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February 5, 2019

VIA ELECTRONIC MAIL

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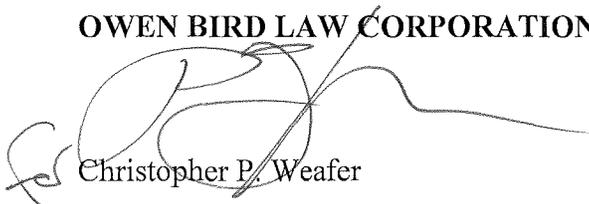
**Re: British Columbia Hydro and Power Authority ("BC Hydro") Supply Chain
Applications Project Phase Two ~ Project No. 1598975**

We are counsel to the Commercial Energy Consumers Association of British Columbia (the "CEC"). Attached please find the CEC's Final Submissions with respect to the above-noted matter.

If you have any questions regarding the foregoing, please do not hesitate to contact the undersigned.

Yours truly,

OWEN BIRD LAW CORPORATION



Christopher P. Weafer

CPW/jj
cc: CEC
cc: BC Hydro
cc: Registered Interveners

**COMMERCIAL ENERGY CONSUMERS
ASSOCIATION OF BRITISH COLUMBIA**

FINAL SUBMISSIONS

**British Columbia Hydro and Power Authority Supply Chain Applications Project
Phase Two
Project No. 1598975**

February 5, 2019

Commercial Energy Consumers Association of British Columbia

**British Columbia Hydro and Power Authority Supply Chain Applications Project
Phase Two
Project No. 1598975**

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**COMMERCIAL ENERGY CONSUMERS ASSOCIATION
OF BRITISH COLUMBIA
FINAL SUBMISSIONS**

**British Columbia Hydro and Power Authority Supply Chain Applications Project
Phase Two**

Project No. 1598975

The Commercial Energy Consumers Association of BC (“CEC”) represents the interests of those ratepayers consuming energy under commercial tariffs in applications before the BC Utilities Commission (“BCUC” or “Commission”).

BC Hydro and Power Authority applies for acceptance of Implementation Phase capital expenditures for the Supply Chain Applications Project (the “SCA Project” or the “Project”).

The CEC participated in the Phase 1 proceeding and in the current Phase 2 application process. The CEC provides the following submissions for the Commission’s review and consideration.

I. SUMMARY POSITION AND RECOMMENDATIONS

1. The CEC submits that the evidence in the Supply Chain Application Phase 2 does not represent a sufficient foundation for the Commission to approve the Project because of the weakness in the financial justification.
2. In particular, the CEC notes that the Project benefits assigned by PwC and BC Hydro in the Verification Report under Benefit ID#5 (Capability Gap 2 ‘Poor Contract Management’) are inflated by nearly 200% over the Phase 1 application and are unsupported by the evidence.
3. The inflated benefits are critical to the financial viability of the Project. In the absence of these additional benefits, the Net Present Value of the Project assuming Expected Benefits and Monetized Costs is negative in the amount of -\$5.8 million.¹
4. The CEC is of the view that the assignment of more than \$10 million in benefits that are unsupported and based on PwC’s vague ‘study’ and potentially unrelated to the implementation of the SCA Project demonstrates poor analysis and casts doubt on the value of the verification report.
5. The CEC notes that PwC has a significant financial and reputational interest in the continuance of the Project. BC Hydro could have employed an unbiased third party to conduct the Verification Report and did not do so.

¹ Exhibit B-3, BCUC 1.12.7 Revised Table 3-6

6. The CEC submits that the Commission could reasonably find the report upwardly biased by a significant conflict of interest in the verification process, but need not do so in order to find the benefits therein to be inadequately justified.
7. The CEC pointed out in its Phase 1 Final Submissions that it does not find the evidence supporting many of the expected benefits to be of good quality.
8. The CEC does not wish to re-argue the Phase 1 issues but abides by its assessment of BC Hydro's benefits evaluation.
9. The CEC also notes that overall the benefits that are being attributed to the SCA Project are not clearly differentiated between those that could potentially be available through various processes and other means at much lower cost.
10. BC Hydro has committed an additional \$15 million towards the implementation of the Project in advance of the Commission decision and without Commission approval. This creates a total committed expenditure of \$41 million, or over half the total Project expected budget.
11. The CEC cautions the Commission against approving a Project that is not adequately based on monetized benefits. The CEC submits that the point of the Phase 2 Verification process was to avoid expenditures based on a non-financially sound Project.
12. The CEC recommends that the Commission find that the Project does not have sufficiently strong evidence to adequately support the expenditures, and the Project may not be cost effective.
13. The CEC recommends that the Commission find that BC Hydro's Expected Costs as presented are in the order of \$71.3 million and the expected benefits are in the order of \$12.7 million when the anticipated monetized benefits of \$23 million are reduced by \$10.3 million.
14. The CEC recommends that the Commission consider that there may be a negative NPV of \$5.8 million based on these findings.
15. The CEC recommends that the Commission find that a potential risk scenario is that costs could escalate and/or benefits not materialize resulting in a negative NPV of \$15.7 million.

A. CEC FINDINGS AND CONCLUSION

BC HYDRO HAS OVER REACHED TO FIND JUSTIFICATION

16. The CEC has found that BC Hydro's Phase 2 Assessment Verification contains a reduction of over 80% in the time and effort benefits assessment from the Phase 1 assessment of the same.

17. The CEC has found that in Phase 2, BC Hydro has instead switched its justification focus for benefits from time and effort benefits to contract management benefits, increasing these benefits by close to a 200% and to over 70% of the total monetized benefit.

PHASE 1 BENEFITS CHANGE NECESSARY

18. The CEC in Phase 1 was very critical of the assessment for these time and effort benefits because the BC Hydro foundation for these was largely little better than guestimates and provided little in the way of baselines from which to measure and evaluate benefits capture. The CEC expects that the Commission should accept this reduction in these benefits and weight this decision, by BC Hydro, significantly in its assessment of BC Hydro's overall attempts to provide justification for this SAP-based Project.

PHASE 2 BENEFITS NOT LOGICALLY ANALYZED OR JUSTIFIED

19. The CEC finds that contract management benefits can be significant and worth time and effort to capture. However, to support an IT project with these benefits logically requires understanding how these benefits are derived and what specific role the IT project will play in capturing the benefits versus the other alternatives and information available to contract managers to capture the benefits.
20. Neither BC Hydro nor its consultants have presented evidence that they have done the logical work to properly identify the benefits and their potential support for and dependence on the IT project information versus attribution to the non-IT people and processes used to capture the benefits and the alternative information source potentials. Further, BC Hydro and its advisors have stated that they believe this is too difficult and hard for them to do, so they do not appear to have done it.
21. The CEC finds BC Hydro's Phase 2 effort at providing justifications for the SAP Supply Chain Project as inadequate if not more so than its Phase 1 effort.

EVIDENCE ON RECORD INSUFFICIENT FOR COMMISSION FINDING PROJECT IN THE PUBLIC INTEREST

22. The CEC believes that substantial cost-effectiveness of capital expenditures is essential to the Commission's role in recovering these costs from ratepayer. The CEC submits that BC Hydro has not adequately met the logical evidentiary tests for cost-effectiveness for the Commission to find this Project in the public interest and make a decision to approve this capital expenditure.

II. Introduction

23. On December 16, 2016 BC Hydro and Power Authority ("**BC Hydro**" or "**BCH**") filed an application with the BCUC seeking acceptance of the capital expenditures up to the end of the Definition Phase of a Supply Chain Applications Project. The SCA Project is BC Hydro's proposal to replace its existing PassPort supply chain IT system, Asset Suite 8, with an SAP-based Supply Chain module and to make improvements to its supply

chain business processes for third party materials and service acquisitions.² The total expected capital cost of the Project was expected to be between \$60.5 million and \$79.3 million³ at that time.

