ONTARIO ENERGY BOARD

FILE NO.:	**EB-2017-0306** **EB-2017-0307**	**Enbridge Gas Distribution Inc.** **Union Gas Limited**

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DATE:	**May 15, 2018**	
	Lynne Anderson	**Presiding Member**
	Christine Long	**Vice-Chair and Member**
	Cathy Spoel	**Member**

EB-2017-0306
EB-2017-0307

THE ONTARIO ENERGY BOARD

Enbridge Gas Distribution Inc. and Union Gas Limited.

Enbridge Gas Distribution Inc. and Union Gas Limited Application for Amalgamation and Rate-Setting Mechanism

Hearing held at 2300 Yonge Street,
25th Floor, Toronto, Ontario,
on Tuesday, May 15, 2018,
commencing at 9:39 a.m.

VOLUME 4

BEFORE:

LYNNE ANDERSON	Presiding Member
CHRISTINE LONG	Vice-Chair and Member
CATHY SPOEL	Member

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IAN RICHLER MICHAEL MILLAR	Board Counsel
KHALIL VIRANEY	Board Staff
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MARK LOWRY	Pacific Economics Group
JOHN VELLONE	Association of Power Producers of Ontario (APPrO)
TOM BRETT	Building Owners and Managers Association, Toronto (BOMA)
SCOTT POLLOCK	Canadian Manufacturers & Exporters (CME)
ROBERT WARREN	Municipality of Chatham-Kent
JULIE GIRVAN	Consumers' Council of Canada (CCC)
BRADY YAUCH TOM LADANYI	Energy Probe Research Foundation
DWAYNE QUINN	Federation of Rental-housing Providers of Ontario (FRPO)
IAN MONDROW	Industrial Gas Users' Association (IGUA)
JAYA CHATTERJEE	City of Kitchener
RICHARD KING	Kitchener Utilities

A P P E A R A N C E S

MICHAEL BUONAGURO	Ontario Greenhouse Vegetable Growers (OGVG)
JESSICA ANNE BUCHTA ALAN ROSS	Rover Pipeline
JAY SHEPHERD	School Energy Coalition (SEC)
BARRY WADSWORTH	Unifor
MARK GARNER	Vulnerable Energy Consumers' Coalition (VECC)

I N D E X   O F   P R O C E E D I N G S

E X H I B I T S

U N D E R T A K I N G S

Tuesday, May 15, 2018

--- On commencing at 9:39 a.m.

MS. ANDERSON: Please be seated.

Good morning, everyone. We are here for Day 4 of an oral hearing on applications by Enbridge Gas and Union Gas for leave to amalgamate and for a rate-setting framework.

As we discussed yesterday, we are going to -- we haven't finished panel 3, but we are going to move to panel 4, and it looks like we have that panel ready for us.

So unless there are any preliminary matters, just to check in -- I wasn't aware of any -- then Mr. Cass, please introduce your witnesses.

MR. CASS: Thank you, Madam Chair. As you noted, we have the applicant's panel 4 ready to testify. On the panel we have Mr. Kitchen and Mr. Culbert again. The new witness, of course, is Jeff Makholm, from NERA, and of course he has not been affirmed yet. I assume that would be the first order of business, and then I will address the matters to be covered by this panel in a little more detail.

MS. SPOEL: Thank you.

ENBRIDGE GAS DISTRIBUTION/UNION GAS - PANEL 4: NERA PRODUCTIVITY STUDY

Mark Kitchen,

Kevin Culbert, Previously Affirmed;

Jeff Makholm; Affirmed.

MR. CASS: Madam Chair, Dr. Makholm's evidence is at Exhibit B, tab 2 in the EB-2017-0307 filing. At the outset of that evidence, page 1, starting at page 1, there are several pages setting out his qualifications as an expert. As well, further on, starting at page 37 of Exhibit B, tab 2, you will be able to see Dr. Makholm's CV. Following that there is quite a detailed listing of some of his experience in different areas.

In order to save time, there have been communications amongst parties about qualification of experts. I understand that Mr. Millar proposes later to qualify Dr. Lowry as an expert in regulatory economics and incentive regulation plans, including total factor productivity. The applicants will have no objection to that.

I propose to put Dr. Makholm forward as an expert in the same area. I don't know that there's any objections. If there are, of course I can go through more questions to qualify him as an expert, but I propose to qualify him on the same basis as I understand that Mr. Millar will be doing with Dr. Lowry.

MS. ANDERSON: Are there any objections?

MR. SHEPHERD: Madam Chair, we have no objection to Dr. Makholm being qualified in the way proposed. I assume that Mr. Culbert and Mr. Kitchen are not being qualified as experts? It is unusual to have utility witnesses on an expert panel. And so I'm just clarifying that they're not experts and they're not answering questions to the expert.

MR. CASS: They are not here to testify as experts, that's correct, Madam Chair.

MS. ANDERSON: Thank you.

Yes, we're fine with that.

MR. CASS: Thank you, Madam Chair.

EXAMINATION-IN-CHIEF BY MR. CASS:

MR. CASS: So Dr. Makholm, if I may. A few questions for you. So the evidence that I have just referred to at Exhibit B, tab 2 of the EB-2017-0307 filing, that is evidence that was prepared by you or under your direction and control?

DR. MAKHOLM: Yes.

MR. CASS: And you adopt that as your evidence in this proceeding?

DR. MAKHOLM: Yes.

MR. CASS: Can you please summarize for the Board the key recommendations in your evidence?

DR. MAKHOLM: Yes. I recommend an X factor of zero for the amalgamated company. I also do not recommend a stretch factor, as I explained in my evidence. It's a well-accepted role -- X factor is a stretch factor that fulfils a well-accepted role relating to the anticipated efficiency benefits of transitioning from one regulatory regime to another. Thus, any anticipated benefits have long since translated into actual measured results for these companies by this, the fourth-generation PBR plan for Amalco units in Ontario.

And that's the sum of my evidence, an X factor of zero and no stretch factor for the amalgamated company.

MR. CASS: Thank you, Dr. Makholm. Can you tell us more about the use of the methodology that you followed in your work?

DR. MAKHOLM: Yes, I derive my X factor recommendation using a highly objective and transparent TFP growth method that has been heavily scrutinized by finders of fact in other regulatory jurisdictions in Canada and the United States.

My method for performing TFP growth studies is rooted in my scholarly PhD research at the University of Wisconsin in the 1980s and has not changed since. I present the same method in my testimony in front of this Board.

The largest ever generic investigation of objective and transparent TFP growth studies for electricity and gas distribution rate incentive regulatory purposes was conducted by the AUC in Alberta in 2010 to '12, where the AUC retained me as an independent expert, ultimately accepting my theory, data, sources, timing, judgments on inputs and computations for deriving the TFP element of the X factor that the AUC chose in that proceeding.

My method -- that is, the theory, data, and computations, and justifications for the use of inputs -- and data set has survived scrutiny beyond that generic proceeding and have been used in their entirety in jurisdictions since, including Alberta in 2017 and Massachusetts in 2018.

MR. CASS: Now, Dr. Makholm, I understand that you and Dr. Lowry actually came to the same conclusion on the X factor being -- or the productivity factor being zero, but you followed different methodologies. I don't think we need to spend a lot of time on it, because you've come to the same conclusion, but can you give the Board just a high-level understanding of the differences in methodologies that led the two of you to the same conclusion on the productivity factor?

DR. MAKHOLM: Yes, Mr. Cass, I think you're right there. Given that we both recommend an X factor of zero, everything I'm about to say in answer to this particular question can be rightly considered merely academic in the literal use of the term. I say that literally and I mean it literally.

I use FERC Form 1 data on electric distributors and electric and gas companies in the United States. The data set that I use was formed by statute by the direction of statute in the 1930s and has been collectively -- and it's been collected consistently -- consistently by federal regulators since.

Dr. Lowry's data set uses state-regulated data because when he decides to perform analyses of regulated distribution companies, those are not regulated by the federal government in the States, only by the States, and the State data that he uses in that respect has to come from various bits and pieces of data collected from state regulatory filings. They don't go to the same place, they are not evaluated by the same people, they don't conform to the same rules.

The -- my methodology I'd like to consider is transparent and easily replicable due to the underlying data that I use. And in this case, I provided all the data, which is all public data, the spreadsheet and the methods when I filed my testimony, as I have done in previous cases.

There -- we also have different methods for measuring capital inputs. The FERC Form 1 data is a useful data set because it allows us to use what's called one-hoss shay depreciation, which is a particularly applicable way of treating assets in productivity studies.

For instance, a pipe serves its intended purpose for a company like these companies to my right, until it's taken out of service. A pipe doesn't get smaller over time; a pipe doesn't burn down like a candle would burn down over time. A pipe is a pipe while it's in service, until it's taken out. A power plant is a power plant; it does what its intended service is supposed to be until it's taken out of service.

One-hoss shay depreciation is a particularly useful method of dealing with capital assets, which is why in my scholarly research, I and other people who do such research use it.

The kind of data that's required for that kind of asset counting is not available from other sources, other than the FERC Form 1. And hence, when Dr. Lowry accounts for capital with gas distributors, he uses other methods, and I conclude that those other methods are not as reflective of what capital assets do you for utilities as the one-hoss shay method.

But once again, it's an academic issue because we both conclude that the X factor is zero anyway.

We have other issues. In our choice of output measures, I use volumes as outputs. Dr. Lowry uses mixtures of volumes and customers as outputs. That was a large issue. It took up a lot of time, and perhaps a whole afternoon of my cross-examination, and his, in the 2010 to 2012 generic proceeding in Alberta. And at the end of that proceeding, the AUC chose my specification of output. But once again, that's an academic consideration because we both come to the conclusion of a zero X factor in this case.

MR. CASS: And then the last question, Dr. Makholm. Could you similarly address the differences, at a high level, between you and Dr. Lowry with respect to stretch factor?

DR. MAKHOLM: We differ on stretch factor. That's not academic in this case. And I have to thank, I believe, the VECC, the consumers' coalition, for a data request which allowed us to isolate what the exact nature of the difference is in our stretch factor recommendations between Dr. Lowry and myself. In L1.VECC.1, the consumers coalition asks with they put as a reference my statement regarding what the stretch factor is intended to do. And I draw up on the generic proceeding in Alberta. Alberta is not everything, but Alberta looked at this issue of stretch factor carefully. And I said, as reflected in the reference in L1.VECC.1, that the AUC made three important determinations -- there it is -- regarding the stretch factor that I conclude are reasonable.

One, it does not have a definitive analytical source, like a TFP growth study, but relies on a regulator's judgment and regulatory precedent.

Two, it has no influence by itself on the incentives for regulated companies to dries cost, no influence.

Three, it serves to reflect the, quote, "Immediate expected increase in productivity growth as companies transition from cost of service regulation to a PBR."

And that IR asked Dr. Lowry whether he agreed, and he said, quote, "For the most part, no," and these were his reasons, four of them. He says that the stretch factor quantification can be argued on different grounds than those. And they are, one, the ability of stretch factors to strengthen performance incentives, his words.

Two, to discourage strategic cost deferrals. Three, to relieve customers of the unfair burden of paying for inefficient operations. And four, to reward superior cost management. Right there.

We differ on all those points, and I think it's useful that he laid it out in that way and I appreciate that.

First, let's deal with strengthening performance incentives. Dr. Lowry has agreed with me in the first AUC proceeding. You are going to hear about this when Mr. Cass cross-examines him to lay out the inconsistency in the first AUC proceeding that the size of the X factor does not influence incentives, contradicting his statement that the size of the stretch factor strengthens performance incentives.

In various places in that proceeding, in ways that will come out on cross, you will see that Dr. Lowry agreed with me in that case that the size of the stretch factor has no influence on the incentives for a company to reduce costs.

What about discouraging strategic cost deferrals. Strategic behaviour, gaming the PBR regime was a big deal from 2010 to 2012 in Alberta. And Dr. Lowry stated in that proceeding that another component of PBR, an efficiency carryover mechanism, not the stretch factor, was the way to deal with strategic cost deferrals.

On that point, Dr. Lowry supported the efficiency carryover mechanisms as a way to deal with that issue, not stretch factor, and that will also come out on cross.

And then the question with rewarding superior cost management. Dr. Lowry has agreed in prior work that the strength of the incentives under a PBR plan is not tied to the magnitude of the X factor, but it's tied to the length of the term of the PBR plan, that is the regulatory lag.

These are areas of disagreements that we have over stretch. We are going to talk about it during my cross-examination here. It's going to come up when Mr. Cass cross-examines Dr. Lowry when he gets on the stand, and it's the issue in this case that divides us.

And I think the fundamental issue is that there is an objective method for analyzing stretch. It's bigger than

Alberta. It's bigger than Ontario. It is part of the economics of performance-based regulation. And in the economics of performance-based regulation, the stretch factor comports with the conclusions that the AUC came with in its generic case, as I agree, not with the conclusions that Dr. Lowry has offered to support his stretch factor of .3 in this case.

MR. CASS: Thank you, Madam Chair. That's the examination in-chief of the panel.

MS. ANDERSON: Okay, thank you. Mr. Millar, you are up for Staff?

CROSS-EXAMINATION BY MR. MILLAR:

MR. MILLAR: Thank you, Ms. Anderson. Good morning, panel. Dr. Makholm, welcome to Toronto.

Madam Chair, we filed a compendium that we will be using as an aid to cross-examination. It is called OEB Staff cross-examination compendium, panel 4. I believe you have copies on your desk up on the dais. So I propose to call that Exhibit K4.1.

EXHIBIT NO. K4.1: BOARD STAFF CROSS-EXAMINATION COMPENDIUM FOR PANEL 4

MR. MILLAR: Most of these documents are already on the record -- actually, a number of them are not on the record, but they were all provided to the panel beforehand and I believe they are all documents familiar to the panel, in any event.

Okay. I'll start with the discussion of the stretch factor, since you've just finished with your examination-in-chief on that topic, Dr. Makholm, although my questions aren't just for you; they will be for the entire panel, I think.

Just to summarize, as you've discussed, the chief difference between your work and Dr. Lowry's work in this proceeding is that you recommend either no stretch factor or a stretch factor of zero, depending on how you want to define it, and Dr. Lowry recommends a stretch factor of 0.3. Have I got that right?

DR. MAKHOLM: Yes.

MR. MILLAR: Is your microphone on, sir?

DR. MAKHOLM: It was not. It is now.

MR. MILLAR: Thank you. Sorry, if you could just repeat your answer.

DR. MAKHOLM: Yes.

MR. MILLAR: And in your view, as you've discussed both in your examination in-chief and in your report, purpose of a stretch factor is chiefly to reflect expected productivity growth due to the heightened incentives that accompany a transition from a cost of service regime to an IRM or PBR regime. Is that fair?

DR. MAKHOLM: Well, I would say, in terms of the economics of PBR, it is not chiefly, it's solely that purpose.

MR. MILLAR: Okay. Thank you for that. I'm going to use the terms IRM and PBR interchangeably, if you don't mind. I know it is typically PBR everywhere else, but we call it IRM. I think we're talking about essentially the same thing. So at least for my purposes, I will use those terms interchangeably.

So as I understand it, it is chiefly -- not chiefly; in your words, it is meant solely to accompany the transition from cost of service to PBR, and I understand it that its purpose is to allow some of these early efficiencies to be shared with ratepayers right from the get-go; is that its function?

DR. MAKHOLM: Well, if you don't -- am I on?

MR. MILLAR: Yes.

DR. MAKHOLM: Let me put it my way: Under cost of service we have data for companies, and we can measure it every year, and under cost-of-service regimes we assume that the incentives for companies are different than the incentives under IRM regimes, and the gentlemen to my right can tell you what those new incentives are, which means that as we look at the data, historical data, before we introduce IRMs, the data for the company don't have those incentives reflected in the productivity that we measure, because those incentives weren't there.

But we know that after we invoke IRM, these new incentives will be there, and we expect that the data that we measure in the years afterwards will reflect a different kind of behaviour on the part of management.

The stretch factor is our way of looking back at the data that's -- we collect under a cost-of-service regime and hypothesize what it would have looked like if we had been measuring an IRM data set, not a cost-of-service data set.

And that is the only purpose of the stretch factor, is to anticipate what those data would have looked like had the IRM been in place during those years that we were measuring the data, because the cost-of-service regime has more torque with incentives.

MR. MILLAR: Okay. But --

DR. MAKHOLM: And that's the thing, that's the role of the stretch factor, to anticipate what's going to happen as we move from cost of service to IRM, reflecting the fact that the data we were looking at before the IRM didn't have those incentives in them.

MR. MILLAR: My simple question was whether the purpose of the stretch was to allow you to share these efficiencies with ratepayers from the get-go?

DR. MAKHOLM: But IRM is all a purpose of --

MR. MILLAR: I'm asking about the stretch factor.

DR. MAKHOLM: -- (inaudible) efficiencies so that consumers can enjoy the benefits of them. That's what we're here for, is to --

MR. MILLAR: That's a yes?

DR. MAKHOLM: -- is to do -- yes, it is. I want to just say all of these things, the X factor, the stretch, the timing, all is there to be a part of an IRM regime that is there to benefit ratepayers.

MR. MILLAR: Okay. I'd like to move on to some of the Board's history with the stretch factor both in the electricity sector and in the natural gas sector.

Let's start with electricity, because that's where some of the Board's policies were -- have been laid out more thoroughly. First of all, can we agree, and any of you witnesses, that the Board's been doing IRM for electricity for many years? We are on, what is it, fourth- or fifth-generation IRM now?

MR. CULBERT: Yes, we understand that.

MR. MILLAR: Okay. And for -- at least for electricity utilities, the Board currently uses stretch factors and always has?

MR. CULBERT: Yes, that's our understanding the --

MR. MILLAR: Okay.

MR. CULBERT: -- Board uses stretch factors in the electrics, yes.

MR. MILLAR: And Dr. Makholm, I believe in your testimony, certainly in the technical conference and perhaps elsewhere, you suggest that the Board isn't necessarily wrong to have stretch factors in electricity, but that they serve a different purpose in electricity, and it's not what you consider a true stretch factor; have I got that right? I don't want to you repeat everything from the tech conference, but if you have a -- if you want to elaborate on that slightly that's fine. I just want to make sure I understand your position.

DR. MAKHOLM: I'm sure we'll get there. I don't have to elaborate at this point. The answer is, yes, it's a different purpose. If it had been called by a different term, like a reward or something else, we might not have the confusion that we have in this case with respect to the term "stretch" and what it's for.

MR. MILLAR: Okay, thank you.

All right. Let's review what the Board has said over the years with respect to a stretch factor.

Can we turn to tab 1 of the compendium, please. This is the Board's -- the report of the Board, the third-generation IRM handbook or report in any event.

If we turn to page 12 of that document, which I think is probably page 5 of the PDF, yes, you will see there is a section on productivity and stretch factors, and the final paragraph there states:

"The stretch factor component of the X factor is intended to reflect the incremental productivity gains..."

DR. MAKHOLM: Excuse me, I don't mean to butt in --

MR. MILLAR: Yes.

DR. MAKHOLM: -- but you said the last paragraph on page 12?

MR. MILLAR: No, I'm sorry, the last paragraph under section 2-point -- it's the third -- the third paragraph there that starts "the stretch factor". You can see it highlighted. It's right in the --

DR. MAKHOLM: Okay. I've got it.

MR. MILLAR: Yes, I'm sorry. It states:

"The stretch factor component of the X factor is intended to reflect the incremental productivity gains that firms are expected to achieve under IR and is a common feature of IR plans. These expected productivity gains can vary by company and depend on the efficiency of a given company at the outset of the IR plan."

So we see there this is the Board's first statement on this, which is third-generation IRM. Doesn't this suggest that at least in the Board's reading the stretch factor seems to serve a purpose more akin to an ESM or something like that?

DR. MAKHOLM: No, I mean the term "incremental" in the first line, "incremental productivity gains the firms are expected to achieve under IR", "incremental" has to be referring to something else, and so it would be referring to cost of service, so I think that this statement agrees with what I've said.

MR. MILLAR: Even though this is a third-generation IRM plan that we're discussing here?

DR. MAKHOLM: Third or not, that statement appears to me to be true and consistent with what I said.

MR. MILLAR: Let's turn to the next page in the compendium, which is page 20 of that same report. You will see here there's a section on the stretch factor, where it states, starting with the second sentence there:

"The Board believes that stretch factors are required in third-generation IR and is not persuaded by the arguments that stretch factors are only warranted immediately after distributors switch from years of cost-of-service regulation to IR. Productivity stretch factors promote, recognize, and reward distributors for efficiency improvements relative to the expected sector productivity trend. Consequently, stretch factors continue to have an important role in IR plans after distributors move from cost-of-service regulation."

Doesn't that suggest the Board takes a different view than you do with respect to whether stretch factors are appropriate immediately after switching from cost of service?

DR. MAKHOLM: I don't think that that is inconsistent. If you conclude -- and I have to say that the "not persuaded" quote comes up four or five times in the demonstrables that you've set out, and it always refers to the Board's discussion of its job of dealing with a regulatory burden that other regulators in North America don't share, which is the burden of dealing with the distributors that it's talking about here, the electricity distributors.

The group of companies now that I think reflect -- 69 at last count, but 22 years ago was 306 -- mostly municipal distributors. I have to say that is a unique burden for a regulatory board in North America. No one else has that burden.

To the extent that you've dealt with it efficiently, you are to be congratulated, but these statements that I've been provided in the demonstrable, where the Board has talked about what it's doing with those distributors, it's talking about the electricity distributors, and it's talking about its job to provide some sort of compact and reasonably effective and doable plan of regulation for those scores of mostly municipal distributors. And in that respect, I think that what it's done is fine, but it's not talking here, in my opinion, about the two investor-owned gas companies that are in front of us in this proceeding. I think --

MR. MILLAR: Well, why --

DR. MAKHOLM: -- that they're different.

MR. MILLAR: Why do you need a stretch factor to -- just because -- let's say there's 60, 70, 80, however many LDCs. Why is a stretch factor necessary to encourage efficiencies there? There are things like the ESM and the X factor itself. What type of stretch factor --

DR. MAKHOLM: The question -- the question for the premise is why is a stretch factor necessary, and it's not necessary for the electrics. All the electrics -- the electric distributors in this province have a choice of whether to take the stretch factor or not. It's not an imposition. It is a choice of one of three different regimes that they've got under -- they can choose the categorization that comes from the statistical benchmarking, they can use a custom regime, or they can choose something that looks to me like a cost-of-service regime.

So it's not necessary, it is just an option for the distributors. But there is another element in here, in all those quotes that you mention with respect to "not persuaded", and that is a reward for the companies for performing well according to the group, and the group are the scores, formerly hundreds, of electricity distributors in Ontario. And that's a uniquely Ontario electricity distribution issue, measuring that cohort among themselves, in terms of who performs well or doesn't perform well, according to some statistical benchmark, with that being the group, now 69, formally 300 distributors.

That's a task that doesn't go into the investor-owned distributors in this state, of which there are two for gas.

My conclusion about these issues is it's uniquely and, for someone like me looking into Ontario from outside, obviously a function of the unusual burden that the Board has of dealing with so many small distribution companies that reflect something almost assuredly less than the minimum efficient scale of low-cost efficient distributors in the rest of North America.

MR. MILLAR: Okay, let's keep this moving. If we could turn to tab 2, please, and this is the supplemental report of the Board under third generation IRM.

I don't want to spend a lot of time on this, because I think it will start to become repetitive. But you will see there this is the supplement report on the Board, again for third generation. If you look at the bottom of page 19 -- which is page 10 of the PDF, I believe -- you will see "Board policy and rationale":

"It is important to note that stretch factors are consumer benefits. They are somewhat analogous goes to earnings-sharing mechanisms, although stretch factors take effect immediately with the application of the formula and are not dependent on the realization of any productivity gains or excess earnings, as would be the case with an earnings-sharing mechanism."

And why don't I move on to the next page, page 21. You will see at the top of that page, again page 12 of the PDF:

"The Board also believes that it is important that a stretch factor be sufficient to influence distributor behaviour over the course of the plan."

And again, I am being a bit repetitive here, Dr. Makholm, and just in the interest of time, hopefully we don't have to go over the same answers again.

After seeing that, do you have anything to add based -- to what you've already noted about stretch factors in the electricity sector?

DR. MAKHOLM: No, which is to say that the context of those orders was the burden of dealing with electricity distributors. The idea that -- just if I may add one or two sentences; I don't want to go on -- the idea that a stretch is of benefit for consumers is obviously true. Any time you transfer funds by any mechanism away from companies to consumers, it is a benefit to consumers, at least at that time.

But as the AUC said in its proceeding, that movement of money via the stretch factor from companies to consumers does nothing to effect the incentives of the company to be efficient. It is not one of those things. It is different.

If you've got scores of electricity distributors, where you give them the option to use that kind of plan to file their cases in a logistically efficient fashion. But that regime, in my testimony and in all my answers here, and in my responses to these demonstrables, says that it's different than the regime facing the gas distributors in Ontario.

MR. MILLAR: I want to follow up on that point with you. You state it doesn't serve as an incentive to cut costs for the utilities. I may have mischaracterized you slightly there, but that's the gist of it.

If you squeeze someone on revenue, why does that not encourage them to be more efficient?

DR. MAKHOLM: If you squeeze somebody on revenue with no principle, and no method and no economics, they are not going to go after any revenue.

MR. MILLAR: Why wouldn't they?

DR. MAKHOLM: Because they are going to be taken from you. If -- that's like having a cost of service regime every time that they do something that's useful to cut costs.

If you're going to squeeze them every time they save a nickel on their cost of service, they are not going to go after the nickel.

MR. MILLAR: But you are squeezing them before they've saved a nickel here.

DR. MAKHOLM: No. An IRM with an X factor, which I tried to demystify in my testimony, the X factor is only there to determine whether or not you can use the Statistics Canada inflation measures without adjustment, and I conclude that you can. You don't need an X factor that. That inflation measure, which is absolutely necessary for a multi-year IRM plan, is good enough for us.

That's a principled method for lengthening regulatory lag, so that these gentlemen to my right can invoke efficiency regimes in their respective divisions to lower their costs, and to make money until such time they do a rebasing.

If you are squeezing them -- there is no squeeze involved in that. There is a principled lengthening of regulatory lag under a firm set of rules that they understand where if they've saved money, they can make money in the intervening years before the next rebasing.

If a stretch factor in their context -- not the electrical context, different. If the stretch factor in their context is just an opportunistic grab of .3 per year with no principled basis, it is a squeeze and it does nothing for their anticipation of profiting by lowering the cost of their enterprise, nothing.

And that's what experts in this business all agree to, and did in the generic proceeding in AUC including, Dr. Lowry back there.

MR. MILLAR: I guess we'll see about that on cross-examination, as you've promised. I do want to keep things moving.

Let's turn to tab 3, please. This is the Board's fourth generation report on the IRM.

DR. MAKHOLM: For the electrics.

MR. MILLAR: Yes, for the electrics. This is all for the electrics so far. I'll get to gas, don't worry.

So on page 26 of that report, which is page 15 of the PDF -- again, we're hearing a lot of the same things here, but this shows that as a fourth generation anyways, the Board is stating:

> "In its RRF report, the Board determined that its approach in relation to the use and assignment of stretch factors under third generation IR will continue."

And it continues:

> "The Board believes that stretch factors will continue to be required, and is not persuaded by arguments that stretch factors are only warranted immediately after distributors switch from years of cost of service regulation to IR."

And then it continues in much the same vein as we've discussed. And indeed, if you turn to tab 4, this is, I believe, the -- this is the final report of the Board under fourth generation IRM.

You will see at page 18, both of the report and coincidentally the PDF, they discuss stretch factor again. And rather than take the time read all this, I think we can simply take it -- and you can review it at your leisure, if you wish -- but it's saying more or less the same thing that I've just been reading to you for the last ten minutes.

And again, I take you to these only to show the Board's thinking on this, at least as recently as the fourth generation IRM plan. Is there anything that we've seen there that alters the answers that you've already given?

DR. MAKHOLM: No. As I've said, the "is not persuaded" is boilerplate that's used in multiple electricity IRM decisions having to do with the unique task that the Board has before it to regulate scores of Distributors that are small and municipally-owned throughout the province.

Being also -- and I have to add the one thing, being a choice for those electricity distributors among three; not in a position, but a choice.

MR. MILLAR: Can we turn back to page 26 of the PDF, please -- pardon me, page 15 of the PDF. This is again from the fourth generation report, and I just take us here because you'll see at the bottom of that first paragraph it says:

> "However, the Board in its RRF report concluded that it will make stretch factor assignments

under price cap IR under the basis of total cost benchmarking evaluations."

And I think you were touching on this, Dr. Makholm.

