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February 4, 2021

Ms. Marija Tresoglavic
 Acting Commission Secretary and Manager
 Regulatory Support
 British Columbia Utilities Commission
 Suite 410, 900 Howe Street
 Vancouver, BC V6Z 2N3

Dear Ms. Tresoglavic:

RE: Project No. 1599045
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
BCUC Review of BC Hydro's Performance Based Regulation Report

BC Hydro writes in compliance with BCUC Order No. G-324-20 to provide its responses to Round 1 information requests as follows:

Exhibit B-9	Responses to BCUC IRs
Exhibit B-10	Responses to Interveners IRs

Please note that for consistency with the information requests submitted by other parties, BC Hydro has re-numbered the information requests from the Commercial Energy Consumers Association of British Columbia to start at 1.

For further information, please contact Chris Sandve at 604-974-4641 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Fred James
 Chief Regulatory Officer

cs/ma

Enclosure

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1.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, p. 3.
Goals of Regulation**

British Columbia Hydro and Power Authority (BC Hydro or the Company) states on page 3 of Exhibit B-8 (Supplementary Evidence) that:

The BCUC should have three broad goals with respect to its regulation of BC Hydro's revenue requirement: to set rates at efficient levels, to maintain adequate, safe and reliable service and to ensure financial integrity through the recovery of reasonable and prudently incurred costs and by providing an opportunity to earn a fair return on investment...

... The question to consider in this proceeding is what form of regulation will provide the most effective incentives for BC Hydro to operate efficiently and provide safe and reliable service, given its unique aspects.

1.1.1 Please discuss whether regulatory efficiency should be another important aspect with respect to regulation of BC Hydro's revenue requirement. Please discuss why or why not?

RESPONSE:

Yes, regulatory efficiency is another important aspect with respect to the regulation of BC Hydro's revenue requirement.

However, in BC Hydro's view, there is a distinction between regulatory efficiency and the three broad goals referenced in the preamble to the question. Regulatory efficiency is more about how the goals of BCUC regulation of BC Hydro should be achieved (i.e., the process rather than the end goal).

Among other things, the process to achieve the goals of BCUC regulation of BC Hydro should be efficient and should facilitate stakeholder understanding.

In Mr. Kolesar's evidence on page 11 of Appendix B in Exhibit B-8, he notes that while it may be possible for PBR to be "...understandable if well explained", he notes his general agreement that "cost of service regulation is more transparent and accessible while PBR is more esoteric, relying on specialized expertise." Mr. Kolesar's evidence on that page also notes that "Alberta experienced an increase in regulatory filings under PBR..."

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That said, the implementation of specific proposals for the regulation of BC Hydro may increase or decrease the extent to which the regulatory process is efficient or understandable.

BC Hydro has proposed changes that we believe will improve both efficiency and understanding under the existing cost of service framework. These are summarized on page 20 of Exhibit B-8 and include a three-year test period, regularly scheduled statistical benchmarking and information only performance-metrics.

We have disagreed with other potential changes that we don't believe will further the goals discussed in the preamble and in this response. For example, one of BC Hydro's concerns with Dr. Lowry's suggestions of using indexing where practical or automatically escalating allowed revenue for customer growth or inflation is that it would introduce additional complexity that could make the regulatory process less efficient and understandable. Specifically:

- As discussed further in section 11.8.3 of BC Hydro's PBR Report (Exhibit A2-1), the use of an index or formula can be more esoteric and rely more heavily on specialized expertise compared to a multi-year cost forecast which is more transparent and accessible;
- As discussed further in BC Hydro's response to Question 7 in Exhibit B-8, replacing a multi-year cost forecast with an index or formula could prompt the introduction of one or both of the most controversial elements of PBR: an earnings sharing mechanism or productivity factor;
- As discussed further in BC Hydro's response to BCUC IR 1.2.3, any method of indexing or automatically escalating BC Hydro's allowed revenue would be controversial and would be less effective at achieving the goals of BCUC regulation of BC Hydro, compared to the use of a multi-year cost forecast; and
- As discussed further in Mr. Kolesar's response to BCUC IR 1.18.4, there are challenges with using an index to forecast operating costs.

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1.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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... The question to consider in this proceeding is what form of regulation will provide the most effective incentives for BC Hydro to operate efficiently and provide safe and reliable service, given its unique aspects.

1.1.2 Please discuss which aspects of the current form of regulation for BC Hydro provides "the most effective incentives to...operate efficiently and provide safe and reliable service."

RESPONSE:

The current form of regulation of BC Hydro's revenue requirement provides the following incentives to operate efficiently and provide safe and reliable service:

- **Rates are set based on forecast costs for multiple years, which requires BC Hydro to manage its actual costs within a pre-determined revenue envelope to achieve its allowed return. For further discussion, refer to BC Hydro's response to Question 6 in Exhibit B-8;**
- **BC Hydro's cost forecast is subject to line-by-line public scrutiny through the regulatory process where any potential excess amounts can be questioned, often through an oral hearing, and disallowed. For further discussion, refer to BC Hydro's response to Question 7 in Exhibit B-8; and**
- **BC Hydro reports to the BCUC on a number of performance metrics. BC Hydro also reports publicly (and to the Government of B.C.) on its Service Plan metrics that align with BC Hydro's mandate. Among other things, these performance metrics provide information on system reliability and BC Hydro's internal operations. For further discussion, refer to BC Hydro's response to Question 12 in Exhibit B-8.**

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As discussed further in section 5 of Exhibit B-8, we have identified three changes that we believe would improve these existing incentives: a three-year test period, regularly scheduled statistical benchmarking and information-only performance metrics determined through a BCUC process.

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2.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, p. 1.
Company's Proposal**

BC Hydro proposes to base its revenue requirements on rate cases with three forward test years.

1.2.1 Please explain if the proposed plan would include an off-ramp provision. If not, please explain why not.

RESPONSE:

BC Hydro does not expect to propose an off-ramp provision in its Fiscal 2023 Revenue Requirements Application. In BC Hydro's view, an off-ramp provision would have limited effect in conjunction with a three-year test period. This is because:

- **It is unlikely that an off-ramp would be triggered in the first year given the proximity between setting rates and incurring costs in that year; and**
- **With regard to the second and third year, the BCUC has taken steps to re-align the timing of BC Hydro's revenue requirements applications so that applications are submitted well in advance of the next test period. This means that under a three-year test period, the application for the next test period will be submitted shortly after the results of the second year of the current test period are known and before the third year of the current test period is complete. In other words, if an off-ramp were triggered in the second or third year it would likely be more efficient to address any associated issues through the proceeding for the upcoming application rather than through a separate process initiated by an off-ramp provision.**

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2.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, p. 1.
Company’s Proposal**

In BC Hydro’s Fiscal 2009/2010 Revenue Requirements Application, BC Hydro proposed to base its operations, maintenance and administration (OM&A) cost forecast on some form of indexing. In that filing the Company stated the following.

This RRA is BC Hydro’s third such application to the BCUC in the space of five years. In each of the previous regulatory processes the BCUC and intervenors have reviewed in detail BC Hydro’s business activities and functions. On this basis, BC Hydro submits, the BCUC and intervenors have become very familiar with the contextual issues impacting BC Hydro’s business, the business functions and cost structure of the corporation, through review processes that have taken many months and involved a significant exchange of detailed information...

BC Hydro has taken the opportunity to present this application in a more streamlined and consolidated manner, focusing more on the incremental view of what is changing since the last test period, as opposed to the entire portfolio of costs and activities. BC Hydro believes this meets the interests of the BCUC and intervenors for regulatory efficiency, and provides detailed information to explain the main drivers behind the proposed rate increases. The Application has been shortened significantly in comparison to the past two revenue requirement applications....

In particular the approach to presenting operating costs differs from past years’ applications, in part to reflect the approach that BC Hydro took in the development of its operating budgets for the forecast period, and in part in recognition of the feedback from intervenors to provide more succinct and consistent forecast information. This approach includes a “growth and inflation formula” for the base running costs of BC Hydro’s business along with details and justifications of significant initiatives, as opposed to very granular details of every cost and activity.¹

1.2.2 Please discuss whether the indexation of OM&A revenue should be considered in this or any successor proceeding on performance based regulation (PBR) for BC Hydro. Please explain why or why not.

¹ BC Hydro Fiscal 2009/2010 Revenue Requirements Application, pp. 1-15 and 1-16.

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RESPONSE:

BC Hydro does not believe that the indexation of OM&A costs should be considered in this or any successor proceeding on PBR for BC Hydro for the reasons set out in BC Hydro's response to Question 7 in Exhibit B-8. Please also refer to Mr. Kolesar's response to BCUC IR 1.18.4 which provides a discussion of the challenges with this approach.

In addition to the reasons set out in response to Question 7 in Exhibit B-8, it is important to recognize that there are important differences between the situation outlined in the preamble to the question with regard to BC Hydro's Fiscal 2009 to Fiscal 2010 Revenue Requirements Application (RRA) and today's circumstances. As stated in the preamble to the question:

“[The Fiscal 2009 to Fiscal 2010 RRA] is BC Hydro's third such application to the BCUC in the space of five years. In each of the previous regulatory processes the BCUC and intervenors have reviewed in detail BC Hydro's business activities and functions. On this basis, BC Hydro submits, the BCUC and intervenors have become very familiar with the contextual issues impacting BC Hydro's business, the business functions and cost structure of the corporation, through review processes that have taken many months and involved a significant exchange of detailed information...”

The current situation is much different. The Fiscal 2020 to Fiscal 2021 Revenue Requirements Application was the first application in approximately 10 years where the BCUC and intervenors had the opportunity to review BC Hydro's business activities and costs in detail and where the BCUC's ability to regulate BC Hydro was relatively un-fettered. In addition, there are a number of issues where more time and review are required to build familiarity and understanding among the BCUC and intervenors. For example, areas identified in BC Hydro's Fiscal 2022 RRA as requiring increased investment (Mandatory Reliability Standards, cybersecurity and vegetation management) and low-carbon electrification (including the Government of B.C.'s CleanBC Plan and Phase 2 of the Comprehensive Review of BC Hydro).

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2.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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Company’s Proposal**

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This RRA is BC Hydro’s third such application to the BCUC in the space of five years. In each of the previous regulatory processes the BCUC and intervenors have reviewed in detail BC Hydro’s business activities and functions. On this basis, BC Hydro submits, the BCUC and intervenors have become very familiar with the contextual issues impacting BC Hydro’s business, the business functions and cost structure of the corporation, through review processes that have taken many months and involved a significant exchange of detailed information...

BC Hydro has taken the opportunity to present this application in a more streamlined and consolidated manner, focusing more on the incremental view of what is changing since the last test period, as opposed to the entire portfolio of costs and activities. BC Hydro believes this meets the interests of the BCUC and intervenors for regulatory efficiency, and provides detailed information to explain the main drivers behind the proposed rate increases. The Application has been shortened significantly in comparison to the past two revenue requirement applications....

In particular the approach to presenting operating costs differs from past years’ applications, in part to reflect the approach that BC Hydro took in the development of its operating budgets for the forecast period, and in part in recognition of the feedback from intervenors to provide more succinct and consistent forecast information. This approach includes a “growth and inflation formula” for the base running costs of BC Hydro’s business along with details and justifications of significant initiatives, as opposed to very granular details of every cost and activity.¹

1.2.3 Please explain why Dr. Lowry’s proposal to escalate allowed revenue by some non-controversial means following the last test year isn’t reasonable.

¹ BC Hydro Fiscal 2009/2010 Revenue Requirements Application, pp. 1-15 and 1-16.

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RESPONSE:

This answer also responds to BCUC IRs 1.2.4 and 1.2.5.

In BC Hydro's view, any method of indexing or automatically escalating BC Hydro's allowed revenue would be controversial and would be less effective at achieving the goals of BCUC regulation of BC Hydro, compared to the use of a multi-year cost forecast.

For example, if inflation and customer growth are used, BC Hydro would expect the following questions and concerns to be raised. Each of these questions could add additional complexity, controversy and uncertainty to the regulatory process:

- What source should be used to determine inflation and customer growth?
- Should BC Hydro's entire revenue requirement be escalated by inflation and/or customer growth or only certain components? What components are appropriate to escalate by inflation? What components are appropriate to escalate by customer growth? What components should be excluded from this approach?
- Should allowed revenues be escalated by customer growth or by only a portion of customer growth, as has been previously approved in the case of FortisBC Inc.?
- Should operating costs and capital costs be escalated differently? If so, how and why? Does a difference in approach create the potential for inefficient allocations between operating and capital budgets?
- Does the automatic escalation of allowed revenue create the need for an earnings sharing mechanism to guard against the possibility that allowed revenue is too high or too low? If so, what should the mechanism be and what are the implications for the incentive power of the regulatory regime?
- Does the automatic escalation of allowed revenue create the need for a productivity factor so that the average productivity gains of a representative industry peer group are automatically passed on to customers through lower rates? If so, how should this productivity factor be determined? What peer group should be used? Is a total factor productivity study required?

In addition, indexing or automatically escalating BC Hydro's allowed revenue would not eliminate the need to develop and review multi-year cost forecasts when setting rates for the test period. This is because there would still be a need to generate these forecasts to test the reasonableness of the index or formula used to set allowed revenue.

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For example, in BC Hydro's recently submitted Fiscal 2022 Revenue Requirements Application, operating costs are increasing by a net amount of \$98.7 million (or 12.2 per cent) from fiscal 2021 to fiscal 2022, due to reliability investments to maintain and achieve compliance with Mandatory Reliability Standards and to improve vegetation management and cybersecurity, as well as uncontrollable cost pressures that are outside of BC Hydro's control. BC Hydro has held other cost increases below inflation, and the drivers of the 12.2 per cent increase are not generally a function of inflation or customer growth.

Under BC Hydro's current regulatory regime, the cost forecasts for each of these items (MRS, vegetation, cybersecurity, other uncontrollable costs, controllable costs) will be subject to line-by-line scrutiny by the BCUC and interveners. Under an alternative approach where, for example, fiscal 2021 allowed revenue was automatically escalated for inflation and customer growth, there would still need to be a review to determine the extent to which these items are funded by the index or formula used to set allowed revenue and the extent to which additional investment, over and above the automatic adjustment, may be required. This review would require the same cost forecast information that BC Hydro is already providing under its current regulatory regime but with the additional controversy, complexity and regulatory burden caused by trying to incorporate a formulaic revenue adjustment.

For further discussion on reasons why BC Hydro does not support indexing or automatically escalating allowed revenue, please also refer to BC Hydro's response to Question 7 in Exhibit B-8.

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2.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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Company’s Proposal**

In BC Hydro’s Fiscal 2009/2010 Revenue Requirements Application, BC Hydro proposed to base its operations, maintenance and administration (OM&A) cost forecast on some form of indexing. In that filing the Company stated the following.

This RRA is BC Hydro’s third such application to the BCUC in the space of five years. In each of the previous regulatory processes the BCUC and intervenors have reviewed in detail BC Hydro’s business activities and functions. On this basis, BC Hydro submits, the BCUC and intervenors have become very familiar with the contextual issues impacting BC Hydro’s business, the business functions and cost structure of the corporation, through review processes that have taken many months and involved a significant exchange of detailed information...

BC Hydro has taken the opportunity to present this application in a more streamlined and consolidated manner, focusing more on the incremental view of what is changing since the last test period, as opposed to the entire portfolio of costs and activities. BC Hydro believes this meets the interests of the BCUC and intervenors for regulatory efficiency, and provides detailed information to explain the main drivers behind the proposed rate increases. The Application has been shortened significantly in comparison to the past two revenue requirement applications....

In particular the approach to presenting operating costs differs from past years’ applications, in part to reflect the approach that BC Hydro took in the development of its operating budgets for the forecast period, and in part in recognition of the feedback from intervenors to provide more succinct and consistent forecast information. This approach includes a “growth and inflation formula” for the base running costs of BC Hydro’s business along with details and justifications of significant initiatives, as opposed to very granular details of every cost and activity.¹

1.2.4 Please discuss what form of indexing could be considered non-controversial? BC-CPI?

¹ BC Hydro Fiscal 2009/2010 Revenue Requirements Application, pp. 1-15 and 1-16.

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.3 where we explain that any form of indexing would be controversial and would not eliminate the need to review multi-year cost forecasts.

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2.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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1.2.5 FortisBC Energy Inc. uses a combination of an AWE:BC and CPI:BC to index its O&M costs.² Please discuss whether this form of indexing would or not be appropriate for BC Hydro, and why.

¹ BC Hydro Fiscal 2009/2010 Revenue Requirements Application, pp. 1-15 and 1-16.

² Decision and Orders G-165-20 and G-166-20, FortisBC Energy Inc. and FortisBC Inc. Application for Approval of a Multi-Year Rate Plan for the Years 2020 through 2024, June 22, 2020, p. 46.

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.3 where we explain why, in the context of BC Hydro, the use of a multi-year cost forecast is better than automatically escalating allowed revenue, or a portion of allowed revenue, by an index.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, pp. 12–14,
p. 20
Changes to the existing cost of service framework**

On pages 12 to 14, BC Hydro states it does not support the use of indexing, stating as one of its reasons that:

- Third, replacing a multi-year cost forecast with an index or formula, may cause the BCUC or interveners to be less certain about whether allowed revenue has been set too high or may cause BC Hydro to advance mechanisms that guard against the possibility that allowed revenue was set too low. This could prompt the introduction of one or both of the most controversial elements of PBR: and earnings sharing mechanism or a productivity factor;

On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro’s existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.1 Please explain how BC Hydro’s proposed approach provides incentives to find productivity improvements, in particular, when performance metrics are for information only

RESPONSE:

In our Supplementary Evidence, we have identified three changes that we believe would improve BC Hydro’s existing cost of service framework.

Extending the test period to a three-year period would increase the incentive to find productivity improvements by increasing the length of time within which BC Hydro must manage its costs within a pre-determined revenue envelope to achieve its allowed return. For further discussion on this point, please refer to BC Hydro’s response to Question 6 in Exhibit B-8 and Dr. Weisman’s response to Question 3 in Exhibit B-8.

The introduction of regularly scheduled statistical benchmarking would help to address any concern with regard to information asymmetry or upward forecasts if multi-year cost forecasts are used to determine allowed revenue. For further

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discussion on this point, please refer to BC Hydro's response to Question 9 in Exhibit B-8.

With regard to information-only performance metrics, Dr. Lowry explains that the use of performance metrics in regulation can alert utility managers to key concerns, target areas of poor (or poorly incentivized) performance, and reduce the cost of oversight on balance (refer to page 22 of Exhibit A2-5). In BC Hydro's view, the use of information-only performance metrics, determined through a BCUC process, achieves all three of these objectives. For further discussion on the incentives provided by information-only performance metrics, please refer to Dr. Weisman's response to Question 4 in Exhibit B-8.

One of the reasons why performance metrics play a key role in multi-year rate plans for investor owned utilities (sometimes with financial rewards or penalties) is to guard against the potential that the incentives associated with a longer period between rebasing will drive the utility to sacrifice service and reliability in the quest for higher profits. This concern is less applicable in the case of a Crown corporation like BC Hydro, since BC Hydro's mandate includes service and reliability (among other things) and does not include profit maximization.

Moreover, there are two related reasons why using performance metrics to determine the application of financial rewards or penalties against allowed net income would not provide an incremental incentive to BC Hydro.

- First, BC Hydro is only expected to achieve its allowed net income and does not have a profit maximization mandate. BC Hydro's motivation to achieve performance metrics is provided by its broader mandate from the Government of B.C. rather than the promise of higher or lower shareholder returns based on its performance against those metrics; and
- Second, the BCUC has previously recognized that financial penalties should only be applied against earnings *in excess of allowed net income*. Since BC Hydro has no mandate to achieve more than its allowed net income in the first place, the threat of withholding those additional earnings is a poor incentive, in the case of BC Hydro. For further discussion on this point, please refer to BC Hydro's response to Question 5 in Exhibit B-8.

BC Hydro notes that the preamble to the question included a reference to a productivity factor. It is important to note that, all else equal, the incentive power of a regulatory regime is the same whether a productivity factor is included in its design or not. As Dr. Weisman explains in his responses to Questions 2 and 3 in Exhibit B-8, ideal incentives for efficiency are present when the regulated firm expects that the benchmark that governs its rate trajectory will not vary based on its own performance (whether that benchmark includes a productivity factor or not). A three-year test period based on a forecast, as BC Hydro has proposed, provides a rate trajectory that will not vary based on its own performance.

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Similarly, using an index or formula does not provide any incremental incentive to find productivity improvements compared to the existing approach of using a multi-year cost forecast. For further discussion on this point, please refer to BC Hydro's response to Question 7 in Exhibit B-8 and Dr. Weisman's response to Question 2 in Exhibit B-8.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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Changes to the existing cost of service framework**

On pages 12 to 14, BC Hydro states it does not support the use of indexing, stating as one of its reasons that:

- Third, replacing a multi-year cost forecast with an index or formula, may cause the BCUC or interveners to be less certain about whether allowed revenue has been set too high or may cause BC Hydro to advance mechanisms that guard against the possibility that allowed revenue was set too low. This could prompt the introduction of one or both of the most controversial elements of PBR: and earnings sharing mechanism or a productivity factor;

On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro's existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.2 To what extent is BC Hydro incented to control costs under the existing cost of service framework? Please identify the specific elements in the current regulatory framework to support your response.

RESPONSE:

This answer also responds to BCUC IRs 1.3.3, 1.3.4, 1.3.5 and 1.3.6. In this answer, we explain how the existing cost of service framework provides incentives for BC Hydro to control costs, increase performance and pursue low-carbon electrification and how BC Hydro's proposed changes will improve these incentives and allow BC Hydro to accomplish its initiatives in these areas. We also explain why alternative proposals would not provide incremental incentives to BC Hydro.

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Controlling Costs

There are two aspects to consider with regard to BC Hydro's incentives to control costs.

First, BC Hydro is motivated to control costs when it sets forecasts for its Revenue Requirements Applications to the BCUC.

BC Hydro has an obligation to set forecasts that reflect no more than the expected prudent costs of providing utility service and must satisfy both the Government of B.C. and the BCUC that its forecasts are reasonable. The Government of B.C. expects BC Hydro to keep rates as low as possible and, through its budgeting process, BC Hydro actively considers and incorporates opportunities to reduce costs and absorb cost pressures. As a result, BC Hydro's forecasts include expected productivity gains.

The BCUC takes steps, through the regulatory process, to test the veracity of BC Hydro's forecasts. Under the existing cost of service framework, BC Hydro's forecasts are subjected to considerable public scrutiny through the Revenue Requirements Application process. Through this process, BC Hydro provides comprehensive evidence to demonstrate that it is operating efficiently and the BCUC and interveners have the opportunity to review and pose questions to BC Hydro based on that evidence. Public scrutiny of BC Hydro's forecasts would continue under BC Hydro's proposed changes.

The BCUC can also consider the veracity of BC Hydro's previous forecasts when evaluating whether forecasts for future periods are reasonable. Therefore, it is in BC Hydro's interest to put forward forecasts that reflect its best efforts to control costs in order to build credibility with the BCUC and interveners over time and for future proceedings.

Second, BC Hydro is motivated to control costs once the BCUC has set rates. The existing cost of service framework provides BC Hydro with productivity incentives because rates are based on forecast costs over multiple years which requires BC Hydro to manage its costs within a pre-determined revenue envelope to achieve its allowed return. BC Hydro (and the Government of B.C. as BC Hydro's shareholder) bears the risk of failing to operate within that revenue envelope. This results in productivity improvements which will be passed on to customers in the current test period (if, in an effort to manage costs, BC Hydro identifies savings over and above what's required to meet its allowed net income and invests those savings in service improvements) and in future test periods, when rates are re-based.

BC Hydro's proposal to add a third year to the test period extends the period over which BC Hydro bears the risk of failing to operate within a defined revenue envelope, which increases the incentive to seek productivity improvements. In

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other words, it “sharpens the sticks” (as discussed by Dr. Weisman in response to MOVEUP IR 1.3.1 in Exhibit A2-3) because BC Hydro is subject to the risk of financial losses for a longer period of time.

Over the course of the test period, ratepayers are protected from further rate increases. Upward cost pressures that would be passed on to customers in the form of rate increases at the end of a two-year test period would have to be absorbed by BC Hydro for another year under a three year test period in order for BC Hydro to achieve its allowed return.

A longer test period would also increase regulatory efficiency and would allow BC Hydro to focus more of its efforts on operating the business and finding additional efficiencies and performance improvements to the benefit of ratepayers.

For further discussion on the benefits of moving to a three-year test period, refer to BC Hydro’s response to Question 6 in Exhibit B-8 and to Dr. Weisman’s response to Question 3 in Exhibit B-8.

BC Hydro’s proposal for regularly scheduled statistical benchmarking is an improvement to the existing cost of service framework. It would reinforce incentives to find productivity improvements by providing the BCUC and interveners with additional data that can be used to evaluate BC Hydro’s cost forecasts and performance and by evaluating whether costs and rates are in line with those of an industry peer group.

For further discussion on the potential benefits of regularly scheduled statistical benchmarking, refer to BC Hydro’s response to Question 9 in Exhibit B-8 and to BC Hydro’s response to BCOAPO IR 1.6.3.

