



COMMISSION OF INQUIRY  
RESPECTING THE MUSKRAT FALLS PROJECT

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Transcript | Phase 1

Volume 23

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*Commissioner: Honourable Justice Richard LeBlanc*

Tuesday

23 October 2018

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

The Honourable Justice Richard LeBlanc presiding as Commissioner.

Please be seated.

**THE COMMISSIONER:** All right, good morning.

Just before we begin, yesterday at the end of the proceedings I had indicated that the statement of Mr. Stanley would be marked as an exhibit. And it has now been marked and it's number 00790.

All right, Ms. O'Brien.

**MS. O'BRIEN:** Thank you.

Good morning, Commissioner.

Our first – our witness for today will be Dr. Guy Holburn. We are presenting Dr. Holburn as an expert witness. So what I'm proposing to do is first I'm going to ask for an order entering his – just his CV, then I'm going to review his qualifications with him.

Other counsel will then have an opportunity to pose questions if they wish. After that, I will be seeking to qualify him as an exhibit in the area of regulation and governance of the energy sector.

**THE COMMISSIONER:** As an expert?

**MS. O'BRIEN:** What did I say?

Yes, exhibit – expert in the area of regulation and governance in the energy sector. And then, assuming his qualifications are accepted by you, Commissioner, then I'll seek to enter his report and a slideshow presentation. And that's what will be – we propose he'll be presenting today.

**THE COMMISSIONER:** All right.

All right, so, Mr. Holburn, I'll ask that you stand, please.

**MS. O'BRIEN:** And Dr. Holburn would like to be sworn.

**THE COMMISSIONER:** Sworn?

**CLERK:** Could you – oh you got the Bible.

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

**DR. HOLBURN:** I do.

**CLERK:** Please state your full name for the record.

**DR. HOLBURN:** Guy Lawrence Fortescue Holburn.

**CLERK:** Thank you.

**MS. O'BRIEN:** Commissioner, the first exhibit I'm seeking to enter is P-00527 and that's Dr. Holburn's CV, please.

**THE COMMISSIONER:** All right, that can be entered as marked.

**MS. O'BRIEN:** Thank you.

Madam Clerk, could you please bring up that exhibit?

Dr. Holburn, your CV is also in tab 1 of the binder before you. And I'm just going to ask you – your full CV is here in evidence – there we go. I'm going to ask you if you could please review it for the Commissioner, highlighting your education and experience that's most relevant to the report that we are seeking to have you speak to today.

**DR. HOLBURN:** Okay.

I'm a professor of business, economics and public policy at the Ivey Business School, University of Western Ontario. My expertise is in the areas of utility regulation, governance and business strategy. I'm also the director of the Ivey Energy Policy and Management Centre, which is a university-based research think tank that focuses on applied energy policy analysis.

In terms of my education, I took my undergraduate degree from Cambridge University in economics between 1989 and 1992. And after that, I took my Ph.D. in

business and public policy and masters in economics from the University of California at Berkeley.

I'm also a director of London Hydro, which is one of the municipal electric utilities. And I should clarify that is London, Ontario, not London, England.

**MS. O'BRIEN:** And when did you become a director of London Hydro?

**DR. HOLBURN:** In 2017.

**MS. O'BRIEN:** And you continue as – in – as a director to this day?

**DR. HOLBURN:** Yes, I do.

**MS. O'BRIEN:** Okay.

Now I know you mentioned that you're founder and director of the Ivey Energy Policy and Management Centre, which is – I know you've described as a – essentially a think tank, is that fair –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – on energy sector policy matters?

**DR. HOLBURN:** Correct.

**MS. O'BRIEN:** Thank you.

And – we're – I'm going to just go to the part of your CV – here's your part that covers education and professional employment. Just going to your journal publications, peer-reviewed publications, are there any there in particular that you would like to highlight, Dr. Holburn?

**DR. HOLBURN:** I would say the majority, about 80 per cent of my academic publications, are on energy and electricity and regulatory issues, so most of those have informed my research agenda over the last 25 years.

**MS. O'BRIEN:** Okay.

And I know that you have also worked in preparing – in organizing conferences. So can you please talk to us about, you know, what are

those – what relevance those conferences that you've organized and attended play in terms of your expertise?

**DR. HOLBURN:** Yes.

As director of the Ivey Energy and Policy Management Centre, I've organized probably more than 30 conferences or helped out with organization and hosting of energy policy-related conferences over the last 10 years. And these are very much focused on regulatory and policy issues in electricity, oil and gas and pipelines. And these conferences have largely been focused on Canadian energy policy issues.

**MS. O'BRIEN:** Okay.

And I know – I'm on page 3 of your CV here. I know you've written a number of public policy papers, are there any in particular there that you'd like to highlight as being relevant.

**DR. HOLBURN:** Yes, I've written, I would say, more than a dozen applied policy papers on various aspects of energy policy within Canada over the last 10 years. I would say most of these are going to be relevant for the purposes of my report and my analysis.

**MS. O'BRIEN:** All right.

Other counsel may have some questions for you, Dr. Holburn. I'm satisfied to go forward with your CV as presented. And again, the area of expertise, Commissioner, is regulation and governance of the energy sector.

**THE COMMISSIONER:** All right.

Are any counsel wanting to cross-examine this witness on his credentials?

Yes, okay.

**MR. HEWITT:** Good morning, Dr. Holburn. My name is Justin Hewitt, and I'm co-counsel to former premier Kathy Dunderdale. Just have a couple of questions about your qualifications as an expert.

So I understand from your curriculum vitae that you've researched quite broadly in the – on the topic of regulation in the energy sector.

**DR. HOLBURN:** Correct.

**MR. HEWITT:** Could you just explain to what extent your research has focused on the impacts of regulatory review of hydroelectric facilities, specifically?

**DR. HOLBURN:** Mm-hmm.

So I've undertaken a number of empirical research papers that have looked at the impact of regulation on regulatory outcomes, specifically around rates making. These have not focused specifically on hydroelectric projects, but they've considered a broad range of utilities within the electricity sector. So that would include hydroelectric companies, natural gas companies, renewable companies and so forth.

**MR. HEWITT:** Now, have you had cause to research the issues of the impacts of regulatory – or regulatory review of the sanctioning phases of hydroelectric facility construction development, those sorts of issues?

**DR. HOLBURN:** The focus of much of my research has been on looking at the regulatory review after projects have been completed as opposed to being right at the initial stages of sanction.

**MR. HEWITT:** And what expertise or what experience do you have in researching the issue of regulatory oversight of Crown corporations?

**DR. HOLBURN:** I have done work on municipally owned utilities. So these are government-owned utilities, and many of the issues that relate to Crown corporations stem from government ownership also extend to municipally owned utilities.

**MR. HEWITT:** And you have published on that topic as well?

**DR. HOLBURN:** Yes, I have.

**MR. HEWITT:** Have you ever been qualified to testify as an expert witness in a court proceeding?

**DR. HOLBURN:** This is my first time.

**MR. HEWITT:** Okay.

Those are my questions. Thank you.

**THE COMMISSIONER:** All right, any other questions? Submissions?

Ms. O'Brien?

**MS. O'BRIEN:** Thank you. Then on that basis we're seeking to qualify Dr. Holburn as an expert in the regulation and governance of the energy sector.

**THE COMMISSIONER:** Okay.

I've had an opportunity to review Dr. Holburn's CV. I am satisfied that in the circumstances he is qualified to provide opinion evidence to the Inquiry on the issue of regulation and governance in the energy sector, and as a result, I will allow him to do that today.

**MS. O'BRIEN:** Thank you.

Commissioner, I'd like an order – to seek an order to enter exhibits P-00528, P-00724, P-00726 and P-00789.

**THE COMMISSIONER:** All right, those then will be marked as numbered.

**MS. O'BRIEN:** Okay. Thank you.

Dr. Holburn, your paper has now been entered as an exhibit as P-00528, and a PowerPoint presentation that I understand you prepared and will be presenting today has been entered as P-00724.

Before I turn it over to you to give that presentation, I do want to ask you a few questions about your scope of work –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – and the paper you prepared.

So I'm going to ask to bring up your engagement letter, please, P-00726. It's at tab 4 in the book in front of you, Dr. Holburn. And if we could please go to page 5 of this exhibit.

Dr. Holburn, you were engaged by the Muskrat Falls Inquiry, by Commission counsel, to prepare this paper, is that right?

**DR. HOLBURN:** Correct, yes.

**MS. O'BRIEN:** And we have actually asked you to prepare two papers. A second paper on governance issues, we will be presenting in phase 2.

**DR. HOLBURN:** Correct.

**MS. O'BRIEN:** Okay.

So today it is your first report that you will be presenting, and on this section of the exhibit that I have up, it covers the scope of work for the contents of that report. Can you just please generally advise the Commissioner as what it was we asked you to do in this paper?

**DR. HOLBURN:** So you've asked me to look at the impact on the developments and costs of exempting the Muskrat Falls Project from PUB oversight, on the developments and the costs of how the project proceeded.

**MS. O'BRIEN:** Okay.

And one of the other – believe we asked you to do some comparative analysis. Can you speak to that?

**DR. HOLBURN:** Yes.

This is – forms an important part of the report, looking at examples of how other provinces approached regulatory oversights of megaprojects within their jurisdictions. I've used four case studies, which were tentatively included in the original scope, that is the Keeyask hydroelectric project in Manitoba, Ontario Power Generation's Darlington nuclear refurbishment project in Ontario and the Western Alberta Transmission link in Alberta.

Instead of the Site C hydroelectric project that was tentatively suggested early on as being a comparative case study, I actually decided it would be more informative to include the example of the Maritime Link in Nova Scotia. And the reason for this is that the Maritime Link is completed, whereas the Site C project is still in the early stages of development.

So in terms of trying to draw out some general insights and some lessons from how other

provinces have approached regulatory oversights throughout the entirety of a project, this provided a more informative case study example.

**MS. O'BRIEN:** Okay.

Now, while Commission counsel was interested in having you do some comparative analysis to what's been done in other areas, is it correct to say that the initial list of the comparative projects that's included on page 7 of Exhibit P-00726 was a list that you generated –

**DR. HOLBURN:** Yeah.

**MS. O'BRIEN:** – as opposed to Mr. Learmonth and I generating?

**DR. HOLBURN:** Yes, it was.

**MS. O'BRIEN:** Okay.

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** And the decision to – not to do a review of the Site C in British Columbia but instead do the Maritime Link in Nova Scotia, whose decision was that?

**DR. HOLBURN:** That was my decision.

**MS. O'BRIEN:** Okay.

The report that's been entered as P-00528, are you the sole author of that report or did anyone assist you in writing it?

**DR. HOLBURN:** I am the primary author on this report. I had some assistance from a colleague with developing material for the four case studies, and that was Adam Fremeth at the Ivey Business School.

**MS. O'BRIEN:** Okay.

And have you read the entire report?

**DR. HOLBURN:** Yes, I have.

**MS. O'BRIEN:** And reviewed the work of your colleague?

**DR. HOLBURN:** Yes, I have.

**MS. O'BRIEN:** And do you accept responsibility for the report as a whole and accept it as your work and opinion?

**DR. HOLBURN:** Yes, I do.

**MS. O'BRIEN:** Okay. Thank you.

Those are my preliminary questions. I'm now going to bring up Exhibit P-00724, which is a PowerPoint presentation. I'll turn the matter over to Dr. Holburn. I think he has control of the slides, and following your report, Dr. Holburn, I may have some additional questions for you.

Thank you.

**DR. HOLBURN:** Okay, before I begin I'd like to thank the Commission for this opportunity to come and provide an external perspective on regulatory arrangements for the Muskrat Falls Project.

Just trying to advance the slides here.

**MS. O'BRIEN:** We can ask technical assistance to come in from the back, please, our (inaudible) will come up.

**UNIDENTIFIED MALE SPEAKER:** Page down.

**DR. HOLBURN:** That's what I'm pressing.

**UNIDENTIFIED MALE SPEAKER:** Page down.

**THE COMMISSIONER:** Go ahead and just –

**DR. HOLBURN:** Yeah, I think I maybe need some assistance here.

**UNIDENTIFIED MALE SPEAKER:** It was tested this morning. Of course it would – excuse me.

**THE COMMISSIONER:** Maybe we'll take just a couple of minutes just to allow this to get set up. So we'll just adjourn for a couple of minutes.

### Recess

**DR. HOLBURN:** So to be clear about the scope of the reports. This has been commissioned by the Inquiry to provide an assessment of the impact of exempting the Muskrat Falls Project from regulatory oversight by the PUB on the developments and costs of the project. So the report will not be considering environmental implications of the exemption.

The report, and also my presentation, fall into eight sections and the presentation follows closely the structure of the report. So, I thought it would be helpful just to, sort of, briefly outline the different elements of it.

To begin with, I'll briefly review the purpose of regulation and why we have regulatory agencies and what is their operation in terms of the public interests. This will then lead to discussion of best practices and the design of regulatory agencies and to understand what are some of the features that lead to effective regulation of the utility sector.

In section 3, I'll discuss some of the advantages and disadvantages of delegating oversight of electricity projects to independent agencies to try and understand some of the boundary conditions, when it might be preferable to delegate or not and to rely on government bodies in terms of overseeing projects. That will then set up the opportunity to provide some detail and to review the Newfoundland and Labrador Board of Commissioners of Public Utilities to understand to what extent they reflect best practice, organization and structure in regulation of the sector.

Following that, I'll move to the four detailed case studies that I've developed for this report. And the goal here is to understand how have other provinces approached oversight of major electricity projects, and these projects include those in Alberta, Manitoba, Nova Scotia and Ontario. And that will then allow us to understand that range of approaches sort of being taken. We'll then move to a discussion of the regulatory arrangements that were implemented for overseeing Muskrat Falls. And then in section 7, I will discuss some of the consequences of exempting the project from PUB oversight. And, finally, I will conclude with some observations in the final section.

So, the purpose of economic regulation. I thought it would be helpful to provide this graphic which, in fact, comes from an old PUB annual report, which I think nicely illustrates the goal of regulators in the utility sector, and that is to balance consumer interests against company interests. And the way that this balance is achieved is by the regulator setting just and reasonable rates. Very simple depiction here of the primary goal of utility regulators

Now, in most markets competitive pressures essentially achieve this balance between consumer and producer interests. Competition between companies ensures that prices don't stray too far from the costs of companies and the costs of production. But, as we know, in the electrical utility sector we don't have, typically, competitive forces. In transmission and distribution, we generally have one company that is providing service and often in the generation components, then we only have one or sometimes a few companies providing service. And often generation markets aren't as competitive as we would like them to be.

So the role of regulatory agencies in a utility sector is to substitute for competitive market forces and to establish and to protect consumers by setting rates that are deemed to be reasonable. The way that regulators achieve this is by setting rates based on the utility's cost of service. Utilities are allowed to recover economic or prudent costs and are also allowed to earn a reasonable rate of return on their assets.

So the key challenge for regulators is to determine what is a reasonable or an efficient level of costs? And we can think about operating costs and capital costs, which sounds simple as an objective but is, in fact, a very difficult one to implement and to achieve. And there are two reasons, to particular challenges why, even though we have simply stated objective, this is difficult to achieve in practice.

First of all, there is a challenge of what is maybe referred to as hidden information or economists will refer to this as asymmetric information, in that it's difficult for an external party to accurately observe the prudence of utility decisions or the efficiency with which they are operating, given the complexity of utility operations. This makes the regulator partly

reliant on utility reports and claims about the degree to which they are operating efficiently.

The second challenge for regulators is that – regards utility incentives. Utilities are able to increase their profits given the return – the allowed return on the rate base by increasing their regulated assets. Now, this creates the risk that utilities will spend too much on capital projects and they will go beyond an efficient level of capital expenditures in a – as a means to increase that overall level of profitability.

So the combination of these two challenges means that regulators understand that utilities have an incentive to over invest and perhaps to a level that's not efficient, but it's difficult to know exactly what that precise level of efficient operations and efficient investments would be. So this is a well-known problem in the utility regulation field.

And economists and policy-makers have spent a long time trying to understand what types of regulatory arrangements and regulatory policy instruments will allow for a more efficient and effective regulation of the sector to mitigate these informational and incentive challenges. Public policy organizations and academic experts have proposed a number of key governance features of regulatory agencies that will enable them to discharge their duties more effectively in regulating the sector, and to arrive at reasonable rates that both balance consumer interests and company interests.

So I'm now going to turn to a summary of some of the best practice principles that have been developed by a combination of economists over a long period of time and public policy organizations, such as the OECD and the World Bank. And there are seven core best-practice principles which I want to emphasize here.

First of all, on the objectives for agencies; best practice is that agencies should have clear principle-based goals established in legislation that reflects this underlying objective of trying to balance consumer and producer interests. Ontario provides a good example here; we could pick many jurisdictions. And in Ontario, the Ontario Energy Board, which is the equivalent to the PUB here, is required to protect the interests of consumers with respect to prices,

promote economic efficiency and facilitate the maintenance of a financially viable electricity sector.

Secondly, regarding resources and powers, agencies should have sufficient budget and staff resources in order to fulfill their mandate. Now, this will depend, to a certain extent, on the size and the complexity of the utility sector. The agencies should also have the powers to gather information from utilities and from other parties, the powers to investigate and the powers to enforce regulation to set penalties. So that's seen as a credible policy-making institution.

Thirdly, regarding independence, it seems best practice for agencies to operate at a distance from government and to have some autonomy in their decision-making. The benefit of this is it is able to increase the level of stakeholder confidence in the impartiality of agency decision-making.

Independence can be established through a number of mechanisms, most fundamentally, by enabling regulators to make their decisions – their decisions and orders – without first requiring approval from government ministers. Secondly, agent commissioner appointment mechanisms that last for long periods of time can help insulate commissioners from immediate short-term political considerations that might arise around reappointment decisions. So, appointment periods for longer than five years are generally seen as being a best practice.

And, secondly, mechanisms for determining agency budgets also have a bearing on independence. Budgets that are determined through consumer rates – so levies that appear on consumer rates – will endow agencies with a greater level of independence and if agencies depend on annual appropriations coming from general government revenue.

Independence need not necessarily imply that agencies aren't accountable, and best practice considerations suggest there are a number of ways in which agencies can remain accountable to the stakeholders and to the government.

Affected parties should have the ability to appeal specific decisions of agencies to the courts. And this provides an immediate safeguard for stakeholders. Agencies should also be

accountable to the executive and legislative branches of government through reporting requirements on an annual basis, which then allow the legislature to review agency performance and to establish whether it has matched the agreed benchmarks and agreed guidelines. So these four sets of best practices essentially describe the structure of – the institutional structure of regulatory agencies.

The next three focus more on the processes by which decisions are made. So regarding stakeholder participation, it's generally seen as best practice to enable affected parties to intervene in hearings to provide evidence, to provide testimony, to cross-examine others. The benefit of this is that it improves the informational environment upon which regulators are making their decisions. This also seems best practice for governments to fund consumer advocates, particularly to represent some of the smaller consumers. These can be small commercial and, particularly, residential consumers, who otherwise may not normally be organized and have an opportunity to participate in hearings.

Secondly, regarding the basis for agency decision-making, it's generally regarded as best practice for agencies to be required or the commissioners to base their decisions on the evidence that is presented during the hearing process. This has an important impact of ensuring that regulatory decisions are not arbitrary and it raises the importance of intervenors and the PUB – sorry, regulators developing credible evidence that will withstand cross-examination.

And finally, regarding transparency, it's regarded as best practice for information about regulatory processes, evidence and decisions to be publicly transparent. Now, this improves the accountability to stakeholders and enables a degree of monitoring of the regulators, both by stakeholders and intervenors, but also by government, by ministers and by the legislature. Full transparency enables these external parties to monitor the regulatory performance. So in sum, these seven best practices essentially help create the ingredients or the constitution for a regulator that can operate effectively in discharging its duties.



So what are the advantages and disadvantages of delegating oversight to agencies? One of the primary advantages – and this is, I think, not to be understated – is that it helps to develop reliable information about utility costs, benefits, impacts and risks, especially – this is especially valuable for large and more complex projects where the informational challenges are more severe.

And so by having better information about these elements and about policy alternatives, it's less likely that policy mistakes are going to be made. The more likely that decisions that are going to be in the public interest will be made on the basis of better information about the consequences of a particular course of action.

The second advantage is that by using due process, characterized by transparent evidence-based open processes, this can be a way to strengthen public and stakeholder trust in regulatory policy decisions.

And thirdly, when agencies operate independently there is a long-term benefit in that by insulating agencies from short-term political pressures that can arise, for instance, when unexpected events occur in the sector or whether – or when there are changes in ministers or in government, this can help to insulate agencies from some of these short-term political turbulence and improve the stability and predictability of regulatory policy in the long term.

Now there are, of course, a number of disadvantages from relying on independent agency oversight. And these need to be balanced against some of the advantages. It can be a time-consuming and costly administrative process to undertake reviews of electricity projects, particularly larger projects. For megaprojects it wouldn't be uncommon for a review to last for longer than 12 months. So if there is some urgency in making a decision, then this might lead to a preferred alternative approach, rather than relying on this administrative due process.

There's also less flexibility when relying on independent agencies to consider factors outside the regulator's mandate. Utility regulators are essentially constituted as economic regulators, and to consider the costs and benefits of a

particular policy course of action. And generally, environmental considerations, for instance, would not be included within a utility regulator's mandate. So if it is deemed that environmental considerations have a very large impact or potential impact then an alternative approach may be deemed necessary. Regulators have to stick to their legislative mandates.

So these are some of the disadvantages and advantages that need to be weighed up. And in general, the scale and scope of each of these is likely to be larger for more complex projects. So with that as backdrop, let's move now to looking at the PUB here in the province, to understand how does it compare to this best practice model – stylized model – that I've sketched out.

So the objectives of the PUB are defined in the *Electrical Power Control Act, 1994* and these are very clear, and I think these are very sort of – these are very consistent with this balance – with achieving this balance between consumers and producers. The EPCA requires efficient production, transmission and distribution at the lowest possible cost consistent with reliable service. The PUB is mandated to set reasonable rates and it's to permit utilities to earn a just and reasonable return, and also to ensure sufficient planning by utilities.

So this includes the core elements of trying to weigh up the consumer interest, on the one hand, with a nod towards efficiency of utility operations, but also recognizing the utilities if they are to be induced to invest and to make long-term commitments in infrastructure. They need to be compensated with a just and reasonable return.

On resources and powers, these are specified for the PUB in the *Public Utilities Act*. Its powers are to undertake investigative hearings and so forth. The resources it has are four Commissioners, 12 staff, and a budget of approximately two and a half million dollars, which would exclude any hearing cost fees. Now, this does rank the PUB as amongst the smallest of regulatory commissions within Canada. At the other end of the scale, the Ontario Energy Board has 178 staff and a budget of \$40 million.

It's quite natural that the PUB here would have the smaller budget, given that the size of the province is much smaller than most other provinces, and the complexity and number of regulated customers that it has to oversee is also smaller than the typical province. So we would expect something – we would expect to see a smaller staff and budget.

That said, with a very small organization like this, it makes it more of a fragile regulatory commission, in that it's more exposed to departures of qualified personnel who may have deep experience in the sector. And this also makes it more challenging for a small organization to deal with unexpected applications or requests, and to incorporate those into its work plan.

In terms of independence, the PUB is established as an independent entity in legislation with its own authority and access to resources, so this is consistent with best practice. Commissioner appointment terms are some of the longest in Canada at 10 years. So these elements add strength independence, as does funding, which comes through industry assessments, which goes onto consumer bills, as opposed to coming directly from government appropriations.

So the PUB is structured to operate on a reasonably independent basis. The government has accrued some directive powers over the ability to determine rate structures, and also the – to set the rate of return for hydro. So these limit the scope of authority, somewhat, that the PUB has.

In terms of accountability, PUB decisions may be appealed at the Court of Appeal. The PUB is also accountable to the Minister of Justice and Public Safety on the budgetary aspect, which is presented for approval to Cabinet. And the PUB is also required to submit an annual report to the House of Assembly, which has an opportunity to review the operations and performance of the PUB. So these are, again, consistent with best practice.

Stakeholder participation: when looking at a number of rules and orders, it's clear that intervenor participation is common in major applications. For example, one of Hydro's recent

general rate cases involved eight intervenors and 45 public hearing days. This is also consistent with what I observed in other provinces in terms of the number of intervenors who would participate in rate cases. The PUB also encourages stakeholder representation by offering cost awards to intervenors to participate, and there is also a government-appointed Consumer Advocate to represent residential consumers.

For the basis of decision-making, the PUB clearly relies on evidence provided by applicants, intervenors, PUB staff and expert consultants, and it has the authority to obtain records of some witnesses and to take evidence under oath. So this is, again, very consistent with an evidentiary standard that is applied to PUB decision-making. The PUB publishes its written decisions and orders that clearly articulates the evidentiary basis and the rationale for its decisions.

And finally on transparency: the PUB is active in notifying the public about applications and pre-hearing conferences; both through local media and through its website. And documentation relating to applications is also publicly available, and this is a common practice for regulatory agencies in all provinces through the website and their electronic management system.

So overall, the PUB is setup and structured in a way that's quite consistent with what we see in many of the provinces. It's setup in a manner that's consistent with the guidelines to provide an expert independent determination of whether utility investments and expenditures are, in fact, consistent with providing the lowest-cost power to consumers, which is their legislated mandate.