Let me ask the witnesses from the utilities this question. Done do you do benchmarking against other North American gas utilities?

MR. KITCHEN: No.

MR. MILLAR: Could you?

MR. KITCHEN: Well, let me start by saying when I said no, we do look at ourselves relative to other utilities in areas of safety and such through associations. But we don't do the type of benchmarking I think the Board was contemplating here.

And we don't do it because, for one, At least in the Union case, Union is a -- not just a distribution utility, it is a distribution storage and transmission utility with an unregulated business as well. And from our perspective, benchmarking ourselves against other utilities gas is very difficult, if not impossible.

And it's not like the electrics, which are easy to benchmark because they all basically have the same business.

MR. MILLAR: Is OPG easy to benchmark?

MR. KITCHEN: I don't know.

MR. MILLAR: Are you familiar that OPG does extensive cost based benchmarking?

MR. KITCHEN: I am aware of that.

MR. MILLAR: And OPG has multiple businesses?

MR. KITCHEN: I'm aware that they do, but I don't believe that changes my answer relative to Union.

MR. MILLAR: Fair enough. They also have unregulated business as well as regulated business, OPG -- or do you know that?

MR. KITCHEN: I don't know that.

MR. MILLAR: Have you ever retained anyone to assist you to see if benchmarking was reasonable or possible for Union?

MR. KITCHEN: Not to my knowledge.

MR. MILLAR: Thank you. Mr. Culbert, do you have a different answer?

MR. CULBERT: Different than Union, yes, we were going to perform a benchmarking analysis as part of a custom IR application, which our understanding of the Board's utility rate handbook was an important aspect of a custom IR application at a point in time, as you're aware. We reached a conclusion that we are filing this MAADs application and determined that that benchmarking study wasn't a necessity because we weren't doing a cost-of-service rebasing and therefore wouldn't be as informative as it would have been in a custom IR application, so what we've provided is the total factor productivity benchmarking analysis that Dr. Makholm has produced.

MR. MILLAR: Okay. Thank you. I do need to keep moving, because I'm conscious of the time.

Let's turn to the Board's history with respect to stretch factor and the gas utilities. As we have discussed, the gas utilities have been under one form or another of IRM for many years, since about 1999; is that correct?

MR. CULBERT: Yes, for EGD about 13 years, I think.

MR. KITCHEN: I think we're about 15 years.

MR. MILLAR: Okay. And I recognize that there have been various iterations, but one way or another, it has been IRM/PBR.

Let's turn to tab 11, if you don't mind. This is the handbook for utility rate applications. And you've referenced this in your evidence. This document reflects the continuation of the renewed regulatory framework and applies equally to all regulated utilities, including gas; is that correct?

MR. CULBERT: Yes, that's correct.

MR. MILLAR: And then if we flip to the next page, which is page 16 of the document, page 53 of the PDF, I didn't include the header to this section which appeared on a few pages earlier, but the header for this section is "the OEB's review of the key components of rate applications", so this is for both gas and electricity.

And if we look to the page that I have on the screen, if you scroll down just a little, in the bolded section it says:

> "In reviewing a utility's proposed outcomes and performance metrics, the OEB's key considerations are..."

And in the fourth bullet point:

"Performance metrics which will accurately measure whether outcomes are being achieved, and which include stretch goals to demonstrate enhanced effectiveness and continuous improvement."

Isn't this the Board saying that stretch factors are required for gas utilities?

DR. MAKHOLM: But not to me.

MR. MILLAR: How --

DR. MAKHOLM: Is my mic on?

MR. MILLAR: It is.

DR. MAKHOLM: Oh, no, not to me.

MR. MILLAR: Okay.

DR. MAKHOLM: And it's easily -- it's easy for someone like myself to look at this and conclude that it has to do with the OEB's job of measuring what it measures statistically for the electricity distributors in its -- under its charge.

But this type of phrasing does not comport with my -- or other expert's understanding of how you deal with idiosyncratic, unique, uniquely situated, large investor-owned companies under an IRM or PBR regime.

MR. MILLAR: See, what I'm hearing, Dr. Makholm, is that you -- is not that the Board isn't saying there should a stretch for gas; you are just saying you disagree with that conclusion.

DR. MAKHOLM: No, no, I don't disagree with the Board. And there is nothing in the repeated recitations of that "we are not persuaded" boilerplate that goes into a number of board decisions, all of which is correct, with respect to the burden of regulating electricity distributors. I have no quibble with that. And I think that they've effectively dealt with a singular problem among regulators in North America. No one else has that problem that you all do, but if there's any criticism of mine, it's not the Board's treatment of its electricity distributors, it's Ontario's failure represented by the discussion that we're having right now to recognize that that job is different than the job of regulating two large investor-owned gas distributors, and that failure, to distinguish between the two, which I conclude Dr. Lowry has capitalized on, to smudge the distinction and to propose a .3 stretch factor that has no logical or principal basis under PBR theory. That's my criticism in this case, not the -- not this language at all.

MR. MILLAR: Dr. Makholm, I have no problem with you not supporting what the Board has said here, but we've already gone over this -- the document that we're looking at right now is for gas and electricity, and it says on its face there should be a stretch, so if you disagree that that should be the case, that's all fine, but my question here is: Does anyone disagree that the Board has said there should be a stretch factor for the gas utility?

MR. KITCHEN: I disagree, Mr. Millar.

MR. MILLAR: Okay.

MR. KITCHEN: And I'll tell you why I disagree, because when I read what's in bold in front of me, and it talks about stretch goals, it doesn't talk about stretch factor, and if I read the paragraph above it says:

"Other utilities (natural gas utilities, electric transmitters, and OPG) should establish performance metrics which are directly linked to the identified outcomes related to their business plans. These performance metrics will generally be part of a set of performance measures that the utility has proposed as a performance scorecard (discussed in the next section) and as part of our '19 rates application we will be bringing forward a utility system plan."

We will be -- that's how I read that section. I look also at the fact that both utilities have been under PBR or IRM for, as you mentioned, you know, let's say 15 years, just to pick a number, and we both have implemented significant changes over that time. We've managed the utilities, the low-hanging fruit is gone, and now where we have the best opportunity for actually achieving savings is through the amalgamation. It's not through the -- through the base business at this point.

MR. MILLAR: The plan that you propose is a price cap incentive, rate-setting plan?

MR. KITCHEN: That's correct.

MR. MILLER: I'm sorry, this isn't in the compendium, but I believe Ms. Adams has the rate handbook handy. I only have the one page here. Could we turn to -- it's page, I guess it's page 41 of the PDF. This is the definition section. You can see price cap incentive rate-setting, which we've just agreed you are applying under, and if you start with the second sentence, this is how the Board has defined it:

> "The formula adjusts current rates for the following year by inflation in input prices (cost of production or service) less expected productivity improvements, including a stretch factor (or consumer productivity dividend)."

Again, hasn't the Board been very clear on this?

MR. KITCHEN: Again, the -- included from my perspective, the inclusion of a stretch factor is not an automatic. Just because the definition talks about a stretch factor, the stretch factor can be zero. We are in a situation where we have been in PBR, as I said, for a number of years. The low-hanging fruit is gone, and we are now entering a situation where there are additional savings that have come through the amalgamation, but it does not come through anything else.

So in fact, a stretch factor of .3 is a significant burden. It would take our -- in order to achieve an allowed ROE that we've projected, we need to have over a billion dollars in savings as a result of such a stretch factor. And I'm -- that's just not reasonable, from our perspective.

MR. MILLAR: You've overearned every single year for the last ten years, both of you? Mr. Shepherd's compendium from day 1 had a chart that set that out. We could pull it up if we had to, but do you dispute that?

MR. KITCHEN: We have either been in earnings sharing or above the allowed, yes.

MR. MILLAR: Okay. And so what -- we're maybe overusing the fruit metaphor, but did you just pick the last piece now, or will there be any left for next year?

MR. CULBERT: There might be some raisins left rather than grapes.

[Laughter]

MR. MILLAR: Okay, maybe I'm getting into argument. Let's not belabour that metaphor any further than we need to.

Okay. Could we turn to tab 5, please. I want to stick with the gas utilities. This is Union -- this is the settlement agreement that gave rise to your current IRM plan; is that correct, Mr. Kitchen?

MR. KITCHEN: Yes, it is.

MR. MILLAR: Okay, and if we turn to page 12 of that document, which is page 24 of the PDF, and there is a discussion on the productivity factor -- at the bottom, yes, thank you. And it states:

> "The annual productivity factor (X factor) in this agreement is expressed as a percentage of inflation."

So you did something a bit new there. What you did was, instead of a specific X factor number you took -- you instead decided to accept 40 percent of GDP IPI FDD as your inflation factor?

MR. KITCHEN: That's correct. That was the result of settlement.

MR. MILLAR: Yes, that's right. That's what you settled to, and the Board approved that.

MR. KITCHEN: Yes.

MR. MILLAR: And if we look at the last sentence there, it says:

> "Together, the upfront productivity commitment described in section 1.2.2 and the X factor are inclusive of a stretch factor."

So is it fair to say that you have a stretch factor in your current plan?

MR. KITCHEN: I don't actually read it that way. The way I read that is that we did not separately negotiate the X factor and the stretch factor. It is just a combination of numbers. There is no quantification.

MR. MILLAR: Oh, I agree with that, I agree with that.

MR. KITCHEN: And that's all that was intended to reference.

MR. MILLAR: But you are specifically referencing that this haircut you are taking on the I factor on inflation is inclusive of productivity and a stretch factor; it's both.

MR. KITCHEN: Actually, I don't think I'm -- what I'm saying is there was no separate identification of a stretch factor, and that's all the settlement agreement shows.

MR. MILLAR: It says it includes a stretch factor. Well, it says what it says, so maybe we can leave that for argument.

MR. CULBERT: I think it's important to note, too, Mr. Millar -- and I know we've discussed this before -- those are the rates at 40 percent of inflation that the Union rate zone customers will be experiencing, plus inflation going forward in the price cap. So those base rates are at this level.

MR. MILLAR: Yes, that's right. I understand that. Okay, thank you.

Why don't we turn to Enbridge, Mr. Culbert, since you -- okay, I believe it's tab 7 for Enbridge.

Like Union, you've been under IRM for many years. But unlike Union, you are currently under a custom IR plan, is that correct?

MR. CULBERT: That's correct.

MR. MILLAR: And custom IR generally incorporates both IRM features and some cost of service elements. Is that a fair, high level description? It is a five-year plan that has the --

MR. CULBERT: Yes, it's been, I'll say redefined by the Board in the RRF update. But it's a five-year projection of costs. It's to include a total factor productivity study for determining a productivity factor to be used in a custom index, and a first year, as you point out, cost of service rebasing inside of that five-year projection of cost. Yes, that's my understanding.

MR. MILLAR: But over the five years, it is at least partially cost-based, right? That's why there is some cost of service analysis for each year?

MR. CULBERT: Yes. But the Board, in the custom IR, requires that you file a five-year cost projection, but also inclusive of a total factor productivity study which would formulate or inform the X factor portion of developing a custom index for use going forward.

It is not simply the use of cost projections, from my understanding for custom IR.

MR. MILLAR: No, I think we agree. Thank you for that.

If we could turn to tab 7, this is the Board's decision in EB-2012-0459. This is the decision that approved the rates that you are currently under, is that correct?

MR. CULBERT: That's correct.

MR. MILLAR: Okay. Could we turn to page 47 of that decision, which is page 33 of the PDF?

This is a discussion by the Board about productivity as it appeared in your application, and if you look at that middle paragraph that starts "One of the specific measures," that states:

"One of the specific measures which Enbridge incorporated into its budgets was the requirement that the FTE level be held flat over the IR term. Enbridge maintained that its use of flat FTEs represented an embedding of productivity and a stretch factor."

So although there is no stretch factor number in your application -- or your current plan, similar to Union, there is an implicit stretch factor in there, is that fair? Or at least that's what you are proposing?

MR. CULBERT: I would say embedded in the productivity element that the Board decided on, they concluded there was an element of stretch in that productivity factor, yes.

MR. MILLAR: Well, not just the Board concluded that; you concluded that. That was your proposal.

MR. CULBERT: Our proposal was that we had embedded productivities ...

MR. MILLAR: Including stretch.

MR. CULBERT: I would have to go back to our evidence to confirm that.

MR. MILLAR: Fair enough. We can agree that's at least how the Board characterized it. The Board is summarizing your position there.

MR. CULBERT: That's right. So without me reviewing the evidence per se, I can't say that we noted it that way. But that's what the Board concluded, that embedded in the productivity was some sort form of stretch –

MR. MILLAR: Okay, fair enough.

MR. CULBERT: -- relative to the misgivings of the application.

MR. MILLAR: So it seems to me -- and maybe you'll disagree with this, but we have PBR/IRM plans for the utilities stretching back 13, 15 years, something like that. And as of today in 2018, we still have at least an implicit stretch factor for both Union and for Enbridge. And that suggests to me that both in the Board's view and indeed the company's view, stretch is not just for the transitionary period.

Do you have any -- am I wrong about that?

MR. KITCHEN: I'm not going to speak to the transitionary nature of it, Mr. Millar. I think that's for Mr. Makholm.

But I can say that at least in Union's case, the termination of the X factor was done through negotiations, and it was not -- it was not from an acceptance of a numeric stretch factor. We were merely acknowledging that there was nothing more than that productivity factor that would be used for the setting of rates.

MR. MILLAR: Okay. Mr. Culbert, do you have anything to add?

MR. CULBERT: No.

DR. MAKHOLM: No.

MR. MILLAR: As you've discussed in several places in your evidence and through the IRs in the technical conference, at least as a general matter, in most cases you've adopted the Board's rate handbook and the Board's policies as they've applied to electricity in preparing your application.

And just some examples, ESM is consistent with the Board's -- with both the rate handbook and what the Board does for electricity. ICM would be similar, Z factors, is that fair? You've just adopted what the Board said in the rate handbook?

MR. CULBERT: Yes, we've adopted what the Board allows there.

MR. MILLAR: Mr. Culbert, is your mic on? I'm having a little -- maybe if you could just speak -- we're a long ways away, unfortunately, and I'm having trouble hearing you.

Okay, I think I heard that, so I think it was a yes.

MR. CULBERT: It was a yes.

MR. MILLAR: So as you discussed with Ms. Girvan on day one, and I think some others through interrogatories, for Z factors, in fact you went with the rate handbook even though your current plans both have higher thresholds for a Z Factor. It's a million dollars if you follow the trail in the rate handbook, but currently you are at something like $1.5 million and $4 million, is that's correct?

MR. CULBERT: Yes, if you turn up Exhibit C, Staff 23.

MR. MILLAR: Yes, that's right. And we have that in our compendium, I think at tab 12.

Essentially, what you've done is whenever you had a question, you just looked at the rate handbook and did whatever that said. Is that fair?

MR. KITCHEN: Well, I don't think that --

MR. MILLAR: Maybe that's too simple.

MR. KITCHEN: I think that's fairly simplistic. But what we did is we went to the rate handbook for the Z Factor. Yes, I acknowledge that both Union and EGD have thresholds that are larger than what we're proposing.

But you have to remember, Mr. Millar, those thresholds were also established through settlement agreements, prior to the handbook being in place. And even with a threshold of a million dollars, we still have to meet all the criteria.

It's not as simple as we exceed a million dollars and we get Z Factor recovery. So that's ...

MR. MILLAR: That's a fair comment.

MR. KITCHEN: So from my perspective, the fact that Amalco is a new entity and the Z factor is no longer being created through settlement negotiation, there is nothing preventing us from using the handbook, and in fact I think it's appropriate.

MR. MILLAR: Okay, that's fair enough, and we heard your evidence before Ms. Girvan.

But I guess what strikes me is when it comes to Z factor, even though you currently have different thresholds that are much higher and you are going to be much bigger than any of the electricity LDCs, you were happy to go with what the rate handbook said and use a million dollars. Under stretch factor, even though it seems clear to me at least, that the Board says in several instances that stretch factor is supposed to apply to gas, you didn't do it for gas. And in fact, you retained an expert to say why you didn't have to do it -- I shouldn't say you retained him for that purpose. You retained an expert who has said that you shouldn't have to have a stretch factor for gas.

So I'm curious as to why you went a different path for stretch than Z.

MR. KITCHEN: I don't think you can characterize it that way, or at least I wouldn't characterize it that way.

What we've done is we've retained Mr. Makholm to do a total factor productivity study that would set Amalco with an X factor. The fact that Mr. Makholm doesn't support the stretch factor is a result of Mr. Makholm's expertise and study.

We don't believe that an X factor is necessary for us. In fact, all we're saying is that the X factor should be zero.

We have been through -- I don't want to repeat myself because it's just going to be several times on the record. But we have been through a number of years of PBR or IRM and the efficiencies that we were able to achieve as separate companies are largely -- are largely gone now, and now the efficiencies will be through the amalgamation.

So the base business doesn't have that level of efficiency to give.

MR. MILLAR: Okay, let's keep moving. Dr. Makholm, I know you've referenced many times in your evidence in the technical conference, the IRs and in your examination in-chief, the AUC generic decision from 2010 to 2012.

I know you're familiar with that case. And you use it to support your position or at least in part to support your position that X factors generally should just be for the first-generation PBR; is that fair?

In the interests of time I ask you not to repeat all that, but I'm just saying that's one of the things you rely on in saying that it should just be for first-generation?

DR. MAKHOLM: I never said that.

MR. MILLAR: Okay.

DR. MAKHOLM: I never said "just first-generation." I said that it had a point related to the transition. How long the transition takes may be more than just the first or the second. What I conclude in this case is the transition is over by the time you get to the fourth. That was my conclusion.

MR. MILLAR: Okay.

DR. MAKHOLM: And it had to do with what kind of incentives are appearing in the data that we measure for the companies in question --

MR. MILLAR: Yes, and I think you've got --

DR. MAKHOLM: -- and if I can add --

MR. MILLAR: -- I won't ask you to repeat that.

DR. MAKHOLM: -- Dr. Lowry misquoted me in that respect, and he said, as you said now, that I said "first." I never said "first", but by the time you get to the fourth you can safely conclude that the elements that the stretch is supposed to measure are long since passed.

MR. MILLAR: I apologize if I mischaracterized you, and perhaps you did not say it's only for the first. And as you are aware, and I'm sure you know where I'm going with this, if we turn to tab 6, Alberta has now moved to its second-generation plan; is that correct?

DR. MAKHOLM: Yes.

MR. MILLAR: And I think they reference your work in that proceeding, but you didn't actually appear on that case; is that right?

DR. MAKHOLM: Yes, they referenced it scores of times, but I was not in that particular proceeding. They already had my independent work and my analysis, which they continue to use.

MR. MILLAR: Understood.

If we could turn to, I think it's page 39 of the decision and maybe 28 of the PDF. It's paragraph 151. I'm sorry, I have to read through a couple of passages here to get to my question. It says:

> "The distribution utilities and their experts have interpreted the commission statement in the previous decision to mean that the inclusion of a stretch factor is warranted only during a transition from cost of service to PBR."

And I'm going to skip ahead to paragraph 152.

> "Parties in this proceeding pointed out that because expenditures under the capital tracker mechanism in the 2013-2017 PBR plans were largely treated on a cost-of-service basis, they were not subject to the same high-powered incentives to control costs as the expenditures under I minus X."

And if we skip to paragraph 153:

> "Given that current-generation PBR plans include a cost-of-service capital trackers mechanism which will be mostly replaced in the next-

"generation PBR plans by the K-bar mechanism..."

And we don't have to get into exactly what that is.

"...the commission expects that next-generation PBR plans will be largely devoid of any significant cost-of-service elements. Therefore, the commission finds merit in including a stretch factor component in the X factor for the next-generation PBR plans for all distribution utilities."

You will have that read that before?

DR. MAKHOLM: Yes, you're making my case. This is exactly what I've said.

MR. MILLAR: Yes, in that if there are significant changes you may be able to realize additional efficiencies? Is that the point I'm to take from that?

DR. MAKHOLM: No, if there are significant changes you've changed the regime. The regime has gone from I minus X or PBR or IRM for base rates and cost of service for the incremental capital to IRM or PBR, including the incremental capital. So there's a new regime, there is a new sheriff in town, and the new sheriff is going to incent different kinds of behaviour, which is exactly what I'm saying. The AUC only predicated the stretch in the second generation on the fact that the IRM regime itself was broader and covered more stuff than their first IRM regime.

MR. MILLAR: What type of plan is Enbridge currently on?

DR. MAKHOLM: The Enbridge -- why don't you answer that question?

MR. CULBERT: As we confirmed earlier, custom IR.

MR. MILLAR: Custom IR. Is that an I minus X regime?

MR. CULBERT: Our custom IR is not, but the custom IRs required by the Board has a custom index, which would have, in my understanding, an I and an X included in it.

MR. MILLAR: Right. But your current plan is not an I minus X regime.

MR. CULBERT: Our current IR is the original application to the Board under their then existing view of custom IR at that time, which as I mentioned earlier has changed, morphed into the current view of --

MR. MILLAR: I'm just asking about your plan, and your plan has significant cost-of-service elements?

MR. CULBERT: Our plan was a custom approach, given the Board's policy at that time, which was a five-year projection of costs, inclusive of, in our application, productivities to a degree, et cetera, so --

MR. MILLAR: So the answer is yes.

MR. CULBERT: It was based on the custom IR application requirements of the Board at the time, yes.

MR. MILLAR: And that's not what you are proposing now. You will be under a straight price cap IRM?

MR. CULBERT: We will be using a price cap to escalate our rates going forward. That's correct.

MR. MILLAR: Okay. Thank you.

Okay. I'm running short on time. Why don't we have a go at the more academic exercise, Dr. Makholm, so --

DR. MAKHOLM: I wouldn't recommend it.

MR. MILLAR: No, I don't relish it myself, but we only have ten minutes left, so I can pull the plug if it starts going too badly and pretend I'm out of time.

Again, the -- you both -- stretch factor is the big area where you disagree on X factor. You actually came up with the same conclusion, as you discussed in your examination in-chief; is that right?

DR. MAKHOLM: Yes.

MR. MILLAR: So again, this is largely academic, although I suppose there may be precedential value based on the different approaches you used, that type of thing. And your results were not identical. Although you came to the same conclusion, there were some different results that were spat out from your studies, so I just want to explore that in the ten minutes I have left.

So just to set the table at a very high level, your TFP study measures the year-over-year productivity trend of, is it -- was it 57 U.S. gas and electric utilities? I have 57 written down, but I'm not sure if that's the right number.

DR. MAKHOLM: I think 60 -- I have it written down too. I'll --

MR. MILLAR: It doesn't matter exactly. It's in that range --

DR. MAKHOLM: -- number of companies. It is the maximum population of companies, is a maximum data set. It changes over time, but I think it's in the 60s.

MR. MILLAR: Okay. And though some of the utilities in your survey provide both gas and electricity service, am I right that your analysis uses only the data from the electricity side?

DR. MAKHOLM: No, both.

MR. MILLAR: But does it use the gas data as well?

DR. MAKHOLM: It doesn't use gas data, but it uses distribution data.

MR. MILLAR: Well, help me with that.

DR. MAKHOLM: If a company distributes gas and electricity, it uses data for the distribution of either gas or electricity.

MR. MILLAR: Okay. Let me just start with the very basics, and this is the highest level type of question, but TFP, total factor productivity, it measures the rate of change of outputs relative to the rate of change of inputs; is that correct?

DR. MAKHOLM: Yes.

MR. MILLAR: Okay. And if we imagine a scenario where you have an input value that falls over time but your output value remains constant, what impact will that have on TFP?

DR. MAKHOLM: If the index of inputs --

MR. MILLAR: If it falls --

DR. MAKHOLM: -- falls and the index of outputs remains the same, the ratio of outputs to inputs will go up, and you will measure what you conclude is a increase in productivity.

MR. MILLAR: Exactly. And sorry, these are not trick questions, I just wanted to --

DR. MAKHOLM: Oh, I'm not taking --

MR. MILLAR: -- and I and the Board and the people in the room understand exactly how this works.

Okay, and if inputs increase and outputs remain constant, TFP would be negative. Is that --

DR. MAKHOLM: That's what we would measure.

MR. MILLAR: Okay. And is it fair to say that the results of any TFP study will be highly sensitive on what you choose as your input measures and what you choose as your output measures?

DR. MAKHOLM: Yes.

MR. MILLAR: And as you went over in your examination in-chief, there are in fact quite a number of similarities between what you -- between the methodologies that you and PEG use. There are some differences, but there are some similarities as well.

For your output measure, although there are some differences, you both use a physical measure; is that right? You used throughput, essentially, either kilowatt hours -- or, pardon me, megawatt hours or M cubeds -- whereas Dr. Lowry used that, but he also added customer numbers; is that right?

DR. MAKHOLM: Yes.

MR. MILLAR: And although there are some differences in how you measure inputs, you both use what's called the monetary method, and that means that monetary method, it relies largely on financial or monetary data as the source of data for measuring these inputs; is that right?

DR. MAKHOLM: Well, dollars, let's say.

MR. MILLAR: Dollars. Okay. Fair enough. But we're in agreement that you both use the monetary method?

DR. MAKHOLM: Well, you have to measure capital, for instance, as something, so we don't use pounds of steel, you use dollars.

MR. MILLAR: So you use the monetary method.

DR. MAKHOLM: I would say dollars.

MR. MILLAR: Okay. Thank you.

DR. MAKHOLM: I've never used the term "monetary method."

MR. MILLAR: Dollars it is.

Okay. So for your input measures, I know there is a variety that you use, but one of the inputs you use is the utility's capital assets, things like buildings, vehicles, transmission lines, what-have-you?

DR. MAKHOLM: Yes.

MR. MILLAR: And there's also some other non-capital items, such as materials, labour, that type of thing?

DR. MAKHOLM: Yes.

MR. MILLAR: Okay, but when we're talking about the capital assets -- and I want to focus on that -- as you discussed in your examination in-chief, the method you use there to measure the input value of capital assets over time is what we call the one-hoss shay method; is that correct?

DR. MAKHOLM: Yes.

MR. MILLAR: And that differs from what Dr. Lowry used. He used what had is known as geometric decay.

DR. MAKHOLM: Correct.

MR. MILLAR: Let me just start with geometric decay. Under geometric decay, as I understand it, the value assigned to a capital asset will decline over time. I kind of liken it to depreciation, although I know it's not necessarily straight line depreciation. But that's how you it would work under geometric decay?

DR. MAKHOLM: Think of it as a handle that burns down over time. And halfway through the life of a candle, there is half a candle left.

MR. MILLAR: And at least in theory, let's see if you agree with this, that's meant to reflect the fact that an asset's productive capacity may deteriorate over time, absent maintenance or repair, or something like that. At least that's the theory behind geometric decay?

DR. MAKHOLM: No. Geometric decay is used in those places where those who create index numbers, like a Statistics Canada or the Department of Trade in the U.S. or elsewhere, or Dr. Lowry with his gas distribution data, doesn't have the ability to measure the assets at their value over their useful life. So those operations have to conclude that there's some sort of -- at some point, you have a whole candle and at some point, you don't have that candle any more. So they presume that the candle burns down and the quantity of capital that you are deploying in your operations with that -- if capital is your candle, it burns down.

But one-hoss shay doesn't make any assumption like that. It doesn't need to, because it's got the data that says you've got a hunk of pipe, and it's going to be used for in it's intended purpose until it's withdrawn.

So there is no candle burning down in one-hoss shay. There is some sort of assumption about the candle burning down, if you do what Dr. Lowry has done, either straight line or geometric decay. But that's only because you don't have the data to hold that candle in place at its full height until you take it out of service.

MR. MILLAR: I'm not sure that is actually so different from what I said. But your answer is on the record, so thank you for that.

And you did discuss one-hoss shay, which is obviously different to the extent that once the capital asset enters service, the assumption is it is retains its entire productive capacity over the life of the asset.

DR. MAKHOLM: Until its retired.

MR. MILLAR: And in your study, I believe the assumption is a 33-year asset life.

DR. MAKHOLM: Correct.

MR. MILLAR: So the input value that you assign to an asset would be the same in year one as it would be in year 32?

DR. MAKHOLM: The input value is --

MR. MILLAR: A dollar.

DR. MAKHOLM: We denominate it in dollars. But the point is there's a certain amount of capital going into the enterprises, and that quantity of capital is the summation of a whole lot of assets.

Those assets are there and used for things until they're withdrawn, and the sum total of the assets have an average life of 33, so we track -- as we can with regulated books in the U.S. and Canada, because you use those things. So that's how we track the property of the companies involved. We want to make sure we don't forget what property they own; those are the equity owners' property values.