While extending the length of the test period increases BC Hydro’s incentive to control costs once rates have been set by “sharpening the sticks”, the introduction of an index or formula to automatically escalate allowed revenue would not provide any incremental incentive power compared to the existing approach of using a multi-year cost forecast. All else equal, the incentive power of a rate trajectory set using a multi-year cost forecast is the same as the incentive power of a rate trajectory set using an index or formula, including a formula that includes a productivity factor. This is because incentive power is determined by the extent to which the rate trajectory is invariant to the regulated firm’s own performance. For further discussion on this point, refer to Dr. Weisman’s responses to Questions 2 and 3 in Exhibit B-8.

While the introduction of an index or formula to automatically escalate allowed revenue would not provide any incremental incentive power, it would be a step backward in other areas. For example, it would reduce the frequency of public scrutiny applied to BC Hydro’s costs forecasts and it would add controversy and

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complexity to the regulatory process. For further discussion on this latter point, refer to BC Hydro's response to BCUC IR 1.2.3 and to Mr. Kolesar's evidence on page 10 of Exhibit B-8.

Considering that BC Hydro already has significant incentives to seek out productivity gains under the current regulatory framework, which would be strengthened by BC Hydro's proposed changes, and that the introduction of an index or formula would reduce the frequency of public scrutiny and add controversy and complexity, BC Hydro submits that the use of an index or formula to set rates is not warranted.

However, as noted above, using a multi-year cost forecast to set rates does not prevent the BCUC and interveners from considering statistical benchmarking information to inform their review of BC Hydro's forecasts. This could include peer-based productivity measures and third-party inflation forecasts and is consistent with BC Hydro's proposal to conduct regularly scheduled statistical benchmarking, based on a terms of reference established through a BCUC process.

Increase Performance

The existing cost of service framework provides incentives to BC Hydro to increase performance because it allows for public scrutiny of BC Hydro's operations and requires BC Hydro to report to the BCUC on its performance, including by providing performance metrics. As stated in BC Hydro's response to Question 7 in Exhibit B-8, public scrutiny is particularly strong in the case of BC Hydro, as a Crown Corporation, owned by the Government of B.C., with a significant public profile.

BC Hydro's proposal for Information-only performance metrics, determined through a BCUC process, would provide an incentive for increased performance in areas that matter to the BCUC and interveners, including electrification. For further discussion on this point, refer to Dr. Weisman's response to Question 4 in Exhibit B-8.

Using performance metrics to determine the application of financial rewards or penalties against allowed net income would not provide an incremental incentive to BC Hydro. For further discussion on this point, please refer to BC Hydro's response to Question 5 in Exhibit B-8 and to BC Hydro's response to BCUC IR 1.3.1.

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Electrification

BC Hydro is motivated to increase low carbon electrification by the mandate provided by the Government of B.C. which is premised on the following two outcomes: (1) helping our customers and the Government of B.C. achieve their objectives with regard to the reduction of greenhouse gas emissions, and (2) generating incremental tariff revenue that can serve to offset cost pressures and keep rates low for customers.

BC Hydro currently has full revenue decoupling, through the Load Variance Regulatory Account. This means that all incremental tariff revenue generated through low carbon electrification benefits ratepayers.

Partial revenue decoupling would divert a portion of the revenues from low-carbon electrification to the Government of B.C., based on the premise that doing so would provide BC Hydro with a stronger incentive to undertake electrification activities than it has today and thereby increase overall revenues. This premise is incorrect because BC Hydro does not have a mandate to maximize profits. As a result, under partial revenue decoupling, ratepayers would be rendered worse off than they are today because they would be unnecessarily foregoing some of the revenue benefits of the electrification initiatives. This is not a desirable outcome from BC Hydro's perspective given the mandate to achieve the lowest rates possible for consumers. For further discussion on this point, refer to BC Hydro's response to BCUC IR 1.6.3.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
 Exhibit B-8, BC Hydro Supplementary Evidence, pp. 12–14,
 p. 20
 Changes to the existing cost of service framework**

On pages 12 to 14, BC Hydro states it does not support the use of indexing, stating as one of its reasons that:

- Third, replacing a multi-year cost forecast with an index or formula, may cause the BCUC or interveners to be less certain about whether allowed revenue has been set too high or may cause BC Hydro to advance mechanisms that guard against the possibility that allowed revenue was set too low. This could prompt the introduction of one or both of the most controversial elements of PBR: and earnings sharing mechanism or a productivity factor;

On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro's existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.3 To what extent is BC Hydro incented to increase performance under the existing cost of service framework? Please identify the specific elements in the current regulatory framework to support your response.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2 where we discuss the incentive for BC Hydro to increase performance provided by the existing cost of service framework and with the changes that BC Hydro has proposed.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro's existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.4 To what extent is BC Hydro incented to control costs under the proposed changes to the existing cost of service framework?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2 where we discuss the incentive for BC Hydro to control costs provided by the changes that BC Hydro has proposed compared to alternative proposals.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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 p. 20
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- Third, replacing a multi-year cost forecast with an index or formula, may cause the BCUC or interveners to be less certain about whether allowed revenue has been set too high or may cause BC Hydro to advance mechanisms that guard against the possibility that allowed revenue was set too low. This could prompt the introduction of one or both of the most controversial elements of PBR: and earnings sharing mechanism or a productivity factor;

On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro's existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.5 To what extent is BC Hydro incited to increase performance under the proposed changes to the existing cost of service framework.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2 where we discuss the incentive for BC Hydro to increase performance provided by the changes that BC Hydro has proposed compared to alternative proposals.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, pp. 12–14,
p. 20
Changes to the existing cost of service framework**

On pages 12 to 14, BC Hydro states it does not support the use of indexing, stating as one of its reasons that:

- Third, replacing a multi-year cost forecast with an index or formula, may cause the BCUC or interveners to be less certain about whether allowed revenue has been set too high or may cause BC Hydro to advance mechanisms that guard against the possibility that allowed revenue was set too low. This could prompt the introduction of one or both of the most controversial elements of PBR: and earnings sharing mechanism or a productivity factor;

On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro's existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.6 Please explain how the proposed changes to the existing cost of service framework will allow BC Hydro to accomplish its initiatives for electrification, maintaining low electricity rates, and maintaining a safe reliable service?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2 where we explain how BC Hydro's proposed changes to the existing cost of service framework will allow BC Hydro to accomplish its initiatives for electrification, maintaining low electricity rates and maintaining a safe, reliable service.

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3.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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 p. 20
 Changes to the existing cost of service framework**

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- Third, replacing a multi-year cost forecast with an index or formula, may cause the BCUC or interveners to be less certain about whether allowed revenue has been set too high or may cause BC Hydro to advance mechanisms that guard against the possibility that allowed revenue was set too low. This could prompt the introduction of one or both of the most controversial elements of PBR: and earnings sharing mechanism or a productivity factor;

On page 20, BC Hydro identifies three changes that it believes would improve BC Hydro's existing cost of service framework:

- A three-year test period;
- Regularly scheduled statistical benchmarking; and
- Information-only performance metrics.

1.3.7 Please discuss BC Hydro's understanding of test period versus test year. Does BC Hydro believe that rate approvals obtained for a test period should be indefinite, or should its effectiveness end with the test period, and why? For example, please discuss whether it is appropriate for BC Hydro to provide a one year forecast and maintain rates until a future need (outside of the one year test period) arises necessitating a rate adjustment.

RESPONSE:

BC Hydro does not draw any distinction between the terms “test period” and “test year”, except that a “test period” can be a year or longer. In BC Hydro's view, the test period is the period for which rates are being set. BC Hydro's practice has been to submit revenue requirements applications for defined test periods and BC Hydro intends to continue with this practice. This approach ensures that BC Hydro's cost forecasts are tested and subject to appropriate scrutiny.

There is no legal requirement for rate determinations to be time limited; a rate could be set without specifying an end date. For example, many of BC Hydro's

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regulatory accounts (which are approved under the rate setting provisions of the *Utilities Commission Act*) have been approved on an ongoing basis, without a specified end date. In the event that a stakeholder or the BCUC was to conclude, after the passage of some time, that something should change, the Act provides for a mechanism to trigger a review. Specifically, section 58 (1) of the *Utilities Commission Act* provides the BCUC with the ability, following a hearing on its own motion or on complaint by a public utility or other interested person, to “determine the just, reasonable, and sufficient rates to be observed and in force”.

BC Hydro expects that it would be unpalatable to stakeholders to go long periods without a public review of BC Hydro's rates, considering the significant public interest in BC Hydro's operations and rates and BC Hydro's status as a publicly owned crown corporation.

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4.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
 Exhibit B-8, BC Hydro Supplementary Evidence, p. 8.
 PBR in Québec**

BC Hydro states on page 8 of its Supplementary Evidence that:

... it is important to recognize that the public may not accept profit maximization as a legitimate objective of a Crown Corporation. This is demonstrated by the experience of Hydro-Quebec where public backlash saw efficiency gains under PBR as customers being “overcharged” and the Government of B.C. subsequently introduced legislation to set electricity distribution rates and remove the requirement for a PBR mechanism to be established.

1.4.1 Please state whether BC Hydro agrees with the following statements about Québec’s experience with PBR, which Dr. Lowry provided on pages 95 to 96 of his report. For statements in which BC Hydro disagrees, please explain why:

- The new law removed the mandate for PBR for power transmission, but PBR continues for this division of Hydro-Québec and the Regie de l’Energie is currently considering transmission benchmarking and productivity evidence.
- The rate that Hydro-Québec Production can charge for the low-cost “heritage block” of power which is available to provincial end users has been indexed for several years.¹
- Rather than suspending PBR for Hydro-Québec, the new law codified an alternative multiyear rate plan (“MRP”) for this division.
- Hydro-Quebec supported this legislation.

RESPONSE:

BC Hydro provides its views on each statement below. At the end of the responses we have provided some additional discussion on the differences between the mandate of BC Hydro and Hydro-Quebec.

¹ Act Respecting the Regie de l’energie, Chapter IV Rate Determination, Section 52.2.

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- ***Statement: The new law removed the mandate for PBR for power transmission, but PBR continues for this division of Hydro-Québec and the Régie de l'Énergie is currently considering transmission benchmarking and productivity evidence.***

The requirement for a specific PBR mechanism for Hydro-Québec Distribution (HQD) and Hydro Québec Transmission (HQT) was removed by repeal of former section 48.1 of An Act respecting the Régie de l'énergie, CQLR, c. R-6.01 (Act).

Electricity distribution (HQD) rates are now being set yearly by government from 2021 to 2024, and the Act mandates rate hearings at the Régie every five years starting for the rate year 2025 unless Hydro-Quebec applies due to special circumstances. The government-determined rates during the period 2021 to 2024 are to be escalated annually in reference to inflation, and the Régie is currently determining a formula (section 48.2 and 48.3; Régie file 4134-2020).

With respect to HQT, section 49(4) of the Act still enables the Régie to “favour measures or incentives to improve the performance of the electric power carrier”, which is HQT. We understand that transmission benchmarking and multi-factor productivity studies are currently being undertaken by experts for HQT and consumer advocacy groups. (Régie file 4058-2018 phase 2)

- ***Statement: The rate that Hydro-Québec Production can charge for the low-cost “heritage block” of power which is available to provincial end users has been indexed for several years.***

Hydro-Quebec Production (i.e., generation) is a non-regulated line of business. The effect of section 52.2 of the Act is that the Government of Quebec has yearly indexed by order the Heritage block (mandatory requirement for HQP to supply HQD with 178.9 TWh yearly including distribution and transmission losses) at the inflation rate since 2014 (2,79 kWh at the time now 2,96 kWh in 2019).

- ***Statement: Rather than suspending PBR for Hydro-Québec, the new law codified an alternative multiyear rate plan (“MRP”) for this division.***

Please refer to the responses to the previous two bullets.

- ***Statement: Hydro-Quebec supported this legislation.***

BC Hydro agrees.

Additional Context Regarding the Difference Between Hydro-Quebec and BC Hydro

An important part of the context when comparing the structure in Quebec to that in BC is that, although both Hydro-Quebec and BC Hydro are Crown corporations,

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they have different mandates. Unlike BC Hydro, Hydro-Quebec has had a clear mandate to maximize returns for the shareholder, which is reflected in all Hydro-Québec Annual Reports since 2010 and also in Quebec Ministry of Finance yearly budgets. For example, in the 2013-2014 budget speech at p. 23:

« Par exemple, nous avons demandé à Hydro-Québec de poser des gestes pour améliorer son efficacité. Elle réduira donc ses charges d'exploitation à très court terme en éliminant 2 000 postes par attrition. Cela augmentera le bénéfice net d'Hydro-Québec et, conséquemment, les revenus de son seul actionnaire, le gouvernement du Québec. Cette amélioration de la performance de la société d'État n'affectera pas les services aux consommateurs »

English Translation:

For example, we asked Hydro-Québec to take action to improve its efficiency. It will reduce its operating costs in the very short term by eliminating 2,000 positions through attrition. This will increase Hydro-Québec's net income and, consequently, the revenues of its sole shareholder, the Québec government. This improvement in the corporation's performance will not affect services to consumers.

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5.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, p. 15.
Statistical Benchmarking**

BC Hydro states on page 15 of its Supplementary Evidence that:

Statistical benchmarking studies would help to address any concern with regard to information asymmetry or upward forecasts if multi-year cost forecasts are used to determine allowed revenue. These studies can provide another tool for the BCUC to set rates at efficient levels... Benchmarking does have limitations and the results can often be controversial. Therefore, BC Hydro suggests that a beneficial first step would be to involve the BCUC and interveners in a process to set out a terms of reference to guide the objective, scope and frequency of future benchmarking studies. This process would also provide an opportunity for all parties to consider the suggestions on benchmarking that were put forward by Dr. Lowry.

1.5.1 What would be a sensible schedule for such a process? For example, would this schedule preclude the use of benchmarking in the establishment of the new multi-year rate plan? Could terms of reference be considered on an expedited basis so as not to delay commencement of such studies?

RESPONSE:

We believe it would be reasonable to use the Fiscal 2023 to Fiscal 2025 Revenue Requirements Application proceeding as the forum to establish the terms of reference for benchmarking studies. This would provide interveners with a sufficient opportunity to have input into the objective, scope and frequency of future benchmarking studies (e.g., was the benchmarking study included in BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application helpful and what other types of benchmarking may be useful?).

The first benchmarking study produced in accordance with those terms of reference could then be included as part of the following application (setting rates starting in fiscal 2026).

There are two reasons why this schedule makes sense.

First, BC Hydro included a benchmarking study as part of its Fiscal 2020 to Fiscal 2021 Revenue Requirements Application, which only recently concluded.

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Second, while the specific scope of future benchmarking studies is not yet determined, it would likely require a very expedited, and ultimately unrealistic, approach if benchmarking were to have any impact on BC Hydro's Fiscal 2023 to Fiscal 2025 Revenue Requirements Application. That Application is anticipated in August 2021, and BC Hydro would need the findings of any benchmarking study well in advance of that date if it were to inform the Application.

The study would take time to complete. As an example, the benchmarking study provided as part of BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application took approximately five months to complete (September 2018 to January 2019), excluding the time taken to retain the expert for this work.

In short, BC Hydro expects that the terms of reference for future benchmarking studies would likely need to be finalized by March 2021 in order for a benchmarking study produced in accordance with those terms of reference to be provided as part of the Fiscal 2023 to Fiscal 2025 Revenue Requirements Application. On this timeline, we believe there would be insufficient opportunity for interveners to have input into the objective, scope and frequency of future benchmarking studies.

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6.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, p. 16.
Low Carbon Electrification**

BC Hydro states on page 16 of its Supplementary Evidence that

Partial decoupling of low-carbon electrification revenues would mean that customers would not receive all of the incremental revenue from BC Hydro's electrification activities. Rather, the Government of B.C. would retain some of the incremental revenue in the form of higher actual net income.

1.6.1 Please confirm that partial decoupling would only permit BC Hydro to keep incremental margins from electrification between rate cases.

RESPONSE:

Confirmed.

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6.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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BC Hydro states on page 16 of its Supplementary Evidence that

Partial decoupling of low-carbon electrification revenues would mean that customers would not receive all of the incremental revenue from BC Hydro's electrification activities. Rather, the Government of B.C. would retain some of the incremental revenue in the form of higher actual net income.

1.6.2 In the event that low-carbon electrification activities generate incremental costs, instead of incremental revenues, please discuss the impacts under the partial decoupling scenario.

RESPONSE:

Partial decoupling means that the shareholder retains a portion of incremental revenues generated, rather than flowing the entire amount to ratepayers.

Low-carbon electrification activities would be expected to generate both incremental costs and incremental revenues. If the incremental costs of a low-carbon electrification activity were to exceed the associated incremental revenues and there was only partial, rather than full, revenue decoupling, ratepayers would be responsible for the prudently incurred incremental costs associated with the initiative but would benefit from only a portion of the incremental revenue.

With regard to incremental costs, ratepayers may pay planned or actual amounts depending on the nature of those costs. Planned amounts would be included in BC Hydro's revenue requirements but in some cases, depending on the regulatory account treatment, ratepayers would ultimately pay the actual amounts. For example, costs for implementing prescribed undertaking programs under section 4(3)(a), (b), (c) or (d) of the Greenhouse Gas Reduction (Clean Energy) Regulation are deferred to the DSM Regulatory Account so that ratepayers pay the actual costs but variances between actual and planned operating costs are not deferred.

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6.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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BC Hydro states on page 16 of its Supplementary Evidence that

Partial decoupling of low-carbon electrification revenues would mean that customers would not receive all of the incremental revenue from BC Hydro's electrification activities. Rather, the Government of B.C. would retain some of the incremental revenue in the form of higher actual net income.

1.6.3 The multi-year rate plan that BC Hydro proposes would permit it to keep all benefits of incremental efficiency gains between rate cases. Please discuss why a multi-year rate plan makes sense for BC Hydro but strengthened incentives to promote beneficial load growth does not make sense.

RESPONSE:

In response to Question 6 of Exhibit B-8, BC Hydro explains that Multiyear Rate Plans are intended to incent efficient performance by creating a multi-year disconnect between allowed revenue and actual costs so that a utility must perform within a pre-determined revenue envelope to achieve its allowed return. BC Hydro's current regulatory system already takes this approach by setting rates based on forecast costs for multiple years. A three-year test period would strengthen incentives because it would create a greater disconnect between BC Hydro's allowed revenue and actual costs.

While this disconnect means that BC Hydro generally keeps the benefit of incremental efficiency gains, it also means that BC Hydro is generally responsible for incremental cost pressures that are not subject to deferral. This provides an incentive for BC Hydro to seek out incremental efficiency gains in response to incremental cost pressures so that it can manage within its pre-determined revenue envelope to achieve its allowed return.

BC Hydro is already motivated to increase low carbon electrification because of the mandate provided by the Government of B.C. which is premised on the following two outcomes: (1) helping our customers and the Government of B.C. to achieve their objectives with regard to the reduction of greenhouse gas emissions, and (2) generating incremental tariff revenue that can help to offset cost pressures and keep rates low for customers.

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Full revenue decoupling means that any variances between forecast and actual revenue are “trued-up” and returned to, or recovered from, ratepayers. Partial revenue decoupling would divert variances in incremental revenues from low-carbon electrification (all of which currently flow to ratepayers under full revenue decoupling) to the Government of B.C., based on the premise that doing so would provide BC Hydro with a stronger incentive to undertake electrification activities than it has today. The diversion of these revenues to the shareholder would mean, all else equal, higher rates paid by customers. In order for partial decoupling to produce net benefits to ratepayers, BC Hydro would need to respond to the additional financial incentive sufficiently to more than offset the revenues diverted to the shareholder. However, we do not believe that the potential to earn higher net income for our shareholder would provide an additional incentive over and above what we have today. BC Hydro does not have a profit maximization mandate and therefore is not incented to exceed its net income target.

As a result, under partial revenue decoupling, ratepayers would be worse off than they are today because they would be unnecessarily foregoing some of the revenue benefits of the electrification initiatives.

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7.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, pp. 4–10,
p. 21
Application of PBR**

On pages 4 to 10, BC Hydro discusses the unique aspects that it believes could affect the application of PBR.

On page 21, BC Hydro references Mr. Kolesar’s evidence, which states:

Alberta experienced an increase in regulatory filings under PBR, in part because of the nature of some of the Commission’s PBR plans, for which the Alberta commission was often criticized. The Commission should carefully analyze and consider the potential regulatory burden under both COSR and PBR.

1.7.1 Please provide distinctions in the industry and regulatory landscape in Alberta that may explain the increase of regulatory filings under PBR (for example, Alberta’s initial approach to developing a PBR framework for all distribution utilities, different proposals with respect to capital expenditures, etc.)

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I have been engaged by BC Hydro to opine on a single question, specifically “Given that BC Hydro is not a profit maximizing utility, are there implications that should be considered in the design of the regulatory regime for the company”. I have not studied in detail the industry and regulatory landscape in BC. Accordingly, I am not able to opine on the specifics of how the BC landscape may differ as to its potential effect on regulatory filings under PBR. However, I would offer the following with respect to the Alberta experience.

The number of regulatory filings required under PBR in Alberta were partly due to the number of companies governed by the PBR regime, each of which were required to file submissions during the proceedings to establish the PBR regimes (which added to the complexity of the proceedings), and each of which were required to submit annual filings required by the PBR regimes. Having fewer entities under a PBR regime will necessarily reduce the number and perhaps complexity of filings for the BCUC.

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My response to BCUC IR 1.18.1. sets out the steps undertaken by the AUC to implement its first PBR plan. It is unlikely that the BCUC, at this stage in its adoption of PBR, would be required to undertake the same number of steps.

There would, in my view, be a requirement for annual filings under a PBR regime in BC to deal with on-going adjustments to rates for the I-X, Y and K factors in a PBR formula, and potentially periodic Z factor applications. The capital tracker regime in the first generic PBR plan in Alberta required a significant number of on-going filings. Under the current PBR plan in Alberta, there are fewer annual filings than under the predecessor PBR regime, particularly with respect to capital expenditures, and they are largely mechanical in nature. There are, nonetheless, more routine filings under the PBR regime than generally required under COSR. Regardless of the approach to K factor adjustments adopted by the BCUC, there are likely to be ongoing regulatory filings associated with capital expenditures, and likely more filings than required under COSR.

In this regard, it is noteworthy that distribution and transmission in Alberta are not vertically integrated and are regulated under different regimes. Specifically, distribution is regulated under PBR and transmission is regulated under COSR. Whereas, in the case of BC Hydro, generation, distribution and transmission are vertically integrated and regulated jointly under a single regime. As I stated in my submission at footnote 7 on page 6, the issues arising in the design of a PBR regime from the lumpiness of capital investment may be further exacerbated when the utility is vertically integrated. This may make the PBR regime for BC Hydro more complex to design and implement, particularly as it relates to the treatment of capital expenditures.

Finally, there will likely be a requirement for on-going filings throughout the PBR regime in BC to monitor financial performance, quality of service, and asset condition, as well as other matters such as depreciation parameters.

Please see my responses to CEC IR 1.18.1 and ZONE II RPG IR 1.4.1 for further discussion of the potential need for on-going filings under a PBR regime for BC Hydro.

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7.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

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1.7.1 Please provide distinctions in the industry and regulatory landscape in Alberta that may explain the increase of regulatory filings under PBR (for example, Alberta's initial approach to developing a PBR framework for all distribution utilities, different proposals with respect to capital expenditures, etc.)

1.7.1.1 Please explain if the reasons described above are unique to Alberta, or would also be applicable to BC Hydro, given BC Hydro's unique aspects as presented in pages 4 to 10?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

Please see my response to BCUC IR 1.7.1.

Having reviewed BC Hydro's unique aspects as presented in pages 4 to 10 of Exhibit B-8, I find that some aspects may impact the number of filings required under a PBR regime. Please see my response to MOVEUP IR 1.5.1.

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8.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
 Exhibit B-8, BC Hydro Supplementary Evidence, p. 6
 Approach to Trade Income and Sale of Surplus Properties**

On page 6, BC Hydro states that:

- Fifth, BC Hydro's approach to Trade Income and the sale of surplus properties demonstrates that BC Hydro does not have a profit maximization mandate and is instead focused on affordability and keeping rates low for customers, consistent with the Government of B.C.'s expectations. The Government of B.C. and BC Hydro have consistently taken the position that all Trade Income and net gains from the sale of surplus properties should benefit ratepayers even though there are alternative approaches that could increase revenues to the Government of B.C., as BC Hydro's shareholder.

1.8.1 Please explain in further detail the alternative approaches that BC Hydro could use to increase revenues to the Government of B.C., as BC Hydro's shareholder, and in what circumstances these approaches would be used.

RESPONSE:

The reference to "alternative approaches" in the quoted passage was intended to refer to the fact that standard ratemaking principles may allow the shareholder to, as an example, retain all proceeds of the sale of a surplus property, rather than flow them to ratepayers as BC Hydro has chosen to do. BC Hydro's approach is indicative of its shareholder not prioritizing profit maximization.

BC Hydro's evidence is that unless the Government of B.C. were to change BC Hydro's mandate so that BC Hydro was mandated to maximize profits, BC Hydro would not seek to advance any approaches for the purpose of achieving actual net income in excess of its allowed return.