The PUB has a large degree of experience in discharging its duties. Over a 10-year period, from 2006 to 2015, they issued more than 400 public utility orders on a range of different topics, going from rate cases to capital funding, and the PUB has also initiated its own prudence review, on at least one occasion, when it had cause to be concerned about the prudence of utility operations. So these suggest that we have here an institution – we have an institution that is mindful of actively monitoring the sector that it's responsible for regulating.

So, how can we assess performance? Trying to assess performance of regulators is a challenging task, and there's no easy answer on how to do this. We can ask stakeholders what their perspectives are. I haven't seen any surveys of stakeholders that have been done on PUB operations, but I did note that Newfoundland Power commented in 2006 in its submission to the 2007 Energy Plan, the regulation in this province has been stable, has worked well and is currently moving in the right direction.

It's also possible to ask for consultants reviews and to ask for their opinions on the operations of our regulatory agencies. The province commissioned a consultant report by Power Advisory that provided a report in 2015. This identified some areas for improvement for the PUB and noted a number of factors. It suggested that the PUB could potentially provide long-term integrated resource plan for the sector, which has not been to a standard practice to date.

It also recommended the PUB could consider time-of-use rate structures, which would encourage more efficient consumption and help reduce peak demands. It is also noted that regulation of hydro has been somewhat infrequent and has been more contentious than regulatory experience with Newfoundland Power, and has twice been appealed to the courts. So there are clearly some areas where PUB operations and practice might be able to improve its performance.

One other indicator of PUB performance is to look at rates. This is not necessarily evidence of, but rapid changes in rates over time might indicate there's an issue with regulation.

So when we look at regulated rates in the province, I'll show you this chart here which shows average rates across all customer classes. This is based on data from Statistics Canada. This shows average rates from 1970 through to 2015, and it charts – each line here is for a different province. The black line represents Newfoundland and Labrador and the top red line is, in fact, PEI.

Now, we can see here that over this 35-year period – sorry, 45-year period – the province has had relatively low rates. They have been below

the national average in each of these years. We have seen little bits of an uptick after 2008 where rates have increased a little bit faster than the national average, but even so, they remain below the national average. So this is evidence that's consistent with, not necessarily evidence of, but it's consistent with a regulatory regime that has been working reasonably well.

Okay. So, I'd now like to turn to a discussion of regulatory oversight of major electricity projects in a number of different provinces. So we have four case studies here. These are all for projects that cost, or were anticipated to cost, more than a billion dollars, and therefore satisfying Professor Flyvbjerg's definition of a megaproject. They've all been commenced or completed over the last decade. In fact, we have two that were commenced and two that were completed and they are in different provinces. So, these are the four projects, which are – and I'll go through each of these in turn.

The Maritime Link in Nova Scotia which cost \$1.6 billion. The Darlington Nuclear Generation Station refurbishment in Ontario, which is forecast to cost close to \$13 billion. Just note that the nuclear power sector is one of those sectors where megaprojects have a very high variance in terms of outcomes and are deemed to be sort of particularly at risk of running into overrun situations. The West Alberta Transmission Line, which cost \$1.7. And, finally, the Keeyask Generation Station in Manitoba which is estimated to cost over \$10 billion.

So in going through each of these projects to understand the regulatory arrangements, I am going to step through five very distinct stages of project development. Beginning with project identification, which looks at the role of regulators and determining the need for the project. Secondly, the evaluation stage, the fundamental question is: What are the project costs and risks relative to alternatives and what is the role of regulators in undertaking evaluation? At the approval stage, the question is: Who approves the project and what is the basis for the decision? During the construction stage: How is the project monitored and overseen by alternative authorities? And then finally in the cost review and recovery stage: Once construction has been completed, what is

the mechanism for reviewing costs after they were incurred and what is the mechanism for recovering those costs in consumer rates and reimbursing the project proponent?

So, at each of these stages we can identify effective standards of regulatory oversight, which then provide a benchmark for evaluating the actual practice that we observe in each of these case studies. So I'm going to step through the effective standards of oversight.

So, with project identification, an effective level of regulatory oversight would involve a system planner, or a utility together with a system planner, periodically developing a long-term integrated resource plan that would include a mix of both demand side and supply side options that will meet future system needs. For instance, in Ontario, we've seen long-term energy plans developed every three or four years or so. Within that context, a planner or a utility may develop a proposal for a project that's consistent with this overall plan that sets out the strategy and the architecture for making decisions around system additions over an extended period of time. Often these integrated resource plans are for periods of 20 years.

The evaluation stage, an effective level of practice would involve a regulator who reviews the system plan or specific project proposal to test whether it meets the mandated criteria, such as cost effectiveness relative to alternatives. Regulate regulatory review should be comprehensive in scope and looking at alternatives, and it should be conducted through a regulatory due process consisting of open and transparent and evidence-based decision making. The review should also involve affected partners and have an evidentiary basis for its determination.

At this point, the project proponent should provide reliable cost estimates and a detailed project management and governance plan. In some occasions, an environmental agency may be required to undertake a separate environmental impact analysis.

At the approval stage: An effective level of practice would be for either a regulator to approve a project, including the cost and the construction schedule if it meets the criteria, and

sometimes regulators may also require conditions for that approval. Or alternatively, it may be the government wishes to make the sanctioned decision, in which case best practice would be for the government to make its decision based on evidence and recommendations that come from a comprehensive regulatory evaluation.

At the execution and oversight stage: Mindful of the risks of potential cost overruns and slippages, best practice would be for a system planner, a regulator or a government-appointed expert to monitor project progress against previously agreed cost and time benchmarks, and to liaise with proponent management or the board. Monitoring allows a government to review progress, often over extended time periods for major projects, and to take action, potentially, if costs escalate – and even, theoretically, to revisit a sanction decision at a point in time if deemed necessary. It also provides the opportunity for government to evaluate change proposals and to approve these, as these are necessarily going to occur.

And finally, the cost review and recovery stage: Upon completion of a project or a particular stage of a project, best practice would be for a proponent to apply to an independent regulator for recovery and rates. The regulator then would conduct a prudency review of the expenditures through an open-transparent, evidence-based process that involves intervenors and stakeholders that are affected. And the task of the regulator here is to assess the prudency and to approve only prudently incurred costs. And one of the benefits of this final stage of regulatory review is it creates the early incentives for the project proponents to tightly manage costs and to implement governance mechanisms that will keep the project on budget and on schedule.

So with these standards as a backdrop, I'd now like to turn to the first case study, which is that of the Maritime Link, which I'm sure many of us are familiar here with in Nova Scotia. So this includes a 170-kilometre subsea high-voltage DC cable going under the Cabot Strait. It is being built by Emera and is one component of the broader Muskrat Falls Project.

In terms of context, Emera is the main utility in Nova Scotia. It has a subsidiary, Nova Scotia Power, which is the primary provider of electricity in the province. It's a vertically integrated utility, owning generation, transmission and distribution assets. And as we can see from this chart on the right here, the single largest source of electricity generated in Nova Scotia comes from coal, and after that wind and hydro. And the province has been trying to move away from a reliance on coal for a number of years.

So beginning with the project identification stage – and I should also indicate that I'm going to be using some colour coding here on the top bar. These are general assessments of the effectiveness with which regulatory oversight is operating for each of these stages. Green reflects a high standard of regulatory oversight. Yellow shading represents a moderate level of regulatory oversight of that particular stage. And red would reflect a weak standard of regulatory oversight.

So the project identification stage in Nova Scotia, the proposal for the Maritime Link was formally announced in 2010 and led to the Joint Development Agreement between Emera and Nalcor that was signed in November of that year. Now this came – this project was announced a year after the – after Nova Scotia Power had updated its integrated resource plan in 2009 in conjunction with the Nova Scotia Utility and Review Board and with sector stakeholders.

So the utility had gone through this long-term strategic planning process to identify the best approach to meeting the province's future electricity needs, and this envisaged a couple of factors which I think are noteworthy. First of all, it noted a very significant growth – planned growth in renewable energy, and also an emphasis on demand-side management.

Just to illustrate one component of a resource plan that comes from Nova Scotia Power, this chart illustrates the alternative scenarios that it assessed in 2009 and these all represent a different fuel and supply and demand-side mixes for meeting energy needs in the province as of 2020. So the left-hand bar here represents the – at the time, the actual mix of different generation

sources. And we can see the gray bar here – the large gray bar represents coal-fired generation. And at top the pink bar represents imports and then we have natural gas, hydro. The 11 bars to the right of that will reflect a series of different scenarios and we can see in each of these there's a decreasing share of coal and what's taking up that gap that's left by this shift away.

One the one hand we see an increase in each scenario of imports – sorry, of renewables, and this would be in particular wind. That's the green segments. And then the top bar is demand-side management. So these are efforts to conserve and to reduce demand for electricity within the province. This is common across all of 11 different scenarios. And the two pink bar – two pink segments you'll see in the sixth and eleventh columns, these reflect scenarios where the province is importing a greater amount of energy from elsewhere.

So we can see here that the Maritime Link is consistent with previously developed integrated resource plans. It's consistent with a shift towards renewables and it's also consistent with the wish to increase imports in a couple of the scenarios as well. We can see here this is the time change for the first scenario, Plan A, as Nova Scotia Power refers to it as. We can see here the declining share of coal-fired generation on the bottom and the top mauve part reflects the impact of conservation and demand-side management. And the target for that was 20 per cent of effective production of supply by 2020.

So moving on to the evaluation stage. The Emera subsidiary, which is responsible for the Maritime Link, Nova Scotia Power Maritime Link – I will just refer to that for simplicity as Nova Scotia Power. It applied to the UARB, the regulator that's the equivalent of the PUB in Nova Scotia, for approval – this I should clarify, this is for pre-approval of the Maritime Link Project in January 2013. This was at the time after DG3 cost estimates had been developed by Nalcor. This then – this application then lead the UARB to initiate hearings and to conduct an open, transparent and evidence-based review process that would involve 23 intervenors and nine days of hearings.

And the goal here was to determine whether the Maritime Link was consistent with, one,

providing the lowest-cost alternative of power to the province and, secondly, whether it was consistent with the province's environmental goals for the electricity sector. And specifically, the province had a goal of increasing the share of renewable energy supply to 40 per cent by the year 2020.

So the UARB considered a range of alternative options as part of their hearings including other imports and wind. Intervenors participated, and the UARB, as well, they retained expert consultants to provide evidence and opinions on the merits of the project in relation to other alternatives.

During the course of the PUB – sorry – the UARB hearings and investigation, one of the key issues that emerged during this in affecting the assessment of whether the Maritime Link would in fact be the lowest-cost option, was the availability to Nova Scotia power of non-firm, market-priced energy that would be available from Muskrat Falls.

The original agreement with Nalcor did not provide a guarantee of the quantity of market-priced energy that would be available. Nova Scotia Power stated that it did not need to have a firm contractual agreement, though during the course of the hearings, seven intervenors raised substantial concerns about the risks that might be apparent for the ratepayers. This led to a significant level of cross-examination and discussion during the hearings.

The conclusion – the UARB, after hearing all the evidence and testimony, concluded that in fact, there was substantial uncertainty about the future of long-term availability and that in the current arrangements there would be a significant risk for ratepayers if it were to approve the project as applied for by Nova Scotia Power.

Reading through some of the commentary in the UARB final decision is, I think, quite instructive in providing some insights into the value of this type of hearing process. The UARB concluded – found that some of the consultants' evidence was thorough, insightful and useful whereas others' was weaker and was less useful. It also found that some of Nova Scotia Power's arguments were inconsistent with one another. It

found that Nova Scotia Power was also selective in presenting some of the choices of scenarios, which, as it stated, portrayed the Maritime Link in its most favourable light.

And it also noted that under cross-examination by the Consumer Advocate, the Nova Scotia Power executive testified that Nova Scotia Power had in fact previously attempted to extract some contractual concessions from Nalcor for the future supply of market-priced energy but, in fact, hadn't been able to achieve that.

So I highlight this episode because I think that it illustrates the value of an open, transparent, evidence-based regulatory review process in protecting ratepayer interests. We can see that the – up front, the availability of market-priced energy was a complex issue with uncertain impacts and risks.

But the scrutiny by intervenors and PUB staff during hearings and cross-examination revealed new information that was previously not fully appreciated about the assumptions, about logic and the reliability of the conclusions of the application. This scrutiny led to identification of some weaknesses and also some strengths in various arguments that had been proposed by the proponent and also by the intervenors.

So it would be risky to assume up front that proponents or intervenor submissions are necessarily correct, and there are some benefits from having a close, hard look coming from different perspectives.

And finally, regulators are clearly required to consider all of the evidence presented to them in reaching a conclusion, which must be based on the evidence and a rational argument. And this then will lead to a more balanced and reasoned evaluation that considers the interests of both ratepayers and also of utilities.

So finally, the conclusion of the hearings in July of 2013 – the Review Board concluded that the Maritime Link Project was the lowest cost alternative only with an enforceable agreement for access to non-firm, market-priced energy.

The UARB approved the Maritime Link with an expected – so a high-confidence cost estimate at

the time of \$1.7 billion subject to the condition that a new access agreement would be reached between Nova Scotia Power Maritime Link and Nalcor.

Now, the Review Board could have rejected its – the application for it based on this determination. But it used its expertise that – and also the insight that came through the hearing process to identify a solution which would then allow it to approve the project, so it created this condition.

The two parties negotiated an agreement and came back to the UARB in October, which reviewed it through another hearing process, and the UARB approved the Maritime Link proposal in November of 2013, which then allowed the project to proceed. So this was a high standard of regulatory review and analysis and the deployment of regulatory expertise.

At the same time, the regulatory board was mindful of the risks of cost overruns. Everyone is aware that megaprojects can go over budget and over schedule, and the board was very pointed in instructing the proponents to adopt mechanisms that would keep costs under control.

It stated that the board expects Nova Scotia Power to have strict controls during the design and construction phase of the Maritime Link Project to keep its costs within the approved envelope. While the board will consider any additional request for cost overrun approval, the prudence test will be applied in rendering this decision. A very clear instruction to the proponent to be mindful and that it should not assume that any additional costs will be approved by the regulator, and it will be looking at these carefully to assess whether they were reasonable or not after they have been incurred.

So we then move on to the execution and oversight stage, which occurs during the construction of the project. The UARB directed Nova Scotia Power to file quarterly project status and cost reports with it and also to submit independent engineer's reports.

Potentially, here – and this is why I've shade – I've given it a moderate level of oversight in yellow rather than green – the UARB could have

requested an independent expert to monitor the Maritime Link Project and to work closely with the – with a project committee within Nova Scotia Power. And this might have given more independent assurance on the project status than relying purely on the cost reports coming directly from Nova Scotia Power. Even so, it did require this regular project reports coming to the regulator, which has got expertise in assessing the status of construction. Maritime Link was completed on schedule and on budget by the end of 2017.

So the cost review and recovery stage: Nova Scotia Power is required to apply to the UARB for cost recovery of the Maritime Link costs in rates. Even though the UARB had pre-approved it, this final check in the process is important here. The UARB has the authority to review and to approve Maritime Link Project costs to assess prudence. And this is conducted through the normal regulatory review process characterized by open, transparent and evidence-based hearings.

Nova Scotia Power applied for inclusion of the Maritime Link costs in 2017. After extensive hearings involving many intervenors, the UARB actually declined to permit full recovery of costs at the time, since it deemed that the Maritime Link was at that moment not useful – was not used and useful, which is one of the standards that applies for whether the investment was a prudent one. This was due to the fact that the Muskrat Falls Project was not yet completed and, therefore, the expected import of power coming from the province had not yet occurred. So it allowed a partial or a temporary interim assessment and has instructed Nova Scotia Power to come back and to reapply for recovery of costs once the Maritime Link is fully operational, which should be in a few years.

So I think it's helpful at this point just – helpful just to summarize how this regulatory oversight process has worked because I think this is a good example of an effective standard of oversight. So it began with a comprehensive, independent regulatory review of the project, which was consistent with a previously approved integrated resource plan for the province.

During the course of the hearings, a potential economic risk was identified and it was mitigated by conditions established by the regulator. Approval was based on a comprehensive evaluation of whether the project met the required economic and also environmental criteria. The regulator implemented monitoring of the project during the construction stage, and then the final regulatory review of prudence gave the opportunity to have a look back, before costs would be then authorized to be recovered in rates. So at each stage of this project development, from beginning to end, the regulators played a central role in protecting ratepayer interests.

So now I'd like to turn to the second case study which is on the Darlington nuclear power plant. As I mentioned earlier, the nuclear industry has a history of cost overruns, so this is an interesting one to consider from a regulatory perspective as the government was very aware, when it commissioned this project, that there would be a substantial risk associated with it.

The Darlington nuclear power plant is a 3½-thousand-megawatt plant. It was commissioned in the early 1990s and is owned by Ontario Power Generation, which is a government-owned corporation in Ontario. And the plant is located near Oshawa, about an hour's drive outside Toronto.

In Ontario, this provides us a very stylized snapshot of the electricity sector here. Installed capacity is around 35,000 megawatts. So this plant represents about 10 per cent of Ontario's installed capacity. So this is a large plant, even by provincial standards, and it produces about 20 per cent of the energy that's generated throughout the year in Ontario.

This shows the source of energy that's generated within the province as of 2016. The majority of power in Ontario does come from nuclear; more than – a little more than 50 per cent is generated by nuclear sources. You'll note there's no coal here. Ontario has moved away from coal-fired to generation capacity over the last 15 years and this has been replaced by a combination of renewables and natural gas. And you also note conservation, which is the black segment of the ring there, which the government reports as

constituting 8 per cent of available theoretical demand.

So let's step through the same five stages of regulatory oversight for this project. So the initial potential to develop the Darlington project was identified by the system planner in Ontario. This was, at the time, called the Ontario Power Authority, which had responsibility for undertaking long-term plans for the sector. In 2005 it wrote an important supply mix advice report which looked at the sources of new generation, given, at the time, the province was facing a potential shortfall that was estimated that around 15,000 megawatts of new capacity would be needed by 2025.

At this time, nuclear capacity was determined by the OPA as being a very low-cost source of baseload supply. And the OPA recommended, in its supply mix report, this should provide the bulk of their new capacity requirements that would be needed in the province, also noting it has a very favourable emissions profile.

Following the advice coming from the OPA, the minister of energy directed the OPA to develop a comprehensive – and this is a formal integrated power system plan. So this would be the equivalent of an integrated or resource plan. And the minister, based on the supply mix report, requires the OPA to include certain targets, so conservation – there's a conservation target of over 6,000 megawatts to be achieved by 2025. And the minister included a renewable energy target of almost 16,000 megawatts by 2025. There was also the requirement of the directive to eliminate coal generation and also to include nuclear – within the overall supply mix – of up to 14,000 megawatts.

So this kicked off long-term system planning within the Province of Ontario. And we've since had a number of long-term plans that come about every three years or so; we've had a 2010 plan, a 2013 plan developed by the system planners in conjunction with the minister of energy. And each of these has identified the need for nuclear to continue to play a central role within the province and to either commission new nuclear plans or to refurbish existing capacity.



The new nuclear option was actually rejected in 2009 and in 2013 after two competitive bidding processes, as it proved that it was going to be much more costly than refurbishing existing nuclear fleets. So we can see here a very deliberate planning process involving the system planners.

And just to illustrate here one scenario from an integrated power system plan that emerged in 2007, this is the forecast of the supply mix over a 20-year period from 2007 to 2027. I'll just point you towards the purple segments at the bottom. These are the existing nuclear fleet, and you will see some lighter shaded purple, pink ones, pink segments coming in. These were the anticipated recommendations and plans for developing the refurbished or potentially new nuclear capacity at that time.

The other point I want to draw your attention to is the yellow segment in each bar, increasing over time. This is the planned contribution of conservation and demand-side measures to meeting system requirements over time. And the goal there was to – was for conservation to account for approximately 15 percent of demands by 2027.

So the evaluation stage: the Ontario Power Authority submitted the integrated power system plan, as required, to the Ontario Energy Board, which is the system regulator. The Ontario Energy Board is equivalent to the PUB here. And the goal of the Ontario Energy Board was to review, conduct hearings and to approve the plan. This led to the first phase of hearings in 2008, which identified some of the key issues, and then it led to the substantive phase later on in the year, which involved a large number of intervenors. And this was the point where the OEB was intending to approve the plan or to send it back for reconsideration to the OPA.

The review process didn't go entirely according to plan. A new minister who had been appointed by the government intervened, and in fact directed OPA to revise its IPSP before it had been approved. The purpose here was to increase the conservation targets and also the renewable targets.

Subsequent long-term energy plans have been developed by a combination of the Ontario

Power Authority – which has now been merged into the Independent Electricity System Operator – along with her stakeholders, and then finally approved and released by the ministry.

So since the point in time, OEB approval has not been required; however, the system plans have been central in making their recommendations to the ministry and we've seen in 2010 and 2013 system plans have continued to include nuclear as the recommended base load source of supply, and to recommend refurbishment of the nuclear plants.

Moving on to the approval stage: the minister of energy endorsed the project in 2016. This came after the – after OPG, Ontario Power Generation – the owner of the plant had developed high-confidence cost estimates which were \$12.8 billion at the time. So this was very consistent with the original supply mix recommendation coming from the OPA in 2005, more than a decade previously.

The government also, as part of its approval, included off-ramp clauses that allowed for a periodic review of the project's development and status at pre-set points in time. These are important opportunities for the government to, in fact, potentially halt a continuation of the project. And the government has been very clear that off-ramps may be used under a number of different scenarios: if costs are substantially breached, relative to the pre-approved amount; if the schedule has substantially slipped; or – and I think this is particularly interesting – if external demand and supply factors have changed within the province – that change the need for the project – the government has the ability to halt further refurbishment.

So this in some sense mitigates the risk during the construction stage, that either costs will escalate more than anticipated, or that the fundamental need for the project has also changed due to factors outside the control of the proponent. There's been some discussion; their financial accountability office has reviewed this mechanism, this off-ramp mechanism to understand how it will be operating.

The government was also clear at the time of its approval that the proponent would need to apply to the Ontario Energy Board at the end of

construction and to undergo a prudence evaluation. So, the OEB has the full authority to evaluate prudence.

So, the project began the construction phase in 2016, this is nine years off the start of the initiation phase and at this point the first of four units was disconnected. The government has instituted a number of layers of oversight for this project. Importantly, there was a Darlington Refurbishment Committee, which has a number of external experts which report to OPG's board. These are experts in megaprojects and in nuclear power.

As part of this committee – and this is bullet points 4 here – the government appointed an external expert advisor to serve as a member of this committee and to report back to the government, specifically to the Ministry of Energy on the project's status.

The expert advisor reports confidentially on a quarterly basis and is a member of the Darlington Refurbishment Committee which meets on a very regular basis. It has full information and access and knowledge about the development of the project. So, the government can be assured of having expert independent and informed oversight on a very frequent basis as the project proceeds, and it's a lengthy project, that's due to – the construction stage is due to last for 10 years.

So, this shows the schedule here. The first unit has been disconnected. I will take 40 months to refurbish and then after that there will be a review period to understand whether the project is on track, and then the next four units will be sequenced after that.

And in terms of costs that have been expended, this chart shows the costs over an extended – over a 16-year period of time from 2010 to 2026 when the fourth of the units will be completed. As predicted, we're now roughly in the middle of this time frame. This shows the annual expenditures each year, broken down by different categories. We can see we're about sort of halfway through the cumulative amount that's expected to be expended on a project which is close to \$13 billion.

So cost review and recovery. The government was very clear that the proponents had to apply to the OEB for recovery, and the government's also instructed the Ontario Energy Board that it couldn't question the need for the projects, but it was required to assess the prudence of the costs and the financial commitments that were made by OPG.

Given that OPG has been incurring costs for the project over an extended period of time, actually beginning in 2007 when it started expending costs to assess the feasibility of the project, OPG has requested recovery of these costs, periodically, through a number of rate cases and OEB reviews after the fact, and for rate cases that have occurred since 2007, which have included Darlington related expenditures.

In each of these, the OEB has carefully reviewed the expenditures and has found that, to date, they have been prudent. They haven't disallowed any of the Darlington related costs, and this has amounted to about \$7 billion so far. So a little bit more than half way through the cost expenditures for the project.

So you can see some similarities here with the Maritime Link. The project was one component over provincially developed integrated resource plan. That was the initiation and it ended with a comprehensive regulatory review of costs.

Now, the one caveat here, and I should emphasize, is the project is not yet completed. We're about halfway through the overall time scale. So time will tell as to where costs will ultimately end up and whether there's any deviation from that \$12.8 billion estimate. So far, the project is on schedule and on budget.

**THE COMMISSIONER:** So, are you going to move on to your third case study?

**DR. HOLBURN:** Yes.

**THE COMMISSIONER:** So this might be a good place to take our morning break.

**DR. HOLBURN:** Okay.

**THE COMMISSIONER:** So we'll break for 10 minutes now.

**CLERK:** All rise.

### Recess

**DR. HOLBURN:** (Inaudible) third case study, which looks at the regulatory arrangements for the Western Alberta Transmission Line. This shows, simply, a southern snapshot – so it's a location coming down towards Calgary. It's a 347-kilometre, a thousand-megawatt-capacity high voltage transmission line that connects the northern area around Edmonton to Calgary.

And the project has been developed and is owned by AltaLink, which is one of two privately owned transmission operators in the Province of Alberta.