We track the assets in the books until they are retired. And so we have the benefit with FERC Form 1 data of being able to use one-hoss shay to keep all those assets in place working until they are withdrawn.

MR. MILLAR: I understand that. But my question was the value will be the same in year 32 as it will be in year one?

DR. MAKHOLM: In terms of a particular asset with a 33-year life, the answer is yes.

MR. MILLAR: Yes, okay. And under geometric decay -- let's take a situation where the asset is valued at $100, just to keep this simple; call it a transmission line.

Under one-hoss shay, in year 32, it will still be worth -- the input value will still be $100. Whereas under geometric decay, the value would be something less than $100.

DR. MAKHOLM: Mr. Millar, I hope you understand that simply denominating it in dollars can allow us to use the word "value" improperly, which you just did. And it's not your fault; it's the questions you were given.

MR. MILLAR: I wrote the questions.

DR. MAKHOLM: Even then, even worse. But we're trying to measure a capital input. We just happen to use dollars to denominate -- as a numerator for that capital.

And what we say in terms of one-hoss shay is that the amount of capital, however you denominate it for a particular asset as part of the capital account, stays in place and doesn't go anywhere. And we denominate it in the same way with the same quantity until it's withdrawn.

Geometric decay, which you just mentioned, assumes that the quantity of capital goes down over time, until it expires -- not withdrawn, but expires.

MR. MILLAR: That's what I just said. You seem to be agreeing with me.

DR. MAKHOLM: So if we are using quantity instead of value, straight line or geometric decay or some other non-linear technique, assumes that the capital goes away, it sort of evaporates, it vanishes over time until it's all gone, and one-hoss shay makes no such assumption. It keeps the capital there doing what the capital does until it's withdrawn. That's the difference.

MR. MILLAR: That seems like a long way of saying yes as a response to my question.

DR. MAKHOLM: No, I think that by using the term "value", you sort of brought into the discussion depreciation practices, which are there for tax purposes, or rate-making purposes, or other things, but not for purposes of measuring productivity.

MR. MILLAR: Dr. Makholm, all else being equal, what impact will using one-hoss shay and as opposed to geometric decay have on TFP results over a period of time, everything else being equal? Would TFP be lower using one-hoss shay, or higher?

DR. MAKHOLM: Well, we have a controlled experiment in this case. Not everything else is equal. Lots of stuff isn't equal.

MR. MILLAR: I know it's not. That's not my question.

DR. MAKHOLM: We don't know. You can't predict, because lots of other things are going on at the same time.

MR. MILLAR: No, in my scenario, they're not.

DR. MAKHOLM: I don't know. That's not possible to predict. It depends on other things. I would just say it depends. I don't know.

MR. MILLAR: Won't the input value be lower under geometric decay than it would be under one-hoss shay?

DR. MAKHOLM: I don't know.

MR. MILLAR: Okay, I have your answer. I am almost out of time, so let me just skip to the end.

Could we please turn to tab 9? This is the Board's decision in the recent Ontario Power Generation case in which there was a battle of the experts about a TFP study.

In that case, they actually came up with different results. But one of the features of the study put forward by OPG's expert in that case was that it is used the physical measure for his TFP study. He used generation produced, as measured in megawatt hours for its output measure, and generation capacity for its input measure.

I want to take you to page 126 of that decision, which I think is page 143 -- pardon me, 43 of the PDF. And if you look at the bottom of that page under "Findings", the second paragraph:

"The OEB agrees with LEI," that was the expert for OPG, "that generation (MWH) is the most appropriate measure of output, as it is generation produced and not capacity which is the basis for revenues to recover capital and operating costs. However, the OEB also recognizes limitations with LEI's approach. The OEB questions LEI's physical approach, which uses megawatt capacity as an input, as this measure does not take into account financial considerations, such as the capital costs. Although many hydroelectric generation assets have very long useful lives, the OEB is not convinced that there is no functional depreciation until end of life. In fact, reviews of capital projects to sustain, refurbish and replace hydroelectric stations and assets in OPG's prior payment amount applications confirm that capital expenditures and operating costs are needed to maintain capacity to the end of a station's life. Absent ongoing capital and operating expenditures, hydroelectric generation assets will depreciate over time. In the OEB's view, LEI's physical method, which assumes no depreciation until the end of life, is not a realistic basis for the analysis of productivity of hydroelectric generation facilities."

DR. MAKHOLM: Yes, I'm familiar with that decision and the inputs that go into it.

MR. MILLAR: And how is this situation different than that, Dr. Makholm?

DR. MAKHOLM: It is completely different. As you recall in that case, that was the first time anybody had ever ventured to do a TFP study for hydroelectric generation. There's a reason for that, and that's because Hydro electric generation -- there is too little of it; it's too big, it is too site-specific, and it is too idiosyncratic.

It makes a TFP study enormously challenging and difficult, to the extent that until that case, no one had ever done one. But calling for one, in the context of that technology of a hydroelectric dam with water coming in you're not paying for, caused the two experts to take diametrically opposed positions with respect to how to quantify the capital involved.

LEI didn't depreciate anything. And the other expert -- who was it again?

MR. MILLAR: Dr. Lowry.

DR. MAKHOLM: Yes, he used this geometric decay business, neither one of which is acceptable in the context of these kinds of companies that don't manage hydro dams.

So what I would say is that the outcome of that dissension was completely predictable, for someone like me who has been doing this kind of analysis for longer than Dr. Lowry is doing, knowing the extreme difficulty of dealing with a Hydro dam and whether it's productive or not, but setting up the contest between not depreciating at all, because the hydro dam is not coming out of service, and geometric decay, you chose what you chose and you came out of that -- you came out of that case with your skin intact.

We don't have a hydro dam here. We just have pipes and wires and trucks and other kinds of distribution equipment that does cycle through. There is a perpetual inventory overhaul with distribution companies or with power generators or with others that aren't hydro plants, so the difficulties faced by the two analysts in that case we don't face. We don't have to worry about that.

MR. MILLAR: Is the difficulty about a hydro facility just its long-lasting life? Is that the -- I'm not quite following what the --

DR. MAKHOLM: Yes, you install -- it's very old, and you install it until you no longer have a company, and how to deal with the capital input of a hydro dam, where everyone is in a different valley, on a different river, gives you a circumstance that, until your case, no one ever wrestled with, and it's those problems that cause you to wrestle with it, but we don't have those problems here.

It's, we don't have the majority of our capital tied up in one big thing that will be there until the end of the company. So we don't face those problems.

MR. MILLAR: Okay, Dr. Makholm. Regrettably I'm at the end of my time, so thank you very much for your assistance with this. Thank you, members of the panel. Madam Chair, those are my questions.

MS. ANDERSON: Thank you, Mr. Millar.

I think it looks like a good time for the morning break, so we'll take 20 minutes, and I think it's Energy Probe when we come back. Thank you.

--- Recess taken at 11:02 a.m.

--- On resuming at 11:22 a.m.

MS. ANDERSON: Thank you. We're back from a break with panel 4. And up next -- I'm not sure who is on for Energy Probe. Is it Dr. Higgin?

DR. HIGGIN: Yes.

MS. ANDERSON: Thank you. Before I start with the panel, just to say that we have prepared a compendium and that has been filed last night and copies are available in the room. So I would like to have an exhibit for that, please.

MS. ANDERSON: Do we have -- I don't think we have that, do we? Or is it in here?

MR. MILLAR: Dr. Higgin, did you provide us with hard copies?

DR. HIGGIN: Yes, I had two boxes down there. I don't know where they all went.

MR. MILLAR: We just need to find it.

MS. LONG: I think we have it. I have mine.

MS. SPOEL: Yes, thank you.

MS. ANDERSON: Okay, thank you.

DR. HIGGIN: So could we have an exhibit please?

MR. MILLAR: Yes. That will be Exhibit K4.2.

EXHIBIT NO. K4.2: ENERGY PROBE CROSS-EXAMINATION COMPENDIUM FOR PANEL 4

DR. HIGGIN: Thank you very much.

Good morning, Dr. Makholm and our returning witnesses from the companies. My name is Rodger Higgin and I'm a consultant to Energy Probe Research Foundation.

DR. MAKHOLM: Good morning, Dr. Higgin.

DR. HIGGIN: By way of background, I am an engineer and a business graduate, but I'm not an economist. So that will provide some context for my questions.

DR. MAKHOLM: Congratulations.

DR. HIGGIN: So we'll move on straightaway to our compendium, and I'd like if you could open up page 3. Then we'll move from that -- just to look at page 3 and then move on to the response.

So this page 3 is a copy of Exhibit C.EP.31, Energy Probe interrogatory 31, and the response -- and now it's up on the screen.

So we provided an attachment of a recent review of productivity studies taken from the evidence filed by PEG, Dr. Lowry in Quebec, that is Régie docket R-4011-2017, piece 0057, as it says on there.

So I'm not going to ask any more questions about that, just to note that is what we put in our interrogatory.

So, I'd like you to turn to page 2 of the response, and I'd like you to just clarify for me your response to part (c) of the response, please, Dr. Makholm.

DR. MAKHOLM: Yes, that's where I'm talking about the AUC's current plan?

DR. HIGGIN: Yes. But just to look at the wording,

"AUC's current IRM price cap of 0.3 percent represents a combined X factor and positive stretch factor for both..."

I'm a bit puzzled by that statement.

Wouldn't that be a higher number than 0.3? Wouldn't it be something like GDPP? I'm just trying to clarify. I'm not trying to ...

DR. MAKHOLM: I think that that might be loose language there. You are probably right. The question was:

"Please confirm that the AUC IRM price cap established an X factor of 0.3 percent for both gas and electric utilities in its current operable second generation plan."

DR. HIGGIN: Right.

DR. MAKHOLM: And my answer, not looking at the clunky language that may be in here, is that the AUC chose 0.3 referring to both stretch and X in that case.

It didn't make a distinction between one and the other. That's what I would have meant to say.

DR. HIGGIN: So it's I minus 0.3?

DR. MAKHOLM: Correct.

DR. HIGGIN: That's what I wanted, just to clarify that. That's all.

Could you turn to page 5 of our compendium? This deals with regulatory precedence, and you were discussing this with Mr. Brett and that's at the technical conference transcript, page 95 and this is a fairly straightforward question and I'd like you to just look at the final, final exchange at the bottom of the highlighted area.

And my question is: How does the regulatory regime -- and that is, in my terms, cost of service or I minus X -- affect the selection of the utility sample at all, and the and the overall TFP result from that sample?

That's my question.

DR. MAKHOLM: To restate it, how does...

DR. HIGGIN: Whether the utilities are operating under cost of service or I minus X, how does that affect the sample, how many of them are in the sample, and how does that influence the result of the TFP analysis?

DR. MAKHOLM: And thus, you mean my population of companies?

DR. HIGGIN: Yes, of course. Oh, yes.

DR. MAKHOLM: It doesn't. There is -- and there is a good reason why it doesn't, and that is because some places like Massachusetts may have defined I minus X regimes. Other places like Maryland may have price freezes, which similarly decouples rates from costs over a period of time with a regulatory lag in, just like I minus X or the custom I minus X plan in this province.

So the classification of how much decoupling and how much lag is operable for any company is an important question. But it is a complicated one because there is lag with everybody. No one does X post cost plus regulation. Every company has some sort of lag, even if it's only a year. Some companies have a two-year lag, some companies have a freeze with a multi-year lag, some companies have I minus X, like in Massachusetts.

But in that there is this continuum of incentives among the companies, they all go in.

DR. HIGGIN: So in your discussion with Mr. Brett, which we've highlighted, you acknowledged that most of the U.S. sample was on PBR -- sorry, on cost of service -- not all, but a significant quantity of your sample was on COS.

Would that be a wrong statement?

THE WITNESS: No, it's not wrong. But it is characterized by the permeable, gradual, fuzzy barrier between cost of service and a regime typified by a decoupling of costs and revenues, and some lengthened regulatory lag.

DR. HIGGIN: When you do the analysis, how does that affect that? Because, as we already know, many of the utilities are under IRM. They are supposed to be reducing their costs and they are supposed to increase productivity.

DR. MAKHOLM: That's the incentive that they face, correct.

DR. HIGGIN: Right.

DR. MAKHOLM: Whether they are supposed to or not, that's their incentive.

DR. HIGGIN: And that's what we would be expect to be seeing in the overall sample. There would be some that would be COS, and some that would be on IRM. That's all I'm asking.

DR. MAKHOLM: Correct, and some would be some sort of vague mixture between the two.

But recall that the whole point of an X factor study is to see what's going on with the market out there, as if we had a competitive barrier, to judge whether or not the productivity we measure in the market, whatever the markets' doing, tells us that there is some problem with using the basic inflationary numbers that we get from Stats Canada. And that's what I concluded -- that's the whole point of the collection of this.

In the market out there, if you are talking about gas distribution or hockey sticks, different companies do different things in different ways. But it is the collection of them; it is the average of what goes on out there in the market that we're concerned with.

DR. HIGGIN: Well, we understand that that's how the analysis is done. You compare the sample to the economy, the industry, to the economy. That's how it works, right? That's how we do it.

DR. MAKHOLM: Yes.

DR. HIGGIN: So can we just now turn to our next topic, and this is service slides, is the next topic, and page 6 of our compendium, which is Exhibit JT2.3.

And what I just want to go to is the result of your analysis that you were asked to do in the technical conference. And to summarize, briefly, that when I look at the result, it seems to show that over the last period -- and these are the four areas of regulatory decisions -- that for Union, it's around 36 or thereabouts -- we are not going to argue over little bits -- and about 38 for Enbridge.

Is that what you concluded in this analysis?

DR. MAKHOLM: These were prepared by Union and Enbridge.

DR. HIGGIN: But you don't disagree with them.

DR. MAKHOLM: No, it is the data from Union and Enbridge. No, I don't disagree.

DR. HIGGIN: Right. So just putting that against your sample and your analysis, you came up with, as was mentioned to counsel, with 33 years, correct?

DR. MAKHOLM: Yes.

DR. HIGGIN: Okay, so the big question, if we have a question, is: Well, what's the relevance of that difference between the 37/38 year for these utilities and the sample that you used in your analysis? That's the question.

So can we go to page 8 of the compendium, and we'll just explore that a little bit, please. So just as background to orient this, that Mr. Shepherd was asking you about this difference, as you see there, and you then have the response that's at the bottom, and showing the -- I think that you would say there, at the bottom you say: "I put great stock and hold to be objective", da-da-da-da, so you then say, final sentence:

"But to the extent that any one company is off the average of distribution life, I would have to look at it and say that it's an anomaly."

So my question is very straightforward, is, did you look at it and is there anomaly for these two companies? That's a straightforward question.

DR. MAKHOLM: Yes, I did look at it when the data was provided in these forms, and I concluded that those data are what they are, and the average for the group which I have measured and confirmed, as I did in the generic case before the AUC, is 33, and these companies are 36 and 37. Those differences are what they are.

The market out there says 33. These companies are that component different, but I -- that doesn't change anything.

DR. HIGGIN: That's the next question. What does it change, if anything?

DR. MAKHOLM: It doesn't change anything, because with respect to what the market is doing, the market's still performing according to a broad average among all the companies in all the years of 33, and to the extent that we looked specifically at these two companies and changed 33 to 36 or 37 to reflect not the market but the particular consequence of these two companies, the numbers do change, but they don't change out of the negative category, and they don't change our conclusions.

DR. HIGGIN: Okay. I won't go into the debate, because there will be one, just a heads-up, that there are differences between gas and electric and between the U.S. and Canada that might explain such differences. Do you have a comment?

DR. MAKHOLM: Yes, I've been through days of hearings on that exact subject in the generic proceeding. And I don't want to keep talking about the AUC like they're this fantastic board, but they did go through --

DR. HIGGIN: Was -- yeah --

DR. MAKHOLM: -- the job of having -- they did go through the job of doing a generic proceeding, and they dealt with that, and when it came to the trade-off between using the Form 1 data and using Canadian data to reflect what you are speaking of, at the end of the day, all things considered, they chose Form 1, and I think that -- that's what I had recommended, and they took that recommendation.

If we had a Form C data for Canada, we'd use it, reflecting what's going on here, but we don't, and so that reflects the trade-offs of doing this kind of analysis, Dr. Higgin.

DR. HIGGIN: Thank you very much. So I'd like to now move on to another area of differences in the two studies, and that is -- obviously it's been discussed, but that's the output quantity index. That's what I'd like to move on next.

So could we look at page 10 -- sorry, page 9 of the compendium, and this is an interrogatory where we asked you about this, this particular topic, and that is the C.EP.32, and that's shown in the compendium. And if we go down here we will see in part (a) to the response, and you outline that there's two options, you say, for the output quantity. And then you mention what Alberta, again, did.

And then we would like to just understand from you, you decided, because that's your methodology, that you used the output quantity -- in this case it would be gas, sales volume -- and the question I had to you is: Did you do any weighting or anything with respect to that in order to develop the output index?

DR. MAKHOLM: No.

DR. HIGGIN: No weighting, just straight sales volume.

DR. MAKHOLM: Yes.

DR. HIGGIN: Okay, thank you. So what we would like to understand a bit better is the fact that, how does that link to the trend in declining average use per customer, which is massive for these two utilities? How does it link to that? Should there not be some weighting or adjustment -- I'll use the word "adjustment" -- to recognize declining average use.

DR. MAKHOLM: And the answer is in a perfect world, perhaps, but we're not in a perfect world, so, no. And what I mean by that is: When you talk about declining use per customer, a number that I'm intimately familiar with, and I've published in my vitae, Energy Law Journal, on that explicit subject with respect to how declining use relates to revenues. Sometimes the effect on revenues is huge, depending on the rate design, and sometimes it's not. If we charged all distribution customers rent for their piece of the distribution system, declining averages would have no effect. Or if we had revenue decoupling and makeups, which many gas distributors do, it has no particular effect.

But we have to choose an output measure that is objective and measurable and at least over time reflects what the companies do. And my opinion is that with a long enough measure -- reflected by what the AUC said, that reflected my opinion -- was that if you have a long enough data set, and if you are careful enough to deal with data that's consistently collected and applied across a large number of companies similarly situated, that you can use output and not apply any other judgments in terms of another kind of output by customers, or how you are going to weight customers over time, or how you are going to deal with the fact that companies can make up for lost revenue per customer issues other ways by decoupling or changing the rate design. As soon as you abandon one measurable and objective measure of output, you open yourself up to a number of subjective judgments on how you are going to make it up some other way. You have to choose the other one. You have to choose how you're going to mix the two, and I conclude that those choices don't pay.

DR. HIGGIN: I was only asking about your methodology, not about the other options that -- such as Dr. Lowry has said --

DR. MAKHOLM: No, no, I'm not --
DR. HIGGIN: -- I was asking just for your methodology, sales volume.
DR. MAKHOLM: That's -- and I was only talking about me.
DR. HIGGIN: Okay.
DR. MAKHOLM: I have to choose it. I have to choose volume as an output, and I know what the other choices would be, the ones that I mentioned.
DR. HIGGIN: Yes.
DR. MAKHOLM: And given that those other choices exist, I choose volumes as most objective and consistent measure of output to use for this kind of study.
DR. HIGGIN: Thank you very much. My next topic -- we are going to move towards the question, I think, of the general trend in productivity in the industry. And I would like to explore that a little bit with you.
And in order to discuss that, we could look at the excerpts from the technical conference transcript on pages 11 and 12.
DR. MAKHOLM: Yes, thank you.
DR. HIGGIN: Thank you. What I'm trying to explore with you is this, that these points -- and you can comment after I just give you them -- that given what's been discussed earlier, can you confirm or comment on these.
"Regulators and ratepayers expect that PBR, IRM will result in growth in productivity at least for the first, second generation and maybe more

plants."

Second, from your review, and this is the key here, of the Ontario electricity distribution sector and now this case, based on your evidence for the gas sector in North America, can you confirm this, that under PBR IRM, the trend in productivity growth is approaching -- or is that zero after a number of years incentive regulation?

Have we reached the point of no return in terms of that, productivity-wise, which is why I think I interpret why a zero X factor is a good number.

DR. MAKHOLM: Oh, no, Dr. Higgin.

DR. HIGGIN: No?

DR. MAKHOLM: It's different than that, and I go back to that point of no return. I mean, that sounds awful. It sounds like we're wasting our time, but we're not.

I go back to the description I have in my testimony, which the company asked for and they were right to ask for, which is why are we even doing this X business? Why am I even here?

We have a regime that decouples revenues and costs and invokes a defined period of regulatory lag. That's where the incentive comes from. But you have to have inflation in there somewhere in life. You can't not have inflation, and X only comes into thee question to determine whether that inflation published by Stats Canada is good enough to allow the IRM to work.

And by saying the X is zero, we're not saying we've reached a level of -- whatever you said, that dark way you had of describing that, that's not it. All it means is that we don't have to fiddle with the Stats Canada number any more, because the productivity that we've measured for the industry has well enough matched the productivity for the economy out there. So we can use that inflationary number for this purpose, for the praiseworthy purpose of invoking regulatory lag with a decoupled set of rates.

So, I mean, put that way, X doesn't sound very important. And it's not. It shouldn't -- it's this mythic weirdo thing that you get expensive consultants to come in and do. But I think we've ground it down to the point where we're saying that the PBR regime, the IRM regime, the price cap plan is a very useful way to regulate. You don't have to see these guys again for another decade. That's great, and that you can do that without fiddling with the Stats Canada number for inflation, given what we've measured in terms of productivity for that industry and for the economy as a whole.

DR. HIGGIN: Thank you. You actually answered my next question, as you tend to do, which was just to conclude -- can we conclude from the evidence that under the price cap formula, costs for Amalco will increase at around GDGPI?

DR. MAKHOLM: Yes.

DR. HIGGIN: Thank you. So then the next question is about regulatory regime. Why do we go with an I minus X as opposed to some of the earlier structures that are available in Ontario under the RRF?

For example, there could be custom IR, there might be multi-year revenue, or it could an indexing. They are both available. Why would we continue with I minus X?

DR. MAKHOLM: I minus X custom IR, to me is just a variance of the same regime, but a decoupled regime with a regulatory lag. So they're two different flavours of the same thing and it's a choice that the company has that you give it to go down one path or another.

In this case, we're in a MAADs proceeding, so it is a little different. But they could choose straight I minus X, or they could choose a custom plan which, for the world at large looking in, except for some details, is the same thing. You might choose to project different kinds of numbers as opposed to measure them, but it's the same basic thing.

Why do we choose? It's their choice.

DR. HIGGIN: You didn't mention the other option, which is indexing, for example, that GDDPI. You didn't mention that.

DR. MAKHOLM: That is another of the same flavour of ice cream.

DR. HIGGIN: Thank you.

MR. MANDYAM: I think that what the Board has done is given companies a choice among flavours.

It is going to be ice cream; it is not going to be pudding.

DR. HIGGIN: Cost of service?

DR. MAKHOLM: That's the pudding, given that it's ice cream and they've got three flavours to choose from.

DR. HIGGIN: Thank you. I actually like the Italian -- but we'll go from there.

MR. KITCHEN: Dr. Higgin, just to add one comment, in the MAADs policy, it is the price cap that is available to utilities to set rates over the IRM, and that's why we're proposing it.

DR. HIGGIN: I understand the framework that you've selected and are working in, and that's not -- I'm asking about, from an economist point of view, how we could go forward in this regime.

MR. KITCHEN: Yes, and I am just clarifying the company's view.

DR. HIGGIN: Thank you. My next topic is obviously treatment of capital under one of those regimes. That's the next capital.

I have some questions then, if we could turn to our compendium -- and I am just going to pick up the page here so we can look at it, and that's page 14 of the compendium.

Do you have that? I just want to look at and discuss briefly the two highlighted areas of this transcript extract, and they are these:

"Capital expenditures are candidates for such trackers must be comparatively unusual," your words, "and narrowly defined," and you give an example such as cast-iron pipe replacements for gas distributors.

And the second passage is looking at another element:

> "We don't make the companies serve new users without the capital to expand."

Expansion; as you know, expansion of the system here in Ontario is currently going on. So that's the context.

So my question to you is: Why and how in designing an appropriate capital tracker for Amalco and -- would you consider and classify these categories of capital additions of capital? First of all, replacement investments such as you note, due to premature fuel failure, end of life replacements, expanding or reinforcing the mains and extending the mains to add new service areas.

And I'm trying to understand what capital do you think should be included in the I minus X formula, and what is to be included in the capital tracker?

DR. MAKHOLM: Okay. Let me begin, Dr. Higgin, by saying that there's nothing about the invocation of an IRM regime that breaks the basic regulatory compact that these companies, who combine investment funds for the purpose of providing public services to the people of Ontario, is different.

The basic regulatory compact remains, which is that in some form or fashion they will get a return on their investment to provide services, and the return is that they serve all comers in a way that's reasonably just and they provide safe, adequate, reliable service.

That basic deal doesn't change here. What changes is how we incentivize better performance under that basic deal. The tracker is there to reflect the idea that taking the current property, the current rate base, and applying to it an I minus X regime is not anticipated to cover what has to be covered to allow them to do that regulatory compact that serve all comers, not only because new capital is expensive, but because they're serving new territories which, by dint of geography, are further away and more spread out than the old territories were.

So it is not to be expected that they can take the I minus X on the current rate base and have the money to do those things. And so everybody has to wrestle somehow with the new capital, either by projecting things or by coming in and having the prudence principle work. They bring to the Board what they need to spend, the Board looks at it, decides whether the costs can be covered or not, and then lets them collect the money for that period of time until the next rebasing for those prudent expenditures. That's what the capital tracker or the capital module is all about, is to make sure that the company can continue to serve its basic bargain, while still being under a different kind of incentive regulatory regime.

DR. HIGGIN: Thank you. So what kind of type of tracker or K factor are you recommending for Amalco? I didn't see that in your pre-filed evidence, Exhibit B, tab 2, or if I missed it in one of the many interrogatories. You did recommend one in Alberta, of course, but are you recommending one here?

DR. MAKHOLM: Well, I was the one that recommended it --

DR. HIGGIN: I know you --

DR. MAKHOLM: -- in Alberta, but that wasn't asked of me in this case. There already is an incremental capital module here, and so I didn't fiddle with it.

DR. HIGGIN: So you didn't fiddle -- or you didn't examine it to see if it would meet the criteria that you would feel were appropriate for a capital tracker. You didn't do an analysis or assessment, or did you? That's what I'm asking.

DR. MAKHOLM: No, I didn't conclude to change the module that the board had already approved.

DR. HIGGIN: Okay.

DR. MAKHOLM: The fact that there was one there -- there wasn't one there in Alberta. We had to make one up. The fact that there was one here and the fact that the company thought it useful and wanted to continue with it was enough for me.

DR. HIGGIN: So the obvious question is that, with that, how does that affect the rate plan going forward, and particularly, how does it deal with the I minus X part of the rate plan? In other words, back to the old stretch factor question again, in Alberta because of that, they put a stretch factor, seemed to me to be linked to changes to the capital tracker. So that's the question to you.

DR. MAKHOLM: Correct, in the second-generation plan they linked the continuation of a stretch factor to the idea that the I minus X regime would apply to more things. It would envelop the capital module under an I minus X regime.

It is highly complex, which is the reason that I didn't -- and I'm not sure whether that complexity itself would pay, but I wasn't in that case; I wasn't asked to opine on that.

I project -- I propose a cost-of-service-based capital tracker, which is not too -- it is unlike the one that they've got here. It doesn't effect the X, but because there's been no regime change here of that type, that, to the extent that you brought up to stretch, it was relevant there but not here.

DR. HIGGIN: Not relevant here, that's what you say.

DR. MAKHOLM: Yes.

DR. HIGGIN: Okay. So you mentioned that we don't have a new regulatory regime here, and of course this brings into play the question of what is Amalco? Amalco is an amalgamation and consolidation. The regime is still price cap. That's what's being applied for. Doesn't that, though, introduce a new dimension to the future and the regulatory regime?

DR. MAKHOLM: You said "dimension." Sure. There is a new dimension as the company tries to -- the amalgamated company seeks to save the costs that the scale economies will allow it to save, but it doesn't affect its bargain or its regulatory regime. That dimension hasn't changed. The MAADs incentive to lower costs to benefit ratepayers applies to all the companies in this province, and -- but that doesn't affect the IRM. IRM -- excuse me, incremental -- is it IRM? I --

DR. HIGGIN: No, ICM or ACM --

DR. MAKHOLM: No, not -- I'm talking about -- bit. I apologize, but it doesn't affect that business.

DR. HIGGIN: Okay.

DR. MAKHOLM: It is pursuing another objective that has been encouraged by the province.

DR. HIGGIN: Thank you very much.

Madam Chair, those are my questions.