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8.0 A. BC HYDRO SUPPLEMENTARY EVIDENCE

**Reference: BC HYDRO SUPPLEMENTARY EVIDENCE
Exhibit B-8, BC Hydro Supplementary Evidence, p. 6
Approach to Trade Income and Sale of Surplus Properties**

In the BC Hydro Fiscal 2020 to Fiscal 2021 Revenue Requirements Application (F2020-F2021 RRA), BC Hydro proposed to change its methodology to have project write-off costs recovered from its ratepayers instead of its historical approach in which the shareholder absorbed these costs.¹

1.8.2 Please discuss how this proposed change in methodology also supports the lack of profit maximization mandate.

RESPONSE:

BC Hydro’s proposal to recover project write-off costs from ratepayers was based on the principle that some project write-offs are reasonable and to be expected in a utility’s normal course of business and therefore, should be recovered from ratepayers rather than absorbed by the shareholder. In its Decision on BC Hydro’s Fiscal 2020 to Fiscal 2021 Revenue Requirements Application, the BCUC accepted this position but denied BC Hydro’s forecast project write-off costs, instead directing BC Hydro to propose a mechanism to capture actual project write-off costs for future recovery, subject to BCUC review. In accordance with this directive, BC Hydro proposed a mechanism, which was approved by BCUC Order No. G-337-20.

The recovery of prudently incurred costs is necessary for a utility to have a reasonable opportunity to achieve its allowed return, which was the intent of BC Hydro’s proposal and which is also required of the BCUC when regulating BC Hydro. BC Hydro’s proposal was not put forward with the intent of exceeding the allowed return or maximizing profits.

¹ BC Hydro F2020–F2021 RRA proceeding, Exhibit B-1, pp. 8-21–8-22; Exhibit B-5, BCUC IR 161.1.

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9.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-8, Appendix A, Dr. Dennis Weisman Supplementary
Report, pp. 5–6 Employee Incentives**

Dr. Weisman states on pages 5 and 6 of his report that:

An example of financial incentives is an employee incentive-compensation plan that rewards (punishes) superior (inferior) performance by putting compensation dollars at risk. This would be expected to induce the company to operate as if it were a profit-maximizing entity even though it is not... Because effort is costly (i.e., leisure is preferred to work), the requisite carrots and sticks must be put in place to motivate superior performance. A carefully designed employee compensation plan can succeed in doing just that even though BC Hydro may not have profit maximization as its primary or even its secondary objective.

1.9.1 Please explain whether the incentive provisions of BC Hydro's employee compensation plan merit consideration by the British Columbia Utilities Commission (BCUC) in this or any successor proceeding on PBR for the Company.

RESPONSE:

No. While the BCUC has jurisdiction to consider whether to allow recovery of the costs of employee incentives for rate making purposes, the BCUC does not have jurisdiction to reject the incentive provisions or direct BC Hydro to alter its employee compensation plan. Designing a compensation plan and determining appropriate employee incentives are fundamentally a management decision, to which the BCUC's jurisdiction does not extend. The BC Court of Appeal has held, for instance:¹

56 It is only under s.112 of the *Utilities Act* that the Commission is authorized to assume the management of a public utility. Otherwise the management of a public utility remains the responsibility of those who by statute or the incorporating instruments are charged with that responsibility.

¹ **British Columbia Hydro and Power Authority v. British Columbia (Utilities Commission), 1996 CanLII 3048 (BC CA) at paras. 56 and 58; Office and Professional Employees' Int'l Union et al v. B.C. Hydro et al, 2004 BCSC 422 at para. 63.**

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...

58 Taken as a whole the *Utilities Act*, viewed in the purposive sense required, does not reflect any intention on the part of the legislature to confer upon the Commission a jurisdiction so to determine, punishable on default by sanctions, the manner in which the directors of a public utility manage its affairs.

In its decision on BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application,² the BCUC underscored the distinction between its rate setting powers and BC Hydro's responsibility for managing compensation:

... the Panel acknowledges some interveners' concerns that BC Hydro must continue to control labour costs, which form a large portion of its base operating costs. However, we are not persuaded by the CEC's argument that the BCUC should not approve the proposed management and professional salary increases. To be clear, the Panel cannot reject a salary increase, merely deny its recoverability in customer rates. However, the savings to operating costs that would ensue from reducing the proposed management and professional salary increase by 0.5 percent would be minimal. The potential long term negative impact on productivity and employee retention resulting from the disallowance of the proposed management and professional salary increase outweighs the benefits of the resulting rate reduction in the Test Period.

With respect to holdback [incentive] pay, BC Hydro appears to have a well-established process for evaluating performance against the individual and corporate objectives. ... [Underline added.]

Similarly, the BCUC cannot reject or direct the incentive provisions of BC Hydro's employee compensation plan; it can only allow or deny recovery of the compensation cost in customer rates where the expense is deemed to be unreasonable. Given the scope of the BCUC's jurisdiction, the BCUC should refrain from considering the design of the incentive provisions of BC Hydro's employee compensation plan.

² [Decision and Order G-246-20.](#)

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10.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-9, Appendix A, Dr. Dennis Weisman Supplementary
Report, p. 6
Revenue Decoupling**

Dr. Weisman states on page 6 of his supplemental report that:

Revenue decoupling can represent an important element of a regulatory regime. The additional revenue stability provided by decoupling (i.e., delinking revenues from system use) can potentially extend the period between rate cases or rebasing (i.e., regulatory lag) and thereby strengthen incentives for performance.

He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.1 Dr. Lowry states in his report that a key additional rationale for decoupling is its ability to remove the throughput (i.e. lost margin) disincentive that can otherwise cause utilities to resist demand-side management (DSM) programs and rate designs that encourage DSM. Does Dr. Weisman agree? Why or why not?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

In general, I agree with Dr. Lowry's statement. However, implicit in this statement is the premise that profit-maximization and earnings-based employee compensation serve as the primary motivation for the utility's behavior. In the case of a Crown Corporation, this may not be the case. A Crown Corporation may well be motivated to take specific actions that are largely independent of profitability so as to be duly responsive to Commission and Government directives.

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10.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

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He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.2 Dr. Weisman is a former economist for a telecommunications utility and has written extensively on that industry's PBR experience. Please discuss the key differences in the telecommunications industry compared to vertically integrated crown-owned utilities, including incentives for marketing their services.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Key differences between the experience with incentive regulation in telecommunications and PBR in electric power are discussed in the following publications, which are provided as attachments.

David E. M. Sappington and Dennis L. Weisman, "The Disparate Adoption of Price Cap Regulation in the U.S. Telecommunications and Electricity Sectors," Journal of Regulatory Economics, Vol. 49(2), April 2016, pp. 250-264.

David E. M. Sappington and Dennis L. Weisman, "The Price Cap Regulation Paradox in the Electricity Sector," The Electricity Journal, Vol. 29, April 2016, pp. 1-5.

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Selected key differences between the telecommunications industry and vertically integrated crown utilities are as follows:

1. **The telecommunications provider would generally be marketing a number of different services, many of which are provided in service bundles. These would include landline telephony, wireless telephony, broadband services, and video entertainment. A number of these services are known to be relatively high-margin offerings;**
2. **The telecommunications provider would tend to be a profit-maximizing entity. This may create a substantive difference in the motivation for marketing select services between the telecommunications provider and the Crown-owned utility. Please see, however, my response to BCUC IR 1.10.1;**
3. **The telecommunications provider would tend to face myriad forms of competition for most, if not all of its service offerings; and**
4. **Environmental considerations play little to no role in the actions related to the provision of services for the telecommunications provider.**

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The disparate adoption of price cap regulation in the U.S. telecommunications and electricity sectors

David E. M. Sappington¹ · Dennis L. Weisman²

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Abstract Price cap regulation (PCR) has experienced widespread adoption in the U.S. telecommunications industry, but not in the electricity sector. We suggest that these disparate experiences may reflect in part the manner in which PCR often is implemented in the U.S., relatively limited opportunity for “regulatory bargains” in the electricity sector, and relatively limited competition in the transmission and distribution components of this sector.

Keywords Price cap regulation · Telecommunications · Electricity

JEL Classification L51 · L94 · L96

1 Introduction

Rate of return regulation (RORR) has been roundly criticized by regulators, regulated firms, consumers, and scholars alike. Under RORR, the prices the regulated firm can charge for its services are set to allow the firm to recover its costs and earn a fair return on its investments. Regulators often disfavor RORR because it can weaken the firm’s incentive to reduce its costs and because it can entail substantial regulatory oversight that is both costly and time consuming. Regulated firms often object to RORR on the grounds that it provides little reward for exceptional performance and

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can invite regulatory micromanagement of its activities.¹ Consumers dislike the high prices that can accompany high costs under RORR. Numerous scholars have identified additional problems that RORR can introduce, including excessive infrastructure investment, limited innovation, inefficient choice of production technology, welfare-reducing diversification into unregulated markets, and inappropriate shifting of costs from unregulated to regulated operations.²

Dissatisfaction with RORR has led to experimentation with alternative forms of industry governance, often referred to collectively as performance based regulation (PBR) or incentive regulation. Price cap regulation (PCR) is a form of PBR that allows the prices the regulated firm charges for its services to diverge from realized costs during the specified PBR regime. PCR can thereby provide strong incentives for the firm to reduce its operating costs during the PBR regime.

Under a form of PCR that is commonly employed in the U.S., the firm's prices are set to reflect prevailing costs at the start of the PBR regime, and then are permitted to increase, on average, at the rate of economy-wide retail price inflation (I), less an offset (X), called the X factor for the remainder of the regime.³ Under this form of PCR, the X factor measures the extent to which productivity in the regulated industry is expected to increase more rapidly and industry input prices are expected to increase less rapidly than in the economy as a whole (Bernstein and Sappington 1999).⁴ Under such PCR, a firm that either increases its productivity growth rate above expected industry norms or reduces its input price growth rate below expected industry norms has the potential to secure extra-normal earnings. In addition to providing strong incentives for the firm to reduce its operating costs and otherwise increase its productivity, such PCR can reduce the need for costly regulatory hearings to measure costs and re-set prices to match costs during the PBR regime.

Although PCR has been widely deployed in the U.S. telecommunications industry (e.g., Abel 2000; Sappington and Weisman 2010), its adoption in the U.S. electricity sector has been far less ubiquitous (e.g., Makholm et al. 2012b; Lowry et al. 2013). The PBR that has been adopted in the transmission and distribution segments of the electricity sector often retains explicit linkages between prices and costs.⁵ It also tends to focus incentives on particular performance dimensions, and often explicitly limits

¹ If the regulated firm is restricted to earn the allowed rate of return on prudent investments but imprudent investments are disallowed, the firm may not be able to realize a return above its cost of capital. Kolbe and Tye (1991) suggest that the allowed rate of return for regulated firms typically does not adequately compensate the firm for this risk of disallowance. Also see Lowry (2007, pp. 7–9).

² See, for example, Averch and Johnson (1962), Braeutigam and Panzar (1989, 1993), Hillman and Braeutigam (1989), Armstrong et al. (1994), Blackmon (1994), Crew and Kleindorfer (1996, 2002), Sappington (2002), Littlechild (2003a), and Armstrong and Sappington (2007).

³ To illustrate, if I is 3 % and X is 2 %, the regulated firm is permitted to increase its prices, on average, by 1 % (= 3 %–2 %) annually. The rate of authorized price increase also can be adjusted (by a “ Z factor”) during the price cap regime to account for major, exogenous changes in revenues or costs. Z factor adjustments are discussed in more detail in Sect. 3.

⁴ Under other implementations of PCR, the X factor is more accurately viewed as the outcome of a bargain between the regulator and the regulated firm over the portion of anticipated profit that should be awarded to consumers (Littlechild 1983; Crew and Kleindorfer 1996, pp. 218, 220).

⁵ Crew and Kahlon (2014, p. 112) observe that in both the energy and water sectors “there has been a move away from PCR into an extended form of ROR[R].”

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authorized earnings. In addition, experiments with incentive regulation have ended with a return to RORR in some jurisdictions.

The purpose of this article is to suggest possible explanations for the relatively limited adoption of PCR in the transmission and distribution components of the U.S. electricity sector.⁶ We emphasize three potential explanations. The first pertains to an element of the implementation of PCR, namely the use of historic industry productivity growth data to predict likely future industry productivity growth. Even when this methodology is applied symmetrically across industries, it can differentially disadvantage regulated suppliers in the electricity sector if the potential for increasing productivity growth over time is relatively limited in this sector. The second explanation concerns the expanded scope for “regulatory bargains” in the telecommunications sector. We suggest that suppliers may have accepted relatively stringent PCR of basic communications services in return for limited regulatory oversight of other communications services. The third explanation is the greater potential for competition in the telecommunications sector. PCR can provide useful pricing flexibility and be particularly effective at motivating cost reduction when it serves as a transition to widespread industry competition (Littlechild 1988).

The discussion proceeds as follows. Section 2 briefly reviews the distinct trends in the adoption of PCR in the U.S. telecommunications and electricity sectors. Section 3 identifies a standard implementation of PCR in the U.S. Sect. 4 suggests possible reasons for the less rapid and less ubiquitous deployment of PCR in the U.S. electricity sector. Section 5 concludes with suggestions for further research.

2 Industry differences in the adoption of incentive regulation

We begin with a brief review of trends in the adoption of PCR and other forms of incentive regulation in the U.S. telecommunications and electricity sectors.

2.1 Telecommunications

Table 1 illustrates the substantial and relatively rapid transition from RORR to PCR that occurred in the U.S. telecommunications industry.⁷ The table reports the number of U.S. states that adopted RORR, pure PCR, earnings sharing regulation, and rate case moratoria between 1985 and 2007. Pure PCR is the form of PBR discussed in the

⁶ Our focus on the transmission and distribution components of the electricity sector reflects the substantial deregulation of electricity generation and utility divestiture of generation assets that have taken place in the U.S. in recent years (Joskow 1998; Hickey and Carlson 2010).

⁷ This transition is often attributed to the gains that PCR can provide to consumers, producers, and regulators alike (Lehman and Weisman 2000). Abel (2000, pp. 66–68) observes that “Under price-cap regulation, telephone prices have either fallen or remained the same, productivity has generally increased, modern infrastructure has been deployed at a more rapid pace, and firms have performed at least as well financially relative to the other methods of regulation available. ... Therefore, ... it is likely that ... price-cap regulation in the United States telecommunications industry has produced benefits to consumers, producers, and regulators alike.” Price cap regulation also has been employed in the postal sector in advanced economies (e.g., Correia da Silva et al. 2004; Eccles and Kuipers 2006).

Table 1 The number of US state telecommunications regulatory agencies employing the identified regulatory policy

Year	Rate of return regulation	Earnings sharing regulation	Rate case moratoria	Pure price cap regulation
1985	50	0	0	0
1987	36	3	10	0
1990	23	14	9	1
1993	17	22	5	3
1995	18	17	3	9
1998	13	2	3	30
2000	7	1	1	39
2003	6	0	0	40
2007	3	0	0	33

Table 1 is reproduced from [Sappington and Weisman \(2010\)](#). The numbers do not sum to 50 in every row of Table 1 because some regulators adopted forms of regulation other than those identified in the table

Introduction under which the authorized rate of price increase is linked to a measure of inflation but not to the regulated firm's realized costs. Pure PCR also places no explicit limits on the regulated firm's earnings and does not require the firm to share any realized earnings with its customers. Under earnings sharing regulation, the regulated firm and its customers share realized earnings above specified thresholds.⁸ Under rate case moratoria, prevailing prices are frozen for a period of time, regardless of the regulated firm's realized earnings.

The persistent reduction in the number of states employing RORR and the corresponding increase in the implementation of pure PCR reported in Table 1 reflect the fact that regulatory agencies that adopted PCR in their telecommunications sectors seldom reversed course and re-introduced RORR.⁹ The reduction in the number of states employing PCR between 2003 and 2007 reflects the increasing (and still ongoing) trend toward more pronounced deregulation of retail telecommunications services.¹⁰

2.2 Electricity

To our knowledge, a counterpart to Table 1 is not available for the U.S. electricity sector. We are not aware of a simple, systematic characterization of the regulatory plans that

⁸ [Schmalensee \(1989\)](#) and [Lyon \(1996\)](#) discuss the merits of earnings sharing regulation.

⁹ PCR has also been implemented in many other telecommunications sectors around the world, including those in Argentina, Australia, Canada, Chile, Columbia, Denmark, Ecuador, France, Germany, Greece, Hungary, Ireland, Mexico, Pakistan, Portugal, Sweden, the United Kingdom, and Venezuela ([Sappington and Weisman 2010](#), pp. 231–234).

¹⁰ [Lichtenberg \(2015, p. iv\)](#) reports that as of July 2015, "36 states had passed legislation deregulating retail telecommunications in all or in part. [Furthermore, the] public utility commissions in Pennsylvania and New Jersey reduced regulation on Verizon where services or geographic areas were found to be competitive. These actions have brought the total number of states eliminating or limiting oversight of retail telecommunications to 38."

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have been adopted in the U.S. electricity sector over time. The more disparate and selective evidence that is available suggests that pure PCR has not been adopted as rapidly or as pervasively in the electricity sector as it has in the telecommunications sector. To illustrate, by the turn of the century, 28 U.S. electric utilities operated under some form of broad-based incentive regulation.¹¹ However, only half of these firms operated under a variant of PCR.¹² Furthermore, three-fourths of the twenty-eight PBR plans contained some form of earnings sharing or “deadbands,” which specify a limited range in which the regulated firm’s earnings can vary (Sappington et al. 2001).¹³

Brown et al. (2010) identify an important regulatory trend in the U.S. electricity sector in the early 2000s that never materialized in the U.S. telecommunications sector. The authors report that the number of U.S. states employing broad-based PBR plans in the electricity sector decreased from 16 in 2000, to ten in 2003, to five in 2007. Broad-based plans have been replaced in part by more targeted plans that explicitly link the prospect of increased earnings to the firm’s performance on specific facets of its operation (e.g., service reliability).

A more recent review of regulatory plans concludes that as of 2013, twelve U.S. states employed what are identified as multi-year price cap plans in their electricity sectors (Lowry et al. 2013, Table 8). These plans include both PCR plans and rate freezes. Several of these plans link rate increases to increases in capital investment, thereby retaining a key element of RORR.¹⁴

In summary, although PCR has been implemented in both the U.S. telecommunications and electricity sectors, its implementation has been more rapid, more ubiquitous, and more persistent in the telecommunications sector than in the electricity sector.

3 The basic price cap formula

We posit that the disparate experience with PCR in the U.S. telecommunications and electricity sectors may be explained in part by the manner in which this form of incentive regulation often is implemented in the U.S. (and in certain other countries, including Canada). To develop this explanation, we first review in more detail the key elements of this implementation of PCR.

¹¹ A broad-based PBR plan is one that permits substantial variation in the earnings of the regulated firm and does not link the variation explicitly to particular performance dimensions (e.g., service reliability).

¹² In contrast, 39 U.S. states employed pure PCR in their telecommunications sectors in 2000.

¹³ Hemphill et al. (2003, p. 323) report that as of 2003, “Although there has been significant change in the electricity industry over the past two decades, there has been relatively limited application of incentive regulation to the major services provided.”

¹⁴ Electricity regulators in Europe have been implementing alternatives to RORR in recent years (Jamash and Pollitt 2007; Cambini and Rondi 2010; Perrin 2013). However, these alternatives typically retain some elements of RORR and many are not broad-based. In particular, although some European electricity suppliers often are not automatically reimbursed for realized operating expenses, they continue to be afforded a fair return on capital investment, much as under RORR. Profit sharing also is common. Furthermore, allowed revenues often are linked to such performance measures as the number of new network connections supplied, realized levels of customer satisfaction, the number of network outages, and the fraction of generated electricity that is lost during transmission (Fox-Penner et al. 2013; Perrin 2013).

At the outset of a price cap regime, the regulated firm's prices typically are set to generate a stipulated target rate of return. Prices, P , are then permitted to increase, on average, at the rate:

$$\dot{P} = I - X + Z. \quad (1)$$

The I in equation (1) is an economy-wide measure of retail price inflation. X is the productivity offset, which reflects the extent to which productivity is expected to increase more rapidly in the regulated sector than elsewhere in the economy during the price cap regime.¹⁵ Z permits adjustments to the authorized rate of price increase in response to certain changes in the firm's costs (or revenues) that reflect exogenous departures from historic experience.¹⁶ Z factor adjustments effectively introduce an element of RORR into PCR, but only for unusual, exogenous events rather than for all of the firm's activities.

Equation (1) implies that the economy as a whole effectively serves as a benchmark for the regulated firms under this form of PCR. If industry productivity is expected to increase at the same rate that economy-wide productivity increases, then (absent substantial exogenous changes in industry costs and revenues) the regulated suppliers are permitted to increase their prices at the same rate that prices increase elsewhere in the economy. In contrast, if regulated suppliers are deemed capable of achieving more rapid productivity growth than other firms in the economy, then the regulated suppliers are required to pass this differential productivity growth onto consumers in the form of prices that increase less rapidly than prices elsewhere in the economy.

The primary challenge in implementing the price cap formula in equation (1) is determining an appropriate value for X . In the U.S., a common approach to this challenging task is to set X equal to X_h , the rate at which productivity growth in the regulated industry has exceeded productivity growth in the economy as a whole historically.¹⁷ This approach implicitly assumes that historic productivity growth differentials are the best predictors of corresponding future differentials.

¹⁵ Technically, as noted above, the X factor measures the extent to which productivity in the regulated industry is expected to increase more rapidly and industry input prices are expected to increase less rapidly than in the economy as a whole. For expositional ease, we will not explicitly mention relevant differences in input price growth rates in the ensuing discussion.

¹⁶ Z factor adjustments typically require that the relevant event: (i) be beyond the control of the regulated firm (i.e., exogenous); (ii) be of sizable financial magnitude; and (iii) affect the regulated firm disproportionately, so that its financial impact is not fully reflected in the inflation index in the prevailing price cap formula. Examples of events that can trigger Z factor adjustments include changes in tax policy, natural disasters, and major changes in regulatory policy. The fuel adjustment clauses that are common in the electricity sector can also be viewed as Z factor adjustments. Fuel adjustment clauses allow the retail prices that a vertically-integrated electricity supplier charges to change automatically to offset a portion of the amount by which costs vary due to changes in key input prices (e.g., the price of natural gas employed to power generating units).

¹⁷ Crew and Kleindorfer (1996, p. 218) observe that this approach to setting the X factor "is frequently employed in practice" in the U.S. To illustrate, the approach was employed at the federal level by the U.S. Federal Communications Commission (FCC) in 1990 (FCC 1990) and at the state level by the Maine Public Utilities Commission (MPUC) in 1995 (MPUC 1995), the Massachusetts Department of Public Utilities (MDPU) in 1995 (MDPU 1995), and the Illinois Commerce Commission (ICC) in 2002 (ICC 2002). The approach has also been adopted by national telecommunications regulators in other countries (e.g., in Canada in 1996 (CRTC Decision, 97-9) and in Peru in 2004 (Bernstein et al. 2006)).

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Although this approach may not always generate the ideal value for X , it has the advantage of constituting a systematic approach that is grounded in economic principles (Bernstein and Sappington 1999) and supported by relevant industry data. Consequently, this relatively mechanistic approach may help U.S. regulators, who typically operate in litigious environments, to limit the extent to which their policies are overturned by courts.¹⁸

U.S. regulators have recognized that past performance may not always be the best predictor of future performance, especially during an initial transition from RORR to PCR. Indeed, one reason for replacing RORR with PCR is to motivate regulated firms to discover new ways to reduce their operating costs and thereby enhance their productivity (Beesley and Littlechild 1989; Weisman and Pfeifenberger 2003; Littlechild 2003b). Consequently, some regulators have added a stretch factor (S) to the basic price cap formula, particularly when PCR is first implemented. The stretch factor reflects an estimate of the extent to which the productivity growth rate in the regulated industry is expected to increase above historic levels because of the enhanced incentives for efficient operation that PCR creates.^{19,20} Thus, under a common (initial) implementation of price cap regulation in the U.S. (and in some other countries, including Canada), the regulated firm's prices are permitted to rise, on average, at the rate:

$$\dot{P} = I - X_h + Z - S \quad (2)$$

4 Explaining the difference in PCR adoption rates

We now consider possible explanations for the different rates of adoption of PCR in the telecommunications and electricity sectors.

4.1 Productivity growth rates

PCR of the form summarized in equation (2) can allow a regulated firm to secure substantial earnings if it can readily achieve productivity growth rates that exceed

¹⁸ Beesley and Littlechild (1989) observe that regulators in the UK typically are not required to justify in complete detail every element of their decisions. Indeed, Professor Stephen Littlechild, the original proponent of PCR in the UK, viewed the X factor as "a number to be negotiated" (Littlechild 1983, ¶ 13.17). In contrast, the X factors adopted by the FCC and various U.S. state regulatory commissions have been subject to legal challenges (Vogt 1999). See, for example, *USTA v. FCC* 188 F.3d 521 (United States Telephone Association v. Federal Communications Commission 1999) and *Illinois Bell Tel. Co. v. Illinois Commerce Comm'n*, 669 n.e.2d 919, 927 (ill. app. ct. 1996).

¹⁹ The FCC included a stretch factor of 0.5 in its implementation of PCR in 2000 (FCC, 2000, ¶ 74). The Canadian Radio-television and Telecommunications Commission (CRTC) adopted a stretch factor of 1.0 in its implementation of PCR in 1997 (CRTC 1997, CRTC 97-9, ¶ 100). The Alberta Utilities Commission (AUC) instituted a stretch factor of 0.2 in its 2012 PBR plan for electricity and natural gas suppliers (AUC 2012, ¶ 499).