In terms of the industry context within which this project is being developed. Alberta has a competitive, wholesale, power-generation market. The majority of electricity is generated in the province by natural gas and coal. And one of the differences between Alberta and many other provinces is its competitive, wholesale, power-generation market. And one of the ways to improve the level of competitiveness is to build new transmission lines, which then enable generators to compete outside their immediate, sort of, geographic area.

And this was part of the motivation for enabling generation capacity that had been built in the northern part of the province to serve southern markets around Calgary.

So stepping through our five stages again, the project – the potential need for the Western Alberta Transmission Line project was identified by the system operator, which in Alberta is the Alberta Electric System Operator, AESO. It was identified in 2004 as part of its long-term transmission-planning document for the province.

At the time, there had been significant growth in both generation capacity in different parts of the province and also in load, particularly following – or with the beginning of the oil sands boom in Alberta, yet there had been no major transmission lines running north-south that had been added during this period.

The AESO completed its – wrote a needs-identification document, which was the first stage in the planning approval process. The needs-identification document was then submitted for approval and review to the Energy and Utilities Board, which, at the time, was the regulator for the electricity system.

This then was reviewed, and it was approved, and then after some consideration, the AESO – with this approval – then directed AltaLink to submit a specific project application for WATL to the Energy and Utilities Board.

So even at this project identification stage, we've got, sort of, the involvement of multiple regulators assessing the need and the cost aspects of this project. The AESO had also – as part of its needs-identification document, there are also other major transmission projects that were included in this.

So then we move to the evaluation stage. AltaLink began the formal evaluation with the Energy and Utilities Board with its application in September 2006, and this is when the EUB would've reviewed the cost elements of the project. However, in 2008, the government dissolved the EUB following concerns over the conduct of public hearings regarding the siting of transmission lines that had been proposed, and it actually created a new agency, the Alberta Utilities Commission, which took the place as the system regulator.

Due to the delays, the government decided that it should deem a number of applications that were already standing before the EUB as critical infrastructure. The delays, particularly at that time when the province had been growing very rapidly in economic terms, had led to these applications becoming more critical, becoming more urgent. So the government actually enacted legislation that included WATL under this term critical transmission information – infrastructure – which then expedited some of the later reviews. It didn't negate the need to review; it expedited it.

AltaLink then filed a new application with the AUC, so this is quite a number of years – five years after its initial application to the EUB. It filed in 2011, then this led to the Alberta

Utilities Commission hearings that were focused on the siting of the line and the impact analysis.

So I would also note that in 2012, the government actually rescinded its authority through legislation to designate transmission projects as critical infrastructure and restore the full authority to the AUC to review and approve AESO needs and identification projects based on their economic and social and environmental impacts.

So at the approval stage, the AUC approved AltaLink's application for the transmission line after hearings and extended review at the end of 2012. And as part of this, the proponents, AltaLink had included its cost estimates which had previously been approved by the system planner, the AESO. And this was forecast to be \$1.4 billion at a time and accuracy range of plus 20 per cent or minus 10 per cent.

So moving on to execution and oversight. The AESO, as a system planner, carefully monitored the construction stage of the project and frequently reviewed the status with AltaLink senior management on a monthly basis and, in fact, with the project team on a weekly basis.

The AESO was also required to review and approve, or not, any applications from AltaLink to make changes for – through a formal project change proposal process. And these would include changes to routing and siting as well as to costs. The government also set up a Transmission Facilities Cost Monitoring Committee consisting of multiple stakeholders, and the goal of this committee was to monitor and to publicly report semi-annually on the progress of transmission projects throughout the province.

Here we can see multiple layers of government oversight during the construction stage to try and ensure the projects are completed on budget and on a schedule. In terms of cost review and recovery, the project is now completed. It was completed at the end of 2015. AltaLink was required to apply to the AUC for recovery of the project costs in its transmission tariffs.

Like other utility regulators, the AUC conducts its reviews through the normal, open, transparent, evidence-based process in order to

determine the prudence of the expenditures. As part of its reviews, it will use the reports coming from the AESO and the project change proposals as part of its assessment of whether the costs were reasonably incurred or not and whether any deviations were justified.

The final cost of the projects was \$1.7 billion, about 20 per cent more than originally forecast but still within the approved cost envelope at the time of sanction.

So we've now gone through three projects – different types of projects – in different provinces and I think it's useful just to reflect on some of the common themes that emerged from these case studies. These projects had been largely constructed on schedule and according to budget so far, with a caveat that the Darlington project is not yet complete, it's about halfway through.

The projects have been consistent with existing integrated resource or system plans. And particularly in Nova Scotia and Ontario as we've seen, these plans have included conservation and demands management targets as part of the overall system forecast. An independent regulator or system planner has conducted an unrestricted evaluation of the project's proposals and evaluated them relative to alternative options.

There's been independent monitoring of the project construction phase by either an expert industry regulator, an expert system planner or a government-appointed expert adviser. Then for each of these projects we've seen final regulatory review of the prudence of project expenditures, where the regulator has the ability to review and to look back and determine whether the management acted in a prudent and efficient manner before making a determination whether costs can be recovered in rates.

So I'd now like to move on to the fourth case study which is looking at the Keeyask generating station in Manitoba. This is a 695-megawatt hydroelectric project located 725 kilometres north of Winnipeg on the Nelson River. It is owned by Manitoba Hydro, a Crown corporation, and a consortium of four First Nations who own 25 per cent of the project.

In terms of the electricity context within Manitoba, the project represents about 12 per cent of installed capacity within the province, so this is a meaningful size. And also in Manitoba exports – you will see exports are around 10,000 gigawatt hours a year. These are an important component of the electricity sector and exports in fact represent about 27 per cent of total generation within the province.

So let's step through the different stages again. The Keeyask project was identified in the early 1990s by Manitoba Hydro as a means to improve system reliability, to meet future demand and also to serve US export markets. Development agreements were signed with four local First Nations in 2000, 2009 and, at this point, engineering and environmental studies were begun. And the project is one component of Manitoba Hydro's sort of broader plans to develop generation and transmission assets within the province over an extended time period, and the overall development plan reaches \$20 billion.

So we can see in contrast to our previous three case studies – unlike Ontario and Nova Scotia, this project was developed in the absence of a regulator-led independent resource planning process – would assess a range of supply and demand-side options in developing a long-term strategic plan for the sector. This process was absent at the time that this project was developed.

In 2012 the government directed the Public Utility Board to commence a Needs For and Alternatives to Review of the Keeyask project, along with other projects that had formed part of Manitoba Hydro's preferred development plan. Now, this review came relatively late in terms of development of the project. Manitoba Hydro had already commenced capital expenditures at that time on the project, and it also came after the government had agreed to \$4 billion worth of export deals with US states to the south to export some of the generation capacity, generation to those areas.

The government also restricted the scope of the NFAT review in important ways. It excluded an associated major transmission line that was going to connect the Keeyask project, which was located in a remote area, to the area of demand

in the south. This was a 1,384 kilometre Bipole III line. It also excluded from analysis the commercial arrangements with Aboriginal partners who owned 25 per cent of the project. And it also included – excluded from the analysis prior Manitoba Hydro development proposals and government assessments of these proposals.

So this was quite a restricted review. And by excluding important costs the PUB was unable to undertake a fully comprehensive economic analysis of the merits of the project. The NFAT review lasted for 13 months and led to a report in 2014 with recommendations to the government. The report recommended – did recommend that the Keeyask project proceed. It recommended that other projects that were included in the analysis not proceed.

It noted in the report that part of its recommendation to proceed was based on the fact that over a billion dollars of costs had already been sunk in the project before the PUB could conclude its report and this had altered the economic assessment at that point in time of continuing with the project. In fact, experts later on went on to voice their concerns about this NFAT process, noting that restrictions on the report had fundamentally affected the conclusions that had been reached. And, in fact, the report concluded that the decision to approve the project was, in fact, imprudent.

Moving on to the approval stage, the PUB in Manitoba did not have the authority to approve the project. It was asked to make a recommendation to the government. The province issued a range of licences for the Keeyask project in 2014, which enabled the project to commence at that point in time. There was no major sanction announcements of the project. At the time, the project was forecast to cost \$6.5 billion and was predicted at the time to be in service by the end of 2019.

The execution and oversight stage: Construction and major expenditures actually commenced in 2010. Normally, we would expect construction to begin after sanction by the government or after approval by a regulator. Manitoba Hydro actually commenced prior to the NFAT review to start developing the Keeyask project. The

general civil contract was finalized in March 2014 prior to the NFAT's completion.

And, unlike Ontario and Alberta, we've seen that there is no – the government did not appoint an independent, project-specific oversight mechanism to provide some monitoring on behalf of the government working with the proponents. Instead, oversight was essentially delegated to the Manitoba Crown Corporations Council – a civilian board that ultimately was disbanded in 2016 – and the Crown Corporation Standing Committee of the legislature which has occasionally asked members of the board to come and present to the committee on the status of the project.

This is a very different type of oversight arrangement from what we've seen in Ontario and Alberta where we have seen governments appoint independent experts to regularly report on the status of the project and to work closely with the corporation's management and board.

At the cost review and recovery stage the PUB is quite – has a very limited scope of authority in Manitoba, compared to what we've seen in Ontario and Alberta and Nova Scotia. Until recently the PUB has had no authority to approve or disapprove capital expenditure plans and expenditures from Manitoba Hydro. Now this sort of restriction has been changed by a new government in April of 2017.

So, the (inaudible) has had very limited ability to assess whether the costs that have been expended have been reasonable and prudent or not. It's simply outside its legislator's mandate. It can review operating costs but, in the case of these megaprojects, we're talking about capital costs, which are the bulk of the overall expenditures up front.

So, the project proponents here has not been operating under a regime where there's a risk of disallowance of costs upon completion of the project by the regulatory authority. The Keeyask Project has been mired in controversy and the focus of considerable public and political discourse, partly due to the fact that costs have escalated significantly since it was originally commissioned.

The costs are predicted to reach \$10.5 billion, according to an independent report, which represents about a 70 per cent increase compared to the sanction date estimate – and there have been – has been considerable concern coming from the credit-rating agencies about the impact on the financial security of Manitoba Hydro.

So, as I think is apparent, this is a very stark contrast to the regulatory oversight of our first case study looking at the Maritime Link. This graphic here simply illustrates the assessment of the effectiveness of regulatory oversight for the four different projects. It's apparent that we have quite a range of standards here – I would argue that the Maritime Link presents probably the most – or the best example of the most effective standard of regulatory oversight for a major project that we've seen here, and Keeyask would be at the other end of the spectrum, representing overall a weaker standard of regulatory oversight.

And I think already we can see a correlation between the standard of regulatory oversight and the performance of these projects to date. Those that have operated under an effective level of regulatory oversight have largely been constructed on budget and on time, to date, whereas the one project that we have seen without strong regulatory oversight is substantially over-budget and also several years – predicted to be several years late.

Okay, so, I'd now like to discuss oversight of the Muskrat Falls Project – and again, I'll be using the same five stages to focus the analysis.

So beginning with the project identification stage. The project's – Muskrat Falls Project's – the potential to serve both domestic and export markets was identified in the province's 2007 Energy Plan. However, in comparison to Nova Scotia and Ontario, this was not part – this did not follow an integrated resource planning process involving the PUB and stakeholders that fully considered a broad range of supply and demand-side options for the future of the electricity sector – and, in fact, a number of reports over several years have suggested there could be some reforms to the system-planning process here in the province.

The Joint Review Panel in 2011 explicitly recommended that an IRP process should be used, saying that such an approach would involve interested stakeholders to look simultaneously at demand and supply solutions, and alternative uses of resources.

Before that, Newfoundland Power had also suggested some improvements, noting that system-planning guidelines that have the benefit of input from all stakeholders would be desirable to ensure both fair competition and appropriate system development – and also recommended the system plan should be available publicly.

More recently, the comprehensive power advisory report from 2015 also said that a public IRP process would provide a transparent framework for the evaluation of options.

So we're seeing a pattern over time, here, of recommendations to strengthen the system-planning process.

Now, one of the benefits of an integrated resource plan is that it helps to focus on the potential contribution – not just the supply-side options, but also of conservation and demand-side management options as well, which can delay potentially the need for new supply-side investments, and even offset them.

Consistent with the absence of a public, PUB-led, integrated-resource-planning process, again, a number of reports and experts recommended the province place greater emphasis on conservation and demand-side management to meet future system requirements.

Navigant, in its 2011 report for Nalcor, noted that conservation savings were 79 gigawatt hours at the target in 2013. That would have constituted about 1 per cent of actual demand. As it turns out, the actual savings that were subsequently reported in a later document were 49 gigawatt hours. So that was closer to half a per cent of forecast demand.

And this led Navigant to recommend that Nalcor could consider some improvements, and the impact of a longer-term CDM initiative, presumably to increase the targets.

Power Advisory, in its report, has described conservation targets as modest compared to the 5 per cent achievement it noted in Ontario and Nova Scotia at that time, and it also argued that a different modelling technique, specifically end-use modelling, which is a best-practice approach, would allow better understanding of the impact of new technologies on future loads.

The PUB, in its report, which it commenced in 2011 and completed in March 2012, advised also that end-use modelling would be beneficial before making a determination in relation to a large incremental increase in capacity such as the Interconnected Option. So, this reinforces the point that if we carefully think about conservation and demand-side options, that will also cause us to rethink the need for proposed supply-side additions.

A professor here at Memorial University, Professor Feehan, argues in his paper published by the C.D. Howe Institute in 2012 that, in fact, higher pricing could – particularly time-of-use pricing that would lead to higher prices paid by consumers during peak hours, this could effectively reduce demand for electricity. And, in fact, may even negate the need for new supply-side additions as well.

So, a considerable – so a number of reports over time here that have argued for a more comprehensive analysis of the broader, sort of, system plan and system strategy before making supply-side-specific project decisions.

Moving on to the evaluation stage. The government did request the PUB to conduct a review of Muskrat Falls in June 2011. However, the review was quite restricted in a number of dimensions.

First of all, it was limited to two specific, closely defined options: the Interconnected Option and the Isolated Island Option, each of which the government defined the timing and magnitude of resource additions. And the scope for the review was to be conducted for the analytical periods 2011 to 2067, a 56-year period. The PUB did not have the flexibility to consider other options.

The government also requested the PUB to commence its review in 2011 before accurate cost estimates were available from Nalcor. The

PUB used DG2 cost estimates around which there is considerable uncertainty over the future costs. There's a broad range of variation in predicted costs, from plus 50 per cent to minus 30 per cent on the capex costs and this is the result of a relatively low level of project definition at that point in time.

The third restriction was that the government initially allocated the PUB six months to conduct the analysis. This proved to be short, particularly after the late arrival of complete information from Nalcor. The complete information came 3½ months late, relative to the initially intended plan. This created some restrictions on the PUB schedule. It led it to cancel a technical conference and to shorten public consultations.

So, the consequences of these restrictions over the PUB review are material. The PUB was not able to evaluate a broad range of supply-side options. And it had limited ability, time and resources to fully investigate a range of demand-side options as well. Given the unavailability of DG3 cost estimates, which are more precise than the DG2 cost estimates, was unable to reliably assess which of the two defined options was lower cost. And this led to its March 2012 conclusion that the information provided by Nalcor and the review is not detailed, complete or current enough to determine whether interconnected option represents the least-cost option.

The Joint Review Panel had reached a similar verdict in August of 2011, so this was after the PUB had commenced its review but before the PUB had completed it. And the Joint Review Panel was also using much of the same information – some of the same information that the PUB was using, notably the DG2 cost estimates. And the Joint Review Panel concluded that Nalcor's analysis showing that Muskrat Falls to be the best and least-cost way to meet domestic demand requirements was inadequate.

So we can see here that the key missing ingredient for both these independent, expert reviews was high confidence cost estimates that would have potentially allowed the (inaudible) to come to a more definitive conclusion.

So, in contrast to the case of the Maritime Link in Nova Scotia, Muskrat Falls was not evaluated by comprehensive, independent, expert regulatory review after reliable cost estimates were ready.

Moving on to the approval stage. Unlike in some of the previous case studies that we have seen, the government moved on to sanction the Muskrat Falls Project in December of 2012. Though this was in the absence of a positive recommendation from the independent regulator following a comprehensive expert review.

Now, the government did cite support from a number of consulting reports, which had concluded that the Muskrat Falls option was least-cost. So it's important for us to understand the contribution of these reports. It cited the Manitoba Hydro International, October 2012 report, which had included DG3 costs and updated load forecasts, and it also cited the Ziff Energy report that was released in October 2012, which had looked at the feasibility of natural gas as an alternative to Muskrat Falls. Because these were released in October of 2012, they were not scrutinized by the public – by the PUB – in the context of a comprehensive regulatory review.

The government also cited the Navigant 2011 report and the Manitoba Hydro, January 2012 report. These had been part of the proceedings in the PUB review, and had already been assessed and formed – and informed the PUB in reaching its conclusion in March of 2012, that it was not able to make a firm determination.

So, consulting reports can certainly be valuable, no question there, but the quality and reliability is not easily observed upfront. The findings may be sensitive to the assumptions, the forecast, the data and the methodologies that are selected by the consultant. And this is going to rely on subjective judgment.

And as we've seen in the case with the Maritime Link Project, the UARB had some very explicit comments and evaluations of the value of different consulting reports. There was seven consultant reports that were included in the evidence for the evaluation of the Maritime Link Project and the UARB noted, very deliberately, that it found some to be more valuable and thorough and others to be less valuable and less



thorough, and it put more weight on, naturally, on the ones that it found to be more thorough and credible.

The financial relationship between a client and a consultant can also raise the question of impartiality. So the regulatory review process, which involves scrutiny by expert independent staff – scrutiny by expert intervenors can help provide an assessment of report quality, and also help understand the reliability of report conclusions. As such, consulting reports may be viewed as an input into the regulatory process as opposed to a substitute for the regulatory process.

It's rare for a government to sanction a project without endorsement from a regulatory agency. There is some comparability with the pipeline sector where major pipeline projects go through a two-stage regulatory process – or approval process. The NEB first makes an assessment based on economic and environmental considerations and makes a recommendation to the federal Cabinet. And the federal Cabinet then makes a final sanction decision following the recommendation by the NEB.

I've conducted an analysis of major pipeline projects in the 10-year period from 2007 to 2017. This involves 26 major pipeline projects that have gone through the regulatory review and approval process. The government has followed the recommendation of the NEB, National Energy Board, 25 out of 26 times, and in each of those cases there's been a decision to approve, as being consistent with NEB recommendation. In one out of the 26 times, the government denied to approve a project that had received a recommendation of a certificate from the National Energy Board. So it's rare to see governments not following the recommendations of expert independent regulators.

Moving on to the execution and oversight stage: The government did set up an Oversight Committee for the Muskrat Falls Project to provide some assurance of the project's performance and status during the construction stage. The Oversight Committee consisted initially of nine senior bureaucrats and the committee was established in early 2014; first met I think in April 2014, which is

approximately a year after construction commenced on the project. The committee has met regularly with Nalcor management and a number of times with Ernst & Young who have provided some independent reports on the project status. The committee reports quarterly to the government.

The effectiveness of the Oversight Committee has been queried by Ernst & Young consultants who've noted that the committee has lacked regular independent expert information on the project. It specifically recommended that an enhanced, independent assurance function performed by qualified independent third party on a regular basis would better enable the OC to fulfill its mandate and meet the expectations of stakeholders.

So you can see here, again, a strong contrast with the oversight mechanisms that were put up in the first three case studies. In the case of Ontario, the government appointed an expert in megaprojects to participate on the board's special committee who was overseeing the Darlington Refurbishment. That enabled independent expert regular monitoring of the project. Also, we saw in Alberta, the AESO – the expert system regulator very closely understands the transmission sector – met very regularly on a weekly or a monthly basis with senior executives in the project management team to understand how the project was proceeding and to review project change proposals. We've not seen this level of expert, regular, independent engagement here through the Oversight Committee, which has led to some questions about the effectiveness in terms of monitoring the status of the project.

Finally, the Cost Review and Recovery stage: The government has exempted the Muskrat Falls Project costs from PUB review ex post. There was a federal loan guarantee that in fact requires Newfoundland and Labrador Hydro to recover all of the costs of Muskrat Falls energy in regulated rates. This is much closer to the Keeyask example than it is to the examples of the Maritime Link, WATL and Darlington Refurbishment where the regulatory agency has had the requirement to assess the prudence of costs after they have been accrued, but before approving them in rates. Here the PUB does not

have the authority to undertake a prudency review.

And so, the absence of a threat of disallowance of costs might be interpreted to reduce the incentives for Nalcor to manage construction costs and to implement government's mechanisms as tightly as possible, compared to a regime with final regulatory review.

So in terms of the summary evaluation here providing a visual guide – as I mentioned earlier the case studies demonstrate a range of regulatory approaches. From a very high standard, as we've seen in Maritime Link in Nova Scotia to a lower standards. I classify Muskrat Falls level of regulatory oversight to be closer to that – that we have seen in the Keeyask Generating Station.

I'd now like to move towards a discussion of the consequences of exempting Muskrat Falls from PUB oversight.

By requiring the PUB to commence its review in 2011 by restricting the scope of the review and by limiting the time available for the PUB to conduct its analysis, the government was ultimately not as informed as it could have been about the project's costs and risks relative to other alternatives. DG3 cost estimates were not scrutinized by an independent regulator in the context of an open, transparent, evidence-based review process. And other potential – a broad range of potential supply and demand-side options were not fully investigated by the PUB. The consulting reports that were released after March 2012 were not tested or validated by the PUB's review process.

So on the basis of this, in the absence of a positive recommendation from an independent expert regulator, the government took a significant risk when it sanctioned the Muskrat Falls Project: that it would in fact be the lowest cost approach to securing the province's electricity future. The government also took a risk that Nalcor would prudently manage construction of the project without the prospect of future regulatory disallowance, and that the Oversight Committee was satisfactory and effectively monitor progress and hold Nalcor to account.

So now I'd like to move to some concluding statements. As we have seen, regulatory oversight is particularly important for protecting ratepayer interests in megaprojects. This is due to the scale of the risks and impacts and also the irreversibility of investment decisions, given this is physically sunk infrastructure and it will last for multiple generations.

One of the key advantages of regulatory oversight is the improved information it obtains about project benefits, costs, impacts and risks. This information comes through an open, transparent, evidence-based, decision-making process. So regulatory due process therefore reduces the probability of selecting poor or uneconomic alternatives and increases the probability of identifying and selecting the most beneficial projects. Effective regulation also creates strong incentives for proponents to manage projects within approved budgets and lowering the chance of experiencing major cost overruns or delays.

Through the case studies we've seen, regulatory agencies in Alberta, Nova Scotia and Ontario have played very central roles in evaluating, monitoring and reviewing megaprojects such as the Western Alberta Transmission Line, Maritime Link and the Darlington nuclear generation station refurbishment. To date, these projects have largely been completed on budget and on schedule. In Manitoba, on the other hand, the PUB has had a much more restricted role in evaluating and overseeing the Keeyask generation project which is significantly over budget and several years delayed.

Newfoundland and Labrador's approach to regulatory oversight of Muskrat Falls has not matched the high standards that other provinces such as Alberta, Nova Scotia and Ontario have adopted in regulatory oversight of their megaprojects, as described in the report. I would like to discuss a potential alternative scenario. Of course, it's not possible to know with certainty what might have happened had the PUB had unrestricted regulatory oversight authority. However, it is plausible that a review would have commenced in 2013, which is after DG3 cost estimates were released. And this is also the timing of UARB review of the Maritime Link in Nova Scotia.

So if the review had occurred in 2013, maybe potentially stretching into 2014, allowing up to 18 months for a review, then we know what new information would have been available to the PUB at that time and we also know what new events occurred at that time, so we can assess would these have affected the evaluation of the Interconnected Option relative to other alternatives. And there are five new types of information and events that might have – that could have entered into the PUB’s analysis.

So, first of all, the PUB, if it was unrestricted would have had the ability to assess a broad range of demand- and supply-side options. For instance, it could have limited the time frame of analysis to 2041 when Upper Churchill power will be available, and it might have limited the scope or considered the scope to look at capacity to serve just domestic needs rather than also export market needs. Detailed scrutiny of a larger number of options could have yielded a lower cost solution alternative than that proposed by Muskrat Falls.

Secondly, in 2013 the PUB would have had new load information. And this was a central part of the PUB’s review in 2011 and 2012. The new load information would have shown the total Island load grew more slowly in 2011 and 2012 than originally forecast by Nalcor in 2010. To be precise, it was about 2 per cent less in 2012 than was forecast in 2010. This may have strengthened the PUB’s concern there was not an immediate need for the large incremental supply associated with the Interconnected Option.

Thirdly, in November of 2013, as we’ve already discussed, Nalcor committed to provide Nova Scotia Power with an additional 1.2 terawatt hours of non-firm, market-priced energy per year on average over an expected 24-year period. This was following the UARB requirements for Nova Scotia Power to strike an Energy Access Agreement with Nalcor. This additional commitment by Nalcor could have altered the economics of the Muskrat Falls Project and could easily have led to a PUB review of the implications for the merits of the project.

Fourthly, DG3 cost estimates for the Interconnected Option when they were released

were approximately 20 per cent higher than the DG2 cost estimates. The high cost of the Interconnected Option would likely have reduced the attractiveness of Muskrat Falls, relative to other potential options the PUB could have explored, but which were excluded from the 2011 and 2012 review.