24. The CEC expressed significant concerns with the application and particularly identified the lack of metrics available for evaluating the cost benefit of the proposed Project and the realization of its benefits in an application that is very costly and largely justified on unverifiable judgements and soft benefits.⁴
25. In Decision and Order G-158-17 the Commission Panel (the “**Panel**”) accepted capital expenditures up to the end of the Definition Phase of \$22.5 to \$29.7 million as being in the public interest but did not accept capital expenditures for the entire Project as being in the public interest.⁵
26. The Commission directed BC Hydro to file a Phase 2 verification report (“**Verification Report**”) at the end of the SCA Project Definition, which was to include the following information:
 - a) Cost Update Report;
 - b) Benefits Update Report;
 - c) Scope Update Report;
 - d) Risk Update Report;
 - e) Project Schedule Update Report; and
 - f) Quality Assurance Advisor Design Review Report.
27. BC Hydro provided its Verification Report in October 2018 with revised costs and benefits.
28. The decision options open to the Commission are set out under subsections 3 and 4 of section 44.2 of the Utilities Commission Act in that the Commission may either:
 - Accept the expenditure schedule, if the Commission considers that making the expenditures would be in the public interest (subsection 44.2(3)(a));
 - Reject the expenditure schedule (subsection 44.2(3)(b)); or
 - May accept or reject a part of an expenditure schedule (subsection 44.2(4)⁶).

² BCUC Decision and Order G-158-17 page i of ii

³ BCUC Decision and Order G-158-17 page 1

⁴ Phase 1 CEC Final Submission page 1

⁵ BCUC Decision and Order G-158-17 page 41

⁶ Exhibit B-4, CEC 1.3.1

III. REPORT VALIDITY – PwC AS SYSTEM INTEGRATOR AND INADEQUATE EVIDENCE

29. The CEC notes that PwC is the System Integrator and provided supporting information used in developing the Verification Report.⁷
30. In particular, PwC documentation was used to justify an additional \$10 million in Expected Benefits which were not considered previously.
31. The CEC discusses the PwC report in Section E ‘Benefits Update Report’ of these submissions.
32. The CEC found that PwC’s evidence is not adequate to justify the inclusion of an additional \$10 million in benefits. The CEC is of the view that the evidence is lacking in foundation as to suggest an unhealthy bias in the report, and certainly a fully inadequate basis for justifying the proposed expenditures.
33. BC Hydro acknowledges that PwC has an interest in the outcome of the Verification Report and BC Hydro proceeding with the SCA Project. They state that ‘successful implementation of the SCA Project is important to the reputation of PwC’.⁸
34. The CEC submits that PwC’s interest in the outcome of the Verification Report and the approval of the Commission is highly significant from a financial perspective, and not just from a reputational perspective.
35. PwC, as the System Integrator, has a key role in the Project being the primary source of, and having responsibility for, people who work on the Project.⁹ As of the Phase 1 Decision, BC Hydro had not yet signed a contract with PwC¹⁰ but has now agreed to a fixed price for all the remaining work.¹¹
36. PwC expects to earn fees for providing services to the Project.
37. System Integrator costs will be increased by an extra \$3.4 million¹² over that originally assumed in the Phase 1 application.

⁷ Exhibit B-4, CEC 1.7.1

⁸ Exhibit B-4, CEC 1.15.1

⁹ BCUC Supply Chain Decision page 10 of 43

¹⁰ BCUC Supply Chain Decision page 5 of 43

¹¹ BC Hydro Final Submission page 42

¹² Exhibit B-1, page 2-9

**Table 2-3 Future Direct Cost Variance Breakdown
(\$ million)**

Variance Explanation	Cost Variance (\$ million)
Change in System Integrator Contract	3.4
Change in BC Hydro's Internal Cost	3.2

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38. Additionally, of the \$1.5 million in contingency fees drawn in Phase 1, \$0.8 million was used to cover increases in the System Integrator Definition Phase costs due to an increase in the scope of their activities.¹⁴
39. The CEC submits that this financial and reputational interest in the Project's continuance represents a substantial conflict of interest which should not have been significantly present in the development of the Verification Report.
40. BC Hydro did not employ an independent firm to conduct the benefits review for the Verification Report due to schedule and cost considerations. They state that while the benefits review team from PwC was comprised of separate individuals from the PwC System Integrator project team, they were able to share benchmarking information, proprietary research, and knowledge of the supply chain applications system design more efficiently than had a separate firm of consultants been used for this exercise.¹⁵
41. BC Hydro relied on PwC having a standard level of professional integrity, quality assurance and ethical standards, as with any other professional services firm. In addition, to add oversight to the quality of the Verification Report, BC Hydro asked KPMG (the SCA Project's Quality Assurance Advisors) to review the benefits and review methodology. KPMG observed that "the SCA Project followed a suitable approach for identifying and validating benefits". KPMG's detailed observations and conclusions on the benefit assessment are included on pages 30-31 of their Design Review Report, which is included as Appendix K-1 to the Verification Report.
42. The CEC submits that not employing an independent firm to conduct the benefits review is potentially questionable when verifying a project with costs in the order of \$70 million and where the evaluator's financial benefit could be substantial.
43. The CEC recommends that the Commission consider the role and potential benefits to the evaluator when making its determinations as to the value of the report.

¹³ Exhibit B-1, page 2-9

¹⁴ Exhibit B-3, BCUC 1.4.1 and 1.4.4

¹⁵ Exhibit B-4, CEC 1.15.1

IV. COST UPDATE REPORT

44. The Cost Update Report must include:

- a) Actual costs incurred to the end of the Definition Phase compared to the mid-range Project cost estimate provided in Table 2-8 of the Application and in BC Hydro's response to BCUC IR 16.1, highlighting any significant variances or difficulties that the Project encountered and the use of any Project contingencies or reserves; and
- b) An updated Project cost range summary and mid-range cost estimate in the same format as provided in Table 2-7 of the Application and in response to BCUC IR 16.1, highlighting the reasons for significant changes in future estimated Project costs and with the Project contingency broken down into reserves for known and unknown risks.

A. ACTUAL COSTS INCURRED TO THE END OF THE DEFINITION PHASE COMPARED TO THE MID-RANGE PROJECT COST ESTIMATE.

- 45. The SCA Project's expected cost to the end of the Definition Phase is \$25.4 million.¹⁶
- 46. In the Phase 1 application, BC Hydro's mid-range cost estimate to the end of the Definition Phase was \$26.1 million before Project Reserve. Of this, \$2.3 million was allocated for contingency. Project Reserve was provided at \$6.3 million for a total expected cost of \$32.4 million to the end of the Definition Phase.¹⁷
- 47. BC Hydro provides the following Verification Cost Report for the Definition Phase in Table 2-2 of the application.