²⁰ Although the stretch factor often accounts for changes in incentives that are expected to lead to higher levels of realized productivity growth, it typically does not account for likely changes in maximum attainable industry productivity growth. Failure to account for these changes can be problematic for electric utilities because declining demand for electricity and environmental mandates can reduce maximum attainable industry productivity growth rates below historic levels.

historic growth rates (Crew and Kleindorfer 1996). In contrast, this form of regulation can constrain the firm's earnings unduly if the firm is incapable of achieving historic productivity growth rates. Therefore, regulated firms are more likely to welcome this form of PCR in settings where achievable productivity growth rates are increasing over time, *ceteris paribus*.

At the time when PCR adoption was increasing most rapidly in the U.S. telecommunications sector, sustained or increasing productivity growth rates often were feasible for two primary reasons. First, the demand for communications services was increasing.²¹ Second, information processing costs (which are a key component of the costs of supplying switched telecommunications services) were declining.²² Increasing output levels and declining input costs both promote increasing productivity growth rates.²³

Corresponding demand-increasing and cost-reducing forces have not been as prevalent in the transmission and distribution components of the electricity sector in recent years. To illustrate, total annual retail sales of electricity in the U.S. increased by less than five percent (from 310.8 to 325.7 billion KWhs) between January 2001 and January 2015. These sales declined (from 331.9 to 325.7 billion KWhs) between January 2010 and January 2015.²⁴ Stagnant or declining demand can cause productivity growth rates to fall below historic levels,²⁵ and so PCR that employs historic productivity offsets (X_h) can unduly constrain the earnings of a firm that is experiencing declining demand for its product (Brennan and Crew 2016). Declining demand can cause a particularly pronounced reduction in productivity growth rates when fixed costs account for a large proportion of total production costs and when electric utilities are required to "stand by" as carriers of last resort.²⁶

The limited growth in demand for electricity in recent years reflects in part concerted efforts by policymakers to promote energy conservation. Although the price reductions and corresponding increased consumption that PCR can promote may be highly valued

²¹ The number of wireline local calls in the U.S. increased steadily from 365.3 million in 1985 to 536.5 million in 2000. Wireline calls declined thereafter as consumers substituted wireless calls for wireline calls. The total number of wireline calls (local and toll calls) and the number of billed wireline access minutes exhibited corresponding growth patterns. (FCC 2010, Table 10.2).

²² Jorgenson (2001) estimates that advances in information technology increased the rate of growth of total factor productivity in the U.S. by 0.5 percentage points between 1995 and 1999. Moore's Law describes the rapid decline in the cost of computing power, which translates directly into reduced costs of supplying switched telecommunications services. As Nuechterlein and Weiser (2013, p. 149) observe, Moore's Law roughly states that "the cost of a given amount of computing power halves every 18 months."

²³ As Mitchell and Vogelsang (1991, p. 9) observe, "In telecommunications networks, production facilities have well-determined capacities, and the costs of operation are nearly independent of the flow of services through those facilities." Consequently, productivity increases as output increases.

²⁴ U.S. Energy Information Administration (2015). The demand for electricity supplied by incumbent utilities is declining in part because of increasing opportunities for profitable electricity production by customers through the use of solar panels (DNV GL Energy 2014).

²⁵ Makhholm et al. (2012a) report that the average annual total factor productivity growth rate for the 72 U.S. electricity and gas distribution firms in their sample was 0.85 between 1973 and 2009. The corresponding average annual growth rate between 2000 and 2009 was -1.08 .

²⁶ See Kahn (1966; 1971, pp. 236–241) and Weisman (1988), for example. The utilities incur a large fraction of their costs in providing the option of use, but recover those costs predominantly on the basis of actual use. Lowry et al. (2013, pp. 24–26) discuss recent efforts to recover a larger fraction of fixed costs from fixed, rather than variable, charges on customers.

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in the telecommunications sector, they often are viewed less favorably in the electricity sector because they can frustrate efforts to promote energy conservation. In addition, revenues that are largely invariant to output (“decoupling”) often are favored in the electricity sector because they can encourage utilities to promote reduced electricity consumption (Brennan 2010). PCR generally does not promote such invariance.²⁷

4.2 Scope for regulatory bargains

PCR can admit substantial variation in earnings and thereby impose considerable financial risk on the regulated firm. Regulated firms are naturally reluctant to accept increased risk without a corresponding opportunity for increased earnings. Given the intense scrutiny that usually accompanies a new regulatory plan, regulators typically are reluctant to include in the plan provisions that clearly benefit the regulated supplier. However, regulators in the telecommunications sector may have had an alternative means of delivering compensatory financial benefits to industry suppliers.

Telecommunications suppliers typically provide many services, including basic local telephone service and other services that include more discretionary local telephone services (e.g., call-waiting and caller identification), long-distance telephone service, and broadband services. This diversity of offerings can permit a “regulatory bargain” which includes price cap regulation that clearly provides substantial, immediate gains for consumers of basic local telephone service.^{28, 29} Corresponding limited regulatory oversight of other services may have enabled telecommunications firms to generate earnings in unregulated markets that more than offset any losses (or relatively meager earnings) that they incurred in regulated markets due to stringent price cap policies.³⁰

Electricity suppliers typically do not enjoy corresponding opportunities for substantial earnings in other sectors. Therefore, regulators cannot promise favorable treatment

²⁷ PBR plans can be designed to foster cost reduction while implementing rate structures that incorporate substantial decoupling. To illustrate, Southern California Edison (SCE) proposed a PBR plan under which authorized revenue increases annually above a base-year revenue by an $I - X$ factor. Authorized revenue is also linked to the number of customers that SCE serves (CPUC 1996). The plan’s focus on base-year revenue (which includes both fixed and variable charges for electricity) helps to insulate SCE against earnings reductions that might otherwise arise as customers reduce their electricity consumption. The CPUC ultimately implemented a plan along these lines (Weber et al. 2006).

²⁸ In addition to guaranteeing price reductions for consumers, telecommunications suppliers often have agreed to undertake costly investment projects (e.g., infrastructure expansion and modernization) when they operate under PCR (Sappington and Weisman 1996, p. 74).

²⁹ These gains include immediate reductions in basic local telephone rates and/or guarantees of limited increases in these rates over time. U.S. regulators have long valued low basic local telephone rates, as evidenced by the fact that they mandated prices for long-distance telephone calls well above cost in order to keep basic local telephone rates low. This rate design was adopted even though it may have failed to promote or perhaps even impeded universal service (Erikson et al. 1998). Sappington and Weisman (1996, p. 30) characterize this rate design as “Reverse Ramsey Pricing” because it implements price-cost margins that vary directly, rather than inversely, with the price elasticity of demand.

³⁰ The fact that many competitive local exchange carriers ultimately exited regulated markets despite the presence of policies designed to encourage their participation suggests a limited potential for substantial earnings in these markets.

in other sectors in return for PBR plans that are particularly favorable to electricity consumers. Consequently, regulated electricity suppliers may be unwilling to overlook problems with PBR (e.g., substantial earnings risk and relatively low expected earnings) that their counterparts in the telecommunications sector would accept in order to secure ongoing substantial earnings in unregulated markets.

4.3 Different degrees of industry competition

Suppliers of telecommunications services typically have faced substantial and increasing competition in recent decades. In contrast, the transmission and distribution components of the electricity sector have experienced relatively little competition. Substantial competitive pressure can promote the adoption of PCR for at least four reasons. First, PCR can be of particular value in industries with emerging competition because it can endow incumbent suppliers with the pricing flexibility they require to respond to competitive pressures. In particular, PCR typically enables incumbent suppliers to avoid lengthy regulatory hearings to assess the merits of proposed price changes, provided the proposed changes comply with the prevailing price cap. Second, PCR can simultaneously help to promote industry competition because it does not authorize contemporaneous increases in the prices of monopoly-supplied services to offset any financial losses the incumbent supplier may incur due to aggressive pricing of services that face growing competition. Third, PCR limits the incentives of a regulated incumbent supplier to exaggerate its costs of supplying regulated services or to undertake welfare-reducing diversification into unregulated competitive markets (e.g., Braeutigam and Panzar 1989).

Fourth, when competition is expected to replace regulatory oversight in the near future, PCR can avoid an undesirable incentive effect that arises when PCR is implemented repeatedly over time. In this latter event, future X factors typically reflect current performance by the regulated firm. Consequently, the firm recognizes that superior current performance will result in more stringent future demands, which dulls the firm's incentive for efficient operation.^{31,32} Such recalibration of the X factor and the associated reduction in incentives are not necessary when PCR is short lived and rapidly replaced by industry competition (Littlechild 1988).

4.4 Different innovation potential

PCR can provide strong incentives to discover innovative ways to operate more efficiently. Such incentives are relatively likely to bear fruit in dynamic industries characterized by substantial potential for innovation and technological change. The

³¹ In this sense, ongoing PCR can function much like RORR. As Armstrong et al. (1994, p. 172) observe, "As a rough characterization, under rate-of-return regulation reviews are infrequent, and the regulatory lag is endogenous because either side can request a review, whereas under price caps the lag is relatively long, and the date of the next review is fixed in advance. The difference is one of degree rather than kind."

³² A firm's incentive for efficient operation is dulled to a lesser extent if the X factor the firm faces reflects average industry performance rather than that firm's individual performance (Littlechild 1988).

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telecommunications industry is generally regarded as having greater potential for technological change than the transmission and distribution components of the electricity sector (Beesley and Littlechild 1989). Consequently, the relatively widespread adoption of PCR in the telecommunications sector may reflect in part the greater potential gains from innovation that PCR can secure in this sector.

4.5 Different regulatory objectives

As noted above, a desire to promote energy conservation can limit supplier support for PCR by reducing productivity growth rates in the electricity sector. Other regulatory objectives also can limit the appeal of broad-based PCR in the electricity sector.³³ To illustrate, high perceived cost of failures of the electricity network can lead regulators to prefer targeted PBR plans to broad-based PCR plans.³⁴ Broad-based PCR plans that provide strong incentives for cost reduction can tempt regulated firms to limit expenditures designed to reduce the likelihood of a service outage.³⁵ Consequently, because legal or political constraints often limit the financial penalties that regulators can impose on suppliers in the event of network outages,³⁶ regulators may be relatively reluctant to adopt broad-based PCR in the electricity sector.

This list of possible explanations for the disparate adoption of PCR in the U.S. telecommunications and industry sectors is not exhaustive.³⁷ However, the list sug-

³³ Crew and Kahlon (2014) note the recent adoption of policies that insulate regulated firms from earnings risk in the energy and water sectors. The authors attribute this adoption in part to the multiple objectives the firms are being asked to achieve, including energy conservation and environmental protection.

³⁴ These costs include the political or reputation costs a network failure can impose on regulators. Outages of regulated wireline telecommunications networks also are disruptive. However, the impact of such outages can be limited by the presence of other (e.g., unregulated wireless) communications networks and by the self-healing nature of wireline telecommunications networks, which routinely detect localized network outages and re-route traffic accordingly.

³⁵ Sappington (2005) reviews the economic literature on the design of service quality regulation for public utilities, which includes the observation by Spence (1975) that price cap regulation can limit incentives for quality provision. Sunderland (2000) reports service quality problems that arose in the telecommunications industry under incentive regulation. Cronin and Motluk (2009) report corresponding problems in the electricity sector. Ter-Martirosoyan and Kwoka (2010) find that although service outages in the electricity sector do not occur more frequently under incentive regulation, the outages that arise tend to persist for longer durations. The authors note that reductions in service quality can be avoided if firms face substantial explicit financial penalties for sub-standard levels of service quality.

³⁶ To illustrate, electric utilities in Massachusetts are liable for up to 2.5 % of annual revenues should they fail to meet service quality standards (Massachusetts Department of Public Utilities 2014). Electric utilities in Alberta face financial penalties that reflect the financial gain the utility derived from allowing service quality to deteriorate (AUC 2012, ¶¶ 896–8). In practice, regulators may be reluctant to impose the maximum feasible penalties for fear of causing the regulated supplier to experience financial distress.

³⁷ One additional potential explanation relates to the problems that arose in California in 2000. Some utilities were operating under a form of PCR at this time when the combination of a dramatic increase in wholesale electricity prices and frozen retail prices caused the firms to experience severe financial distress (Borenstein 2002). This fact led some to blame PCR for the firms' financial troubles, even though the troubles were not limited to utilities that operated under PCR (Hemphill et al. 2003) and many factors other than PCR contributed to the troubles (Jurewitz 2002.) Thus, PCR may have fallen victim to the *post hoc ergo propter hoc fallacy*, as some may have mistakenly attributed the problems in California's electricity markets to experimentation with PCR, thereby limiting the adoption of PCR in other electricity sectors.

gests that widespread adoption of PCR as practiced in the U.S. telecommunications sector is unlikely to arise soon in the U.S. electricity sector. Conceivably, PCR might be implemented more widely in the U.S. electricity sector if it were implemented differently. In particular, the X factor might explicitly reflect an estimate of the productivity growth rate that industry suppliers can reasonably achieve rather than a simple extrapolation of historic productivity growth rates. Such implementation of PCR would be more challenging, but may be necessary to garner industry support for PCR unless future productivity growth rates are at some point expected to exceed historic rates.

5 Conclusion

PCR has enjoyed rapid and widespread deployment in the U.S. telecommunications industry, but not in the U.S. electricity sector. This fact is somewhat puzzling because PCR often is considered to be a superior form of economic regulation quite generally rather than a superior form of regulation only in selected settings. We have suggested several possible explanations for the observed disparate experiences. The explanations include a more limited scope for regulatory bargains, relatively slow and perhaps diminishing productivity growth, and more limited potential for competition in the electricity sector.

The foregoing discussion leaves many questions for future research. For instance, the extent to which each of the possible explanations of the disparate experiences in the U.S. telecommunications and electricity sectors has actually contributed to these distinct experiences merits careful study. Future research also should examine whether PCR as practiced in the U.S. telecommunications sector is an appropriate regulatory policy in the electricity sector. If not, then fruitful modifications to this common implementation of PCR warrant investigation.

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The price cap regulation paradox in the electricity sector

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ABSTRACT

PCR has experienced widespread adoption in the U.S. telecommunications industry, but not in the electricity sector. Important institutional differences between the two sectors and the specific manner in which PCR has been implemented in the U.S. may help to explain this outcome. Changes to the standard implementation of PCR might promote its adoption in the electricity sector.

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1. Introduction

It is generally accepted that economic regulation should seek to emulate competitive market outcomes.¹ Price cap regulation (PCR) is generally deemed to be superior to traditional rate of return regulation (RORR) in accomplishing this objective because RORR can induce excessive infrastructure investment, limit innovation, and encourage inefficient production technologies and excessive diversification into unregulated markets.² PCR allows the prices the regulated firm charges for its services to diverge from costs for a specified period of time. By limiting the extent to which cost increases can be passed on to consumers in the form of price increases, PCR can provide the regulated firm with strong incentives to innovate and reduce its operating costs.

These observations introduce a paradox. If PCR is a superior form of economic regulation quite generally, why do we observe widespread adoption of PCR in the U.S. telecommunications industry, but not in the transmission and distribution segments of the electricity sector? The purpose of this article is to propose two complementary explanations for this apparent paradox. The explanations pertain to important institutional differences between the two sectors and to details of a common implementation of PCR in the U.S. We also suggest modifications of standard

implementations of PCR that may enhance its appeal in the electricity sector.

Before developing these explanations in detail, we briefly review the U.S. experience with PCR and with other alternatives to RORR, which are often referred to collectively as performance-based regulation (PBR).

1.1. PCR adoption in the telecommunications and electricity sectors

During the past few decades, the vast majority of U.S. states have abandoned RORR in favor of PCR in their telecommunications sectors. By 2003, 40 of the 50 states had adopted PCR. Furthermore, once a state adopts PCR, it almost never reverts to RORR.³

This contrasts sharply with the experience in the electricity sector. The number of U.S. states employing broad-based PBR plans in the electricity sector decreased from 16 in 2000, to 10 in 2003, to five in 2007.⁴ Broad-based plans were replaced in part by more targeted plans that explicitly link increased earnings prospects to

³ David Sappington and Dennis Weisman, "Price Cap Regulation: What Have We Learned from Twenty-Five Years of Experience in the Telecommunications Industry?" *Journal of Regulatory Economics*, 38(3), December 2010 at 15. The widespread adoption of PCR may be explained by the fact that PCR can be designed to provide gains to all interest groups. Dale Lehman and Dennis Weisman, "The Political Economy of Price Cap Regulation," *Review of Industrial Organization*, 16(4), June 2000 at 343–356.

⁴ Toby Brown, Paul Carpenter, and Johannes Pfeifenberger, "Incentive Regulation: Lessons from Other Jurisdictions," AUC PBR Workshop, Edmonton, Alberta, May 26–27, 2010. For an early survey of PBR trends in the electric power sector, see David Sappington, Johannes Pfeifenberger, Phillip Hanser, and Gregory Basheda, "Status and Trends of Performance-Based Regulation in the U.S. Electric Utility Industry," *The Electricity Journal*, 14(8), October 2001 at 71–79. A broad-based PBR plan is one that permits substantial variation in the earnings of the regulated firm and does not link the variation explicitly to particular performance dimensions (e.g., service reliability).

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¹ Alfred Kahn, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS*, Volume I, New York: John Wiley and Sons, 1970 at 17; and James Bonbright, *Principles of Public Utility Rates*, New York: Columbia University Press, 1961 at 107.

² For an overview and summary of the relevant economics literature, see Mark Armstrong and David Sappington, "Recent Developments in the Theory of Regulation," in Mark Armstrong and Robert Porter (eds.), *The Handbook of Industrial Organization*, Volume 3. Amsterdam: Elsevier Science Publishers, 2007 at 1557–1700.

the firm's performance on specific dimensions (e.g., service reliability). PBR plans in the electricity sector also commonly impose tight bounds on the range in which the regulated firm's earnings can vary.⁵

A recent survey finds that as of 2015, 14 U.S. states employed what are identified as multi-year rate plans in their electricity sectors.⁶ Some of these plans link rate increases to increases in capital investment, thereby retaining a key element of RORR.

In summary, the adoption of PCR in the U.S. has been more rapid, more ubiquitous, and more persistent in the telecommunications sector than in the electricity sector. We now suggest two complementary explanations for this phenomenon.

2. The role of institutional differences

Explanation 1. The disparate adoption of PCR reflects institutional differences between the electricity and telecommunications sectors.

Key institutional differences include the following.⁷

2.1. Industry competition

Suppliers of telecommunications services have faced substantial and increasing competition in recent decades. In contrast, the transmission and distribution segments of the electricity sector have experienced relatively little competition.⁸ Substantial competitive pressure can promote the adoption of PCR for two primary reasons. First, PCR can provide incumbent suppliers with the pricing flexibility they require to respond to increasing competition. Second, PCR can help to promote industry competition because it prevents incumbent suppliers from increasing prices of monopoly-supplied services to offset losses on competitively supplied services.

2.2. Productivity growth rates

As explained more fully below, PCR often acts like a two-edged sword: it permits a regulated firm to secure substantial earnings if it can readily achieve productivity growth rates that exceed historic growth rates, but can expose the firm to considerable

earnings risk if historic productivity growth rates cannot be replicated. Therefore, regulated firms are more likely to embrace PCR in settings where achievable productivity growth rates are increasing over time.

Moore's Law combined with demand growth has supported increasing productivity growth in the telecommunications industry in recent decades.⁹ In contrast, stagnant or declining demand¹⁰ coupled with higher production costs (due in part to environmental mandates) may have led to diminished productivity growth in the transmission and distribution segments of the electricity sector.¹¹

2.3. Environmental considerations

The limited growth in demand for electricity in recent years reflects in part the promotion of energy conservation policies. Although the price reductions and corresponding increased consumption that PCR can promote are encouraged in the telecommunications sector, they may be viewed less favorably in the electricity sector because they can impede energy conservation efforts.

2.4. Regulatory bargains

Telecommunications suppliers typically provide many services, including basic local telephone service and more discretionary services such as call waiting, caller identification, and broadband Internet access. This combination of offerings can facilitate a "regulatory bargain" whereby the regulator agrees to little or no regulatory oversight of discretionary (and often highly profitable) services in exchange for a stringent cap on the prices charged for basic local telephone service. Electricity suppliers typically enjoy relatively few opportunities for substantial earnings in other sectors. Consequently, regulators cannot promise favorable treatment in other sectors as the *quid pro quo* for PBR plans that deliver substantial benefits to electricity consumers.

2.5. Reliability concerns

High perceived costs of service interruptions can lead regulators to prefer targeted PBR plans to broad-based PBR plans like PCR. The existence of multiple telecommunications networks and the self-healing characteristics of these networks can temper these reliability concerns in the telecommunications industry. Broad-based PBR plans that provide strong incentives for cost

⁵ Sappington et al., 2001, Op. Cit. Hemphill et al. observe that "Although there has been significant change in the electricity industry over the past two decades, there has been relatively limited application of incentive regulation to the major services provided." Ross Hemphill, Mark Meitzen, and Philip Schoech, "Incentive Regulation in Network Industries: Experience and Prospects in the U.S. Telecommunications, Electricity, and Natural Gas Industries," *Review of Network Economics*, 2(4), December 2003 at 323.

⁶ Mark Lowry, Mathew Makos, and Gretchen Waschbusch, "Alternative Regulation for Emerging Utility Challenges: 2015 Update," Edison Electric Institute, November 2015 at Table 7.

⁷ For a more comprehensive discussion of these institutional differences, see David Sappington and Dennis Weisman, "The Disparate Adoption of Price Cap Regulation in the U.S. Telecommunications and Electricity Sectors," *Journal of Regulatory Economics*, 49(3), June 2016 (forthcoming).

⁸ The focus on the transmission and distribution components of the electricity sector reflects the substantial deregulation of electricity generation and utility divestiture of generation assets that have taken place in the U.S. in recent years. Emily Hickey and J. Lon Carlson, "An Analysis of Trends in Restructuring of Electricity Markets," *The Electricity Journal*, 23(5), June 2010 at 47–56.

⁹ Moore's Law describes the rapid decline in the cost of computing power, which translates directly into reduced costs of supplying switched telecommunications services. Moore's Law roughly states that "the cost of a given amount of computing power halves every 18 months." Jonathan Nuechterlein and Philip Weiser, *Digital Crossroads*. Cambridge MA: MIT Press, Second Edition, 2013 at 149.

¹⁰ Since the mid-1990s, electricity consumption has increased more slowly than output has expanded in the U.S., reversing a long-standing trend. Richard Hirsh and Jonathan Coomey, "Electricity Consumption and Economic Growth: A New Relationship with Significant Consequences?" *The Electricity Journal*, 28(9), November 2015 at 72–84. Total annual retail sales of electricity in the U.S. increased by less than 5% between January 2001 and January 2015, and declined by almost 2% between January 2010 and January 2015. U.S. Energy Information Administration, *Electricity Data Browser*, Retail Sales of Electricity (<http://www.eia.gov/electricity/data/browser/#/topic/5?agg=2,0,1&geo=g&freq=M&start=200101&end=201506&ctype=linechart&type=pin&rtype=s&maptype=0&rse=0&pin=>), visited September 21, 2015.

¹¹ The average annual total factor productivity growth rate for the 72 U.S. electricity and gas distribution firms examined in a recent study was 0.85 between 1973 and 2009. The corresponding average annual growth rate between 2000 and 2009 was –1.08. Jeff Makhholm, Agustín Ros, and Meredith Case, "Total Factor Productivity and Performance-Based Rate-making for Electricity and Gas Distribution," Presented at the 31st Annual Eastern Conference of the Center for Research in Regulated Industries, May 2012.

reduction can tempt regulated firms to restrict expenditures that reduce the likelihood of a service outage.¹² Service quality problems have arisen in both the telecommunications and electricity sectors following the adoption of PBR.¹³ Consequently, because regulators are limited in the financial penalties they can impose on suppliers in the event of network outages, they may be reluctant to adopt broad-based PCR in the electricity sector.

2.6. The California meltdown

California experienced a meltdown of unprecedented proportion in its electricity sector in 2000. A number of utilities in California were operating under a form of PCR at this time when a perfect storm of spiking wholesale electricity prices and frozen retail prices caused the firms to experience severe financial distress.¹⁴ These events prompted some to attribute the firms' financial woes to PCR, even though the troubles were not limited to utilities that operated under PCR, and a combination of factors other than PCR contributed to the meltdown.¹⁵ This attribution may have slowed the adoption of PCR in electricity sectors in other states.

3. The role of implementation details

Explanation 2. The disparate adoption of PCR reflects the manner in which PCR has been implemented in the U.S. and the differential earnings risk this imposes on electricity suppliers.

To explain the key implementation details that underlie Explanation 2, we begin by examining the key elements of the basic price cap formula commonly employed in PCR plans.

3.1. The basic price cap formula

At the outset of a price cap regime, the regulated firm's prices (P) typically are set to reflect prevailing costs. In an attempt to provide the firm with a reasonable opportunity to earn a fair return on its investments without linking prices to costs, the firm's prices are then permitted to increase, on average, at the rate of economy-wide price inflation (I), less an offset (X) called the X factor, for the remainder of the regime. Formally, the regulated firm's prices are permitted to rise, on average, at the rate:

$$\dot{P} = I - X + Z. \quad (1)$$

The X factor measures the extent to which productivity in the regulated industry is expected to increase more rapidly and industry input prices are expected to increase less rapidly than in the economy as a whole.¹⁶ A firm that increases its productivity growth rate above expected industry norms or reduces its input

price growth rate below expected industry norms has the potential to secure extra-normal earnings.