And, finally, had the PUB review occurred during 2014, it may have coincided with the 50 per cent drop in world oil prices as a result of increased US oil production from shale oil and also non-OPEC oil production, which led to a structural shift in global oil markets. Changes in market analyst forecasts of future oil prices could have affected net worth differential between the Interconnected Option and other options, including the Isolated Island alternative.

And as the PUB had noted during its review, the oil price forecast is one of the key factors that altered the sensitivity or the relative attractiveness of the Interconnected Option, relative to the Isolated Island Option. I’d estimate about a 20 per cent reduction in the oil price coupled with a 20 per cent reduction in load will lead to similar estimates of net worth. So the timing of the PUB review could have been consequential on this element as well.

So, either all – any of these factors could have reduced the probability of the PUB finding in favour of the Muskrat Falls Project. If the PUB had explicitly concluded, after a comprehensive review, the Muskrat Falls project was either not needed at the time or it was not the lowest cost alternative, this would have made it more challenging for the government to justify a sanction decision relative to the case where the PUB declined to make a recommendation one way or another. If the government had decided to proceed with the project, allowing the PUB to review project costs and to assess prudence after construction was completed could have contributed to better cost containment and on-time delivery during the construction stage.

And with that I will conclude. Thank you for your attention and I look forward to discussion and questions.

**THE COMMISSIONER:** All right, Ms. O’Brien.

**MS. O'BRIEN:** Thank you.

Dr. Holburn, if we could – one point of clarification. Can we just go to slide 7, please?

I understood when you were giving your evidence that this slide 7 and the following slide 8 were a collection of best practices that – I believe you had cited a number of sources for where the best practices –

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** – had come from. One you cited was the OECD, can you please explain to us what the –

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** – OECD is?

**DR. HOLBURN:** The OECD stands for the Organization for Economic Co-operation and Development. It's an economic think tank that has, as a member, countries – 20 to 30 advanced countries. So these are modern economies that fund the OECD to undertake studies of common policy issues.

**MS. O'BRIEN:** Okay.

Can we then go to slide 19 please? Now, this came up a number of times in your presentation, and it's on this slide is where I first noted it, but it repeats. And this is the concept of a system planner.

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** So we here have heard evidence about our – obviously our PUB, our Board of Commissioners for Public Utilities in this province, which is our regulator. It's clear from your review that some jurisdictions have both a regulator, like our PUB, and a system planner.

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** Can you please explain for us the difference between those two types of entities?

**DR. HOLBURN:** Mm-hmm.

So the system planner historically has had more of an engineering focus and has typically been responsible for looking at the physical integrity of the electricity system; understanding the reliability of transmission assets; the reliability and contribution of generation assets, distribution assets to ensure that the system is able to reliably deliver electricity over a long-term period of time; and also, building on that, to undertake assessments of the need for future physical requirements; taking into account where load is growing in different parts of a jurisdiction based on engineering studies; and also, to develop economic assessments, as well, of the cost of different supply planning and forecasting scenarios.

So in Ontario, this is done – originally, it was done by the Ontario Power Authority, which was created explicitly in 2004 as an independent agency to undertake, sort of, long-term plans and to ensure that it was contracting for a sufficient generation capacity and building new transmission lines.

**MS. O'BRIEN:** Okay.

So we do not have a system planner in this province, is that right?

**DR. HOLBURN:** We do not – there is not a separate planner here in the province, correct.

**MS. O'BRIEN:** Is that – can do – are other provinces in a similar boat in that they don't have the system planner on top of the regulator?

**DR. HOLBURN:** My understanding is that Nova Scotia also does not have a separate system planner for the province.

**MS. O'BRIEN:** And so where did the, for provinces that have a system planner –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** The duties that that system planner does, where do they, you know – how – who does those in our province?

**DR. HOLBURN:** Okay. Yes. Good question.

So in Nova Scotia, which I think is probably a good analogy for here, system planning is done

by a combination of Nova Scotia Power, which is the vertically integrated, dominant utility that serves the province, in conjunction with the UARB.

So the – Nova Scotia Power has to produce an integrated resource plan in consultation with a range of stakeholders, and then it requires a review and approval by the Utility and Review Board. So they will have some system-planning capabilities. These plans would be done on a periodic basis, not every three years or so, as we've seen in Ontario, but on a somewhat frequent basis.

**MS. O'BRIEN:** We've already had some testimony here at the Commission about integrated resource plans and integrated resource planning, but it might be helpful if you gave a short explanation of what you mean –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – by the term.

**DR. HOLBURN:** Mm-hmm.

So an integrated resource plan is one that fully considers a range of alternative options – on the generation side, looking at the – all the different generation technologies, looking at the need for new transmission to connect generation options, different parts of a jurisdiction. That's on the supply side. It also looks at the potential contributions of conservation and demand-side management in managing loads.

And the broad goal of an integrated resource plan is to develop a strategic architecture for reliable operations of electricity system that include both supply-side generation technologies and transmission as well as demand-side options to manage load in a way that achieves economic and environmental objectives.

So this would be achieving sort of a low-cost way to serve electricity on a reliable basis and also one that includes environmental objectives. So for instance, in Ontario, we've seen the inclusion, following direction from the government to include a certain amount of renewable capacity. Many provinces have been moving in this direction, and again, we see in Nova Scotia there's a target of 40 per cent of

generation – electricity supplied coming from renewables, so that would form part of that integrated resource plan.

So the integrated resource plans are typically developed by the system planner and/or in conjunction with the economic regulator, in conjunction with the utilities as well, and government may provide some explicit direction about targets to include.

**MS. O'BRIEN:** And I don't know if you'll have any comment on this or not, but obviously, we are not a province the size of Ontario. We –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – are a province about half a million people here. I would assume that when you're putting in more complex planning initiatives, like integrated resource planning, those come at – with a cost.

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** Any comment about whether that further investment makes sense in a province of our size?

**DR. HOLBURN:** The benefit of an IRP process is it requires consideration across a broad range of different issues. It doesn't have to be done every year or every three years. In Nova Scotia, I think it's worked out as being about, sort of, once every five years.

Yes, it can be a costly process to go through. It requires involvement of a broad range of stakeholders. It requires regulatory review and administrative due process, but it sets up that long-term strategic architecture and a planning framework within which decisions can be made over an extended period of time. But yes, it is – can be costly and time consuming.

**MS. O'BRIEN:** Slide 29, please? Thank you.

So when you gave your presentation on this slide – this is one of your slides on the approval process for the Maritime Link – you referred to them having a, I believe, a high reliability estimate.

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** And here we see on the slide, the P97 –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** P97.

**DR. HOLBURN:** Yep.

**MS. O'BRIEN:** So we have had a lot of testimony here at our Inquiry about these P-factors. So am I to understand that this would be a – is that one of these reliability factors that you're referring to here, the P97?

**DR. HOLBURN:** Correct. P97 means that there's only a 3 per cent chance the actual cost of the project will exceed \$1.7 billion.

**MS. O'BRIEN:** Okay.

**DR. HOLBURN:** And the cost of the project actually ended up as being \$1.6 billion.

**MS. O'BRIEN:** Okay.

And could we just go, please, to slide 40? And here, I understand then, same thing here for the Darlington project. At their approval stage, they had a P90, so only 10 per cent likelihood of going over?

**DR. HOLBURN:** Correct.

**MS. O'BRIEN:** And if I could just then go – just wanna follow up on this – slide 49. Now we're into the western Alberta, the transmission line there.

**DR. HOLBURN:** Uh-huh.

**MS. O'BRIEN:** Now, here you don't have a P-factor but you have the 1.4 billion with an accuracy range of plus 20, minus 10. And you said that it ultimately came in between – with 20 per cent cost overage which was in that range. So am I right? Would this be the equivalent of a P80 number then, or am I misinterpreting?

**DR. HOLBURN:** I'm not sure we can make that a direct assessment. I did look for an equivalent P-value for this and I wasn't able to find it. But I'd be hesitant to say that's necessarily translating to an 80 per cent P-value.

**MS. O'BRIEN:** Okay, but it came in within 20 per cent of the 1.4 billion –

**DR. HOLBURN:** It did.

**MS. O'BRIEN:** – that was sanctioned?

**DR. HOLBURN:** Correct.

**MS. O'BRIEN:** Okay. And there's no mention of – even an accuracy range or a P-value for the Keyask project that you reviewed –

**DR. HOLBURN:** Mmm.

**MS. O'BRIEN:** – in Manitoba, do you know what confidence level they used in that province?

**DR. HOLBURN:** I don't. No, I don't.

**MS. O'BRIEN:** Okay. Thank you.

And when you talked about the additional agreement that was required in the Maritime Link after the UARB review – that would be the Excess Energy Agreement that was ultimately signed?

**DR. HOLBURN:** Correct.

**MS. O'BRIEN:** Okay. Thank you.

I'm just tying that because we've already had some evidence –

**DR. HOLBURN:** Right.

**MS. O'BRIEN:** – about that agreement.

Slide 31, please.

I just want to get some sense of the UARB here. This is in the execution and oversight portion of review of the Maritime Link for the UARB. And I just wanted to get where – get some sense of the expertise of that board to review construction costs –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – as they're going along. Obviously, these are construction of megaprojects.

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** It's a very complex area and perhaps not – you know, a regulatory board knows a lot about –

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** –regulation.

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** But when we get into managing construction –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – and schedules and those types of things, it seems to be a different area of expertise. Do you have any comment about how the UARB is doing that or would be expected to do that –

**DR. HOLBURN:** Mmm.

**MS. O'BRIEN:** – with their in-house capabilities or are they using consultants or ...?

**DR. HOLBURN:** Yeah, so this is a good question. By definition, regulators are going to be knowledgeable about costs of operating the sector and costs of new capital projects, we'll say, or reviewing and approving projects on a regular basis as they come in. That said, this is a relatively unique project. It's not often that a project of this scale is going to come across the desk of the UARB.

So I do imagine there are going to be some unique challenges in terms of assessing the prudence, based on the skill base that the UARB already has in-house. So I think this is a little bit of a challenge for it. It's partially (inaudible) but likely not fully knowledgeable about the costs of developing a subsea cable over 170 kilometres.

So I think that's why it was looking for the independent engineer's reports. That would have been influential in its assessment. But I think this was probably one of the weaker areas in terms of the assessment of the oversight. I don't know the full details of staff competencies within the UARB. I haven't looked at that level of detail to understand where they had specific

expertise for a project of this type and of this magnitude.

And that's why I think that maybe stronger oversight could have come if they'd appointed an independent expert that did have very specific expertise. Maybe it existed, but I don't know the full details on that.

**MS. O'BRIEN:** Okay, so am I to understand this is one of the reasons why this got a yellow –

**DR. HOLBURN:** Yes, correct.

**MS. O'BRIEN:** You gave this a yellow –

**DR. HOLBURN:** Yeah.

**MS. O'BRIEN:** – as opposed to a green.

**DR. HOLBURN:** Yeah, yeah.

**MS. O'BRIEN:** Okay.

Can we go back to slide 40? I know it's a slide we just looked at but I have a further question there.

This is the Darlington review. We talked about the P90. Just a little – if I could get a little bit more from you as to why, in this case on the Darlington, on the approval stage, you also categorized it as yellow –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – which is the moderate level that –

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** – that you designated.

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** Can you give us a little bit more as to why –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – why you gave it that categorization?

**DR. HOLBURN:** Yeah, yeah. Okay, it's a good question.

One of the differences from the Maritime Link Project is that there was not an explicit regulatory approval of the Darlington refurbishment project. So the equivalent here would have been if the Ontario Energy Board had undertaken a comprehensive normal sort of regulatory review of this specific project. That would have met the high standard that we saw for the Maritime Link.

Here instead, we have the case where the project has been assessed and recommended by independent system planners going back to the Ontario Power Authority's supply mix report in 2005 and then – that was the original recommendation for refurbishment. And then we've seen subsequent planning agencies continue to recommend refurbishment.

So there's been independent evaluation by the system planners but it hasn't gone through that full regulatory review by the Ontario Energy Board. So, that's why I've coded it as a moderate level of approval regulatory oversight.

**MS. O'BRIEN:** Thank you.

I'd like to ask you a similar question on slide 48.

So, this is the Western Alberta Transmission Line and this is in the evaluation stage –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – and again you gave this a yellow –

**DR. HOLBURN:** Yup.

**MS. O'BRIEN:** – and if I could just get –

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** – a little bit more about why –

**DR. HOLBURN:** Okay.

**MS. O'BRIEN:** – you gave it that moderate categorization.

**DR. HOLBURN:** Yup. Yup.

So, again here, there was some turmoil in the constitution of the regulatory authority in Alberta, the EUB was disbanded and it was replaced by the AUC.

AltaLink had already gone through part of the initial application process and evaluation with the EUB. It had gone partway through that, before the government pulled the EUB and then classified the WATL project as being a critical transmission infrastructure.

So it didn't go through the full review subsequently with Alberta Utilities Commission; it went through an expedited review. So, again if it had gone through the full regulatory review process then that would have been a high standard. It went through a curtailed process both with the EUB and also with the AUC.

**MS. O'BRIEN:** Thank you.

Could we go to slide 56 please? This is at the Keyask project again –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** –at the evaluation stage and here you gave it a red, so the weakest categorization that you've used.

**DR. HOLBURN:** Right.

**MS. O'BRIEN:** One of the points that you made was that the PUB review was done – relatively late, I think were the words that you use – it was after there had already been some export deals entered and after there had been some major capital expenditures. Can you – do you have any more information as to why the PUB was only asked to do its review relatively late? Why it wasn't involved earlier in the process?

**DR. HOLBURN:** My understanding is that there had been some pressure put onto the government to conduct an independent review of the project after it had initially been proposed and after expenditures had become. So, there was political pressure put on the government to have a review. The government announced it would have the review and then it asked the PUB to do it. But this was – my interpretation



from reading about this is, it was a political reaction.

**MS. O'BRIEN:** Thank you.

And page – slide 66. This is one that deals with the Muskrat Falls Project, and this is in particular on oversight. Now, there was – you mentioned the independent engineer reports with respect to the Maritime Link, and I know you mentioned the independent engineer in your paper –

**DR. HOLBURN:** Yes.

**MS. O'BRIEN:** – with respect to Muskrat Falls, but you don't mention it here on this slide.

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** So I just wanted to get your views on the involvement in terms of the oversight piece, the use of the independent engineer –

**DR. HOLBURN:** Mm-hmm.

**MS. O'BRIEN:** – here, which we know is appointed under the federal loan guarantee – it was a requirement of that guarantee that the independent engineer be appointed.

**DR. HOLBURN:** Yes. So the independent engineer reports are an important way to provide an assessment of the physical development of the project primarily, in terms of looking at the achievement of the schedule relative to the previously agreed plan, in terms of how far is the construction proceeding? So it is part of the oversight mechanisms; a focused primarily on the economic side of regulatory oversight rather than looking at the construction aspects.

**MS. O'BRIEN:** Thank you, Dr. Holburn, those are the questions I have for you.

**DR. HOLBURN:** Thank you.

**THE COMMISSIONER:** It's about 12:30, so I think we'll take our break here, and we'll begin cross-examination of Dr. Holburn this afternoon at 2 o'clock. So we'll adjourn 'til 2 o'clock.

**CLERK:** All rise.

### Recess

**CLERK:** This Commission of Inquiry is now in session.

Please be seated.

**THE COMMISSIONER:** All right, so this morning we completed the direct examination of Dr. Holburn. So we'll proceed now with cross examination.

Province of Newfoundland and Labrador?

**MR. RALPH:** Good afternoon, Dr. Holburn.

**DR. HOLBURN:** Good afternoon.

**MR. RALPH:** My name is Peter Ralph and I represent the Government of Newfoundland and Labrador. And I'd like to first thank you for your report, it's a very helpful – I think very helpful for the work of the Commissioner.

We don't take issue of your conclusions, I just wanted to raise a couple of questions regarding oversight of the Muskrat Falls Project.

And, I guess, firstly, I was curious to see the source of your information on the Oversight Committee. Was that largely from the site – from the web page?

**DR. HOLBURN:** Yes, this was from our reading Oversight Committee reports. Particularly, one of the early ones explained the scope that the Oversight Committee would be operating under and the purpose of the Oversight Committee. I think that was the June 2014 quarterly report.

**MR. RALPH:** Fair enough. I think you mentioned in your report that the Oversight Committee meets or reports quarterly.

**DR. HOLBURN:** From looking at the meeting minutes, they met, I think, on almost a monthly basis. And it reported quarterly to the government with its formal report.

**MR. RALPH:** Right because I understand it does report actually monthly and quarterly.

**DR. HOLBURN:** Okay.

**MR. RALPH:** Are you aware of that?

**DR. HOLBURN:** In terms of the meeting minutes?

**MR. RALPH:** Yes.

**DR. HOLBURN:** Yes.

**MR. RALPH:** And you talked about the work of the independent engineer this morning. Again –

**DR. HOLBURN:** Mm-hmm.

**MR. RALPH:** – I'm not suggesting this as a sort of questioning the conclusions you've come to regarding best practices of oversight. I just wanna raise a couple of issues in terms of the actual activities of the committee.

You talked about the independent engineer, and on the web page it talks about different types of reports that's done by the engineer. Is that right?

**DR. HOLBURN:** As far as I recall, yes.

**MR. RALPH:** So there was, I guess, reports, monthly reports, going to the committee, and there was some site reports.

**DR. HOLBURN:** Mm-hmm.

**MR. RALPH:** So, you're not aware of reports that perhaps would not be public. For example, I understand the engineer writes reports which basically go to Nalcor or the Government of Canada saying that it's okay to pay certain contracts. Are you aware of those reports?

**DR. HOLBURN:** I would not be aware of anything that wasn't publicly available on the outside committee website. That's where I drew my information from.

**MR. RALPH:** Fair enough. And I have no questions.

**DR. HOLBURN:** Mm-hmm.

**MR. RALPH:** I just want to point out those issues.

Thank you.

**DR. HOLBURN:** Okay.

**THE COMMISSIONER:** All right, Nalcor Energy?

**MR. SIMMONS:** Good afternoon, Prof. Holburn, my name is Dan Simmons. I'm with counsel for Nalcor Energy. So I do have a few things I want to discuss with you now this afternoon.

First of all, I wanted to ask you a question about the selection of the four cases that –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – you used for the case studies that you presented, and you did refer this morning to the paper that had been presented at the start of the Inquiry by Prof. Flyvbjerg.

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** So you're – I guess you've read through that and you've seen the –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – material that he's presented –

**DR. HOLBURN:** Yup.

**MR. SIMMONS:** – to the Commission, have you?

**DR. HOLBURN:** I've looked at his presentation.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** Yes, I have.

**MR. SIMMONS:** And in his presentation he had given us kind of a broad statistical overview of megaprojects in order to get some idea of what the extent of overruns were in different sectors of industry in different parts of the world and so on. So that was kind of a snapshot to get a broad view.

That's not what you attempted to do in the selection of your four case studies?

**DR. HOLBURN:** No, correct. Obviously, Prof. Flyvbjerg's presentation came after I had largely completed this project.

**MR. SIMMONS:** Right.

So would I be correct, then, that in selecting the four cases that you did, you were looking for examples that you could use to illustrate some of the practices that you would regard as either being best practices or not, in this area.

**DR. HOLBURN:** So –

**MR. SIMMONS:** Is that fair?

**DR. HOLBURN:** What I was looking for was a selection of projects that: (a) satisfied a megaproject definition in terms of being of large scale, so over a billion dollars. I wanted them to be across a range of different provinces as well.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** So we could look at that different approach across our provinces, and then also to include a mix of some completed projects. There are a number of projects that are currently underway at the moment, but I thought it was important to have a couple, at least a couple of completed projects as well. So that was the basis for selecting the projects.

There aren't a large number of mega-electricity infrastructure projects that have been either completed or commenced in Canada over the last decade.

**MR. SIMMONS:** Right.

So, the case of each of the four examples that you've used, they can be useful to allow us to make observations and can draw some comparisons.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** But it – would it be a mistake for us to think that these four are representative and we can draw conclusions across the board for Canada in the way that megaprojects are – the way regulation of megaprojects is handled?

**DR. HOLBURN:** Mm-hmm.

One would probably need a larger sample to draw definitive conclusions.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** One thing I will say, at the beginning of the case studies, I didn't have an understanding, an accurate understanding of whether the regulatory of the site was operating effectively or not, so I wasn't selecting projects on the basis of my preliminary understanding of whether they were working well or less well.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** So, to that extent there was a random element in my selection of these projects.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** So I didn't understand what the final outcomes would be. But, I think, in order to draw stronger conclusions, one would indeed need a larger sample. That said, there aren't a large number of major electricity projects within Canada.

**MR. SIMMONS:** Sure. So, for example, if we were to say how often are major hydroelectric projects exempted from the kind of regulatory oversight we saw in Nova Scotia? You didn't do a review to make an assessment of whether this is common or uncommon or how –

**DR. HOLBURN:** No, I didn't.

**MR. SIMMONS:** Okay. Good, all right.

If we can take a look, please, at Exhibit P-00724, which is, I think, up there now. And I'm going to go through a number of slides, just kind of as keys for some questions that I want to ask you. Starting first with page 5, slide 5.

This was – at this point in your presentation you gave us some information about what I understand to be the sort of underlying basis for a public utility regulation.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** And, if I understand correctly, public utilities are often monopolies,

and I think I've heard the term before, natural monopolies.

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** Because the type of service that they deliver is one where, even if left the free market place, monopolies would develop because there's not effective ways for separate utilities to compete at the consumer level. Is that fair?

**DR. HOLBURN:** Correct, yes.

**MR. SIMMONS:** And that so the balancing of interests that happening in that regulation is the regulators want to make sure that the services are delivered at the lowest cost possible to consumers, but that the companies that are investing the money to generate power and distribute it are getting a fair return on their investment.

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** Yeah. So there's a tension there between the profit motive that the companies have and the fair treatment of consumers who are otherwise subject to a monopoly.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Okay.

And I can understand that – and maybe I'm assuming this – but I would think that that kind of approach to needing that regulation has arisen out of the fact that, historically, many utilities have been private companies that are, in fact, driven by the profit motive.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Okay.

So I'm interested in your comment, or any comment you can provide us, as to where publicly-owned utilities fit into this scheme, coming from a fundamental, you know, –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – a theoretical basis because a publicly-owned utility, I'm gonna suggest, is not necessarily driven by the same sort of profit motive that a private company is. Publicly-owned utilities may be driven more by the need to provide a public service at the instance of government, instead of generate a profit return from shareholders.

So I wonder if you can give us some insight as to, you know, how that fits into the regulatory scheme.

**DR. HOLBURN:** Mm-hmm.

Yes, I think that's an interesting question. So, a couple of responses. Increasingly, we're expecting that government-owned utilities do operate on a commercial basis. So even though they're owned by government, increasingly the expectation is that they will operate on commercial terms, and deliver value to consumers and to ratepayers.

And I think this has been a little bit of a shift over the last 20 years or so in terms of our expectations of Crown corporations –

**MR. SIMMONS:** Mmm.

**DR. HOLBURN:** – municipally-owned utilities, and so forth. We've seen a number of provinces produce a formal – performance expectations, in terms of growth and efficiency. So to the extent that Crown-owned or government-owned utilities do have some commercial element to their objectives, then this creates a role for regulators to try and check some of those natural monopoly tendencies. So that would be one thought on that.

The second response is that there's a large degree of research and literature in the economics field, particularly that studied the performance of government-owned utilities, and compared it to privately-owned utilities to understand: is there a difference in the efficiency with which these utilities operate? And the broad finding is that government-owned enterprises tend to operate less efficiently than privately-owned ones. And there were lots of reasons for that, and there's an absence of capital market discipline, for instance, that may be exerted on management.

So to the extent that if we believe these results – and this is, I think, a fairly robust finding in the academic literature – if we believe these results – that utilities that are owned by governments tend to be a little bit less efficient – then there’s an opportunity for a regulator to provide a little bit of a check and a balance, and to provide some incentives for these utilities to operate more efficiently and to deliver electricity as efficiently as possible to their consumers.

So, I think it’s an interesting question – what are the fundamental motives that are guiding Crown-owned corporations. But to the extent that there is some element of a commercial objective, I think it’s appropriate for them to be regulated by independent regulators.

**MR. SIMMONS:** Now you may not be able to answer this question for me, but, historically, I think it’s been the case that the privately-owned utilities have been under public utility regulation –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – and which is – that’s probably why the regulation has evolved the way it has, in part – and has it been a more recent phenomena for the publicly-owned utilities to start to be brought under the same public utility regulation regime as the private utilities?

**DR. HOLBURN:** Well, if I look at the experience of Ontario – and in Ontario we’ve got a mixed system – we have about 70 municipally-owned distribution companies, we have some private generation, we have some government-owned generation, we have a transmission company that’s half-private and half-government. This shift towards the private sector involvement in the energy sector started in the 1990’s – particularly with generation – and now, in fact, what’s interesting is that in the distribution component we have local government-owned corporations, but they are set up – rather than being sort of, departments, they are set up as formal Ontario business corporations.

So the shareholders of the local municipal councils are then constituted as private corporations, and with that comes the

responsibility to operate efficiently and to – they have boards of directors and there’s – there’s a profit motive now – it’s been injected into this government-owned system. And my overall sense is that this has produced sort of – a more efficient set of outcomes in the sector than might otherwise have occurred – and again, the government has recently started to sell off parts of the transmission entity – Hydro One – to try and inject a greater sort of capital market discipline, which will then lead to hopefully more efficient production.