MS. ANDERSON: Thank you. And I believe, Mr. Brett, you are next for BOMA.

CROSS-EXAMINATION BY MR. BRETT:

MR. BRETT: Thank you, Madam Chair, Panel.

Dr. Makholm, in the Alberta case in which you were involved, the 2012 case, did you -- in your -- and you were -- in the material you prepared for the Board in that case, did you -- or otherwise during the case, did you take a position on the stretch factor?

DR. MAKHOLM: No.

MR. BRETT: You did not?

DR. MAKHOLM: No.

MR. BRETT: And did you discuss it in any detailed way or...

DR. MAKHOLM: No.

MR. BRETT: Okay. If you turn up, please -- I have a compendium, by the way. I hope everybody has it. I have --

MR. MILLAR: Perhaps we should mark this.

MR. BRETT: Does the panel have it, first of all?

MR. MILLAR: Do you have it at the dais? First we'll mark it as K4.3.

EXHIBIT NO. K4.3: BOMA CROSS-EXAMINATION COMPENDIUM FOR PANEL 4.

MR. BRETT: Does the Panel have it?

MS. ANDERSON: Yes.

MR. BRETT: Have each of you got a copy of it for the panel?

DR. MAKHOLM: Yes.

MR. BRETT: Could you turn up page 21 of the compendium, please. And this is an excerpt from that decision, from the case that you were involved with. And I just wanted to refer you briefly to --

DR. MAKHOLM: I think I might correct you there, excuse me, Mr. Brett. This -- unless I'm mistaken -- and I was mistaken, I'm sorry, starting on page 19 is my case. Before that was the later case. I stand corrected. I apologize for interrupting --

MR. BRETT: That's fine.

DR. MAKHOLM: -- please go forward.

MR. BRETT: Look at -- down at -- start with down at the paragraph 486 on -- that's on page 21. "Finally" -- the commission notes -- this is the Alberta commission: "Finally, the commission notes that the companies characterize the inclusion of a stretch factor (or lack thereof) as an alternative to an ESM. In this regard the commission agrees with NERA and intervenors, and although there is some trade -- that although there is some trade-off between an ESM and a stretch factor, they are not mutually exclusive. This is demonstrated by the fact that a number of PBR plans in North America have both of these components."

Now then -- and down on page 487 -- paragraph 487:

"In light of the above considerations, the commission agrees with EPCOR, Alta Gas, and the intervenors that a stretch factor should be part of PBR plans for Alberta companies."

Right? And that -- so the commission in this particular case said that a stretch factor should be part of the future PBR plans.

DR. MAKHOLM: Yes.

MR. BRETT: And then over at paragraph 515, which is every at page 27, the commission went on to say:

"Furthermore, as set out in section 6.5, the commission determined that a stretch factor of 0.2 percent will apply to the companies' PBR plans for the duration of the PBR term. Accordingly, the commission finds that the total X factor for the electric and gas distribution companies, inclusive of a stretch factor, will be 1.16 percent."

So that was their final decision on the X factor, right?

DR. MAKHOLM: Yes.

MR. BRETT: Now, the -- I want to look briefly at the next case, which is -- if you look at page -- I believe it's page -- page 7, I'm sorry.

If you look at page 7 of the compendium, and that's an excerpt from the second Alberta generic case, the December 16th case which Mr. Millar asked you about, I just want to briefly touch on this.

Turning over to page 7:

"The commission has determined an X factor..."

Well, let's go to the bottom, the last line in that paragraph.

"The commission finds that a reasonable X factor for the next generation PBR plans for the electric and gas distribution utilities, inclusive of a stretch factor, will be 0.3 percent."

So the commission set a stretch factor in the second generic plan, which will cover the Alberta gas and electric PBRs going forward, right?

DR. MAKHOLM: Yes.

MR. BRETT: And in your discussions with Mr. Millar, you basically said that the -- I think I heard you say that this is a new regime.

Mr. Millar asked you about the fact that this is not an initial -- an initial PBR term. First of all, I guess I should go back and just confirm that in the 2012 case, at that point in time, for the most part Alberta utilities, I take it, were on cost of service.

DR. MAKHOLM: Yes.

MR. BRETT: With the exception of Enmax, which was the old Calgary Electric, which had introduced a PBR plan in

2009, right?

DR. MAKHOLM: Correct.

MR. BRETT: Now, you were asked about the fact that this is a stretch factor which is put in place several years after what you call the transition from cost of service to a PBR. So you would -- on that basis, he asked you why that wouldn't run counter to giving your definition of a purpose of a stretch factor, which you discussed.

You said, well, effectively this is a change of regime. You said this is a wholesale change of regime, the 2016 plan, or rather the generic proposal being made by the companies -- and I guess being accepted by the Board -- not I guess -- and being accepted by the Board represents a stepped change in the regulatory regime because, as I heard it, the method for measuring capital had evolved, or had changed dramatic particularly.

But I've listened to your comments about moving to a tracker or a K-plan, and I don't understand -- why do you say that's a change in regime? Isn't that simply a change in how you're going to deal with capital costs within a PBR framework?

You know, I -- that doesn't strike me as moving to the level of a change in the regulatory compact. It strikes me as more simply a refinement of the PBR plan. Do you have a comment on that?

DR. MAKHOLM: Sure. You used the term "wholesale", with which I would quibble. I don't think I said --

MR. BRETT: Sorry, what was that?

DR. MAKHOLM: You said wholesale change in your question.

MR. BRETT: You've used different phrases -- all right. I may have said that, yes.

DR. MAKHOLM: Let me start there. I wouldn't say that I said that. But I will start by saying the AUC itself said that there was enough of a change -- enough of a new application of I minus X, in addition to the old I minus X, that justified their use of the stretch.

They knew, the AUC, that they're the ones that had been so definitive on polling the electorate of experts to determine that the consensus among them was that stretch was related to a transition.

And so the AUC knew, in my opinion, that it had -- if it wanted a stretch factor, to predicate it on an extension of the I minus X regime to include its new K-bar, and it did so. It said in its own decision -- its own opinion, that it was including the stretch factor, combined with the -- combined with the X, to make a .2 in consideration of having extended the I minus X to new territory. That's what their opinion is.

I agree with that justification, but it's their justification.

MR. BRETT: Well, actually what they seem to say in this -- back on page 7 is that the -- if I look at paragraph 169, this is the second decision now, the 2016 decision that we're talking about:

"The commission has determined an X factor, using

"... its judgment and expertise in weighing the evidence and in taking into account the multitude of considerations sets out above, in particular evidence demonstrating that the TFP growth value cannot be certainty be identified as a single number."

And it gives a range of minus 79 to plus 75, so they give themselves a good range of movement there. And then they say:

"The commission finds that a reasonable X factor for the next generation PBR plan for electric and gas distribution utilities in Alberta, inclusive of a stretch factor will be 0.3 percent."

So they do merge the two together, as was pointed out earlier.

But I don't see anything in that paragraph that ties their decision to any one factor. It seems to me they're talking about a whole range of -- they're saying we look at everything and we conclude that going forward, we should have a stretch factor for everybody of 0.3, or a combined X factor and stretch factor of 0.3 percent.

Is that not the case?

DR. MAKHOLM: No. The AUC explicitly in its order, as I cited in my testimony, predicated the continuation of the stretch factor on a greater reach of the I minus X regime, period. That's their justification.

MR. BRETT: And the greater reach that you are talking about is what? A change from -- let me go back half a step.

What was the -- the greater reach was the substitution of what they call a K-bar program for a capital tracker.

DR. MAKHOLM: K-bar program for a cost of service capital tracker.

The new K-bar requires the companies to take a recent trend -- I call it a back cast -- a recent trend of capital additions that could not otherwise be paid for with depreciation charges, and used that as a basis for an I minus X regime for what they used it applied to cost based capital trackers.

So they are taking the experience of each company as measured by its own data in the previous two or three years, and they are creating an expectation for how much new capital the company will need that will not be covered by I minus X in the basic rate base.

It is complicated. It's really complicated, and it hasn't yet been worked out in practice, but that was the expectation. They would take a cost-of-service tracker regime like the one we have here and change it to make an I minus X-based capital tracker regime. And as you can imagine, that's a pretty tall order, and that's --

MR. BRETT: But we...

DR. MAKHOLM: -- but that was the justification that they gave to extend the stretch factor into the second-generation plan.

MR. BRETT: And that sounds similar in some ways to the ICM concepts that we have in Ontario here. But --

DR. MAKHOLM: Not to me, Mr. Brett.

MR. BRETT: Not to you?

DR. MAKHOLM: No.

MR. BRETT: Do these individual capital pieces under the K-bar have to be applied for individually in the year in which the capital is going to be spent, or is this something that is given to them as part of the -- is it embedded in the formula itself?

DR. MAKHOLM: Both. They're two different kinds of new capital, tier 1 and tier 2 or type 1 and type 2. Type 1 is strangely idiosyncratic and unanticipated. That goes right into cost of service. Type 2, which was the expectation would be most of the capital tracker type stuff, would be applied to the K-bar that would I minus X those costs.

MR. BRETT: And in the previous -- well, I better move along here, because I want to stick within my time -- in the previous four years, the first set of -- the first set of PBRs that ensued after the 2012 decision, assuming there was a set of them, what capital tracker did they use, or did they have one at all?

DR. MAKHOLM: Oh, they all tracked capital, and they all -- the rates reflected the tracked capital during that period of time.

MR. BRETT: All right, so effectively they got the cost-of-service treatment of capital; is that what you're saying?

DR. MAKHOLM: Yes.

MR. BRETT: Let me just move on a little bit. What I'd like you to do is -- I want to ask you to -- perhaps we can do this without a reference, but if you need one I can give you one. The -- you had a -- you and I had a discussion at the technical conference about -- and this turns on what's a change in the regulatory compact and what is simply an adjustment to the current practice, and I had asked you about, as Roger -- Dr. Higgin did, isn't the merger -- isn't the merger a major change that would justify a -- that would justify a shift, and you said, no, it's not, but in the case of -- now, that's -- compare and contrast that with what you've said about this Alberta situation, and it seems to me your concept of transition is pretty elastic. You say the merger is not -- doesn't qualify as such an event, but a change in treatment of capital under an IMR does qualify -- IRM does qualify. Where do you draw the line here? I might say -- and perhaps, in fairness, I should give you a reference for -- well, let me try this on just for purposes of expediency, and I think if you need a reference I can probably give it to you, but in the technical conference we had a conversation -- I had a conversation with Mr. Rietdyk, of Union, and I think -- about productivity changes with the merger, and I think this has been mentioned a couple of times here in the proceeding this morning. One of the things that Mr. Rietdyk said was, Well, we pretty much run out of opportunities to increase the productivity of our two gas companies, and in order to really start afresh and have a new set of productivity opportunities we really must do this merger.

So he was making a point, I thought, that this was a quantum shift, that doing the merger would allow the two companies to tackle some remaining inefficiencies, and much of it has to do with back-office systems, amalgamating various kinds of computer systems, and amalgamating their customer-service computer systems; it is basically IT-driven, and it drives out a whole range of alleged savings.

Now, given that sort of a background, why is it that you would simply consider the merger -- as not a -- not an event that would qualify for a transition?

DR. MAKHOLM: Okay, I'll take that last question that by itself.

MR. BRETT: Fair enough.

DR. MAKHOLM: Because I -- that was a long question.

MR. BRETT: I agree.

DR. MAKHOLM: So let me just take the last one.

The basic regulatory compact was worked out in Canada and the United States over the course of decades, sort of ending with the Northwest Utilities decision and our Hope decision in the 1940s.

It was the basic protection for the capital that investors would put into the service of the public and be assured that the actions of regulators would allow them to get their money back with a reasonable return. That is the basic incentive regulation that drives us all.

The I minus X business was an innovation on top of the basic, what I have written about elsewhere as incentive regulation 1.0, the basic regulatory compact with the prudence part of it that allows customers to be served well with reasonable costs.

I minus X is regulation 2.0, a way that institutionalizes regulatory lag with the ability of costs to keep up with inflation, the decoupling costs from prices in order to incent new behaviour. I call it regulation -- incentive regulation 2.0.

Under 2.0, since the 19 -- since the early 2000s there has been a great deal of amalgamations and mergers among utilities, particularly in the States. We used to have 22 gas distributors in New England. Now I think we have four or five. None of those combinations that were pursued for the purpose of lowering costs or economies of scale had anything to do with regulation -- incentive regulation 1.0 or 2.0.

The same cost-of-service prudent-based standard of evaluating property, and it's the same -- if it's in Massachusetts -- I minus X-based plan for incentivizing extra good behaviour applied whether or not it was Boston Gas or whether it's National Grid Gas that envelopes the old Boston Gas with other companies. That did not change the nature of regulation, just the combination, just like these guys.

I don't see -- and in my experiences also that regulators don't see -- combinations between companies done for the purpose of lowering costs for the benefit of consumers to be a regulatory change. It is just a different change in operating the business under the same regulatory regime that they currently have. And that's my dividing line.

MR. BRETT: Let me ask you this: Could you -- and I'll have to, I think, give you a reference here. This is -- you want to look at -- this is in your evidence that you're filing, which is Exhibit B, tab 2, and you want to look at -- and I'm using the PBR numbers here. Well, no, let's look at page 17. Look at page 17 of your submission. I think this will get me what I need here. I'm not sure this is -- I'm not sure --

DR. MAKHOLM: We're looking at the screen at page 15 of -- that I have numbered.

MR. BRETT: What about page --- well, let's look at that and -- no, I want to ask you about the point that you -- where you make the point that -- it may be page 19. If we go to page 19, page 19 of the -- of your evidence, your study. We're on page 7 here. Oh, I see that's my page 7. All right. Yeah, okay, that's it. That's what I need.

If you look at A25, question and answer, okay? And I'm -- I want to just read a brief passage:

> "Indeed, the literature in using statistical techniques to gauge efficiency levels across different operations points to the usefulness of using such methods for gauging efficiency levels in the public sector, as contrasted with the private sector."

And we're talking here about the stretch factor, and you were -- and you were careful to observe in the next paragraph:

"The stretch factors that the OEB used for its third and fourth generation PBR plans, which I understand embody such benchmarking, are different than the type of stretch factors that I find the AUC discussed. The label stretch is the same, but the foundation and functions is different."

The question I wanted to hone-in on is that you seem to be saying -- my paraphrase -- that stretch factors are okay for OEB to use with electrics, because they have 79 of them and they have to figure out some way to regulate them. So they use stretch factors to categorize them into different levels of efficiency.

And then you also say,

"And by the way, they are more appropriate for public sector companies than private sector companies."

And my question for you is how -- where is your evidence, or what do you rely on to say that stretch factors should be more appropriately -- they are more appropriately used by public companies, not in the sense of publicly traded, but publicly owned companies but not by privately owned companies? What's behind that?

DR. MAKHOLM: Well, I studied the issue and I provided the footnotes for that.

Benchmarking, as you can imagine, is a fraught subject because it depends on whether or not what you are choosing to benchmark with something else has any commonality it something else.

MR. BRETT: I'm sorry, I may have misspoken. I was asking you about stretch factors in public versus private companies.

DR. MAKHOLM: All right, I'm answering that direct question, public versus private.

Look at the footnotes. I'm giving scholarly references to the -- to benchmarking that happens for public enterprises, schools or other public enterprises, as opposed to private enterprises of an idiosyncratic nature, like Union or Enbridge.

So in terms of what's my basis for my saying so, the basis was to say that there is scholarly support, two elements of which I cite, to support the OEB's use of benchmarking for the purpose of creating a sorting out high, medium, and low benchmarked electricity distributors in the context of those being public enterprises.

I was basically saying there is support in the literature for what the OEB is doing for those enterprises.

MR. BRETT: You didn't provide the support, though.

DR. MAKHOLM: I cited it right at the bottom of the page.

MR. BRETT: I read your footnote many times, and it is a reference to what looks like a European article on -- well, I can't tell whether it's European or North American.

But the footnote says:

"The frontier approach to the measurement of productivity and technical efficiency in economic issues."

That doesn't tell me whether that has anything to do with energy. That looks to me to be a very broad brush treatment of some theorist's view of public versus private -- public versus privately-owned companies and how they behave. And I just want to --

DR. MAKHOLM: You are right on that score, Mr. Brett, you're right. They had nothing to do with energy. It was just where benchmarking occurs with enterprises, it occurs most -- and most effectively, according to these scholars -- with public enterprises.

MR. BRETT: You are saying benchmarking again here now?

DR. MAKHOLM: Yes.

MR. BRETT: I'm saying stretch factor; my question is about stretch factor -- or maybe I should rephrase it a little bit.

Is that -- are you not -- let me just be sure that I am being fair to you, and fair to myself. Are you saying that stretch factors are more likely to be useful if they are used in publicly owned company relative to privately owned companies. I thought that was part of the case you're making.

DR. MAKHOLM: No. The question and answer 25, I tried to word very carefully so as to not let things get away.

And the question has to do with measuring productivity levels as opposed to productivity growth. And that's what the answer was designed to illustrate, was where out in the world do organizations, scholars, analysts measure productivity levels for the purposes of doing whatever -- stretch factor, or rewards, or staffing, whatever they happen to do.

Where in the world is productivity levels analysis -- where does it gain traction. And I've described that there for the purpose of supporting the Bard's use of what it does for benchmarking productivity levels, as opposed to the growth bit that I do, for its electricity distributors.

It was there to say and to support for that element of what the OEB does, in terms of basing its whole stretch business -- a word that I wish they hadn't used. I wish they had used another word. But it was there in support of the Board for what it does not electricity front.

MR. BRETT: All right. So you are aware that in Ontario, the LDCs, while they are publicly owned, are commercial operations, effectively? They are incorporated under the Canada Business Corporations Act; they are expected to earn a return on capital. They are treated as commercial corporations for purposes of regulation. Are you aware of that?

DR. MAKHOLM: Yes.

MR. BRETT: All right. And it doesn't change your answer at all?

DR. MAKHOLM: No. They are still owned by the public.

Whatever you call them, they are still owned by the public.
MR. BRETT: They are owned by -- and what does that mean?
DR. MAKHOLM: They are political subdivisions of Ontario.
MR. BRETT: No, they're not. They're separate corporations. Maybe I should be a little clearer.
In the United States, when you have publicly owned companies, you have rural co-ops or you have in certain cities -- I think I asked you this at the technical conference -- certain cities, the utilities are divisions of the council. They are divisions of the municipal corporations, right? Philadelphia, there are a number of them. They tend to be divisions of the government.
In this province, they're not. They are specifically by legislation required to incorporate separately, pay dividends, earn a return on capital, and they are treat for regulatory purposes as if they were privately-owned companies. There isn't a distinction made.
Do you get that?
DR. MAKHOLM: Except one, there are no private owners.
MR. BRETT: Sorry?
DR. MAKHOLM: Except the most important one. There are no investor-owned shareholders.
MR. BRETT: It doesn't matter.
DR. MAKHOLM: They do whatever they want, and there's no reason why.
MS. SPOEL: Don't argue. You are getting very

argumentative.

MR. BRETT: I'm not arguing; I am trying to just clarify the facts. The gentlemen is saying they can do whatever they want.

MS. SPOEL: That's his answer. You keep saying to him he's wrong. You are giving evidence if you say they can't. It is very argumentative.

MR. BRETT: Let me move on with one last question. On your --

MR. CASS: Could Dr. Makholm be allowed to finish the answer?

MR. BRETT: I thought he was finished.

DR. MAKHOLM: I only have two sentences to finish. And that is that I'm the most senior energy economist at the largest and oldest firm of consulting economists in the world.

I've seen public and private utilities on six continents, hundreds of them, and the most important dividing line between what we're talking about is whether there are investor-owners or not. And no matter how you characterize the corporation of a municipal distributor, if it doesn't have private investor owners, it's not of that type. And that's what I was trying to convey.

MR. BRETT: I looked at your -- at your submission of your experience in some detail with some interest, and I observed that of the 300 or so odd citations that you have provided for work you had done, with the exception of a handful, and I mean literally a handful, all of your work was for privately-owned businesses.

And I take from that that your -- I asked -- I'll put it this way to you. Have you had -- have you worked in -- for publicly -- public, in my sense, municipally-owned utilities, government-owned utilities, in your career?

I think I put to you in the technical conference the Bonneville Power, the Tennessee Valley Authority. We talked about rural co-ops. We talked about divisions of U.S. cities, city governments. And I didn't get the sense that you'd done work, any work -- or if so, very little work for these publicly-owned businesses.

DR. MAKHOLM: You saw that in my vitae that I did two major pieces of work for the State of Alaska, my client, against the owners of the Trans-Alaska oil pipeline, America's biggest crude-oil pipeline.

MR. BRETT: I see.

DR. MAKHOLM: And in fact, my work for the state of Alaska in the last case, which was a gigantic case, involved the largest imprudence disallowance in the FERC's history, pushed by the state of Alaska and two other oil companies, in the state of Alaska was my client.

It is not right to say that I only work for private companies. One of my largest assignments in 2017 and '18 is on a virtually constant basis of consulting for the federal regulatory commission in Mexico to determine all of the new regulatory open-access secondary market, tariff-making, and billing aspects of their new regulatory regime now that it is out from under the constitutional protection from competition.

When it comes to dealing with regulated enterprises, particularly when you look at a worldwide reach, since most of the regulated enterprises outside of North America started as public enterprises, a great deal of my work happens for public enterprises and governments, and in fact, of -- I just realized that I have to say that an important job of mine that I did in the 1990s in Australia, in Melbourne, was dealing with a publicly owned Gas and Fuel of Victoria, which is where I met one of the current vice-presidents of Amalco, when she worked at Gas and Fuel of Victoria. Much of my work around the world in the past 30 years has been for public enterprises.

MR. BRETT: Just one last question. In the list of companies that you used in your sample, or your population, as you put it, I looked through this list fairly carefully. I don't have the same level of knowledge of U.S. utilities that you do, but I have some, and of these, what are there, 72 companies here in total, I pick out about 10 or 11, between 10 and 12, that are what I'd call combination utilities, gas and electricity. There are no pure gas utilities, and there are -- the rest are electric utilities; is that about right? Is that a fair summary?

DR. MAKHOLM: That's fair.

MR. BRETT: Okay. Those are my questions. Thank you.

MS. ANDERSON: Okay, thank you. Then we'll take a one-hour lunch break and return with this panel. Thanks.

--- Luncheon recess taken at 12:35 p.m.

--- On resuming at 1:35 p.m.

MS. ANDERSON: I believe, Mr. Pollock, you are up next for CME.

CROSS-EXAMINATION BY MR. POLLOCK:

MR. POLLOCK: Thank you very much, Madam Chair.

Good afternoon to the witnesses. My name is Scott Pollack and I'm representing Canadian Manufacturers & Exporters.

I would like to begin a discussion ...

MS. ANDERSON: Mr. Pollock, could you turn your microphone up a bit? It's just --

MR. POLLOCK: Is this better?

MS. ANDERSON: Much better, definitely.

MR. POLLOCK: Excellent. Turning to question and answer number 24 -- and I won't refer to this just yet, but I wanted to have it in front of you to sort of prime our conversation.

And I'd like to discuss the merger and your definition of transitions, and I'm cognizant of the fact that you spoke with Mr. Brett earlier, so I'm going to explore in a different way.

The first thing that I'd like to discuss is the actual mechanics of what happens when you move from a cost-of-service regime to an incentive regime.

And as I understand it, the prime mover, the first thing that happens is the Board makes a regulatory decision to change regimes -- as you've called it, invoking PBR, correct?

DR. MAKHOLM: Yes.

MR. POLLOCK: As a result of that decision, there has been a disconnect between the previously-measured I minus X productivity factor, I will call it, and what you anticipate will be the actual number because there is this change in behaviour. Is that in the neighbourhood?

DR. MAKHOLM: Well, drop the I minus X productivity factor.

MR. POLLOCK: Okay.

DR. MAKHOLM: There is a disconnect between what you observed in terms of the company's performance prior and what you -- what you believe you will observe post.

MR. POLLOCK: Okay, so there is a disconnect between what happened before, and what you've been able to measure happened before, and what you think will happen going forward?

DR. MAKHOLM: Yes.

MR. POLLOCK: And then the vehicle that the regulator chooses to try and address that disconnect is the stretch factor that they use their regulatory judgment and to try to craft. Is that correct?

DR. MAKHOLM: That's a very good way to put it.

MR. POLLOCK: Thank you, I do try. So am I right in thinking that the actual achievement of the productivity gains is the product of two things. There is the motivation for the company companies to go out and get productivity gains, and there's productivity potential, i.e. there are gains to go and get. Is that fair?

DR. MAKHOLM: Is that one thing or two?

MR. POLLOCK: Well, in my mind, there would be two things. There would be the motivation to go and get them, and then there would have to exist some productivity that you are able to go and get once motivated.

DR. MAKHOLM: Okay.

MR. POLLOCK: Okay. So I just want to then compare that to the mechanics of what's going to happen in this proceeding.

So in this proceeding, the Board is once again the prime mover. They are going to make a decision on whether or not to approve the company's amalgamation, correct?

DR. MAKHOLM: I don't know the nature of that approval as such.

MR. POLLOCK: Fair enough. We'll leave it to the Board to figure out how they want to say it.

But the Board will make some sort of decision in this proceeding, correct?

DR. MAKHOLM: Yes.

MR. POLLOCK: And would you agree with me that there will then be a disconnect, not necessarily between the behaviours, but the results of what we have previously measured to be the productivity enhancements that the companies have gained and what we can expect going forward?

DR. MAKHOLM: No, not a regulatory disconnect, no. If the disconnect we were talking about in your previous question had to do with a change in the regulatory regime, that it those things that you discussed, those two things;

that's the same.

MR. POLLOCK: So am I right in thinking that absent the discussion of the regulatory context, that we -- in the previous several years of measurement, we can expect going forward there to be a very different productivity achievement on the part of the companies than has been previously the case?

DR. MAKHOLM: We don't know. There may be, to the extent that some economy of scale for this amalgamated company produces ratepayer benefits, yes. So for this company, that's the anticipation, that this will lower rates for consumers, and that's the salutary purpose for which they're pursuing this amalgamation.

MR. POLLOCK: So I guess you no doubt have anticipated me. But isn't it open to the Board to then try and anticipate -- in the same way that they've tried to use the stretch factors as a vehicle to anticipate the previous difference between what we observed and what we expect going forward, isn't it acceptable for the Board to use a stretch factor to try and anticipate the difference now between the previous results and the new results?

DR. MAKHOLM: This isn't friendly cross, is it? Because the answer to that question is no, that would be entirely elicit to try to anticipate what the benefits would be of a merger and then to take them.

That removes the incentive. The incentive on a well-founded I minus X regime is that you've got a new measure of unbundled -- of -- and timely movement in prices, uncoupled with more regulatory lag that permits the company to profit and keep it until the next rebasing.

And if you construe that and tilt it to say that in the judgment of the finders of fact here, they want to take those specific benefits away before they happen, to trash the incentive.

MR. POLLOCK: I wanted to pick up on one thing. I've seen in your testimony and again here, you've pointed out specific benefits. So am I to understand that one of, if not the only differentiating factor is in the change of regulatory regime, there's going to, say, be an unidentified basket of efficiencies and the X factor anticipates those unnamed efficiencies, whereas to take a specific efficiency and to anticipate that, is that the part of the dividing line?

DR. MAKHOLM: No.

MR. POLLOCK: So when you talk about applying it to a specific incentive, or behaviour that they go ahead with, why do you keep using "specific"? Why is that part of your answer in every case?

DR. MAKHOLM: That doesn't pertain to the dividing line.

It's true. You are right to point out that X stands for stuff that we can't name. Hence we use X, like the performance, X factor on TV; we don't know. But the regime is the decoupling and the lagged -- and the regulatory lag. That's the new regime; that's regulation 2.0.

We only fool around with X to see whether we can use

Stats Canada's inflation measures confidently.

That's the regime, and in that regime, there is no appropriation of efficiencies in advance, except for that thing called stretch, which is there only to reflect the transition as it's commonly understood.

We are not that specific or general. That's not part of the business.

MR. POLLOCK: Okay. I guess now with that answer, the issue that I'm having is why is it acceptable to anticipate some of the benefits in advance the first time, for the original stretch factor?

Still, it seems to me what you are doing is you're saying you are going to gain a bunch of efficiencies later on, at some point during the term, and right now we are going to take that from you, and we are going to give it to ratepayers.

So why is it okay the first time, but not the other times?

DR. MAKHOLM: Because adding -- as it's generally accepted and agreed among the experts, not just me, the changing from regulation 1.0, as I defined it this morning, to regulation 2.0 and institutionalizing regulatory lag with decoupling is a major change.

