Fiscal 2020 to Fiscal 2021
Revenue Requirements Application

Chapter 11

Performance Based Regulation

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11.1 Executive Summary

British Columbia Hydro and Power Authority (**BC Hydro**) files this report on Performance Based Regulation (**PBR**) in response to Directive 28 from the British Columbia Utilities Commission (**BCUC**) in its Decision on BC Hydro's Previous Application.[373]

11.1.1 Scope of this Report

In its Decision on our Previous Application, the BCUC acknowledged previous cost cutting measures by BC Hydro and the potential for further savings through the Government of B.C.'s Comprehensive Review. However, it expressed concern regarding BC Hydro's base operating costs and suggested that a rate setting mechanism, like PBR, could help BC Hydro accomplish its cost control objectives and provide incentives to improve productivity while maintaining service quality.[374]

The BCUC recommended that BC Hydro consider a PBR plan and directed a PBR report to be filed, addressing the following issues:

- A discussion of the types of PBR plans that may be suitable for BC Hydro (i.e., Revenue Cap, Price Cap, hybrid);
- The length of PBR term that may be appropriate;
- A discussion of potential earnings sharing mechanisms that may be suitable for BC Hydro;
- The appropriateness of off-ramps;
- How capital spending could be managed as part of the PBR program;
- A list of potential key performance indicators to assist BC Hydro and the BCUC to evaluate progress during the PBR term;

[373] BCUC Decision and Order No. G-47-18, BC Hydro Ficsal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), pages 111 and 117.

[374] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), pages iv and 110.

- An Annual Review process and/or other monitoring processes during the PBR term; and
- An implementation timetable, including a proposed schedule of consultation with representatives of key customer groups and BCUC staff.[375]

11.1.2 Our Approach to this Report

FortisBC, an investor-owned natural gas and electric utilities in British Columbia, are currently operating under PBR. In its Decision on FortisBC's 2014 to 2018 PBR Application, the BCUC stated:

> "The Commission Panel is not looking at this Application from a short–term viewpoint. We see an opportunity to make significant change over the long term with the way regulation is conducted in this jurisdiction and the way in which revenue requirements are determined."[376]

BC Hydro agrees that the shift from cost of service regulation to PBR would be significant. It would represent a significant change for all stakeholders, including BC Hydro, interveners and the BCUC. We believe that the adoption of PBR for BC Hydro should be carefully considered.

Accordingly, to assist us in identifying the opportunities and challenges associated with the adoption of PBR for BC Hydro, we retained Dr. Dennis Weisman, Ph.D., a recognized expert in PBR.

At BC Hydro's request, Dr. Weisman completed a whitepaper titled *"A Report on the Theory and Practice of Performance-Based Regulation",* which outlines the theory and application of a successful approach to PBR. The whitepaper is included as Appendix FF and referenced throughout this report. Dr. Weisman also previously co-wrote a paper with Dr. David Sappington titled *"Assessing the Treatment of*

[375] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), page 111 (paraphrased and re-ordered).

[376] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 14.

Capital Expenditures in Performance-Based Regulation Plans", which was commissioned by the Edmonton Power Corporation (**EPCOR**) and filed with the Alberta Utilities Commission in 2016. This paper is included as Appendix GG.

BC Hydro's report is divided into three parts.

- First, in section 11.2, we provide an overview of cost of service regulation and PBR as well as a discussion of the different roles of the regulator, interveners and the utility under both approaches.
- Second, in sections 11.3 through 11.7, we provide our initial conclusions in response to the issues raised by the BCUC. These initial conclusions provide a framework for a PBR plan, should the BCUC decide to adopt PBR for BC Hydro.
- Third, in section 11.8, we review the potential implications of adopting PBR and conclude that BC Hydro should continue to be regulated through cost of service regulation at this time.

11.1.3 PBR is a Different Approach to Regulation

BC Hydro is currently regulated through a cost of service approach. Under this approach, BC Hydro submits evidence to the BCUC regarding the costs we expect to incur to provide safe, reliable, affordable and clean electricity to our customers. The BCUC reviews these costs and sets rates to allow BC Hydro to recover only those costs that it determines to be prudently incurred plus a reasonable rate of return (net income).

In simple terms, PBR involves setting rates through a formula. This formula de-links costs and rates for a specified period of time. A typical approach to PBR in the electricity industry is a hybrid plan where some costs are subject to a PBR formula and other costs are set through cost of service regulation.

Under PBR, a cost of service review would be conducted first, to set BC Hydro's base costs. In subsequent years, cost components subject to PBR would be determined by applying a formula to adjust the previous year's costs for the effects of inflation and productivity improvements. This means that the amount of revenue recovered through rates in subsequent years would be independent from BC Hydro's costs, rather than dependent on them.

Once the base costs are established, the BCUC would not focus on reviewing the cost components subject to PBR. Instead, the BCUC would design and implement mechanisms to incent the discovery of new savings. This shift in focus would provide BC Hydro with increased autonomy from detailed regulatory reviews. If BC Hydro were able to discover efficiencies over and above what is required to meet the formula, BC Hydro or the Government of B.C. (our shareholder) would retain those savings or share them with our customers, until rates were "re-based" to reflect the cost of service at the end of the PBR term.

By allowing BC Hydro to retain all or a portion of the savings over and above what is required to meet the formula, PBR would aim to incent a process through which new savings - that were not previously identified under cost of service regulation - are discovered.

A key difference between these two approaches is the role of BC Hydro, the BCUC and interveners. Under cost of service regulation, BC Hydro must provide a forecast of the costs that it expects to incur and then justify the reasonableness of those costs. The BCUC's role is to acquire information to determine which expenditures are prudent and which expenditures are imprudent. Interveners support this process by submitting information requests and arguments from a customer's perspective.

In contrast, PBR is predicated on providing greater autonomy to the utility. Under PBR, the BCUC's role would be to provide a framework to incent efficient behaviour and then allow BC Hydro to manage its expenditures within that framework without performing a detailed regulatory review that would second guess the decisions made. In exchange for this increased autonomy, BC Hydro would assume both the risk that the PBR formula would not sufficiently fund certain costs as well as the opportunity to retain additional savings, if new efficiencies were discovered, over and above what was required to meet the formula.

11.1.4 Summary of BC Hydro's Responses

We have reviewed the potential implications of adopting PBR and concluded that, at this time, BC Hydro should continue to be regulated through cost of service regulation, for the following four reasons:

- First, cost of service regulation should be given the opportunity to work. BC Hydro believes that unconstrained cost of service proceedings would address the issues raised by the BCUC in its Decision on our Previous Application.
- Second, given that BC Hydro is only now returning to enhanced regulation, it is likely to be more challenging to secure stakeholder support for the principles of PBR. BC Hydro believes that the most effective way to build the familiarity and comfort required to secure stakeholder support for the principles of PBR is through successive cost of service proceedings.
- Third, cost of service regulation is more intuitive and accessible, while PBR is more esotetic and relies heavily on specialized expertise.
- Fourth, BC Hydro does not have a mandate to maximize profits, which can dull the additional "carrot" incentive that PBR attempts to provide. This does not mean that BC Hydro will not seek out and find additional efficiencies in future years. Rather, it means that the incentive to find these efficiencies would come, as it does today, from the obligation and commitment on the part of management to deliver on its mandate within the budget set by the BCUC, and not from the opportunity to increase earnings.

BC Hydro respectfully recommends that the BCUC use this Revenue Requirements Application proceeding to engage interveners to canvass their views.

Should the BCUC decide to adopt PBR for BC Hydro, this report provides the following initial conclusions in response to the issues the BCUC has asked BC Hydro to address. These initial conclusions provide a framework for a PBR plan.

- **Types of PBR Plans:** The most suitable PBR plan for BC Hydro would be a hybrid plan, in which certain costs are subject to a PBR formula and other costs are "carved out" from the formula and reviewed through cost of service regulation. This hybrid plan should be more broad-based than targeted and should "carve out" items over which BC Hydro has little or no control. It will be important to appropriately align the roles and responsibilities of BC Hydro and the BCUC to maintain the distinction between cost of service regulation and PBR under this hybrid approach. The PBR formula should be a revenue cap which caps BC Hydro's total allowed revenue.
- **Creating and Sharing Benefits Under PBR:** The goal of adopting PBR is to incent a process through which savings – that were not previously identified under cost of service regulation – are discovered. The strength of the incentives provided depends on the extent to which the amount of revenue recovered through rates is independent from BC Hydro's costs, rather than dependent on them. The PBR term should be at least five years as a longer term would provide stronger incentives. There are trade-offs if stretch factors or Earnings Sharing Mechanisms are used to manage the allocation of benefits during the PBR term. A stretch factor would maintain the distinction between PBR and cost of service regulation and would not counteract the stronger financial incentives for efficient performance that PBR attempts to provide. An Earnings Sharing Mechanism reduces the strength of incentives; however, if an Earnings Sharing Mechanism is desired, then one with a "deadband" would provide stronger incentives than one that shares a set percentage of all earnings above

BC Hydro's allowed net income. Both financial and performance re-openers or off-ramps should be used. The financial triggers should be high enough to incent the vigorous pursuit of efficiencies while remaining low enough to provide a safeguard against excessive profits or losses.

- **Managing Capital and Other Costs under PBR:** A variety of approaches may be used to manage capital spending and other costs incurred by BC Hydro under a PBR plan. Each approach has trade-offs between the incentives provided, the degree of regulatory oversight and the level of certainty that funding will be sufficient to support the required investment. In this chapter, we identify areas where "adders" to the PBR formula or "carve outs" from the formula may be required; however, the appropriate approach should be determined in the context of an overall PBR plan proposal and not in isolation.
- **Monitoring the PBR Plan:** A number of the performance metrics already included in BC Hydro's Service Plan are likely appropriate as key performance indicators to monitor progress under PBR. Some additional customer service and emergency response metrics may need to be added. An Annual Review process, similar to the one adopted by the BCUC for FortisBC, would likely be appropriate for BC Hydro.
- **Implementing the PBR Plan:** BC Hydro has filed a cost of service Revenue Requirements Application for fiscal 2020 and fiscal 2021. BC Hydro suggests that the BCUC provide its decision on the adoption of PBR for BC Hydro in its decision on this Revenue Requirements Application. We believe that BC Hydro should continue to be regulated through cost of service regulation at this time. However, if the BCUC decides to adopt PBR for BC Hydro, following this Revenue Requirements Application proceeding, BC Hydro could file a proposed PBR plan, using fiscal 2021 as the base year, by February 2021. The consultation process on a PBR plan for BC Hydro could be similar to the model used for BC Hydro's 2015 Rate Design Application. A negotiated settlement

process to identify areas of common agreement, prior to BC Hydro's submission of a proposed PBR plan, may help to secure intervener and stakeholder support for elements of the proposed plan and streamline the subsequent regulatory review process.

11.2 PBR is a Different Approach to Regulation

In the following sections, BC Hydro provides an overview of cost of service regulation and PBR as well as a discussion of the different roles of the regulator, interveners and the utility under both approaches.

11.2.1 Overview of Cost of Service Regulation and PBR

BC Hydro's rates are currently set through cost of service regulation. Under cost of service regulation, BC Hydro applies to the BCUC to set rates for a certain period and submits evidence regarding the costs we expect to incur to provide safe, reliable, affordable and clean electricity to our customers. This is referred to as our "revenue requirements". The BCUC reviews these costs and sets rates to recover only those costs that it determines to be prudently incurred plus a reasonable rate of return (net income).

BC Hydro has made considerable progress in identifying cost savings under cost of service regulation. We have achieved cost reductions through the 2011 Government of B.C. review and the 2013 10 Year Rates Plan. In addition, the Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (**Previous Application**) provided an opportunity for oversight by the BCUC and interveners.

In its Decision on BC Hydro's Previous Application, the BCUC approved our revenue requirements but expressed concerns regarding base operating costs stating:

> "The Panel recognizes that in some cases, comparing forecast cost increases to the rate of inflation may be considered an appropriate measure for evaluating the reasonableness of forecast cost increases in the test period. This method is likely more suitable in situations where a regulator has consistently

> been empowered to oversee all aspects of the utility's forecast and historical expenditures through proceedings in which the underlying base costs were initially established. However, given the Commission's limited involvement in the approval of BC Hydro's recent revenue requirements, the Panel does not have a high degree of comfort in BC Hydro's starting point, being the 2016 base operating costs." [377]

The BCUC went on to suggest that a rate setting mechanism that could help BC Hydro to accomplish its cost control objectives would be of value, stating:

> "Performance Based Rate (PBR) setting mechanisms are implemented successfully in many jurisdictions, particularly in Canada, including BC. PBR provides incentives for utilities to improve productivity and create efficiencies to allow for rates to be more effectively managed, while maintaining service quality."[378]

While cost of service regulation sets rates to recover only those costs that the regulator determines to be prudent, PBR de-links rates and costs for a specified period of time.[379] The premise underlying this break is that since the utility has the strongest understanding of its costs and operations, the regulator should not focus on trying to collect and review this information. Instead, PBR shifts the regulator's focus to the design and implementation of rules that will incent the utility to discover all possible efficiencies and productivity improvements. [380] This shift in focus provides the utility with increased autonomy from detailed regulatory reviews. [381]

While the starting point for PBR is typically a cost of service review to establish a base year, rates in subsequent years are then determined by applying a formula which adjusts the previous year's rates for the effects of inflation and productivity

[377] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), page 33.

[378] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), page 110.

[379] Appendix FF, page 8.

[380] Appendix FF, pages 4 to 6.