**MR. SIMMONS:** Okay, thank you.

Page seven, please.

At this point in your presentation, you were talking about best practices in the design of regulatory agencies. We’ve heard the term best practices a number of times –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – through the 23 days of hearings we’ve had so far, but nobody’s counting.

And I haven’t asked this question to anyone before, but it seems to me, best practice is a term I have only really been hearing for the last decade or so. And I’ve heard it applied in many different areas of expertise –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – by many different people.

So, in the area in which you’re working here is the design of regulatory agencies. You’ve mentioned OECD as being a source of –

**DR. HOLBURN:** Uh-huh.

**MR. SIMMONS:** – best practices, but is there any standard or guidance that we look to, to define what it – when we can call something a best practice, and when we can’t, or is it just a matter of opinion of people who are familiar in the area, for them to determine what they consider a best practice to be?

**DR. HOLBURN:** Mm-hmm.

So there is no single authoritative source that would be the, sort of, go-to source that would define: this is a best practice. That said, there are a number of public policy organizations and experts that have produced reports titled best practices –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – or best guidelines and I cite a few of them in my report.

What I think these do is reflect what would be commonly accepted high standards of practice within the sector as to what would constitute effective regulation. It's not a legal definition of best practice –

**MR. SIMMONS:** Sure.

**DR. HOLBURN:** – so there is always going to be an element of subjective definition here. But I would regard these as being commonly accepted principles –

**MR. SIMMONS:** Right.

**DR. HOLBURN:** – of effective regulation, and in fact a number of the reports that I cite in my report have the words best practice in their titles.

**MR. SIMMONS:** Right.

So in this case, we rely on your expertise – the work you've done, your background – in order to be able to tell us what, in your view, the best practices are here. But I presume that at times there are debates –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – among people who are – have the expertise similar to yours and work in this academic area, as to whether or not something is a best practice or how to define it.

**DR. HOLBURN:** I'm sure there is going to be a range of opinions. Academics are famous for disagreeing with one another. What I've tried to do is I've tried to distill a summary of best practices from the various policy organizations.

**MR. SIMMONS:** Yeah. Good.

Okay. And jump to page 11, please.

On page 11, you summarized objectives, resources and powers, independence, accountability of the Board of the Commissioners of Public Utilities here in Newfoundland and Labrador. And you – under resources, you did identify that it has some of the smallest resources of similar public utility regulating bodies in Canada. Saying there's 12 staff, budget of 2.5 million; I think you compared that to Ontario which has, by my account, 12 or 15 times as many people and 12 or 15 times the budget.

**DR. HOLBURN:** Hmm.

**MR. SIMMONS:** Yeah. Would you know what the comparison is to Nova Scotia?

**DR. HOLBURN:** I did look at this. So the Utility and Review Board has a broader mandate, as I recall, than the PUB. So to the extent that it has a broader set of industries to regulate and consider, then budgets and staffs are naturally going to differ. I can't recall off the top of my head what the (inaudible) staff budget numbers are. My recollection is that they are larger than here in Newfoundland and Labrador.

**MR. SIMMONS:** Right. And you do understand the Public Utilities Board here has more responsibility than just electricity rate –

**DR. HOLBURN:** Yes, I do.

**MR. SIMMONS:** – regulation? There are some other areas –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – of responsibility they have as well within this resource –

**DR. HOLBURN:** Yes, yes.

**MR. SIMMONS:** – complement that they have.

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** Okay.

Now, so the budget that you've identified here, this 2.5 million, that would be money provided

to the Public Utilities Board by the government of the province through the provincial budget I presume?

**DR. HOLBURN:** I think this is the approved budget –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – that gets approved by the government.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** And these are assessments on consumer rates.

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** So these are authorized charges on consumer bills. And this is the source of financing –

**MR. SIMMONS:** Right.

**DR. HOLBURN:** – for the PUB.

**MR. SIMMONS:** So for the – for paying for the – having the PUB there to do its work, its overhead, its staff and so on, the value of that is – the cost of that is 2.5 million – not actually paid for by the government, by the taxpayer, but it's paid for by the ratepayers through assessments on their power rates?

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** Yeah. Now when the PUB holds – conducts a review, such as a general rate application from Newfoundland Power, Newfoundland and Labrador Hydro, and has to – its staff have to apply their time to do that, to do a review, there can be experts retained, there's hearing time, there's lawyers involved. Those costs are all passed on to the ratepayers as well, separately. Are they?

**DR. HOLBURN:** So my understanding is that additional hearing costs are levied upon the applicant, and then eventually those will be recovered in rates.

**MR. SIMMONS:** Right. So the applicants – Newfoundland Power, Newfoundland and

Labrador Hydro – will pay the cost of the hearing; it forms part of the rate base, I suppose –

**DR. HOLBURN:** I –

**MR. SIMMONS:** – maybe not the rate base, but it finds its way into being paid for by the consumer, eventually.

**DR. HOLBURN:** You will have to check with the technicalities on how it's accounted for with the PUB officials themselves. But my understanding is that ultimately it will be paid for by the consumers –

**MR. SIMMONS:** Yes. So –

**DR. HOLBURN:** – by the ratepayers.

**MR. SIMMONS:** So the kind of – the idea behind how this public utilities regulation system works is that it's not paid for by the taxpayer, it's ultimately paid for by the ratepayers who are the ones who are supposed to get the benefit of the regulatory scheme.

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** Right. Okay.

And I'm interested in a comparison then to different sized jurisdictions –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – because Ms. O'Brien asked you a question –

**DR. HOLBURN:** Mmm.

**MR. SIMMONS:** – about that. Newfoundland is a much smaller jurisdiction than Ontario, or Quebec, or Alberta or BC population wise; fewer ratepayers to pay the cost of these overheads. So – and it would seem that if Newfoundland and Labrador is to adopt as expansive a regulatory regime as we might see in Ontario or maybe even Nova Scotia that the cost per ratepayer may be higher here than it would be in those large jurisdictions.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Is that a fair consideration?

**DR. HOLBURN:** If you expand –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – the size and the budget then – naturally that’s going to fall to consumers.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** Just to emphasize, Ontario has a much larger electricity system so the burden of regulation is much greater.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** And that’s one of the reasons why the Ontario Energy Board has a staff of 178.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** There are 70 distribution utilities –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – and that’s just the distribution part. And then you have generators and transmission and so forth.

**MR. SIMMONS:** Right.

So when we’re looking at what sort of cost we want to add to the utility regulation system, it would seem to me that there – for the people who make the decisions about whether or not to adopt some of the different processes that we’ve talked –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – about here this morning, there’s a decision to be made to evaluate the potential benefit versus the additional cost. Yeah.

**DR. HOLBURN:** Yes, absolutely.

**MR. SIMMONS:** Can we go back to page 9, please?

At this point in your presentation you were speaking of the advantages and disadvantages of delegating oversight to agencies. You list some advantages; you list some disadvantages. I have a note that in the course of discussing this slide, that you said that urgency might lead to a preferred alternative approach, compared to the approach that you’ve described here.

And I’m curious as to what you were referring to then and what sort of alternatives might be a preferred alternative approach to the scheme of regulation –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – we’re looking at?

**DR. HOLBURN:** Mm-hmm.

So one of the examples that I discussed, I think, brought in this element of urgency, and that was the Western Alberta Transmission Line.

**MR. SIMMONS:** Mmm.

**DR. HOLBURN:** Just a recap: AltaLink, which was the project proponent, had started the regulatory review process; halfway through the government disbanded the regulator. There was a delay before the government created a new regulatory authority – the Alberta Utilities Commission. During that period, which was I think around 2008, 2009, this was a time when the Albertan economy was booming – 2007, 2008, 2009. And there was an urgency to bring on new transmission infrastructure and the province had not had major north-south transmission infrastructure –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – upgrades over a 20-year period. So it had got to that point where it was becoming urgent in terms of assuring system reliability. So that would be one example of urgency, where there’s a need for the government to step in and bring it to an expedited regulatory review process.

**MR. SIMMONS:** Right. So in that case, these considerations that government took into account were – I take it in your view – were appropriate for them to choose to use a more



expedited review process than the fulsome process that might normally be the case, if there weren't that sense of urgency –

**DR. HOLBURN:** Hmm.

**MR. SIMMONS:** – needed to get a decision made?

**DR. HOLBURN:** The government was heavily criticized at the time for –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – doing this.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** The government took a lot of heat.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** There was some opposition to the development of these transmission lines.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** So I think it wasn't an easy decision for government to do at the time. And it did actually reverse that ability subsequently once –

**MR. SIMMONS:** Presumably when that urgency had passed?

**DR. HOLBURN:** That is correct, yes.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** And it restored the authority back to the Alberta Utilities Commission.

**MR. SIMMONS:** Right. Okay.

Can you tell us anything more about what happened in Alberta when – was it the EUB, was –

**DR. HOLBURN:** Energy and Utilities Board.

**MR. SIMMONS:** – when that had to be disbanded –

**DR. HOLBURN:** Mmm.

**MR. SIMMONS:** – because – was there a problem with the functionality of that board? Was – do you know anything about what the circumstances were that lead to the government having to intervene –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – and take that fairly drastic step?

**DR. HOLBURN:** Mm-hmm.

There were concerns at the time about the conduct of public hearings –

**MR. SIMMONS:** Mmm.

**DR. HOLBURN:** – around the siting of transmission infrastructure. And I don't know the full details. I know there was some concerns about the way they were being administered –

**MR. SIMMONS:** Mmm.

**DR. HOLBURN:** – and some of these hearings were quite contentious –

**MR. SIMMONS:** Mmm.

**DR. HOLBURN:** – and this lead to a bit of an outcry, and the government decided it would be easier to start again and start with a fresh sheet –

**MR. SIMMONS:** Mmm.

**DR. HOLBURN:** – than to constitute a new regulatory body.

**MR. SIMMONS:** Mm-hmm. Okay, thank you.

Page 11 again, please.

I have a note here that when we were discussing – we're back to talking about the resources available to the Public Utilities Board. You did describe it as being a more fragile –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – regulator due to its small size, and would that be – and you mentioned that

it's exposed to the departure of experienced people. Is – because of having smaller cadre of experienced people available, if one or two leave, they obviously – I guess they're harder to replace. You also said they would have to deal with unexpected requests or it's more difficult to deal with –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – unexpected requests. Can you expand on that a little bit and tell me what you were referring to there?

**DR. HOLBURN:** So lateral organizations generally have a little bit more flexibility or slack within the organizations to –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – accommodate unusual applications or requests, or it's easier for them to move people around, to accommodate requests that may have an unusual profile.

Within a smaller organization, there are fewer degrees of freedom, and it's harder to manage an application that might be out of the normal run of regulatory affairs.

**MR. SIMMONS:** Right.

**DR. HOLBURN:** So it's probably a little bit more of a challenge to accommodate – not necessarily insurmountable, but I think it's a little bit more of a challenge than for a larger regulatory agency that's got a broader set of resources.

**MR. SIMMONS:** Right.

As part of your review, I think you looked at the decisions that have been made by the Public Utilities Board here in Newfoundland and Labrador. Over –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – a period of time you –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – counted up how many there were. And – so – can you give me some idea of

what you can say about the types of regulatory matters –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – that they dealt with? There would have been, I think, I'm going to suggest there would have been general rate applications –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – annual capital budget approvals.

**DR. HOLBURN:** Yup.

**MR. SIMMONS:** What other sorts –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – of things did you see in there that might have been on a recurring basis of – for involvement by the PUB?

**DR. HOLBURN:** Those account for the bulk of them.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** There were, I think, were also some rate hearings or – sorry – some applications around capital financing, too.

**MR. SIMMONS:** Yes. Yeah.

**DR. HOLBURN:** I think that that probably accounts for the bulk of them –

**MR. SIMMONS:** Yeah.

**DR. HOLBURN:** – in terms of the rate applications and the capital expenditure applications.

**MR. SIMMONS:** So the capital expenditure applications, they tend to cover capital expenditures of a more routine, ongoing –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – maintenance nature rather than –

**DR. HOLBURN:** Yeah.

**MR. SIMMONS:** – large additions to the generation in the province. Is that correct?

**DR. HOLBURN:** Correct. Yes.

**MR. SIMMONS:** Did you see any evidence of the board having been involved in the review of any large hydroelectric or other types of generating projects within the last 10 years or more?

**DR. HOLBURN:** Not that I noticed. I didn't look and – I didn't study every single –

**MR. SIMMONS:** Sure.

**DR. HOLBURN:** – application. This was an overall view, but I was keeping an eye out for larger applications and –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – I didn't notice anything of a particularly large magnitude.

**MR. SIMMONS:** So there may – there might be a couple of things we can draw out of that, I'll suggest and get your comment on.

The first is that, without any recent experience in dealing with, say, a large hydroelectric project, would you expect a small board with its limited expertise here to have the kind of expertise on hand and in house to deal with such an application –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – when it does come in?

**DR. HOLBURN:** So I would like to just mention also, just as a point of –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – comparison here, how the Ontario Energy Board, sort of, viewed the Darlington Refurbishment Project. It commented very explicitly in its – in one of its orders that this presented an unusually large and challenging application before it. I think they said – I've probably got it in my report – this

was the largest application that they've had to deal with ever, and this was a \$5 or \$6 billion rate application.

**MR. SIMMONS:** So presumably they had not dealt with the original approval of any of these nuclear plants?

**DR. HOLBURN:** So they had gone through elements of cost recovery, but they – correct, no, they hadn't approved it originally up front.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** But this project presented a challenge. They had to review, sort of, the prudence once Ontario Power Generation came along. They were very explicit saying this is an unusually large and complex project that the Ontario Energy Board is not used to dealing with.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** But they went on to say that the same principles apply in terms of due process, evaluation, cross-examination, discovering and so forth.

So I think their view was, yes, this is going to be challenging but we have the processes in place to provide an examination of this project, recognizing it's gonna be more demanding for the organization.

So we can think about resources, not just in terms of the number of bodies, number of people on the staff. I think we can also think about the experience with going through the process to handle an application, and the PUB has been through that many times, clearly not with an application of the magnitude of something like Muskrat Falls, but it's used to that administrative process.

**MR. SIMMONS:** Okay.

Would you have been aware, or would you have learned through your work, your investigation here, that development of the hydroelectric resources of the Lower Churchill River had been, by order-in-council, exempted from review by the Public Utilities Board for quite some time –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – before 2012?

**DR. HOLBURN:** Yes, yes.

**MR. SIMMONS:** You were aware of that?

**DR. HOLBURN:** I was aware of that.

**MR. SIMMONS:** So when, in 2011, the matter was referred to the Public Utilities Board, would you put that in the category of an unexpected request, one that would not necessarily have been anticipated that would be coming to the board since it had previously been excluded?

**DR. HOLBURN:** Sorry, if it had – sorry, you're saying if it had been put towards (inaudible) –

**MR. SIMMONS:** Once it's referred in 2011 –

**DR. HOLBURN:** Right, yes.

**MR. SIMMONS:** – do you put that in the category, from the board's perspective, –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – as being an unexpected request –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – that comes in? Okay.

**DR. HOLBURN:** I – yes, I would agree with that because this is a very rare type of project that comes along.

**MR. SIMMONS:** So from the point of view then of the proponent of the project, which in this case was Nalcor Energy, similarly knowing that the project had been exempted for quite some time – any projects on the river – would you consider that from their perspective it would be an unexpected issue to have to deal with as well?

**DR. HOLBURN:** I hesitate to put myself in the feet of Nalcor executives. I think you'll have to ask them that question.

**MR. SIMMONS:** Okay. Thank you, yeah.

Page 14, please.

Mr. Holburn, this is – I think this is a very useful chart that you've included in your report showing what I understand to be provincial electricity rates from 1970 up to 2014 in a number of provinces. Is the Canadian average shown by one of the lines on this chart?

**DR. HOLBURN:** No. So I didn't include the average –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – line in this chart. It is in the report –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – but just for sake of brevity – (inaudible) the presentation –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – was very brief, but I did omit –

**MR. SIMMONS:** Yeah.

**DR. HOLBURN:** – it from the presentation.

**MR. SIMMONS:** And I think you said this morning that the rates in Newfoundland and Labrador have been consistently below the Canadian average, right? Okay.

And would – in looking at these rates here, would it be fair to comment also that the rates in Newfoundland and Labrador had been fairly stable over time without dramatic fluctuation?

**DR. HOLBURN:** Yes. That would be correct. These – I'm sorry, I would just like to stress –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – these are real rates in terms of they're represented in 2010 dollars as opposed to nominal rates.

**MR. SIMMONS:** Right.

**DR. HOLBURN:** So, these are accounted for inflation if we – if I charted the nominal rates,

then we would have seen a gradual trend upwards over time as opposed to staying essentially flat –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – between the late 1980s and about, sort of, 2008.

**MR. SIMMONS:** Right.

So, from the point of view of someone who looks at – studies utility regulation, can you comment on whether there is any value or not in maintaining rates that are relatively stable as opposed to fluctuating within short time periods?

**DR. HOLBURN:** Mm-hmm.

In terms of predictability and consistency, which businesses value and consumer value –

**MR. SIMMONS:** Yeah, that's a good criteria.

**DR. HOLBURN:** – then there is value in having rates that are stable over time. At the same time, there's always value in having rates that – from an economic perspective there's value in having rates that reflect the true economic cost of producing, transmitting and distributing the energy so that we have an efficiently operating sector so that households and businesses are making efficient consumption decisions.

**MR. SIMMONS:** So, the objective of efficient decision making, and the objective of predictability, they would seem to be objectives that would have to be balanced – to some extent – by the regulator when determining what model to adopt to set their utility rates.

**DR. HOLBURN:** I think it also comes back to the planning process –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – and to determining whether changes in investments are going to lead to rapid escalation in costs.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** So, there's an early determination here where the regulator would be balancing both the stability concerns along with economic efficiency concerns.

**MR. SIMMONS:** Thank you.

Now, slide 19, please.

So, you've given us some evidence this morning about the role of system planners. And, if I understand correctly, there are jurisdictions where there is some form of independent agency that carries out the system planning role, which would be assessing the future needs for electricity generation and planning for the measures to be taken, whether that's adding generation or instituting conservation in order to address the predictions about what demand will be in the future.

So, have I got that –

**DR. HOLBURN:** Correct. Yes.

**MR. SIMMONS:** – basically right?

**DR. HOLBURN:** Alberta and Ontario are examples of jurisdictions with separate system planners –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – from the regulatory agency.

**MR. SIMMONS:** Right, and is that a relatively new development. Traditionally, has that been the way that system planning has been carried by utilities in Canada, or do you know?

**DR. HOLBURN:** So, I'm less familiar with Alberta.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** I have a little more knowledge about Ontario.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** The planning agency in Ontario was created in 2004 –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – and continues today. This came after the government restructured the electricity sector in 2000, 2001. That was the time when it separated out the Crown-owned corporation, which was Ontario Hydro, it separated out transmission from generation, and also moved some – also created some privately owned generation, and this was the time when there was a natural need to have a new entity that would undertake system planning.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** Previously, it had been undertaken by Ontario Hydro. Now, with this desegregated electricity sector, it was appropriate to create a new planning agency.

**MR. SIMMONS:** So, in Ontario then, the creation of the independent system planner seems to have been an outcome or product of the kind of breakup of the electricity generation distribution system –

**DR. HOLBURN:** Mmm.

**MR. SIMMONS:** – compared to what it had looked like before these government measures were taken.

**DR. HOLBURN:** Correct, and –

**MR. SIMMONS:** So –

**DR. HOLBURN:** Sorry.

**MR. SIMMONS:** That's fine.

**DR. HOLBURN:** There was also a need at the time to procure new generation capacity.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** There was a concern that Ontario would go into a shortfall and, in fact, there was a large blackout in 2003 –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – which hit the northeast area of the US and also parts of Ontario, and there was a recognition that there needed to be some systematic long-term planning which also fall at the generation side, which let – that was one of

the other motivations for creating the Ontario Power Authority at that time.

**MR. SIMMONS:** So is the independent system planner a separate agency with its own staff, its own office, its own overhead?

**DR. HOLBURN:** Yes, it is.

**MR. SIMMONS:** And how is it paid for? Where do the costs of it find their way to – do they find their way to the taxpayer, to the ratepayer?

**DR. HOLBURN:** They are funded through assessments on consumables.

**MR. SIMMONS:** Okay, so they find their way to –

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** – the ratepayer (inaudible) in that case.

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** Yeah, okay

And in Nova Scotia, I believe –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – you said there's some form of independent system planner in Nova Scotia now as well?

**DR. HOLBURN:** Actually, no, I don't think I –

**MR. SIMMONS:** I may –

**DR. HOLBURN:** – said that.

**MR. SIMMONS:** – have gotten that wrong, okay.

**DR. HOLBURN:** My understanding in Nova Scotia – and I'm going to be brief because I don't have as much understanding –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – about Nova Scotia as I do about Ontario.

My understanding is that the utility and review board takes sort of responsibility for system planning in conjunction with Nova Scotia Power.

**MR. SIMMONS:** Okay, so that's a bit of a different model.

**DR. HOLBURN:** Yes, it is. It's a different model. I'm not aware of a separate system planner in Nova Scotia.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** I'm not an expert, though, on Nova Scotia's electricity system.

**MR. SIMMONS:** Okay.

So, back to Ontario then for a moment. The independent system planner, does it function like our Public Utilities Board in that does it hold hearings and hear representations from parties, or is a functional organization that carries out these studies?

**DR. HOLBURN:** So, if I go back to – so there have been some reorganizations –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – since the original system planner was set up, but the – I would say it's a cross between the two.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** In that the original IP – Integrated Power System Plan was developed, it was developed through a consultative process led by the Ontario Power Authority; it involved a range of stakeholder consultations to develop a plan, which then it took to the Ontario Energy Board to be reviewed.

So, my impression from the time was it wasn't following exactly the same type of adjudicative process the Ontario Energy Board would review. There was more of a technical element to it, but clearly due process was a very important part in developing this plan.

**MR. SIMMONS:** How closely have you looked at the system planning process here in this province?

**DR. HOLBURN:** I have a read a number of consulting reports that have spoken about that. I've read a number of PUB documents and annual reports, so I've done as much – I've done a reasonable amount of desk space investigation.

**MR. SIMMONS:** Right.

So you would understand that Newfoundland and Labrador Hydro, a subsidiary –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – of Nalcor, conducts regular – prepares regular system planning reports –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – on an ongoing basis, if not annually –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – pretty close to annually, you'd be aware –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – of that.

**DR. HOLBURN:** Yup.

**MR. SIMMONS:** And are you aware of to what extent the Public Utilities Board plays a role in reviewing those reports?

**DR. HOLBURN:** Mm-hmm.

I haven't seen any explicit PUB comments on these reports. What I've noted from reading a variety of consultants' reviews and reports is that there hasn't been a PUB led or independent resource planning process –

**MR. SIMMONS:** Right.

**DR. HOLBURN:** – here in the province.

**MR. SIMMONS:** Okay, yeah.

And you've spoken this morning about an IRP process.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** I think it is. And, as we know, a more comprehensive process than the more additional system planning. Would it be correct that that would also come with more cost?

**DR. HOLBURN:** Yes. To the extent that IRPs are reviews by regulators and they go through due process; there's an emphasis on a broad range of stakeholder consultation, public input and then looking for regulatory review and approval, yes.

**MR. SIMMONS:** Yeah, okay.

Still on side 19, there; in the bottom section where – under approval, you've stated that there are, I guess, a couple of ways that major electricity projects can be approved in Canada. One is where the regulator has the authority to approve the project. The second is, you say: "Or, government approves ... based on evidence and recommendation from comprehensive regulatory evaluation."

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Now, is – can you say that either one or the other is best practice or preferable or ...? Do you have any comment on ...? Or are they both acceptable ways of approaching the approval of major electricity projects?

**DR. HOLBURN:** So I think this depends a bit on – in terms of the scope of the impacts that a project has and the scope of regulatory analysis. So typically economic regulators are looking at the economic aspects of a project, but often with large megaprojects there can be broader impacts, there could be environmental impacts, that also require some evaluation.

If the regulator – if the economic regulator is not mandated to explore and assess the environmental aspects, then ultimately a weighing up has to be achieved, and so this would be potentially the role for government to consider. On the one hand, well, this is the

economic analysis and here is the environmental analysis and to weigh up, and potentially on social impacts as well, and so then make a determination on that –

**MR. SIMMONS:** So what you're suggesting –

**DR. HOLBURN:** – and to take into account all the evidence.

**MR. SIMMONS:** – is that environmental impacts would be a factor outside of the jurisdiction of the public utility regulator that someone should be taking appropriate account of, and that would be the role of government to do that?

**DR. HOLBURN:** If that is excluded –

**MR. SIMMONS:** Right.

**DR. HOLBURN:** – from the regulator agreement. Yes.

**MR. SIMMONS:** What about the potential for there to be other benefits from a large hydroelectric project other than the ones that accrue directly to the ratepayers? I'll give you an example: In the Keeyask Project you've identified that export power –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – was a part of that project. Is that the sort of factor that falls within, conventionally, the jurisdiction of a public utilities regulator to deal with? Or is that more on the plate of governments to assess when they're deciding whether to accept or reject a recommendation?

**DR. HOLBURN:** So exports affect the economic returns to a project, as well as the cost side too. So I would see that economic and financial consideration as falling under an economic regulator's mandate.