The Z factor in Eq. (1) permits adjustments to the authorized rate of price increase in response to certain changes in the firm's costs (or revenues) that reflect substantial, exogenous departures from historic experience.¹⁷ Z factor adjustments effectively introduce the cost-plus nature of RORR into PCR, but only for unusual, exogenous events rather than for all of the firm's activities.

To illustrate, if I is 3%, X is 2.5%, and there are no Z factor adjustments, Eq. (1) indicates that the regulated firm is permitted to increase its prices, on average, by 0.5% ($=3\% - 2.5\%$) annually. If $X = Z = 0$, then the regulated firm is allowed to increase its prices at the rate of inflation. Therefore, the X factor reflects the degree to which the regulated firm is permitted to increase its prices more rapidly than the rate of growth in retail prices elsewhere in the economy.

The primary challenge in implementing the price cap formula in Eq. (1) is determining an appropriate value for X . A common approach to this task in the U.S. is to set X equal to X_h , the rate at which productivity growth in the regulated industry has exceeded productivity growth in the economy as a whole historically.¹⁸ This approach implicitly assumes that historic differential productivity growth rates are the best predictors of corresponding future growth rates. Even when this methodology is applied symmetrically across industries, it can differentially disadvantage regulated suppliers in the electricity sector, where the potential for increased productivity growth tends to be relatively limited due in part to the institutional factors identified in Section 2.

This approach does not always produce the most appropriate value for X . However, the approach is a systematic one that is firmly grounded in economic principles and readily implemented using available industry data.¹⁹ Consequently, this somewhat mechanistic approach to setting the X factor may help U.S. regulators (who often operate in litigious environments) to reduce the risk that their policies will be overturned by courts.

U.S. regulators recognize that past performance is not always the best predictor of future performance, particularly during an initial transition from RORR to PCR. Indeed, one reason for replacing RORR with PCR is to motivate regulated firms to discover new ways to reduce their operating costs and thereby enhance their productivity.²⁰ Consequently, some regulators have added a stretch factor (S) (sometimes referred to as a "consumer

¹⁷ Z factor adjustments typically require that the relevant event: (i) be beyond the control of the regulated firm (i.e., exogenous); (ii) be of sizable financial magnitude; and (iii) affect the regulated firm disproportionately, so that its financial impact is not fully reflected in the inflation index in the prevailing price cap formula. Examples of events that can trigger Z factor adjustments include changes in tax policy, natural disasters, and major changes in regulatory policy.

¹⁸ Crew and Kleindorfer observe that this approach to setting the X factor is frequently employed in practice in the U.S. Michael Crew and Paul Kleindorfer, "Incentive Regulation in the United Kingdom and the United States: Some Lessons," *Journal of Regulatory Economics*, 9(3), May 1996 at 218. This approach was employed by the U.S. Federal Communications Commission, the Maine Public Utilities Commission, the Massachusetts Department of Public Utilities, and the Illinois Commerce Commission. See Sappington and Weisman, 2016, Op. Cit.

¹⁹ Bernstein and Sappington, 1999, Op. Cit.

²⁰ Michael Beesley and Stephen Littlechild, "The Regulation of Privatized Monopolies in the United Kingdom," *RAND Journal of Economics*, 20(3), Autumn 1989 at 454–472; and Dennis Weisman and Johannes Pfeifenberger, "Efficiency as a Discovery Process: Why Enhanced Incentives Outperform Regulatory Mandates," *The Electricity Journal*, 16(1), January/February 2003 at 55–62.

¹² A 2010 study finds that although service outages do not occur more frequently under incentive regulation, the outages that arise tend to persist for longer durations. Anna Ter-Martirosoyan and John Kwoka, "Incentive Regulation, Service Quality, and Standards in U.S. Electricity Distribution," *Journal of Regulatory Economics*, 38(3), December 2010 at 258–273.

¹³ Kim Sunderland, "State Regulators Go After Ameritech," *Channel Partners Online*, November 1, 2000 (<http://www.channelpartnersonline.com/articles/2000/11/regulatory-news-state-regulators-go-after-amerite.aspx>); and Francis Cronin and Stephen Motluk, "Ontario's Failed Experiment (Part 2)," *Public Utilities Fortnightly*, 147(8), August 2009 at 50–59.

¹⁴ Severin Borenstein, "The Trouble with Electricity Markets: Understanding California's Restructuring Disaster," *Journal of Economic Perspectives*, 16(1), Winter 2002 at 191–211.

¹⁵ John Jurewitz, "California's Electricity Debacle: A Guided Tour," *The Electricity Journal*, 15(4), May 2002 at 10–29.

¹⁶ Jeffrey Bernstein and David Sappington, "Setting the X Factor in Price Cap Regulation Plans," *Journal of Regulatory Economics*, 16(1), July 1999 at 5–25. For expositional convenience, references to differences in input price growth rates are suppressed in the ensuing discussion.

productivity dividend”) to the basic price cap formula, particularly when PCR is first implemented.²¹ The stretch factor is an estimate of the extent to which the productivity growth rate in the regulated industry will increase above historic levels because of the enhanced incentives for efficient operation that PCR creates.²² Thus, under a common (initial) implementation of price cap regulation, the regulated firm’s prices are permitted to rise, on average, at the rate:

$$\dot{P} = I - X_h + Z - S = I - (X_h + S) + Z. \quad (2)$$

The term $(X_h + S)$ in Eq. (2) may be interpreted as the efficient historical productivity offset. This is the differential productivity growth rate that would have been observed if industry suppliers had been operating efficiently.

3.2. Adjusting for exogenous productivity trends

It is apparent that the standard implementation of PCR in Eqs. (1) and (2) can subject the regulated firm to financial hardship if the firm is not able to sustain historic productivity growth rates.²³ To address this concern, the standard implementation of PCR can be modified to incorporate a forward-looking factor. This “F factor” is the difference between the historic (X_h) productivity offset and the corresponding future offset (X_f) that is expected to prevail if industry suppliers operate efficiently. The F factor can be expressed formally as:

$$F = X_h - X_f = \Delta X. \quad (3)$$

When the F factor is included in the basic price cap formula in Eq. (1), industry prices are permitted to increase at the rate:

$$\dot{P} = I - X_h + Z + F = I - X_h + Z + \Delta X = I - X_f + Z. \quad (4)$$

The maximum permissible rate of price increase under the price cap formula in Eq. (4) exceeds the corresponding rate under the common price cap formula in Eq. (1) when (and only when) the estimated future productivity offset is less than the offset that reflects historic data. Therefore, use of an F factor can render PCR more attractive to suppliers that operate in industries where the maximum productivity growth rate that is readily achieved is declining over time.

The specification of an appropriate F factor in the electricity sector entails explicit consideration of likely changes in the demand for electricity, environmental mandates, and sector-specific costs. Energy conservation efforts (including demand-side management activities) can reduce the demand for electricity, and distributed generation (including photovoltaic rooftop panels) can reduce the demand for electricity supplied by incumbent utilities. In addition, environmental mandates (e.g., carbon taxes, reducing carbon emissions, or producing a specified fraction of electricity

²¹ Although the stretch factor often accounts for changes in incentives that are expected to lead to higher levels of realized productivity growth, it typically does not account for likely changes in maximum attainable industry productivity growth. This can be problematic for electric utilities because declining demand for electricity and environmental mandates can cause the maximum attainable industry productivity growth rates to decline below historic levels.

²² The Federal Communications Commission included a stretch factor of 0.5 in its implementation of PCR in 2000. The Canadian Radio-television and Telecommunications Commission adopted a stretch factor of 1.0 in its implementation of PCR in 1997. The Alberta Utilities Commission instituted a stretch factor of 0.2 in its 2012 PBR plan for electricity and natural gas suppliers. See Sappington and Weisman, 2016, Op. Cit.

²³ Makhholm et al. Op. Cit., May 2012 at 14 report TFP growth for electricity and gas distribution firms in their sample that “fluctuates considerably year to year and . . . in more recent years exhibits sharp declines. The fastest TFP growth occurred in 1976 at 4.96% while the slowest TFP growth occurred in 2008 at -5.26%.”

using renewable resources) can increase production costs and diminish productivity growth rates.

3.3. Adjusting for changes in required investment

The PCR formula in Eq. (2) can also fail to compensate the regulated firm fully for efficient operating and investment costs if the investment the firm must undertake during the price cap regime exceeds historic levels of investment. To the extent that major new investments (e.g., expanded smart grid infrastructure)²⁴ are required to serve customers’ needs, a “K factor” can be employed to modify the standard “I – X” formula. A K factor represents the extent to which the firm’s prices must be permitted to rise more rapidly over the course of the PBR regime in order to generate the additional revenue that is required to offset the increased efficient investment.²⁵ Formally, when a K factor is employed, the firm’s prices are permitted to increase over the course of the PBR regime at the rate:

$$\dot{P} = I - X_h + Z - S + \Delta X + K = I - X_f + Z + K. \quad (5)$$

Although this adjustment to the standard formulation of PCR is straightforward in principle, the adjustment can give rise to many complexities in practice. In particular, it can be difficult to determine whether a specific “new” investment departs sufficiently from historic (baseline) investment to warrant special treatment in the form of a capital (K factor) adjustment.²⁶ It can even be difficult to determine whether a particular investment is properly treated as a baseline investment or a new investment. To illustrate, to limit the number of times that communities are inconvenienced by construction, existing plant is often upgraded at the same time that new infrastructure is installed. The appropriate allocation of relevant costs to baseline and new investment can be difficult to identify precisely in such cases.

Capital adjustments also should reflect more than just the cost of the new investment. In particular, the adjustment should be reduced to the extent that the new investment permits reductions in ongoing operating costs.²⁷ Similarly, the capital adjustment should be reduced to the extent that the new investment permits reductions in other investments without reducing service quality. Furthermore, capital adjustments should only compensate the firm for efficient capital expenditures in order to motivate the firm to avoid unnecessary capital investment.

When a regulated firm is afforded substantial opportunity to modify the standard I – X formula to reflect changes in required investment, the firm may have an incentive to exaggerate the

²⁴ The Electric Power Research Institute estimates that the net investment required to transform the existing U.S. electricity grid into a smart grid “is between \$338 and \$476 billion.” Electric Power Research Institute, *Estimating the Costs and Benefits of the Smart Grid: A Preliminary Estimate of the Investment Requirements and the Resultant Benefits of a Fully Functioning Smart Grid*, Report #1022519, March 2011 at 1–4.

²⁵ K factors are common in PBR plans in the electricity sector. See Mark Lowry et al., November 2015, Op. Cit.; and Jeff Makhholm, Agustin Ros, and Stephen Collins, “North American Performance-Based Regulation for the 21st Century,” *The Electricity Journal*, 25(4), May 2012 at 33–47. In contrast, K factors are seldom (if ever) employed in the telecommunications sector. This might be the case because rising productivity growth rates may permit regulated telecommunications suppliers to operate profitably in the face of increasing investment requirements even without explicit K factors. They may therefore decline to request K factor adjustments in order to avoid the regulatory scrutiny of earnings that such requests likely would elicit.

²⁶ Any such adjustment should determine whether the problem is one of under-funded capital investments or simply a mismatch between the timing of revenues and the timing of capital expenditures.

²⁷ To illustrate, advanced metering infrastructure (AMI) is a new technology that allows for the remote reading of electricity meters and therefore expected reductions in operating expenditures.

extent and magnitude of the required investments. To limit this incentive, ex post assessments of the prudence of the investment and its financial implications might be undertaken. If, for example, the net cost of the investment is ultimately found to substantially exceed initial estimates, then a corresponding reduction in a future $I - X$ value might be imposed.

The stringency of the ex post review and the firm's corresponding financial liability might be linked to the stringency of the associated ex ante review. In particular, if the regulator explicitly approves the new investment following a thorough review of its merits and its net cost, then the regulated firm might not face any substantial financial penalty if the investment ultimately proves to be of more limited net value than initially thought. In contrast, if the standard $I - X$ formula is modified to reflect the firm's assessment of the net cost of a required investment with only limited regulatory scrutiny of the firm's projections, then the firm might be held liable for (at least) the full extent to which it is ultimately judged to have exaggerated the need for and the net cost of the investment in question.²⁸

Extensive use of F factor and K factor adjustments would alter the standard implementation of PCR as practiced in the U.S. telecommunications industry in part by requiring explicit predictions of likely departures from historic productivity and investment trends and in part by re-adjusting authorized prices over the course of the price cap regime as unanticipated investment needs arise. Increased reliance on such predictions likely would introduce greater subjectivity (and associated controversy) into the regulatory process. Increased use of ongoing price adjustments would increase the complexity of the regulatory process and introduce elements of RORR into PCR. However, appropriate use of F factor and K factor adjustments should limit the application of K factors to a relatively small portion of the regulated firm's activities.

4. Conclusion

PCR has enjoyed rapid and widespread adoption in the U.S. telecommunications industry, but not in the U.S. electricity sector. This fact may seem puzzling because PCR is often considered to be

a superior form of economic regulation quite generally rather than simply a superior form of economic regulation in certain settings. We have proposed two complementary explanations of the inter-industry differences in the adoption of PCR. We have also suggested modifications of the standard implementation of PCR that may enhance its appeal in the electricity sector.

Despite these modifications, the adoption of PCR in the electricity sector may never match that in the telecommunications industry, in part because of the delicate balance that a PBR plan must strike in the electricity sector in light of prevailing environmental and conservation goals. A successful PBR plan must motivate the regulated firm to operate more efficiently, limit harmful environmental externalities, and reduce electricity consumption while ensuring a reliable supply of electricity and the firm's financial solvency. These diverse objectives add considerable complexity to the design and implementation of PBR. Overcoming these challenges while adhering to the key tenets of PCR may be possible, but certainly will not be straightforward.

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David E. M. Sappington holds the titles of Eminent Scholar in the Department of Economics and Director of the Robert F. Lanzillotti Public Policy Research Center, both at the University of Florida. He has served as the Chief Economist for the U.S. Federal Communications Commission and as President of the Industrial Organization Society. He presently serves on the editorial boards of several journals, including the *Rand Journal of Economics*, the *Journal of Economics and Management Strategy*, and the *Journal of Regulatory Economics*.

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²⁸ A regulator's natural inclination to reserve judgment on the prudence of all investments under such a policy may be limited by the attendant increase in the firm's cost of capital.

British Columbia Utilities Commission Information Request No. 1.10.2.1 Dated: December 21, 2020 British Columbia Hydro & Power Authority Response issued February 4, 2021	Page 1 of 2
British Columbia Hydro & Power Authority BCUC Review of BC Hydro's Performance Based Regulation Report	Exhibit: B-9

10.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-9, Appendix A, Dr. Dennis Weisman Supplementary
Report, p. 6
Revenue Decoupling**

Dr. Weisman states on page 6 of his supplemental report that:

Revenue decoupling can represent an important element of a regulatory regime. The additional revenue stability provided by decoupling (i.e., delinking revenues from system use) can potentially extend the period between rate cases or rebasing (i.e., regulatory lag) and thereby strengthen incentives for performance.

He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.2 Dr. Weisman is a former economist for a telecommunications utility and has written extensively on that industry's PBR experience. Please discuss the key differences in the telecommunications industry compared to vertically integrated crown-owned utilities, including incentives for marketing their services.

1.10.2.1 Please discuss whether effective marketing was one cause of the rapid productivity growth in the telecommunications industry that permitted these companies to operate under high X factors or rate freezes.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Please see the aforementioned Sappington and Weisman articles provided in response to BCUC IR 1.10.2.

To the extent that marketing had a non-trivial impact on demand growth, it may have been a factor in contributing to relatively high rates of productivity growth and, in turn, the X factors under the various incentive regulation plans in the telecommunications industry. Moore's Law and high demand growth contributed to high productivity growth in telecommunications. I believe that it is reasonable to believe that marketing likely had some effect on demand growth, but I cannot

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attest to the fact that it was a significant effect. I am not aware of any peer-reviewed published articles that rigorously estimate the effects of marketing on demand growth in the telecommunications industry.

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10.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-9, Appendix A, Dr. Dennis Weisman Supplementary
Report, p. 6
Revenue Decoupling**

Dr. Weisman states on page 6 of his supplemental report that:

Revenue decoupling can represent an important element of a regulatory regime. The additional revenue stability provided by decoupling (i.e., delinking revenues from system use) can potentially extend the period between rate cases or rebasing (i.e., regulatory lag) and thereby strengthen incentives for performance.

He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.2 Dr. Weisman is a former economist for a telecommunications utility and has written extensively on that industry's PBR experience. Please discuss the key differences in the telecommunications industry compared to vertically integrated crown-owned utilities, including incentives for marketing their services.

1.10.2.2 Please confirm, or otherwise explain, that the telecommunications industry operated for many years under price caps with no revenue decoupling.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Confirmed. To the best of my knowledge, revenue decoupling was not an element of incentive regulation plans in the telecommunications industry in North America.

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He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.3 Based on his telecommunications experience, does Dr. Weisman believe that revenue decoupling weakens the Company's incentive to promote beneficial electrification, power exports, and services to price-sensitive customers?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

In general, I believe that revenue decoupling can potentially weaken the incentives for a profit-maximizing company to promote revenue growth. It would not necessarily have the same effect if the company were motivated primarily by other objectives, including Commission or Government directives.

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He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.3 Based on his telecommunications experience, does Dr. Weisman believe that revenue decoupling weakens the Company's incentive to promote beneficial electrification, power exports, and services to price-sensitive customers?

1.10.3.1 Please discuss whether this is a legitimate issue to consider in this and any successor proceeding on PBR for BC Hydro.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Please see my answer to BCUC IR 1.10.3.

Yes. Specifically, the BCUC could consider whether a modification to the current decoupling mechanism or some form of partial decoupling would alter incentives for marketing, in the case of BC Hydro.

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He states on pages 16 and 17 of this report that: “the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime.”

1.10.3 Based on his telecommunications experience, does Dr. Weisman believe that revenue decoupling weakens the Company’s incentive to promote beneficial electrification, power exports, and services to price-sensitive customers?

1.10.3.2 Are the options Dr. Lowry has discussed to remedy this problem, such as partial decoupling or performance incentive mechanisms (PIMs), worthy of further consideration?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Please see my answers to BCUC IR 1.10.3 and BCUC IR 1.10.3.1.

I have no direct knowledge that decoupling is a “problem” that adversely affects marketing incentives, in the case of BC Hydro.

Nonetheless, I believe the options that Dr. Lowry discusses, including partial decoupling and PIMs, are worthy of further consideration. By the same token, I believe it is also necessary to recognize that BC Hydro, as a Crown Corporation, may be motivated to take certain actions for reasons unrelated to profitability and earnings-based employee compensation (e.g., Commission and Government Directives).

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He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.4 Dr. Lowry has stated that, in the United States, revenue decoupling is usually combined with automatic escalation of allowed revenue on some sensible basis (e.g., customer growth) following any years in which revenue requirements have been established on the basis of rate cases. Can you confirm this?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

No. I cannot confirm this statement because I have not conducted an independent, exhaustive survey to examine this question. I am certainly aware that this is the case in certain instances. That said, I would have no reason to question the veracity of Dr. Lowry's statements on this matter.

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He states on pages 16 and 17 of this report that: "the share of the efficiency gains retained by the regulated firm has a pronounced effect on the power of the regulatory regime."

1.10.5 Dr. Lowry reports that many utilities who have been able to operate for many years without rate cases or formal multi-year rate plans have improved their cost performance. Please discuss whether this kind of provision makes sense for BC Hydro.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

I believe that so-called "stay-out provisions" or what I have termed rate case moratoria can potentially have beneficial effects in motivating utilities to improve performance. Improved performance can be expected when profit-maximization is a key element in motivating utility behavior. In the case of BC Hydro, the merits of this approach relative to the status quo would depend on its ability to implement an incentive-based employee compensation scheme so that its employees would be motivated to behave as if the utility is a profit-maximizing entity even though, in practice, it is not. However, to the extent that BC Hydro and its employees are motivated by factors other than increased profitability and earnings-based compensation, it is conceivable that its performance would not materially change if "stay-out provisions" were adopted. Indeed, Dr. Lowry's "mixed" findings regarding the performance of publicly owned utilities under PBR may provide some confirmation of this possibility.

See Performance-Based Regulation: Basic Features and Possible Applications to BC Hydro, Mark Newton Lowry, PhD President, Matthew Makos Consultant II,

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Rebecca Kavan, Economist, Prepared for the British Columbia Utilities Commission, 28 February 2020, Section 8.

Dr. Lowry further observes that "The impact of PBR on the performance of cooperative and publicly owned utilities is not well understood."

M.N. Lowry, M. Makos, J. Deason, and L. Schwartz, "State Performance-Based Regulation Using Multi-Year Rate Plans, for U.S. Electric Utilities," July 2017, p. 1.1., note 2.

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**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-8, Appendix A, Dr. Dennis Weisman –
Supplementary Report, pp. 7–8
Multi-year Rate Plans**

Dr. Weisman states on pages 7 and 8 of his supplemental report that:

Multi-year rate plans can strengthen the incentive power of the regulatory regime through a combination of external benchmarks (e.g., an $I - X$ index) or a fixed rate trajectory based on cost forecasts for rate setting and by increasing the length of the test period. The degree to which the incentive power of the regulatory regime is increased will depend on the various parameters of the multi-year rate plan. These parameters include, but are not limited to, the length of the regulatory regime (i.e., regulatory lag), the existence and structure of the earnings-sharing mechanism and the efficiency-carryover mechanism.

1.11.1 Please confirm that the Hybrid approach, popular in California and described by Dr. Lowry in his report, which indexes OM&A and bases capex budgets on an average of the utility's recent historical plant additions, is a well-established alternative in energy utility regulation to the two approaches that he has mentioned.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Not confirmed. I have not conducted an independent, exhaustive survey of the electric utility industry with respect to plan options to determine conclusively that this is a “well-established” approach as that term is used here. I am certainly aware that this is an approach that has been employed in some jurisdictions, but I cannot say more than that. Dr. Lowry points out in his BCUC report that California returned to a “more traditional regulatory system” in 2013.

See Performance-Based Regulation: Basic Features and Possible Applications to BC Hydro, Mark Newton Lowry, PhD President, Matthew Makos Consultant II, Rebecca Kavan, Economist, Prepared for the British Columbia Utilities Commission, 28 February 2020, p. 81.

An outstanding question concerns why this form of PBR has not had greater staying power? I would also point out that I believe there are hazards in simply

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examining regulatory practices in other jurisdictions and reflexively assuming that it would work satisfactorily or is necessarily the optimal approach in the case of BC Hydro as a Crown Corporation. I believe it is helpful to be mindful of the counsel proffered in the following quotation.

The two most important lessons to be drawn from the literature surveyed here are that there is no single combination of regulatory settings that is best in all situations and that the various components of a regulatory scheme are interrelated. The most appropriate regulatory scheme for a given situation will depend on the characteristics of the firm and industry being regulated, as well as the institutional environment.

Graeme Guthrie, "Regulating Infrastructure: The Impact on Risk and Investment," *Journal of Economic Literature*, Volume 44(4), December 2006, p. 966.

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1.11.1 Please confirm that the Hybrid approach, popular in California and described by Dr. Lowry in his report, which indexes OM&A and bases capex budgets on an average of the utility’s recent historical plant additions, is a well-established alternative in energy utility regulation to the two approaches that he has mentioned.

1.11.1.1 Please discuss the pros and cons of this approach in an application to BC Hydro. In this discussion, please do not assume that, in successive applications, the new capex budget would necessarily be based on the capex in the expiring plan.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

The potential advantages (“Pros”) associated with this approach may include the following:

1. Recognizes that the company may have greater control over OM&A expenses vis-à-vis capital additions in managing its operations.
2. Potentially provides adequate compensation for OM&A expenses if the index is chosen appropriately.

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3. **Potentially provides a mechanistic approach to capital additions and therefore reduces reliance on company forecasts which would then have to be scrutinized by the Commission and interveners. This purported advantage may also be a disadvantage, as discussed below.**
4. **Potentially provides company with strong incentives to maximize efficiency.**

The potential disadvantages (“Cons”) associated with this approach may include the following:

1. **Depending on the specific design of the PBR plan, this approach may limit opportunities for the company to engage in efficiency enhancing capital-labor substitutions.**
2. **The choice of an appropriate index for OM&A expenses may prove difficult in practice. Consultation with Statistics Canada may be advisable in the construction of an appropriate index. The Alberta utilities have consistently raised question as to the suitability of the index chosen by the Alberta Commission and whether it accurately reflects their input price growth.**
3. **The choice of an appropriate X factor specific to OM&A expenses (and the scope of costs to apply it to) can prove difficult as there is no apparent consensus among productivity measurement experts regarding the viability of this approach. In Decision 2012-237, the Alberta Utilities Commission echoed this sentiment in stating that “the Commission is not satisfied that there is any acceptable way to create an X factor suitable for use for non-capital-related costs only” (paragraph 58). The Alberta Utilities Commission reaffirmed its position on this matter in Decision 2013-435, paragraph 214. “In Decision 2012-237, the Commission did not approve the use of any partial productivity factors (either for capital or for O&M) of the type proposed by Dr. Lowry and the CCA.”**
4. **To the extent this approach links allowed CAPEX expenditures to historical capital additions, over-compensation or under-compensation can result. This is likely to be a problem if the industry is in a state of disequilibrium wherein the past is not a reliable guide to the future.**

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1.11.2 Please confirm that, in testimony for EPCOR in Alberta, Dr. Weisman supported a K bar approach to the design of rate and revenue cap indexes that effectively links each company’s capital revenue escalation to its recent historical capex.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Not Confirmed.