¹⁶ Exhibit B-1, page 2-4

¹⁷ Exhibit B-1, page 2-7

Table 2-2 Definition Phase: Verification Report Cost Estimate (including Actual Cost) versus Phase One Cost Estimate (\$ million)

Ref	Components	Capital Costs		Operating Costs		Total Costs		
		Phase One Cost Estimate (A)	Verification Report Cost Estimate (B)	Phase One Cost Estimate (C)	Verification Report Cost Estimate (D)	Phase One Cost Estimate (E)	Verification Report Cost Estimate (F)	Variance (F-E)
A	Supply Chain Transformation Blueprint (Early Design Costs)	7.3	7.3	-	-	7.3	7.3	0.0
B	Identification	-	-	1.2	1.2	1.2	1.2	0.0
C	Definition (Early Definition as of November 2016)	3.0	3.0	0.1	0.1	3.1	3.1	0.0
D	Definition (Early Definition post November 2016)	1.0	0.7	0.3	0.0	1.2	0.7	-0.6
E	Definition (Mobilization, Design & Implementation Planning)	9.4	9.7	0.8	1.4	10.2	11.0	0.9
F	Total Life-to-Date Cost as of August 31, 2018 (A + B + C + D + E)	20.7	20.6	2.4	2.7	23.1	23.4	0.3
G	Direct Future Costs to End of Definition	-	1.3	-	0.1	0.0	1.4	1.4
H	Contingency (% * Direct Future Costs to End of Definition)	2.1	0.0	0.2	0.0	2.3	0.0	-2.3
I	Interest During Construction	0.8	0.7	-	-	0.8	0.7	-0.1
J	Total Expected (Mid-range) Cost Estimate to end of Definition (F + G + H + I)	23.5	22.6	2.6	2.8	26.1	25.4	-0.7
K	Project Reserve - incremental contingency	1.9	0.0	0.2	0.0	2.0	0.0	-2.0
L	Project Reserve - reserve for known risks	4.2	0.0	-	0.0	4.2	0.0	-4.2
M	Incremental Interest During Construction on Project Reserve	0.1	0.0	-	0.0	0.1	0.0	-0.1
N	Total Project Reserve (K + L + M)	6.1	0.0	0.2	0.0	6.3	0.0	-6.3
O	Total Authorized Cost Estimate to end of Definition (J + N)	29.7	22.6	2.8	2.8	32.4	25.4	-7.0

Notes:

1. Minor differences attributable to rounding.
2. Contingency in Phase One Application was 20 per cent of Direct Future Costs of \$10.3 million.
3. Direct costs are inclusive of inflation. Contracts with third parties are inclusive of inflation. Internal labour cost estimates are built using BC Hydro's standard labour rates, which are also inclusive of inflation.
4. As BC Hydro resources charge their time directly to Information Technology projects, capitalized overheads are not allocated to BC Hydro's Information Technology projects.

48. The CEC notes that the negative variance in costs of -\$7 million occurs as a result of \$8.6 million composed of contingency savings (\$2.3 million) and Project reserve savings (\$6.2 million) plus \$0.1 million in IDC savings.
49. These are offset by increases of \$1.7 million in actual costs including \$0.3 million in Total Life to Date costs plus \$1.4 million in Direct Future costs to end of Definition.
50. BC Hydro states that 'it is important to note that BC Hydro expected the contingency to be spent'.¹⁹
51. The CEC has reviewed the evidence related to the costs up to the Definition phase and do not have evidence to contest the cost accounting.

¹⁸ Exhibit B-1, page 2-7

¹⁹ BC Hydro Final Submission page 10

B. AN UPDATED PROJECT COST RANGE SUMMARY AND MID-RANGE COST ESTIMATE

52. BC Hydro’s original Project Cost range included the following:

Lower Bound: \$60.5 million
 Mid-range cost (Expected cost) \$65.9 million
 Upper Bound: \$79.3 million. (The Authorized cost estimate).²⁰

53. BC Hydro did not provide a Lower Bound and Middle cost as it did in Phase 1, but instead provided a Revised Project Cost range.²¹

54. The Project Cost range provided was:

Expected cost: \$71.3 million
 Upper Bound/Authorized Cost: \$79.3 million.²²

55. The Expected Cost is approximately \$5.4 million higher than the original ‘Expected cost’ and \$10.8 million higher than the Phase 1 Lower Bound of \$60.5 million.

56. The BCUC requested that a Lower Bound be calculated using the estimating accuracy of -10%. This resulted in a Lower Bound of \$66.7 million.

Revised Table 2-5: Lower Bound Amount (\$ million)

Ref	Cost Components	Capital Cost	Operating Costs	Total Cost
X	Mid-Range Cost Estimate (row AF from Table 2-7 in the Verification Report)	61.1	10.2	71.3
Y	Lower Bound adjustment (-10% of rows AB, AC and AD from Table 2-7)	(3.6)	(0.7)	(4.4)
Z	Lower Bound Interest During Construction adjustment	(0.2)		(0.2)
AA	Lower Bound Total adjustment (Y + Z)	(3.8)	(0.7)	(4.6)
AB	Lower Bound Amount (X + AA)	57.3	9.5	66.7

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57. BC Hydro did not alter the Upper Bound of the cost estimate even though costs were deemed to be higher in the Verification Report than they were in Phase 1. BC Hydro states that the \$79.3 million is still considered to be the upper end of the cost estimate

²⁰ Exhibit B-1 page 2-2

²¹ Exhibit B-1, page 2-1

²² Exhibit B-1, page 2-2

²³ Exhibit B-3, BCUC 1.2.1.2

(and Authorized cost) because the estimating accuracy range of -10%/+15% is applied only to the future estimated costs of \$43.6 million. The future estimated cost of \$43.6 million, increased by the upper end of the accuracy range of 15 per cent equals \$50.1 million.

58. The \$79.3 million figure is calculated as the addition of the \$50.1 million plus total interest during construction of \$2.5 million, reserves for known risks of \$1.3 million, and total life-to-date actual cost (as of August 31, 2018) of \$25.4 million.²⁴
59. As a project is only considered defined at the end of the Definition Phase, BC Hydro compares actual project cost to First Full Funding (“**FFF**”) approval (the cost estimate at the beginning of the Implementation Phase).²⁵ BC Hydro has collected cost metrics on all completed technology projects since fiscal 2016. Over the last 3 years BC Hydro has come within 4% of total approved funding for completed technology projects.²⁶

Fiscal Year	No. of Initiatives completed	Percentage of Initiatives Completed within FFF Amount	Cumulative Initiative Cost (\$ million)		Variance	
			[A] FFF Amount (\$ million)	[B] Actual Final Cost (\$ million)	[A – B] (\$ million)	[(B – A) / A] (%)
2016	34	68	42.0	41.0	1.0 underspent	2.4 underspent
2017	37	81	59.6	61.1	(1.5) overspent	(2.5) overspent
2018	23	91	33.5	32.4	1.1 underspent	3.3 underspent

60. The CEC is of the view that an increase of \$5 million in Expected costs since Phase 1 is indicative of costs that may likely continue to rise over the course of the Project.

C. ESTIMATING ACCURACY RANGE

61. The expected cost has been assigned an estimated accuracy range of +15%/-10%. In BCUC 1.2.2 the Commission inquired as why the estimating accuracy range on the Expected Cost should continue to be the same as that in the Phase 1 application.
62. BC Hydro states that it is standard practice to develop an estimate with this range at the completion of the Definition Phase. They note that the accuracy range only applies to future costs and the reserve for unknown risks is reduced from \$7.7 million to \$6.5 million.²⁷

²⁴ Exhibit B-4, CEC 1.2.1 and BCOAPO 1.1.1

²⁵ Exhibit B-4, CEC 1.5.2

²⁶ Exhibit B-4, CEC 1.5.2

²⁷ Exhibit B-3, BCUC 1.2.2

63. The CEC is of the view that the completion of the Verification Report should have accomplished greater certainty in costs than was available in Phase 1, prior to the Verification Report.
64. BC Hydro argues that a narrower cost estimating accuracy range is not appropriate because the cost estimating range used in the Phase 1 application was narrower than would normally be assigned due to the additional information that was available.
65. The CEC submits that this is effectively arguing that there has been no improvement in the estimating accuracy from that in the Phase 1 report because the Phase 1 report was better than it should have been.
66. The CEC submits that the Verification Report should have resulted in an improved cost estimating accuracy range given the time and money expended on the report.
67. BC Hydro considers the SCA Project's Expected cost of \$71.3 million to be analogous to P50, which is defined as the cost estimate that will not be exceeded 50% of the time.
68. BC Hydro considers the SCA Project's Authorized cost, of \$79.3 million to be analogous to a P90 estimate plus an additional Project reserve for specific quantified risks. A P90 estimate is defined as the cost estimate that will not be exceeded 90% of the time.²⁸
69. BC Hydro states that it did not develop a formal P50 or P90 estimate using the Monte Carlo technique, and do not normally do so for technology projects. Rather, they consider that a 15% reserve can be added to future expected costs to approximate the difference between a P50 and P90 estimate.