Ontario has done it. Alberta tried it at the same time, but they lost -- they lost the will to continue until Willie Grieve came back as the chairman of the AUC.

That change is big and important. It requires either legislation or agreement among the players. It's a big deal, but it's a big deal if it's based on principle. And the general agreement is that it will incent a new kind behaviour. It didn't show up in the old data, but we reasonably accept that it will show up in the new data. And that's why we have a stretch factor.

It is going from regulation 1.0 to 2.0 and the transition between the two.

MR. POLLOCK: Let me see if I can follow-up with you in terms of -- I think you said, and you can correct me if I'm wrong, but if you allow -- if you as the regulator take away the efficiencies that would be gained by a specific measure that's undertaken, you've destroyed or undermined the incentive. That's sort of the heart of what we're trying to do; is that a fair paraphrasing of what you were saying?

DR. MAKHOLM: Yes.

MR. POLLOCK: Isn't that only true if there's no incentive left? So I'll tell you what I mean: If you stand to gain, as an actual number, if we were all-knowing, if you stood to gain .5 percent every year, as efficiencies, and the stretch factor was only .3, wouldn't there still be an incentive to go and pursue the rest of that, because you would be better off than the alternative of not pursuing it. Isn't the incentive still there in that case?

DR. MAKHOLM: The premise of your question, Mr. Pollock, is incorrect.

MR. POLLOCK: Okay.

DR. MAKHOLM: The size of the X factor or the size of the X factor plus stretch has nothing to do with incentives. As the AUC described, I think fairly, it does transfer money from consumers to shareholders or from shareholders to consumers, but it doesn't affect the incentive. The incentive comes through the decoupling and the lag, not the size of the X factor. All we're trying to do is mimic what's happening in the world with the X bit, and in this case Lowry and I propose no X, in a world that's generally accepted stretch has a role to play, in the cusp of 1.0 to 2.0, but outside of that accepted role, I think it would be seen as opportunistic for these kinds of companies.

MR. POLLOCK: So I want to just explore a little this idea of the size of the stretch factor and its effect on the incentive.

So my understanding was, in your evidence earlier, if you had a bunch of productivity benefits that the company could achieve over the course of the term, that's the incentive. They get -- for the time they start the plan to the time they end the plan, they get to keep whatever efficiencies they've made, and that's what incents them, right?

DR. MAKHOLM: Within the context of earnings sharing and such, yes.

MR. POLLOCK: And my understanding was that if you took that away from them in advance then there would be no incentive, right?

DR. MAKHOLM: Well, would affect nothing at the margin, and that's where the incentive lies, is at the margin. Whatever happened in the proceeding, whatever the X, if stretch is decided as a result of this, if the company's faced during the time that this rebasing period is in effect with the ability to do something to save a buck, they have that incentive at the margin, whether they are in a hole or not, whether they are underearning or overearning, and so that's the incentive property of I minus X regulation. It happens at the margin.

And what we're discussing in terms of setting the size of an X or stretch factor involves deciding whether you are going to put the company -- where you're going to put the company in this hole to ladder --

MR. POLLOCK: Right.

DR. MAKHOLM: -- before they decide on the incremental benefits of pursuing some activity that could save them money.

MR. POLLOCK: All right, so I guess, just to sum that up, there is a world that's possible that there is a stretch factor, and they are still on the ladder, rather than in the hole, right?

DR. MAKHOLM: Ladder or hole, I'm -- I'm sorry, I'm responsible for the metaphor --

MR. POLLOCK: You can feel free to abandon it if you like.

DR. MAKHOLM: I'd like to abandon it.

MR. POLLOCK: Okay, we can try something else. Sorry, could you -- go ahead.

DR. MAKHOLM: At the end of this discussion, the incentives, the companies feel, at the margin, when a proposal comes up to save money, irrespective of whether there they are in the hole or on a ladder -- sorry.

MR. POLLOCK: We're back to the hole and the ladder?

DR. MAKHOLM: I see we are going back. But do you see -- I hope that that's clear enough.

MR. POLLOCK: I think I understand what you're saying, in terms of, the incentive exists, regardless of whether you are putting them behind the eight ball or not.

DR. MAKHOLM: Or have put them, conjunctively speaking.

MR. POLLOCK: But then the incentive exists regardless of whether there's an X factor, which was why I'm confused as to why you say to anticipate -- I think if we can go to question and answer 42 -- 32. Lines 7 and 8. Oh, sorry, one page down. You say at line 7:

> "But if the stretch factor is repurposed to be a way of trying to take those efficiencies before they happen then it will undermine the basis for incentive regulation."

And I guess my confusion comes about, if the X factor doesn't really change the incentive, if they are still incented to do it whether they are hole or ladder, why is this destroying the basis for incentive regulation?

DR. MAKHOLM: Focus on the word "basis."

MR. POLLOCK: Okay.

DR. MAKHOLM: Any regulation 2.0 regime, I minus X or equivalent, depends on the credibility of the regime to do what it said it was going to do. It depends on some objective credibility. And what I'm saying here, if you take something called stretch and for these companies use it just as a way to appropriate gains without -- that is just as a way of transferring money to consumers away from the company, in this case $400 million over the 10-year rebasing period, you are in this case -- forget the electrics -- undermining the credibility of the commitment to pursue this kind of I minus X regulation.

It is as if you took a term, not X, Z, or something, but invented a new term, and said that we, Ontario, for these two distributors are going to have a W term, and the W term is to -- something new that we are going to do to transfer money, even though we're calling it I minus X regulation, and in my experience, in front of regulators, for instance, like the AUC, credibility and consistency was the most important thing for them, and I think it's still important here to have a regime for these companies that's based on accepted principles, and that's our quibble about stretch.

MR. POLLOCK: And I guess this will my final question, because I'm conscious of my time. In terms of credibility and consistency, I believe Mr. Millar took to you a number of documents, including the previous plans that both utilities are under, and those would include, as I understood it, something approximating a stretch, correct?

DR. MAKHOLM: Yes.

MR. POLLOCK: Thank you. Those are my questions.

MS. ANDERSON: Thank you, Mr. Pollock.

I believe Mr. Shepherd is next.

MR. GARNER: No, I believe it's --

MS. ANDERSON: Do I have that right?

MR. GARNER: It's me.

MS. ANDERSON: Were you next? Oh, yes, sorry, I didn't see you at the end there. Sorry, Mr. Garner.

CROSS-EXAMINATION BY MR. GARNER:

MR. GARNER: Can you hear me, Madam Chair? I hope the panel can hear me.

Good afternoon, Mr. Makholm, my name is Mark Garner, and I'm a consultant with the Vulnerable Energy Consumers' Coalition, and in the vein of Dr. Higgin, I consider myself an economist, just not a very good one, and so I'm not going to ask you anything about depreciation in my cross-examination.

What I'd like to focus on is the issue of the stretch factor, like many people have, and I found your in-chief very helpful, by the way, where you went through it this morning, and maybe I can say it back to you just so I think I understand what you were saying.

The stretch factor in the TFP PBR framework that you are talking about has a specific meaning, and you've gone over this a few times, it seems to me, and that specific meaning is, it's to capture these anticipated efficiencies in the rate-making regime change, and we don't have to talk about how long that is, because you've discussed that too, but that's your definition of that term. You are saying it is very specific in your work; is that correct?

DR. MAKHOLM: Yes.

MR. GARNER: Right, and you went on to say, in the electricity area, the stretch factor is for a different purpose, and I think you said it might have been better described with a different word because it really isn't to the same -- to the same model or same framework. Is that correct also?

DR. MAKHOLM: In my opinion, it doesn't conform to the same term of art that is accepted elsewhere, yes.

MR. GARNER: Yeah, thank you. That's it. So I don't know if I should call that, from what you just said, just recently, to a W factor or an incentive factor, but can I just call that for electricity an incentive factor so as we go -- there is a difference between the stretch factor and this incentive factor that you and I can keep in our heads.

What I'm curious about that is I want to explore that difference a bit. But before I -- as I do, what I'd like to understand is a lot of the work you've been discussing also relies on -- or you've discussed on the Alberta Utilities Commission work.

Now, I'm not familiar with that work, that proceeding. But was that proceeding at all about utilities merging, or combining in any sense?

DR. MAKHOLM: It wasn't about it, but it didn't exclude any of that.

MR. GARNER: Well, was it an application for two utilities to merge? Let me put it that simply.
DR. MAKHOLM: No, it was not.
MR. GARNER: So the panel wasn't being asked the question: How does one deal with the stated productivity savings that will arise out of this merger, as the applicant themselves have now -- have put in their evidence.
It wasn't addressing that question at all in that proceeding, it was?
DR. MAKHOLM: No.
MR. GARNER: Thank you. Now, I was a little curious about the conversation that you had with Mr. Brett this morning. You were talking about -- now I'm going to talk about the incentive factor in electricity.
You were talking about electricity and the incentive factor, and the difference in electricity potential because of ownership -- municipal ownership, in this case -- and there was a little back and forth about what that meant.
I'm not really quite clear on how that has a bearing on an incentive factor or not. I mean, you were suggesting there is a meaning to that ownership and it affects those -- the use of, let's say, an incentive factor, not a stretch factor; is that what you are saying?
DR. MAKHOLM: I wasn't saying anything, I think, so specific.
All I was contending when I had the back and forth with Mr. Brett about ownership was that scholarship

supports levels benchmarking studies among public agencies. I didn't say energy. I just said public agencies.

And how that comes about, how you deal with incentives involved and so on, was not a part of that discussion on that point.

MR. GARNER: So am I to -- am I to draw any conclusions by the fact that in electricity, there is an incentive system with this municipal corporation that was discussed vis-a-vis looking at this utilities, privately owned utilities, that I should draw some sort of conclusion from that?

That's where I'm confused. What are you trying to tell me? Are you trying to tell me that the incentive factor might be different under a municipal ownership vis-a-vis a private ownership?

DR. MAKHOLM: I'd answer two ways. One, the incentives bearing on public owners as opposed to private owners is a big deal, and it's widely accepted.

If it weren't widely accepted, we wouldn't have had a worldwide wave of privatization that was started by Margaret Thatcher's government in the 1980s to pursue greater efficiency among privately owned enterprises transformed out of public enterprises.

That's a trend that is accepted broadly, way beyond Ontario.

MR. GARNER: Right.

DR. MAKHOLM: The other part of my answer has to do with what's going on with the particular incentives of the individual municipal distributors, whether they are corporatized or not. And I really don't have any opinion on those things.

MR. GARNER: Right. Can I -- just switching, I was looking at your CV; it is very impressive. But I did notice -- is this the first time you've appeared in front of the Ontario Energy Board?

DR. MAKHOLM: Yes.

MR. GARNER: Welcome. I hope you had no problem getting across the border.

DR. MAKHOLM: Don't get me started.

MR. GARNER: That's okay. If we're stopping economists, it may not be the worst thing, but...

The reason that I asked is after listening to that discussion with Mr. Brett is have you done work for Fortis, one of the Fortis companies out west in Canada?

DR. MAKHOLM: Yes. Fortis has been a client of mine in some major cases before the NEB.

MR. GARNER: Are you aware that Fortis is a shareholder in what's called a municipal -- you've described and people have described as municipal corporations in Ontario, these municipal utilities. Are you aware that they are an investor in some of those companies, some of those companies?

DR. MAKHOLM: Yes. I think they two they have two or three, including Algoma.

MR. GARNER: Right. Those companies do have private ownership. That's why I was wondering when you said --

when Mr. Brett was talking about the difference in Ontario, they do have private ownership in them. And I'm wondering why then your distinction is meaningful in Ontario.

DR. MAKHOLM: In my testimony, I said mostly municipal-owned, and that's still the case. There are two, or three, or four -- I forget the count -- that are owned by investors like Fortis. I think Fortis is the one.

But that does not change the nature of the regulatory burden having to deal with scores of electricity distributors in Ontario that this Board has to deal with.

MR. GARNER: So you say owned by Fortis; do you mean a hundred percent owned by Fortis?

DR. MAKHOLM: I don't know. I do know that there are some municipal distributors that have caps on other types of ownership, like pension funds, trustee organizations and others.

MR. GARNER: Right.

DR. MAKHOLM: And there are those handfuls, two, three or four, that as far as I understand, are wholly owned by Fortis.

MR. GARNER: Right, okay. Thank you, Madam Chair, those are my questions. Thank you, Dr. Makholm.

DR. MAKHOLM: Thank you.

MS. ANDERSON: Thank you. Now, Mr. Shepherd.

CROSS-EXAMINATION BY MR. SHEPHERD:

MR. SHEPHERD: Madam Chair, because I am vetting clean up, I have no compendium.

I do have a bunch of questions and I will try to stay within my 30 minutes, counting now.

MS. ANDERSON: 01 and counting.

MR. SHEPHERD: The first question, Dr. Makholm -- we talked at the technical conference.

The first question is -- I just wanted to clarify. In the second Alberta case, the most recent Alberta case, you were not involved, right?

DR. MAKHOLM: Correct.

MR. SHEPHERD: So the AUC did not come back to you for further work on that?

DR. MAKHOLM: That's correct.

MR. SHEPHERD: Is there any particular reason, or -- I'm just fishing here. I don't know.

DR. MAKHOLM: I had given them a data set and a plan and a method, and had told them that one of the reasons that I did that in the first case was they ought to be able to do it themselves in subsequent cases, given that there was no proprietary data, no transparent method. And my expectation was they can do that for themselves thereafter.

MR. SHEPHERD: So they didn't need you any more, basically.

DR. MAKHOLM: As far as I understand, they did not.

MR. SHEPHERD: Thank you. I want to talk -- you've talked a little bit about the purpose of stretch factors, and I want to step back one step and talk about something that you talked about a little earlier in cross-examination with Mr. Millar, the purpose of IRM itself.

And you said the purpose of IRM is to benefit ratepayers through promoting efficiency, right?

DR. MAKHOLM: Yes.

MR. SHEPHERD: And in fact, I think -- was it you, Mr. Kitchen, who agreed that the whole point of having a stretch -- of structuring your application the way it was was to show a benefit to the customers? Right?

MR. KITCHEN: Yes, in the end, there will be a benefit to the customers.

MR. SHEPHERD: All right. So if the purpose of a stretch factor is to share some of the benefits of IRM with customers, but you say that at this point, stretch factor -- there are no more benefits to get, the stretch factor doesn't have anything to capture, then why are we doing IRM?

DR. MAKHOLM: You're asking me?

MR. SHEPHERD: Yes.

DR. MAKHOLM: I don't agree with the premise of your question, Mr. Shepherd. First you said that the that the stretch factor was there to share the benefits of IRM. That gives it a much more heroic purpose than I ever would have agreed to.

Stretch factor is there at the cusp between regulation 1.0 and 2.0, and that's it for me. It's not there to share anything.

MR. SHEPHERD: What's the purpose of having it?

DR. MAKHOLM: The purpose of any incentive regulatory regime is to benefit consumers of public services.

MR. SHEPHERD: Why the stretch factor? What's the purpose of having it in the formula when you go from 1 to 2?

DR. MAKHOLM: It -- I mean I can go through this again if the Board would like me to. Otherwise I can refer to what took up a half hour this morning. I think I've been through that on the stand. It's your call.

MR. SHEPHERD: So you don't have an answer is what you're saying?

DR. MAKHOLM: I do have an answer, and I went through it at length this morning about the purpose of the stretch factor.

I hope you don't think I'm being cheeky, but I understand -- if you would like me to, I'll do it again.

MR. SHEPHERD: I am trying to get at something that is implicit in what you're saying. You're saying that once you are at this stage in the process where you're in the fourth generation, there are no incremental benefits to get.

That's what you've said. You've said that's the reason why you don't have a stretch factor.

DR. MAKHOLM: I'm sorry, that's not what I said. I didn't say there are no benefits to get. I said there's no role for the stretch at this fourth generation stage.

We still don't know what the company will do, either combined or separate, to create efficiencies to benefit ratepayers. That's the unknown future territory. They've talked about taking the low-hanging fruit. Great. They've taken the low-hanging fruit.

We can't predict the future. We don't know the technology that's going to happen in the future. We have a good idea. But where all the efficiencies are coming from, we're going to let them figure it out as their own management and staff come at them with new ideas and new formulas. We don't --

MR. SHEPHERD: How is that different from IRM?

DR. MAKHOLM: -- have to predict those, but that's why we have the length of the period that we do, to allow them with a ten-year rebasing to seek out ways of investing money and earning returns during that longer rebasing period than they would under a five-year rebasing period, but we don't have to identify what those are in order for the regime to do its job.

MR. SHEPHERD: Dr. Makholm, do you think we have a ten-year IRM period in Ontario?

DR. MAKHOLM: It is the rebasing period that they proposed.

MR. SHEPHERD: And do you think that applies to anybody who is not doing a merger? Do you know? I'm not asking you, Mr. Kitchen. I know you know.

MR. CASS: Well, Mr. Shepherd, I don't think he ever said or implied to any such thing. He just referred to the ten-year rebasing period that is proposed by the applicants in this case.

MR. SHEPHERD: Actually, what Dr. Makholm said is the reason why you have ten years instead of five is to get them more chance to get efficiencies. Isn't that right, Dr. Makholm?

DR. MAKHOLM: It's my understanding that that's the basis of the filing in this case and the questions before the Board.

MR. SHEPHERD: And you weren't aware that that only applies in Ontario in the case of a merger, were you?

DR. MAKHOLM: I don't know "applies". I know that it applies in this case. Applies generally, I'm not here to testify on.

MR. SHEPHERD: All right. What I'm trying to understand is this: Something happens as you go further into IRM in third- or fourth- or fifth-generation that I understood you to say there's less efficiency to get. Is that not what you're saying?

DR. MAKHOLM: That's not what I'm saying.

MR. SHEPHERD: Well, then if there is a stretch factor when you go from one to two, that transition, because there is efficiencies available and you want to share them, then why isn't that also the case when you are going from four to five?

DR. MAKHOLM: Because you've misconstrued my testimony.

MR. SHEPHERD: Okay.

DR. MAKHOLM: When you say "you want to share them", what does that mean? In my parlance, it means you want to share the efficiencies, so you rebase and capitalize those for the benefit of consumers. That's what the rebasing is for, to share all the accumulated salutary efficiency projects and money-saving activities that the company has engaged in over the respective ten-year rebasing period and you get those into rates when you rebase.

Now, there are a couple of other explicit sharings. There is the earnings sharing after the six years --

MR. SHEPHERD: Can I stop you for a second? I didn't ask you about sharing; I asked you about stretch factor.

DR. MAKHOLM: No, you had --

MR. SHEPHERD: No --

DR. MAKHOLM: -- "share" in your question, Mr. Shepherd --

MR. SHEPHERD: Well, you can't just pick a word; that's not how it works.

MR. CASS: Madam Chair, I don't think these questions are fair at all. Mr. Shepherd is asking questions about broad concepts and subjects, and Dr. Makholm is doing his best to respond. I think the answer was quite responsive to Mr. Shepherd's proposition about sharing with ratepayers.

MR. SHEPHERD: My proposition was the stretch factor is there to share with ratepayers. If it's not there to share the benefits with ratepayers, Dr. Makholm, what's it there for? Because that's what your evidence is.

DR. MAKHOLM: Well, I stand on my evidence. It's there to reflect the different incentives when you move to regulation 2.0.

MR. SHEPHERD: You said that a stretch -- that the I minus X formula doesn't incent the utility. I just heard you talking about that. So if it's not an incentive then what is it?

DR. MAKHOLM: It's to reflect the regime change.

MR. SHEPHERD: And the regime change then that -- you are reflecting the regime change by incenting or by sharing? What's the stretch factor for?

DR. MAKHOLM: As I said the first thing this morning, the stretch factor is to reflect the different incentives under a new regime that are not manifested in the data that we have for companies like these in the years before they had the new regime.

If we had data to look at over the course of 15 or 20 years that includes the varied incentives that come with a new regime, then we would assume then we would assume that the effects of those various incentives would be in those data that we would measure, but it's not in the period before we invoke regulation 2.0.

MR. SHEPHERD: Excellent.

DR. MAKHOLM: That's the nature of the stretch factor.

MR. SHEPHERD: Excellent.

DR. MAKHOLM: It's to bridge, going from one to the other.

MR. SHEPHERD: So basically, if you measure productivity under cost of service you won't capture the different incentives that exists under IRM, so you have to adjust for it with the stretch factor; is that right?

DR. MAKHOLM: It is an anticipatory move to reflect what you postulate, what the Board believes those data would have shown had they been dealing with a different incentive scheme all along.

MR. SHEPHERD: So my experience is that good companies can always do better, they can always find more efficiencies. Is that your experience too?

DR. MAKHOLM: I don't know any reason why I would question that statement.

MR. SHEPHERD: All right. So then if this Board concludes that one of the purposes of a stretch factor is to share in advance, to build in for the customers sharing of the benefits of the expected efficiencies, would you agree that a stretch factor is appropriate in this case, if that's the purpose of it?

DR. MAKHOLM: No.

MR. SHEPHERD: Okay, why not?

DR. MAKHOLM: I just told you my definition of stretch.

MR. SHEPHERD: I didn't ask that. I asked you, if this Board decides that a purpose is to share benefits, then would you agree a stretch factor does that?

DR. MAKHOLM: No. I would -- if asked that question, I would say I disagree with the premise of that question. I disagree with the premise of the repurposing of the stretch factor, and I talked about that in my testimony. I used that term, "repurpose." And if you repurpose the stretch factor, as you're hypothesizing, it's my writing in my testimony, I've written it down, that you project an undermining of the credibility of the regime. That's my opinion as I wrote it in my testimony.

MR. SHEPHERD: So -- and if I understand that thesis, it is, if you take away the efficiencies from the utility in advance, you're basically demotivating them to get the efficiencies; is that fair?

DR. MAKHOLM: That's a good way of putting it.

MR. SHEPHERD: Okay, but then you just said in response to my friend here that it doesn't matter whether you're down here or up there -- I'm not going to use hole and ladder -- it doesn't matter where you are. You are still incented to save the next bundle if it's available, right?

DR. MAKHOLM: But we went there with your friend, and it was -- it had to do with whether or not, whether in the hole or in the ladder, the ability to contemplate actually profiting from your innovations is there with a credible regime.

That's -- and that's why I said that repurposing the stretch factor for something different than it's accepted by the wider world of economists out there, and regulators, including the AUC, would undermine the basis for incentive regulation.

MR. SHEPHERD: So if you called it something else, if you called it a guaranteed earnings sharing, let's say -- in fact, utilities have done that -- if you called it that, that would be okay?

DR. MAKHOLM: What utilities have done that?

MR. SHEPHERD: There have been utilities in Ontario that have said we'll guarantee an earnings sharing. Hydro One does that all the time.

DR. MAKHOLM: As part of a settled practice, I presume.

MR. SHEPHERD: No, no, as part of the proposal.

DR. MAKHOLM: Well, it sounds like a settlement to me.

MR. SHEPHERD: I'm just telling you what they do.

DR. MAKHOLM: And so if a company decides to do such a thing, it is free for the company to do that. This company hasn't done that.

MR. SHEPHERD: That's -- sorry, I took you off on a tangent. My fault.

My question is: If you call it guaranteed earnings sharing, it is it now okay because it's not sullying the words "stretch factor"?

DR. MAKHOLM: If the effect is to, in a way other than the way that they've proposed already with their earnings-sharing, to do what the stretch factor proposes to do in this case, the .3 applied to a base for the ten years, which is worth $400 million to them, if there's something else that as a result of the end of this case, presages the removal of $400 million from them to ratepayers over the ten years, it doesn't matter what you call it.

MR. SHEPHERD: It is interesting you say $400 million dollars; that was my next question.

So if you do the math on 0.3, what you find is that it's $412 million over ten years. You knew that, right? I mean obviously you ...

DR. MAKHOLM: That's what I understand.

MR. SHEPHERD: Okay. So you're arguing all these reasons why you wouldn't want a stretch factor, but another possible reason is that you can't show $411 million of savings from stand-alone as the company has, that is benefit to customers, if you have a stretch factor in your assumptions, can you?

It's still a question for you, doctor.

DR. MAKHOLM: I don't know if that's a question. I don't talk about the outcome in this case.

MR. SHEPHERD: I'm putting to you, because you did know the $400 million number -- I'm putting to you that the reason why you're recommending no stretch factor is so that my friends here can claim they are giving a $411 million benefit to their customers, when in fact all they're doing is playing with the numbers, with your assistance. That's what I'm putting to you.

DR. MAKHOLM: I can't help you. I have no answer to that.

MR. SHEPHERD: So you are denying that that was the reason for your recommendation?

DR. MAKHOLM: I don't even understand your question.

MR. SHEPHERD: All right. I'll try it again. Your proposal to have no stretch factor is built into the company's forecast of revenues, both stand-alone and Amalco.

That forecast says there is $411 million of benefits to their customers built into the structure. Those benefits do not exist if there's a stretch factor. They are wiped out almost to the dime. I don't believe in coincidences. I'm asking you did you have a hand in that?

DR. MAKHOLM: I don't know what you're speaking about.

MR. SHEPHERD: All right. I'll move on.

I want to move to capital and I'll start with one-hoss shay, just because when I was in law school I was a big fan of Oliver Wendell Holmes until I learned more about him.

But nonetheless, there is -- I want to ask two questions about it, and I don't want to get into the details.

The first question is you were asked by Mr. Millar, I think, about whether there is a mathematical difference between one-hoss shay and geometric decay, in terms of the results of a TFP study, and you said you didn't know.

I would have thought that for you, who use the math all the time, you should know that if you keep everything the same, one-hoss shay will produce lower TFP. Is that not correct?

DR. MAKHOLM: That's not correct.

MR. SHEPHERD: It's not correct?

DR. MAKHOLM: No.

MR. SHEPHERD: Then the next thing I want to just talk about on one-hoss shay is -- one-hoss shay, the actual poem is about one carriage that falls a apart after it's a hundred years old. Until then, it's fine. And that's the concept that you are talking about.

But you are not dealing with single assets, are you?

Aren't you dealing with pools of assets?
DR. MAKHOLM: You are dealing with the summation of individual assets.
MR. SHEPHERD: Well -- and that's a pool of assets, right?
DR. MAKHOLM: No, it's the summation of individual assets.
MR. SHEPHERD: So in your work, you use probabilistic analysis, don't you?
DR. MAKHOLM: No.
MR. SHEPHERD: You don't use probabilistic analysis?
DR. MAKHOLM: Well, other than describing an average. Other than taking geometric means to construct an index number, the answer is no.
MR. SHEPHERD: So you wouldn't be aware, for example, that the expected useful life, the expected time when an asset dies, may be a particular time for a single asset. But for a whole body of assets, it's actually a curve, isn't it?
DR. MAKHOLM: I'm aware of that.
MR. SHEPHERD: And that curve exactly matches geometric decay, doesn't it? In fact, that's where it comes from, isn't it?
DR. MAKHOLM: No, not necessarily. No, advance accelerated techniques for depreciation can come from many places. But this has nothing to do with the way in which I created an index number for capital.
I mean, I don't care what those numbers show because

we have the pleasure with Form 1 data of calculating all additions and all retirements, the summation of both of those for every company for every year in the population.

So, we don't have to deal with hypothetical depreciation curves or geometric decay curves; that has nothing to with the creation of that index number.

That is one of the great benefits of using Form 1 data. We can -- we can treat assets as they're treated by the companies in real world. The truck stays on the job until the truck is retired. The pipe stays full and shipping gas until the pipe is withdrawn from service.

That's the way the actual assets work; that's the way the one-hoss shay method treats them when determining an index for productivity.

MR. SHEPHERD: And the thousand trucks in the Utility, they actually end their lives and are taken out of service on a parabel (sic), or whatever that's called, which roughly matches geometric decay, isn't that right?

DR. MAKHOLM: I'm not sure the pathway or the rough average.

MR. SHEPHERD: Right.

DR. MAKHOLM: I do know that trucks last different periods of time. But that doesn't trouble utilities and regulators, as long as the average retirement matches the expected period of time over which, for rate-making purposes, they're depreciated.

But that has nothing to do with my analysis.

MR. SHEPHERD: I'm still on the subject of capital.

You said in your -- when you were being cross-examined by Dr. Higgin, that ICM is a cost of service based capital tracker -- I actually have some checkmarks where you said that again and again.

That's right, right? The ICM model is basically a cost-of-service type of model?

DR. MAKHOLM: That's my understanding.

MR. SHEPHERD: Okay, good. And you also said that the purpose of having capital trackers -- of which ICM was one, right?

DR. MAKHOLM: Yes.

MR. SHEPHERD: Is that new territories that you are adding are further away, so they're more expensive to get to when you are adding customers, and new capital is more expensive -- and I assume you mean more expensive in real terms, not in nominal terms, right?