The version of K-Bar that I supported was discussed in my direct testimony in that proceeding. In its decision, the Alberta Utilities Commission “mechanized” the K-Bar approach by linking supplemental capital to the historical capital additions of the companies. This “mechanization” was not part of my evidence.

The above observations notwithstanding, I believe that historical capital additions can provide useful information as a benchmark to evaluate company forecasts. The Commission and interveners would then have the opportunity to query the company as to the reasons why deviations from historical capital additions, if any, are warranted. Hence, while I believe there is informational value in examining historical capital additions, I do not believe it is sound regulatory practice to reflexively assume that the future will necessarily look like the past insofar as capital additions are concerned.

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1.11.2 Please confirm that, in testimony for EPCOR in Alberta, Dr. Weisman supported a K bar approach to the design of rate and revenue cap indexes that effectively links each company's capital revenue escalation to its recent historical capex.

1.11.2.1 Please confirm that an efficiency carryover mechanism (ECM) can have an especially large incentive impact in the context of a relatively short plan term such as the three years that BC Hydro proposes. Should ECMs, which have been included in the current and expired multi-year rate plans (MRPs) of the FortisBC companies, be considered for BC Hydro in this or any successor proceeding on PBR for BC Hydro? If not, why not?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Confirmed. In general, I believe that ECMs are an important tool for increasing the incentive power of regulatory regimes because they would be expected to have the same qualitative effect as increasing the length of the regulatory regime, ceteris paribus. It would be premature and therefore ill-advised for me to comment authoritatively on the specific ECM design that would be appropriate for any specific PBR plan that may be proposed by BC Hydro.

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Forecasting Cost Growth**

Dr. Weisman states on page 10 of his supplemental report that:

While the protracted technical debate over the proper value of the X factor is circumvented with this approach, the cost forecasts must still be scrutinized rigorously. This exercise can prove challenging in an environment in which there are pronounced informational asymmetries. In other words, the regulated firm typically knows far more about its costs (and its ability to reduce them) than the regulator and interveners. Furthermore, to the extent that this approach obviates the need for an earnings-sharing mechanism, it eliminates another one of the most controversial elements of PBR.

In Appendix GG of Exhibit A2-1, Dr. Weisman stated that with regard to Option E that “the forward-looking approach that the plan entails could provide the company with incentives to exaggerate capital investment needs... the initial forward-looking assessment of prudent capital investment requires substantial regulatory resources.”

1.12.1 Given the material disadvantages of basing revenue requirements on cost forecasts, and the fact that many MRPs do not include earnings sharing, is the approach proposed by BC Hydro necessarily superior to the indexing and hybrid approaches to revenue cap escalation that Dr. Lowry discusses in his report?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

The primary focus of my analysis was on the incentive power of the regulatory regime. Assuming the benchmark that governs the utility's behavior (i) is invariant (exogenous) to the utility's behavior; (ii) does not undermine the financial viability of the utility and (iii) there is no earnings sharing in either regime, the incentive power may not differ between the two approaches.

I cannot state authoritatively at this point in time that one approach would necessarily dominate the other in terms of the rates that consumers pay. Finally, I believe the question as posed includes an implicit premise that may not hold in

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practice. Specifically, I believe the question implicitly assumes that the indexing approaching would necessarily eliminate forecasts. I do not believe this to be the case in all applications. For example, the allowed capital additions, to the extent they are not directly tied to the regulated firm's historical behavior, would also entail some element of forecasting. Hence, I do not believe it is generally correct that the use of an indexing approach necessarily obviates the need for forecasts, ceteris paribus.

Finally, a recent article in The Electricity Journal questions the wisdom of an indexing approach using I – X for future PBR plans given the significant, non-traditional investments in the electric power industry.

See Jeff D. Makholm, "The rise and decline of the X factor in performance-based electricity regulation," The Electricity Journal, Vol. 31, 2018, pp. 38-43.

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In Appendix GG of Exhibit A2-1, Dr. Weisman stated that with regard to Option E that “the forward-looking approach that the plan entails could provide the company with incentives to exaggerate capital investment needs... the initial forward-looking assessment of prudent capital investment requires substantial regulatory resources.”

1.12.2 Please discuss if utilities in California and Alberta face more risk concerning the regulator’s acceptance of their future costs, given the California and Alberta K bar approaches to the design of revenue cap escalators do not require the regulator to sign off on multi-year cost forecasts. Please discuss whether this mechanism provides an incentive advantage over the forecasting approach that BC Hydro proposes?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

At least with respect to Alberta, the utilities would not seemingly face a risk of cost disallowances since each is provided with what is essentially a pre-approved cost envelope within which it must manage its operations. [My understanding is that the only true-up in Alberta’s K bar approach is with respect to the actual cost of debt and any changes to the approved equity ratio and ROE.] Whether this cost envelope is adequate in the sense that it provides for financial viability is an outstanding question. In terms of the incentive power of the two approaches, I do

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not see any a priori reason to believe that they would be markedly different. In both cases, the cost envelope is (i) preapproved; and (ii) invariant to the firm’s extant behavior.

The firm’s incentive to exaggerate forecasts is an important consideration, but that incentive is not unequivocal. For example, if the regulated firm consistently exaggerated its forecasts, it would lose credibility with the regulator and the regulator has many tools available to “punish” firms that deliberately abuse its discretion. Second, in game-theoretic terms, the relationship between the regulator and the regulated firm is not a one-shot game, but a dynamic, multi-period game in which aberrant behavior in one period can be disciplined in subsequent periods. This is likely one of the reasons why the Averch-Johnson effect (i.e., the incentive to overemploy capital) under COSR regulation, which was initially developed in a static model, has defied consistent empirical validation. In other words, how the regulated firm would behave and conduct its operations when there is no “tomorrow” is likely to diverge significantly from how the regulated firm would behave and conduct its operations when there are many “tomorrows.” The multi-period game, which characterizes the interaction between the regulated firm and the regulator, provides a disciplinary mechanism that does not exist in a one-shot or static game.

Finally, there is no assertion that company forecasts would not be carefully scrutinized by the Commission and interveners. Moreover, there may be some value in using an appropriately chosen I – X index and historical capital additions as tools to evaluate company forecasts. In this manner, the company would be held to account for any significant divergence between its forecasts and what would be permitted under the I – X index and historical capital additions. Hence, these two approaches need not be mutually exclusive. This explains why I do not necessarily believe that the regulated firm’s incentive to exaggerate forecasts is unequivocal.

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Forecasting Cost Growth**

Dr. Weisman states on page 10 of his supplemental report that:

While the protracted technical debate over the proper value of the X factor is circumvented with this approach, the cost forecasts must still be scrutinized rigorously. This exercise can prove challenging in an environment in which there are pronounced informational asymmetries. In other words, the regulated firm typically knows far more about its costs (and its ability to reduce them) than the regulator and interveners. Furthermore, to the extent that this approach obviates the need for an earnings-sharing mechanism, it eliminates another one of the most controversial elements of PBR.

In Appendix GG of Exhibit A2-1, Dr. Weisman stated that with regard to Option E that “the forward-looking approach that the plan entails could provide the company with incentives to exaggerate capital investment needs... the initial forward-looking assessment of prudent capital investment requires substantial regulatory resources.”

1.12.3 Please discuss if the California and Alberta K-Bar approaches also reduce the need for earnings sharing.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

To the extent that these two approaches reduce or eliminate significant earnings windfalls or shortfalls (i.e., the variance in earnings), regulators may subscribe to the view that there is less need for earnings sharing mechanisms. I am not of the opinion that either approach would necessarily obviate the regulator’s perception that an earnings-sharing mechanism is necessary. I am of the view that properly designed offramps as a safeguard for earnings windfalls or shortfalls represent a superior approach to earnings-sharing mechanisms. Earnings-sharing mechanisms can significantly reduce the incentive power of PBR plans, ceteris paribus. In fact, such mechanisms can be even more intrusive than COSR as practiced in BC because it would necessarily entail annual earnings reviews. Finally, the empirical evidence on the performance gains from price cap regulation with earnings sharing mechanisms in the telecommunications industry is disappointing or worse.

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13.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-8, Appendix A, Dr. Dennis Weisman –
Supplementary Report, p. 11; Appendix B, Mr. Mark Kolesar
Submission
COSR**

Dr. Weisman states on page 11 of his supplemental report that:

In the textbook model of cost-of-service regulation, the earnings of the regulated firm are capped, and an earnings review can be triggered whenever earnings diverge sufficiently from target levels. In contrast, the form of cost-of service regulation that applies to BC Hydro specifies a fixed test period over which the regulated firm is not subject to an earnings review and a recalibration of rates to achieve a target rate of return. The distinction between textbook cost of-service regulation and PBR is often cast in terms of whether the term of the regulatory regime (i.e., regulatory lag) is fixed in advance or determined endogenously on the basis of the regulated firm’s earnings.

Mr. Kolesar’s discussion of cost of service regulation (COSR) in contrast contains the following passage on pages 6 to 7.

Once the forecast revenue requirement is established by the regulator, rates are approved to recover the revenue requirement in each of the years that are the subject of the regulatory regime and the utility is set on a “revenue trajectory” for the duration of that regime. *Barring any sufficiently significant events that might compel the regulator to bring the utility in for a subsequent review* prior to the end of the current regime (or that might compel the utility to apply for a subsequent review), this revenue trajectory is not altered... the utility is expected to respond to this incentive and to seek productivity improvements under COSR, thereby emulating to some extent the results expected in a competitive market, and in so doing retain any return in excess of the allowed return. *[italics added]*

1.13.1 Please support Dr. Weisman’s contention that “the textbook model” of COSR includes the earnings review he describes as an essential feature. In addition to a citation from his own academic work, please include a definition of COSR from another respected source that treats earnings reviews as an essential feature of COSR.

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RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

The statement that is quoted from my evidence does not make a definitive statement about an earnings review being an essential part of COSR, though I believe this is generally the case. To wit, I state that “the earnings of the regulated firm are capped, and an earnings review can be triggered whenever earnings diverge sufficiently from target levels.” (underlining added). In addition, as Armstrong et. al. state in their regulatory treatise:

A long lag provides good incentives for productive efficiency but might adversely affect allocative efficiency. A pure version of a price cap would have an infinite lag, whereas rate-of-return regulation has frequent reviews of prices. Regulatory lag is perhaps the key feature that differentiates RPI – X from rate-of-return regulation. ... As a rough characterization, under rate-of-return regulation reviews are frequent, and the regulatory lag is endogenous because either side can request a review, whereas under price caps the lag is relatively long, and the date of the next review is fixed in advance. The difference is one of degree rather than kind.

Mark Armstrong, Simon Cowan, and John Vickers, **REGULATORY REFORM**, Cambridge MA: The MIT Press, 1994, p. 172.

By linking allowed revenues to realized or estimated production costs, rate-of-return regulation provides the regulated firm with relatively weak incentives to reduce operating costs. In practice, incentives for cost reduction are not absent entirely because of regulatory lag. (footnote omitted) The firm's operating costs are not monitored continually, only at intermittent rate hearings. Therefore, cost reductions achieved between rate hearings are not immediately passed on to consumers in the form of lower prices, so the regulated firm can benefit temporarily from any cost reductions it implements. Nevertheless, rate-of-return regulation generally limits the firm's financial incentives to reduce operating costs.

David E.M. Sappington and Dennis L. Weisman, **DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY**, Washington D.C.: American Enterprise Institute and Cambridge MA: MIT Press, 1996, p. 5.

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Finally, in my view, the statement by Mr. Kolesar does not indicate that he is referencing the “textbook model” of COSR. Contextually, it would appear that Mr. Kolesar is referencing a form of COSR that was employed in Alberta for the regulation of Gas and Electric Power Companies.

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Once the forecast revenue requirement is established by the regulator, rates are approved to recover the revenue requirement in each of the years that are the subject of the regulatory regime and the utility is set on a “revenue trajectory” for the duration of that regime. *Barring any sufficiently significant events that might compel the regulator to bring the utility in for a subsequent review* prior to the end of the current regime (or that might compel the utility to apply for a subsequent review), this revenue trajectory is not altered... the utility is expected to respond to this incentive and to seek productivity improvements under COSR, thereby emulating to some extent the results expected in a competitive market, and in so doing retain any return in excess of the allowed return. *[italics added]*

1.13.2 Are earnings reviews commonplace in contemporary COSR for energy utilities? Does Dr. Weisman agree with Dr. Lowry statement on page 100 of his report that “many U.S. electric utilities have over the years avoided general rate cases for lengthy periods without a formal rate case stayout”?

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RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

I have not conducted an independent, exhaustive survey of whether earnings reviews are commonplace in COSR plans for energy utilities. Therefore, I cannot confirm Dr. Lowry’s statement, nor do I have reason to question its veracity. That said, it is difficult in general to see how a utility would avoid a rate case for an extended period of time unless an earnings review confirmed that the utility was experiencing neither a windfall nor a shortfall in earnings. The company would be expected to step forward in the case of significant deficient earnings, while consumer groups would be expected to step forward in the case of significant excess earnings.

What is more, even if select companies were able to stay out of rate cases for an extended period of time, there would still be uncertainty on the part of the company that the regulator would initiate a rate case at any time. This uncertainty can be expected to have deleterious effects on incentives because the utility would not know how long it would be able to retain the efficiency gains from its cost-reducing innovation prior to rebasing. The value in a formal rate case stay-out lies in its ability to eliminate the uncertainty associated with the length of time over which the regulated firm would be able to retain the gains from its cost-reducing innovation.

Finally, there is also a concern that regulated firms could be concealing higher earnings through what has been referred to as “regulatory abuse.” These are expenditures that the regulated firm incurs that would not be incurred by a firm in a competitive market.

See, for example, Glen Blackmon, **INCENTIVE REGULATION AND THE REGULATION OF INCENTIVES**, Boston: Kluwer, 1994.

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14.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
Exhibit B-8, Appendix A Dr. Dennis Weisman –
Supplementary Report, p. 17 Performance Metrics**

Dr. Weisman states on page 17 of his supplemental report that:

Suppose the Commission identifies a set of performance metrics related to conservation and the use of disfavored inputs. The Commission may decide to make these performance metrics “informational only.” This means that the regulated firm’s performance on these metrics would be publicly disclosed, perhaps even reported on the Commission’s web site, but it would not be rewarded or penalized financially for compliance or lack of compliance with these performance metrics... The regulated firm may still have strong incentives to meet or exceed these performance metrics even though there are no financial rewards or penalties directly associated with compliance or non-compliance... it is *not necessarily* the case that financial incentives would be required to induce compliance with Commission’s performance metrics. [*italics added*]

- 1.14.1 Please discuss whether targeted performance incentive mechanisms and special incentives that use disfavored inputs should merit consideration in this and any successor BC Hydro PBR proceeding.

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

Yes, I believe that targeted PIMS and incentives to use disfavored inputs merit consideration. As I indicated in my supplementary report, “information-only metrics” may prove sufficient in the case of BC Hydro to elicit the desired behavior. The Commission can subsequently turn to financial rewards/penalties should the “information-only metrics” prove insufficient in eliciting the desired behavior.

I would make the following general observations on PBR and performance incentives more generally based on three-plus decades of experience as an academic, journal editor/referee, industry practitioner and economic consultant involved with the theory and practice of incentive regulation and PBR.

The case for incentive regulation, predominantly pure price cap regulation, is strong in the telecommunications industry. There is now a large body of empirical

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evidence to confirm that these regulatory innovations have conferred benefits on all primary interest groups, including regulators, regulated firms, consumers, and competitors.

The theoretical case in support of PBR (e.g., pure price-cap or revenue-cap regulation) for profit-maximizing electricity utilities (or those than can be induced to act as such) is also relatively strong. That said, there is no large body of published, peer-reviewed empirical studies to confirm that the gains from adopting PBR are on par with the adoption of pure price-cap regulation in telecommunications. Those gains may well exist, but the empirical support in the form of peer-reviewed publications is relatively sparse.

The case for PBR in motivating superior performance for Crown Corporations is the weakest of the three for reasons that both Dr. Lowry and I have canvassed in our various submissions. Moreover, to the extent that (i) BC Hydro's behavior is not motivated by the prospect of higher earnings; and (ii) institutional constraints preclude BC Hydro from adopting an incentive-based compensation scheme for its employees, the case for PBR is weaker still.

These observations are not dispositive in suggesting that PBR would not benefit consumers, but it does suggest that the case for adopting PBR under these conditions is less compelling. This is one of the reasons why I recommend that the Commission seriously consider lengthening the test period from 2 to 3 years. This is a modified form of the Commission's current approach to COSR that has parallels with some of the early forms of incentive regulation in telecommunications (i.e., rate-case moratoria).

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14.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

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1.14.1 Please discuss whether targeted performance incentive mechanisms and special incentives that use disfavored inputs should merit consideration in this and any successor BC Hydro PBR proceeding.

1.14.1.1 Please discuss whether performance incentive mechanisms have the special advantage of being able to target weaknesses in the incentive power of the regulatory system. Why or Why not?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

In general, I would tend to agree with the statement regarding the ability of PIMs to target specific areas of concern to the regulator. This is common practice, and for good reason, with service quality metrics to ensure that regulated firms do not sacrifice service quality and reliability in the course of their efforts to minimize costs and increase profitability under incentive regulation in telecommunications and PBR in electric power.

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1.14.2 Please explain the basis for Dr. Weisman’s position that information only performance metrics are generally *strong* (as opposed to having *some* impact)?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

I do not believe the two statements are mutually exclusive. For purposes of expositional clarity, what I stated is that “The regulated firm may still have strong incentives to meet or exceed these performance metrics even though there are no financial rewards or penalties directly associated with compliance or non-compliance.” (underlining added).

In discussions with BC Hydro management over the past 3 years, I have formed the opinion that the company has a strong commitment to delivering reliable power to its customers at the lowest possible prices. It is also a company that seemingly takes great pride in its commitment to compliance with performance metrics that the Commission and its government owner have delineated. This is what prompted me to draft the statement in the question as I did. That said, I reiterate my previous point that the two statements in the question are not mutually exclusive.

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Finally, should it be the case that BC Hydro is not sufficiently responsive to information-only metrics, the Commission could consider alternative approaches that may be expected to provide the requisite motivation. Such alternative approaches may be necessary, but that is not a foregone conclusion, nor do I believe that these measures should be the first recourse of the Commission.

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1.14.3 Can the incentive impact of such metrics be further strengthened by 1) assigning a target to the metric without adding awards and/or penalties and 2) linking performance to employee compensation?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

I believe that it is reasonable to add a target metric, or perhaps a range that would be considered acceptable performance. I would agree with the second part of the statement in the context of a profit-maximizing regulated firm (or a utility in which its employees could be induced to act as if the company were a profit-maximizing entity). In the case of a Crown Corporation, and BC Hydro in particular, I also believe it is necessary to recognize the possibility that the company and its employees are motivated by “rewards” and “penalties” that are not necessarily denominated in dollars per se.

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1.14.4 Does Dr. Weisman believe that the incentive impact of service quality incentives is sufficiently strong that there is no need for them to be linked to awards and penalties in multi-year rate plans for energy and telecom utilities? Why or why not?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

In general, I believe that service-quality rewards and penalties are appropriate and, in fact, advisable for energy and telecommunications utilities. In the case of a Crown Corporation, I also recognize the possibility that monetary penalties and rewards would not necessarily have the same effect as they would for profit-maximizing utilities. This observation notwithstanding, I believe that the Commission should adopt the appropriate safeguards to ensure that service quality and reliability remain at or above target levels.

Finally, I would point out that poor service quality and reliability do not cast regulators and the government in a favorable light, even in the case of investor-owned utilities. This effect is magnified in the case of a Crown Corporation, which is effectively a government entity.

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15.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

**Reference: DR. DENNIS WEISMAN SUPPLEMENTARY REPORT
 Exhibit B-8, Appendix A, Dr. Dennis Weisman –
 Supplementary Report, p. 19;
 Exhibit A2-5, p. 58
 Earnings Sharing**

Dr. Weisman states on page 19 of his supplemental report that:

It is conceivable that the cost-benefit test for a formal PBR regime is likely to be more difficult to pass in the case of BC Hydro. **The specific form of cost-of-service regulation under which the company currently operates is properly characterized as a form of PBR.** Moreover, with a three-year (or longer) test period this type of regulatory regime may well give rise to greater incentive power than an indexed form of PBR with a term of 5 years that incorporates a significant earnings-sharing component. This suggests that at least in terms of incentive power, the Commission may well be taking a step backward if it opted for this type of PBR regime. **[emphasis added]**

1.15.1 Does Dr. Weisman believe that BC Hydro's current regulatory system, which necessitates frequent rate cases, has some PBR attributes or that it is properly considered a form of PBR? Why or why not?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

As I indicated in my supplemental evidence, BC Hydro's current regulatory system has characteristics similar to rate case moratoria in the early stages of incentive regulation in the telecommunications industry. Abstracting from whether the prospect of higher earnings increases BC Hydro's motivation for superior performance, this form of regulation would tend to give rise to stronger incentive properties than textbook COSR regulation, ceteris paribus. To wit, a 2-year test period would give rise to stronger incentives for performance than a 1-year test year, and a 3-year test period would give rise to stronger incentives for performance than a 2-year test period, ceteris paribus.

In my opinion, the labels of PBR and COSR can sometimes be misleading. In a quotation widely attributed to Professor Alfred Kahn, the former regulator and renowned economist observed that "All regulation is incentive regulation." This is necessarily the case because all forms of regulation put in place incentives for

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performance, some that are relatively strong and others that are relatively weak. Moreover, some forms of COSR can actually give rise to more high-powered incentives than regulatory regimes formally designated as PBR plans. [See, for example, Dennis L. Weisman, "A Report on the Theory and Practice of Performance-Based Regulation," December 12, 2018, Exhibit A2-1, Appendix FF, p. 1.]

I believe the proper focus for the Commission is properly placed on whether there is a viable alternative to the current form of regulation that holds out the prospect of increasing the incentive power of the regulatory regime, while ensuring that rates are "just and reasonable." As I have pointed out, a modified form of the Commission's current approach to COSR (i.e., moving from a 2-year to a 3-year test period) can exhibit stronger incentive power than a formal, indexed PBR plan with a significant earnings-sharing component. Finally, the following quotation is instructive in understanding that PBR and COSR can have certain elements in common.

"overall COS and PC regulations have a lot in common . . . the contrast between the two modes is mostly one of emphasis."

Jean-Jacques Laffont and Jean Tirole, *A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION*, Cambridge MA: The MIT Press, 1993, p. 19.

Note that in the referenced quotation COS refers to Cost of Service regulation and PC refers to Price Cap regulation (i.e., PBR).

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15.0 B. DR. DENNIS WEISMAN SUPPLEMENTARY REPORT

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1.15.2 Please discuss whether or not Dr. Weisman agrees with Dr. Lowry's statement that Earning Sharing Mechanisms (ESMs) are used on only half of current US and Canadian MRPs (p. 58 of Dr. Lowry's report, Exhibit A2-5) and that they are not used in Alberta and Ontario plans. Why or why not?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

I have not conducted a recent, independent, comprehensive survey of PBR plans in North America. Hence, while I am not able to independently confirm Dr. Lowry's finding regarding the frequency of ESMs, I would have no particular reason to question its veracity.

I included the referenced statement in my evidence because I am aware that the BCUC has exhibited some penchant for attaching ESMs to PBR plans.

I can confirm that ESMs were never part of the Commission-initiated PBR plans in Alberta and are not currently part of PBR plans in Ontario. To the best of my knowledge, the Alberta Utilities Commission never seriously contemplated ESMs, despite calls from various parties that they be given due consideration. In the case of the Alberta Utilities Commission, I believe it recognized that ESMs would

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undermine both economic efficiency and regulatory efficiency, given that annual reviews would be necessary. In rejecting proposals for ESMs, the Alberta Commission observed the following:

One of the purposes of PBR is to start with cost of service-based rates and then sever the link between revenues and costs as a means of strengthening incentives for the companies to seek productivity improvements, and achieve lower costs than would otherwise be realized under cost of service regulation. PBR regulation allows regulated prices to change without a review of the company's costs, thereby lengthening regulatory lag. This better exposes the companies to the types of incentives faced by competitive firms. However, periodic review of the plans will be required. What the correct timing of a review will be and what the nature of the review should be will depend on the circumstances at the time.

Alberta Utilities Commission, Rate Regulation Initiative, Distribution Performance-Based Regulation, Decision 2012-237, September 12, 2012, Paragraph 832.

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1.15.3 Does Dr. Weisman believe that earnings sharing would be a practical necessity in a plan for BC Hydro even if it only applied to OM&A?

RESPONSE:

RESPONSE PROVIDED BY DR. WEISMAN

No. In general, while I understand why regulators sometimes perceive the need for an earning-sharing mechanism (e.g., to provide a safety net of sorts), I generally believe that the costs of such mechanisms in terms of weakening the efficiency properties of PBR are so great as to make the game not worth the candle. In other words, there is no robust theoretical or empirical basis to believe that PBR with ESMs generate sufficient gains over traditional COSR to justify the effort and cost of designing and implementing a PBR plan. In addition, ESMs would require annual reviews and thereby work at cross purposes with one of the primary objectives of PBR – increasing regulatory and administrative efficiency.

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16.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
 Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
 Report, p. 2, p. 12; Alberta Utilities Commission Decision
 2009-035, Enmax Power Corporation, 2007-2016 Formula
 Based Ratemaking, March 25, 2009
 Crown Corporations**

Mr. Kolesar states on page 2 of his report that: "BC Hydro is not a profit-maximizer and will be unlikely to fully respond to the incentives of PBR. Accordingly, I conclude that the benefits of PBR are unlikely to be fully realized."