Contingency

70. The current contingency for the Implementation Phase is \$5.7 million and is \$0.6 million lower than the contingency included in Phase 1 of \$6.3 million.²⁹
71. BC Hydro reduced its contingency from 20% of future direct costs to 15% of future direct costs because the scope of the SCA Project is more fully defined, and the implementation plans are more fully developed. This results in a higher percentage of Project activities being defined within the SCA Project's direct costs and a lower percentage being covered by contingency.³⁰ BC Hydro's standard practice for technology projects is to assign a contingency of 15% to each project phase subject to an adjustment based on project risk.³¹
72. The CEC submits that the reduction in contingency from 20% to 15% is acceptable.

²⁸ Exhibit B-4, CEC 1.2.2

²⁹ Exhibit B-1, page 2-10

³⁰ Exhibit B-4, CEC 1.9.1

³¹ Exhibit B-4, CEC 1.9.2

Cost Overruns

73. If the SCA Project costs are expected to exceed the Authorized Cost, a revised business case and Expenditure Authorization Request (“**EAR**”) will be prepared which will require approval from the Steering Committee, the President, and the Board of Directors before the costs are incurred. In addition, the Commission will be advised of possible Project cost overrun information in proposed Project progress reporting.³² In the event the SCA Project is forecast to exceed its Authorized Cost, the Commission could request further information on Project cost over-runs as it reviews the semi-annual progress reports. When the SCA Project is brought into service, and the final costs are known, the Commission could investigate the SCA Project’s final costs and consider a prudency review.³³
74. The CEC submits that the evidence on the record is that the range of cost is expected to be between \$71.3 million and \$79.3 million.
75. The CEC recommends that the Commission utilize these figures in their analysis of the Project.

V. BENEFITS UPDATE REPORT

76. BC Hydro’s Verification report must include: an updated listing of the Project benefits as provided in Attachment F, workbook tab F1, of the Application; updated benefits savings by year; and updated NPV of discounted cash flow and revenue requirements impacts. The Benefits Update Report must also provide an initial set of the baselines, metrics and measures pertaining to the Project’s benefit realization plans.

A. BENEFITS UPDATE

77. The annual recurring quantifiable benefits of the SCA Project at stabilization are expected to be \$34.8 million, or approximately \$8.6 million more than the total benefits of \$26.2 million that were anticipated in the Phase 1 Mid Scenario.
78. \$23 million of the expected \$34.8 million of total benefit, or 66% of the total, is expected to be monetized (100% for cost-based values and 18% for effort-based values).³⁴ The \$23 million total is approximately \$3.2 million lower than BC Hydro’s original mid-range estimate of \$26.2 million.³⁵
79. The CEC notes that in the Phase 1 filing BC Hydro reduced its total expected benefits by 50%, which the Commission found to be realistic given that ‘IT implementations rarely

³² Exhibit B-4, CEC 1.8.1

³³ Exhibit B-4, CEC 1.8.1.1

³⁴ Exhibit B-1 pages 3-9 and page 3-14

³⁵ Exhibit B-1, page 3-1

go exactly to plan and the nature of benefit estimates is such that applying a rate higher than the proposed 50% would not be prudent.³⁶

Annual value of benefits (Phase 1 Filing)

	Phase 1 Filing (Low Case)	Phase 1 Filing (Mid Case)	Phase 1 Filing (High Case)
Cost	\$6.9 M	\$11.4 M	\$13.7 M
Effort	\$8.8 M	\$14.7 M	\$17.7 M
Risk	\$0.0 M	\$0.0 M	\$0.0 M
Total	\$15.7 M	\$26.2 M	\$31.4 M

Figure 2: Summary of Low/Mid/High Case Projections from Phase 1 Filing

Annual value of benefits (Phase 2 Filing)

	Phase 2 Filing
Expected Monetized Benefit	\$23.0 M
Non-Monetized Benefit	\$11.8 M
Risk (Non-Quantified)	\$0.0 M
Expected Quantified Benefit Total	\$34.8 M

Figure 3: Summary of benefit estimates for Phase 2 Filing

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80. BC Hydro provides Table 3-4 Cost Reduction and Effort Reduction Expected Benefits and Monetized Benefits at page 29 of its Final Submissions which the CEC has reproduced with additional information relating to the monetization factors below. Cost Reduction Benefits are considered to be monetized at 100% whereas Effort Reduction Benefits were monetized at 18%.³⁸

Benefit Type	Phase 1 Mid Scenario (\$ millions)	Verification Report Expected Benefits (\$ millions)	% Monetized in Verification Report	Verification Report Monetized Benefits (\$ millions)
Cost Reduction Benefits	11.5	20.4	100%	20.4
Effort Reduction Benefits	14.7	14.4	18%	2.6
Total	26.2	34.8	*66% ³⁹	23.0

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³⁶ BCUC Phase 1 Decision page 33 of 43

³⁷ Exhibit B-1, Appendix G page 5 of 10

³⁸ Exhibit B-1, Verification Report Appendix G Table 3-4 (Benefit ID monetized 16 at 100%, other effort-based benefits at 15.7% see Final Submissions page 27-28)

³⁹ Exhibit B-1, page 3-15NB: 66% is calculated

81. It is notable that Cost Reduction Benefits have increased from \$11.5 million to \$20.4 million and Effort Reduction Benefits have declined from \$14.7 million to \$2.6 million. The increase in ‘cost benefits’ is primarily the result of changes in benefits related to Capability Gap 2.
82. The following provides the variances by capability gap.

Table 3-3 Phase Two Annual Expected Benefits versus Phase One Annual Mid Benefits Scenario at Full Ramp Up (\$ million)¹

Capability Gap	Phase One Mid Scenario Benefits (A)	Verification Report Expected Benefits (B)	Variance (B - A)
1 - Inability to manage service related spend	12.04	10.85	-1.18
2 - Poor contract management	5.98	16.29	10.30
3 - Limited ability to manage inventory levels	6.04	3.55	-2.49
4 - Poor management of individual supplier performance	0.20	0.00	-0.20
5 - Limited ability to manage supply chain for capital projects	0.00	1.12	1.12
6 - Lack of order, delivery and payment tracking	0.10	0.09	-0.01
7 - Inability to support return of unused materials	0.07	0.82	0.75
8 - Inability to pre-assemble materials for field crews	0.39	0.00	-0.39
9 - Lack of mobile access to inventory information	0.00	0.00	0.00
10 - No self-serve option for routine service requests	0.62	1.33	0.72
11 - Inability to pay suppliers without an invoice	0.06	0.00	-0.06
12 - Inability to streamline controls and approvals process	0.02	0.29	0.27
13 - Inability to integrate with work management systems	0.68	0.43	-0.24
Total	26.17	34.77	8.59

¹ Minor differences due to rounding

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83. There were 11 newly identified benefits in Phase 2 while 8 original benefits from Phase 1 were removed.⁴²
84. BC Hydro provides its Benefits Analysis, including Net Present Value Analysis, in Chapter 3 of the Application (Phase 2). The Conclusion Summary and Updated Analysis Post-Design Stage are included in Appendices G and H respectively.
85. BC Hydro engaged PwC’s supply chain consulting practice to review and work with BC Hydro to update the potential benefits of the SCA Project based on the completed design work.⁴³
86. The CEC notes that PwC is the System Integrator and has a vested interest in the outcome of this proceeding.