[381] Appendix FF, page 5.

improvements, through an inflation factor and a productivity factor.[382] This means that the amount of revenue recovered through rates in subsequent years is largely de-linked from the utility's costs over the term of the PBR plan.[383] If a utility is able to discover efficiencies over and above what is required to meet the formula adjustments, it retains all or a portion of those savings until rates are re-based at the end of the PBR term. At that point, some or all of the efficiencies are reflected in customer rates in future years.[384]

By allowing a utility to retain all or a portion of the savings over and above what is required to meet the formula, PBR aims to incent a process through which new savings - that were not previously identified under cost of service regulation - are discovered.[385] The effect of this process is to go beyond the "static" efficiencies that are discovered through aligning costs and prices under cost of service regulation and emulate what would happen in a competitive market where, in an effort to increase their market share, rival producers would continually discover new ways to reduce their costs, achieving "dynamic" efficiencies.[386]

11.2.2 PBR's Use of Incentives and Greater Utility Autonomy Alters the Roles and Responsibilities of All Stakeholders

A key difference between cost of service regulation and PBR is the role of the utility, the regulator and interveners.

Under cost of service regulation, the utility must provide a forecast of the costs that it expects to incur and then justify the reasonableness of those costs. The regulator's role is to determine which expenditures are prudent and which expenditures are imprudent. Interveners support this process by submitting information requests and arguments from a customer's perspective. PBR is premised on the idea that this

[382] Schmidt, page 2.
[383] Appendix FF, pages 8 to 10 and 49 to 50.
[384] Appendix FF, page 8.
[385] Appendix FF, page 5.
[386] Appendix FF, page 22.

approach may have limitations. This concept is explained by Professor Alfred Kahn in *The Economics of Regulation: Principles and Institutions*:

> "Effective regulation of operating expenses and capital outlays would require a detailed, day-by-day, transaction-by-transaction, and decision-by-decision review of every aspect of the company's operation. Commissions could only do so only if they were prepared completely to duplicate the role of management itself." [387]

Under PBR, the regulator's role is to provide a framework and allow the utility the necessary autonomy to manage its expenditures within that framework. As explained by Dr. Michael Schmidt in *Performance-Based Ratemaking: Theory and Practice*:

> "A desirable aspect of price cap regulation lies in the fact that the regulatory authority no longer has to second-guess the utilities' operations and evaluate the prudence of its investment decisions and operating practices. Second-guessing is a difficult task because it is generally recognized that the utility has superior information regarding its business operations including opportunities for reducing costs. Therefore, the regulator must resist-second guessing the utility and rely on the PBR."[388]

These different roles create different responsibilities for both the regulator and the utility. For example, under cost of service regulation, the utility must outline its forecast costs in detail, because it must prove to the regulator that the costs are reasonable. At the same time, the regulator has a responsibility to acquire information to evaluate the prudency of expenditures. However, under PBR, the utility does not have to demonstrate the reasonableness of forecast costs each year and the regulator has a responsibility to resist acquiring and evaluating information so that it does not second guess the decisions of the utility. In exchange for this increased autonomy from detailed regulatory review, the utility assumes greater risk

[387] Alfred E. Kahn, The Economics of Regulation: Principles and Institutions, Volume I, New York: John Wiley and Sons, 1970, pages 29 to 30.

[388] Dr. Michael R. Schmidt, Performance-Based Ratemaking: Theory and Practice, Public Utilities Reports, Inc., 2000, page 101.

and is provided with the opportunity to retain additional savings.[389] Figure 11-1 provides a matrix of respective responsibilities under both cost of service regulation and PBR:

Figure 11-1 Regulator and Utility Responsibilities under Cost of Service Regulation and PBR

	Regulator	Utility
Cost of Service Regulation	Acquire information to evaluate prudency of expenditures	Provide information so that prudency can be evaluated
Performance Based Regulation	Create a framework and resist second guessing the utility's decisions	Assume greater risk in exchange for greater autonomy from detailed regulatory review

As Dr. Weisman explains, aligning these roles and responsibilities is critical to maintaining the distinction between cost of service regulation and PBR:

> "It follows that if the firm is uncertain as to whether regulatory commitments will be honored, there may be little practical difference between PBR and [cost of service regulation]. In this manner a weak regulatory commitment undermines the superior incentive properties of PBR." [390]

11.3 Suitable Types of PBR Plans if PBR is Adopted

In response to the BCUC's request, this section discusses the types of PBR plans that may be suitable, if the BCUC decides to adopt PBR for BC Hydro.

There are various approaches to designing a PBR plan. A PBR plan may subject all costs to the PBR formula and may include "adders" if there are forecast costs that are not sufficiently funded by the formula. Alternatively, a PBR plan may be a "hybrid" where some costs are subject to the PBR formula and some costs are "carved out" and set through cost of service regulation. In addition, the PBR formula can set a price cap which caps the allowed rate increase or a revenue cap which

389 Appendix FF, page 11.

390 Appendix FF, page 50.

caps the allowed total revenue. We believe that the most suitable PBR plan for BC Hydro would be a hybrid plan and that the PBR formula should be a revenue cap.

Under PBR, an inflation factor (or "I" factor) escalates the utility's rates or revenue by an inflation index.[391] As the BCUC has noted, there are many considerations when establishing the appropriate inflation index including which indexes are most suitable, the appropriate allocation between labour and non-labour costs, the weighting of operating and capital costs, and whether to use forecast values, forecast values with a "true-up" or actual values from the previous year.[392]

A productivity factor (or "X" factor) offsets the inflation factor and is meant to represent the average productivity gains of a representative industry peer group, so that they can be passed on to customers through lower rates. It is important to recognize that the "productivity" measure used in the PBR formula means the amount of "output" (energy) per unit of "input" (cost). This means that productivity increases either when the amount of output increases and the amount of input remains the same, or when the amount of output remains the same and the amount of input decreases. Therefore, investments that increase the amount of energy produced tend to increase productivity while investments required for the reliability or sustainment of the electricity system or to support customer service, tend to decrease productivity because they increase costs but do not increase the amount of energy produced.

Dr. Weisman emphasizes that the productivity factor applied to electric utilities under PBR must account for these dynamics, stating:

> "…when productivity growth is declining over time, a backward-looking X factor (one based on historical data) is likely to overestimate the industry's capabilities going forward. This

391 Appendix FF, page 31.

392 BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), pages 31 to 34.

> may well explain why PBR plans were not renewed or prematurely terminated in the electric power industry… backward-looking X factors in the electricity sector may well result in decreasing price-cost margins over time that would render it more difficult to fund capital requirements…"[393]

The productivity factor is meant to pass average industry productivity gains on to consumers and to be independent of the utility's own performance. This means that while the utility's past performance may inform the productivity factor at the start of a PBR plan, it cannot be used repeatedly. Rather, ongoing adjustments to the productivity factor should be based on a representative peer group of utilities in the same industry. The selection of peer group is fundamental to the fairness of the PBR plan, since benchmarking against utilities that are not facing the same operating circumstances could result in a formula that is too aggressive or too lenient. [394]

Lastly, a PBR formula typically includes an unforeseen factor (or "Z" factor) which allows rates to be adjusted to reflect one-time external events that are beyond the control of the utility. [395] The BCUC has previously determined that Z factors should be included as part of the PBR formula and that the following criteria should determine whether an event qualifies to be reflected in rates through the Z factor:

> 1. "The costs/savings must be attributable entirely to events outside the control of a prudently operated utility;
> 2. The costs/savings must be directly related to the exogenous event and clearly outside the base upon which the rates were originally derived;
> 3. The impact of the event was unforeseen;
> 4. The costs must be prudently incurred; and

[393] Appendix FF, pages 16 to 17.
[394] Appendix FF, pages 53 to 54.
[395] Appendix FF, page 32.

5. The costs/savings related to each exogenous event must exceed the Commission-defined materiality threshold."[396]

The BCUC has determined that materiality thresholds are a necessary component of "Z" factor criteria[397] and that these thresholds should be non-aggregated,[398] which means that multiple individual events below the threshold cannot be added together to meet the threshold and receive "Z" factor treatment. However, Dr. Weisman cautions that a non-aggregated materiality threshold may lead to "death by a thousand cuts."[399]

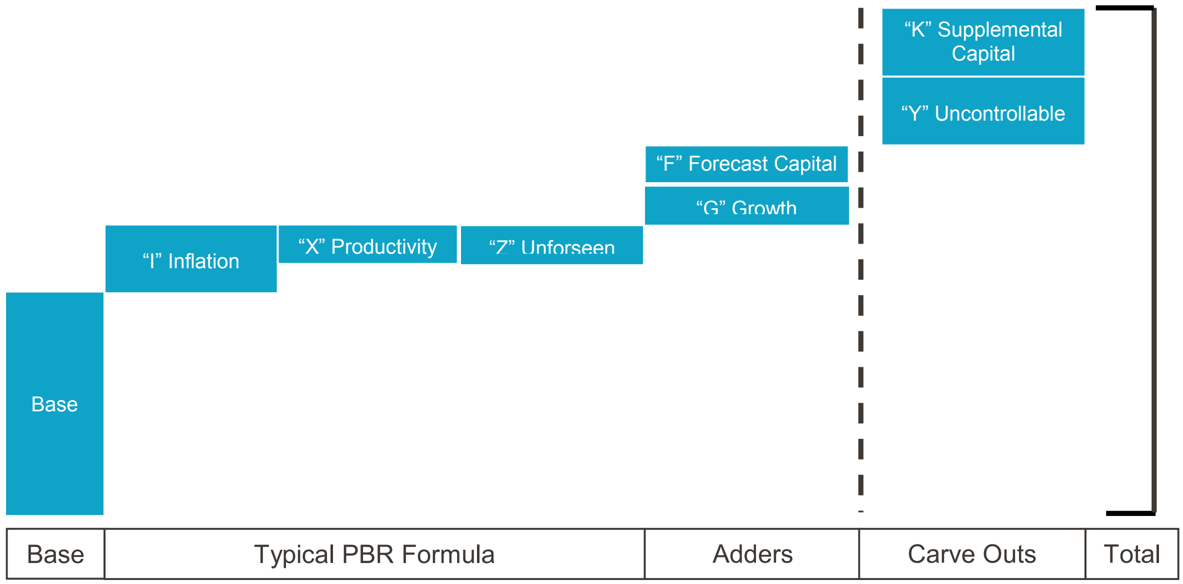
11.3.1 The PBR Plan Should be a Hybrid Approach

As discussed in section 11.2.1, the PBR formula adjusts rates for inflation and productivity improvements.

However, this adjustment may not be able to provide sufficient funding for all of a utility's forecast costs. For example, large capital projects may require "lumpy" investments and energy costs can fluctuate significantly. In these cases, "adders" or "carve outs" may be used. As Dr. Weisman observes, this is common in the electricity industry as the standard PBR formula does not account for recurring expenditures over which the utility has no control and may not generate sufficient revenues to adequately fund required capital investments.[400] Figure 11-2 provides a visual demonstration of how some common "adders" or "carve outs" may be used in combination with the adjustment for inflation and productivity improvements:

396 BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 94.
397 BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 95.
398 BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 96.
399 Rebuttal Testimony of Dennis L. Weisman, Ph.D., Alberta Utilities Commission, Application No. 1606029, Proceeding ID No. 566, Rate Regulation Initiative (April 4, 2012), page 21.
400 Appendix FF, page 33.

Figure 11-2 Common “Adders” and “Carve Outs” Under PBR



“Adders” refers to factors that are part of the PBR formula and are intended to increase the amount of funding that the formula provides. “Carve outs” refers to factors that remove costs from the formula entirely. Costs that are “carved out” of the PBR formula are subject to regulatory oversight on a cost of service basis, since those costs flow directly through to rates.[401] Accordingly, “carving out” certain costs results in a “hybrid” approach where some of the utility’s costs are subject to the PBR formula and other costs are determined through cost of service regulation.

A PBR formula with “adders” may include the following factors:

- A growth factor (or “G” factor) adds to the escalation provided by the inflation factor so that rates reflect the additional costs required to serve new customers.[402] The BCUC has previously stated that it is “reasonable to conclude that there are cost increases associated with growth” but has noted some complexities including that costs may only increase when a certain

401 *Id.*
402 Appendix FF, page 27.

threshold of growth is reached and that those costs may not increase or decrease in a linear manner.[403]

- A forward-looking factor (also referred to as a “K-bar” or “F” factor) captures forecast costs associated with capital projects that are partially, but not fully, funded through the PBR formula.[404]

A hybrid approach with “carve outs” from the PBR formula may include the following factors:

- An uncontrollable factor (or “Y” factor) reflects recurring expenses that are beyond the control of the utility and should be fully reflected through an adjustment to rates.[405] Examples of items that may be included under a “Y” factor are interest, taxes and post-employment benefit costs.[406] In its 2016 PBR Decision, the Alberta Utilities Commission established the following criteria for “Y” factor treatment:

  > “(i) The costs must be attributable to events outside management’s control.
  >
  > (ii) The costs must be material. They must have a significant influence on the operation of the [utility]; otherwise the costs should be expensed or recognized as income, in the normal course of business.
  >
  > (iii) The costs should not have a significant influence on the inflation factor in the PBR formulas.
  >
  > (iv) The costs must be prudently incurred.

[403] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), pages 116 to 117.

[404] Appendix GG, pages 32 to 33.

[405] Appendix FF, page 33.

[406] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), pages 97 to 98.

(v) All costs must be of a recurring nature, and there must be the potential for a high level of variability in the annual financial impacts."[407]

In British Columbia, the BCUC has previously observed that the research undertaken to determine expected productivity improvements that should be reflected through the "X" factor must be aligned with the scope of the "Y" factor.[408] In other words, the scope of items covered by the "X" factor must not overlap with the scope of items captured by the "Y" factor, otherwise those costs may be "double counted" in the resulting adjustment to rates.