Further, on page 12 of his report Mr. Kolesar states that:

...under PBR, it is most likely BC Hydro will seek productivity improvements sufficient to earn the return expected by its shareholder, but no more. Given this finding, the Commission should consider whether BC Hydro's culture, processes and procedures, compensation scheme and the expectations of its shareholder are adequately attuned to the incentives of PBR, and whether, upon weighing all of the Commission's objectives, a form of COSR might better suit the circumstances of BC Hydro.

1.16.1 Please confirm whether Mr. Kolesar participated in the ENMAX PBR proceeding and the two Alberta Utilities Commission (AUC) generic energy PBR proceedings during his time at the AUC.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I participated in ENMAX POWER CORPORATION Formula Based Ratemaking Application No. 1550487 2007-2016 Proceeding ID No. 12 and Rate Regulation Initiative Distribution Performance-Based Regulation Application No. 1606029 Proceeding ID No. 566.

I did not participate in 2018-2022 Performance-Based Regulation Plans for Alberta Electric and Gas Distribution Utilities Proceeding 20414, except with respect to the following subsequent decisions:

23479-D02-2018 The ATCO Utilities (ATCO Electric Ltd. and ATCO Gas and Pipelines Ltd.) ENMAX Power Corporation FortisAlberta Inc., Decision on Preliminary Question, Applications for Review of Decision 22394-D01-2018

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**Rebasing for the 2018-2022 PBR Plans for Alberta Electric and Gas
Distribution Utilities First Compliance Proceeding, October 30, 2018.**

**24325-D01-2020 Second Stage Review Proceeding to Consider the
Concepts and Principles of an Anomaly Adjustment, Review of Decision
22394-D01-2018: Rebasing for the 2018-2022 PBR Plans for Alberta Electric
and Gas Distribution Utilities First Compliance Proceeding,
January 30, 2020.**

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16.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
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Report, p. 2, p. 12; Alberta Utilities Commission Decision
2009-035, Enmax Power Corporation, 2007-2016 Formula
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Crown Corporations**

Mr. Kolesar states on page 2 of his report that: "BC Hydro is not a profit-maximizer and will be unlikely to fully respond to the incentives of PBR. Accordingly, I conclude that the benefits of PBR are unlikely to be fully realized."

Further, on page 12 of his report Mr. Kolesar states that:

...under PBR, it is most likely BC Hydro will seek productivity improvements sufficient to earn the return expected by its shareholder, but no more. Given this finding, the Commission should consider whether BC Hydro's culture, processes and procedures, compensation scheme and the expectations of its shareholder are adequately attuned to the incentives of PBR, and whether, upon weighing all of the Commission's objectives, a form of COSR might better suit the circumstances of BC Hydro.

1.16.1 Please confirm whether Mr. Kolesar participated in the ENMAX PBR proceeding and the two Alberta Utilities Commission (AUC) generic energy PBR proceedings during his time at the AUC.

1.16.1.1 Please confirm if these proceedings resulted in the application of PBR to two municipal power distributors (ENMAX and EPCOR).

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

Confirmed. These proceedings resulted in the application of PBR to two municipally owned power distributors (ENMAX and EPCOR).

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16.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, p. 2, p. 12; Alberta Utilities Commission Decision
2009-035, Enmax Power Corporation, 2007-2016 Formula
Based Ratemaking, March 25, 2009
Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.2 Please explain if Mr. Kolesar has changed his views on the propriety of PBR for municipal power distributors since this time, and if so, why?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I remain of the view that a well-crafted PBR plan can be adopted for municipal power distributors, and for that matter Crown-owned power distributors, if the

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conditions for its adoption are adequate and the benefits are sufficient to justify the potential effort required to design and implement a workable PBR plan. It is noteworthy that in Proceeding ID.12, that led to the above referenced decision, the Commission considered this very question.

On the one hand, the evidence before the Commission from Dr. Cronin was that “some FBR plans suffered from serious design flaws in the rate adjustment mechanism and the consequences on company profits and consequent regulatory backlash” and that “despite being potentially superior to cost of service regulation, regulators have found it imperative that regulatory safeguards be built into PBR plans to mitigate the tendency and severity of structural shortcomings.”

On the other hand, the Commission heard the following from Mr. Holden, the ENMAX CEO:

“When I took on the role of CEO of ENMAX, my clear expectation and mandate that I established with the Board of directors was, first of all, to verify for myself that this was indeed a board of directors that could act like a commercial company or nongovernment-owned company and had a mandate to operate as a board that was sufficiently independent that commercial decisions could be made without undue political influence. ... The second is, I try very much to run this company as if it is competing in a world aggressively with investor-owned utilities, investor-owned competitors, private competitors, entrepreneurs. And I'm assembling a team that has the capabilities to work in that way.”

The Commission concluded that “the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an FBR plan.”

My submission in the current proceeding recognizes that the BCUC is faced with the same question in this instance and should weigh the evidence before it to determine if conditions in BC Hydro, given that it is not a profit-maximizing entity, lend themselves to the adoption of a PBR plan, sufficient to justify the potential effort required to design and implement a workable plan, and given the consequential risks if the plan is not successful.

The ENMAX FBR plan faced a number of unanticipated difficulties. The company under-earned throughout the FBR regime ostensibly due to flaws in the design of the plan, and the Commission was required to re-open the plan to deal with matters related to the under-funding of capital additions.

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16.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, p. 2, p. 12; Alberta Utilities Commission Decision
2009-035, Enmax Power Corporation, 2007-2016 Formula
Based Ratemaking, March 25, 2009
Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.3 Please present any statements the AUC made during the subsequent two generic PBR proceedings expressing a low expectation of the earnings potential of municipal utilities under PBR.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I am unaware of any statements expressing a low expectation of the earnings potential of municipal utilities under PBR.

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16.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, p. 2, p. 12; Alberta Utilities Commission Decision
2009-035, Enmax Power Corporation, 2007-2016 Formula
Based Ratemaking, March 25, 2009
Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.4 Do you believe that the current operating performances of ENMAX and EPCOR are inferior to those of the two investor-owned power distributors (ATCO and Fortis) which have been subject to the PBR plans?

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RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I have no data to compare the operating performance of ENMAX and EPCOR to the operating performance of ATCO and Fortis. In any event, such comparisons are difficult to make, given the different operating territories and cost structures of the companies.

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16.0 C. MR. MARK KOLESAR SUBMISSION

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Report, p. 2, p. 12; Alberta Utilities Commission Decision
2009-035, Enmax Power Corporation, 2007-2016 Formula
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Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.5 EPCOR evidently retained Dr. Weisman as a witness to consider PBR alternatives in these proceedings. Did EPCOR oppose PBR for its power distribution services?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

EPCOR was not a party to proceeding ID. 12, which led to the above referenced Decision 2009-035.

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16.0 C. MR. MARK KOLESAR SUBMISSION

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 Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.6 Please confirm that EPCOR operated for several years under a multi-year rate plan with a price cap index in the years prior to its regulation by the AUC.¹ Please confirm that EPCOR Water currently operates under such a plan in the City of Edmonton.²

¹ City of Edmonton Bylaw 12367 outlined an MRP for EPCOR with a term from 2001-05

² This is laid out in City of Edmonton Bylaw 17698 EPCOR Water Services and Wastewater Treatment Bylaw.
<https://www.epcor.com/products-services/water/rates-terms-conditions/edmontonratetermsconditions/c-oe-bylaw-17698.pdf>.

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RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I have no knowledge as to whether EPCOR was operating under a multi-year rate plan with a price cap index prior to coming under Alberta Utilities Commission jurisdiction, as I was not a commission member at that time. I also have no knowledge as to whether EPCOR water currently operates under such a plan, as the Alberta Utilities Commission has no jurisdiction over City of Edmonton water rates, except on a limited complaint basis with respect to water services provided to other municipalities outside of Edmonton (e.g., Sherwood Park).

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16.0 C. MR. MARK KOLESAR SUBMISSION

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2009-035, Enmax Power Corporation, 2007-2016 Formula
Based Ratemaking, March 25, 2009
Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.7 Is there reason to suspect that PBR will work better for municipal utilities like ENMAX and EPCOR than for a crown corporation?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

There is no reason to suspect that PBR will work better or worse for municipal utilities like ENMAX and EPCOR than for a crown corporation, *ceteris paribus*. In other words, if the conditions for the adoption of PBR are present and adequate in a crown corporation, then PBR may achieve the objectives of regulation for a crown corporation just as well as for a municipal utility.

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However, a question for the BCUC in this proceeding is whether the conditions for the adoption of PBR in BC Hydro are present, given that it is not a profit-maximizing entity, and sufficient to justify the potential effort required to design and implement a workable plan, and given the consequential risks if the plan is not successful.

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16.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, p. 2, p. 12; Alberta Utilities Commission Decision
2009-035, Enmax Power Corporation, 2007-2016 Formula
Based Ratemaking, March 25, 2009
Crown Corporations**

In AUC Decision 2009-035 approving a PBR plan for ENMAX the AUC stated on pages 12 to 13 that:

The Commission considers that there are potentially many benefits of a well crafted [P]BR regulatory regime. These include better economic incentives for the utility that more closely mimic the incentives in a competitive market, a reduction over time in the overall regulatory burden, and an opportunity for the utility to capture greater productivity, subsequently allowing for lower rates than would otherwise be enjoyed by consumers.

With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.8 Even if the effect of PBR were diminished by BC Hydro's crown corporation status, is it your view that the BCUC as a regulator with extensive PBR experience, that BC Hydro and other Canadian crown corporations should be regulated under COSR instead?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

Not as a rule. I remain of the view that a well-crafted PBR plan can be adopted for crown-owned power distributors, if the conditions for its adoption are adequate and the benefits are sufficient to justify the potential effort required to design and

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implement a workable PBR plan, given the consequential risks if the plan is not successful. In this instance, the BCUC should weigh the evidence before it to determine if conditions in BC Hydro, given that it is not a profit-maximizing entity, lend themselves to the adoption of a PBR plan, and whether its regulatory objectives for BC Hydro might better be achieved with a COSR regime. I would respectfully encourage the Commission to consider that PBR is not always and everywhere superior to COSR.

Also refer to my response to BCOAPO IR 1.12.2.

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 Report, p. 2, p. 12; Alberta Utilities Commission Decision
 2009-035, Enmax Power Corporation, 2007-2016 Formula
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With respect to the specific criticism that [ENMAX], as a municipally owned utility, may not be a good candidate for an [P]BR plan, the Commission notes that despite the reservations referred to above, all parties agreed that an [P]BR plan could be adapted to [ENMAX] at this time.... The Commission is satisfied that an [P]BR can provide benefits for [ENMAX] and its customers through improved efficiency and predictability. The Commission is also satisfied by the testimony of Mr. Holden that the incentives and culture being created at [ENMAX] at least in part by competition in other related lines of business lend themselves to the adoption of an [P]BR plan. ...

The Commission finds that there is no compelling reason to conclude that a properly crafted [P]BR plan cannot be adopted for [ENMAX].

1.16.9 If the Company is resistant to incentives due to its crown corporation status, should the incentives be stronger than the norm for private utilities operating under PBR?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

BC Hydro is not resistant to incentives. The company will respond to the incentives created by its shareholder (e.g., keeping rates among the most affordable in North America) and the incentives created by its regulator.

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PBR relies on the profit incentive to compel the utility to seek out productivity gains so as to increase shareholder returns, and this same incentive will compel a profit maximizing utility to seek productivity improvements under COSR as well. And, *ceteris paribus*, PBR will generally produce stronger incentives to seek out productivity gains for a number of reasons discussed at length on the record of this proceeding. However, as explained in my submission, BC Hydro is not a profit maximizer and is unlikely to respond fully to the stronger incentives of PBR.

However, as I point out in my response to BCOAPO IR 1.12.1, BC Hydro will nonetheless have an incentive to seek productivity improvements for the purpose of satisfying its mandate to keep rates among the most affordable in North America.

In addition, other non-profit focused incentives such as those resulting from the improvements to BC Hydro's existing cost of service framework proposed by the company can assist the BCUC in achieving its regulatory objectives under COSR.

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**Reference: MR. MARK KOLESAR SUBMISSION
 Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
 Report, pp. 5–6; AUC Decision 2012-237, Rate Regulation
 Initiative, Distribution Performance-Based Regulation,
 September 12, 2012
 Cost of Service Regulation**

Mr. Kolesar stated on page 5 of his report that:

a COSR regime establishes a forecast revenue requirement deemed necessary to satisfy the service obligations of the utility... and then approves rates intended to recover that revenue requirement. The process generally involves a line-by-line analysis of the utility's costs.

He states on page 6 that:

There may be very good reasons to implement a COSR regime..., COSR may be a good alternative when certain conditions are present in the utility's market, precisely because it does not break the link between costs and revenues... The potential misalignment of revenues and costs may be more severe when the utility's billing determinants are fairly stable, but it has aging infrastructure that requires replacement, resulting in significant capital additions to serve existing customers. Although a PBR regime will include factors to account for capital additions, these may be less effective than COSR in adequately recognizing the effect of capital requirements on utility costs.

1.17.1 Does Mr. Kolesar agree with Dr. Lowry that, prior to the start of the generic PBR plan, three large Alberta power distributors had for many years filed frequent rate cases that produced rapid rate increases?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I assume the three power distributors to which Dr. Lowry is referring are ATCO Electric Ltd, FortisAlberta Inc. and EPCOR Distribution & Transmission Inc. Prior to the start of the generic PBR plan (Decision 2012-237) these distribution companies ordinarily filed a COSR application every two years.

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With respect to the question as to whether these rate cases “produced rapid rate increases,” I am not in possession of the information necessary to confirm Dr. Lowry’s assertion. In any event, an assessment that rates increased rapidly is not dispositive with respect the efficiency of COSR relative to PBR. If it can be assumed that the Alberta Utilities Commission approved “just and reasonable rates” then the rates approved, whether they increased rapidly or not, were the rates required to recover the companies’ prudently incurred costs. Moreover, there are many reasons that may explain why the prudently incurred costs of the companies increased rapidly, if indeed they did. Among these may be the rapid expansion of the Alberta economy during this time, or the capital replacement cycle of some of the companies in this period.

The underlying assumption in Dr. Lowry’s assertion is that rates increased more rapidly under COSR than they would have under PBR, or than they subsequently did under PBR, because of the form of regulation. This assumes facts not in evidence.

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17.0 C. MR. MARK KOLESAR SUBMISSION

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 Initiative, Distribution Performance-Based Regulation,
 September 12, 2012
 Cost of Service Regulation**

The AUC proceeding that ultimately led to the suspension of this regulatory system and its replacement with PBR featured a kickoff letter that stated in part that:

This initiative proceeds from the assumption that rate-base rate of return regulation offers few incentives to improve efficiency, and produces incentives for regulated companies to maximize costs and inefficiently allocate resources... Regulators ... must critically analyze in detail management judgments and decisions that, in competitive markets and under other forms of regulation, are made in response to market signals and economic incentives. The role of the regulator in this environment is limited to second guessing...The Commission is seeking a better way to carry out its mandate so that the legitimate expectations of the regulated utilities and of customers are respected.¹

1.17.2 Does Mr. Kolesar agree with the quoted statement? Was Mr. Kolesar working for the AUC at the time of this AUC proceeding?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I was an acting member of the Alberta Utilities Commission at the time and participated in Proceeding ID 12.

I agree that under COSR regulators are required to critically analyze in detail management judgements and decisions; assessing the reasonableness of decisions and the prudence of costs in the public interest precisely because the utilities they regulate are monopoly enterprises that are generally not subject to market forces (although there may be market signaling in some areas of activity). In my submission, I spoke to the shortcomings of COSR that make the regulator's task challenging under COSR.

¹ Alberta Utilities Commission, "AUC letter of February 26, 2010," pages 1-2, Exhibit 1.01 in Proceeding 566.

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On February 26, 2010, the Alberta Utilities Commission began an initiative to reform utility rate regulation in Alberta, indicating that it was “seeking a better way to carry out its mandate.” The Commission proposed to adopt PBR as the form of regulation for distribution utilities under its jurisdiction.

In my view, the Commission underestimated the complexity of adapting PBR to electric distributors and, as I pointed out in my submission, the Commission faced numerous challenges, particularly with the development of K factors to deal with capital growth in its PBR regimes.

This is not to say that PBR should not be considered as a form of regulation if the conditions for the adoption of PBR are present and adequate. However, as my submission points out, a question for the BCUC in this proceeding is whether the conditions for the adoption of PBR in BC Hydro are present, given that it is not a profit-maximizing entity, and sufficient to justify the potential effort required to design and implement a workable plan, and given the consequential risks if the plan is not successful. Or, whether the Commission's regulatory objectives for BC Hydro might better be achieved with a COSR regime. I would respectfully encourage the Commission to consider that PBR is not always and everywhere superior to COSR.

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17.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, pp. 5–6; AUC Decision 2012-237, Rate Regulation
Initiative, Distribution Performance-Based Regulation,
September 12, 2012
Cost of Service Regulation**

In Decision 2012-237, pages 2 and 3, the AUC stated concerning COSR with multiple forward test years that:

this framework also creates an incentive for the companies to provide cost forecasts (both operating and maintenance (O&M), and capital) that are higher than what the company expects to be able to achieve or to provide conservative forecasts of the number customers and other billing units that are lower than what the company expects, thus increasing profits above the approved return.

1.17.3 Please discuss if this is a concern with the proposed changes to BC Hydro's existing cost of service framework. Why or why not?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

In my submission, at pages 5 and 6, I spoke to the challenges for regulators under COSR arising from informational asymmetry and the inherent upward forecasting bias, particularly as the forecast horizon gets longer. However, there is a trade-off between these shortcomings in COSR and the stronger incentive for the utility to seek productivity gains as the period between COSR proceedings is increased. And, as I stated in my submission, even in the absence of a profit maximizing incentive, the utility under COSR may be compelled to seek productivity improvements over the duration of its COSR term. In my response to BCOAPO IR 1.21.1 I note that BC Hydro has an incentive to seek productivity improvements under COSR to satisfy its mandate to keep rates among the most affordable in North America.

Accordingly, I agree with Dr. Lowry and Dr. Weisman that a three-year test period will create a greater disconnect between BC Hydro's allowed revenue and actual costs and increase the incentive power of COSR. Of course, the BCUC will have to be mindful of the countervailing shortcomings of COSR when establishing BC Hydro's revenue requirement for the proposed three-year term of the COSR regime. In addition, the reporting of performance metrics and periodic statistical benchmarking, as proposed by BC Hydro, will further augment the incentive power of COSR.

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1.17.3 Please discuss if this is a concern with the proposed changes to BC Hydro's existing cost of service framework. Why or why not?

1.17.3.1 If no, please identify where the above concerns with COSR may be mitigated with the proposed changes to BC Hydro's existing cost of service framework.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

Please refer to my response to BCUC IR 1.17.3.

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1.17.4 Please discuss if Mr. Kolesar is questioning the use of PBR in a setting of aging infrastructure, given his observations about the Alberta infrastructure and the AUC adopting a system of PBR that featured indexed rate and (for gas utilities) revenue caps without earnings sharing that continued this general approach with some refinements in a successor plan. The refined approach effectively links growth in each utility's capital revenue to its recent historical plant additions.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I am not questioning the use of PBR in a setting of aging infrastructure. However, when the utility has aging infrastructure that must be replaced, PBR becomes more complicated to implement so as to provide the utility with sufficient capital to fund capital additions and replacements, as required. The task is more straightforward under COSR because the regulator deals with forecasts that explicitly account for replacement activities.

With respect to the refined approach referenced in the question above, that effectively links growth in capital revenue to recent historical additions (Type 2 capital), this approach bases capital revenue on the historical plant additions in a notional year, indexed annually by I-X. In so doing it is assumed that utilities will add and retire capital at historical average levels throughout the PBR term. If that

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assumption does not hold, the utility runs the risk of being underfunded and may respond by delaying capital replacements to future generations or strategically shifting costs between O&M and capital additions, which may result in intergenerational inequities, economically inefficient decisions with respect to capital additions and potentially higher overall costs in the long run.

When basing future capital additions on historical capital additions, whether under PBR or COSR, the regulator must satisfy itself that historical additions are a reasonable proxy for future additions, or adjust accordingly. This may not be the case when the utility is faced with aging infrastructure and may be entering a more intense period of capital replacement. In addition, this assumption that the future looks like the past is particularly problematic when the industry is in disequilibrium and change is afoot.

This is why under the successor PBR plan in Alberta, the Commission considered whether there were anomalies that may require an adjustment to the PBR plan for each utility and retained a capital tacker mechanism for Type 1 capital (which was narrowly defined) to ensure that the utilities would have sufficient capital funding under the PBR regime. In addition, the Commission retained a re-opener mechanism as a safeguard.

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1.17.5 Is a linkage of capital revenue growth to a utility's recent historical capex a sensible way to reduce the regulatory cost of PBR and sidestep forecasting controversies? Please discuss why or why not.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

Please refer to my response to BCUC IR 1.17.4.

Further to that response, linking capital revenue growth to a utility's recent historical capex may not totally sidestep forecasting controversies, because the Commission must satisfy itself that the utility's recent historical capex is a reasonable proxy for future capex. This is no different than the obligation under COSR when the regulator bases forecast capex on recent historical capex. And the regulatory burden may not be reduced significantly under PBR if the PBR regime requires companion measures (e.g., Type 1 capital) to ensure the utility has sufficient capital.

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18.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
 Exhibit B-8, Appendix B, Mr. Mark Kolesar – Supplementary
 Report, p. 7
 PBR**

Mr. Kolesar states on page 7 of his report that:

There is no need in this discussion to go over the process of developing a PBR plan... However, it is noteworthy that, despite potential assumptions to the contrary, the process is no less onerous than that required under COSR to establish a revenue requirement and set rates, and both PBR and COSR require a significant amount of judgment on the part of the regulator.

1.18.1 Is Mr. Kolesar saying that the development of a PBR plan has a regulatory cost that is comparable to or larger than a single rate case, a rate case with multiple test years, or even multiple rate cases? If so, please substantiate this assertion.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

A PBR plan may indeed be more burdensome and have higher regulatory costs than even multiple rate cases.

By way of example, the first generation of PBR for distribution utilities in Alberta (the proceeding for which commenced on February 26, 2010) required a lengthy process with several phases including (1) the Commission's invitation to parties to assist in determining the scheduling and the scope of issues for PBR implementation, (2) a roundtable to discuss steps for the implementation of PBR, (3) a participant workshop, (4) a proceeding to solicit comments on the principles that should guide the development of PBR in Alberta, (5) the filing of utility PBR proposals and intervenor evidence, (6) multiple rounds of information requests, (7) an oral hearing from April 16, 2012 to May 8, 2012 (spanning some 17 hearing days) followed by the usual argument and reply, culminating in Decision 2012-237 on September 12, 2012. Following Decision 2012-237, the Commission initiated a follow-up proceeding to hear a review and variance application of Decision 2012-237, resulting in Decision 2013-071 on March 4, 2013.

With respect to implementing the PBR plan pursuant to Decision 2012-237, the Commission required two compliance filings resulting in Decision 2013-072 on

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March 4, 2013 and Decision 2013-270 on July 19, 2013. The Commission also initiated a follow-up proceeding to consider capital tracker applications and to rule on the criteria for capital trackers, culminating in Decision 2013-435. The Commission's capital tracker process required the utilities to file capital tracker applications (potentially on an annual basis) for approval of their capital tracker forecasts and a capital tracker true-up application to approve their actual capital addition results. In addition, the utilities were required to file annual PBR applications to apply the I-X and other factors (e.g., Y and K) and to approve the resulting annual rate adjustments.

Admittedly, the foregoing is an extreme example. However, even under the subsequent PBR regime, there were follow on proceedings including compliance filings, a proceeding to deal with a review and variance application, a proceeding to reconsider the definition of an anomaly and then applications for anomaly adjustments. And, as with the previous PBR regime, there is an ongoing requirement for annual PBR filings.

The point of the foregoing examples is that PBR presents somewhat of an unknown with respect to the amount of regulatory burden the regime will result in, whereas COSR is relatively predictable. What is more, as I intimated in my response to BCUC IR 1.20.1, given my experience with the application of PBR in the telecommunications sector and in the electric distribution industry during my time at the Alberta Utilities Commission, PBR is far more complicated in electric power in comparison to incentive regulation in telecommunications. The institutional and technological differences between the two industries present unique challenges in electric power.

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18.0 C. MR. MARK KOLESAR SUBMISSION

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PBR**

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- 1.18.1 Is Mr. Kolesar saying that the development of a PBR plan has a regulatory cost that is comparable to or larger than a single rate case, a rate case with multiple test years, or even multiple rate cases? If so, please substantiate this assertion.
- 1.18.1.1 In Alberta, for example, how has the number of hearing days needed to consider PBR plan design provisions compared to the hearing days for a 2-year rate case?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

Please refer to my response to BCUC IR 1.18.1.

It is not a question of hearing days alone, but the complexity of the proceeding(s) often required to implement a PBR regime, the annual filings generally required for implementation and the potential for follow on (often annual) proceedings, as experienced in Alberta.

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1.18.2 Does a regulatory community engaged in PBR go through a learning curve, finding ways to streamline PBR proceedings over the years? For example, did this happen between the first and second plans in Alberta that Mr. Kolesar was involved with?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

A regulatory community and regulators engaged in PBR do go through a learning curve that may lead to some streamlining of PBR proceedings and improvements in PBR regimes. This was the experience in Alberta between the first and second plans.