⁴⁰ BC Hydro Final Submissions page 29

⁴¹ Exhibit B-1, page 3-10

⁴² Exhibit B-1, Appendix H page 14

⁴³ Exhibit B-1, page 3-4

87. This work included:

- Validating quantified and non-quantified benefits and update;
- Refining the assessment of the attainability of the benefits based on the experiences of industry peers; and
- Providing documentation for future benefits tracking.

88. The steps included:

Step 1: Document Review and Analysis;

Step 2(a): Stakeholder Validation through interviews with stakeholders;

Step 2(b): Industry Peer and Benchmark Comparison – compared benefits to the measurement of benefits realized by industry peers for key benefits to assess realization timeframe and ration and identify changes; and

Step 3: Tested benefits with BC Hydro stakeholders.

89. The benefits assessment approach was assessed by KPMG, the Quality Assurance Advisor, and concluded that PwC had followed a suitable approach.⁴⁴ (appendix K-1)

90. The CEC has reviewed KPMG’s evaluation of benefits which states:

To estimate effort reduction benefits, the SCA Project followed a bottom-up approach to estimate the total effort saving. The team then followed up by using a top-down approach to validate the total cost saving as a result of repurposing certain roles.

To estimate cost reduction benefits, the SCA Project team applied benchmarks for savings captured from similar projects, to BC Hydro’s current state performance. The Benefits Assessment Team considered both industry benchmarks and findings from past project delivered by the SI. To validate the suitability of benchmarks, the Benefits Assessment Team considered BC Hydro’s current state supply chain maturity relative to the state of maturity for the benchmark organization. The assessment team also considered benchmarks validated by several sources. Based on interviews with the members of the Benefit Assessment Team, KPMG observed that certain members of the team had previously worked on preparing BC Hydro’s Supply Chain Business Model in 2013 and therefore have a suitable reference point for the performance maturity of BC Hydro’s supply chain organization.

KPMG observed that the Benefits Assessment Team suitably incorporated findings identified during Design into the benefits assessment. KPMG observed that throughout the Design Phase, the Benefit Assessment Team:

- Incorporated new design findings in the benefit identification and validation process, by reviewing documents, interviewing key stakeholders and attending Design Playback sessions;

⁴⁴ Exhibit B-1, page 3-4

- Validated and updated the benefits and the underlying assumptions that were documented in the previous report;
- Identified and quantified new benefits;
- Updated key variables, such as industry benchmarks, ranges, the detail of stabilization and ramp-up period.

91. The CEC submits that while KPMG appears to endorse the process followed by PwC, there is no significant comfort to be gained from the generic nature of the comments, particularly given the new, vague ‘broad-based’ approach provided by PwC in its tripling of the benefits in closing Capability Gap 2, discussed below.

B. MONETIZATION

92. BC Hydro provides evidence related to Expected Benefits and Monetized Benefits.⁴⁵
93. The CEC submits that Monetized benefits are the appropriate metric with which to assess the application.
94. In the Phase One Application, BC Hydro assumed that the discounting of the benefits (i.e., 30, 50 and 60 per cent realization rate scenarios) would be sufficient to compensate for the challenges in monetizing small increments of time across many individuals. However, based on PwC’s advice during the benefits review process, BC Hydro recognizes that this will be more challenging than initially thought.⁴⁶
95. BC Hydro’s updated benefits analysis incorporates a new distinction between benefits that can be quantified, and quantified benefits that can also be monetized. The updated benefits analysis recognizes that it might be difficult to monetize the financial value of some of the effort reduction benefits. BC Hydro has therefore assumed that where effort reductions are in short-time increments distributed across large working groups, the effort-reduction benefits will not be monetized.⁴⁷
96. The CEC submits that this is an appropriate assumption.
97. As noted above, Cost Reduction Benefits are now estimated to be \$20.4 million⁴⁸, which are monetized at 100%. This represents an increase of about \$9 million from the Cost Reduction Benefits of \$11.4 million anticipated in Phase 1.⁴⁹
98. The CEC notes that of the \$20.4 million in Cost Reduction Benefits, \$10.3 million are related to Benefit ID #5, which the CEC discusses below.

⁴⁵ Exhibit B-1, page 3-21

⁴⁶ Exhibit B-4, CEC 1.11.1

⁴⁷ BC Hydro Final Submission page 27

⁴⁸ Exhibit B-1, Appendix G page 10 of 10

⁴⁹ Exhibit B-1, Appendix G page 5 of 10

99. Effort Reduction Benefits are now estimated to be of \$14.4 million, which are monetized at 18% for a total Monetized Benefit savings of \$2.6 million. The 18% is based on the ratio of total effort-related Monetized Benefit (\$2.6 million) divided by total effort-related Expected Benefits (\$14.4 million). This includes Benefit ID#16 (\$433,000⁵⁰) which was monetized at 100%, while all other effort benefits were monetized at 15.7%.⁵¹
100. The \$2.6 million represents a reduction of about \$12.1 million from the \$14.7 million⁵² anticipated in Phase 1.
101. This 82% reduction in the monetization of effort-related benefits from the Phase 1 expectation represents a significant admission by BC Hydro of a lack of confidence in its benefit evaluation.
102. The expected monetized benefits of \$2.6 million represent a targeted reduction of 20 full time equivalent (“FTE”) positions, which BC Hydro has estimated can be made without introducing new risks and negatively impacting business.⁵³
103. BC Hydro states that ‘...other than for Benefit ID #16 it is not possible to specifically identify the headcount reduction attributable to individual effort benefits in isolation.’⁵⁴
104. The CEC submits that BC Hydro’s reduction of its effort-related benefits by \$12 million is notable and is consistent with the CEC’s views of the high level of uncertainty surrounding the Effort Reduction Benefits promoted as being available in the Phase 1 report.
105. The CEC submits that the \$2.6 million is more apt, but that a ‘targeted’ reduction of 20 FTEs with inadequate baseline evidence and an inability to attribute the source of the headcount reductions amounts to little more than a guesstimate about the total savings that can be made.

C. REALIZATION

106. It is expected that there will be a one-year stabilization period before there will be actual realization of financial benefits. This is followed by a four-year and two-year ramp-up for cost and effort benefits respectively. The ramp-up factors were applied to all benefits.

⁵⁰ Exhibit B-3, BCUC 1.13.2

⁵¹ Exhibit B-3, BCUC 1.13.3

⁵² Exhibit B-1, Appendix G page 5 of 10

⁵³ Exhibit B-3, BCUC 1.13.2

⁵⁴ Exhibit B-3, BCUC 1.13.2

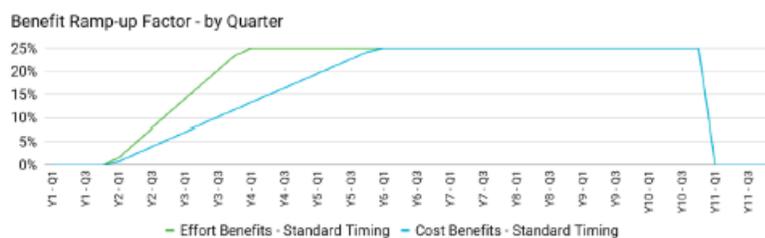


Figure 5: Benefit ramp-up factor by quarters

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- 107. The realization ratios were developed jointly by BC Hydro and PwC.⁵⁶
- 108. The CEC notes that delays in implementation and ramp-up will result in a lower Net Present Value than is predicted.

