twenty-six thousand (26,000) gigawatt hours, not twenty-five thousand (25,000), as I believe was used in -- in your

analysis.

Do you accept that correction that we see at line 22 here?

MR. PATRICK BOWMAN: Yeah, I -- I do. I didn't get into it. I was trying to make sure that I wasn't capturing things like SEP load or something though that wouldn't be affected by this.

But to me, within the range of -- of precision we were working with, that was -- that was splitting hairs.

MS. DAYNA STEINFELD: And so, I take it from your answers to me just now that you would take your evidence in terms of the combined annual impact after three (3) years, make the corrections that are at lines 12 and 13 as well as -- as 22, and then use those corrections to arrive at your rate impact numbers, but you would not include the alternate adjustments shown at lines 16 through 20?

MR. PATRICK BOWMAN: Yes. And I would also, if I were the -- the PUB's advisors, able to do this, I would also be taking the short-term export market number I used and be updating it for information that they have access to that I don't.

So, as I said, I used four point four (4.4) cents, which is above any measure of peak, off-

peak, or -- or shoulder in the recent SEP pricing, but I don't know where those are going forward.

And my understanding is that the PUB advisors would -- would have access to information on -- in that regard that I wouldn't. I suspect it would, if anything, be a bigger factor than everything else shown here and would -- would increase the estimate of the en -- impact in the three (3) years rather than decrease it.

MS. DAYNA STEINFELD: And as we discussed earlier, Mr. Bowman, this -- this analysis that we see in front of us does not attempt to allocate the increase in DSM revenue requirement or export revenues to individual customer classes according to the approved cost of service methodology, correct?

MR. PATRICK BOWMAN: Correct.

MS. DAYNA STEINFELD: And it also does not attempt to establish what the unit rate increases would be in order to maintain revenue to cost coverage ratios to the various customer classes, correct?

MR. PATRICK BOWMAN: Correct. But more importantly, it -- that would -- that would deal with the interclass aspects. The first thing that we deal with with Hydro is what is the overall revenue

impact, and it doesn't deal with whether there's some degree of absorption in the overall revenue impact.

I'm sceptical there's much room for that. But it's possible that Hydro wouldn't even be seeking these rate increases; they'd just suffer with a lower net income for a while.

I -- I don't see that they have a lot of latitude to do that, but it's always possible.

MS. DAYNA STEINFELD: Thank you, Mr. Bowman. And thank you to Mr. Friesen. Mr. Chair, those are my questions of this witness panel. And I -- I thank these witnesses for their time and attention to Board council's questions.

THE CHAIRPERSON: Thank you very much. Mr. Hacault, any re-examination?

RE-DIRECT EXAMINATION BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: Just two (2) questions. One (1) is to correct the record. Mr. Bowman was reading from a very, very small table when he was describing the program limits.

And perhaps, in looking at the table on a bigger magnification which might be shown on the screen with respect to the customer program, under the program limits, if we can expand that, Ms. Schubert.

(BRIEF PAUSE)

MR. ANTOINE HACAULT: He was attempting to read from the document which is in front of us now and which I'll quote:

"Lesser of calculated energy incentive, or 50 percent of total project costs, or 100 percent -- or to reduce incremental project cost payback to..."

And if it's zoomed in, I think it's one point zero (1.0) years. We can see it now. So, I'd like to correct that on the record.

MR. PATRICK BOWMAN: I -- I see that now. I -- I have never seen the decimal in any of the versions I've looked at. And I must say it no longer makes any sense whatsoever to me because we know that collectively this program has a payback reported at over five (5) years.

So, if in fact Hydro's intent -- or Efficiency Manitoba's intent is to make incremental project costs -- to reduce incremental project costs to bring the payback down to one point-o (1.0) years, I don't know how collectively it could ever come up at five (5) years, which is what they report.

So, I -- I may not have seen the decimal. It -- it may have been for good reason, too, and so that's -- that's all I can comment at this time.

THE CHAIRPERSON: Sorry, Mr. Hacault, who created this table?

MR. PATRICK BOWMAN: This is from a response to an IR made -- created by Efficiency Manitoba, in response to a MIPUG IR.

THE CHAIRPERSON: And --

MR. PATRICK BOWMAN: If you scroll up to the top, you can see what the column -- the column headings and the like. It's a long way from the --

THE CHAIRPERSON: Yeah, no, I'm just wondering if --

MR. PATRICK BOWMAN: Yeah. Yeah.

THE CHAIRPERSON: -- if --

MR. ANTOINE HACAULT: For the record, at the top of this page, for sake of completeness, if was MIPUG IR of EM Round 1 1-H, so the attachment to that IR.