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1.18.2 Does a regulatory community engaged in PBR go through a learning curve, finding ways to streamline PBR proceedings over the years? For example, did this happen between the first and second plans in Alberta that Mr. Kolesar was involved with?

1.18.2.1 Please discuss how BC can learn from Alberta’s PBR experience, avoiding some of the problems that were encountered there.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

If the BCUC chooses to adopt PBR for BC Hydro, it will be important for the Commission to garner the understanding and support of parties for the adoption of PBR, particularly given that it has only recently been granted greater regulatory oversight of BC Hydro. The Alberta Utilities Commission was criticized for its PBR plans by intervenor groups who were not afforded the opportunity to engage in the kind of detailed oversight that is available under COSR, and who considered PBR to be “too rich” for the utilities, at the expense of rate payers. To avoid this outcome, the BCUC may consider adopting safeguards and oversight mechanisms in its PBR regime that allow intervenor groups to be involved in some level of ongoing oversight by the Commission. Please refer to the response to MOVEUP IR 1.5.1.

The treatment of capital in a PBR regime is the most difficult aspect of this form of regulation. The Alberta Utilities Commission was challenged in this regard. If the BCUC adopts PBR, this is an area that will need to be carefully considered. As I

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point out in the response to BCUC IR 1.7.1, in the case of BC Hydro, generation, distribution and transmission are vertically integrated and regulated jointly under a single regime. This may make the PBR regime more complex to design and implement, particularly as it relates to the treatment of capital expenditures.

Finally, in my view, the Alberta Utilities Commission did not do enough to promote its role as a regulator, particularly as it related to PBR, and to engage with the public, the utilities, intervenors and the government to make sure it was perceived as achieving its public interest mandate efficiently through the implementation of PBR.

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1.18.3 BC, like Alberta, has extensive PBR experience. Would this not reduce the regulatory cost of developing a PBR system for BC Hydro? Please discuss why or why not.

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I have been engaged by BC Hydro to opine on a single question, specifically *“Given that BC Hydro is not a profit maximizing utility, are there implications that should be considered in the design of the regulatory regime for the company”*. I have not studied in detail the extensive PBR experience in B.C. Accordingly, I am not able to opine on the specifics of how the BC PBR experience may reduce the regulatory cost of developing a PBR regime for BC Hydro.

However, as I note in response to BCUC IR 1.18.1, PBR presents somewhat of an unknown with respect to the amount of regulatory burden the regime will result in.

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1.18.4 Several years ago, BC Hydro proposed to use an index to forecast its OM&A expenses in rate cases. Based on your experience with index formulas in Alberta, and in light of the emerging consensus to develop some kind of multi-year rate plan for BC Hydro, does this seem like an idea worth considering in this and any successor proceeding on PBR for BC Hydro? Please discuss why or why not.

RESPONSE:

BC Hydro agrees with Dr. Lowry on extending the test period to three years; however, BC Hydro would not characterize agreement on this issue as an emerging consensus with regard to the development of a multi-year rate plan for BC Hydro.

RESPONSE PROVIDED BY MR. KOLESAR

Developing an index to forecast O&M expenses in rate cases is an alternative that may be explored by the BCUC for BC Hydro. However, the Commission should be mindful of the following.

The Commission must consider what measures of inflation to use and what weightings to apply when constructing the index. Generally, under COSR the regulator considers the previously forecast expenses for various categories of O&M expense and the actual results achieved by the utility. This approach considers any O&M productivity gains, cost overruns or potential over-forecasting in prior periods when approving a forecast for the next period(s). The regulator also considers forecast measures of inflation, usually from independent

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forecasters (e.g., Conference Board of Canada) to develop a forecast (or set of forecasts) for a future test period. In so doing, the regulator must determine what measures to use for various categories of labour, materials, etc. All of the above requires the regulator to apply considerable judgement.

Rolling these individual measures up into a weighted average index across the panoply of O&M expenses presents challenges in determining what measures of inflation should apply and how these measures should be weighted (e.g., as among labour, materials, etc.).

If the objective is to develop a formulaic index that is self-adjusting relative to achieved results, the actual inflation index(es) in a prior period, or the current forecast inflation index(es) for the next period, then the task will have all of the foregoing challenges coupled with the requirement to develop a workable and reasonable formula.

If the objective is to apply an I-X type formula only to O&M expenses, there are additional considerations. First, developing a productivity factor for O&M alone is a difficult task, largely because Total Factor Productivity measures are not easily bifurcated into measures of O&M, as distinct from capital; and it is not clear that partial productivity factors can be reasonably or easily developed and may not pass academic muster. Secondly, applying an I-X to O&M alone may be detrimental in that it may provide an incentive to shift costs from O&M to capital and vice versa, potentially negatively influencing the achievement of dynamic efficiencies in the firm and increasing costs in the long run.

In doing any of the above, the regulator should consider whether the result will provide a better forecast of O&M expenses and, more importantly, whether the index approach will increase the utility's incentives to seek out productivity gains.

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19.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
 Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
 Report, p. 9
 Crown Corporation**

Mr. Kolesar states on page 9 of his report that:

BC Hydro is expected to earn and provide to its shareholder, the government of British Columbia, a net income in the amount required by Direction 8. There is no expectation for the Company to deliver a net income in excess of that amount. Indeed, any earnings in excess of that amount may be viewed as unpalatable, as they may lead to allegations that rates have been higher than they otherwise should have been. While Direction 8 is time limited with respect to the matter of return and the determination of allowed return may be altered after fiscal 2021, there would still be no expectation that the Company's net income should exceed the approved amount, barring a change in the expectations of its shareholder.

- 1.19.1 Please provide evidence to support the notion that the government, having established a net income goal for BC Hydro, would not welcome higher income if it was the result of good operating performance.

RESPONSE:

The following response was prepared by BC Hydro. BC Hydro informed Mr. Kolesar that the Government of B.C. does not expect BC Hydro to exceed its allowed net income and provided Mr. Kolesar with references to publicly available information for additional context (e.g., BC Hydro's Mandate Letter).

In BC Hydro's view, the key question is not what the Government of B.C. may or may not welcome but rather, what the Government of B.C. expects of BC Hydro and has mandated BC Hydro to do. This determines what incentives BC Hydro will respond to and what incentives BC Hydro will not respond to.

BC Hydro's evidence is that the Government of B.C. does not expect BC Hydro to exceed its allowed net income and has not mandated BC Hydro to maximize profits. In addition, the Government of B.C. has set out various expectations for BC Hydro with regard to providing safe, reliable, affordable and clean electricity.

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Accordingly, BC Hydro is incented to seek out incremental efficiency gains in response to incremental cost pressures so that it can achieve its allowed return. To the extent that BC Hydro is able to achieve incremental efficiency gains that exceed its incremental cost pressures, the mandate provided to BC Hydro by the Government of B.C. incents BC Hydro to re-invest any cost savings from efficiency gains into initiatives that support the provision of safe and reliable electricity service or other identified policy priorities.

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- 1.19.2 Please discuss the use of potential surplus earnings for other uses, such as deferrals to fund future capex surges, mitigation of potential cost overruns of capital projects, investments in electrification, and other government policy objectives.

RESPONSE:

The following response was prepared by BC Hydro. BC Hydro informed Mr. Kolesar that the Government of B.C. does not expect BC Hydro to exceed its allowed net income and provided Mr. Kolesar with references to publicly available information for additional context (e.g., BC Hydro's Mandate Letter).

Please refer to BC Hydro's response to BCUC IR 1.19.1 where we explain that the mandate provided to BC Hydro by the Government of B.C. already incents BC Hydro to re-invest any cost savings from efficiency gains into initiatives that support the provision of safe and reliable electricity service or other identified policy priorities.

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BC Hydro is expected to earn and provide to its shareholder, the government of British Columbia, a net income in the amount required by Direction 8. There is no expectation for the Company to deliver a net income in excess of that amount. Indeed, any earnings in excess of that amount may be viewed as unpalatable, as they may lead to allegations that rates have been higher than they otherwise should have been. While Direction 8 is time limited with respect to the matter of return and the determination of allowed return may be altered after fiscal 2021, there would still be no expectation that the Company's net income should exceed the approved amount, barring a change in the expectations of its shareholder.

1.19.2 Please discuss the use of potential surplus earnings for other uses, such as deferrals to fund future capex surges, mitigation of potential cost overruns of capital projects, investments in electrification, and other government policy objectives.

1.19.2.1 Could BC Hydro use these potential surplus earnings to invest in the above type of projects without the need for cross-subsidization from other ratepayers? Please discuss.

RESPONSE:

The following response was prepared by BC Hydro. BC Hydro informed Mr. Kolesar that the Government of B.C. does not expect BC Hydro to exceed its allowed net income and provided Mr. Kolesar with references to publicly available information for additional context (e.g., BC Hydro's Mandate Letter).

In BC Hydro's view, prudently incurred costs necessary for the provision of utility service should be recovered from ratepayers. Any costs that are not prudently incurred for the provision of utility service should be absorbed by the shareholder regardless of the extent to which BC Hydro has achieved or exceeded its allowed net income.

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19.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, p. 9
Crown Corporation**

Mr. Kolesar states on page 9 of his report that:

BC Hydro is expected to earn and provide to its shareholder, the government of British Columbia, a net income in the amount required by Direction 8. There is no expectation for the Company to deliver a net income in excess of that amount. Indeed, any earnings in excess of that amount may be viewed as unpalatable, as they may lead to allegations that rates have been higher than they otherwise should have been. While Direction 8 is time limited with respect to the matter of return and the determination of allowed return may be altered after fiscal 2021, there would still be no expectation that the Company's net income should exceed the approved amount, barring a change in the expectations of its shareholder.

1.19.3 With respect to the statement that "there would still be no expectation that the Company's net income should exceed the approved amount," please discuss whether BC Hydro would be able to reinvest any surplus earnings back into the organization for the purposes of maintaining a healthy capital structure.

RESPONSE:

The following response was prepared by BC Hydro. BC Hydro informed Mr. Kolesar that the Government of B.C. does not expect BC Hydro to exceed its allowed net income and provided Mr. Kolesar with references to publicly available information for additional context (e.g., BC Hydro's Mandate Letter).

Under the Government of B.C.'s current dividend policy, no dividends are being paid and therefore all earnings are retained for the purposes of maintaining a healthy capital structure.

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20.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
Exhibit B-8, Appendix B, Mr. Mark Kolesar – Supplementary
Report, p. 2
Revenue Decoupling**

Mr. Kolesar states on page 2 of his report that:

I have over 30 years of experience in the regulated utilities sector, having worked in the areas of regulation and public policy, external relations, marketing, strategy and business development, and mergers and acquisitions. This includes over 20 years of corporate experience in the telecom sector, where I was Vice President, Economic Affairs at TELUS, one of Canada's largest telecommunications companies.

1.20.1 Based on his experience, does Mr. Kolesar dispute Dr. Lowry's contentions that 1) telecommunications utilities operated for many years under price cap regulation with no revenue decoupling, and some still do; 2) when operating under such regulatory systems, they have generally had strong incentives to market their services, and considerable flexibility in doing so; and 3) effective marketing was one of the reasons for the rapid productivity growth that permitted these companies to operate under high X factors and rate freezes?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I agree with Dr. Lowry that telecommunications utilities operated for many years under price cap regulation with no revenue decoupling. I have not researched whether some telecommunications utilities still operate under price cap regulation. I also agree that while operating under price cap regulation, these utilities had strong incentives to market their services and considerable flexibility in doing so.

With respect to Dr. Lowry's contention that effective marketing was one of the reasons for their rapid productivity growth, I note that the effective marketing to which he refers was not the principal source of the utilities' productivity growth. The replacement of mechanical and electro-mechanical switching with digital switching, advances in multiplexing (including fibre optics) and the development of the asymmetric (or asynchronous) digital subscriber line, among other advances (all of which were largely developed by multi-national companies and

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adopted by the utilities) drove costs down and allowed for the development of new services over existing network elements. These advances in telecommunications technology presented opportunities for productivity gains, and the utilities had an incentive beyond the incentive accruing from PBR to adopt them in the face of emerging competition. It seems unlikely at present that the electric utility sector will enjoy the unprecedented opportunity for productivity gains available to the telecommunications sector from advances in technology.

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20.0 C. MR. MARK KOLESAR SUBMISSION

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1.20.2 During Mr. Kolesar's years as a Commissioner in Alberta, did the AUC approve revenue decoupling for its gas or electric utilities? If not, why not?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

For clarity, I assume that by revenue decoupling the Commission is referring to the delinking of a utility's profits from the sale of energy, usually by aligning the rate of return with the achievement of certain targets and adjusting rates up or down to meet the target at the end of a predetermined adjustment period, so as to make the utility indifferent to a reduction in billing and thereby willing to promote the achievement of certain public policy objectives (e.g., demand side management) that might otherwise result in lower revenues to the company.

The Alberta Utilities Commission did not approve revenue decoupling for its gas or electric utilities during my tenure, for two principal reasons. First, the Commission did not have a mandate to promote public policy objectives, such as demand side management, nor did it have the jurisdiction to approve such proposals when requested by the distribution utilities. Second, the Commission considered that the utilities subject to PBR would have a greater productivity incentive if they carried billing determinant risk.

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1.20.3 Based on these experiences, does Mr. Kolesar believe that revenue decoupling weakens the incentive for BC Hydro to promote beneficial electrification, profitable exports, and service to price-sensitive provincial customers? If so, is this problem and alternatives to full decoupling such as partial decoupling and PIMs a legitimate issue for this and any successor proceeding on PBR for BC Hydro?

RESPONSE:

RESPONSE PROVIDED BY MR. KOLESAR

I have been engaged by BC Hydro to opine on a single question, specifically *“Given that BC Hydro is not a profit maximizing utility, are there implications that should be considered in the design of the regulatory regime for the company”*. I have not I considered partial revenue decoupling or PIMS for BC Hydro.

However, there is no reason for the BCUC to not consider alternatives to the status quo of full revenue decoupling, such as partial decoupling or PIMs in this proceeding or any successor proceeding. Nonetheless, I do not consider that full revenue decoupling weakens the incentive for BC Hydro to promote beneficial electrification, profitable exports, and service to price-sensitive provincial customers.

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21.0 C. MR. MARK KOLESAR SUBMISSION

**Reference: MR. MARK KOLESAR SUBMISSION
 Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
 Report, pp. 9–10
 Executive Compensation**

Mr. Kolesar states on pages 9 to10 of his report that:

Executive compensation in the Company, as approved by its board of directors, includes incentive pay for executives and directors, based on BC Hydro's Service Plan performance measures. None of these performance measures can be interpreted as promoting profit maximization. On the contrary they support reliable and responsive service delivery, ensure that rates are "among the most affordable in North America," promote safety, and deliver on a number of other policy objectives such as energy conservation, clean energy and aboriginal relations... The Commission should consider whether BC Hydro's culture, processes and procedures, compensation scheme and the expectations of its shareholder are attuned to the incentives of PBR.

1.21.1 Given the current surplus of electricity in BC, is a mandate to keep rates "among the most affordable in North America" sufficient to ensure efficient operation? Please discuss.

RESPONSE:

The following response was prepared by BC Hydro.

BC Hydro's affordability mandate includes operating efficiently.

BC Hydro is actively advancing electrification activities to secure incremental load and revenue that can reduce the current electricity surplus, take pressure off rates and help to achieve the Government of B.C.'s CleanBC goals. The most recent mandate letter to the Minister responsible for BC Hydro, provided as Attachment 1 to this response, sets out clear expectations with regard to the government's CleanBC goals, which BC Hydro is expected to help the government achieve.



November 26, 2020

Honourable Bruce Ralston
Minister of Energy, Mines and Low Carbon Innovation
Parliament Buildings
Victoria, British Columbia V8V 1X4

Dear Minister Ralston:

Thank you for agreeing to serve British Columbians as Minister of Energy, Mines and Low Carbon Innovation and Minister responsible for the Consular Corps of British Columbia. You are taking on this responsibility at a time when people in our province face significant challenges as a result of the global COVID-19 pandemic.

COVID-19 has turned the lives of British Columbians upside down. None of us expected to face the challenges of the past number of months, yet British Columbians have demonstrated incredible resilience, time and time again. We will get through the pandemic and its aftereffects by building on this resilience and focusing on what matters most to people.

British Columbians voted for a government focused on their priorities: fighting the COVID-19 pandemic, providing better health care for people and families, delivering affordability and security in our communities, and investing in good jobs and livelihoods in a clean-energy future.

I expect you – and the work of your ministry – to focus on the commitments detailed in our platform, *Working for You*, along with the following foundational principles:

- **Putting people first:** Since 2017, our government has focused on making decisions to meet people's needs. That focus drove our work in our first term and will continue to be our priority. British Columbians are counting on the government to keep them safe and to build an economic recovery that works for everyone, not just those at the top. Keeping people at the centre of everything we do means protecting and enhancing the public services people rely on and working to make life more affordable for everyone.
- **Lasting and meaningful reconciliation:** Reconciliation is an ongoing process and a shared responsibility for us all. The unanimous passage of the *Declaration on the Rights of Indigenous Peoples Act* was a significant step forward in this journey. True

.../2

Office of the
Premier

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PO Box 9041 Stn Prov Govt
Victoria BC V8W 9E1

Location:
Parliament Buildings
Victoria

reconciliation will take time and ongoing commitment to work with Indigenous peoples as they move toward self-determination. Our government – and every ministry – must remain focused on creating opportunities for Indigenous peoples to be full partners in our economy and providing a clear and sustainable path for everyone to work toward lasting reconciliation.

- **Equity and anti-racism:** Our province's history, identity and strength are rooted in its diverse population. Yet racialized and marginalized people face historic and present-day barriers that limit their full participation in their communities, workplaces, government and their lives. Our government has a moral and ethical responsibility to tackle systemic discrimination in all its forms – and every ministry has a role in this work. While our caucus elected a record number of women, more work remains to address gender equity. Delivering on our commitments to address racial discrimination will require a commitment by all of government to ensure increased IBPOC (Indigenous, Black and People of Colour) representation within the public service, including in government appointments. Our efforts to address systemic discrimination must also inform policy and budget decisions by reviewing all decisions through a Gender-Based Analysis Plus (GBA+) lens.
- **A better future through fighting climate change:** In 2018, our government launched our CleanBC climate action plan. CleanBC puts British Columbia on the path to a cleaner, better future by building a low-carbon economy with new clean-energy jobs and opportunities, protecting our air, land and water and supporting communities to prepare for climate impacts. It is every Minister's responsibility to ensure your ministry's work continues to achieve CleanBC's goals.
- **A strong, sustainable economy that works for everyone:** We will continue our work to support British Columbians through the pandemic and the economic recovery by investing in health care, getting people back to work, helping businesses and communities, and building the clean, innovative economy of the future. Our plan will train the workforce of tomorrow, help businesses hire and grow and invest in the infrastructure needed to build our province.

The pandemic has reminded us that we're strongest when we work together. Delivering on our commitments to people will require a coordinated effort with your cabinet and caucus colleagues, supported by the skilled professionals in the public service. You will also support your cabinet colleagues to do their work, particularly where commitments cross ministry lines.

British Columbians expect their elected representatives to work together to advance the broader public good despite their partisan perspectives. That means seeking out, fostering and championing good ideas, regardless of their origin. I expect you to reach out to elected members from all parties as you deliver on your mandate. Further, you will build thoughtful and sustained relationships through public and stakeholder engagement plans that connect with people to incorporate their perspectives early in the policy development process. These plans must include measurable outcomes and ensure active dialogue and ongoing outreach in your ministry's actions and priorities.

.../3

Over the course of our mandate, I expect you will make progress on the following items:

- Work with cabinet colleagues to advance clean economic opportunities and CleanBC goals as our government responds to and recovers from the COVID-19 pandemic.
- Accelerate the adoption of zero emission vehicles with income-tested rebates, new incentives for purchasing used electric vehicles and an expansion of the CleanBC Specialty-Use Vehicle Incentive program.
- Increase vehicle charging capacity by providing additional incentives to expand home and workplace electric vehicle charging.
- Enhance energy efficiency programs and incentives for residential and commercial buildings, including Property Assessed Clean Energy financing to help homeowners make energy-saving retrofits and repay the cost of them over time.
- Establish the BC Centre for Innovation and Clean Energy to drive made-in-B.C. innovations such as carbon capture and storage and renewable fuels.
- Drawing on the findings of the independent review, ensure the cost and schedule pressures facing construction of the Site C project are addressed in a manner that protects the best interests of British Columbians.
- Undertake a review of oil and gas royalty credits to ensure they meet B.C.'s goals for economic development, a fair return on our resources and environmental protection.
- Complete implementation of the Fuel Price Transparency Act to ensure oil and gas companies are publicly accountable for unexplained markups and price increases.
- Implement world-leading regulations and technologies to support detection and reduction of harmful methane emissions in the oil and gas sector.
- Work with the federal government and BC Hydro to fast track the expansion of electrification by working with industries of all sizes across sectors to make it easier for them to go green.
- Continue to implement the recommendations of the Mining Jobs Task Force to strengthen this important sector and create good jobs for people.
- Create a Mining Innovation Hub to identify and support innovation, training for workers in new technologies, regulatory excellence, environmental management and low-carbon approaches.
- Support the Minister of Environment and Climate Change Strategy to ensure owners of large industrial projects are bonded moving forward so that they – not B.C. taxpayers – pay the full costs of environmental cleanup if their projects are abandoned.

.../4

Our work as a government must continually evolve to meet the changing needs of people in this province. Issues not contemplated in this letter will come forward for government action and I ask you to bring such matters forward for consideration by the Planning and Priorities Committee of cabinet, with the expectation that any proposed initiatives will be subject to the usual cabinet and Treasury Board oversight. Your ministry's priorities must reflect our government's overall strategic plan as determined by cabinet.

All cabinet members are expected to review, understand, and act according to the *Members' Conflict of Interest Act* and conduct themselves with the highest level of integrity. As a minister of the Crown, your conduct will reflect not only on you but on cabinet and our government. You are responsible for providing strong, professional and ethical leadership within cabinet and your ministry. You will establish a collaborative working relationship with your deputy minister and the public servants under their direction who provide the professional, non-partisan advice that is fundamental to delivering on our government's priorities. You must ensure your minister's office meets the highest standards for integrity and provides a respectful and rewarding environment for all staff.

My commitment to all British Columbians is to do my level best to make sure people's lives are better, safer and more affordable. I believe the challenges we face can and will be overcome by working together. By way of this letter, I am expressing my faith that people can expect the same commitment from you.

Sincerely,

A handwritten signature in blue ink that reads "John J. Horgan". The signature is fluid and cursive, with a long horizontal stroke at the end.

John Horgan
Premier

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21.0 C. MR. MARK KOLESAR SUBMISSION

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Exhibit B-8, Appendix B Mr. Mark Kolesar – Supplementary
Report, pp. 9–10
Executive Compensation**

Mr. Kolesar states on pages 9 to10 of his report that:

Executive compensation in the Company, as approved by its board of directors, includes incentive pay for executives and directors, based on BC Hydro’s Service Plan performance measures. None of these performance measures can be interpreted as promoting profit maximization. On the contrary they support reliable and responsive service delivery, ensure that rates are “among the most affordable in North America,” promote safety, and deliver on a number of other policy objectives such as energy conservation, clean energy and aboriginal relations... The Commission should consider whether BC Hydro’s culture, processes and procedures, compensation scheme and the expectations of its shareholder are attuned to the incentives of PBR.

1.21.2 Please discuss how the incentive pay provisions of BC Hydro are aligned to ensure efficient operation.

RESPONSE:

As referenced in the preamble to the question, the Government of B.C. expects BC Hydro to keep rates affordable. BC Hydro sets its budget in accordance with this objective and, among other things, Executive Team members are expected to achieve the budgets for which they have accountability, in order to receive holdback pay. For further information on BC Hydro’s holdback pay structure, refer to pages 7 to 8 of Exhibit B-8.

BC Hydro sets budgets that are efficient and challenging to achieve. David Wong, BC Hydro’s Executive Vice President of Finance, Technology and Supply Chain and Chief Financial Officer, spoke to this point during the Fiscal 2020 to Fiscal 2021 Revenue Requirements Application proceeding, stating:

“Well, first of all, when we put together this application we pushed hard to recreate budgets that I would say are hard to deliver on what we need to deliver on. And we are actually finding that this year.

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I mean, [there are] pockets of groups within our company are finding it really challenging. Just the technology as an example, in our area.

And so a lot of effort went in [to the] development of this application to find those savings, and now what we need to do is actually realize on them, which I think we are doing a really good job of.

We are working very hard every day to rationalize and manage our costs. And so, on the record, we are not providing what is happening as far as within the business. But I can tell you things like insurance costs have increased for us. We have to deal with that. So we are finding other areas to manage against that, and we are essentially slightly over budget on our operating costs when we look for the year. But like it was mentioned earlier, as a team what we are doing is we are looking at, well what can people, customer care and regulatory do to reduce costs, in order to help the vegetation maintenance that needs to happen over in integrated planning? And those conversations are happening, and we are doing it. And we are working extremely hard to be able to end our year end on budget.”

In addition, and as noted on page 10 of BC Hydro's Supplementary Evidence (Exhibit B-8), while the BCUC's Decision on BC Hydro's Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, which prompted this proceeding, emphasized cost control, the BCUC's more recent Decision on BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application, expressed concern that cost cutting may be too aggressive.