DR. MAKHOLM: In dollar terms.

MR. SHEPHERD: Okay. But if new capital is more expensive -- it is more expensive relative to inflation, that is it's inflated in cost exactly the same as inflation, then it shouldn't matter, right? That will be captured in your --

DR. MAKHOLM: What do you mean by it shouldn't matter?

MR. SHEPHERD: Because that will be captured in your IR term, right.

DR. MAKHOLM: No. I was giving example of why you would conclude that the I minus X formula applied to the current rate base of the company. It wouldn't produce number money for them to go out and do the things that the regulatory compact compels them to do, like look up customers who are due to be hooked up under their own line extension policy, or replace cast -- replace pipes or assets or facilities that have to be replaced.

It's just a well known fact that for a number of reasons, the new facilities cost more than the old facilities do, not just for inflation, but because new technology has better materials, and there are more permitting requirements, and there are zoning things that didn't come into play in 1950. There are all sorts of different reasons why maintaining, and adding to, and extending the reach of a gas distributor is more expensive on average than is reflected in the current rate base. Lots of reasons.

I only give a couple of examples. I did not mean to say that I covered the landscape.

MR. SHEPHERD: So you have evidence that new capital is systematically more expensive?

DR. MAKHOLM: Yes.

MR. SHEPHERD: Okay. Where?

DR. MAKHOLM: I was involved for Atco Gas in their tracker case to document those things.

MR. SHEPHERD: And you filed some evidence here that says that new capital is systematically more expensive for a gas utility in Ontario.

DR. MAKHOLM: No.

MR. SHEPHERD: You actually haven't looked at that,

have you?
DR. MAKHOLM: I have looked at that a great deal in General, but I haven't applied any testimony to this case. That will come up when the company files its ICM.
MR. SHEPHERD: So your --
DR. MAKHOLM: The Board will have the ability to evaluate those projects and determine their justness.
MR. SHEPHERD: So you are not giving an opinion on whether the proposed capital tracker here is appropriate, are you?
DR. MAKHOLM: I wasn't asked to judge the proposed capital tracker here, but it does serve a purpose that I think is useful in charting the cost of these areas.
MR. SHEPHERD: I'm sorry, you are an expert witness. Are you giving an opinion on the capital tracker or not? I thought it was a yes or no question.
DR. MAKHOLM: I -- and my answer is yes.
MR. SHEPHERD: Okay.
DR. MAKHOLM: Qualified the way I did it.
MR. SHEPHERD: Okay. And so where's the opinion in your evidence? Because I didn't see it.
MR. CASS: You just asked him for his opinion, Mr. Shepherd, and he gave it to you.
MR. SHEPHERD: No, I asked him whether he's -- as an expert witness he is giving an opinion on it, and he said yes.
MR. CASS: Yes.
MR. SHEPHERD: So that's the first time I've heard his

opinion.

MR. CASS: Well, you asked.

DR. MAKHOLM: I listed in the voir dire section of my testimony the projects that I'm talking about, including my work for ATCO and my work for Gaz Métro, having to do with extending its lines to its Saguenay and Eastern Township networks, which did involve raising their general average cost of their rate base to get there, having to do with the larger expense of extending to those townships than otherwise.

So I did put you on notice that I had done that work. Now, you didn't ask me for those testimonials, but you could have, and what they would have said was, as is generally known to be the case, and what fuels capital trackers everywhere, is that new stuff costs more on average per customer than old stuff does, and dealing with the new stuff being more expensive than the old stuff, which is what fuelled the adoption of my capital tracker proposal in AUC 1 and the new proposal at AUC 2, that's not something that's contradicted by the general vibe of incentive regulation; it's accepted.

MR. SHEPHERD: If it's not true in Ontario that new customers are more expensive to attach than old customers, then is it true that your theory is incorrect?

DR. MAKHOLM: No.

MR. SHEPHERD: In Ontario?

DR. MAKHOLM: The theory is the concept. Of course the answer to that is no. I -- it is sort of a silly question. To the extent that the new stuff is more costly than the old, they'll file the incremental capital module so that the Board can judge that for itself. It's an empirical question in this case. It is not a theory that I'm talking about; it is a concept, given the data that happens in the world. It is what fuels capital trackers everywhere.

MR. SHEPHERD: Here's where I'm going with this. The thing that I've never understood is if you look at TFP studies -- and I'm sure you've seen way more of them than I have, but I've seen dozens, sadly -- and in almost every case where they look at capital productivity and OM&A productivity, the capital productivity is worse. I actually haven't seen an example where that isn't true; is that your experience too?

DR. MAKHOLM: No.

MR. SHEPHERD: So you don't generally find that capital productivity is lower than OM&A productivity?

DR. MAKHOLM: No.

MR. SHEPHERD: Okay. So wasn't that true in your study?

DR. MAKHOLM: I don't believe so, but I never asked that question. That wasn't the point of my study.

MR. SHEPHERD: Okay.

DR. MAKHOLM: I gave everybody all the data, and if they wanted to do different things with it, they were perfectly willing to do so, but I never did those things.

MR. SHEPHERD: Well, in fact, Dr. Lowry took your data and he found that on your data capital productivity was much worse than OM&A productivity, right?

DR. MAKHOLM: I don't recall what he did with it in that respect.

MR. SHEPHERD: Here's why I'm asking that. That may well reflect what you are talking about; that is, capital has a tendency to end up being more expensive, and that would drive down productivity, right?

DR. MAKHOLM: I don't know what he did with my data in that respect. I wasn't interested. But to the extent that it takes more capital per MCF or per customer, as you expand and update gas distributorships, you would think that that would somehow come out in the wash.

MR. SHEPHERD: If we generally find, in Ontario, that capital productivity for gas is lower than for -- than OM&A productivity, if we generally find --

DR. MAKHOLM: If you what? What was the second thing?

MR. SHEPHERD: Lower than OM&A productivity.

DR. MAKHOLM: OM&A?

MR. SHEPHERD: Or operating productivity, if we generally find that, is it true then that that could be capturing the effect you are talking about, the reason why you have a capital tracker, which is that your capital is inherently costing more money every year; is that possible?

DR. MAKHOLM: It is possible, but I wouldn't ascribe any particular weight to it. It doesn't affect our rate-making.

MR. SHEPHERD: Well --

DR. MAKHOLM: I don't see why you would find that an important fact.

MR. SHEPHERD: Well, because from ratepayers' point of view, they feel like it's double-counting. They feel like you're getting -- you are building into the total factor productivity figure the negative or low capital productivity, and you are getting extra money for your capital. How is that fair?

DR. MAKHOLM: Well, it's nothing in it that's even a shade of double-counting. This company is not asking for anything other than the cost of serving the public, either in its rebasing or in its capital program. There's no double-counting in this respect. There is only counting. They are only adding it up. They are not adding it up more than once.

MR. SHEPHERD: Yeah, but that would actually be cost of service, wouldn't it?

DR. MAKHOLM: Well, that's what the rebasing is.

MR. SHEPHERD: Oh, you think there is a rebasing here?

DR. MAKHOLM: There will be a rebasing when this rebasing happens. Yes, there will be a rebasing at the end of the period that is specified in the request for this -- this proceeding.

MR. SHEPHERD: Well, we don't have one now, do we?

DR. MAKHOLM: No.

MR. SHEPHERD: So then how are they counting?

DR. MAKHOLM: How are they counting?

MR. SHEPHERD: Yeah, you said they are counting everything up --

DR. MAKHOLM: I said --

MR. SHEPHERD: -- counting up their cost, sorry, how is that?

DR. MAKHOLM: The -- I think you've misconstrued what I said, Mr. Shepherd. The -- and we were talking about costs and whether there was double-counting, and I said that rates, today's rates -- we're not the rebasing now, but they came from a rebasing. The company is proposing a rebasing in the future. Those are the adding up of costs; that's how we denominate the property that the owners have in this enterprise, and it is really important that we do it carefully, and during the period of time that -- before the next rebasing, the incremental capital module is there to record the necessary costs that these guys require to serve the public in the judgment of the Board to cover the incremental cost needed to do so.

In none of that is there a double-counting. It's only once.

MR. SHEPHERD: Have you looked at the ICM formula?

DR. MAKHOLM: Yes.

MR. SHEPHERD: And does it capture what you are talking about?

DR. MAKHOLM: I conclude that it does.

MR. SHEPHERD: So it captures only the costs that are incremental to your productivity study.

DR. MAKHOLM: That's my understanding, yes.

MR. SHEPHERD: And did you do analysis of that?

MS. ANDERSON: Mr. Shepherd, you are -- you are over your time. I just want to --

MR. SHEPHERD: This is my last question. Did you do a study of that?

DR. MAKHOLM: I read the incremental capital module and looked at the formula. It looks a little bit like -- it looks reasonably similar to the formula that I proposed for the AUC and AUC 1.

MR. SHEPHERD: So the answer is in terms of calculating whether that formula captures only the capital incremental to your productivity study, you didn't do that math, did you?

DR. MAKHOLM: Nothing is incremental to my productivity study. I never said anything incremental to my productivity study. I just said the cost I needed to serve the public under the regulatory compact that they live in. And that's the fuel for capital trackers, but there's nothing about them that is what you described to be a double-counting, in my opinion.

MR. SHEPHERD: Thank you, Madam Chair, for the indulgence.

MS. ANDERSON: With that, Mr. Cass, do you have any re-exam?

MR. CASS: I have a few questions, Madam Chair. Thank you.

RE-EXAMINATION BY MR. CASS:

MR. CASS: So panel, during Mr. Shepherd's cross-examination he was attempting to make a connection between the ratepayer benefit that the applicants have presented in evidence in this case of approximately $400 million and the approximately $400 million impact of a stretch factor being imposed.

Mr. Kitchen or Mr. Culbert, can you first of all explain, where did the calculation of the 400 and -- I think it's $11 million ratepayer benefit come from?

MR. CULBERT: The 400 and -- I think it's 410 million, 411, is from the no-harm test that appears in our evidence, and is basically the calculation of the comparison between a stand-alone Union and EGD operations and the Amalco under a price cap.

MR. CASS: And then where did the other 400 odd million figure come from being the impact of a 0.3 percent stretch factor?

MR. KITCHEN: We took the stretch factor that was proposed by Mr. Lowry at .3 percent, and did a calculation to determine what that was.

MR. CASS: Did you have that stretch factor proposed by Dr. Lowry at the time of calculating the other $400 million figure that you've referred to, the ratepayer benefit comparing the price cap scenario to the status quo scenario?

MR. KITCHEN: No, we did not.

MR. CASS: Just one other question. At the end of Mr. Pollock's cross-examination -- sorry, I'm just looking for my notes here -- there was a reference to what he referred to as approximating a stretch factor in the previous gas utility plans.

Can the panel, anybody on the panel, comment on this notion that there was something approximating a stretch factor in the previous gas utility plans, and what implications that would have in terms of a stretch factor for Amalco?

MR. KITCHEN: I can start with Union. When we negotiated the settlements that we are currently just wrapping up, we negotiated a 60 percent X factor as a percentage of inflation. And the way it was written in the settlement agreement was that that was an X factor inclusive of stretch.

When we used those words, from my perspective, that just means that there is no additional stretch to be added to the amount that was negotiated.

MR. CULBERT: For EGD, the conversation I had with -- I think it as with Mr. Millar, in the Board's decision in the custom IR application, the Board reached a conclusion that it was imputing some further productivities and used the word "stretch" implicit in that productivity.

So in effect, when they approved the custom IR application, they disassociated the rates that we were getting from our forecast of cost with the inclusion of a productivity factor and, in their view, inclusive of a stretch factor.

Whether our evidence suggested there was a stretch included, like I've said, I would have to check our evidence to be sure of that.

I know we included productivities embedded in our application.

MR. CASS: And, Dr. Makholm, does that tell us anything about the stretch factor for Amalco?

DR. MAKHOLM: Not to me.

MR. CASS: Thank you, Madam Chair, that's my re-examination.

MS. ANDERSON: Thank you. We'll take five minutes to -- yes?

MR. SHEPHERD: I'm sorry, I have a procedural request.

MS. ANDERSON: Okay.

MR. SHEPHERD: The question has been raised whether -- I raised the question whether the two 400 millions are the same.

This will come back up when the -- when panel 1 returns, because obviously they'll be talking about their results and the $400 million benefit.

I wonder whether it would be helpful to the panel if the applicants took FRPO 11, which has all those calculations in it, and reran them with a 0.3 stretch factor on both sides where you would have a stretch factor.

We don't have the live versions of those. I don't believe we do. I think we have just dead versions, and I wonder if it would be helpful to see what the result is.

MS. ANDERSON: Okay. I'm not understanding the FRPO reference.

MR. SHEPHERD: Sorry, FRPO 11 is the response that has all of the calculations and assumptions that lead to the

$411,000,000 ratepayer benefit.

MS. ANDERSON: I think we'll take five and get the new panel coming, and then we'll come back.

--- Recess taken at 2:40 p.m.

--- On resuming at 2:49 p.m.

MS. ANDERSON: Mr. Millar, I look to you.

MR. MILLAR: Yes, thank you, Madam Chair. Good afternoon. We are pleased to present Dr. Mark Lowry to present his testimony. Perhaps we could have him affirmed.

OEB STAFF - PANEL 1

Mark Lowry; Affirmed.

MS. ANDERSON: Mr. Millar.

MR. MILLAR: Thank you, Ms. Spoel, Madam Chair. I will be seeking to have Dr. Lowry qualified as an expert in regulatory economics and incentive regulation plans and in particular total factor productivity. I've canvassed my friends, and I understand there are no objections to that, so I propose to go through this relatively quickly.

Dr. Lowry's CV is attached to his report, which is filed as Exhibit M1, and I think we see it there on the screen now.

Dr. Lowry is well-known to the Board. He has been qualified as an expert here and testified in several proceedings before the Board. Elsewhere he has been qualified and given testimony in more than 30 proceedings on TFP and related issues. He has also published widely on the topic, and all of that is contained in his CV, but I don't propose to go through it all unless it would be of assistance to the Panel or if there is some objection that I'm not expecting.

So with that, I'm asking that he be qualified as an expert in regulatory economics and incentive regulation plans with a particular focus on total factor productivity.

MS. ANDERSON: Okay. I see no objections. We agree.

EXAMINATION-IN-CHIEF BY MR. MILLAR:

MR. MILLAR: Okay, thank you.

Good afternoon, Dr. Lowry. You prepared the report that was filed by Board Staff and has been labelled Exhibit M1?

DR. LOWRY: Yes.

MR. MILLAR: Have there been -- and this report was prepared you or under your supervision?

DR. LOWRY: I'm sorry?

MR. MILLAR: This report was prepared --

DR. LOWRY: Yes.

MR. MILLAR: -- by you or under your submission?

DR. LOWRY: Yes.

MR. MILLAR: And are there or have there been any corrections that you need to make to your report?

DR. LOWRY: Yes, there was a round of errata that was distributed to the party, and this, in turn, required some revisions to our responses to some information requests that had referred to the original research, so that is all noted -- hereby noted.

DR. MILLAR: And did any of these errata or changes change the conclusions to your report?

DR. LOWRY: No.

MR. MILLAR: Okay. You also -- you referenced the interrogatory questions. You either prepared the responses or they were prepared under your supervision?

DR. LOWRY: Yes.

MR. MILLAR: And other than the changes we just discussed there are no further changes?

DR. LOWRY: No.

MR. MILLAR: And you adopt all of this as your evidence in this proceeding?

DR. LOWRY: Yes, I do.

MR. MILLAR: Okay. Thank you.

Dr. Lowry, we just have a few minutes for you to provide a high-level summary of your report. I am wondering if you could start with a summary of your analysis, conclusions, with respect to the productivity factor.

DR. LOWRY: Okay. Well, as we all know by now, the applications hired Dr. Jeff Makholm, senior vice-president, NERA, to provide X factor testimony in this proceeding.

Dr. Makholm has done a number of past productivity studies, and he's also generally known to provide reasonable productivity factor recommendations in IR proceedings.

That said, NERA's evidence is problematic in several respects that should, in my opinion, be brought to the Board's attention.

Number one, they made a pretty big mistake when they estimated the TFP trends of Enbridge and Union, and I'll discuss this a little bit more later on.

Secondly, they prepared a study of productivity trends of U.S. energy distributors, and this study is also problematic in ways that the Board should be aware of.

I'll start just by saying that the study is not, in my opinion, very relevant. The study addressed the productivity of U.S. electric utilities in the provision of power distribution services, whereas the applicants provide gas distribution services and also transmission and storage services. All gas costs were removed from the study for the few utilities that provide both gas and electric services.

Now, it could be a necessary evil to entertain a power distribution productivity study if good data were not available to measure gas productivity, but, in fact, there is good data available for this purpose.

Now, Dr. Makholm noted this morning that this data is provided to state commissions and not to a single federal regulatory agency, and that is true, but what he didn't say is that these studies use the FERC Form 2 as their template, and this is the template for interstate pipeline companies in the United States, and many interstate pipeline companies, incidentally, provide gas distribution, some gas distribution services, and so therefore it's a very satisfactory basis for a productivity study.

Now, this being the case, numerous gas utilities over the years have submitted gas utility productivity studies in IRM proceedings like this one, and we need look no farther than Enbridge Gas Distribution that has done it on two separate occasions, once by the Brattle Group and once by Concentric Energy Advisors.

Another concern I have about the relevance of this study is that it excluded costs of administration and of customer services, such as billing, metering and billing. Actually, possible that the metering was included, but the customer care services were excluded, and this is unfortunate, because these are certainly important costs of the applicants, as well as the fact that in a merger situation, these are the principal areas where merger savings are likely to come from.

Now, NERA, however, has provided these costs in earlier studies. They did. I believe that they took them out when they were doing the study for Alberta, because Alberta utilities, peculiarly, do not provide the full range of customer services, but in prior studies I believe that they had included these studies.

And lastly, as Dr. Makholm mentioned right before he left the witness stand, there is no evidence provided on the productivity of OM&A and capital input separately, and it turns out that this is quite relevant to this particular proceeding.

Now, the study is also problematic in that it shows a marked decline in the TFP of U.S. power distributors after 2000, and this means that the results are extremely sensitive to the choice of a sample period.

Several utility witnesses have seized upon this opportunity to embrace Dr. Makholm's -- NERA's methodology, but have argued that a truncated sample period be used, say one starting around the year 2000, that would produce a productivity trend of around negative 1 percent.

And in my opinion, if this study is embraced uncritically by the Board in this proceeding, you can look forward to seeing the same strategy play out in a prospective fifth-generation IRM proceeding here in Ontario.

Now, the study also uses problematic methods, and to ease the Board's review of these I've tried to talk about the important issues and the numerous issues that aren't so important, and today I just want to focus on two issues that do matter quite a bit, and one is the volumetric output index that NERA uses.

As I explained in section 3 of my report, when a productivity index uses a volumetric output index, the results are very sensitive to the trend in the average use of energy by the residential and commercial customers of the distributor.

And as it happened, there was a very sharp change in this trend for U.S. power distributors around the year 2000. And this, indeed, is the very reason for the dramatic decline -- principal reason for the dramatic decline in productivity growth that is found using the NERA methodology.

Now, here again, if this was just part of a reality we would all have to deal with that would be one thing, but in fact the applicants have proposed a continuation of the normalized average consumption or average use adjustments that they have had in their previous IRMs, and so they are essentially a separate rate-making treatment for the trend in residential and commercial average use.

In my opinion, therefore, in view of the fact that they have these provisions in their plans, the appropriate output measure to use in this study should have been the number of customers served.

Now, the second concern I have is about the one-hoss shay method, and there has already been a fair bit of conversation about this where the idea of one-hoss shay is that when you invest in an asset, it provides a constant flow of services until it is retired, sort of like a light bulb.

And I would note, first of all, that two utility witnesses have in the past touted the benefits of a one-hoss shay approach. And in each case, the Board went out of its way to provide some push back, most recently in the hydroelectric generation proceeding where this was proposed by London Economics. And the Board said on that occasion that it felt that it was not reasonable to assume a constant service flow from electric utility assets.

Now, there are many other arguments against one-hoss shay, as there are some arguments against geometric decay, which is the one that I've used in this proceeding, and I wanted to focus here today and in the report emphasize that my biggest concern about its use in an application to power distribution is just that it is hard to do accurately. Because capital quantity depends on the quantity of retirements and the practitioner measuring the productivity has data from the FERC Form 1, in his case, for the value of retirements. But he does not know the age of the retirements. So he has to come up with an assumption about the average service life.

The lower is the average service life, the slower is the productivity growth.

Now, NERA assumed a 33-year average service life and I have provided evidence in this proceeding from three different sources to show that this is an unrealistically low number.

For one thing, the companies have average service lives of around 37 years. We did a survey of power distributor testimony in recent proceedings which showed that the average service life was typically around 44 years. And then we did our own calculation using retirements data of the average service life that seems to be implicit in retirements. And all of them pointed to an average service life that was well above 33 years.

Now, for these and other reasons, the one-hoss shay approach to measuring capital quantities is not widely used. It is not just a matter of situations where retirement data is unknown. In utility X factor calibration studies, the one-hoss shay has been more the exception than the rule, except recently when the result came out about this negative productivity trend that has incented a number of utility witnesses to suddenly embrace this method.

To give you examples of studies that did not use one-hoss shay are the two studies that were previously done by Enbridge Gas Distribution witnesses, both of which used the geometric decay approach.

Now, I was also asked to provide some independent calculations on the productivity issues, and so the first thing I did was try to correct for the error that I mentioned before in Dr. Makholm's results. And it did show that for one utility, it didn't matter very much. But for the other utility, there was a substantial increase in the estimated total factor productivity trend.

But equally of interest, in my opinion, was the fact that my study did break down the OM&A and capital productivity of Enbridge and Union, and showed that the productivity trends -- the OM&A productivity trends of both of them were in the neighbourhood of one percent. They are proposing the zero percent, but the OM&A productivity that they've actually realized is more like one percent.

Now, I also endeavoured to test the sensitivity of some of Dr. Makholm's methods, and I showed that if you use a more appropriate average service life assumption and use the number of customers as the measure of output and make a few other small changes, but otherwise stick with his general approach -- that I might say is doing one-hoss shay more correctly -- the estimated productivity trend since the year 2000 rose from negative 1.21 percent to positive 0.49 percent.

I also estimated the productivity of a large sample of U.S. gas utilities using the sort of data that we were discussing earlier, and actually found there that the productivity trend was a little less than one percent on average for the utilities in the study. It was actually negative 0.23 percent.

But I also found that the productivity of OM&A inputs was much more rapid than the productivity of capital inputs. OM&A productivity was averaged a 0.88 percent growth, whereas capital productivity averaged a 0.98 percent decline.

MR. MILLAR: Thank you, Dr. Lowry. We're almost at the end of our time for examination in-chief. Could I ask you to very quickly go over your conclusions with respect to the stretch factor, and I think we'll have to leave it at that?

DR. LOWRY: Okay. Well, the applicants propose zero percent, and Dr. Makholm supports this by arguing that stretch factors are -- well, I thought his argument was only warranted in first generation IR. But actually what he said when asked that question was what the Alberta commission thought of that issue, and that is their opinion.

I will say, based on my experience, that there is no consensus at all amongst regulators or regulatory economists that a stretch factor is only for the purposes of sharing the benefits of the initial introduction of PBR.

There are in fact several good reasons to continue stretch factors in subsequent plans. For example, utilities are not necessarily efficient after one or two or three plans. For example, Enbridge Gas Distribution has had negative productivity growth since the year 2000.

Utilities in productivity samples generally do not operate under PBR, so taking an average of their trends is not necessarily a good target for the applicants.

Finally, when a product -- a stretch factor is linked to a benchmarking study, there is definitely an incentive impact of having the stretch factor mechanisms, as the Board has said itself in past decisions.

And I would add to this that this impact is especially big on investor-owned utilities. I mean, if there is one problem with the regulation of publicly-owned utilities it's that oftentimes they are not very responsive to the incentives.

For these reasons, many regulators, in addition to the Ontario Energy Board, use stretch factors in second, third and fourth generation plans. And in addition to British Columbia, I would also emphasize the state of Massachusetts where Dr. Makholm lives recently approved a stretch factor for Eversource Energy.

Lastly, I would just note that one of the arguments against linking stretch factors to benchmarking studies that has been raised in this proceeding is whether or not you can count on the results of a statistical benchmarking study. And I would just note in this regard that I have twice testified on behalf of Enbridge Gas Distribution on productivity studies in their rate applications.

MR. MILLAR: Thank you very much, Dr. Lowry. I think, unfortunately, that brings us to the end of our time.

Madam Chair, Dr. Lowry is now available for cross-examination.

MS. ANDERSON: Thank you. Dr. Higgin, I think you are first.

DR. HIGGIN: Thank you, Madam Chair.

I'll still be using our compendium, and my references and so on start at page 20, and the extracts and so on that I will be using with Dr. Lowry follow that in the last part of the compendium.

So it starts at page 20, panel 5, and that's what I'll be using with Dr. Lowry. I'm just waiting until everybody has that.

MS. ANDERSON: I didn't hear what you said.

DR. HIGGIN: I'm just waiting until everybody has it. I can see everybody shuffling papers.

MS. ANDERSON: It is up on the screen, so I would proceed.

CROSS-EXAMINATION BY DR. HIGGIN:

DR. HIGGIN: Okay. Thank you. So good afternoon, Dr. Lowry.

DR. LOWRY: Good afternoon.

DR. HIGGIN: As you know, I am Roger Higgin for -- consultant to Energy Probe, and as you would know, we've crossed paths many times in the past and still do in other places such as Quebec, so nice to see you here.

So I would like to have some -- talk to you about some questions that I have, both arising from your report and evidence but also, without going into big criticisms of the NERA report, how things link into their study. Okay?

So the topics I've hoped to cover with you quickly in this period is these follow-ons, and they're on the page 20 of the compendium, and those are the areas that I'll be exploring with you. Okay?

So the first area is just a bit of information about your retainer, then about your sample of utilities compared to, for example, NERA, and then some questions about cost of service versus IRM PBR regulation. So that's the first topic.

So first about the retainer, so can you confirm whether you were retained and Pacific Economics LLC by Board Staff before or after the rate-setting application had been filed and the supporting NERA TFP study? That would be somewhere around November. Did your retainer be before that or did it follow that?

DR. LOWRY: You know, I confessedly do not remember. I mean, that as matter of semi-public record, whether it was known or not at the time.

DR. HIGGIN: Yes, the implication here -- and I'm just going to go to my next question -- is: So was that retainer directly related to the applicant's rate proposal and NERA study; i.e., that was the framework that you were provided to work with or -- this is important -- were you given latitude to do a study of gas utility TFP and benchmarking, as you have done for the Ontario electricity distribution industry?

DR. LOWRY: Well, I recollect that we were -- I mean, the way this usually works is that my main charge is to review the empirical evidence and then to provide independent evidence to the extent required. And in this case, after a while it was decided that there was need for a gas productivity study. There certainly was no need for an electric study, but there was deemed to be some need to show the sensitivity of the NERA study to some of the assumptions that they use and some of the specifications that they have.

So there was envisioned as a very good chance that I would need to provide some sort of supplemental evidence, and then they decided that that supplemental evidence would take the form of a gas study.

DR. HIGGIN: Right, so just to clarify, that was a TFP-based study, as opposed to one that included benchmarking?

DR. LOWRY: Well, that's right, that's -- benchmarking is a whole 'nother can of worms --

DR. HIGGIN: Yes.

DR. LOWRY: -- often very helpful to have the cooperation of the utility, and was never envisioned, I believe, for -- it was never considered an option.

DR. HIGGIN: Okay, I just wanted to clarify the framework that you were working with.

DR. LOWRY: So I was telling you other planned provisions, did I -- just to make sure I mention that I was asked to review other planned provisions.

DR. HIGGIN: Okay. Thank you.

So the next question relates to your sample of utilities, and I think you covered this in-chief, but just to be clear, between the two samples can you just summarize your study sample and NERA's in layman's terms and what was included in the two samples, please.

DR. LOWRY: Well, we try, when we do a study like this, to have as big a sample as practicable. Sometimes cost considerations enter in. There are some problems that need to be fixing, and don't have time or possibly funding for them, but we have, in this study, a, you know, a rather large sample, a rather diverse sample, that includes some smaller utilities as well as most of the larger U.S. utilities.

Now, we do the same thing when we do a power distribution study, and our -- I don't know -- Dr. -- I've heard Dr. Makholm say this afternoon that his was the, pretty much the universe of study -- of companies for which there's data, but our sample for power distribution is considerably larger than his. I'm not sure why, but we -- and may I say that when we expanded our sample a few years back we found that the productivity trend of power distributors was slower than we used to think, and we've stuck with the results for the larger sample ever since because there was no good reason to exclude them.