D. BENEFITS TRACKING

- 109. BC Hydro states that it will internally track and monitor the realization of the SCA Project benefits on an annual basis at least until benefits are fully realized. Monitored outcomes with tracking plans are provided for 12 Benefits including IDs #5, 26, 7, 14, 29, 105, 102, 67, 104 and 103.⁵⁷
- 110. BC Hydro will report to the Commission on the realization of the SCA Project benefits in the Project Closure and Evaluation Report (“PCER”) as well as future revenue requirement applications until the benefits have been fully realized. The content of the reporting will be based on the benefit tracking sheets described on page 3-17 and included in Appendix I of the Verification Report.⁵⁸ Appendix I-2 provides the Benefits Tracking Sheet Guide.

E. BENEFIT ID #5 COST SPEND REDUCTION THROUGH ACTIVE CONTRACTOR AND SUPPLIER MANAGEMENT

- 111. The CEC notes the considerable significance of the increase in the Expected Benefits Benefit ID #5, included in capability gap ‘Poor Contract Management’ (Capability Gap No.2).

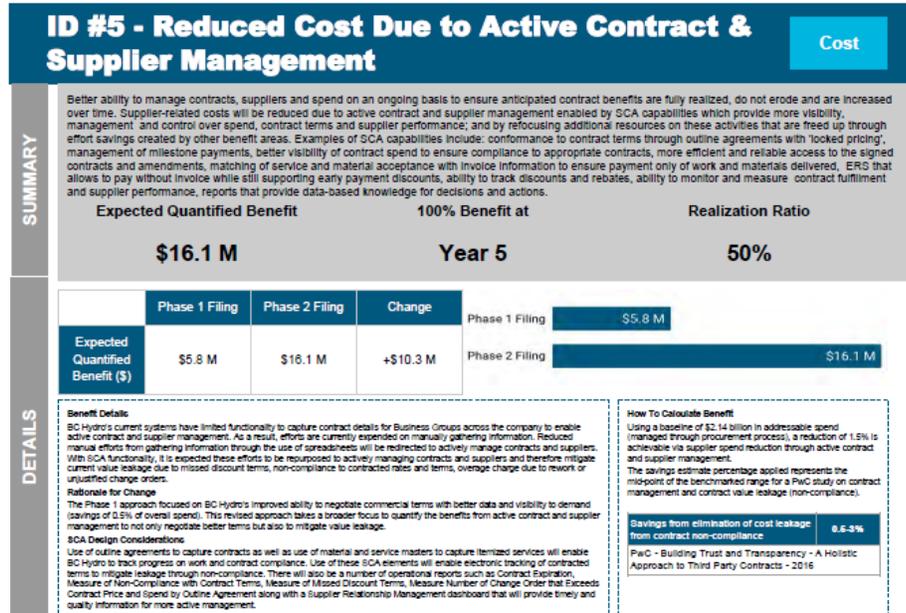
⁵⁵ Exhibit B-1, Appendix G page 7 of 10

⁵⁶ Exhibit B-4, CEC 1.13.1

⁵⁷ Exhibit B-1, Appendix II

⁵⁸ Exhibit B-3, BCUC 1.1.2.2

- 112. Benefit ID #5 is entitled ‘Spend reduction through active contract and supplier management’⁵⁹ and is classified as a Cost (Reduction and Avoidance) benefit and is therefore monetized at 100%. Stabilization is anticipated to take 1 year, with 100% benefit at Year 5.
- 113. An overview is provided in Appendix H of the application at page 20.



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- 114. Benefit ID #5 now accounts for over \$16.1 million⁶¹ or nearly 50% of the Expected Benefits overall (\$34.8 million) and 70% of the Total Monetized Benefits of \$23.0 million.
- 115. Previously, this benefit accounted for \$5.8 million, or less than a quarter of the \$26.2 million in total benefits identified in Phase 1.
- 116. Without the \$10.30 million increase in Benefit ID #5, the total Expected Benefits would be in the order of \$24.47 million or nearly \$2 million lower than the \$26.17 million originally expected.
- 117. More importantly, the ‘monetized benefits’ would decline from \$23 million to \$12.7 million.
- 118. The CEC provides the following calculated benefits excluding the increase in Benefit ID #5.

⁵⁹ Exhibit B-1, Appendix page I-1 pages 3 to 6 of 29

⁶⁰ Exhibit B-1, Appendix H page 20

⁶¹ Exhibit B-1, Appendix H page 20

Benefit Type	Phase 1 Mid Scenario (\$ millions)	Verification Report Expected Benefits (\$ millions)	Verification Report Monetized Benefits (\$ millions)	Verification Report Removing Additional \$10.3 million
Cost Reduction Benefits	11.5	20.4	20.4	\$10.1
Effort Reduction Benefits	14.7	14.4	2.6	\$2.6
Total	26.2	34.8	23.0	\$12.7

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119. A description is provided in Appendix I-1, at pages 3-6 of 29.
120. The CEC has reviewed the description of the benefits and does not find that there is compelling evidence that significant cost reduction savings are available, nor that they are directly attributable to the Project, or even a portion of the Project.
121. The CEC notes that reducing ‘contract value leakage’ (non-compliance) and ‘active contract and supplier management’ are the key benefits being referenced. Contract Value Leakage activities are outlined in in Appendix II, at pages 5 and 6 of 29.
122. The CEC submits that a new supply chain system of more than \$70 million is not, and should not be, required for BC Hydro to actively manage its contracts and address non-compliance.
123. The CEC expects that if there are \$10 million in available savings available from better contract management, these savings should be largely achievable with various policy changes accompanied by dedicated staff members and supporting processes at significantly lower cost than the proposed IT system.
124. The CEC notes that the baseline metrics against which BC Hydro intends to evaluate the SCA Project represent the status quo of existing systems and processes and do not reflect any kind of internal efforts that could be undertaken in the absence of the Project.⁶³ BC Hydro has tracking and compliance activities in place but there are already clearly identified areas that could be improved. A 2016 audit found that ‘Responsibility for tracking and collecting volume discounts has not been formally assigned. There is a

⁶² BC Hydro Final Submissions page 29

⁶³ Exhibit B-4, CEC 1.24.1

potential financial exposure that advantage may not always be taken of these discounts”.⁶⁴

125. The CEC inquired as to how it can be assured that the benefits are only attributable to the capital expenditures associated with the Project and not to other activities which could be supported as a result of corporate buy-in and top-level commitment that would achieve the benefits more cost-effectively.
126. PwC, as System Integrator, made its reply in CEC 1.24.2. The CEC notes that their view includes the position that ‘The value of trying to segment from where the value creation is derived is difficult and often a fruitless endeavor. Except in the cases where technology is eliminating transactions, benefits measurement does not provide value creation segmentation’.⁶⁵
127. The CEC submits that this PwC statement is not true and that simple methodologies exist to achieve the segmentation to causes.
128. The CEC finds the response concerning and submits that the lack of metrics and unwillingness to assign value to spending is not appropriate in reporting intended to assess the cost benefit relationship of projects.
129. The CEC submits that there is no substantial evidence to suggest that contract management could not be significantly enhanced by creating new assignments and activities independently of the SCA Project.
130. BC Hydro originally forecast the value of the ID#5 benefit as a reduction of 0.5% of overall spend based on its improved ability to negotiate commercial terms with better data and visibility to demand.
131. In the Phase One Application, BC Hydro’s focus for this benefit was on pre-contract award efforts to negotiate better terms and therefore BC Hydro calculated the value of this benefit as a reduction of 0.5 per cent of overall spend.⁶⁶
132. However, PwC and BC Hydro working together effectively nearly tripled the expected value (from 0.5% to 1.5%), adding \$10.3 million in anticipated savings.
133. BC Hydro stated that:

‘BC Hydro had forecasted the value of this benefit as a reduction of 0.5 per cent of overall spend based on its improved ability to negotiate commercial terms with better data and visibility to demand. PwC advised taking a broader focus to quantify the benefits from active contract and supplier management not only to negotiate better terms, but also to mitigate value leakage. The benchmarked range for savings from the

⁶⁴ Exhibit B-4, CEC 1.26.2

⁶⁵ Exhibit B-4, CEC 1.24.2

⁶⁶ BC Hydro Final Submissions page 30

elimination of cost leakage from contract non-compliance was determined to be between 0.5 per cent and 3 per cent in a PwC study

BC Hydro and PwC determined that a reduction of 1.5 per cent, which is just below the mid-point, is achievable and reasonable.⁶⁷

134. The study referenced is a PwC study entitled 'Building Trust and Transparency – A Holistic Approach to Third Party Contracts – 2016.'
135. The document was not included in the application but was available through information requests.
136. The study is also referenced as the source of the benefits calculation in Appendix H, page 20 of 87.
137. The document is again referenced as the source of benefits assessment in BC Hydro's response to BCUC 1.12.4.
138. The CEC submits that the study does not provide an adequate foundation for the Commission to accept an increase of over \$10 million in benefits, and nearly 50% of the total expected monetized benefits of \$23 million from the SCA Project overall.

PwC Study Building Trust and Transparency

139. The CEC has reviewed the document used to verify the expected benefits which is 9 pages long and was provided in response to CEC 1.23.1
140. The CEC takes exception to the use of this document in assigning and 'verifying' an additional \$10 million worth of benefits for capability gap 2.
141. The CEC submits that the use of this source of information in verifying an additional \$10 million in benefits, or almost 50% of the total monetized benefits being touted by this application, and almost 30% of the total Project benefits of \$34.8 million, is so significant that it provokes serious questions as to the validity of the verification report altogether.
142. The CEC does not find the evidence to be adequate in justifying a \$10 million benefit increase seen in the Verification Report for this 'capability gap'.
143. Indeed, the document itself appears to be nothing more than a sales tool for PwC and there is virtually no kind of serious analysis that provides an evidence for comfort in the validity of the estimates.

⁶⁷ Exhibit B-1, page 3-11

The report is vague and cannot be verified

144. The CEC notes that:

- 3 of the 9 pages are devoted to cover, end page and sales contacts;
- A graph depicting how value delivered changes over time has no values, and no sources of information;
- Statements of the 'value leakage' being between 5% and 15% has no supporting evidence or indication of how it was derived, the number of companies studied nor any kind of evidence to justify the figures;
- Statements regarding corporate issues with third party vendors are vague, general statements about declining governance and contract management over time;
- The 'holistic approach' is not defined;
- There is one reference to a single, unnamed, pharmaceutical company utilizing a 'holistic approach' and identifying potential areas of weakness with no context, or other information;
- There is no evidence to suggest that expected savings are derived from IT projects of similar size and magnitude as BC Hydro's;
- The document has no apparent relevance to utilities or especially to BC Hydro.

145. The CEC provided BC Hydro with the opportunity to explain the value of the 'broader focus' that was advised to be included by PwC and requested specific examples and quantification in CEC 1.26.1.

146. BC Hydro elaborated on the 'broader focus' championed by PwC but provided no quantifiable and verifiable evidence to support their assertion.

'In BC Hydro's Phase One filing this benefit was generally focused on the potential reduction of 0.5 per cent of spend due to an enhanced ability to negotiate better commercial terms with better data and visibility to demand.

PwC experience and additional market research indicates that by taking a 'broader' more holistic view through the consideration of post-contract value leakage that these savings could potentially be increased.

PwC's report 'A Holistic Approach to Third Party Contracts' included in Attachment 1 to BC Hydro's response to CEC IR 1.23.1, indicates that cost leakage from contract non-compliance can generate between 0.5 per cent and 3 per cent in contract specific savings. As this report is generated from a wider supply chain sampling than solely the utility industry, PwC corroborated this range by evaluating confidential benchmark data derived from previous utility industry consulting engagements. Secondly this range was evaluated against other commercially available market intelligence.

Beyond the research, our evaluation considered the potential for success for BC Hydro relative to the range reported in the data. Mitigating contract value leakage can be greatly enhanced through improvements to systems and processes that increase controls through enhanced reporting capabilities including the ability to compare contractual terms to

invoices. BC Hydro possess a higher than average complexity of transactions due to its ratio of service Purchase Orders (POs) to material POs. The SCA Project will enhance the ability to govern service POs and will in turn enhance the ability to mitigate contract value leakage on a high percentage of contracts.

Following an evaluation, it was concluded that the potential for success to achieve this savings was high and 1.5 per cent was an appropriate and reasonable estimate⁶⁸.

147. The CEC submits that BC Hydro response does not provide any useful information in assessing the validity of the 'broad based approach', the validity of the report, of the range of 0.5% to 3%, and the selection of 1.5%. or of the attribution of savings to the capital expenditures in the Project. Rather, it amounts to unverifiable generalizations and vague references to other commercially available market intelligence, none of which is cited or reviewable.

There is no relationship to BC Hydro

148. The CEC inquired as to how PwC modified its expectations of the 'benchmark range' to account for the unique aspects of BC Hydro and its current projects in CEC 1.23.5.
149. The CEC submits that the response is general and does not provide significant confidence in relating PwC's benchmarking to BC Hydro.
150. The CEC submits that PwC's 'broad based' approach amounts to simply assigning a mid-range value from questionably relevant industry examples.
151. The BCUC also explored the validity of the report in its IR 1.12 series of questions.
152. In response to BCUC IR 1.12.4, BC Hydro and PwC comment on how BC Hydro is 'at a lower level of technological maturity with respect to supply chain technologies than the average company that may be reflected in PwC's report.' This is supported by no evidence except PwC's own determinations.
153. Additionally they state that:
- 'The report was tested against other available market intelligence and PwC's experience at industry peers which were determined to align with recommendations provided in this report'.
154. The CEC does not find this satisfactory as it remains vague and unverifiable.
155. In BCUC 1.12.5, PwC declined to provide any information on the companies that make up the 'benchmarked range' as it would 'breach client confidentiality'.
- PwC cannot provide the details of the companies as it would breach client confidentiality. Many of the organizations were comparable in terms of size, scale and technological maturity (or advanced in technological maturity). Beyond this study, PwC's recent

⁶⁸ Exhibit B-4, CEC 1.26.1

experience working with utility and other organizations on similar projects indicates implementing SAP ECC has resulted in savings through active supplier management, contract management and contract value leakage that were in the range of 1.5 per cent to 3 per cent, which confirms that the 1.5 per cent mark is reasonable and achievable.⁶⁹

156. The CEC submits that the PwC response is inadequate to justify the expected benefits ‘verified’ by PwC. There is no verifiable information as to the size, relevance, standing of the companies or as to the opportunity or realization of any benefits.
157. The CEC is of the view that PwC could readily have provided significant evidence as to the makeup of the study such as industries involved, number and size of companies, relevance of utilities or other companies, the types of benefits actually realized, issues encountered or any other myriad of metrics which could shed some light on the validity of the report and the transportability of any findings to BC Hydro if such information were likely to have serious evidentiary value. Instead, any information related to the report is well beyond the Commission’s ability to assess its value.