So, it was a document that was produced by Efficiency Manitoba.

THE CHAIRPERSON: Yeah. I'm -- I'm just a little concerned that --

MR. DALE FRIESEN: I might be able to provide --

THE CHAIRPERSON: It's the number one (1), or is it ten (10)?

MR. DALE FRIESEN: It's one (1).

THE CHAIRPERSON: It is one (1). Okay.

MR. DALE FRIESEN: I think that's quite clear in the document. If you zoom it in, it is one point zero (1.0) years. I can -- think I can provide a little insight as to why the five point four (5.4) exists.

If Efficiency Manitoba has followed past practice that we used at Manitoba Hydro, we generally did not include the influence of caps when planning programs and designing programs. That was an effect that was accounted for in the evaluation, but it was not accounted for in the design of the program.

So, that's my speculation on why the five point four (5.4) and the one (1) are as diverse as they are.

THE CHAIRPERSON: Mr. Hacault, before I go back to you, I neglected to ask Dr. Grant if had any questions. Dr. Grant, are you still on?

BOARD MEMBER GRANT: I am. And I'm

fine. Thank you.

THE CHAIRPERSON: Okay. Thank you. Mr. Hacault, any further re-examination?

CONTINUED BY MR. ANTOINE HACAULT:

MR. ANTOINE HACAULT: I had one (1) other question on re-exam. You were asked about SEP rates and costs. Would there be a recent Board order that we could refer to which might assist in putting some perspective to that discussion that you were having with Ms. Steinfeld?

MR. PATRICK BOWMAN: Yes. I had noted that I had used four point three nine (4.39) cents as the course estimate of -- of export revenues because I -- I didn't have another value and I wanted to be sort of conservative; it -- it comes from more of a long-term value.

For the current values, Board Order 5-20 which was issued as a weekly update, January 15th is the most recent sort of measure of -- of short-term -- largely export market prices.

And if you go down to page 6 of that is the probably the easiest place to go. This is the estimated average spot market rate. Remember I was using four point four (4.4) which would show up on the

graph as forty-four ($44) per megawatt hour. These are the prices for the last five (5) years -- four and a half (4 1/2) years or four -- four (4) and a bit years.

For the average across all time periods, if you scroll down to the next page, you actually see those converted into SEP rates. This is for a general service medium customer so with some line losses, so they're actually a little bit higher than -- that would otherwise be the case for exports.

But at peak times, you -- you'd be -- right now is the red portion of it, which would be around four and half (4 1/2) cents. But if you scroll down one (1) more page, and you see the impact of -- of shoulder season times which right now are in -- in dark blue on the left-hand side which are around three and a half (3 1/2) cents.

And if you scroll down one (1) more, you get to off-peak times which, at this point, again are three and a half (3 1/2) cents. But if you put the line across at -- at four point four (4.4), you can see that, in terms of -- of estimates, I was trying to be generous in terms of what we thought that -- that -- for the purpose of this calculation, what Hydro might be able to achieve on -- on nearer term

export markets.

And -- and again, these numbers show a little over four (4) history, so it's not just cherry picking the current moment.

MR. ANTOINE HACAULT: Those are all my questions.

MS. DAYNA STEINFELD: Mr. Chair, if I may somewhat unorthodoxly ask the panel and Mr. Hacault for indulgence. It might assist the panel if Mr. Bowman could, by way of undertaking, produce two (2) new versions of the chart at PUB 14, page 380, both incorporating the corrections to the chart that he accepts, one (1) with the Manitoba Hydro DSM amortization and one (1) without, and also incorporating what Mr. Bowman believes to be the most current approximation of -- of export pricing.

And that may bring that evidence together in -- in the form of an undertaking. Is that acceptable?

MR. ANTOINE HACAULT: Yes, it is.

--- UNDERTAKING NO. 17: Mr. Bowman to produce two (2) new versions of the chart at PUB 14, page 380, both incorporating the

corrections to the chart that he accepts, one (1) with the Manitoba Hydro DSM amortization and one (1) without, and also incorporating what Mr. Bowman believes to be the most current approximation of export pricing

MS. DAYNA STEINFELD: Thank you very much.

THE CHAIRPERSON: I'd like to -- I'd like to thank the panel very much for attending today and assisting the Board. I'd like to thank all counsel for their cooperative approach today under this time crunch.

We're going to adjourn and resume on Friday at 9:00 a.m. Thank you.

--- Upon adjourning at 1:56 p.m.

Certified Correct,

_____

Donna Whitehouse, Ms.