- A supplemental capital factor (also referred to as "capital tracker" or "K" factor) reflects capital investment required to adequately sustain infrastructure or meet new demand that cannot be accommodated within the adjustment made to rates for inflation and productivity improvements. In other words, capital that is "supplemental" to what can be accommodated under the constraints of the PBR formula. [409]

As Dr. Weisman observes, regulators have struggled to strike the appropriate balance between the capital that is included under the PBR formula and the capital that is supplemental and funded through an adjustment to rates by the "K" factor. [410] Section 11.5.1 provides a summary of the trade-offs between various approaches to managing capital spending under a PBR plan. These approaches may include the use of "adders" such as "G" or "F" factors or the use of "carve outs" such as a "K" factor. In some cases, these factors may be used together. For example, a "F" factor may be used to capture forecast costs associated with capital projects that are partially, but not fully, funded through the PBR formula and the "K" factor may be used to capture costs associated with unique lifecycle capital replacement projects

[407] Alberta Utilities Commission, Errata to Decision 20414-D01-2016, 2018-2022 Performance-Based Regulation Plans for Alberta Electric and Gas Distribution Utilities (February 6, 2017), page 89.
[408] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 103.
[409] Appendix FF, page 33.
[410] Appendix FF, pages 46 to 47.

or projects required by external parties, which are outside the normal course of business and therefore not captured at all within the PBR formula.[411]

Overall, we believe that a hybrid approach, which includes some "carve outs" from the PBR formula, would be appropriate for BC Hydro given our capital investment requirements and various uncontrollable costs, which are discussed further in section 11.5.

Dr. Weisman emphasizes that PBR is not "one-size-fits-all",[412] citing a survey by Professor Graeme Guthrie, which concluded that:

> "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."[413]

Accordingly, Dr. Weisman provides some principles to guide the design of a PBR approach that appropriately reflects the unique circumstances of a utility:

- It should be more broad-based than targeted so that a utility does not devote excessive attention to those items covered by the PBR formula at the expense of items that are "carved out" of the formula[414] and so that the utility is not incented to make inefficient decisions to push additional costs outside of the PBR formula;[415]
- Items over which the utility has little or no control should be "carved out" of the PBR formula;[416]

[411] Appendix GG, pages 32 to 33.
[412] Appendix FF, page 12.
[413] Graeme Guthrie, "Regulating Infrastructure: The Impact on Risk and Investment," *Journal of Economic Literature,* Volume 44(4), December 2006, page 966.
[414] Appendix FF, pages 13 to 14.
[415] Appendix FF, page 26.
[416] Appendix FF, page 14.

- With regards to capital projects, the productivity improvements assumed by the "X" factor must recognize that increased investment is required in the electricity industry. This investment is necessary to refurbish aging infrastructure and to improve seismic safety so that existing assets may keep producing the same results. These types of investments result in negative productivity improvements, as the amount of resources inputted increases but the output remains the same. Setting a "X" factor that recognizes this trend is important so that as much capital as feasible may be included within the PBR formula. Otherwise, excessive amounts of supplemental capital may need to flow directly through to rates, through the "K" factor, which may weaken the incentives to discover new efficiencies in the planning and delivery of capital projects.[417]

11.3.2 The PBR Formula Should be a Revenue Cap

As explained by the BCUC in its Decision on FortisBC's 2014 to 2018 PBR Application, the PBR formula generally takes the form of a price cap or a revenue cap. Under a price cap, a utility's rates are determined by the previous year's rates as adjusted by the PBR formula. Under a revenue cap, the utility's total allowed revenue is determined by the previous year's total allowed revenue as adjusted by the PBR formula. The primary difference between these two approaches is that under a price cap, the utility's allowed revenue fluctuates as demand fluctuates (e.g., if load is less than forecast then allowed revenue will also be less) while under a revenue cap, allowed revenue is decoupled from demand and remains constant regardless of whether load is more or less than forecast. In other words, under a price cap, the utility assumes the risk associated with changes in demand while under a revenue cap, customers assume the risk associated with changes in demand.[418]

[417] Appendix FF, page 47.
[418] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 19.

As explained in the BCUC's decision on BC Hydro's Fiscal 2009 to Fiscal 2010 Revenue Requirements Application, prior to fiscal 2009, BC Hydro assumed the risk associated with changes in demand as "variances from forecast were expected to be symmetrical and fall within a range of $20 million on an annual basis". However, based on the asymmetry and volatility in load actually experienced from fiscal 2005 to fiscal 2008 and the expectation that volatility may increase in future years, BC Hydro proposed that the net impact of load variances be included in the Non-Heritage Deferral Account starting in fiscal 2009, transferring the risk associated with changes in demand from BC Hydro to customers. [419] In Directive 31, the BCUC approved this request. [420] Direction No. 7 required the BCUC to continue to allow BC Hydro to defer the variances between actual and forecast cost of energy arising from differences between actual and forecast domestic customer load to the Non-Heritage Deferral Account.[421]

A revenue cap would recognize the continued uncertainty around the load forecast.[422] A revenue cap is also consistent with the approach that the BCUC has previously approved for FortisBC's natural gas and electricity utilities. [423] Accordingly, we believe that a revenue cap would be most suitable for BC Hydro.

11.4 Sharing Benefits Under PBR

The BCUC has asked for a discussion of a number of mechanisms that can be used to allocate the benefits achieved under PBR between BC Hydro and our customers. In this section, we address those mechanisms as well as others that may be included in a PBR plan as follows:

- Section 11.4.1 - PBR Term and Efficiency Carry-Over Mechanisms;

[419] BCUC Decision, BC Hydro Fiscal 2009 to Fiscal 2010 Revenue Requirements (March 13, 2009), page 166.
[420] BCUC Decision, BC Hydro Fiscal 2009 to Fiscal 2010 Revenue Requirements (March 13, 2009), page 232.
[421] Direction No. 7, section 7 (c) (i).
[422] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), Appendix GG, page 13.
[423] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 21.

- Section 11.4.2 – Stretch Factors and Earnings Sharing Mechanisms; and
- Section 11.4.3 – Off-Ramps and Re-Openers.

It is important to recognize that mechanisms to allocate benefits achieved under PBR may affect the strength of the incentives provided to discover those benefits in the first place.

The strength of the incentives provided depends on the extent to which the amount of revenue recovered through rates is de-linked from a utility's costs, over the term of the PBR plan. Incentives are weak when the utility has the ability to pass along cost changes in the form of rate changes and are strengthened as this ability becomes more limited.[424]

It is important to recognize that the current cost of service approach to regulating BC Hydro already provides some limitation on the ability to pass along cost changes in the form of rate changes. For example, as BC Hydro's revenue requirements applications are submitted on a forecast basis and cover multiple years, rates are set independently of BC Hydro's actual costs over the test period. This means that unexpected cost pressures that arise during the test period must be managed and fully absorbed by BC Hydro within its existing approved revenue requirement, unless there is a regulatory mechanism in place to defer the impact.

Dr. Weisman explains that the strength of the incentives provided, depends on the mechanisms for allocating benefits and that adopting PBR does not automatically result in stronger incentives:

> "Whereas traditional cost-of-service regulation is frequently treated in the literature as a discrete alternative to PBR, these two types of regulatory regimes are best understood in terms of lying along a continuum based on the strength of the incentives for efficient performance. The textbook model of [cost of service

[424] Appendix FF, pages 8 to 10 and 49 to 50.

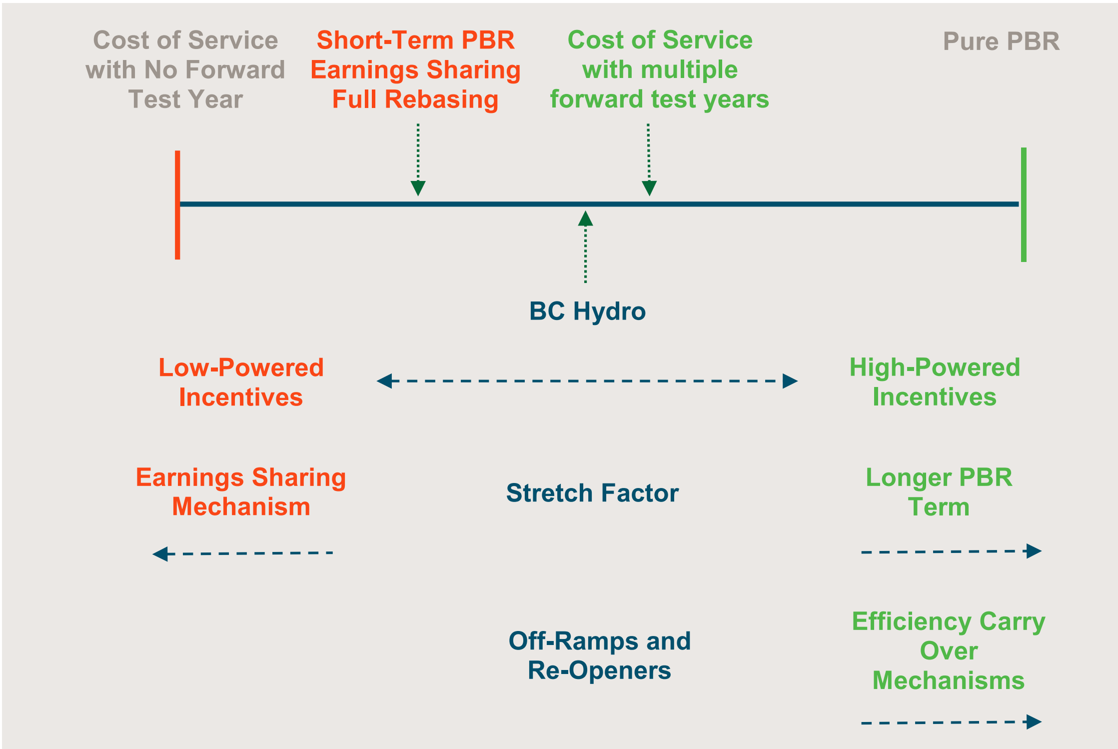
> regulation] with no regulatory lag[425] contemplates instantaneous rate reductions that serve to normalize excess returns. This regulatory regime lies at the far left on this continuum indicating extremely weak (low-powered) incentives. In contrast, long-term PBR with no earnings sharing or rebasing lies at the far right on this continuum indicating extremely strong (high-powered) incentives. Notably, [cost of service regulation] with a long regulatory lag may reside on this continuum to the right of a short-term PBR regime that incorporates a narrow deadband, pronounced earnings sharing and a full-rebasing of rates at the end of the PBR term. In this special case, [cost of service regulation] exhibits more high-powered incentives than PBR."[426]

Figure 11-3 indicates BC Hydro's current position on this continuum and shows how various mechanisms may increase, decrease or maintain the strength of incentives for efficient performance.

[425] In the context of PBR, "regulatory lag" means the length of time between rate reviews (e.g., the "regulatory lag for BC Hydro's Fiscal 2017 to Fiscal 2019 cost of service Revenue Requirements Application was three years). PBR aims to increase regulatory lag to strengthen financial incentives for efficient performance.

[426] Appendix FF, page 1.

Figure 11-3 Relative Incentive Power of BC Hydro's Current Regulatory Framework



In this section, we conclude that the PBR term should be at least five years as a longer term would provide stronger incentives. We also identify the trade-offs associated with using stretch factors or Earnings Sharing Mechanisms to manage the allocation of benefits during the PBR term. We conclude that a stretch factor would maintain the distinction between PBR and cost of service regulation and would not counteract the stronger financial incentives for efficient performance that PBR attempts to provide. If an Earnings Sharing Mechanism were to be included in the PBR plan, a mechanism with a "deadband" would provide stronger incentives than one which shares a set percentage of all earnings above or below the allowed net income. We also conclude that both financial and performance re-openers or off-ramps should be used. The financial triggers should be high enough to incent the vigorous pursuit of efficiencies while remaining low enough to provide a safeguard against excessive earnings or losses.

For simplicity, the discussion below focuses on benefits; however, it is important to note that the opportunity for customers to share in greater benefits is typically accompanied by increased exposure to risk. In other words, as customers receive a greater share of the benefits under PBR, through the mechanisms described below, they would also become exposed to more risks and the prospect of increased costs – through higher rates - should those risks materialize. Conversely, as BC Hydro's share of any benefits achieved under PBR increases, customers should become more insulated from potential risks and the corresponding costs.[427]

11.4.1 PBR Term and Efficiency Carry-Over Mechanisms

The BCUC has asked BC Hydro to discuss the appropriate length of a PBR term.

The PBR term refers to the period from the outset of PBR to "re-basing", when rates are "trued up" to reflect the utility's new cost of service. Through re-basing, some or all of the gains made under PBR are passed on to customers through lower rates in future years. The PBR term helps to determine how the benefits of PBR are shared between the utility and customers because it sets the minimum length of time that must pass before some or all of those benefits are transferred to customers, through re-based rates.