DR. HIGGIN: Just to confirm, your sample was based on state-regulated gas utilities?

DR. LOWRY: The gas one was based on applications to state commissions that usually use the FERC Form 2 as a template. They are very, very similar from state to state.

DR. HIGGIN: Thank you. Thank you for those responses.

Now, I asked Dr. Makholm about the NERA study as it related to the sample and cost of service versus IRM regulation.

The premise that I have there is that under PBR IRM utilities are expected to show productivity growth relative to the economy. Therefore, the average productivity growth rate for that -- for an industry sample that had a lot of PBR-regulated would be different to a cost-of-service sample. That was the premise.

So just to clarify, that factor was not taken into account in the samples as to how many of the utilities were on cost of service and how many were on PBR IRM.

DR. LOWRY: That's right, and most -- of course, most of the utilities in the United States are not under an IRM for power distribution. It is more common for vertically-integrated utilities, but not for power distributors, and part of the reason is that they look at what you've all had to deal with here about, well, what is the future cost trajectory of power distributors and gas distributors, and people are asking for -- it just so happens that now they need a whole bunch of extra money, and this has been -- given a lot of American regulators pause.

So most of them are cost of service, and to me that's one of the arguments for a stretch factor, is that this -- the sample that you are using as your peers are mostly companies operating under cost-of-service regulation. In the case of gas, many of them also have these capital cost trackers that are weakening their incentives to contain their capital spending in recent years, and indeed you see evidence of that in my data.

DR. HIGGIN: Okay, thank you very much.

Now, can you agree with me that -- if this is correct or not? It seems to us that for the Ontario gas sector, that leaving aside all of the differences in methodology, the evidence seems to come forward suggesting that for Union and EGD, after two, three generations of IRM, at least for O&M, operating and maintenance, costs have reached the point of matching economy-wide increases.

And that's where we are now after -- at this point, with this going forward.

DR. LOWRY: So in Table 4A of my revised evidence, I have evidence on the corrected productivity trends of Enbridge and Union, and I think it is best to use the number of customers as the output measure for that, and you see that the -- since 2000 the productivity -- O&M productivity growth of Union as 1.15 percent and that for Enbridge is 0.88 percent, and those are both pretty similar to the nationwide O&M productivity trend, the numbers for

Union being a little above it.

Now, when you see the Enbridge numbers, put a little bit of an asterisk by that, because during that period they had -- often had very brisk customer growth that would provide unusual opportunities for economies of scale, so that kind of means that maybe, you know, their trend was even a little less than it could have been, but my results also show that in the years prior to 2001, there was a -- they'd had very brisk O&M productivity growth as well, and that's very consistent with the statistical benchmarking study that I did for the company back around 2004, that they'd gotten to the point of being a pretty good O&M cost performer.

DR. HIGGIN: Thank you for that explanation. Now my next topic is the output quantity index used for the TFP analysis. Perhaps you could turn up page 21 of the compendium.

I know this was covered in your in-chief, so I won't -- I've reduced my questions on this. So this exhibit is a response on that topic from you to EGD/Union. This is what this exhibit is about, confirmed?

DR. LOWRY: Yes.

DR. HIGGIN: And I just want to talk about the last piece of this page, the last three lines, and if you could perhaps indicate to us what seems to be some conditional acceptance, I'll use that word, that revenue per customer cap plans, number of customers, that seems to be some distinction that is being used for -- depending on the type of regulatory scheme. Would you like to comment on that?

DR. LOWRY: Yes. The discussion here was about whether or not you should customize productivity results depending upon the application.

Now, in contrast to Dr. Makholm, I've long been an advocate of a more customized approach, and I would use one output index for a price cap perhaps, and another for a revenue cap.

So I had commented on that in this proceeding and they basically agreed -- and actually, Dr. Makholm also agreed that basically for a revenue cap, particularly if it was a revenue per customer type of cap, that the number of customers was the proper output measure.

Now, the issue before the Board is, well, what about if you have a separate normalized average consumption adjustment. And my math that I showed in section 3 of my testimony was to make the point that yes, the same applies to this type of IRM that the company is proposing, that the number of customers would be appropriate to use to measure output.

DR. HIGGIN: Okay, thank you. That's exactly where I was next going to go to get clarification on, and that is

if we could turn up to page 23 of the -- of the -- no, I'm sorry, it should be page 22, and there is a section highlighted there. This is from your report.

I just want to understand the connection here, and what changes. So it says here, if -- if, a conditional if -- the OEB approves the normalized average use adjustments and LRAMs that the companies have proposed, then the number of customers should be used. That's what the statement says.

So I just want to clarify, condense that down and say what are you recommending as an output quantity index if there is not an a NAC and LRAM adjustments, and if there is a NAC and LRAM adjustment.

DR. LOWRY: Well, the statement is that if there is one, then you use the number of customers. If there isn't one, then you are in the realm of trying to reckon with the average use trend of the companies and factor that into the productivity research, and that's kind of a messy business.

I've delivered ideas about how to do that in past OEB IRM proceedings, the second one back that Enbridge and NERA were part of. I said could you probably break it down into two pieces where you just measure industry productivity with the number of customers, and then have a separate average-use adjustment. And I guess that's what I would probably do -- but then isn't that what I'm advocating here as well.

They have a separate average use adjustment and so...

DR. HIGGIN: Just to state that it's a request for them to continue that in the new -- for Amalco.

DR. LOWRY: Yes.

DR. HIGGIN: And there has been, as you may have heard from the cross-examination and settlement, concerns about that from ratepayers.

DR. LOWRY: Mm hmm.

DR. HIGGIN: And therefore, that is a live issue, I suggest, that needs still to be determined by the Board based on the evidence and so on.

So that's all. I was just trying to give the two options here as to how that would work.

So finally, I'm just going to come to the dreaded stretch factor a little bit. I won't spend a lot of time on it, but I need to try and understand from you what the stretch factor that you are recommending is.

Could you please go to page 23 of your report, just to give us a segue into this? And this is an extract where you talk about stretch factors and so on.

So this is page 23 of the compendium, and it comes from page 48 of your report, an extract.

Do you have that?

DR. LOWRY: Yes.

DR. HIGGIN: Thank you. So what I'm trying to understand here is basically the basis of this stretch factor.

There are a number of things that it could be based on. One, it could be analysis, one could be regulatory precedent, okay. So there could be other factors. I am just trying to understand the pieces -- the things that went into your recommendations of a 0.3 stretch factor.

I'm not going to go into the issue of whether there should be one or should be not. I'm more interested in why 0.3 percent.

DR. LOWRY: Well, for one, to state what's almost obvious is that my charge for the Board is to come up with the most objective number, and I think that my reasoning here was trying to balance all considerations.

I had done a study that showed that the productivity trend of the gas utility industry was negative 0.23. So that's one number that you can hang your hath on.

Another is that when you corrected Dr. Makholm's numbers, a number of positive 0.49 arose. A third is that I, you know, prepare studies of power distribution productivity trends on a fairly regular basis, and my most recent and analogous number was in a study that I did for Lawrence Berkeley National laboratory, which is affiliated with the United States Department of Energy, and found a 0.23 percent TFP trend over a similar 2001 to 2014 period.

I also took note -- I think it's germane and something I wasn't able to talk about in my examination in-chief that I'm generally concerned about this IRM being -- the proposed IRM being tilted unduly favourably to the utility. They are very good about asking for compensation for the problems that they face, and they are not as generous about offering -- sharing with customers the benefits of any opportunities that they face. In this particular case, the merger is a conspicuous opportunity.

In the United States when two companies merge, a very common rate-making treatment is to have a rate freeze for four or five years, a rate freeze. Now, think of the productivity that's implicit in that. That's equal to the inflation -- input price inflation that the utility is experiencing.

So considering all that, I felt that the number zero, which is after all above my negative 2.3 -- negative .23 productivity trend estimate was a reasonable compromise.

DR. HIGGIN: You said zero. I assume you meant 0.3.

DR. LOWRY: No, I meant zero for the base productivity trend.

Now, you would add then to that the 0.23 percent stretch factor. Where does that come from? Well, as we all know, that's sort of the normal stretch factor for a utility under the price cap IR, and Enbridge and Union had their opportunity to provide convincing evidence in this proceeding that they were a good cost performer, and they did not provide such evidence.

I mean, here, in fact, is what we know about their cost performance. We've already talked about how their O&M productivity has been pretty respectable since 2001. It's been similar to or a little above that of the industry as a whole. And that may be one of the reasons that they like to talk about the fact that the low-hanging fruit is gone. They are attributing it to IR. Actually, this is normal productivity growth, potentially.

On the other hand, Enbridge in particular has had very negative capital productivity growth for a long time. And so when you look at -- for example, for the United States as a whole, capital productivity is negative 0.98 percent, but Enbridge's capital productivity has been negative 2.33 percent.

So that kind of eats up a lot of those benefits of the O&M, and I think you are just left with the result that there is no convincing case that the applicants are superior cost performers. Again, they had their chance, but having not provided such evidence, then the 0.3 is applicable.

There is certainly no evidence that they are a bad performer, but no evidence that they're good.

DR. HIGGIN: Okay, I think that helps me understand better what that -- how you arrived at that.

So I would just like to talk a bit about --

MS. ANDERSON: Just a time check, because we are --

DR. HIGGIN: I know, I'm just -- my last question, and then --

MS. ANDERSON: -- really tight. You've got five minutes.

DR. HIGGIN: I know, yes.

So my last question here is related to the Z factors, and if you could turn up page 26 of our compendium.

So just the last two bullets there you talk about recommendations, other recommendations about the Z factors, and so basically -- leaving aside, we see your recommendation -- can you just summarize briefly for us on the record your criteria for -- general criteria for inclusions and exclusion in a Z factor and for establishing a Z factor threshold when you are considering and saying it's too low, et cetera, just what your criteria are, please.

DR. LOWRY: Well, I mean, I think my criteria are the same as the company would state. I mean, they are kind of the normal set of considerations about it being external and it being material and not somehow being picked up by the productivity index. The benefits of the Z factor with the materiality threshold -- the benefits of the materiality threshold is that it reduces the likelihood of frivolous requests, taking up the Board and the community's time over minor cost concerns.

It strengthens their performance incentives, and it also, particularly combined with a deadband like exists with the IC materiality threshold, reduces double-counting, because, you know, when Enbridge or Union come in and say we've incurred costs due to a highway relocation project, well, don't you think that those types of costs are incurred by the utilities in the productivity sample? So they are asking for a dollar-for-dollar recovery of a shortfall, and at the same time the X factor is lower because of those, so I, you know, said that in addition to there being a higher materiality threshold than they propose, there should be a deadband.

DR. HIGGIN: Okay, thank you, that's very helpful to understand your thinking on that. Thank you, Madam Chair. Those are my questions.

MS. ANDERSON: Thank you.

Mr. Shepherd, we haven't forgotten your other request. We will get to that, but we are trying to get to the end of Mr. Lowry -- Dr. Lowry today.

MR. SHEPHERD: Thanks.

MR. MILLAR: Madam Chair, perhaps I neglected to inform you. I think Mr. Shepherd no longer has any questions for Dr. Lowry.

MS. ANDERSON: Okay. Yes, I did not know that.

MR. SHEPHERD: I actually sold my time.

[Laughter]

MS. ANDERSON: Well, I guess -- yes. Mr. Cass. I'm mindful you've got an hour. We also have to take some time for the court reporter to take a bit of a break in here, so we could take the break now and start or you could start and we're kind of -- whichever you prefer.

MR. CASS: I think I'm indifferent, Madam Chair.

MS. ANDERSON: Maybe ten now. Okay. And then we'll get to the end. Thanks.

--- Recess taken at 3:34 p.m.

--- On resuming at 3:46 p.m.

MS. ANDERSON: Mr. Cass?

MR. CASS: Thank you, Madam Chair. Madam Chair, I have a compendium for this cross-examination. I hope that everyone has that. It's actually a bound volume. It looks a little different.

MR. MILLAR: We'll mark that as K4.4.

EXHIBIT NO. K4.4: UNION/ENBRIDGE CROSS-EXAMINATION COMPENDIUM FOR PANEL 5

MR. CASS: I apologize for my inability on the front page to spell distribution correctly.

Dr. Lowry, as I think you know, I am Fred Cass and I represent the applicants in this proceeding. You, Dr. Lowry, were a witness in the AUC generic proceeding we've heard about a bit today, proceeding number 566; is that correct?

DR. LOWRY: Yes, I was a witness in all three of the generic PBR proceedings that have been held by the AUC.

MR. CASS: Thank you. So I'm just talking about proceeding 566 for now. We'll talk a little bit about the other ones.

In this generic proceeding that I'm talking about, the AUC was considering implementation of a form of performance-based regulation for both electricity and natural gas distribution companies. Is that correct?

DR. LOWRY: That's correct.

MR. CASS: And correct me if I'm wrong, but I believe that the decision that the AUC issued would have applied to three electricity distribution companies and two gas distribution companies. Does that sound right?

DR. LOWRY: Well, I think it eventually applied to four power distributors, because one entered late in the plan.

MR. CASS: Okay, thank you. In this context, the AUC had indicated its expectations regarding inclusion of an I minus X formula as part of the PBR plans, right?

DR. LOWRY: Yes.

MR. CASS: And accordingly, the AUC received evidence on the elements and factors of an I minus X formula, including X factor?

DR. LOWRY: Yes, they did.

MR. CASS: Would you agree with me that in this context of a generic proceeding concerning so many different companies, the AUC undertook a wide-ranging review of these appropriate parameters of an I minus X formula?

DR. LOWRY: I would say it was fairly wide-ranging.

There were a couple of topics that they kind of squelched -- they didn't have much sympathy to like statistical benchmarking. It's not like there was a lot of evidence provided on that topic, for example.

MR. CASS: But generally in relation to the parameters of the I minus X, it was a quite a broad review?

DR. LOWRY: Yes.

MR. CASS: And I believe it included a number of experts with respect to TFP analysis. Is that right?

DR. LOWRY: Well, Dr. Makholm was an expert. I don't know about -- there were a number of newcomers to the topic that were brought in, or people with very limited experience were brought in by some of the utilities. So it was a mix.

Several of them were -- Dr. Makholm for sure was knowledgeable and also Dr. Scheck (ph).

MR. CASS: So it would be my understanding that there were -- in addition to you and Dr. Makholm, there would have been five or more experts who were qualified by the panel, the AUC, in this area.

MR. MILLAR: They qualified them. You asked me my opinion.

MR. CASS: Sorry, I didn't intend to ask you your opinion. I was just trying to get a sense of the context of this proceeding.

So you would agree that in addition you and Dr. Makholm, the AUC qualified five or more other experts in this area?

DR. LOWRY: I'll accept -- whether it's four or five, I don't recall. But yes, there were about that many.

MR. CASS: And I would assume you've never been involved in a regulated utility case involving these issues with as large an array of experts on productivity as there was in that case.

DR. LOWRY: Well, again it depends on whether your definition of an expert is.

MR. CASS: My definition is accepted by the --

DR. LOWRY: Accepted by the commission? Yes, it was unusual how many there were.

MR. CASS: Okay, thank you. Would you agree with me that this was the most wide-ranging review of these matters that has occurred in any recent case that you're aware of?

DR. LOWRY: No, I don't know any reason to say that.

MR. CASS: Can you give me an example of a recent case that has had a greater range of consideration of these issues, and a greater range of parties and experts involved?

DR. LOWRY: Well, there are definitely were more witnesses. But apart from that, you know, you're asking me to say was there a wider review of the issues and I wouldn't say -- not really, not that I'm aware of.

MR. CASS: Okay.

DR. LOWRY: I'm not prepared to agree with you on that.

MR. CASS: But you agree that there was a wider range of expert witnesses as accepted by the commission?

DR. LOWRY: Certainly.

MR. CASS: And just for the record, the excerpts from the decision that resulted from this proceeding, those are at tab 3 of the compendium. I assume you have the compendium?

DR. LOWRY: Yes, I do.

MR. CASS: So you would be quite familiar with that decision?

DR. LOWRY: Yes.

MR. CASS: Thank you. Now, just coming back to the case before us, in this case, you said that the data for your TFP growth study came from a company called SNL financial, is that right?

DR. LOWRY: In this proceeding, yes.

MR. CASS: And you claimed that as confidential information in this proceeding?

DR. LOWRY: Well, it's information that is gathered by vendors, and they place considerable restrictions on the use of the data. I don't want somebody -- another party to the proceeding to get a copy and send it to his buddy in Atlanta. And so you have to sign a confidentiality agreement in order to have access -- to have access to SNL data, which is, you know, very common in Ontario proceedings, as you know.

MR. CASS: Well, I understood you to say in response to a couple of questioners who preceded me that this data is essentially coming from FERC Form 2. Is that not what you said?

DR. LOWRY: Remember what I said was that it comes from a template for FERC Form 2, and the problem is that it goes to these state commissions and it's -- so you have to go to individual state commissions and gather the data. It is a big job.

It is, you know, if you want to get the data for FERC Form 1, just go on their website and you can pull it down -- you can get up and going in the space of a few weeks. But for the gas thing, it's much more efficient to rent it from an expert.

MR. CASS: So it's publicly available, but you say it would be a big job to go and get it yourself?

DR. LOWRY: Yes, it is better to delegate that to one person who then -- there's actually two companies that do it. Another one is called Ventix that provides these data to the public; it's more efficient.

MR. CASS: And the data relied on NERA's TFP worked for the purposes of this case, it is all publicly available, right?

DR. LOWRY: Yes.

MR. CASS: Now, in your confidential work papers, I believe you -- I'm not getting into any confidential information by the way -- you included a table that lays out the changes in revisions that you needed to make that underlying data due to things like missing values and anomalies. Is that right?

MR. MILLAR: Yes, there are some.

MR. CASS: And NERA included a similar table in this case, but it was public, right?

DR. LOWRY: Yes.

MR. CASS: All right. Now, in this proceeding, you've reviewed referred to the fact that you had some errata that you corrected, right?

DR. LOWRY: Yes.

MR. CASS: That affected not only your prefiled evidence, but also some answers to interrogatories?

DR. LOWRY: Yes.

MR. CASS: And would it have been some of the confidential answers to interrogatories that were affected?

DR. LOWRY: Well it did affect -- I don't think so. Well, the -- what it was mostly about was at the very last minute, I realized that we should have included pensions in the study because -- again, to have a properly customized study, the companies have agreed not to Y factor their pensions. And I shouldn't have asked my staff to do that at the very last minute, because you have to change several things to do that correctly. So it turned out that it needed to be fixed.

MR. CASS: And when you provided this, if I could call it post errata information, you didn't actually provide all of the pre-errata information that would have allowed NERA to check the source and effect of your changes?

DR. LOWRY: I'm not sure what was provided to them. I'm not sure.

MR. CASS: Okay. And another thing that you did for the purposes of your work in this case is you used something called SST software for your analysis. Is that right?

DR. LOWRY: Yes.

MR. CASS: And you would be aware from previous proceedings that other experts that work in this area don't use that software?

DR. LOWRY: This has come up in the -- it came up in the Alberta proceeding.

MR. CASS: Right.

DR. LOWRY: I mean, if I may say to the panel that, you know, in that proceeding, in which there were a number of highly paid consultants, they kind of took it to the next level with complaints about matters of transparency, as if somehow they couldn't possibly cope with a -- a -- having the research done in code, for example, or they couldn't -- they didn't like the fact that they had to sign a confidentiality agreement. In my opinion, these are mostly just tactics, but it did work -- it did help their case in that one proceeding, because in that one proceeding the AUC was more skeptical of our work because of these complaints.

MR. CASS: Well, I'm going to actually take you to more than one proceeding. First if I could take you to tab 6 of the compendium, if you don't mind, please, Dr. Lowry.

DR. LOWRY: Okay.

MR. CASS: I'm looking as -- first of all, just to set the context, this was an AUC proceeding to establish the parameters of PBR plans for the 2018 to 2022 period, correct?

DR. LOWRY: Sorry, I'm still looking.

MR. CASS: Oh, I'm sorry, tab 6.

DR. LOWRY: Tab 6.

MR. CASS: And I'm looking at paragraph 96. It is decision 20414 of the AUC.

DR. LOWRY: Okay, I'm sorry, I've got tab 6, but which page?

MR. CASS: I'm looking at paragraph 96.

DR. LOWRY: Oh, paragraph 96. Okay.

MR. CASS: But first just to set the context, I'm just asking you to confirm, this was the AUC's proceeding to establish parameters of PBR plans for the 2018 to 2022 period, correct?

DR. LOWRY: Yes.

MR. CASS: And so just -- I'm going to come back to the opening words of paragraph 96, but as you've indicated, there is a reference there to distribution utilities submitting that caution should be exercised when relying on the results of the Lowry study. I'll come back to that, but then skipping down to the next sentence:

"Specifically, while the Lowry study in this proceeding relied on publicly available data in that proceeding, the distribution utilities stated that these TFP results were obtained using a software package that is not widely used, rather than spreadsheets, and that the underlying calculations and assumptions were not documented or clearly explained."

So that was the concern that was expressed there?

DR. LOWRY: Well, they say they -- not explained to their satisfaction. There was certainly extensive explanation provided.

MR. CASS: And then at the beginning of paragraph 97 with respect to this software, you indicated that PEG uses this for all its projects and it is available for purchase? That was your response?

DR. LOWRY: Yes.

MR. CASS: All right. And then in the middle of paragraph 98, the AUC's preference was, and I'll just quote:

"In the future the commission would prefer such analysis to also be reproduced using spreadsheets when as in the situation it is possible to do so."

Right?

DR. LOWRY: Yes.

MR. CASS: And in this particular case NERA asked you to reproduce the information on spreadsheets, or at least the applicants did in an interrogatory, and you were able to do so, right?

DR. LOWRY: Yes, we complied with that request.

MR. CASS: Right, so now, just to pick up on the -- back on the first sentence of paragraph 96, this is referring back to the other decision that we talked about. It refers to the AUC addressing objectivity, consistency, and transparency in decision 2012-237. That is the decision from the first generic case, right?

DR. LOWRY: I'm sorry, what paragraph are we on now?

MR. CASS: I'm back at paragraph 96, just above --

DR. LOWRY: Okay. Yes.

MR. CASS: -- where we were a moment ago.

DR. LOWRY: Mm-hmm.

MR. CASS: Okay. And this is taking us back to the decision from the first generic proceeding, which is decision 2012-237, right?

DR. LOWRY: Yes.

MR. CASS: And that's at tab 3 of the compendium.

If I could ask you to turn to paragraph 347 of that decision. So in the first sentence of paragraph 347 the AUC says:

> "All parties confirmed the importance of relying on publicly available data and transparent methodologies for the purpose of the TFP studies used in regulatory proceedings in order to make such studies objective and neutral."

Now, since all parties confirmed that, I assume that the party you were giving evidence for agreed with that?

DR. LOWRY: I have no recollection of that.

MR. CASS: Are you saying that the AUC just got this wrong or you simply don't remember?

DR. LOWRY: I have no recollection. I don't know whether it's right or wrong.

MR. CASS: Okay, thank you. And again, on the next sentence of paragraph 347:

> "In this respect, while no party questioned the transparency of NERA's methodology and the availability of FERC Form 1 data, parties to this proceeding took issue with PEG's productivity study over issues of objectivity and transparency."

You do remember that, I think, because you've referred to that.

DR. LOWRY: Well, I would like to make a comment to the Board about what they mean by "objectivity." As we discussed here, I am want to -- more to customize studies to the particular proceeding. And in two proceedings, IRM proceedings for gas, for example, I was -- I worked for the Board, and I said that an X factor for Enbridge should take consideration into the fact that they experience rapid customer growth.

And the -- so in Alberta, the utility's also experiencing very rapid customer growth, and I, like Dr. Makholm before me, had proposed a more custom peer group, productivity peer group, for Alberta utilities. Dr. Makholm participated in a prior proceeding in which he had used a western peer group, and so I did present results with a western peer group, and I also presented results just for a group of United States utilities with customer growth that was similar to that in Alberta.

Now, that, in the view of some witnesses, was considered to be not objective approach. In other words, any attempt to try to customize results to the business conditions was considered to be not objective.

MR. CASS: So just for clarity then, to the extent -- understood that I'm not asking you whether you agree with it, but these comments that were raised, they were about objectivity and transparency. They were in the context of your work to customize, to get the results of your study.

DR. LOWRY: The transparency was also about the matter of the SNL data of proprietary data, so that was a little different. That also had to do with the code, but I was just trying to explain to the Board what was meant by "objectivity" in this case.

MR. CASS: Thank you. That's a good clarification.

Now, you said that the -- that parties expressed this concern, but I believe the commission shared the concern in its decision, and perhaps I can take you to a couple of points on that.

But first, just to confirm, over at paragraph 352, to allay -- this indicates that to allay these concerns about using proprietary data you recalculated your TFP growth of the sample in that case using data entirely in the public domain, right?

DR. LOWRY: At the end of the proceeding I did, yes.

MR. CASS: You were able to do that.

So, now, just to -- I want to give you a chance to see the comments by the commission that I just referred to. They're in two different places. One is paragraph 354 and the other, I think, is 364. So I'll look at them both and then put a question to you.

So at paragraph 354, the AUC said:

> "With respect to PEG's study, the commission shares the gas companies' concerns that the TFP analysis of Dr. Lowry and his colleagues was not fully transparent and conducive to the detailed scrutiny by other experts or by the commission."

And similarly at paragraph 364 -- sorry if I'm going too quickly. In paragraph 364:

> "In light of the above considerations, the commission agrees with NERA, ATCO Gas, and AltaGas that the lack of publicly available data and transparent methodology represent major drawbacks to the use of PEG's productivity analysis."

So it was not just parties that were expressing this concern, the commission agreed with it, right, Dr. Lowry?

DR. LOWRY: The commission in that particular case displayed in -- what I would consider to be an undue preoccupation with matters of transparency and objectivity.

In the very next proceeding, they did things differently and somehow my study was considered along with others in the setting of the X factor. But in this particular proceeding, they bought into the arguments of these various utility witnesses.

MR. CASS: So do you say they just got it wrong in this decision?

DR. LOWRY: I think did. Of course I do think that.

MR. CASS: Let me take you back to one other part of the decision on this, paragraph 356, if you don't mind.

I'm looking at a little more than halfway through the paragraph, and there is a sentence starting "in addition", and the words I'm interested in are those staring:

> "If Dr. Lowry and his colleagues at PEG are the only persons who are able to repeat the TFP analysis, the success of any future PBR plans will depend on PEG's participation."

Do you agree with what the commission said there?

DR. LOWRY: Yes. To me, this is an example of an absolutely ridiculous statement, that for some reason we wouldn't want to use that one witness because you might have to use that witness the next time, as opposed to whether one witness was better than another and had shown himself to have a superior study.

I think this is a bizarre statement.

MR. CASS: Okay. So you think what the AUC said here was ridiculous?

DR. LOWRY: Well, I will say one thing that I should explain to the Board, and that is back at that time, I was using a proprietary -- some proprietary older capital cost data. When you are estimating the productivity trend, a total factor productivity trend of a utility, you would like to have your capital cost data go as far back as possible. And the more -- the further back you go, the more accurate it is.

And so I had some data that I had gathered some years back from members of the American Gas Association, upon the promise that they would be kept confidential.

Now, you would think that this was a treasure trove of data that would make the study more valuable, and that would show that I was a particular expert on this issue.

Instead, the AUC took the view that, wow, we'd be stuck having to have him come back because he has this good data.

MR. CASS: And that's what you are characterizing as ridiculous?

DR. LOWRY: Yes.

MR. CASS: okay, thank you. So to move to another subject but the same decision, could I ask you to turn to paragraph 469, please?

DR. LOWRY: Okay.

MR. CASS: As you can see from the top of the page -- sorry, I'm going too quick again. Paragraph 469.

I'm looking in the paragraph, just after the word "nevertheless" in the second line.

The AUC says:

"Most parties to this proceeding agreed that the
rationale behind the stretch factor is to share
with customers the benefits of the expected
acceleration in productivity growth as the
company transitions from a cost of service rate-
making system to performance-based regulation."

Now, did the AUC get this wrong, or was the AUC correct in indicating that most parties to the proceeding agreed with that rationale?

DR. LOWRY: Well, this is more an area of legitimate differences of opinion. I don't agree with the AUC's decision on this. They were the ones that took this rather extreme attitude that the benefits of -- that the stretch factor was just to share the benefits of the initial productivity acceleration. I don't consider that to be ridiculous. I don't agree with it.