**MR. SIMMONS:** Okay. What, if anything, can you tell me about the practice in other jurisdictions –

**DR. HOLBURN:** Mm-hmm.



**MR. SIMMONS:** – in Canada for actually placing that consideration –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – the potential value of exports of power, in the hands of the utility regulator to consider, versus leaving it to the government –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – that’s going to –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – decide whether or not to do the project, to take into account?

**DR. HOLBURN:** So I don’t think we have too many examples here. I don’t want to stretch beyond my knowledge. I would just say that in the Keeyask evaluation –

**MR. SIMMONS:** Hmm.

**DR. HOLBURN:** – there the regulator included analysis of the exports opportunity within that. That fell within the regulator’s mandate for Keeyask.

**MR. SIMMONS:** Right. So in that particular case, was that because when the terms of reference were set for the review that was done by the regulator in Manitoba, that evaluation was captured by the terms of reference? The evaluation of the cost or benefit of –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – the export power.

**DR. HOLBURN:** I can’t recall whether export of power was explicitly included within the terms of reference, I’m sorry.

**MR. SIMMONS:** Yes, okay. Good, all right.

If we can go, please, to slide 25; I’m just going to use this as an example to pose a question for you related to demand-side management.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** And I understand this to be an illustration of an integrated resource plan that was developed by Nova Scotia Power in 2009 covering a period from 2010 up to 2032, and each of the separate colours here represents a different type of either power generation, or in the case of the lavender – I’ll call it – demand-side management contribution towards meeting the forecast of demands.

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** Have I got that right?

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** Okay.

So I can understand that in the case of, say, a hydro project that you can look to the future and know: If we build this hydro project it will produce X megawatts, and we’ve got that. And for natural gas, if we build a natural gas-fired combustion turbine –

**DR. HOLBURN:** Yeah.

**MR. SIMMONS:** – it has the capability –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – of producing X – we don’t know what it will cost to do it, ’cause it will depend on the price of fuel – but we know we can get X out of it.

For the demand-side management, where we are projecting into the future that consumers of power will continue to reduce their consumption by various means, is there the same sense of certainty about what’s achievable with that, looking off into the future, as there is when you build a power generation unit and you know exactly –

**DR. HOLBURN:** Mmm.

**MR. SIMMONS:** – what the amount of power that can be generated from it is?

**DR. HOLBURN:** Mmm. Forecasting conservation and demand-side management impacts is difficult – you’re trying to predict stuff that you can’t observe easily. So no, it is

more challenging predicting the contribution of an asset that you can physically touch –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – and you know it's going to be producing over 10, 20, 30 years. So it is more challenging to make firm predictions about demand-side management and also conservation methods.

**MR. SIMMONS:** Right.

**DR. HOLBURN:** Yeah.

**MR. SIMMONS:** So if I'm gonna put in a combustion turbine, I'd suggest there's little risk that I'm going to be wrong about how much power I can get out of it –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – in 10 years' time. But is there more risk that I'm going to be wrong if I'm relying on projected savings from demand-side management?

**DR. HOLBURN:** Is there a high level of variation?

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** I think you would need to speak to some conservation specialists on that to understand what's the current state of understanding. There's been a lot of – there's been an enormous amount of studies and research on the efficacy of conservation and demand-side management programs over the last 20 years or so. So I imagine our understanding now is a lot better than it was 20 years ago.

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** I think it'd be best to speak to a –

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** – focused expert on that topic.

**MR. SIMMONS:** Thank you.

Slide 29, please.

This was part of your presentation concerning the Maritime Link Project, and this is on the approval page. Here you answered – you explained and answered some questions regarding the Nova Scotia UARB decision to, I think, make a conditional approval of the project; subject to the proponent going back and negotiating access to more market price power –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – from Nalcor. And I think I'm correct in you describing this as an example of the regulator intervening to obtain something that was of value to the consumers of power in the Province of Nova Scotia – to the ratepayers of Nova Scotia.

**DR. HOLBURN:** So I think I was saying that this is an example of a regulator using its expertise not to just come up with a, sort of, one-zero, up-or-down decision on an application, to deny or approve, but to point to a solution that would allow for approval, which would benefit both the consumers and also the proponent.

**MR. SIMMONS:** Well, maybe you're not the right person to ask this question, then, to –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – but I'll try it anyway.

The outcome of this would seem to be that there was – that the agreement, the Energy Access Agreement, provided a benefit to ratepayers in Nova Scotia. Do you know whether that means that there had – that there was some detriment or disadvantage to ratepayers in Newfoundland and Labrador on the other hand? Like, is this a zero-sum –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – situation, or are you in a position to know whether because one party got an advantage the other one necessarily –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – had to give something up.

**DR. HOLBURN:** I think it's probably best to ask Nalcor that question. What was the implication –

**MR. SIMMONS:** Right.

**DR. HOLBURN:** – for the economics of the project?

**MR. SIMMONS:** Okay.

So you're not here suggesting, in that case, that there was any adverse implication for Nalcor or the ratepayers in Newfoundland and Labrador?

**DR. HOLBURN:** I wouldn't like to speculate on that, but it's something that Nalcor didn't provide an initial commitment to.

**MR. SIMMONS:** Right. Okay.

Mr. Ralph asked you some questions about the role of an independent engineer? And if we go to slide 31, please?

You'd noted here that at the Maritime Link example, under the Execution and Oversight heading, that the Nova Scotia UARB had directed Nova Scotia Power to file quarterly project status cost reports at the UARB and also to submit independent engineer's reports.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** So in that case, who was it retained the independent engineer in that situation, do you know? Was it the regulator itself, or was it the –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – utility, Nova Scotia Power?

**DR. HOLBURN:** That's a good question.

I can check on that. Unfortunately, I don't have the answer off the top of my head.

**MR. SIMMONS:** Okay.

And I think Mr. Ralph asked you some questions concerning – in the case of the Muskrat Falls, Labrador-Island Link Project,

there was an independent engineer retained who reported to the federal government –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – under the provisions of the federal loan guarantee, and that those reports also found their way and were submitted to the provincial government's oversight committee.

Okay, and you've looked at the ones that were online –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – but you're not in a position, I presume, to comment more expansively on how effective the role of that independent engineer was –

**DR. HOLBURN:** No.

**MR. SIMMONS:** – (inaudible)?

**DR. HOLBURN:** I did not focus on that in my analysis, on engineering aspects. I was very much focused on the regulatory side.

**MR. SIMMONS:** Okay.

And maybe, on the same topic, we can jump ahead to page 41, slide 41, please.

So this is in the part of the presentation dealing with the refurbishment of the Darlington nuclear reactor in Ontario, and it's under Execution and Oversight, which you have given a green to, here –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – as being the higher level of evaluation–

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – that you've included here. And in the middle bullet, where it describes “multiple layers of internal and external oversight,” and there are four different types of advisors here, and the first three – am I correct that the first three were all internal to Ontario Power Generation?

**DR. HOLBURN:** Yes. Correct.

**MR. SIMMONS:** They were not either retained by or reporting to any outside regulator?

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** And the fourth one was an external expert advisor, appointed by government, but reporting directly to the Ministry of Energy?

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** And again, not either appointed by a regulator or reporting to a regulator?

**DR. HOLBURN:** No. Correct.

**MR. SIMMONS:** No. Okay.

And in your evaluation this collection of oversight merited the green status in your evaluation?

**DR. HOLBURN:** Mm-hmm. The Ministry of Energy has expert staff, and they're also responsible for oversight over the agencies that –

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** – operates in the electricity sector.

**MR. SIMMONS:** Right.

**DR. HOLBURN:** But what I think's interesting about this example is it's not just – it's the combination of the external oversight and the internal oversight, in that we've got an internal oversight mechanism that's been set up, which is a Darlington Refurbishment Committee, which has excellent experts, reports directly to the Ontario Power Generation Board, and the external expert advisor is made a member of that committee.

So he's not operating by himself. He's operating as a member of that committee, and the benefit of that is that he's able to see the month-to-month regular operations. He gets that access and the insight into the operations of the

Darlington Refurbishment. He gets that very detailed information in terms of its progress.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** So he's been appointed. That's right. He is the external independent advisor –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – but he's almost embedded within this internal oversight committee.

**MR. SIMMONS:** Okay.

And in point 4 there, I note as well that the reports that come from this external advisor to the Ministry of Energy, you describe them a being on a confidential basis?

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** So do I presume that those are not made public?

**DR. HOLBURN:** No. No.

**MR. SIMMONS:** Page 40, please.

So also in connection with Darlington, one of the things you've flagged here as being, I think – you suggested would be a good practice – were that the – there were off-ramps –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – built in that would enable government to stop the project at pre-specified points. So in the case of the Darlington nuclear reactor, if we – refurbishment – if we flip over to page 42, you've included a schematic or a graphic.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** And did I take it that this shows the scheduling of the work on each of the four units?

**DR. HOLBURN:** Correct, yes.

**MR. SIMMONS:** The sequence at which it was to be carried out?

**DR. HOLBURN:** Yes. Yeah.

**MR. SIMMONS:** Yeah.

Now, I don't know a lot about the physical setup of this plant.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** I'm guessing – correct me if I'm wrong – I'm guessing that we have four reasonably independent reactor generator units, because I read – you've said here that one of them gets shut down –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – first –

**DR. HOLBURN:** Yeah.

**MR. SIMMONS:** – taken out of service. The others keep running, and they do one.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** And according to the schedule, it looks like they finish one before –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – they go on to the next one.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Okay.

So you're – and you're nodding your head, so you're saying yes.

So the off-ramp opportunity here seems to me to be that there was an opportunity to do one full unit, learn as much as you can, see how it goes, see what problems developed, see if the costs rise, and then you get a clean break to decide whether you're going to go on a do the others. Is that –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – correct?

**DR. HOLBURN:** That's my understanding.

**MR. SIMMONS:** Yeah, okay.

So in the case of a new hydroelectric plant, do you have any idea whether this similar type of opportunities –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – for off-ramps would present themselves?

**DR. HOLBURN:** I think it's a very good question. To what extent is this model applicable –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – to other types of generation technology? It seems like it lends itself to development of an off-ramp given the specification of this particular nuclear plant.

**MR. SIMMONS:** That Darlington does?

**DR. HOLBURN:** That Darlington does.

**MR. SIMMONS:** Yeah.

**DR. HOLBURN:** I don't have knowledge of the design, construction sequencing of major hydroelectric projects to understand –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – whether there's anything equivalent –

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** – to that, so unfortunately, I'm not able to add any insight.

**MR. SIMMONS:** Good, okay.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Page 44, please.

For the Darlington project, this was the slide you – where you're dealing with cost review and recovery and this is just a fact question here for you. In the second bullet, you've noted that the "OEB reviews prudence of expenditures and

financial commitments.” And you said there were applications in 2007, 2010, 2013 and 2016.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** So was 2016 the last application that came before the OEB for prudence review of expenditures?

**DR. HOLBURN:** Yes, it was.

**MR. SIMMONS:** Okay.

And if we were to flip back to page 40 – I’m sorry, 42 – 42. 2016 seems to be the very beginning –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – of the work –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – on the first reactor.

**DR. HOLBURN:** Yep.

**MR. SIMMONS:** So has there been a prudence review done of expenditures since they actually started –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – work on refurbishment?

**DR. HOLBURN:** Yes, they have.

So the – so this included – so the prudence review that Ontario Power Generation initiated in 2016 –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – was completed towards the end of 2017. That included the expenditure for the test period that includes the Unit 2 refurbishment. So Ontario Power Generation has already made their commitments – financial commitments and so forth – to undertake these expenditures. So the test period includes that forecast amount for Unit 2.

**MR. SIMMONS:** Okay.

So the forecast amount for Unit 2 –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – not the actual results –

**DR. HOLBURN:** Yes, yes.

**MR. SIMMONS:** – of the refurbishments?

**DR. HOLBURN:** Correct. Yep.

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** Yep.

**MR. SIMMONS:** I see. So essentially, they reviewed the estimate?

**DR. HOLBURN:** For that one – yes, the expected amount, that’s right. Some of it had already been expended –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – as we can see from the cost slide’s chart. But at that point, the financial, sort of, commitments and the contracts and so forth had been –

**MR. SIMMONS:** Yeah.

**DR. HOLBURN:** – entered into.

**MR. SIMMONS:** ‘Cause one would think –

**DR. HOLBURN:** Yeah.

**MR. SIMMONS:** – in a refurbishment of something as complex as a nuclear reactor, the potential for overrun would probably come up more in the course of doing the work, than – just – (inaudible).

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** Okay. Page – slide 50, please.

This is dealing with the Western Alberta Transmission Line, and here you are on execution and oversight, and there’s a reference here to the AESO –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – closely monitoring project execution. And I think the AESO is the Alberta Electric System Operator? Defined it as.

**DR. HOLBURN:** Yes, that’s the system planner.

**MR. SIMMONS:** Okay.

So this is a similar question to the one I asked you about the Ontario system planner. Does the AESO operate functionally as a public utilities board does –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – in that does it hold, you know, public proceedings, conduct expert reviews, invite intervenor comment on issues such as the monitoring of the project execution, or how does it functionally carry it out?

**DR. HOLBURN:** That’s a good question.

The AESO has responsibility for planning and also has responsibility for the operation of the wholesale power market as well. So it has a more complex mandate and remit. I don’t know the exact administrative procedures –

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** – that it undertakes.

**MR. SIMMONS:** Slide 65, please.

On the – at the bottom of this slide, you’ve noted that in the pipeline sector the “federal government makes final sanction decisions on major projects after review and recommendation by NEB.”

This is as much a curiosity question as anything: Does the NEB only send up, to the federal Cabinet for a final decision, projects that it recommends approval, or does everything have to go up the federal Cabinet –

**DR. HOLBURN:** Mmm.

**MR. SIMMONS:** – whether it’s been recommended for approval by NEB or not?

**DR. HOLBURN:** Good question.

The government actually changed the legislation on this in July of 2012 to allow the government to approve a pipeline that had formally been denied a certificate by the NEB.

So the government – so the federal government now gets to see both projects that are being denied and also approved –

**MR. SIMMONS:** Right. So –

**DR. HOLBURN:** – by the NEB.

**MR. SIMMONS:** – prior to 2012 they only saw the ones that had been recommended –

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** – for approval?

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** So in the time period you’ve described there –

**DR. HOLBURN:** Yup.

**MR. SIMMONS:** – of the 26 major projects, 2007 –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – to 2017, from 2007 to 2012, everything that went to the federal Cabinet had been approved – had been recommended for approval?

**DR. HOLBURN:** Yes. In fact – so this is a complete set of projects.

I looked at all the major pipeline projects that had initiated a process for approval with the NEB, so in theory, then, they could’ve been denied. They were actually all recommended, and the NEB has got latitude to apply a sort of broad range of conditions as well, as part of its approval process.

**MR. SIMMONS:** Yeah, okay.

Slide 76, please. This is in the section where you were dealing with an alternative scenario.

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** And – well, first of all, let me ask you: This was something that you were asked to do as part of your report, I think, was to evaluate what – I'll paraphrase, now – what might –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – have happened had the Public Utilities Board in this province been asked to conduct –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – a review at the beginning of 2013 –

**DR. HOLBURN:** Yes.

**MR. SIMMONS:** – after government had decided that they wanted to sanction the project.

**DR. HOLBURN:** In terms of understanding what the impact would be of exempting, this was part of the analysis. So the timing wasn't specific around when a review –

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** – would have recurred.

**MR. SIMMONS:** Right.

So in doing this, were you looking at what should've been taken into account to decide whether to do a review at the beginning of 2013, or did you say, had a review been done, let's get to the end of the process, and based on everything that happened in that time period, what would the likely outcome have been?

**DR. HOLBURN:** Yes, the latter case.

**MR. SIMMONS:** The latter case.

**DR. HOLBURN:** If a review had occurred –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – then what can we say as to what might have been the outcome.

**MR. SIMMONS:** Right, so that's why you took into account things such as the drop in oil prices,

which at the beginning of 2013, I'm gonna suggest no one else predicting –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – but it happened before the end of an 18-month review period, had it begun in 2013.

**DR. HOLBURN:** So, the goal of this exercise –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – was to try and understand what new information would the – or could the PUB have had at that time –

**MR. SIMMONS:** Right.

**DR. HOLBURN:** – that might have had an impact on its assessments.

**MR. SIMMONS:** So if the question had been a little different, if the question had been: What kind of consideration should've been taken into account at the beginning of 2013 in deciding whether to ask the PUB to conduct –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – a review? No one would've known then what future changes in oil prices would've been, other than the estimates, the predictions –

**DR. HOLBURN:** Yeah.

**MR. SIMMONS:** – that were in place at that time.

**DR. HOLBURN:** Correct.

**MR. SIMMONS:** Right. Same with the –

**DR. HOLBURN:** Mm-hmm.

**MR. SIMMONS:** – variation in load forecast –

**DR. HOLBURN:** Correct, yes.

**MR. SIMMONS:** – that you observed during that time period.

**DR. HOLBURN:** Yeah.



**MR. SIMMONS:** Yeah, okay.

And my question I was going to come to on page 76 there was in relation to that variation in load forecast, point 2. You've said that the total Island load grew more slowly than originally forecasted, about 2 per cent less.

Now, just a point of clarification, so that was 2 per cent less growth, not 2 per cent less load?

**DR. HOLBURN:** No, that was 2 per cent less load.

**MR. SIMMONS:** Less load?

**DR. HOLBURN:** That was 2 per cent less load –

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** – than was forecast –

**MR. SIMMONS:** Okay.

**DR. HOLBURN:** – at the time.

**MR. SIMMONS:** Okay.

And I think I only had one other question for you and it's back to the sort of standing resources or staff complement that the Newfoundland and Labrador Public Utilities Board had.

In order to conduct the kind of review that you've contemplated in this alternative scenario, can you tell me what resources and expertise you think the board would have needed to have available in order to conduct this kind of review?

**DR. HOLBURN:** Mm-hmm.

I haven't looked at that specifically, but from my observation of the conduct of other reviews of major electricity projects, it's common to involve a number of expert consultants.

**MR. SIMMONS:** Yes.

**DR. HOLBURN:** Intervenors would also hire their own expert consultants.

In the Maritime Link there was 14 intervenors who were active in the hearings. There were seven sets of expert consultants who provided reports and evidence. (Inaudible) I think some scale of types of resources are going to be needed in a broad administrative process. In terms of what it would mean specifically for the PUB resources –

**MR. SIMMONS:** Mm-hmm.

**DR. HOLBURN:** – I haven't looked at that.

**MR. SIMMONS:** Okay, good.

Thank you, that's all the questions I have.

Thank you very much.

**THE COMMISSIONER:** Concerned Citizens Coalition.

**MR. BUDDEN:** Perhaps we can take our afternoon break first?

**THE COMMISSIONER:** I'm sorry?

**MR. BUDDEN:** Could we perhaps take 5 or 10 minutes first?

**THE COMMISSIONER:** Sure, let's take that now then.

**MR. BUDDEN:** Thanks.

**THE COMMISSIONER:** Ten minutes.

**CLERK:** All rise.

**Recess**

**CLERK:** All rise.

Please be seated.

**THE COMMISSIONER:** All right.

Mr. Budden.

**MR. BUDDEN:** Good afternoon, Dr. Holburn.

My name is Geoff Budden. I'm the lawyer for the Concerned Citizens Coalition, which is a

group of individuals who, for many years, have been concerned about the Muskrat Falls Project.

I guess my first question, from your report, it appears that of the five megaprojects you reviewed the successful ones were the ones with the robust regulatory process? And I guess by successful, I mean were developed – or are being developed on time and on budget. And by robust regulatory process, I mean a process with multiple appropriately funded intervenors, expert reports, extend adherence and so forth. So do you want me to repeat my sentence?

**DR. HOLBURN:** No, no. I think that's a broad conclusion that would come from looking at these five projects.

**MR. BUDDEN:** Yes.

I realize that – as you have testified – you have not systematically examined every energy megaproject in Canada. But speaking as an expert – you've been qualified as an expert in the regulation and governance of the energy sector. So, I guess, bringing to mind all of your expertise, are you confident that this is true for energy megaprojects, generally?

**DR. HOLBURN:** I think, as we've seen, there's a wide degree of variation in regulatory approaches. What I would say, though, is that the impact of regulatory insight – the impact of regulatory oversight that was seen on these five projects is consistent with what we might expect based on our understanding of how regulation works. And as I elaborated at the beginning, one of the benefits of regulation is: one, providing better information about project impacts, and risks and benefits; and the second impact is around changing utility incentives as well.

So I think that even though we've got five case studies – so this is not a large statistical sample like Dr. Flyvbjerg presented. This is consistent with our expectations of how a robust regulatory regime would operate.

**MR. BUDDEN:** Sure.

You mentioned Dr. Flyvbjerg in your – not in your report but in your direct evidence, and I was struck by the – his concept, of course, which I'm sure you're familiar with, of optimism bias –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – and how that appears to factor into megaproject proposals on development. I guess my question to you, which perhaps you've already somewhat answered: Is a robust regulatory process, perhaps, an effective counterbalance to the inherent optimism bias one seems to get with energy megaprojects?

**DR. HOLBURN:** Yes, I think that's absolutely right. The regulatory process forces an explicit statement of assumptions of data with methodologies, and it rigorously tests them. It scrutinizes them to stand up; to make them see the light of day. So it's hard to remain optimistic in that type of – regulatory type of environment.

**MR. BUDDEN:** Or at the very least your optimism is tested by a process of cross-examination of having to confront contrary views, expert evidence and so forth?

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** Okay.

I guess, it begs the question: Why would anybody ever resist regulation? What kind of arguments have you encountered by parties that say: No, you know, this particular project doesn't require regulation, it doesn't require this robust vetting?

**DR. HOLBURN:** Mm-hmm. So if we could just go back to the advantages and disadvantages.

**MR. BUDDEN:** Yes.

**DR. HOLBURN:** So this is slide 9 of my report. (Inaudible.) Yes, here we go.

**MR. BUDDEN:** Yes.

**UNIDENTIFIED MALE SPEAKER:** Yeah.

**DR. HOLBURN:** As I mentioned before, if there's urgency for bringing on a project that might be one reason to not go a length – or a lengthy and costly review.

The other potential situation would be if you've got a very small project where the impact is

going to be relatively small or the risks are relatively small, going through an extended administrative process, which is costly in terms of time and resources, may not justify the reduction in uncertainty that comes for a small project.

**MR. BUDDEN:** So –

**DR. HOLBURN:** So that might be another example where it would be appropriate to not go through the administrative process.

**MR. BUDDEN:** So the, I guess, the corollary of that: If a project is very large and not especially time urgent, there is no good reason to resist a robust regulatory process?

**DR. HOLBURN:** I wouldn't say no – I wouldn't want to say no good reason. I would say there would be less reason to do that.

**MR. BUDDEN:** Less apparent reason?

**DR. HOLBURN:** Less apparent reason.

**MR. BUDDEN:** Okay.

Did your mandate include a review of the terms of the Power Purchase Agreement between Newfoundland Hydro and the Muskrat Falls Corporation?

**DR. HOLBURN:** No, I didn't look at that.

**MR. BUDDEN:** Okay. So you're not in a position to comment on that or its implications.

**DR. HOLBURN:** No, no.

**MR. BUDDEN:** Okay.

The UARB – and perhaps you can help me here – was that a process that was specifically created or modified in any respect to evaluate the Maritime Link? Or did it just get plugged into an existing process that was already – in all key respects, already there?

**DR. HOLBURN:** Okay. So actually could we turn to that –

**MR. BUDDEN:** Of course.

**DR. HOLBURN:** – example here. So – let me find the slide.

**MR. BUDDEN:** What page are you on, Doctor?

**DR. HOLBURN:** So this would be slide 26 – page 26.

**MR. BUDDEN:** Sure.

**DR. HOLBURN:** So the UARB was required in legislation by the government to approve the Maritime Link, if it satisfied two criteria. And these were specified in legislation that it had to be the lowest cost alternative, and also it had to be consistent – I'm sort of summarizing here – with the province's environmental goals for the electricity sector, which had stated that they needed to have 40 per cent renewable energy by 2020.

So this was a very specific instruction to the administrative agency. Then the conduct of the review followed the normal process the UARB would follow for any application.

**MR. BUDDEN:** Okay.

**DR. HOLBURN:** So in that sense it was standard, but the mandate came from government, specifically, on this project.

**MR. BUDDEN:** Okay. So it was somewhat bespoke, but it just plugged into –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – an existing –

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** – process.

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** We will hear from a witness tomorrow and part of that witness's evidence, as I understand it, will be that the PUB experienced delays in getting information out of Nalcor, out of the project proponent. Is that something that appears to have been a factor, at all, in the Maritime Link UARB hearings?

**DR. HOLBURN:** Not – so –

**MR. BUDDEN:** That you're aware of?

**DR. HOLBURN:** Not that I noticed. But in terms of the timing of the application – and this was so – the application commenced when Nova Scotia Power initiated the proceeding. So as far as I'm aware, UARB was not directed by the government to start on a particular date or a particular time. It was up to the applicant to initiate the proceeding, and it initiated it once the DG3 cost estimates had been developed by Nalcor.

**MR. BUDDEN:** Okay.

Is it, in your experience, customary for project proponents to resent or resist the authority of the utility regulator, or they just accept that as a fact of life?

**DR. HOLBURN:** I don't think the – if I think about Ontario, then utilities don't have any choice. It is a costly process to go through and there's some uncertainty in terms of what regulators will decide, but this is part of being a regulated utility.