Two important considerations should inform the length of the PBR term:

- First, as the length of the PBR term increases, the incentives for the utility to achieve efficiencies also increases. This is because the utility retains those efficiencies for a longer period of time before some or all of the savings are transferred to customers, through re-based rates. [428]
- Second, the PBR term must be long enough to allow the utility to undertake the changes and investments necessary to discover and achieve additional efficiencies. If the PBR term is too short, re-based rates may reflect the costs of

[427] Appendix FF, page 11.
[428] Appendix FF, page 33.

additional investments made but not the expected efficiencies from those investments.[429] The BCUC has previously recognized this benefit of a longer PBR term, stating:

> "Efficiencies that require upfront costs in order to deliver a stream of benefits over a period of years are, in the Panel's view, more likely to be pursued under a PBR with a longer time period."[430]

Even with a longer PBR term, some cost effective investments may still be challenging to undertake if all of the benefits achieved from those investments are passed on to customers when rates are re-based. For example, towards the end of the PBR term, the payback period before rates are re-based becomes very short and some investments may require a payback period that is longer than the actual PBR term.[431] Efficiency Carry-Over Mechanisms address this issue by allowing the utility to carry-over a portion of its realized savings (or losses) into the next PBR term.[432]

The BCUC has previously recognized the potential value of Efficiency Carry-Over Mechanisms as a means of incenting the development of efficiency initiatives throughout the PBR term, provided that they balance the interests of the utility and its customers, are limited to specific investments where a longer payback period is required, and are applied on a case by case basis.[433]

BC Hydro's Previous Application under cost of service regulation was for a three-year period. As Dr. Weisman explains, the amount of time between when rates are re-based determines the relative strength of the incentives for efficiency between

[429] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 22.

[430] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 26.

[431] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 121-122.

[432] Appendix FF, page 42.

[433] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 128.

PBR and cost of service regulation.[434] In other words, all else equal, a PBR term of three years may provide no greater incentives for efficiency than the status quo.

Accordingly, BC Hydro suggests that the PBR term should be a minimum of five years and that Efficiency Carry-Over Mechanisms should be included in the PBR plan.

11.4.2 Stretch Factors and Earnings Sharing Mechanisms

While the PBR Term and Efficiency Carry-Over Mechanisms determine when and how rates are re-based so that the benefits achieved under PBR are transferred to customers, a PBR plan may also provide ways to share benefits with customers before rates are re-based. While the BCUC specifically asked BC Hydro to discuss potential Earning Sharing Mechanisms, we have also included a discussion on stretch factors, which are an alternative to Earnings Sharing Mechanisms.

As discussed in section 11.2.1, the objective of PBR is to provide stronger incentives than cost of service regulation so that the utility achieves new efficiencies that would not have otherwise been discovered. A stretch factor attempts to forecast these expected benefits in advance and immediately pass the savings on through lower rates to guarantee customers a share of the benefits from the stronger performance incentives that are expected under the PBR plan.[435] It is implemented by increasing the assumed productivity improvements in the PBR formula.[436] A stretch factor may be used to account for the relative efficiency for a utility at the beginning of a PBR plan.[437] In other words, if a utility is inefficient when it enters PBR, it may be subject to a high stretch factor, whereas a utility that has already been seeking out efficiencies would be subject to a lower stretch factor or none at all. Appendix T of this application provides a benchmarking study on BC Hydro's operating costs,

[434] Appendix FF, pages 1 and 33.

[435] State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities, MN Lowry, M Makos, J Deason, L Schwartz, page 4.2.

[436] Appendix FF, page 32.

[437] Appendix FF, pages 55 to 57.

completed by The Brattle Group. This study indicates that BC Hydro's operating costs compare favourably to those of an appropriate peer group and it should be considered when establishing whether any stretch factor is appropriate for BC Hydro.

While the stretch factor applied to each utility may be the same or different, it is set independent of the utility's performance during the PBR term. In other words, during the PBR term, the amount of benefits shared with customers, through the stretch factor, remains the same regardless of the actual level of efficiencies achieved by the utility.

Dr. Weisman observes that any stretch factor is ultimately a judgement call and there is no consensus that it is possible to develop a stretch factor in a scientifically rigorous manner. [438] As Dr. Weisman notes, regulators have taken different approaches to determining the appropriate stretch factor:

- the Alberta Utilities Commission has concluded that there is no definitive analytical source to determine the size of a stretch factor;
- the BCUC has determined that a stretch factor is judgement based and ordered FortisBC to conduct a benchmarking study to inform its judgement; and
- the Ontario Energy Board uses benchmarking studies to evaluate the efficiency of utilities relative to their peer group, in order to inform the selection of an appropriate stretch factor.[439]

While a stretch factor attempts to forecast benefits in advance so that they can be shared with customers immediately through lower rates, an Earnings Sharing Mechanism provides a way to share actual benefits achieved with customers, during the PBR term, before rates are re-based.[440] In this sense, a stretch factor and an Earnings Sharing Mechanism both provide ways to deliver benefits to customers and

438 Appendix FF, page 55.
439 Appendix FF, page 55.
440 Appendix FF, page 36.

may be considered complementary to each other or alternatives to each other.[441] If a PBR plan already includes other mechanisms to share benefits and risks during the PBR term (such as a stretch factor or a Z factor, which is discussed in section 11.3 or regulatory accounts, which are discussed in section 11.5.8), an Earnings Sharing Mechanism may not be required.[442]

A key difference between an Earnings Sharing Mechanism and a stretch factor is that while a stretch factor is set independent of the utility's performance during the PBR term, an Earnings Sharing Mechanism, by sharing actual benefits achieved, is dependent on the utility's performance during the PBR term.

An Earnings Sharing Mechanism may be a set percentage of all earnings achieved above the allowed net income or it may be triggered or adjusted at certain thresholds so that the benefits retained by the utility, prior to rates being re-based, remain within acceptable bounds.[443] The utility's share may be constant or it may increase or decrease as certain thresholds are reached.[444] As discussed in section 11.4.3, off-ramps and re-openers are another option to keep the benefits retained by the utility within acceptable bounds. An Earnings Sharing Mechanism typically takes the form of a refund or an offset to rates or allowed revenue in the subsequent year.[445]

In *Designing Incentive Regulation*, Dr. Sappington suggests that establishing a "deadband" so that an Earnings Sharing Mechanism is not triggered until earnings reach a certain threshold above or below the utility's allowed net income, is preferable to a mechanism that shares a set percentage of all earnings above or below the allowed net income. A 2015 survey commissioned by the Edison Electric

[441] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 79.
[442] Lowry et al., page A.1.
[443] Appendix FF, pages 34 to 35.
[444] Schmidt, page 73.
[445] Schmidt, page 77.

Institute indicates that among utilities that have an Earnings Sharing Mechanism, most have a "deadband".[446] As Dr. Sappington explains:

> "A common form of profit-sharing establishes a band…around the target rate of return. Within that band, the firm retains all of the returns it generates. Just outside of this band, sharing occurs... A sharing scheme like this has many attributes. In the immediate range around the target rate of return, the firm faces ideal incentives to foster cost reduction. Every dollar in reduced operating costs accrues to the firm, which provides strong incentives for the firm to minimize production costs. The incentives are less strong outside of this immediate range, but some incentives still remain."[447]

The BCUC has previously approved both a stretch factor and an Earnings Sharing Mechanism. With regards to earnings sharing, the BCUC has stated that:

> "The Panel notes that the purpose of implementing a PBR mechanism is to provide an environment where efficiencies are created through actions initiated by the utility. Accordingly, there is an expectation that all things being equal, the Fortis utilities will, over the course of this PBR, generate efficiency savings resulting in earnings which allow them to exceed the approved [return on equity]… To deny the customer the opportunity of sharing these savings would not be in their interest."[448]

While PBR can and should benefit all stakeholders, including customers, through the discovery of new savings not previously identified under cost of service regulation,[449] Dr. Weisman cautions that distributing benefits to customers during the PBR term may prevent those benefits from being discovered in the first place.[450] As explained in his article *Is There 'Hope' for Price Cap Regulation?:*

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[446] Of 25 utilities surveyed by Pacific Economics Group Research LLC, 13 have no Earnings Sharing Mechanism. Of the 12 utilities that have an Earnings Sharing Mechanism, only four do not have a "deadband". (Alternative Regulation for Emerging Utility Challenges: 2015 Update, Pacific Economics Group Research LLC, Table 7).

[447] David E.M. Sappington, "Designing Incentive Regulation" *Review of Industrial Organization*, Volume 9, 1994, page 263.

[448] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 120 to121.

[449] Appendix FF, pages 12 to 13.

[450] Appendix FF, pages 48 to 50.

> "The key point, however, is that higher than normal earnings no longer (necessarily) imply rates that are not "just and reasonable." These higher than normal earnings may simply reflect the stronger incentives for efficient performance under price cap vis a vis earnings regulation. Should this be the case, these additional earnings would not exist but for the regulator's commitment to allow the regulated firm to be the residual claimant for its realized efficiency gains." [451]

Further as explained in *"Efficiency as a Discovery Process: Why Enhanced Incentives Outperform Regulatory Mandates":*

> "A common refrain is that because utilities have a "statutory obligation" to be efficient, any additional rewards for achieving efficient behavior through incentive regulation are unnecessary - and serve only to foster an inequitable distribution of efficiency gains between regulated firms and customers… the achievement of performance gains is first and foremost a "discovery process" in which more efficient operating practices and superior use of technology are learned over time. It is the recognition of this discovery process that leads to the conclusion that the efficiency gains realized under incentive regulation need not imply that the firm was knowingly inefficient under cost-of-service regulation. To the contrary, it is quite plausible that the firm under [cost of service regulation] was as efficient as it knew how to be."[452]

Weakening the incentives provided under PBR by incorporating an Earnings Sharing Mechanism should logically lead to a reduction in the assumed productivity improvements in the PBR formula, resulting in rates being higher than they otherwise would have been.[453] Earnings sharing may also reduce the actual efficiencies achieved under PBR, resulting in fewer actual benefits being passed on to customers through rate re-basing at the end of the PBR term.[454] Dr. Weisman notes that empirical analyses suggest that earnings sharing decreases the benefits

451 Dennis L. Weisman, "Is There 'Hope' for Price Cap Regulation?" *Information Economics and Policy*, Volume 14(3), 2002 at 363-64.

452 Dennis L. Weisman and Johannes P. Pfeifenberger, "Efficiency as a Discovery Process: Why Enhanced Incentives Outperform Regulatory Mandates," *The Electricity Journal,* Volume 16(1). January/February 2003, page 59.

453 Appendix FF, pages 37 to 38.

454 *Id*.

achieved under PBR[455] and that the Federal Communications Commission has recognized the trade-off between earnings sharing and assumed productivity improvements under the PBR formula. [456] Further, as noted in *State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities*:

> "Some [plans] contain menus of provisions from which utilities can choose…a utility might, for example, have a choice between (1) a low [productivity] factor and an earnings sharing mechanism and (2) a higher productivity factor and no earnings sharing."[457]

By weakening the incentives to discover new efficiencies and re-establishing a link between costs and rates, PBR with earnings sharing blurs the distinction between PBR and cost of service regulation. As the former Chair of the Massachusetts regulatory Commission once observed:

> "The [Massachusetts regulatory] commission decided that earnings sharing was not appropriate because it introduces many of the cost-of-service disincentives for efficiency that price cap regulation is designed to eliminate. The commission also did not want to have to rule on the prudence of investments in an increasingly risky and speculative industry, which would have been required for an earnings calculation. Also, earning sharing would require an annual review of earnings, which the Commission thought would be a significant administrative burden."[458]

As explained in section 11.2.2, a key difference between cost of service regulation and PBR is the role of the BCUC. Under cost of service regulation, the BCUC's role is to acquire information to determine which expenditures are prudent and which expenditures are imprudent. Under PBR, the BCUC's role would be to provide a framework and allow BC Hydro to manage its expenditures within that framework

455 Appendix FF, pages 38 to 39.

456 Federal Communications Commission, CC Docket No. 91-41, LEC Price Cap Performance Review, April 7, 1995.

457 Lowry et al., page 4.11.

458 Paul Vasington, "Incentive Regulation in Practice: A Massachusetts Case Study," *Review of Network Economics,* Volume 2(4), 2003, page 459.

without performing a detailed regulatory review that would second guess the decisions made. Dr. Weisman provides the following example which demonstrates why earnings sharing may blur this distinction:

> "A possible example of this phenomenon occurred in the aftermath of the epic floods that plagued the Midwest in the summer of 1993. After scrutinizing how Southwestern Bell allocated its resources in responding to this natural disaster, the Missouri Public Service Commission ordered cost disallowances that had the effect of moving the company's financial returns from the non-sharing range to the sharing range. These events prompted Southwestern Bell to move expeditiously across its five states with initiatives to eliminate earnings sharing from its price cap regulation plans."[459]

In other words, in the absence of an earnings sharing mechanism, the utility is assumed to have the appropriate financial incentives to make the most cost effective decisions. However, the presence of an earnings sharing mechanism may encourage second-guessing of those decisions so that the mechanism is triggered or results in a different allocation of costs. In this environment, PBR may not be distinct from cost of service regulation.

The Alberta Utilities Commission and the Ontario Energy Board have both rejected earnings sharing in favour of re-openers and off-ramps, which are discussed further in section 11.4.3. In its 2012 Decision, the Alberta Utilities Commission stated:

> "The Commission generally agrees with Dr. Weisman and Dr. Schoech that PBR plans with an [Earnings Sharing Mechanism] provide weaker incentives for efficiency gains, in part because costs and rates are no longer completely decoupled… In the Commission's view, the safeguards offered by an [Earnings Sharing Mechanism] do not outweigh the negative efficiency incentives that would be re-introduced into the PBR plan as a result of the incorporation of an [Earnings Sharing Mechanism]… Accordingly, the Commission finds that [Earnings sharing Mechanisms] as proposed by the parties, are not warranted as an additional safeguard and the disincentives

[459] Appendix FF, page 38, footnote 88.