But yes, this is -- they are one commission that has done things differently from the Ontario Energy Board, and the British Columbia commission and other commissions, and taken this rather narrow view of what stretch factor is all about.

MR. CASS: Okay. Well, perhaps we could look a little more at the decision then. Could I ask you to turn -- or to look at paragraphs 479 and 480? I'm sorry, I'm going to need to read both of them to have the full context, but they aren't lengthy. Paragraph 479:

"The commission agrees with the rationale for a
stretch factor put forward by EPCOR, NERA,

Altagas, the UCA and Calgary. The purpose of a stretch factor is to share between the companies and customers the immediate expected increase in productivity growth as companies transition from cost-of-service regulation to a PBR regime."

And the next paragraph, "The Atco companies and the CCA" -- and if I could just stop there, you were a witness for the CCA in this proceeding?

DR. LOWRY: Yes.

MR. CASS: "The Atco companies and the CCA agreed that this reasoning forms part of the consideration when adding a stretch factor. As such, the commission observes that is this definition of stretch factor has been accepted by all parties to this proceeding, except Fortis."

Now, did the AUC get that wrong?

DR. LOWRY: Well, as you can see, they put discussion of CCA in a separate paragraph and said that it formed part of the reason. And so, of course we concede that this is one of the reasons for a stretch factor, and so they're noting that we didn't deny that it was one of the reasons. I think that's the spirit in which they meant that.

I don't have a problem with the way that is written. But I also note that that they showed -- they make here the statement that "the purpose of the stretch factor is to share between the companies the immediate expected increase."

And I believe that in Dr. Makholm's testimony, he asked himself the question: Well, what's a stretch factor all about? And rather than saying what he thought, he quoted the Alberta commission and now we find out today that he actually believes that, hey, you know, it could take two or three generations of PBR before there is no need for a stretch factor any more. He just knows for sure that in a fourth generation, there isn't one needed.

But I just note here, since it's right handy for the commission -- the Board to see that he was quoting this as the explanation rather than providing his own view in his direct evidence.

MR. CASS: All right. Well, I'm not going to argue with you on that one. So you suggesting that you just found out today what Dr. Makholm's view is on the purpose of a stretch factor?

DR. LOWRY: Well, I was surprised. I thought I did understand it, and he characterized me as misrepresenting it. So after that, I was curious to go back and read and then I was reminded about it, and I thought about it at the time, that when it comes up in his evidence, he quotes the commission rather than stating his own view and that, in turn, has given him license now to kind of say, well, I don't exactly agree with the AUC on this. I think that it could take two or three generations of PBR to ring out all of the initial inefficiencies on it. This is new to me.

MR. CASS: Well, you are clearly hearing different things than me, Dr. Lowry, but we will just move on.

For clarity, you said more than once in your evidence that Dr. Makholm had said that the stretch factor applies only in the first PBR plan, didn't you?

DR. LOWRY: I did say that, and maybe I was incorrect slightly in the sense that he was quoting the Alberta commission as saying that, without actually stating his own view.

MR. CASS: Have you got any evidence reference at all where Dr. Makholm said that the stretch factor applies only in the first PBR plan?

DR. LOWRY: Well, now I'd have to go back and look. I'm not sure.

MR. CASS: If I could take you to tab 1 of the compendium, please, Dr. Lowry. So you would recognize this as one of the interrogatories that the applicants asked you in this proceeding?

DR. LOWRY: Yes.

MR. CASS: And in the references, part (c) to the interrogatory, there was a quote from the evidence in the AUC proceeding. Are you with me so far, part (c)?

DR. LOWRY: Yes.

MR. CASS: And you were asked by commission counsel -- you were given the opportunity to state the rationale for including a stretch factor in a PBR plan, right?

DR. LOWRY: Yes.

MR. CASS: And your answer is what is recorded here:

"The rationale is to share some of the expected acceleration in productivity growth as you go from a cost-of-service rate-making system to a "performance-based rate-making system."

That was your answer?

DR. LOWRY: That was my answer, yes. And I would like to say that I probably meant that in the broader sense that Dr. Makholm has now revealed, that it could take several generations of PBR in order to wring out all of the initial efficiencies, but that said, this is just one comment I made in cross, and in the course of the proceeding I obviously said other things, because I was never counted as an advocate of the view that it was to share the immediate benefits. I was never counted as the one who said that was the only reason for a stretch factor.

MR. CASS: But you were asked.

DR. LOWRY: There were a lot of things about this, but in this comment I agree does kind of convey the impression of more of Dr. Makholm's view.

MR. CASS: Well, in fairness to you, there is more to it. It is in part (d), and I am going to come to that.

DR. LOWRY: All right.

MR. CASS: And I'm not suggesting it changes the rationale, but it addresses more the duration --

DR. LOWRY: Yes.

MR. CASS: -- which is what you were talking about.

DR. LOWRY: Mm-hmm.

MR. CASS: So in part (d) there is an additional question from commission counsel there about how long this would be reflected in the PBR plan, and your response was:

"In my opinion, it should continue until a credible levels benchmarking study has shown that the utility is a superior performer, and that's a fairly tall order. I don't know that any such study has ever been performed for any Alberta utility."

So that was your answer?

DR. LOWRY: Yes, I mean, it would be the same thing as this proceeding. The company has not provide a credible benchmarking study since I last provided one for Enbridge, and that was only in an OM&A study, so until a credible study shows that you are quite efficient, then you should still have a stretch factor, in my opinion.

MR. CASS: Okay. So --

DR. LOWRY: And I might add to this that although the Alberta Utility Commission has not been sympathetic to the idea of statistical benchmarking studies, and incidentally, their view of statistical benchmarking studies is that they are insufficiently objective to be used, but the Alberta government has a different view of this matter and recently retained me to prepare a statistical benchmarking study of Alberta power distributors that was jointly funded by the Utilities Consumer Advocate and the Energy Ministry of the province.

MR. CASS: Okay, so just to come back to what you were talking about in this evidence that we are looking at at tab 1 of the compendium, Dr. Lowry --

DR. LOWRY: Mm-hmm.

MR. CASS: -- so first you indicated that you had done a benchmarking study for Enbridge but it did not include capital, so the benchmarking study that you are talking about here in the AUC proceeding would be one that includes capital, right?

DR. LOWRY: It would, yes, just like the Ontario Energy Board routinely does total cost benchmarking.

Now, it could be also disaggregated, taking a separate look at capital and OM&A expenses, and even go to more detailed levels. I mean, here in Ontario the commission has retained us to develop a so-called activities and program benchmarking capability where the focus will be even more granular.

And incidentally, the reason for that is that they feel that the total factor productivity or that the total cost benchmarking studies that are currently done by the Board provide an inadequate basis for disallowances in rate applications.

And this is one of the reasons that I disagree with Dr. Makholm for saying that the reason they do benchmarking here is to facilitate the regulatory process. In reality these benchmarking studies are not used in rate applications, because they are at too high a level of aggregation.

MR. CASS: Okay, so Dr. Lowry, back to the evidence at the AUC. So the benchmarking study you were talking about here would be one that would include capital, right?

DR. LOWRY: Yes.

MR. CASS: And you referred to it as a levels benchmarking study?

DR. LOWRY: Yes.

MR. CASS: So it would not be a study of TFP trends or growth; it would be a study of TFP level?

DR. LOWRY: It is the same kind of study that the British Columbia commission recently ordered Fortis companies to provide the next time they come in for PBR.

MR. CASS: Right. And this is the type of study you called a "tall order" in your testimony here?

DR. LOWRY: I didn't mean in saying a "tall order" that it can't be done. It is actually a very straightforward thing. In fact, I've already done it for all four Alberta power distributors. Two of them are quite good performers. So I didn't mean in saying "tall order" -- just what I think I meant to say there is that they are far, far away from having the evidence to protest a stretch factor, and that unless they provide such a study they would still have to be subject to stretch factors.

MR. CASS: Okay, can I take you to tab 5 of the compendium, please, Dr. Lowry. This is the AUC's decision in the proceeding to consider a mechanism to fund capital-related costs outside of the I minus X mechanism that was addressed in that previous 2002-237 decision, correct?

DR. LOWRY: Mm-hmm.

MR. CASS: Could I ask you to look at paragraph 137 of that decision.

DR. LOWRY: Mm-hmm.

MR. CASS: So this paragraph is referring to some of your evidence, I believe. It's the AUC referring to your evidence during the hearing.

And there's a quote in paragraph 237 -- 137, I'm sorry. If I could skip to the end of the third line, you indicate to the AUC that this whole area of capital benchmarking which was mentioned by Dr. Wiseman is very much in its infancy and you don't think it's going to happen anytime soon, right?

DR. LOWRY: Sorry, what -- I'm missing the paragraph.

MR. CASS: Oh, I'm sorry, paragraph 137, and this is tab 5.

DR. LOWRY: Yeah. I'm not having that.

MR. CASS: It is on the screen as well, I think --

DR. LOWRY: Okay.

MR. CASS: -- in front of you if that helps at all --

DR. LOWRY: Why don't I just look at that.

MR. CASS: So I'm looking at the quote in paragraph 137, starting at the right-hand side of the third line.

DR. LOWRY: Mm-hmm.

MR. CASS: And you indicated that this whole area of capital benchmarking was very much in its infancy and you didn't think it was going to happen anytime soon.

DR. LOWRY: Mm-hmm. Well, to focus, the question here is for purposes of deciding things like rate-making treatment of capital, if you just had a focus study on capital cost, how sophisticated could they be. And it is true that for capital costs is the hardest thing to benchmark, and one of the problems with doing it in Alberta is that the available data don't go back many years.

As I was saying before, you know, with capital cost you'd like to go back as many years as you can, and the data from Alberta only go back to, like, 19 -- 2004 or thereabouts, so it is particularly hard to do accurate capital cost benchmarking. It's an area that we'll be working on with the OEB in this activity and program benchmarking project. Incidentally in the study that I just did for the Alberta government, it did include capital cost benchmarking, but with the caveats that, hey, this is, you know, this is -- this is an experimental study.

MR. CASS: Thank you. And just, again, to get a little more of the flavour of this, if we could look on in the quote, you do elaborate some more. You say:

> "You can get capital productivity trends. That's easy. But capital levels benchmarking would be harder."

So it's the levels benchmarking we're talking about here that's difficult, right?

DR. LOWRY: Well, they are both kind of hard in the context of Alberta because the data don't go back as far, but, yes, the capital levels benchmarking is harder because you would want to have data on the age of assets that is not currently available.

Now, we tried to do this in Ontario. We will probably have to go to the utilities and ask for a whole bunch of data on system age, but that data was not available in Alberta. So --

MR. CASS: Right.

DR. LOWRY: -- that's what makes it so hard.

MR. CASS: Right. And to link this back, the type of benchmarking study that you said would be the test as to whether a stretch factor continues to be appropriate was levels benchmarking, right?

DR. LOWRY: Levels benchmarking. It is easier to do here than it is in Alberta, because the data go back a larger number of years.

MR. CASS: But nobody has done it in Ontario for natural gas distributors, right?

DR. LOWRY: A benchmark -- well, it isn't any harder to do than a study of -- for power distribution. I mean, the work I'm referring to that I'm doing with the OEB on the APB project is power distribution. But I'm not -- it isn't -- it isn't that much harder to do or it isn't really any harder to do for gas than it is for electric. It's just -- still got a ways to go to be really to the point we'd like it to be.

MR. CASS: Right. And we're talking levels benchmarking, and it is going to include capital, and it hasn't been done for gas companies in Ontario?

DR. LOWRY: No, but it's done for electric companies all the time and they have -- you know, for many of the companies, there is less data available than are available for Enbridge and Union. I mean, Hydro One's data only goes back to the year 2002 or thereabouts, for example. So it's are just as feasible for Enbridge and Union as it is for the power distributors, if not more so, because Enbridge's data goes back quite a bit further.

MR. CASS: But have you actually tried it for a gas utility in Ontario?

DR. LOWRY: Well, we haven't had the occasion to yet.

I mean, what you could have done in this study is to submit a study and then to have us review it. You know, if you wanted to have a zero stretch factor, that would have been the best course of action.

MR. CASS: Well, is there a decision from a North American regulator...

DR. LOWRY: May I just interrupt you to say that this is exactly what Terrison Gas -- the former Terrison Gas. Now it's called Fortis in B.C.; it used to be B.C. gas.

I mean, they're doing a study this year, a total cost benchmarking study at the commission's -- at the B.C. commission's direction. They are doing it right now.

MR. CASS: A levels --

MR. MILLAR: Yes, yes.

MR. CASS: But it hasn't been completed yet?

DR. LOWRY: Not yet.

MR. CASS: So we started off on this by reference to tab 1 of the compendium, and the indication there in your evidence that your view was that a credible levels benchmarking study is what would determine whether a stretch factor is appropriate -- not the level of a stretch factor, but whether it's appropriate to continue, right?

DR. LOWRY: Yes, and I might interject that -- I'm on the record in this proceeding as saying that superior performers potentially could have a negative stretch factor.

MR. CASS: Fair enough. Now, there is no decision from any North American regulator for a gas utility that says not to set a stretch factor, but just to even determine whether it's appropriate to continue at the point they are in PBR or IR to have a stretch factor that you should have a credible levels benchmarking study, is there?

DR. LOWRY: Well, that's what's done by the OEB. Many other jurisdictions use statistical benchmarking studies in deciding the stretch factor.

We've prepared these studies on several occasions, total cost benchmarking studies for Massachusetts gas distributors in the past. I mean, we were doing that 15 and 20 years ago, and they were part of the submission that had a bearing on the stretch factor issue.

MR. CASS: I don't think that's what I asked you, Dr. Lowry, but maybe we'll just move on and leave it for argument.

DR. LOWRY: Well, I gave it a shot.

MR. CASS: Now, in the AUC proceeding, you indicated that an efficiency carryover mechanism is a deterrent to the -- the word that I think was used, perhaps not specifically by you, but to gaming that might be associated with the timing of capital investments under an IR plan. Do you recall that?

DR. LOWRY: Yes, I do.

MR. CASS: But as we've already discussed, when you were asked in that proceeding as to the rationale for a stretch factor, you didn't give discouraging strategic cost deferrals as part of the rationale for a stretch factor, did you?

DR. LOWRY: Well, that's an interesting question that has arisen today. Dr. Makholm said, oh, stretch factor is all about sharing the initial productivity gains from moving from PBR.

Well, my first thought was, well, what does that mean? Suppose you took the combination of a stretch factor and the benchmarking studies that are done here in Ontario and called it something different. Suppose you called it an efficiency carryover mechanism. Are you still opposed to it?

Because, you know, there's been a segue in the role of the stretch factor to having this extra benefit of strengthening performance incentives and discouraging opportunistic deferrals of cost. That's been a real problem in Ontario, the strategic deferrals of cost under the price cap IR framework, and there have been many examples, for example, where the utilities would try to load their capex into the rate year, so that they would have a higher jumping-off point for their revenue in the course of the IR plan.

So I think that, you know, there is a role for it.

MR. CASS: Okay. But my question was when you were asked -- you were asked a question to give the rationale in

Alberta, and you didn't say anything about the stretch factor discouraging strategic costs.

DR. LOWRY: Well, that commentary, however, presaged my increasing appreciation of what they do in Ontario, because over the course of time I realize, you know, that the stretch factor system that they have in Ontario is kind of the coolest efficiency carryover mechanism that's out there.

It could be better. It could be that there could be more money riding on it, they could use it to disallow costs in the rate applications as well as just a modest adjustment to the X factor. But it actually does function as -- plays the function of an efficiency carryover mechanism, and so what difference does it make what it's called. I think it's perfectly sensible to call it a stretch factor, because it's basically an adjustment to X based on conditional and cost performance.

MR. CASS: Okay. Can we go back to tab 3 of the compendium, please, Dr. Lowry?

DR. LOWRY: Sure.

MR. CASS: And specifically paragraph 494.

DR. LOWRY: Okay.

MR. CASS: Again I will just read this to you:

> "Similar to the discussion about the size of the X factor, parties commented on whether the presence and the magnitude of a stretch factor have any effect on the incentives of PBR plans. EPCOR, AltaGas and the ATCO companies submitted

that the strength of the incentives under a PBR plan is not tied to the magnitude of the X factor (including the stretch). NERA and the CCA supported this view."

DR. LOWRY: Mm-hmm.

MR. CASS: Again, the CCA was the party that you were giving evidence for?

DR. LOWRY: Yes, and in that context, I stand by the statement because there were no statistical benchmarking studies. They had no such capability, the Board was an opposed to them, and if you are just trying to say, well, what should the stretch factor be, I agree that whether it's .2 or .4 in that context, it is not going to strengthen the company's performance incentives.

It has to be tied to a statistical benchmarking study for that to happen.

So what I did is I did some research that tried to compare the incentive power of the utilities in the productivity sample to the incentive power of the PBR plan, and then basically split the difference -- proposed to split the difference in terms of the stretch factor. In other words, the stretch factor would share the benefit of the acceleration comparing the two. And I believe that that was the basis for the -- that my testimony pointing to the 0.20 stretch factor was very influential with the AUC in choosing a similar number.

MR. CASS: Your recommendation of a 0.3 percent stretch factor in this case is not supported by statistical benchmarking, right?

DR. LOWRY: No, its not supported by statistical benchmarking, but it would play a similar -- I mean, in this province, they do it a little differently. If you are an average performer, you get 0.3. So that's rather than try for that complicated additional piece of analysis, that I'm sure in Alberta would be considered horribly not objective by some of the witnesses, you know, I just elected to go with the normal productivity effect -- stretch factor that they use here, which is very similar to the one I've proposed in the past.

MR. CASS: Can I ask you to turn to paragraph 500 of the same decision?

DR. LOWRY: Mm-hmm.

MR. CASS: I will just take it a sentence at a time.

> "Finally, the commission agrees with the parties who argue that while the size of a stretch factor affects a company's earnings it has no influence on the incentives for the company to reduce costs."

When a commission refers to the parties who argue that, would that include the party you were a witness for that argued it affects the size of earnings but has no influence on the incentives to reduce costs?

DR. LOWRY: In the context where there is no statistical benchmarking.

MR. CASS: Okay, well, I don't see that in the AUC's words, but we can leave that.

Taking the next sentence in:

"Similar to a discussion in section 6.1 of this decision, the commission considers that PBR plans derive their incentives from a decoupling of a company's revenues from its costs as well as the length of time between rate cases and not from the magnitude of the X-factor (to which the stretch factor contributes)."

Do you agree that the incentive comes from the decoupling of the revenues and the length of time between rate cases?

DR. LOWRY: Not if there is benchmarking linked to the stretch factor. Then there is a incentive tied to -- clearly, an incentive tied to doing a good job. I mean, basically, what the stretch factor system does in Ontario is going to be to reward a utility that comes in at the end of five years and is offering customers good value in the next rate application. They want to reward them for that with a lower stretch factor.

Clearly that will incentivize them somewhat to do a better job with their cost performance and not ask for an especially large cost increase in the year of the -- in the forward test year of the rate application.

MR. CASS: Okay. Sorry, Dr. Lowry, I just want to be sure I understood that answer, because I took you to say no at the beginning. All I had asked you was whether you agree that PBR plans derive incentives from the decoupling of revenue from costs and the length of time between rate

cases.
That's all I'd asked you, and you said no to that?
DR. LOWRY: No, they do definitely -- remember, I'm the guy who has done complicated incentive power studies, and so of course I agree that the longer the plan term and the -- and what was the other one --
MR. CASS: Decoupling.
DR. LOWRY: And the decoupling, using something like indexing, strengthened performance incentives, but my research has also shown a very powerful additional incentive from what I call in the research an assistant efficiency carryover mechanism, and the kind of linkage of stretch factor to benchmarking that they have in Ontario is probably one of the better examples of an efficiency carryover mechanism in the world, and it is one of the reasons that the Ontario Energy Board is a world-class practitioner of PBR.
MR. CASS: Madam Chair, I think I've come in under my time estimate. I did have other things in my compendium and other things I was going to cover, but I propose to wrap it up there and --
MS. ANDERSON: Yes.
MR. CASS: -- keep the time estimate.
MS. ANDERSON: Okay. Thank you. And thank you, Dr. Lowry.
Mr. Millar, do you have any re-exam?
MR. MILLAR: Just a couple of quick questions. But did the Panel have questions first? I can go before or

after.

MS. ANDERSON: Okay, yes, no questions.

RE-EXAMINATION BY MR. MILLAR:

MR. MILLAR: Okay. Thank you. Just very briefly, Dr. Lowry. Mr. Cass had a discussion with you about some of the concerns that the Alberta regulator expressed about what they described as the transparency of your study, and I understand there were two sources of that.

One was your use of SSM software. Do you recall that discussion?

DR. LOWRY: SST.

MR. MILLAR: SST, pardon me, and that is -- do you still use that software?

DR. LOWRY: Well, we -- you know, I'm a big believer in using code for this type of research. It's so much more flexible, and you can consider so many different types of sensitivity, so many variations on the theme.

Now, Mr. Cass has been wont to quote the AUC on its attitude about many issues. Well, another thing that they like to talk about there is that, please, in future proceedings, anytime somebody files a productivity study, please provide ample sensitivity analyses so that we know the sensitivity of the study to things like, what's the output specification, what's the average service life.

With code it's really easy to come up with 12 and 15 different sensitivity analyses. Dr. Makholm provides no such analyses and seems to think it's a matter of principle not to do so.

So I think that that code is really great for doing the basic research. Now, when a gentleman like Dr. Makholm, who is accustomed to seeing the results in a spreadsheet, requests a spreadsheet, well, we'll bend over backwards to try to provide it.

It is an extra step, and, you know, usually you are only going to do it with the final run, but we were happy to oblige if time permitted, and it did permit in this case.

MR. MILLAR: Okay. Thank you for that. I want to be careful I don't abuse my privileges for redirect.

This SST software is available for purchase?

DR. LOWRY: It is available for purchase, and it is also really easy to follow. You know, there are some of the statements about bringing in the data, for example, that are a little more confusing, but just to read the code, you know, it really makes it very clear what you're doing, whereas with a spreadsheet we feel it is much harder to review the credibility of spreadsheets. Spreadsheets involve tens of thousands of separate calculations that you have to check, whereas the code is done in about 500 lines, so -- at any rate, we've tried to be more open. With every proceeding we learn a little something new, and so from these Alberta proceedings we learned to be a little more cooperative with those who want a spreadsheet.

MR. MILLAR: Okay, thank you.

With respect to the SNL, the data that you purchased from them, can anyone purchase that data?

DR. LOWRY: Oh, of course. It is kind --

MR. MILLAR: And indeed --

DR. LOWRY: -- of expensive, but -- it is, I think, 20 grand, but it's -- anyone can purchase it.

MR. MILLAR: And indeed, in this proceeding, subject to him signing the undertaking, you were able to provide those data to the applicants?

DR. LOWRY: Yes, and, you know, utilities in -- in this province do this all the time. They have witnesses with some proprietary data of one sort or another, and they expect people to sign confidentiality agreements. I mean, this is just another example of where the AUC is a little quirky. There are some smart people there, but they've made some unusual decisions about a few things.

MR. MILLAR: Okay. Thank you for that.

Final question --

MR. CASS: Madam Chair, I hesitate to object to Board Staff re-examination. I would point out that in addition to the scope that this re-examination has taken on, the last question was a leading question to the witness, which is, I don't think, an appropriate way to do a re-examination.

MR. MILLAR: Fair enough. I simply asked if someone could purchase the question -- the data. I don't think that's leading, but I am happy to move on. I have one final question and then I'm finished. I think it is a short one.

Dr. Lowry, to the extent someone has the SST software and purchases the SNL data, would they be able to replicate your results?

DR. LOWRY: Of course.

MR. MILLAR: Okay. Thank you. Those are my questions.

MS. ANDERSON: Okay, thank you. I believe that concludes panel -- do my math -- 5. There are a few procedural matters that we wanted to address before we do close for the day, but we can excuse Dr. Lowry. Thank you.

So I guess the first matter is the request by Dr. Shepherd of a calculation of savings using a stretch factor of 0.3 percent, and so we have considered it. The company has proposed a zero percent stretch factor. You've also done a calculation of savings that I think I've heard in the order of 411 million. Some people say 410, but it is in that order of magnitude. Dr. Lowry has proposed a stretch factor of 0.3 percent.

The Panel would find it helpful to know what those savings would be calculated at at a stretch factor of 0.3 percent.

MR. SHEPHERD: Madam Chair, there is a set of spreadsheets that are in FRPO 11 that do that calculation, but they also provide all of the background assumptions. And if it can be presented in that way it would make it a lot easier to look at the difference between what the company's proposing and what Dr. Lowry is proposing --

MS. ANDERSON: And I know some of your witnesses are not here, Mr. Cass.

MR. CASS: Yes, Madam Chair. The issue here is I haven't had an opportunity to canvass this question with others. I'm not sure to what extent it's doable, if I can use that word. I haven't even pulled out FRPO 11 myself to remind myself of what is in there.

MS. ANDERSON: So we would like you to undertake to look into that. We would find that calculation helpful whether -- if it can't be done to the level of detail of FRPO, then you could come back to us with what level you could provide. Ideally, it would be consistent with the previous calculation.

MR. CASS: Certainly, Madam Chair, we will look into it and see what can be done.

MR. MILLAR: Madam Chair, should we assign that an undertaking number?

MS. ANDERSON: Yes, please.

MR. MILLAR: That will be undertaking J4.1.

UNDERTAKING NO. J4.1: TO RE-CALCULATE SAVINGS SHOWN IN FRPO 11 USING A STRETCH FACTOR OF 0.3 PERCENT

PROCEDURAL MATTERS:

MS. ANDERSON: So next procedurally -- so we have time scheduled for Friday, and it is our hope that -- we wanted to finish off panel 3 and I know we're waiting for panel 6 as well. But we would like to finish off panel 3 and our hope is that they are available for Friday.

MR. CASS: Yes, they are.

MS. ANDERSON: Okay. So then we would finish off panel 3, 6, and then that would be concluding the cross on the evidence.

Then we also spoke of scheduling an additional day to look at cross-examination on the undertakings. It looks to us like the first available day is the 28th, and so it is our hope to do that on the 28th.

I know there's a lot of parties not here today, but we can have staff communicate that plan.

MR. MILLAR: Madam Chair, for the Friday -- forgive me if I've forgotten. I thought there were some time constraints. Will we be starting at 9:30 on Friday?

MS. ANDERSON: 9:30.

MR. MILLAR: For some reason, I had 10 in my mind. I just wanted to make sure that 9:30 is the start time.

MS. ANDERSON: It is the Friday before the long weekend, so I would assume people would prefer to finish earlier rather than later.

MR. MILLAR: I don't think that will a problem given the time estimates that we have.

MS. ANDERSON: Yes, Dr. Higgin?

DR. HIGGIN: The question we had was when would the applicant's argument-in-chief be?

MS. ANDERSON: So we'll have to decide that after the 28th. Well, potentially before that, but we don't have a date for that at this point. Anything further?

MR. CASS: Madam Chair, mighty I just ask -- I'm sorry, I caught you just as you were about to conclude. Is it not possible that the argument-in-chief could be on the 28th? That is one of the possibilities.

MS. ANDERSON: That certainly is one of the possibilities, and would be great if we could fit in and conclude by three o'clock.

I guess -- hopefully our time estimates in the hearing plan are reasonably accurate, and then we should be finished fairly early with the finishing of panel 3 and with Energy Probe.

MR. CASS: Sorry, Madam Chair, I was talking about the 28th when we come back.

MS. ANDERSON: Oh, yes, the 28th, yes. What would be -- I think we haven't made a determination.

The other thing I think would be helpful to the applicants, we've said it's cross-examination on the undertakings and that would be from panels 1, 2 and 3.

If parties don't have cross-examination for some of those panels, please advise us and we'll advise the applicants, so they don't have to bring the witnesses in for that if not necessary. So I think that would be -- we'd like to hear what specific areas or which specific undertakings you are planning to cross-examine on. We know it's JT2.4, but what else.

MR. SHEPHERD: Madam Chair, you said panels 1, 2 and 3. Will we have -- assuming we have undertaking J4.1, I would assume that would be a critical element of that cross and that's not panel 1, 2 or 3.

MS. ANDERSON: Yes, the thought was we won't have Dr. Lowry and Dr. Makholm on that day. So I agree that it would also be this undertaking number you just asked for, which hopefully we'll hear back on.

DR. HIGGIN: Just one thing, Madam Chair. There were some undertakings, as you know, in panels 2 and 3 that haven't been filed. We hope there won't be any follow-up, but we would just like that opportunity should there be one.

MS. ANDERSON: Okay, I think with that, we are closing. Thank you very much.

--- Whereupon the hearing adjourned at 4:51 p.m.