**MR. BUDDEN:** The – of course, the Newfoundland process, as with Nova Scotia, involve the government essentially making a reference to its utility regulator. That much at least is true for both provinces, you would agree?

**DR. HOLBURN:** Sorry, which provinces? Sorry.

**MR. BUDDEN:** I'm sorry. Both – in Newfoundland –

**DR. HOLBURN:** Okay.

**MR. BUDDEN:** – the government made a reference –

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** – to the PUB.

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** And as they did in Nova Scotia –

**DR. HOLBURN:** Okay, yes.

**MR. BUDDEN:** – regarding the Maritime Link.

**DR. HOLBURN:** Yup.

**MR. BUDDEN:** However, the content of the references, the task being assigned to the utility regulator was quite different, wasn't it?

**DR. HOLBURN:** It was.

**MR. BUDDEN:** What was demanded of it?

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** The nature of the question was quite different?

**DR. HOLBURN:** It was.

**MR. BUDDEN:** Okay.

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** From a regulatory point of view, is there any reason that you can think of why the Newfoundland government was limited in its option in the way that it ultimately directed its reference?

**DR. HOLBURN:** I haven't found any discussion or arguments about that, so I don't have any insights as to why the government restricted the review in the way that it did.

**MR. BUDDEN:** Okay.

The Newfoundland reference also contains, I would suggest – well, I believe that your own words was a long time frame, in terms of the time frame for evaluating the –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – cost of the energy.

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** Have you ever seen a time frame of 56 years used – as long as 56 years used – in your experience with energy regulation?

**DR. HOLBURN:** No, no I haven't.

**MR. BUDDEN:** Okay, what's –

**DR. HOLBURN:** Most integrated resource plans are 20 years, sometimes 25 years.

**MR. BUDDEN:** Okay. So have you ever seen one longer than 25 years, other than our Newfoundland example?

**DR. HOLBURN:** No, no I haven't.

**MR. BUDDEN:** Okay. So we're more than twice as long as any other you've ever seen?

**DR. HOLBURN:** Correct.

**MR. BUDDEN:** Okay.

In your experience with regulatory regimes, is it customary to limit the options, such as was done in Newfoundland, to, on the one hand, you know, you basically have two choices here, either A or B. Is that the customary way reference questions are framed or are they left to the regulator itself to determine and choose from a range of options?

**DR. HOLBURN:** It's customary to leave it up to the regulator's discretion to investigate options that it believes might be feasible alternatives.

**MR. BUDDEN:** Okay.

In your direct evidence, you noted that the regulator – again, the PUB – was forced to use DG2 cost estimates because they were, at that time, the only ones available. What level of cost estimates would a regulatory board ordinarily have in front of it when considering cost options?

**DR. HOLBURN:** Mm-hmm.

As I think my examples demonstrate, it's a narrow range of uncertainty. So, with the AltaLink project for the Western Alberta transmission line, the range of uncertainty there was minus 20 per cent to plus 10 per cent, which is a narrow range then for the DG2 estimates. So that's the most directly comparable one.

The other estimates are presented in terms of P-values and the probability that a project will go over the assessed amount. For the Darlington Project, it was a P90.

**MR. BUDDEN:** Yes.

**DR. HOLBURN:** And for the Nova Scotia one it was a P97, so a 3 per cent probability the costs would go over the approved amount at the time.

**MR. BUDDEN:** Yes, and when Ms. O'Brien was questioning you about the Alberta example and suggested the possibility of a P80, you were a little hesitant, but you would acknowledge it was perhaps somewhere in that range with respect to the Alberta project?

**DR. HOLBURN:** I don't know exactly how the cost ranges will translate into a probability exceeding that threshold. I don't think there's a clear one-for-one translation, so I wouldn't like to make a statement on that side.

**MR. BUDDEN:** Sure, okay.

On any event, we have the Ontario one's a P90 – or rather the Ontario one at P90 and the Nova Scotia one at P97.

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** Then we have the DG3 P50 that was used with respect to Muskrat Falls. In your experience, which range is more representative of the energy megaprojects when they come before energy regulators?

**DR. HOLBURN:** Having a narrower range would be more consistent with what I'd seen in the case studies.

**MR. BUDDEN:** Okay, so more of a P90 or P97 as opposed to –

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** – a P50.

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** Okay.

In Ontario, which is as you've indicated, the jurisdiction of which you're most familiar, does the energy board require or appear to require in practice a certain minimum P-factor before they will approve or even evaluate a project?

**DR. HOLBURN:** I haven't seen that.

**MR. BUDDEN:** Okay.

**DR. HOLBURN:** Yeah.

**MR. BUDDEN:** You haven't seen it as a formal request?

**DR. HOLBURN:** No, I haven't.

**MR. BUDDEN:** But what you have seen is that the P-factors that do come forward are in a certain range.

**DR. HOLBURN:** They are higher than a P50 range.

**MR. BUDDEN:** Yes, more like a P90.

**DR. HOLBURN:** They're higher than a P50 range, so we've seen P90, P97 and 20 per cent – a plus 20 per cent, minus 20 – minus 10 per cent range.

**MR. BUDDEN:** Sure, thank you.

Perhaps we could go to slide 65. And I'm interested, Doctor, in the – under consultant reports, the second dash if you could perhaps read beginning – the line that begins with financial relationship.

**DR. HOLBURN:** The “financial relationship with client can raise question of impartiality.”

**MR. BUDDEN:** Okay.

In my understanding, and this would emerge I guess as the evidence emerges, is that Navigant had a fairly significant prior history of doing consulting work for Nalcor, which was of course a proponent of the Muskrat Falls Project. Would that ordinarily be an issue in terms to regulatory board relying on a report from Navigant?

**DR. HOLBURN:** I think the evaluation needs to be done at a project or report level. The – and,

again, I think it's helpful to refer to the Maritime Link example where the utility and review board explicitly commented on the value of the range of consultant reports that it had presented to it. And it was very deliberate in going through the various reports and consultants saying we find this one to be particularly thorough and valuable, and, therefore, as a commission, we're going to put more weight onto it.

**MR. BUDDEN:** Okay.

**DR. HOLBURN:** Others it said were less thorough or less valuable or weaker. So there's a ranking. So I think the board was making an evaluation after taking into account a variety of factors.

One of the reports that it found to be valuable was the report coming from Nova Scotia Power. It described it as being very thorough and it found it very comprehensive; it done a lot of analysis. So I think that also is an important consideration in the board's evaluation. It's not just that financial relationship, which will be one element in terms of assessing whether a report is impartial or not.

**MR. BUDDEN:** Okay.

But, of course, it goes beyond actual impartiality to the –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – appearance of impartiality –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – you would agree?

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** So when you make that assertion there: financial relationship with a client can raise question of impartiality –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – is that, I guess, is that – are you speaking to your own views or is that appear to be a view generally taken by energy regulators?

**DR. HOLBURN:** I think in any type of regulatory situation one has to be mindful of the origin of the reports and the recommendations that are coming through, and to ask exactly these questions are they impartial, unbiased recommendations.

So, I think, that's a questions that's always going to be in the back of a regulators mind when making an expert evaluation.

**MR. BUDDEN:** And are you basing that, I guess, on evidence on your review of various regulatory decisions or processes? Or are you just asserting it, I guess, as a guiding – what should be a guiding principle?

**DR. HOLBURN:** This would be my own opinion as to best practice in terms of evaluating evidence that's presented as part of a regulatory hearing process.

**MR. BUDDEN:** Speaking, of course, as an expert in the field of energy governance and regulation?

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** Okay.

My understanding as well, from evidence yet to come, in that when the Newfoundland PUB in dealing with its reference question, the individual – or one of the individuals assigned to recruit consultants – screened out consultants who had previously done work for the parties, or on the project.

Would that be in accordance with best practice as you understand best practice to be?

**DR. HOLBURN:** Sorry, could you just elaborate a little bit? So the PUB – you're saying was screening –

**MR. BUDDEN:** The Newfoundland PUB hearing –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** My understanding of evidence that we will hear, is that one of the individuals assigned to – one of the experts assigned to arrange for a consultant report to guide the PUB

in its decision-making process – in selecting possible experts or shortlisting possible experts –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – excluded from that shortlist consultants who had previously worked for the parties, or on the project. Would that kind of thing be in accordance with your understanding of best practices?

**DR. HOLBURN:** So you're saying that they would – screening out projects – when you say parties to the projects, do you mean the proponents? Do you mean Nalcor or –?

**MR. BUDDEN:** That's what I mean, yes.

**DR. HOLBURN:** Right.

To be honest, I haven't studied that aspect. But I think the general principle for regulators is they want to have unbiased, impartial evidence that is going to be presented towards them.

**MR. BUDDEN:** Sure, thank you. With regard to your very interesting consideration of the Darlington Project in your report and your slide show, you refer to a special Darlington Refurbishment Committee –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – of the Ontario Power Generation board of directors, as one element of a multiple-layer oversight process. Can you tell us a little bit more about that committee and –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – the expertise that was on that committee?

**DR. HOLBURN:** Mm-hmm. Yes. I can give you a high-level overview. This was constituted as a special project-level committee of the board, and they brought in a number of external experts with experience in megaprojects and with nuclear, to provide detailed assessments on a regular basis to OPG's board, which has ultimate, sort of, authority and oversight over the project's execution.

The committee had the authority to retain its own separate experts. It has the ability to access all information that it requires from OPG's management commission – special reports and so forth.

So this is a well-resourced committee designed to provide that level of oversight reporting to the board.

**MR. BUDDEN:** That was external?

**DR. HOLBURN:** It's partly so. Some of the members are external experts and then it also has committee members on OPG's board as well.

**MR. BUDDEN:** Okay.

So it's at least partially external –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – would this be what would be considered a cold eyes review? Are you familiar with that term?

**DR. HOLBURN:** No, I'm not.

**MR. BUDDEN:** Okay.

How would you compare this oversight process with the Muskrat Falls Oversight Committee that has been formed in our own province?

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** Perhaps you could compare and contrast –

**DR. HOLBURN:** Right.

**MR. BUDDEN:** – the two bodies.

**DR. HOLBURN:** So one of the contrasts is that, like I said, the government – if I look at the – what the government has put into place – the government retains an expert advisor who became a member of that Darlington refurbishment committee. So he is independent, expert in the area and has embedded access to information on how the project is proceeding because he's a member – or she – we'll say he –

is a member of this committee – special committee of the board.

So quite a strong contrast to the Oversight Committee for Muskrat Falls, which is – which was originally composed of senior bureaucrats.

Now, I don't know whether they had significant experience in megaprojects, but that would be one question that I would want to ask about it.

**MR. BUDDEN:** Sure.

We'll hear, but I would ask you to assume –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – for purposes of this discussion that they did not have significant experience in megaprojects.

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** In that case, would the Ontario oversight process be not more in accordance with best practices as you understand them?

**DR. HOLBURN:** Yes.

In fact, Ernst & Young, in their 2017 report, explicitly laid out a best-practice approach for external oversight, and that mirrored the approach taken by the Ontario government for the Darlington refurbishment.

**MR. BUDDEN:** Okay. You, also in your report, dealt with the prudency test supplied by the Ontario and Nova Scotia regulators –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – which, as I understand it, enabled those regulators to decide how much of the cost of the projects they were regulating would or should be recovered in rates. Was there, to your knowledge, any equivalent process in Newfoundland?

**DR. HOLBURN:** Not that I'm aware of, no.

**MR. BUDDEN:** Okay, thank you.



Are those prudence tests a common feature of project regulation in Canada? Megaproject regulation?

**DR. HOLBURN:** For the three case studies, yes, they are. Not in the Keeyask case, where the regulator was excluded from reviewing capital expenditures of the proponent. But that has now in fact changed.

**MR. BUDDEN:** Okay. So the ones that are coming in on time and on budget are the ones that also have the prudence tests?

**DR. HOLBURN:** Correct.

**MR. BUDDEN:** Okay.

**DR. HOLBURN:** Can I just make sort of, one caveat? The Darlington Nuclear Refurbishment Project has not yet been completed.

**MR. BUDDEN:** Of course, yes.

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** But so far at least –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – it appears to be on time and on schedule. Which –

**DR. HOLBURN:** Yes.

**MR. BUDDEN:** – I understand is quite a – from, you know, virtually everything I know is from Professor Flyvbjerg, but that is quite unusual I understand –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – for nuclear projects.

**DR. HOLBURN:** It'll be interesting to see in 10 years' time, and maybe it'll be a world first. We'll have to invite Professor Flyvbjerg back if it is.

**MR. BUDDEN:** Yes. Well hopefully we won't still be sitting in 10 years' time. You –

**THE COMMISSIONER:** We won't be.

**MR. BUDDEN:** Pardon?

**THE COMMISSIONER:** We won't be.

**MR. BUDDEN:** That's good.

You also spoke – and I may be conflating the two, so straighten me out if I am – but if I understood correctly, there's also a Darlington Construction Review Board?

**DR. HOLBURN:** Yes, correct.

**MR. BUDDEN:** And how did that, I guess, interact with the refurbishment committee, or were they entirely separate?

**DR. HOLBURN:** Right. So these are separate entities. There's – the review board reports to the CEO, and the Darlington Refurbishment Committee reports to the board. So separation of internal oversight mechanisms there.

**MR. BUDDEN:** Okay.

And on top of that, do the Ontario Ministry of Energy also have an oversight board? Or would that have been one of the boards we've already heard of?

**DR. HOLBURN:** So the Ontario Ministry of Energy was relying on its special advisor in terms of being that link between the Darlington Refurbishment Committee – which the advisor was a member of and then reporting back to the government in terms of progress.

**MR. BUDDEN:** So for Darlington – which, again, the example we're talking about now, the one you're most familiar with, there's really a whole array of regulatory and oversight agencies and bodies?

**DR. HOLBURN:** Correct; yes, there are.

**MR. BUDDEN:** Okay. And I'm struck by the fact, while Darlington is a big project, Muskrat Falls is also a big project –

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** – but yet the population of Ontario, or for that matter the population of Alberta, is much larger than that of

Newfoundland. Would it follow from that, I guess – are you familiar with a project on the scale of Muskrat Falls relative to the province, which it is being constructed within, that went ahead without a robust regulatory regime?

**DR. HOLBURN:** No, I'm not aware of that relative ratio of the size of the capital project to the size of the population.

**MR. BUDDEN:** Okay.

**DR. HOLBURN:** The Darlington Project has a similar order of magnitude, obviously, for a much larger province, and it's for a plot that serves about 20 per cent of the province's electricity needs.

**MR. BUDDEN:** Yes, and with considerable and robust oversight.

**DR. HOLBURN:** Mm-hmm.

**MR. BUDDEN:** Perhaps that might be a good point to turn to reading my last series of questions, which would be slide 52 perhaps, Madam Clerk, common themes. So I'm going to ask you to extend this a bit; we walk through the bullets.

Projects consisting with existing integrated resource or system plans, which also emphasized the important contribution or – of conservational demand management. That was a feature of the successful megaprojects. I'm correct on that, right?

**DR. HOLBURN:** In terms of the projects were a consistent – they were – they fitted into an existing long-term strategy for the electricity sector, which was being developed by expert agencies.

**MR. BUDDEN:** Okay.

Was that a feature of the Muskrat – is that a feature of the Muskrat Falls Project?

**DR. HOLBURN:** We haven't seen here the same type of integrated resource planning process involving the PUB and stakeholders and public consultations and so forth, as we've seen in Ontario –

**MR. BUDDEN:** Sure.

**DR. HOLBURN:** – and Nova Scotia.

**MR. BUDDEN:** The next bullet: "Independent regulator or system planner conducted unrestricted evaluation of project proposals." That too is a feature of the successful projects?

**DR. HOLBURN:** Correct, yes.

**MR. BUDDEN:** But it is not a feature of Muskrat Falls?

**DR. HOLBURN:** We have not seen the unrestricted evaluation of a broad range of alternatives, correct.

**MR. BUDDEN:** "Independent monitoring of project construction phase by industry regulator, system planner or government-appointed expert." That too is a feature of the successful projects?

**DR. HOLBURN:** Correct.

**MR. BUDDEN:** Is it a feature of Muskrat Falls?

**DR. HOLBURN:** Not that we have seen so far.

**MR. BUDDEN:** "Final regulatory review of prudence of project expenditures – regulator determines whether costs can be recovered in rates." Is that a feature of the successful projects?

**DR. HOLBURN:** Yes, it is.

**MR. BUDDEN:** Okay, is it a feature of Muskrat Falls?

**DR. HOLBURN:** Not that I'm aware of.

**MR. BUDDEN:** Okay.

And, finally, we'll go back to the boldface at the top: "... megaprojects constructed to date largely on budget and on schedule." Is that a feature of Muskrat Falls, to your knowledge?

**DR. HOLBURN:** Not to date.

**MR. BUDDEN:** Thank you. I've no further questions.

**THE COMMISSIONER:** Okay, thank you.

Edmund Martin?

**MR. SMITH:** Good day, Sir. Harold Smith for Edmund Martin.

I'm going to be somewhat brief, and I'd ask the Clerk to bring up the engagement letter, 00726 – P-00726, tab 4.

Now, Doctor, I was wondering if you would be kind enough to identify in your engagement letter the requirement to provide – I think you called it – alternative scenario.

**DR. HOLBURN:** Yes. So, on page 6.

**MR. SMITH:** Yes.

**DR. HOLBURN:** The bottom d – sorry, section g: “Discussion of possible PUB decisions in hypothetical scenario where PUB had jurisdiction over the Muskrat Falls Project.”

**MR. SMITH:** And in that context, were you provided with a copy of the interpretation of the terms of reference from Mr. Justice LeBlanc?

**DR. HOLBURN:** The terms of reference for the –

**MR. SMITH:** For the Inquiry.

**DR. HOLBURN:** – Inquiry? Yes, I believe, I have looked at that.

**MR. SMITH:** Okay, and in particular, I look at the alternative that you spoke to, and again I hazard to read it, but it says: “Had the PUB review occurred during 2014, it could have coincided with the 50% drop in world oil prices as a result of increased US shale oil and non-OPEC oil production. Changes in market analyst forecasts of future oil prices could have affected the CPW differential ....”

So that's a shot in time, subsequent to – if I'm not mistaken – subsequent to sanction?

**DR. HOLBURN:** Correct.

Yes, so this is looking at the hypothetical situation where the sanction by the government

had not occurred at this point, but a PUB review had commenced.

**MR. SMITH:** But in the context of this Inquiry, we're dealing with what was known at time of sanction.

**DR. HOLBURN:** My understanding of what I've – what I was asked to do in the report was to also look at the hypothetical scenario where a PUB review could have started at a different point in time or it had an unrestricted (inaudible).

**MR. SMITH:** But if sanction was on December of 2012, and it takes approximately a year, 18 months or whatever to get through the process that you're –

**DR. HOLBURN:** Mm-hmm.

**MR. SMITH:** – advocating.

**DR. HOLBURN:** Mm-hmm.

**MR. SMITH:** Then presumably that would have meant that the process would have started not in 2014, but rather in sometime in 2010 or 2011 –

**DR. HOLBURN:** So –

**MR. SMITH:** – to do sanction on the – in December.

**DR. HOLBURN:** So what I was considering was a situation where the PUB review would commence when there was greater certainty and greater reliability over the cost estimates.

So, for instance, a good analogy, I think, is with the Maritime Link Project, where the proponent initiated review with the Nova Scotia Utilities and Review Board, once it had a confident estimate about the cost of the project. And seeing as it's so tightly linked to the broader Muskrat Falls Project, then I was thinking – I was taking the situation where review would commence in 2013.

**MR. SMITH:** Yeah.

But you would agree with me, I assume, that the regulatory framework existing in Nova Scotia is

not what's here in Newfoundland. That's not the same regulatory framework.

**DR. HOLBURN:** And when you say framework –

**MR. SMITH:** Well, the framework meaning that the PUB, you know, not only identifies the project and assesses the project and follows the project –

**DR. HOLBURN:** Mm-hmm.

**MR. SMITH:** – okay? That's not been the regulatory process in the province. So it's more than hypothetical, it's almost fairyland.

**DR. HOLBURN:** So, this is not what the PUB has followed but the alternative scenario would be, if the PUB had been asked to do a full review, then that's the alternative counterfactual that I'm assessing.

**MR. SMITH:** Right.

But in order to – for your hypothetical to flow, you would have had to pick, you know, the falling oil price at 2014. Whereas, in 2018 the price is back to where it was.

**DR. HOLBURN:** There has certainly been some fluctuation.

What I was trying to understand is if a review had started in 2013 when there were more reliable cost estimates what new information would the PUB have had, or potentially had, at that point in time?

The fall in oil prices was one element. More investigation would be needed to be done to understand, well – what were the implications for long-term oil forecasts? Did they change sufficiently in order to impact the economic evaluation of the project?

**MR. SMITH:** For that I'm concerned with what's written in bold – next after – it says, “These factors could have reduced the probability of the PUB finding in favour of the Muskrat Falls Project. If the PUB had explicitly concluded, after a comprehensive review, that Muskrat Falls was not needed at the time or was not the lowest-cost alternative, it would have

been more difficult for the government to justify a sanction decision.”

That suggests that by picking a point in time when oil prices fell and picking, you know, some evidence that the load wasn't as forecast – okay – that the government might have – could have – maybe – said no.

**DR. HOLBURN:** I'm wondering if there's a slight misunderstanding. So, what I'm proposing here is the initial review of the project before leading to sanction. So, I'm wondering if you're talking about the final, sort of, regulatory review of the project as opposed to the initial pre-approval, which is what we saw happen in Nova Scotia.

**MR. SMITH:** Yes.

But what I would have anticipated, Sir, is that when you're trying to do a –quote, unquote – alternative analysis, you'd look at the timeline that the government decided to sanction the project. The timeline that you're suggesting happens to be more than a year – or two years – almost two years after the project was started and I'm wondering how valuable that alternative scenario would be in the context of what the Commission's investigation is, and that is to determine whether the project was properly sanctioned or not sanctioned –

**DR. HOLBURN:** Mm-hmm.

**MR. SMITH:** – based upon the regulatory framework that we have.

**DR. HOLBURN:** So, the timeline that I was envisaging would be that a PUB review would commence once reliable cost estimates were ready. This would then lead to a recommendation to government and the conclusion of the review then the government would have information and would be in a position to make a sanction decision out of the conclusion of the review.

**MR. SMITH:** But –

**DR. HOLBURN:** Yeah.

**MR. SMITH:** – you're picking a point in time where you're effectively molding the

information in order to get to the alternative scenario, aren't you?

**DR. HOLBURN:** I don't think so.

The DG3 cost estimates were released in October of 2012. So I was taking 2013, so three months after that, as being the potential starting year. I haven't been precise about when in 2013; it could potentially – a review could potentially have commenced in January of 2013, which is when Nova Scotia Power also initiated its application, in Nova Scotia.

So I'm making some assumption then, yes, that it would start in 2013, which is three months after the release of the cost estimates, and also to be consistent with Nova Scotia Power application. But I'm not assuming it would necessarily start in 2014 or any other time; I'm just saying let's suppose sometime in 2013, that it started.

**MR. SMITH:** Okay.

One final point then. From a perspective of when the project was actually sanctioned in '12 –

**DR. HOLBURN:** Mm-hmm.

**MR. SMITH:** – and the alternative that you put forward, that has the benefit of hindsight with respect to both the load and the oil price. Correct?

**DR. HOLBURN:** So the goal here was to understand what information would the PUB have had at that time, and we can –

**MR. SMITH:** Right.

**DR. HOLBURN:** – and we know what the information turned out to –

**MR. SMITH:** But we know that because of hindsight. Not because of what was known at the time of sanction.

**DR. HOLBURN:** We know how it turned out but we know what the regulator would have known at that time as well. So the regulator – so the PUB would have known – if it started a

review in 2013 – it would have known what load would have been, for example, in 2012.

**MR. SMITH:** And if it had started a review in 2018 –

**DR. HOLBURN:** Mm-hmm.

**MR. SMITH:** – it would have had no reduction in oil – the real cost of oil.

**DR. HOLBURN:** Right, I see, yes. If it had started in 2018, absolutely.

**MR. SMITH:** Okay. So –

**DR. HOLBURN:** Yes –

**MR. SMITH:** – so the –

**DR. HOLBURN:** – okay.

**MR. SMITH:** So the analysis is very time-specific and doesn't take note of the duration or the length of the project. Whether it be 20 or 30 or 50 years –

**DR. HOLBURN:** Mmm.

**MR. SMITH:** – correct?

**DR. HOLBURN:** In terms of coming to that sanction review and decision, yes. I have assumed that it would – an alternative, sorry – would be to start in 2013. Maybe it could've started in 2014, 2015, those would be alternative scenarios to consider as well.

**MR. SMITH:** So we look at the alternative scenario we have here now, based upon 50 per cent less oil and less load, okay? It made the decision, as you say, it may have very – meant that the government wouldn't sanction the project, okay? And now in 2018, we're back up to excessive oil prices.

**DR. HOLBURN:** So –

**MR. SMITH:** Where does that take us?

**DR. HOLBURN:** We could look at another potential scenario. If the PUB initial review – so the project hadn't started yet – we could look at a review occurring during 2017, '18 –

absolutely, it's going to be a different environment at that time, yes.

**MR. SMITH:** Thank you, Sir.

**DR. HOLBURN:** Okay.

**THE COMMISSIONER:** Kathy Dunderdale.

**MS. E. BEST:** Good afternoon, Dr. Holburn.

**DR. HOLBURN:** Hello.

**MS. E. BEST:** I'm Erin Best, I'm counsel for Kathy Dunderdale, our former premier.

Who took the positive step of exempting the Lower Churchill Project from PUB oversight?