> they will introduce are inconsistent with the objectives of PBR."[460]

Despite the economic drawbacks, sharing benefits during the PBR term may have some advantages. One potential advantage is to provide stability to the PBR plan by aligning the interests of the utility and its customers in a tangible way. [461] In other words, with earnings sharing, customers benefit from efficiencies discovered at the same time as the utility. As Dr. Weisman and Dr. Sappington observe in *Designing Incentive Regulation for the Telecommunications Industry:*

> Political support for a policy can be garnered when consumers benefit financially in direct, visible ways precisely when the regulated firm benefits, as is the case under earnings-sharing plans. Widespread political support for a policy can ensure its long-term survival and thus a continued flow of benefits to all parties. A sustained flow of moderate gains can often serve all parties better than can a short-lived spurt of particularly large gains." [462]

As Dr. Schmidt observes, striking the appropriate balance between providing incentives under PBR while assuring the stability and acceptance of the PBR plan among all stakeholders is a difficult challenge:

> "Economic theory and common sense tell us that a utility's best incentive to pursue productivity enhancing investments would be to allow the utility to retain 100 percent of the benefits of those investments. Anything less… will result in the utility foregoing some portion of what would otherwise be beneficial investments. Yet earnings sharing is a tool that can be seen to have different goals… The most challenging task faced by regulators and utilities is drawing the appropriate balance between following economic theory and these other goals."[463]

[460] Alberta Utilities Commission Decision 2012-237, Rate Regulation Initiative, Distribution Performance-Based Regulation (September 12, 2012), paragraphs 816, 818 and 822.

[461] Appendix FF, pages 36 to 37.

[462] David E. M. Sappington and Dennis L. Weisman, Designing Incentive Regulation for the Telecommunications Industry, Cambridge MA: The MIT Press, 1996, page 334.

[463] Schmidt, page 73.

Dr. Weisman observes that the economic evidence suggests that the costs of earnings sharing outweigh the benefits, but adds that some of the concerns with earnings sharing may be mitigated if it is temporary and intended to facilitate a successful transition from cost of service regulation to PBR:

> "Evaluating the various economic arguments both for and against earnings sharing, the weight of the evidence does not support including a traditional [earnings sharing mechanism] in a PBR plan. The net economic gains from replacing [cost of service regulation] with PBR that includes earnings sharing are likely to be small. Whereas regulators, consumer groups and sometimes even regulated firms may be comforted by the "safety net" that earnings sharing provides, it is the very presence of that "safety net" that undercuts the performance of PBR… The significant resources required to design and implement a PBR regime with earnings sharing would be difficult to justify when the expected benefits in terms of improved efficiency and innovation are so limited… it is conceivable that some of these concerns may be mitigated if PBR with earnings sharing is merely a transitional regulatory regime that represents an intermediate step along a dynamic path toward pure PBR… The outstanding question is whether such an intermediate step is warranted in light of the decisions of other Canadian regulatory commissions to forego earnings sharing for both electric power and telecommunications companies".[464]

Table 11-1 provides a summary of the advantages and disadvantages of stretch factors and Earnings Sharing Mechanisms.

[464] Appendix FF, pages 39 to 41.

Table 11-1 Advantages and Disadvantages of Stretch Factors and Earnings Sharing Mechanisms

	Advantages	Disadvantages
Stretch Factor	Does not weaken the incentive to find efficiencies because it is set independent of the utility's performance.	Ultimately a judgement call. No consensus that it is possible to develop a stretch factor in a scientifically rigorous manner.
Earnings Sharing Mechanism	Provides stability to the PBR plan by allowing customers to benefit from the discovery of new efficiencies at the same time as the utility. May help with the transition from cost of service regulation to PBR.	Weakens the incentives for efficiency because it re-establishes the link between rates and costs and is dependent on the utility's performance. Logically leads to a reduction in the assumed productivity improvements resulting in higher rates. May reduce the actual efficiencies achieved under PBR, resulting in fewer actual benefits being passed on to customers through rate re-basing at the end of the PBR term.

A stretch factor would maintain the distinction between PBR and cost of service regulation and would not counteract the stronger financial incentives for efficient performance that PBR attempts to provide. If an Earnings Sharing Mechanism were to be included in the PBR plan, a mechanism with a "deadband" would provide stronger incentives for efficient performance than one which shares a set percentage of all earnings above or below the allowed net income.

11.4.3 Off-Ramps and Re-Openers

Off-ramps and re-openers provide a way to intervene early, prior to rate re-basing, to adjust or reset the PBR plan, in the event that the benefits (or penalties) experienced by the utility during the PBR term, become excessive.

Re-openers provide an opportunity to investigate and modify a specific component of the PBR plan while off-ramps provide an opportunity to investigate and modify the entirety of the PBR plan, including possible termination of PBR for the utility.[465]

An off-ramp or re-opener that is triggered if a utility's earnings are above or below a certain threshold is an alternative to earnings sharing.[466] Thresholds are typically set

[465] Appendix FF, page 44 to 45.

using "basis points" where one basis point is equal to one one-hundredth of a percentage point (e.g., 100 basis points equals 1 per cent). Under this approach, if the benefits or costs realized under PBR are excessive, rather than transferring those benefits or costs to customers prior to rates being re-based, a re-opener or off-ramp can be triggered to adjust part or all of the PBR plan or to terminate the PBR plan.

Both the Alberta Utilities Commission and Ontario Energy Board favour this approach over earnings sharing during the PBR term.[467] As Dr. Weisman observes:

> "When the utility perceives that the probability of triggering these reopeners is negligible, which it will be with a sufficiently wide deadband, it will have virtually the same incentives for superior performance as if it were operating under a pure PBR regime. Nonetheless, sufficient earnings safeguards remain in place should returns diverge too far from target levels."[468]

The BCUC has recognized the importance of balanced thresholds for triggering off-ramps or re-openers, stating:

> "With respect to the financial trigger… it should strike a balance between being high enough to incent the utility to vigorously pursue efficiencies and savings while being low enough to provide a safeguard for customers and the utility if either profits or losses become excessive".[469]

The Alberta Utilities Commission has set its financial trigger for a re-opener at +/- 300 basis points (3 per cent) for two consecutive years or +/- 500 basis points (5 per cent) in any one year. The Ontario Energy Board has set its financial trigger at +/- 300 basis points (3 per cent). The BCUC set FortisBC's financial trigger at

[466] Appendix FF, pages 41 to 42.
[467] *Id.*
[468] *Id.*
[469] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 155.

+/- 150 basis points (1.5 per cent) for two consecutive years or +/- 200 basis points (2 per cent) in any one year, after accounting for 50 per cent earnings sharing.[470]

The BCUC and the Ontario Energy Board have also determined that it is appropriate to use off-ramps or re-openers to address unacceptable performance levels,[471, 472] however, the Alberta Utilities Commission has determined that it has appropriate tools to address service quality performance issues and that a degradation in service quality should not trigger a re-opener or off-ramp.[473]

BC Hydro believes that both financial and service quality triggers are appropriate. With respect to financial triggers, we agree with the BCUC that a balance should be struck between being high enough to incent the vigorous pursuit of efficiencies and being low enough to provide a safeguard against excessive profits or losses. If this balance is struck, using off-ramps or re-openers rather than an Earnings Sharing Mechanism, to keep earnings within acceptable bounds would maintain the distinction between PBR and cost of service regulation and would not counteract the stronger financial incentives for efficient performance that PBR attempts to provide.

We believe that the appropriate financial and performance triggers for BC Hydro should be determined through a PBR application process.

[470] *Id.*
[471] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), pages 157 to 158.
[472] Ontario Energy Board, Report of the Board, Renewed Regulatory Framework for Electricity Distributors: A Performance-Based Approach, October 18, 2012, page 13.
[473] Alberta Utilities Commission, Rate Regulation Initiative Distribution Performance-Based Regulation, September 12, 2012, Decision 2012-237, section 8.1.1.

11.5 Managing Capital and Other Costs Under PBR

As discussed in section 11.3.1, a PBR plan may have “adders” to the formula or “carve outs” from the formula that all interact to determine how costs are managed. It is critically important for the assumed productivity improvements in the PBR formula to reflect the capital investment requirements of the utility and for the “adders” or “carve outs” to appropriately capture expenditures that are not covered by the PBR formula, without becoming excessive.

There are inherent trade-offs with any approach. PBR aims to provide the utility with stronger incentives to discover new efficiencies and increased autonomy from detailed regulatory reviews, but the revenue cap set by the PBR formula may not adequately fund all of the utility’s expenditures. “Adding” to the formula or “carving out” certain costs from the formula may provide more adequate funding for necessary investments. When costs are “carved out”, the BCUC and interveners may have more ability to review those expenditures; however, the incentives and discretion provided by the PBR plan are decreased, which could limit the incremental efficiencies achieved.

Although the BCUC has asked BC Hydro to specifically discuss how capital spending could be managed under PBR, the discussion below addresses a number of our cost components as similar issues and trade-offs exist in a number of areas.

Table 11-2 provides a summary of this discussion, indicating the cost components that could likely be managed through the PBR formula, potentially with some “adders” or “carve outs” as well as cost components that may need to be “carved out” entirely.

Table 11-2 Management of Various Cost Components under a PBR Plan

Likely subject to PBR formula with some "adders" or "carve outs"	Various options – approach best determined through PBR application process	Likely "carved out" from the PBR formula entirely
Operating Costs	Capital Expenditures	Cost of Energy
		Taxes
		Finance Charges
		Demand Side Management
		Revenues and Subsidiary Net Income

11.5.1 Capital Expenditures

BC Hydro's capital expenditures include power system growth, redevelopment, dam safety, and sustaining expenditures along with technology, properties and fleet investments. Capital expenditures do not impact rates until a capital project is placed in service and becomes a capital addition, and the expenditure is amortized.

Our infrastructure is aging, requiring ongoing investments to maintain the safety and reliability of the electricity system. In addition, we must meet growing local, regional and system-wide demands from our customers as well as increased customer service expectations and changing technology requirements. To meet these requirements, we prepare an annual Capital Plan, which provides guidance and constraints for bottom-up capital planning.

The following issues would need to be carefully considered when designing an approach to capital expenditures under PBR for BC Hydro:

- Scope - Capital investment requirements can change significantly within a short timeframe due to project investigation work, market conditions, resource availability and scheduling, engagement with stakeholders and changing regulatory and environmental requirements;
- Asset Health – Historical capital expenditures are not an accurate predictor of future capital expenditures as future requirements are driven by asset health

and where assets are in their lifecycle. As explained in *State Performance-Based Regulation Using Multiyear Rate Plans for U.S. Electric Utilities*:

> "…in the short to medium run a utility's productivity growth is driven by the position of the utility in the cycle of asset replacement. Productivity growth will be slower to the extent that the need for replacement [capital expenditures] is large relative to the existing stock of capital."[474]

- Risk – If short-term asset replacements are deferred due to insufficient funding, increased costs and risks will develop over the long-term; and
- Customer Demand – BC Hydro has an obligation to serve all customers.

In support of their *Next Generation PBR Plan* which was filed in 2016 with the Alberta Utilities Commission, EPCOR commissioned Dr. Sappington and Dr. Weisman to review options for the treatment of capital expenditures in PBR plans. In their report titled *Assessing the Treatment of Capital Expenditures in Performance-Based Regulation Plans*, which is included as Appendix GG, Dr. Sappington and Dr. Weisman identified seven potential PBR-based options. The plans range from "carving out" all capital expenditures from the PBR formula and conducting a cost of service based review to including all capital expenditures within a PBR formula. A number of in-between options are also explored with trade-offs between the incentives provided, the degree of regulatory oversight and the level of certainty that funding will be sufficient to support the required investment.

The BCUC has previously recognized the potential consequences of "carving out" excessive amounts of supplemental capital, stating:

> "In the Panel's view, the more capital excluded from formula spending, the fewer benefits of PBR accrue to ratepayers and shareholders alike. Excluding significant amounts of capital reduces the ability of the utility to achieve operational efficiencies. However, it also provides opportunities for a utility

[474] Lowry et al., page B.10.

> to game the system such as by combining smaller projects into larger projects that will be excluded from the formula."[475]

Dr. Weisman also cautions that a PBR plan which "carves out" all capital expenditures from the PBR formula may encourage inefficient capital-labour substitution.[476] For example, capital upgrade projects could replace more cost effective operating maintenance programs.

While a broad and inclusive approach to capital may be preferable, the BCUC has also determined that a less inclusive approach may be appropriate in certain circumstances, stating:

> "By applying the formula driven spending envelope to smaller capital projects only, and providing for funding of larger capital projects outside of the formula, there is less risk of needed projects being underfunded. In addition, this approach also mitigates the risk of lumpy capital spending patterns by excluding any projects that are large enough to potentially distort the amount of formula spending and result in gains or losses to either ratepayers or shareholders."[477]

Dr. Sappington and Dr. Weisman evaluated each potential approach to managing capital expenditures based on the degree to which it:

- Avoided elements of traditional rate of return regulation and provided strong incentives for efficiency;
- Provided sufficient funding for required capital investments in a comprehensive and principled manner; and
- Was simple, transparent, and reduced the regulatory burden for all parties relative to cost of service regulation.

[475] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 170.
[476] Appendix FF, page 46
[477] BCUC, FortisBC Energy Inc. and FortisBC Inc. Multi-Year Performance Based Ratemaking Plans for 2014 through 2019 Approved by Decisions and Orders G-138-14 and G-139-14 Capital Exclusion Criteria under PBR – Compliance Filing, page 7 to 8.

Table 11-3 provides a summary of this evaluation.

Table 11-3 Assessing the Treatment of Capital Expenditures in PBR Plans

Option	Strong Incentives	Sufficient Funding	Reduced Regulatory Burden
A. Operating costs are subject to PBR but capital costs are subject to cost of service regulation with a mid-term update.	No	Yes	No
B. Same as A but no mid-term update.	No	Yes	No
C. All costs subject to PBR with a “K” factor adjustment to reflect the costs of unique lifecycle replacement projects or projects required by external parties as well as projects inadequately funded by the PBR formula. Projects included in the “K” factor must exceed a non-aggregated materiality threshold. A true-up between forecast and actual capital costs occurs for “K” factor projects only.	Possibly	Yes	Possibly
D. Same as C but the “K” factor does not include projects inadequately funded by the PBR formula and the materiality threshold is aggregated.	Possibly	No	Possibly
E. All costs subject to PBR with a “F” factor adjustment to reflect the extent to which the PBR formula is insufficient for required capital investments and a “K” factor adjustment to reflect unique lifecycle replacement projects or projects required by external parties. The “F” factor adjustment is set at the beginning of the PBR term and does not change while the “K” factor can be trued up annually to reflect actual capital costs.	Yes	Possibly	Yes
F. Same as E but the “K” factor is not trued up annually. Rather, a mid-term review, limited to unique lifecycle replacement projects that were not known at the start of the PBR term, is conducted to determine the required “K” factor adjustment.	Yes	Possibly	Yes

Option	Strong Incentives	Sufficient Funding	Reduced Regulatory Burden
G. All costs subject to PBR but the "X" factor (productivity factor) for capital is determined based on a moving average of the company's historical capital expenditures. No "F" or "K" factor adjustments are permitted unless corrections are required in response to unforeseeable "Z" factor events.	Possibly	No	Yes

Table 11-3 and Appendix GG provide an indication of the relative merits of each approach. We have not attempted to evaluate which of these options may be most appropriate for the management of capital expenditures under a PBR plan for BC Hydro. This evaluation should be conducted through a PBR application process.

The best way to manage capital expenditures under a PBR plan may be to adopt different approaches for different types of capital expenditures. As Dr. Weisman observes:

> "The specific attributes of each element of production may give rise to either a different form of PBR (price caps versus revenue caps) or specific design attributes for the PBR regime. For example, generation is typically characterized by more "lumpy" capital investments and this may require special provisions for capital within the PBR regime (e.g., capital trackers). Conversely, the generally smoother investment profiles commonly associated with transmission and distribution elements may allow for a more limited scope of special provisions for capital in the PBR regime." [478]

The Alberta Utilities Commission has revised the extent to which special provisions like "adders" or "carve outs" are necessary to accommodate transmission capital expenditures within a PBR plan.

In 2009, the Alberta Utilities Commission approved a formula-based ratemaking plan (similar to PBR) for Enmax, which included transmission expenditures, stating:

[478] Appendix FF, page 30

> "The Commission agrees… that [a PBR] mechanism is not as well suited to transmission in Alberta as it is to distribution. Nevertheless, the Commission considers that it is in the public interest to approve an incentive regulation plan for transmission in order to promote efficiency of operations and efficiency of the regulatory process. The Commission has recognized some of the effects of the structure of the regulatory framework for transmission in determining the X factor. The structure of the regulatory framework for transmission also requires specific adjustments in [a PBR] plan to recognize capital additions each year."[479]

However, in 2012, Enmax applied to re-open the plan for its transmission function as its return on equity was below the established threshold. In its 2014 Decision on this application, the Alberta Utilities Commission stated:

> "Accordingly, the Commission finds that the significant increase in capital additions beginning in 2010 was the event that triggered the re-opener. Following… the increase in capital additions, the [growth] factor was unable to achieve its intended objective of allowing for the recovery of the revenue requirement related to the transmission capital expenditures made by ENMAX during the [plan] term that exceed the revenue available from rate increases permitted under the I-X mechanism."[480]

Finally, in 2012, the Alberta Utilities Commission denied a proposal by EPCOR to include transmission services in its PBR plan, opting instead to continue to regulate transmission under cost of service regulation.[481] However, Dr. Weisman notes that this decision may be re-visited in the future.[482]

It may also be appropriate to adopt a different approach for managing generation, transmission or distribution capital expenditures that are approved through processes that are separate from the PBR plan. Currently BC Hydro must obtain a

[479] Alberta Utilities Commission Decision 2009-035, Enmax Power Corporation, 2007-2016 Formula Based Ratemaking (March 25, 2009), paragraph 222.

[480] Alberta Utilities Commission Decision 2014-100, Enmax Power Corporation Formula-Based Ratemaking Transmission Tariff Re-opener (April 15, 2014), paragraph 54.

[481] Alberta Utilities Commission Decision 2012-237, Rate Regulation Initiative, Distribution Performance-Based Regulation (September 12, 2012), paragraphs 68 to 74.

[482] Appendix FF, page 30.

separate Certificate of Public Convenience and Necessity (**CPCN**) for significant system extensions. BC Hydro also seeks acceptance of capital expenditure schedules under section 44.2 of the *Utilities Commission Act* for many other large capital investments.[483] The BCUC has previously rejected the idea of aligning CPCN criteria with the criteria to establish which capital expenditures should be "carved out" from the PBR formula, stating:

> "…the use of [Certificate of Public Convenience and Necessity] criteria as an exclusion criterion for the PBR formula is arbitrary. Further, the CPCN requirements do not differentiate between routine capital projects and projects that are not routine. Therefore, they are not a good indicator of the exogenous nature of the capital project." [484]

BC Hydro agrees that criteria established for one purpose cannot be arbitrarily used for another purpose. However, it may be appropriate to consider how criteria may be aligned to allow for a specific "adder" or "carve out" within a PBR plan for projects that have obtained a CPCN. In the absence of a specific mechanism, a project may be approved through a CPCN proceeding and subsequently captured within the PBR formula. The PBR formula may produce a rate adjustment that is not sufficient to fully fund the cost of that project. Conversely, a project may be considered in determining the productivity factor for the PBR formula and then not proceed because it was not approved in a separate proceeding. In this case, the funding envelope produced by the PBR formula may be too large.

11.5.2 Cost of Energy

BC Hydro's Cost of Energy are largely uncontrollable and we expect that it may be appropriate to "carve out" the cost of energy from the PBR formula.

BC Hydro's costs of energy include:

- Water rentals;

[483] BC Hydro Initial Proposal, Review of the Regulatory Oversight of Capital Expenditures and Projects, page 1.

[484] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 171.

- Market electricity purchases;
- Natural gas for thermal generation;
- Domestic transmission costs;
- Columbia River Treaty Related Agreements;
- Water rental remissions;
- Independent Power Producers (**IPPs**) and Long-Term Commitments
- Costs to supply Non-Integrated Areas;
- Gas and other transportation costs;
- Market electricity purchases;
- Surplus sales; and
- Net Purchases (Sales) from Powerex.

Water rentals are set by the *Water Sustainability Act* and are similar to taxes in that government sets the rental rates and receives the rental revenues. The generation of energy subject to water rentals is also based on a number of non-controllable factors such as water inflows, storage availability and system load requirements.

Market electricity purchases are determined by forward market prices and purchase volume. BC Hydro is generally a price-taker on any market purchases and the amount of market energy that we acquire is influenced by a number of volatile factors such as weather and water inflows.

Natural gas commodity costs to supply our thermal generating facilities are based on system load requirements, gas volumes and market commodity prices which are beyond our control.

Domestic Transmission costs include costs associated with surplus sales as well as our obligations under the Skagit Valley Treaty. Costs related to Columbia River

Treaty Agreements, Surplus Sales and Remissions represent offsets to our energy costs and are not directly controllable by BC Hydro.

Costs related to IPPs and Long-Term Commitments are generally long term supply contracts with established prices and fixed take or pay terms. As discussed in our Previous Application and in Chapter 4, section 4.3.2 of this application, we have taken a number of steps to manage the volume and costs of our IPP commitments.[485] However, further cost reduction opportunities are limited as government directions have mandated cost recovery in rates for most energy supply contracts.

BC Hydro also incurs costs to supply non-integrated areas, including IPP supply costs and costs to provide service through diesel generation. IPP supply costs are generally fixed and diesel fuel costs are determined by the spot fuel market where BC Hydro is a price-taker.

Based on the issues discussed above, we expect that it may be appropriate to “carve out” the cost of energy from the PBR formula and have those costs flow directly to rates through the “Y” factor.

11.5.3 Operating Costs

As discussed in section 5.5.1 of this application, BC Hydro considers base operating costs to be the key measure for the assessment of our overall operating costs.[486] The operating costs that are excluded from base operating costs vary significantly from year to year and we expect that it would be appropriate to include those costs in the “Y” factor. Therefore, the remainder of this section is focused on base operating costs.

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485 BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, section 1.5.6.

486 Base operating costs are defined as “personnel, materials and external services expenses included in income that are incurred in the day to day operating of BC Hydro’s electric utility, net of recoveries, capitalized costs and reclassification adjustments.” Further information is provided in Chapter 5, section 5.5.1.

Labour costs account for approximately 52 per cent of total base operating costs, services approximately 42 per cent, and materials and supplies approximately 6 per cent. If PBR were adopted for BC Hydro, the labour cost index used to help determine the inflation factor would need to recognize that BC Hydro is subject to the bargaining mandate for the broader public sector as determined by the British Columbia Public Sector Employers Association.

As discussed in our Previous Application, BC Hydro has already taken significant steps to reduce its base operating costs under cost of service regulation[487] and as a result, opportunities for further reductions may be limited.

In addition, some base operating costs are beyond our control and would likely need to be included in a “Y” factor. Some examples include:

- Storm restoration costs;
- Regulatory compliance costs (e.g., Mandatory Reliability Standards and North American Electric Reliability Corporation Critical Infrastructure Protection);
- Mandatory memberships (e.g., Western Electricity Coordinating Council);
- Employer taxes such as the employer health tax or the Canada Pension Plan premium; and
- Current service pension costs.

In addition, there are some cases where operating costs would need to be adjusted for one-time events or increases through a “Z” factor. Some examples include:

- New regulatory compliance costs (e.g., new WorkSafe BC requirements or new environmental standards); and
- Significant weather events.

487 BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, sections 1.5.2 and 1.6.1.5.

11.5.4 Taxes

BC Hydro pays school taxes, taxes related to energy purchase agreements that are classified as capital leases for accounting purposes, and grants-in-lieu to municipal, regional district and local governments.

School taxes are based on assessed property values and tax rates established by government. Grants-in-lieu are based on assessed property values as well as revenue grants equal to 1 per cent of gross revenue from domestic energy sales, which are based on forecast sales revenue increases. We expect that these costs will increase much faster than inflation in the future. Given this and the fact that these costs are uncontrollable, we expect that it would be appropriate to include all taxes within the "Y" factor.

11.5.5 Finance Charges

Finance charges reflect the cost of BC Hydro's debt portfolio, and are primarily composed of interest charges on debt, excluding sinking fund income, charges capitalized to unfinished construction, and interest allocated to regulatory accounts.

Interest costs are heavily influenced by the nature of our debt portfolio, long and short term interest rates and Canada/US exchange rates.

As discussed in our Previous Application, BC Hydro has implemented a debt management strategy, which aims to lock in interest rates by entering into future debt hedges to mitigate interest rate risk. Any gains or losses from future debt hedges are recorded in the Debt Management Regulatory Account and amortized into rates over the remaining term of the associated long-term debt issuances.[488]

As discussed in section 11.3, an inflation index may use forecast values, forecast values with a "true-up" or actual values from the previous year. The selected approach under a PBR plan for BC Hydro would need to recognize that actual interest rates have varied significantly from forecast interest rates in recent years. If

[488] BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, section 7.5.13.

the inflation index is not based on actual values or does not include a "true-up" mechanism, we expect that finance charges would need to be "carved out" from the PBR formula through the "Y" factor to avoid the potential for significant gains or losses to BC Hydro if there continues to be a large difference between actual and forecast interest rates.

In addition, as BC Hydro's overall debt is influenced by its amount of capital expenditures, we expect that if some or all capital expenditures are "carved out" from the PBR formula, finance charges may need to be "carved out" as well.

11.5.6 Demand Side Management

BC Hydro has undertaken a broad range of demand side management programs over the past 25 years. These programs help our customers reduce their energy consumption and save money, while also reducing our need to acquire new energy supply resources. While there are a range of options to manage demand side management expenditures under a PBR plan, the most common approach is to "carve out" these expenditures from the PBR formula.

BC Hydro's demand side management plan is influenced by government policy and legislation. For example, the Demand- Side Measures Regulation under the *Utilities Commission Act* defines measures that we are required to undertake for our demand side management plan to be considered adequate and also provides detailed guidance on how the cost-effectiveness of demand side management measures is to be determined.

In addition, government sets policy targets for demand side management, such as the *Clean Energy Act* objective to reduce the expected increase in demand for electricity by the year 2020 by at least 66 per cent.

Under section 44.2 of the *Utilities Commission Act*, BC Hydro may apply to the BCUC for a public interest acceptance of demand side management expenditures by filing a demand side measures expenditure schedule. The BCUC may accept or reject BC Hydro's proposed expenditure schedule but cannot modify programs or require a specific level of spending.

Demand side management expenditures are deferred to the Demand Side Management Regulatory Account and amortized into rates over a 15-year period. As explained in Chapter 10 of our Previous Application, we reduced our demand side management expenditures and eliminated or revised programs that were not cost effective, to take pressure off rates and to reflect reduced forecast system needs.

The BCUC issued the following directives with regards to demand side management in its Decision on our Previous Application:[489]

- Directive 20 accepted BC Hydro's proposed demand side management expenditure schedule;
- Directive 21 recommended that BC Hydro consider more targeted programs directed at residential customers in the next demand side management application; and
- Directive 23 directed BC Hydro to provide an update on how concerns raised regarding demand side management for Non-Integrated Areas have been addressed in its next demand side management application.