**DR. HOLBURN:** Right.

So my understanding is that it was exempted by a previous administration development of the Lower Churchill.

**MS. E. BEST:** Okay, thank you.

So, to be clear, lifting the exemption at or around the time of sanction would've been a change in the status quo?

**DR. HOLBURN:** That is my understanding, yes.

**MS. E. BEST:** Okay, and one that government would have to answer to and justify?

**DR. HOLBURN:** Yes, potentially.

**MS. E. BEST:** Okay, thank you.

Do you happen to know if government since then has rescinded the – that order – the exemption order?

**DR. HOLBURN:** I'm not aware.

**MS. E. BEST:** Thanks.

In your presentation earlier today and in your report, you explicitly refer to the PUB as having expertise. And my learned friend, Mr. Simmons, raised this issue a little while ago; but I'd like to dig into it just a little deeper. So, we know that

the PUB in Newfoundland and Labrador had never reviewed a hydroelectric megaproject to determine if it was the least-cost option prior to sanction. In fact, they had never reviewed a hydroelectric megaproject, so we know that.

But what actual experience did the PUB have reviewing any kind of projects? Because you said they had experience with the process, but I had a look at the PUB website, it seems to only go back to 1996. But it seems to me that during that time they hadn't reviewed – or since then they haven't reviewed any kind of project.

**DR. HOLBURN:** They have reviewed capital expenditure plans coming from Newfoundland Power.

**MS. E. BEST:** You're talking about now –

**DR. HOLBURN:** Mmm.

**MS. E. BEST:** – in the context of rate reviews. I'm –

**DR. HOLBURN:** Yes.

**MS. E. BEST:** – talking about – what I'm asking you about is experience reviewing what we're actually talking about here today, so the Muskrat Falls Project, or the Lower Churchill Project, but I guess the Muskrat Falls Project in total.

**DR. HOLBURN:** Okay. So, you're saying that they haven't reviewed, sort of, major new hydroelectric or generation –

**MS. E. BEST:** I'm saying they –

**DR. HOLBURN:** – projects.

**MS. E. BEST:** – haven't reviewed any kind of project, right? They've participated in these rate hearings –

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** – but in terms of actual projects like other hydroelectric projects, I don't think they reviewed our wind projects – not to my knowledge anyway – and going back to 1996. Do you know of any project that they actually reviewed in this manner?

**DR. HOLBURN:** Right. No, I don't definitely know, no.

**MS. E. BEST:** Okay, so they don't have that kind of experience, do they?

**DR. HOLBURN:** If they haven't reviewed particular large project applications, then, no.

**MS. E. BEST:** Okay.

So it's fair to say that this is a legitimate point that the government would take into consideration.

**DR. HOLBURN:** Yes, I think that's reasonable. It's one element of experience.

**MS. E. BEST:** Sure, that's what I meant.

**DR. HOLBURN:** Yes.

**MS. E. BEST:** So – and the reviews that you mentioned, so the, you know, I guess, your experience with regulatory reviews in other provinces of projects, how much did they cost? And you can tell me a range, I'm not looking for exact dollars.

**DR. HOLBURN:** The cost of reviews, you're saying?

**MS. E. BEST:** Yeah.

**DR. HOLBURN:** It's not something that I've studied, unfortunately, in terms of the dollar costs of these reviews.

**MS. E. BEST:** Okay. So, did you know that the PUB was given, I think it was \$3 million to do their – to review the question that was –

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** – put to them? Did you know that?

**DR. HOLBURN:** I was understanding there was an additional resource provided. I didn't know the exact amount.

**MS. E. BEST:** Okay. I think it was around \$3 million.

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** So if it costs a regulatory body \$3 million to do a limited question, does that give you any insight into how much it would cost to do a large – to ask a larger question, to expand the mandate?

**DR. HOLBURN:** I think there's no question that lengthy reviews of complex projects involving a large number of intervenors requiring many hearing days, these are costly. I think it's not unusual for reviews like this to extend to a year or more. So, this is an administratively costly process.

**MS. E. BEST:** Okay.

**DR. HOLBURN:** I can't give you an exact figure or amount. That's not something I've looked at.

**MS. E. BEST:** Okay. And – so I appreciate that's your evidence. And you've said costly a few times today. But you were asked to look at the impact, right, to the ratepayers? And I would put to you that the cost of the review – as my learned friend Mr. Simmons also mentioned earlier today – would be borne by the ratepayers. But yet you did not even consider how much the cost would be?

**DR. HOLBURN:** My remit was to look at the impacts on the costs and development of the project. I haven't explicitly looked at the administrative costs of a review.

**MS. E. BEST:** Okay. But it would likely be millions.

**DR. HOLBURN:** I think that's probably reasonable – that's a reasonable assumption.

**MS. E. BEST:** Okay. And there would have been a cost as well for – associated with Nalcor's participation in that review process, right?

**DR. HOLBURN:** Yes, there would.

**MS. E. BEST:** And the cost associated with a PUB review, that's something – that's a legitimate issue for government to take into consideration, prior to –

**DR. HOLBURN:** Yes, I think it is. It's one of the disadvantages that needs to be weighed up against the advantages.

**MS. E. BEST:** Thank you.

And to stick on that point of disadvantages. So you stated this morning, you talked – you put a couple of disadvantages – you listed a couple on slide 9, and you stated something along the lines of: these regulators can't consider environmental or labour benefits.

Does that sound like one of the disadvantages you described?

**DR. HOLBURN:** If it's not within the scope of the mandate of the regulator –

**MS. E. BEST:** Right.

**DR. HOLBURN:** – then they're going to stick to their mandate, which is generally economic.

**MS. E. BEST:** Right.

Okay, so environmental and labour benefits. So I suggest to you that that short list of two items is quite abbreviated, and I refer to the list of benefits that were actually outlined in the press release that, in fact, you cited in your paper, the government press release that you cited in your paper. And I'd just like to go through some of them and you can tell me if, in your experience, these are things that are – that likely would have been considered had the question been put to the PUB here.

So, “8,600 person years of work on the project within the province between 2011 and 2017, with 5,400 of these person years occurring in Labrador. Adding the indirect and induced economic impact, there will be 18,400 person years of work in the province, and 47,800 person years in the whole country; with peak employment of approximately 2,700 people.”

Would the PUB have considered that, do you think?

**DR. HOLBURN:** The PUB would have incorporated the direct costs as part of the financial impact of the project. It would be less common to include indirect spillover impacts

into the broader region, which are not a direct part of the project costs.

**MS. E. BEST:** Okay. So most of what I just described would not be included.

**DR. HOLBURN:** They would only include the direct costs associated with the project.

**MS. E. BEST:** “Surplus capacity from Muskrat Falls can be recalled as needed for industrial development in Labrador” leading to economic development in Labrador.

Would the PUB consider something like that?

**DR. HOLBURN:** Again, issues around industrial policy and industrial development are typically the remit of government, and would typically not be included within a PUB type of mandate – regulatory review mandate.

**MS. E. BEST:** So your answer is no?

**DR. HOLBURN:** Yes.

**MS. E. BEST:** Thank you.

“The generating station at Muskrat Falls would be 100 per cent owned and operated by Nalcor Energy.”

Is that something they consider?

**DR. HOLBURN:** In terms of the ownership?

**MS. E. BEST:** Yes.

**DR. HOLBURN:** I think they're going to be –

**MS. E. BEST:** And the benefit associated with that.

**DR. HOLBURN:** Right. I think they'd be focussed primarily, again, on the cost side.

**MS. E. BEST:** Okay.

“... transmission systems ... will be majority owned by Nalcor ...” and the province.

**DR. HOLBURN:** Mm-hmm

**MS. E. BEST:** Is that, again, the same thing?



**DR. HOLBURN:** I think economic regulators tend to be agnostic about ownership and focus more on the economic aspect.

**MS. E. BEST:** “At the termination of the delivery of the Nova Scotia Block” of power “ownership of the Maritime Link will revert back to Nalcor Energy for \$1.” So the province will own that asset.

**DR. HOLBURN:** Mm-hmm

**MS. E. BEST:** Same answer?

**DR. HOLBURN:** Yes, again, that factors into the overall economic assessment of the costs of the project relative to the benefits.

**MS. E. BEST:** “All engineering for the generation and the Labrador-Island link will be done in the province.”

Do you think the PUB would consider that benefit?

**DR. HOLBURN:** It would be looking at the cost of that as opposed to the location of the labour and the contractors.

**MS. E. BEST:** Okay, but they wouldn’t be factoring it in as a benefit?

**DR. HOLBURN:** Typically not explicitly.

**MS. E. BEST:** Okay.

“First consideration for jobs in Labrador will go to the Labrador Innu as outlined in the New Dawn Agreement.”

I think you’ve already said Aboriginal concerns, as well, or benefits are something that they typically don’t consider – the PUB.

**DR. HOLBURN:** Unless that was part of the mandate. Governments do sometimes change mandates of regulators. But if that’s excluded, then, no, it wouldn’t normally be either case.

**MS. E. BEST:** Okay.

We’re displacing expensive use of dirty oil in the Holyrood generation plant.

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** What about that?

**DR. HOLBURN:** So that comes onto the environmental aspect. And governments have taken different approaches here in terms of requiring regulators – or not – to consider environmental considerations.

In Nova Scotia, there’s a requirement that 40 per cent of electricity generated should come from renewable sources. So the regulator is operating under that mandate when it’s making its decisions. And we’ve seen this commonly, also, in states in the US where sector regulators have to abide by a renewable percentage standard.

**MS. E. BEST:** Sorry, where is that in our legislation?

**DR. HOLBURN:** No, I’m just – sorry, no – I said in states within the US.

**MS. E. BEST:** Okay.

**DR. HOLBURN:** I’m just giving examples here of how other jurisdictions have required some regulators to account for the environmental attributes of power generation. It –

**MS. E. BEST:** Okay, but is that part of our mandate?

**DR. HOLBURN:** No. Not that I’m aware of.

**MS. E. BEST:** Thank you.

**DR. HOLBURN:** Yeah.

**MS. E. BEST:** So – okay. So the PUB wouldn’t consider those things, but of course government has to consider those things.

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** Other disadvantages you mentioned, time consuming and costly. So costly we kind of dealt with already.

Time consuming – so I think you said something this morning about a year being normal for a regulatory review of a megaproject. That seems slim to me, especially since half the examples

you gave went far over that – didn't they? Didn't Darlington take nine years, you said?

**DR. HOLBURN:** No. Darlington had a slightly different process. The equivalent one – well, one equivalent one is Keeyask. And that project – there was a 13-month review, Needs For and Alternatives To Review, and conducted by the PUB. That was 13 months.

The Maritime Link review was six months –

**MS. E. BEST:** Now, I'm not sure the Maritime Link review is really, you know, an equivalent project – do you think?

**DR. HOLBURN:** That was – I'm just providing it as an illustration here. It was legislated – or the PUB has to conduct its reviews within six months. There's a six-month clock that starts running once the application is initiated.

**MS. E. BEST:** Right, but we gave our PUB six months to answer –

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** – this one question then. I know there were other issues that you've –

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** – outlined, but that six-month period was also – was an issue for them, right?

**DR. HOLBURN:** It was indeed, yes.

**MS. E. BEST:** Yeah. So – and you mentioned this morning that perhaps – I think you suggested that something about 18 months.

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** Right? You gave the figure of 18 months for our PUB to do a review.

So my question to you is: Did you consider the impact of waiting 18 months?

**DR. HOLBURN:** Of waiting – you mean, in terms of delaying –?

**MS. E. BEST:** Delaying sanction by 18 months.

**DR. HOLBURN:** Right. The alternative scenario I've presented looks at essentially a delay in the timing of the review process.

**MS. E. BEST:** So –

**DR. HOLBURN:** So I'm not sure if that directly answers your question.

**MS. E. BEST:** No. It doesn't –

**DR. HOLBURN:** Yeah.

**MS. E. BEST:** – actually. Let me rephrase.

Did you consider the negative impact of waiting the 18 months or delaying sanction by that 18 months?

**DR. HOLBURN:** Do you mean delaying sanctioning or delaying a review?

**MS. E. BEST:** Oh, delaying sanctioning because you're doing the review.

**DR. HOLBURN:** Right. What types of negative impacts would you be considering? Is this primarily on the cost side and the administrative side?

**MS. E. BEST:** Did you consider that at all?

**DR. HOLBURN:** That would be part of the overall consideration as to whether a delay is warranted or not.

**MS. E. BEST:** Okay.

**DR. HOLBURN:** There is going to be, obviously, a higher cost if there's going to be a review that's going to extend over a year or longer. That's going to come with a high administrative cost.

**MS. E. BEST:** Okay. So let's talk about that.

So we're talking about the cost of the – so we have the cost of the actual PUB review. And then what about carrying costs of Nalcor? I mean, what – the people who would be – who were there to work on the Muskrat Falls Project, I guess they're – they still have to be paid during this 18 months, right? So that would be a cost – wouldn't it?

**DR. HOLBURN:** So this would be assuming the construction stage would commence after the conclusion of a review.

**MS. E. BEST:** Isn't that what you recommended?

**DR. HOLBURN:** So this would be the normal process in that the regulator would conduct a review; then if the decision – the sanction decision is to proceed, then construction starts.

**MS. E. BEST:** Right. So the answer is yes. That is the – that is what you recommended, right? Is that we –

**DR. HOLBURN:** I'm not sure I've made any explicit recommendations.

**MS. E. BEST:** Okay, I guess you sort of suggest them in the way that you present your evidence.

**DR. HOLBURN:** Where explicitly am I suggesting that?

**MS. E. BEST:** Okay, so let me get it straight. So you're suggesting that we should build the project before sanction – start building the project before sanctioning?

**DR. HOLBURN:** My recommendation is to undertake a comprehensive evaluation so then the government understands, with some reliability, what the implications are; then it's able to make an informed decision as to whether to proceed or not. If so, then the costs are incurred after that point.

**MS. E. BEST:** Okay. So would still result in – I mean, if the PUB reference was prior to sanctioning, there would be some additional costs associated with that. Do you agree?

**DR. HOLBURN:** These are the administrative costs, yes.

**MS. E. BEST:** Okay. And did you consider Nova Scotia legislative timelines to retire coal-fired generation?

**DR. HOLBURN:** That's not something that I explicitly looked at.

**MS. E. BEST:** Okay.

'Cause I understand that one of the options that were an alternative to the Maritime Link for Nova Scotia was buying power from Quebec. And if it was known to everyone in 2012 that the issue of sanction was going to be a live issue until, say, 2014, did you consider whether Nova Scotia might've abandoned the idea of the Maritime Link on that basis?

**DR. HOLBURN:** I'm assuming that if a viable project was determined and approved then that would have arisen, at that point in time, still with Emera. So I didn't explicitly consider whether Emera might have cancelled the Maritime Link Project or a component of the broader project if –

**MS. E. BEST:** Well, why didn't you consider the risk?

**DR. HOLBURN:** – if a review had started slightly later.

**MS. E. BEST:** Because – well, I mean, why didn't you consider that? I guess, is what I'm asking because I think we – the evidence is that if the Maritime Link had not occurred that there wouldn't have been a federal loan guarantee. I mean, that was one of the essential conditions of the federal loan guarantee. And the federal loan guarantee resulted in a cost savings to ratepayers. Are you aware of that?

**DR. HOLBURN:** Yes I am, yeah.

**MS. E. BEST:** Okay.

So do you think it's legitimate for the government to consider the risk of losing the Maritime Link and the federal loan guarantee because it decided to delay the project by 18 months?

**DR. HOLBURN:** What would be the reason for Emera not to participate in a Maritime Link if the review was postponed by a year or so? What would the reason be for that?

**MS. E. BEST:** Well, I'm putting to you – well, I asked you if you considered the Nova Scotia legislative timelines to retire coal-fired generation and you said you hadn't. So what I'm getting at is that I don't think you looked into this at all, did you? This area?

**DR. HOLBURN:** Onto the legislation, looking at coal-fired power generation? No, no I didn't look at that.

**MS. E. BEST:** I guess what I'm saying at the core is, you know, how – I guess this goes back to what you said earlier – potential urgency. Or the – you know, how sometimes timing is critical. Did you consider that that might be a factor here?

**DR. HOLBURN:** So the implication is that if coal-fired generation is going to be closed down, then that would make the project more urgent? Is that the argument they are developing here?

**MS. E. BEST:** Well, if Nova Scotia had to choose an option by a certain timeline.

**DR. HOLBURN:** I wasn't aware of coal-fired power generation legislation. I haven't seen any discussion on that. But I was aware that there were a range of alternative supply options that had been discussed and were potential alternatives at that time.

**MS. E. BEST:** Okay. So – and all I'm getting at is that if a delay in the Muskrat Falls Project by 18 months had made one of those other options look more attractive than the Muskrat Falls Project, did you consider that? And the risk associated with that and the impact on the ratepayers?

**DR. HOLBURN:** I think I would need to understand the details of what that potential counter-factual would have been.

**MS. E. BEST:** Okay. So all I'm asking you, is if you considered it. It sounds like no.

**DR. HOLBURN:** Around the deployment, around coal-fired generation – no, that's not a scenario that I explicitly looked at.

**MS. E. BEST:** Your four case studies. Now, four case studies is a small sample. How did you choose those four?

**DR. HOLBURN:** So, there aren't a large number of megaprojects that have been either completed or started within the country.

**MS. E. BEST:** Well hold on a second, 'cause one of these is not completed, right?

**DR. HOLBURN:** Sorry, which –

**MS. E. BEST:** Darlington?

**DR. HOLBURN:** Yes, no, Darlington's not completed, correct. Yes, that's right. And the Keyask Project also is not completed.

**MS. E. BEST:** Okay.

**DR. HOLBURN:** I was looking for projects that had been completed or commenced over the last decade. This would provide, sort of, greater availability of information and details in order to conduct the studies. So that's why I looked over the last decade. And I wanted to have a mix of different provinces, too. And it came down to a small set.

**MS. E. BEST:** So let me understand that. So you say there – did – I'm not sure I just misheard you or not. Did you say there weren't a lot of megaprojects that were completed or started over the –

**DR. HOLBURN:** Correct.

**MS. E. BEST:** – course of the last 10 years?

**DR. HOLBURN:** Yes.

**MS. E. BEST:** So what –

**DR. HOLBURN:** Electricity megaprojects.

**MS. E. BEST:** Okay. So why didn't you just include them all?

**DR. HOLBURN:** Scope of the work. It would have taken a lot longer to have an exhaustive analysis. As academic, it would've been much better – I would've liked to have undertaken a larger sample. I agreed with counsel that we would look at four projects.

**MS. E. BEST:** You mentioned in your CV, you were on the board of – what was it? Ontario –

**DR. HOLBURN:** London Hydro.

**MS. E. BEST:** London Hydro.

And so did – I’m gonna retract that question, sorry.

Why did you decide not to include the BC Site C hydro project at the end?

**DR. HOLBURN:** When I looked into it – the beginning of my investigation of the report – it became very clear it’s in the early stages of development. And so I hadn’t proceeded through many of the stages, and also with the Darlington Project being not completed and the Keeyask project also not being completed, I thought it would be more instructive to have an example of a project that had gone through all the five stages.

**MS. E. BEST:** Mm-hmm.

On slide 32, where you’re talking about the Maritime Link cost recovery. You gave it the green light in that – for that aspect of your process. And it’s – I think you said – yeah, in the third bullet point there – thank you, Madam Clerk – UARB declined Nova Scotia Power’s 2017 application to recover costs since the Maritime Link was not used and useful. So who was on the hook for the cost?

**DR. HOLBURN:** The shareholders, ultimately, are bearing these costs for –

**MS. E. BEST:** The Emera shareholders?

**DR. HOLBURN:** The Emera shareholders are bearing these costs for the time being.

**MS. E. BEST:** Okay, so let’s contrast that to the situation here. So in that case, we have – and this has been something that has come up, I think, already where we’ve talked about the difference for distinguishing, you know – at law that’s what we say when we distinguish one case from another, right – distinguishing the situation of the Maritime Link UARB analysis versus the Newfoundland and Labrador PUB analysis, okay?

Because we have – and again, my friend – learned friend, Mr. Simmons, touched on this earlier. We have quite a different situation, right, where we have in Nova Scotia, a private company, Emera, who’s a proponent. And in Newfoundland and Labrador, we have the

government, who’s a proponent. But essentially, again, the people of Newfoundland and Labrador are the proponent. So we have kinda of the same people on both sides

So this line here – line three on this slide – drove that home for me, if you would agree, because in this case when the UARB found that the costs weren’t able to be recovered from the ratepayers, it was Emera who was on the hook for them. But in our situation, it’s the Newfoundland and Labrador public who are the hook –

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** – for them, right?

**DR. HOLBURN:** Correct.

**MS. E. BEST:** So that seems to me – you know, that’s something that government would’ve taken into consideration as well – wouldn’t you agree? The difference between the situation where you have a private proponent and a public proponent?

**DR. HOLBURN:** Potentially – one of the goals of a regulatory process is to protect ratepayers and to ensure that economically efficient decisions are made. So I think that applies both to the privately-owned utilities as well as it does to the government-owned utilities.

**MS. E. BEST:** But you can see how – and I take your point on that – but you can see how this fact of that – this being a different scenario with a private proponent versus –

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** – a public proponent – you can see how that would be a legitimate consideration of government, when they’re deciding whether or not they’re going to put the issue to the PUB.

**DR. HOLBURN:** Potentially.

**MS. E. BEST:** I just have a couple more questions, Commissioner.

**THE COMMISSIONER:** No problem.

**MS. E. BEST:** You – we talked about integrated resource management –

**DR. HOLBURN:** Yes.

**MS. E. BEST:** – and you discuss it in your report. I just wanted to ask you – there’s an Exhibit, Madam Clerk – P-00789.

**THE COMMISSIONER:** Tab 5.

**MS. E. BEST:** So I just wanted to ask if you had – if you were aware of this document before you wrote your report?

**DR. HOLBURN:** Yes, I had seen it.

**MS. E. BEST:** Okay. And would – and, in particular, the consultations that were done –?

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** If you want to – if you could please scroll down, Madam Clerk, just so we can see the title of this document – so it’s the government’s Energy Efficiency Action Plan, from 2011. And so – did you consider this to be part of the integrated resource management approach?

**DR. HOLBURN:** So – this is an interesting document.

**MS. E. BEST:** Did you cite this in your paper, sorry?

**DR. HOLBURN:** I’m not entirely sure – there are a lot of footnotes in there. I’m – I would have to check. I don’t know.

So this document provides an overall, sort of, vision for energy efficiency within the province.

**MS. E. BEST:** Mm-hmm.

**DR. HOLBURN:** So that’s how I would describe this – as a first step.

**MS. E. BEST:** Well, it’s not just a vision. I mean, they speak about consultations, right?

**DR. HOLBURN:** Mm-hmm. They do.

**MS. E. BEST:** They did quite a bit of consultation.

**DR. HOLBURN:** Yes.

**MS. E. BEST:** Isn’t that part of an integrated resource management plan?

**DR. HOLBURN:** That would be part of it, yes. Correct.

**MS. E. BEST:** Okay. Thank you.

This morning I wrote down a quote you said. You said: It would be rare for a government to sanction a project without endorsement from a regulatory agency. And then you went on to provide support for that statement by describing the – by describing 26 pipeline projects.

**DR. HOLBURN:** Mm-hmm.

**MS. E. BEST:** So I just wanted to qualify your statement. What you should have said was: It’s rare for private pipeline projects to not have undergone – excuse me – it’s rare for private pipeline projects to receive sanction without endorsement from regulatory agency.

**DR. HOLBURN:** Yes, I’m happy for that qualification to be added.

**MS. E. BEST:** Thank you. Those are my questions.

Thank you.

**THE COMMISSIONER:** Thank you.

All right. I think I’d like to take stock of where we are in the sense of what time we need for tomorrow. I don’t plan on going behind schedule, as you all know, but I’m not sure exactly what the plan is for tomorrow, so I need to speak with Commission counsel just to see what that is. Otherwise, we can proceed. I’m not sure how much longer – if I knew we could finish this in half an hour I’d stay, but I’m not sure we’re gonna do that.

When are your flight arrangements?

**DR. HOLBURN:** Tomorrow, early afternoon.

**THE COMMISSIONER:** Okay.

So, let's take a break for a couple of minutes just so I can get – figure out where we are right at the moment and I'll just know where we're gonna go.

**CLERK:** All rise.

**Recess**

**CLERK:** Please be seated.

**THE COMMISSIONER:** All right.

So having discussed the plan for the rest of the week, Commission counsel have advised me that they feel there was enough – there was likely enough time – or there is enough time to finish what we have planned. So, that's great.

What I would like to do is we'll stop here because I understand, too, that some of you have indicated that you're going to be a while with this witness. So, I'd like to start tomorrow morning at 9.

My hope for you, Mr. – or Dr. Holburn is that we will finish you early tomorrow morning so that you'll be able to make your flight and – actually, I'm going to guarantee you're going to make your flight. Okay?

So, we'll start early tomorrow morning at 9 and we'll continue on with Dr. Holburn and then we'll go into Maureen Greene and Fred Martin.

So, thank you. We're adjourned 'til tomorrow morning at 9 o'clock.

**CLERK:** All rise.

This Commission of Inquiry is concluded for the day.