Including demand side management expenditures within a PBR formula may run counter to Directives 21 and 23 and to the adequacy requirements as set out in the Demand Side Measures Regulation. Programs developed to broaden access or target specific customer groups may be less cost effective than other opportunities available to BC Hydro. As a result, including demand side management expenditures within the PBR formula could incent adjustments that limit, rather than expand, customer access to demand side management programs.

[489] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), page 117.

In addition to traditional demand side management, BC Hydro has recently been exploring low carbon electrification programs. These programs support the reduction of greenhouse gas emissions by encouraging the use of electricity instead of more carbon intensive fuels. Low carbon electrification expenditures, meeting requirements under the *Greenhouse Gas Reductions Regulation* under the *Clean Energy Act*, are considered to be prescribed undertakings.[490] The *Clean Energy Act* requires the BCUC to set rates that allow for cost recovery of prescribed undertakings.[491]

The options to manage demand side management spending within a PBR plan are similar to the options to manage capital expenditures with the same inherent trade-offs between the incentives provided, the degree of regulatory oversight and the level of certainty that funding will be sufficient to support the desired investments. While Table 11-3 provides a wide range of options, an approach similar to options A or B, where demand side management expenditures are completely "carved out" of the PBR formula, appears to be the most common approach.[492] This is also the approach that the BCUC has adopted for FortisBC.[493] Accordingly, we expect that it would be appropriate to "carve out" demand side management expenditures from the PBR formula.

11.5.7 Revenues and Subsidiary Net Income

As outlined in Chapter 8 of this application, BC Hydro receives miscellaneous revenues, inter-segment revenues, revenue from other utilities and net income from its subsidiaries Powerex and Powertech. [494] These items are uncontrollable and we expect that it would be appropriate to capture them through the "Y factor."

490 Greenhouse Gas Reduction Regulation, section 4.
491 *Clean Energy Act*, section 18.
492 A survey by IndEco Strategic Consulting and Navigant Consulting canvassed 12 leading jurisdictions across North America and found that none of them included demand side management as part of the PBR formula. (DSM in North American gas utilities, IndEco Strategic Consulting and Navigant Consulting, page 6).
493 BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 250.
494 BC Hydro, Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, pages 8-11 and 8-12.

11.5.8 Regulatory Accounts

The BCUC's guidelines identify four situations where it is appropriate to use regulatory accounts:[495]

- To capture the variance between forecast costs or revenues and actual costs or revenues (variance accounts);
- To defer recovery of costs to a future period, when the benefits of those cost are realized, if they provide long-term benefits to current and future ratepayers (benefit matching accounts);
- To mitigate rate shock resulting from the impact of large forecast one-time items or resulting from forecast overall general rate increases or to reduce rate volatility (rate smoothing accounts); and
- To recover or refund certain uncontrollable costs or revenues that materialize after the occurrence of an unforeseeable event (retroactive expense account);

The BCUC's guidelines also recognize that there may be other situations that require a regulatory account. BC Hydro has two types of accounts that fall into this category:[496]

- Non-cash provision accounts: To recognize a non-cash provision in order to create a regulatory asset to match an accounting liability that is required under the accounting standards, prior to the actual expenditure of funds; and
- IFRS transition accounts: To defer the impact of a required change in the accounting treatment of costs to ensure proper recovery of those costs in rates.

The existing balances in BC Hydro's regulatory accounts should not be subject to a PBR formula because they represent past costs and their recovery in rates is required by Direction No. 8 to the BCUC. BC Hydro has no ability to find further

[495] BCUC Regulatory Account Filing Checklist (May 3, 2017).
[496] BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, pages 7 to 9.

efficiencies on costs that have already been incurred. Accordingly, the amortization of existing balances from BC Hydro's regulatory accounts should remain unchanged and flow into rates through the "Y factor."

With regards to the future use and amortization of regulatory accounts, the adoption of PBR would not change the period of time over which the benefit of a particular service or asset accrues to ratepayers, the requirement for loss provision liabilities or the potential for non-controllable financial impacts from a change in the accounting standards applicable to BC Hydro. Therefore, BC Hydro expects that there would be no reason to consider changes to its benefit matching accounts, non-cash provision accounts or IFRS transition accounts under PBR.

With regards to BC Hydro's variance accounts, these accounts reflect examples of appropriate "Y" factor costs, as discussed throughout section 11.5. There are various recovery mechanisms and periods in place for these accounts. In its Decision on FortisBC's 2014 to 2018 PBR Application, the BCUC noted that there must be a mechanism to manage variances between forecast and actual costs captured by the "Y" factor but determined that regulatory accounts are not necessarily required in all cases as small variances could be "trued-up" each year without a significant rate impact.[497] BC Hydro does not believe that the adoption of PBR should prompt a change to recovery mechanisms or periods and that opportunities to "true-up" small variances on an annual basis are best explored within a PBR application process.

BC Hydro does not currently have any retroactive expense regulatory accounts. Under a PBR plan, any unforeseeable costs or revenues would be captured by a "Z" factor and if those costs or revenues were to be recovered in rates over a period longer than one year, a retroactive expense regulatory account may be required.

497 BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), pages 107 to 109.

With regards to rate smoothing, as part of the Comprehensive Review, BC Hydro ceased using the Rate Smoothing Regulatory Account at the end of the third quarter of fiscal 2019. BC Hydro is not proposing to smooth rates over the fiscal 2020 to fiscal 2021 test period and is requesting BCUC approval to close the Rate Smoothing Regulatory Account.

11.6 Monitoring the PBR Plan

In response to the BCUC's request, this section provides a list of potential key performance indicators to assist BC Hydro and the BCUC to evaluate progress during the PBR term as well as a proposed Annual Review process.

11.6.1 Potential Key Performance Indicators

In its Decision on FortisBC's 2014 to 2018 PBR Application, the BCUC determined that earnings must be linked to the achievement of key performance indicators (also referred to as service quality standards) so that there are consequences if efforts to discover further efficiencies result in failure to achieve reasonable performance. Specifically, the BCUC stated:

> "The PBR is being approved with incentives for the utility to create efficiencies and reduce unnecessary cost. However, if [operating and maintenance costs] and maintenance capital are too tightly constrained this may result in a degradation of key service level areas. Therefore, the Panel considers that incentives related to reducing costs and creating efficiencies need to be counter balanced to ensure this occurs without a degradation of service levels as measured by [service quality indicators]." [498]

[498] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 133.

The BCUC also determined that service quality indicators must be balanced and fully reflect the obligations legislated under the *Utilities Commission Act* to provide "reasonable, safe, adequate and fair service."[499]

BC Hydro's Service Plan has 12 performance metrics which correspond to four goals around safety, reliability, affordability and clean energy. These performance metrics are developed in consultation with the Government of B.C. and approved by BC Hydro's Board of Directors.

In its Decision on FortisBC's 2014 to 2018 PBR Application, the BCUC set out 10 Approved Service Quality Indicators for the electric utility in Table 2.26.[500] Of these 10 indicators, five identical or similar metrics are already contained within BC Hydro's Service Plan (All Injury Frequency Rate, Customer Satisfaction Index, System Average Interruption Duration Index, System Average Interruption Frequency Index and Key Generating Facility Forced Outage Factor). The remaining five metrics are focused on emergency response and customer service.

Additional key performance indicators focused on customer service and emergency response may be appropriate for BC Hydro. With regards to customer service metrics, BC Hydro internally tracks both First Contact Resolution and Telephone Service Factor. However, Billing Index and Meter Reading Accuracy would not be appropriate key performance indicators as the installation of smart meters means that BC Hydro is at nearly 100 per cent on both of these metrics. A more appropriate metric may be per cent of bills issued on actual reads, which is already reported to the BCUC on a quarterly basis through our Summary Report of Customer Complaints and Consecutive Estimates.

BC Hydro's Service Plan contains additional metrics compared to those approved for FortisBC. We believe that the Progressive Aboriginal Relations Designation, Project

[499] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), pages 142 to 143.

[500] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 147.

Budget to Actual Cost, Zero Fatality and Serious Injury and Timely Completion of Corrective Actions metrics would also be appropriate to evaluate progress during the PBR term.

The Affordable Bills, Clean Energy and Energy Conservation Portfolio metrics would likely not be appropriate for evaluating progress during the PBR term. With regards to the Affordable Bills metric, a PBR plan would already provide incentives to discover efficiencies to achieve competitive rates and as explained above, key performance indicators are meant to counterbalance these incentives, not reinforce them. With regards to the Clean Energy and Energy Conservation Portfolio metrics, the *Clean Energy Act* already contains legislative requirements with regards to energy generation and conservation. A key performance indicator would not provide any additional incentive to meet these objectives relative to the existing legislative requirements.

11.6.2 Annual Review Processes

In its Decision on FortisBC's 2014 to 2018 PBR Application, the BCUC set out an Annual Review process that would include:[501]

- An evaluation of the PBR Plan and identification of deficiencies and concerns with recommendations to address;
- A review of current year projections and upcoming year forecasts;
- Identification of efficiency initiatives that require a payback period extending beyond the PBR plan and whether these initiatives should be captured through an Efficiency Carry-Over Mechanism;[502]
- A review of unforeseen events that should be put to the BCUC for decision on exclusion (through the "Z" factor); and

[501] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 179-180.
[502] Refer to related discussion in section 11.3.2 of this report.

- A review of performance on key performance indicators and identification of any key performance indicators that should be reviewed.

We believe that the above scope is appropriate and that a similar Annual Review process would be suitable for BC Hydro.

11.7 Implementing a PBR Plan

The BCUC has asked BC Hydro to consider an implementation timetable for a PBR plan including a proposed schedule of consultation with representatives of key customer groups and BCUC staff.

Dr. Schmidt cites Edison Electric Institute's *Performance-Based Regulation: Design and Implementation Strategies* to provide the following guidance regarding the implementation of a PBR plan:

> "Do not expect the PBR process to be quick or routine. The process of change is not simple or easy. Utilities have found that their first PBR case involved a tremendous amount of regulatory work. The initial PBR case can look very much like a full-blown general rate case with a full cast of intervenors."[503]

11.7.1 Potential Implementation Timetable

BC Hydro has filed a cost of service Revenue Requirements Application for fiscal 2020 and fiscal 2021. BC Hydro suggests that the BCUC provide its decision on the adoption of PBR for BC Hydro in its decision on this Revenue Requirements Application.

As discussed further in section 11.8 below, we believe that BC Hydro should continue to be regulated through cost of service regulation at this time.

However, if the BCUC decides to adopt PBR for BC Hydro, following this Revenue Requirements Application proceeding, BC Hydro could file a proposed PBR plan, using fiscal 2021 as the base year, by February 2021. This timeline would provide

[503] Schmidt, page 105.

approximately one year, following the BCUC's decision on BC Hydro's Revenue Requirements Application, to develop a PBR plan and conduct consultation with customer groups and BCUC staff.

11.7.2 Proposed Consultation Approach

There are many significant and complex issues that will inform whether PBR is adopted for BC Hydro and how a PBR plan is designed. Given the nature and importance of these issues, we believe that extensive consultation with customer groups and BCUC staff would be required to identify concerns, opportunities and potential solutions.

A potential approach would be to adopt a consultation process similar to the one used to inform our 2015 Rate Design Application. BC Hydro could conduct topic-specific workshops, including information presentations and a question and answer session. The following topics may be appropriate for dedicated workshops:

- PBR Principles – to establish common objectives that all parties hope to achieve from the transition from cost of service regulation to PBR;
- PBR Framework – including whether BC Hydro's PBR plan should be a price cap or a revenue cap, if a hybrid approach is appropriate, the criteria for uncontrollable (Y) and unforeseen (Z) factors, potential key performance indicators to monitor progress and the appropriate Annual Review process;
- Creating and Sharing Benefits Under PBR – including the length of the PBR term and the appropriate application of efficiency carry-over mechanisms, stretch factors, an earnings sharing mechanisim and off-ramps and re-openers; and
- Managing Capital and Other Costs Under PBR – including how capital spending and other cost components should be managed under the PBR plan and the appropriate trade-offs between the incentives provided, the degree of

regulatory oversight and the level of certainty that funding will be sufficient to support the required investment.

In addition to the workshops, BC Hydro could use the following process to obtain and consider feedback. Based on previous experience, two to three months would be required to complete the full cycle for each workshop topic:

- Materials, including the presentation and any background or supporting information, would be circulated in advance of each workshop;
- Workshop summary notes, including stakeholder questions and BC Hydro initial responses, would be posted in draft to an external website for access by participants;
- Stakeholders would provide written comments for consideration by BC Hydro and all participants; and
- BC Hydro would prepare consideration memos for each workshop to summarize feedback received and how that feedback was considered and used to develop or narrow alternatives.

Some interveners have previously expressed reservations about the adoption of PBR in British Columbia and for BC Hydro.[504] In its Decision on FortisBC's 2014 to 2018 PBR Application, the BCUC stated:

> "Regardless of the method chosen, to be successful over the longer term, the parties need to feel that their concerns are heard and where reasonable, acted upon."[505]

BC Hydro believes that a negotiated settlement process to identify areas of common agreement prior to BC Hydro's submission of a proposed PBR plan may help to secure intervener and stakeholder support for elements of a proposed PBR plan.

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[504] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 10-15 and BC Hydro Review of the Regulatory Oversight of Capital Expenditures and Projects Workshop Transcript (May 23, 2018), pages 69 to 72.

[505] BCUC Decision, FortisBC Inc. Multi-Year Performance Based Ratemaking Plan 2014-2018 (September 15, 2014), page 15.

Negotiated settlements have been successful in British Columbia in the past.[506] In addition, in their summary paper titled *Negotiated Settlements: The development of legal and economic thinking*, Dr. Joseph Doucet and Dr. Stephen Littlechild[507] identify a number of advantages to this approach.

For example, as explained in *Nonunanimous settlement of public utility rate cases: a response*, a negotiated settlement process may identify better solutions than a traditional regulatory process:

> "…the settlement process permits solutions that the regulatory agency itself, constrained by statute, may *not* be able to pursue… the flexibility inherent in the settlement process may be by far the most telling ground for its encouragement…"[508]

Further, as explained in *Democracy and Regulation: How the Public can Govern Essential Services*, a negotiated settlement may produce a more acceptable outcome:

> "[W]hen the regulator makes the decisions, everyone loses something, and the parties have no control over what they lose. In the negotiation process, each party chooses which among the many points it is willing to lose in order to gain something else. Although this may sound like a distinction without a difference, in fact, the trade-offs arrived at voluntarily are much more stable and effective. Negotiated settlements are actually more democratic because all parties participate in the decision. As a result the terms are more likely to be implemented with enthusiasm and effectiveness than if they had been imposed from above by a regulator. Furthermore, in an atmosphere of

506 BCUC Decision, BC Hydro Fiscal 2011 Revenue Requirements Application, Appendix FF, Order No. G-180-1, pages 4 and 7 and BCUC Decision, FortisBC Energy Utilities 2012-2013 Revenue Requirements and Rates Application, pages 21 to 22.

507 Dr. Littlechild is widely regarded as the pioneer of performance based regulation in the United Kingdom. In 1983, he authored a report to the Secretary of State for Industry entitled "Regulation of British Telecommunications' Profitability" which is often referred to as "The Littlechild Report."

508 Buchmann, A.P., Tongren, R.S., 1996. Nonunanimous settlement of public utility rate cases: a response. Yale Journal of Regulation 13, page 343.

> trust and negotiation, more information is freely shared, with the result that more comprehensive solutions can be developed."[509]

Lastly, as Dr. Doucet and Dr. Littlechild observe, a negotiated settlement process may foster trust and collaboration:

> "Settlements have also provided a new forum of collaboration and increased value creation between pipelines and their customers. Observers and participants are in no doubt that this could not have occurred under the traditional litigated approach to utility regulation."[510]

11.8 BC Hydro Should Continue to be Regulated Through Cost of Service Regulation

In sections 11.3 to 11.7 above, BC Hydro has provided its initial conclusions in response to the issues raised by the BCUC. This provides a framework for a PBR plan, should the BCUC decide to adopt PBR for BC Hydro. However, for the following four reasons, we believe that BC Hydro should continue to be regulated through cost of service regulation at this time.

11.8.1 Cost of Service Regulation Should Be Given Time to Work

First, after years of significant limitations on the BCUC's jurisdiction over BC Hydro, cost of service regulation should now be given the opportunity to work.

As shown in Table 11-4 below, through various directions, the Government of B.C. has historically limited the BCUC's oversight of BC Hydro. Government directions have, for all practical purposes, determined rates in recent years.

509 Palast, G., Oppenheim, J., MacGregor, T., 2003. Democracy and Regulation: How the Public can Govern Essentla Services, page 96.

510 Doucet, Joseph and Littlechild, Stephen. Negotiated settlements: The development of legal and economic thinking. Utilities Policy 14 (2006), page 274.

Table 11-4 BC Hydro Revenue Requirement Proceedings and Government Directions

Revenue Requirement Proceeding	Government Direction	Outcome
Fiscal 2005 to Fiscal 2006		BCUC Decision (Order No. G-94-06)
Fiscal 2007 to Fiscal 2008		Negotiated Settlement Agreement (Order No. G-143-06)
Fiscal 2009 to Fiscal 2010		BCUC Decision (Order No. G-16-09)
Fiscal 2011		Negotiated Settlement Agreement (Order No. G-180-10)
Fiscal 2012 to Fiscal 2014	Direction 3	Rates set by Direction 3 (Order No. G-77-12A)
Fiscal 2015 to Fiscal 2016	Direction 6	Rates set by Direction 6 (Order No. G-48-14)
Fiscal 2017 to Fiscal 2019	Direction 7	BCUC Decision within rate caps set by Direction 7 (Order No. G-47-18)

It has been nine years since the BCUC made an unconstrained rate decision under cost of service regulation.[511]

The Fiscal 2017 to Fiscal 2019 Revenue Requirements Application provided the opportunity for a detailed examination of BC Hydro's operations and forecast costs. However, due to the rate caps and various other directives prescribed by Direction No. 7, the BCUC's oversight was more limited than it would have been in a traditional cost of service proceeding.

In its Decision on the Fiscal 2017 to Fiscal 2019 Revenue Requirements Application, the BCUC stated:

> "We acknowledge BC Hydro's cost cutting measures and also the upcoming comprehensive government review of BC Hydro's expenditures and we are hopeful that further efficiencies can be found. Our concern lies in the apparent decoupling of revenues and expenditures within the test period. Expenditures have risen

[511] BCUC Order No. G-180-10 authorizing the Fiscal 2011 Negotiated Settelement Agreement was issued on February 19, 2010. As part of the Fiscal 2009 to Fiscal 2010 Revenue Requirements Application proceeding, an Oral Hearing was held from October 6, 2008 to October 29, 2008.

> faster than revenues. A company with expenditures that exceed its revenues is not sustainable. Accordingly we are of the view that a rate setting mechanism that could help BC Hydro to accomplish its cost control objectives is of value."[512]

In June 2018, the Government of B.C. initiated a Comprehensive Review of BC Hydro. Phase One of the Comprehensive Review resulted in two significant changes:

- First, the Government of B.C. rescinded Direction Nos. 3, 6, and 7, enhancing the BCUC's oversight of BC Hydro.
- Second, BC Hydro ceased using the Rate Smoothing Regulatory Account at the end of the third quarter of fiscal 2019. The Rate Smoothing Regulatory Account, in combination with the rate caps prescribed by Direction No. 7, had allowed BC Hydro to defer portions of the approved revenue requirement in a particular fiscal year for recovery in future fiscal years. In this application, BC Hydro is not proposing to smooth rates during the fiscal 2020 to fiscal 2021 test period and is requesting BCUC approval to close the Rate Smoothing Regulatory Account.

With enhanced oversight of BC Hydro and the closure of the Rate Smoothing Regulatory Account, the BCUC now has the ability to examine BC Hydro's forecast revenues and expenditures and to set rates based on cost of service principles. BC Hydro believes that unconstrained cost of service proceedings would address the issues raised by the BCUC in its Decision and that cost of service regulation should be given the opportunity to work, before the adoption of PBR is seriously considered.

[512] BCUC Decision and Order No. G-47-18, BC Hydro Fiscal 2017 to Fiscal 2019 Revenue Requirements Application (March 1, 2018), page 33.

11.8.2 Conferring the Necessary Autonomy on BC Hydro Under PBR May Be Less Palatable Given the Return to Enhanced Regulation is So Recent

Second, the fact that BC Hydro is only now returning to enhanced regulation is likely to make it more challenging to secure stakeholder support for the principles of PBR.

As Dr. Weisman explains in his report, there may be little practical difference between PBR and cost of service regulation, in the absence of a strong regulatory commitment to the principles of PBR. A key principle of PBR is that the utility should be provided with the autonomy to manage its expenditures within the PBR framework without a detailed regulatory review that would second guess the decisions made. In exchange for this increased autonomy, the utility assumes both the risk that the PBR formula may not sufficiently fund certain costs as well as the opportunity to retain additional savings, if new efficiencies are discovered, over and above what is required to meet the formula.

A strong regulatory commitment to this principle requires stakeholder support for the adoption of PBR over cost of service regulation. In the absence of stakeholder support, it may be difficult to avoid detailed regulatory reviews that would lead to second guessing.

BC Hydro believes that it may be challenging to secure stakeholder support for the adoption of PBR at this time:

- Intervener comments during a workshop in the BCUC's Review of the Regulatory Oversight of Capital Expenditures and Projects proceeding indicate that many interveners may have concerns about the increased autonomy from detailed regulatory review that some of BC Hydro's cost components would receive under PBR.[513]

[513] BC Hydro Review of the Regulatory Oversight of Capital Expenditures and Projects Workshop Transcript (May 23, 2018), pages 69 to 72.

- Greater autonomy from detailed regulatory review is likey the opposite of what interveners are expecting, following a prolonged period where the BCUC's oversight of BC Hydro has been limited.
- In its Decision, the BCUC stated that it did not have a high degree of comfort in BC Hydro's starting operating costs, given its limited involvement in the approval of recent revenue requirements.

If PBR is adopted for BC Hydro, the regulatory framework for BC Hydro would have shifted from cost of service regulation with rate caps, to cost of service regulation without rate caps, to PBR, in a very short period of time. BC Hydro believes that it would be difficult to secure stakeholder support and regulatory commitment to the principles of PBR, so soon after BC Hydro's return to enhanced regulation. In addition, cycling through various regulatory regimes, in such a short time frame, is likely to create instability and uncertainty that can undermine confidence in the regulatory process.

In addition, it would be particularly important to establish familiarity and comfort with BC Hydro's costs, prior to locking them in as base costs, for a prolonged period of time, under a PBR plan. BC Hydro believes that the most effective way to build a strong foundation of familiarity and comfort is through successive cost of service proceedings that would provide the BCUC and interveners with the opportunity to become fully conversant with BC Hydro's operations.

11.8.3 Cost of Service Regulation is Intuitive While PBR is Esoteric

Third, cost of service regulation is more transparent and accessible while PBR is more esoteric, relying on specialized expertise.

The process under cost of service regulation is fairly intuitive: BC Hydro provides information, the BCUC and interveners ask questions and the BCUC sets rates to recover only those costs that it determines to be prudently incurred plus a reasonable rate of return.

Under PBR, once base costs are established, the amount of revenue recovered through rates would be largely independent of BC Hydro's costs. This separation is achieved by adjusting rates for the effects of inflation and productivity improvements for a specified period of time. This shifts the focus of the proceeding from determining the prudent level of spending to identifying total factor productivity growth for the electricity industry, determining what costs can be accommodated by a formula or should be treated as flow through items, guarding against service deterioration, and determining how benefits and risks should be allocated.

These issues introduce an alphabet of factors (e.g., i, x, k, y, z) into the regulatory process. The design of PBR, the inter-relationship among various PBR elements, and determination of these factors is highly specialized and is primarily the domain of experts. The complexity of these issues makes PBR inherently less accessible to customers and the public generally. While interveners are eligible for Participant Assistance Cost Award funding, which can help fund experts and other support, participants and customers may feel more disconnected from these types of proceedings than a traditional cost of service review.

11.8.4 PBR is Premised on a Profit Incentive, but BC Hydro Does Not Have a Mandate to Maximize Profits

Fourth, BC Hydro does not have a mandate to maximize profits, which can dull the additional "carrot" incentive that PBR attempts to provide.

When the amount of revenue recovered through rates is de-linked from a utility's costs, rather than dependent on them, this creates both "carrot" and "stick" incentives for efficient performance.

In the conclusion to his report, Dr. Weisman discusses the adoption of PBR for Crown Corporations like BC Hydro, stating:

> "Policymakers should recognize that the expected gains from adopting PBR may be subject to greater uncertainty in the case of crown corporations. In many respects, these public enterprises are de facto subject to two different

regulatory authorities—the regulatory commission of jurisdiction and its government owners." [514]

As a Crown Corporation, under cost of service regulation, BC Hydro already has significant "stick" incentives to operate efficiently:

- As BC Hydro's shareholder, the Government of B.C. has required BC Hydro to manage within a very efficient framework. For example, the 2013 10 Year Rates Plan set rate targets for fiscal 2020 to fiscal 2024 and BC Hydro was required to find new efficiencies to maintain those rate targets as a declining rate of load growth created new cost pressures. In addition, through the Comprehensive Review, the Government of B.C. and BC Hydro worked together to identify additional opportunities to reduce costs, to support the government's affordability mandate.
- As BC Hydro's revenue requirements applications are submitted on a forecast basis and cover multiple years, rates are set independently of BC Hydro's actual costs over the test period. This means that unexpected cost pressures that arise during the test period must be managed and fully absorbed by BC Hydro within its existing approved revenue requirement, unless there is a regulatory mechanism in place to defer the impact.

By allowing a utility or its shareholder to retain all or a portion of the savings over and above what is required to meet the formula, PBR aims to use financial incentives to motivate a process through which new savings - that were not previously identified under cost of service regulation - are discovered. This process is intended to emulate what would happen in a competitive market where, in an effort to increase their market share, rival producers would continually discover new ways to reduce their costs, achieving "dynamic" efficiencies.

Accordingly, the incremental benefit of adopting PBR would be to provide "carrot" incentives on top of the "stick" incentives that are already in place.

[514] Appendix FF, page 63

The challenge with applying this approach to BC Hydro is that it assumes BC Hydro is motivated by the prospect of higher earnings. This is not the case. Rather, the Government of B.C. expects BC Hydro to achieve its allowed net income target, not to exceed it. This does not mean that BC Hydro will not seek out or find additional efficiencies in future years. Rather, it means that the incentive to find these efficiencies would come, as it does today, from the obligation and commitment on the part of management to deliver on its mandate and not from the opportunity to increase earnings.

11.8.5 Cost of Service Regulation is More Appropriate for BC Hydro than PBR

In sections 11.3 to 11.7 above, BC Hydro has provided its initial conclusions in response to the issues raised by the BCUC. This provides a framework for a PBR plan, should the BCUC decide to adopt PBR for BC Hydro. However, for the reasons set out above, we believe that BC Hydro should continue to be regulated through cost of service regulation at this time. BC Hydro respectfully recommends that the BCUC use this Revenue Requirements Application proceeding to engage interveners to canvass their views.