The report does not relate savings to an IT project

158. The report makes no effort to distinguish benefits attributable to better contract management activities from benefits derived from otherwise unattainable information sources.
159. The CEC notes that there is very little evidence in the report of the role played by the SAP or other IT systems vs. contract management in achieving benefits, or what proportion of the total SAP costs would be required to achieve those benefits.
160. In the CEC’s review of the PwC Report, the CEC identified 22 functions required to avoid ‘value leakage’ and deliver contract management benefits.
161. Only two of those functions appeared to be remotely related to requirements from an IT system, and no IT system functions were identified in the report as a clear requirement.
162. PwC’s ‘holistic’ approach, by definition, does not relate the benefits it proposes are available to particular IT project functions.
163. The CEC submits that the evidence cited by BC Hydro and PwC is inadequate to justify the near tripling of expected benefits (to over \$16 million) in contract management to be derived as a result of the SAP system.
164. The CEC submits that if there were any reasonable likelihood of benefit achievement and direct linkage to the Project and Project costs there should be considerably more evidence on the likely values in the forms of other reports readily available.
165. The CEC recommends that the Commission provide very little weight to the PwC report as being inadequate to justify the increase in monetized benefits from \$5.8 million to

⁶⁹ Exhibit B-3, BCUC 1.12.5

\$16.1 million because the report makes no effort to distinguish benefits attributable to better contract management activities from benefits derived from otherwise unattainable information sources.

Cost Benefit Percentage

166. In BCUC 1.12.6.1 BC Hydro states:

Application of an average cost benefit percentage across all addressable spend is a common practice within the industry as observed by PwC on benefits calculations and is regarded as a reasonable method for organizations with such a wide variety of product and service categories to arrive at an overall estimated benefit.⁷⁰

167. The CEC submits that application of an ‘average cost benefit percentage across all addressable spend’ would not constitute best or even adequate practices especially where the ‘industry’ is not the same as that being addressed and the information used is as vague and unsupported as is being utilized in this case.

168. The CEC submits that this approach is also contrary to the Commission’s finding in its Supply Chain Decision Phase 1 as to the value of BC Hydro’s original analysis. The Commission wrote:

BC Hydro has identified 13 capability gaps and has analysed these to determine their impact on the organization. This has provided guidance as to systems requirements and potential benefits that can be realized through making desired improvements. BC Hydro has examined each of these in detail to determine and quantify the benefits in terms of reduced costs to current operations and reduced effort creating an opportunity to reduce or reallocate staff to other requirements. As BC Hydro has stated, this bottom-up approach to its examination of benefits has allowed for a calculation of the monetary value of benefits based on actual quantified values, which in the view of the Panel increases the credibility of the outputs. In addition, the Panel notes that BC Hydro has taken steps to guard against being overly optimistic with its projections by discounting the monetary value of the benefits. The Panel considers the 30 to 60 percent range for scenarios reasonable and BC Hydro’s approach prudent as it is designed to reduce concern that the utility is over-stating its ability to deliver. In addition, the Panel notes that all of the scenarios developed result in a positive NPV on cash flows providing additional comfort.⁷¹

169. The CEC submits that PwC’s new approach is not consistent with the Commission’s acceptance of BC Hydro’s ‘bottom-up approach’ and reliance on ‘actual, quantified values.’ Rather it is a vague guesstimate with little to no verifiable evidence.

170. Overall the CEC does not support the assessment of 1.5% of the overall spend, and further does not support the application of 100% monetization of the \$10.3 million.

⁷⁰ Exhibit B-3, BCUC 1.12.6.1

⁷¹ BCUC Decision and Order G-158-17 (Supply Chain Decision) page 32 of 43

Benefits are Not Calculated Against Best Practices without Project

171. The benefits tracking for Benefit ID #5 is provided in Appendix II of the application.

‘The benefit will be calculated as the difference between what is forecasted to occur given the SCA solution versus an estimate of what would have occurred without the SCA application’.

172. The CEC submits that the assessments of what have happened versus what would have happened are open to interpretation and opinion as to be unacceptable.

The Overall Estimate is a Guesstimate

173. In its Final Submissions in Phase 1 the CEC expressed serious concern over the original benefits assessment and the reliance on employee judgements and assessments.

CEC has expressed concern with BC Hydro’s reliance on the use of employee judgements and assessments in determining its benefit assessments. While such methods of benefit calculation are not ideal, the Panel accepts that where time and effort cannot be accurately quantified, it is reasonable to rely on the estimates of those involved with performing the tasks to understand the impact of automation of these processes. Moreover, the Panel points out that the reliance on a 50 percent discount rate for the monetary valuation of benefits mitigates some of the risk with reliance on these estimates and therefore finds the approach taken by BC Hydro to be reasonable given the circumstances.⁷²

174. The CEC submits that even the 0.5% benefits are suspect and should not be relied upon but does not intend to re-argue this point in light of the Commission’s earlier findings.

175. The CEC considers that whether the contract management benefits are 0.5% or 1.5% these purely judgemental guesstimates would need to be discounted by 50% based on the Commission’s prior decision.

176. The CEC submits the Commission should not accept any of BC Hydro’s evidence increasing the Expected Benefits in Benefit ID#5.

177. The CEC recommends that in the absence of other information the Commission should rely on the 0.5% for Benefit ID#5 as provided in the Phase 1 application.

F. BENEFIT ID #16 ELIMINATE MANUAL MATERIAL RESERVATIONS AT MATERIAL MANAGEMENT

178. Benefit ID #16 is described as ‘Eliminate manual material reservations at Material Management’. There is a total estimated benefit of \$432.6 thousand.⁷³

⁷² BCUC Supply Chain Decision page 33 of 43

⁷³ Exhibit B-1, Appendix I-1 pages 23-25

- 179. It is considered to be an Effort based benefit, however BC Hydro determined to monetize Benefit ID #16 at 100% rather than at the average 15.7% used for other Effort based benefits⁷⁴ because the FTE positions can be counted as being eliminated.
- 180. The CEC has reviewed the evidence and submits that if BC Hydro eliminates the workload and positions, and they are directly attributable to the IT system, then 100% benefit may be justified.

VI. NET PRESENT VALUE

- 181. BC Hydro’s assessment of the Net Present Value of the discounted cash flows for the Base Case scenario is that it is positive at \$41.8 million. The equivalent mid scenario NPV of discounted cash flows in the Phase 1 proceeding was \$68.3 million.⁷⁵
- 182. BC Hydro states that the NPV in the new base case is lower than the Phase 1 mid-range scenario primarily due to the reduction in effort benefits and the \$5.4 million increase in expected cost.⁷⁶ Additionally, the change in nominal discount rate from 7% to 6% had a positive impact of \$7.2 million on the Base Case.⁷⁷
- 183. BC Hydro also calculates various NPV based on scenarios using total expected benefits with no adjustment for ‘monetization.’⁷⁸

**Table 3-6 NPV of Discounted Cash Flows:
Sensitivity and Breakeven Analysis**

Scenarios	NPV of Discounted Cash Flows (\$ million)	Benefit Percentage Required to Breakeven (%)
Expected Costs / Monetized Benefits	41.8	60
Authorized Costs / Monetized Benefits	31.9	69
Expected Costs / Expected Benefits	102.5	38
Authorized Costs / Expected Benefits	92.6	44

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⁷⁴ Exhibit B-3, BCUC 1.13.2

⁷⁵ Exhibit B-1, page 3-21

⁷⁶ Exhibit B-1, page 3-21

⁷⁷ Exhibit B-1, page 3-21

⁷⁸ Exhibit B-1, page 3-22

⁷⁹ Exhibit B-1, page 3-21

Table 3-7 NPV of Revenue Requirements: Sensitivity and Breakeven Analysis

Scenarios	NPV of Revenue Requirement (\$ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.1	67
Authorized Cost / Monetized Benefits	19.4	75

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184. The CEC submits that these should be given little weight by the Commission as they are overly optimistic and unreasonable.
185. The CEC submits that the added benefits of \$10.3 million (with 100% monetization) derived from Benefit ID #5 is the key element which is salvaging a positive NPV in the Verification Report. As noted above, the CEC believes there is little merit in including the \$10.3 million in added benefits due to the significant and logical flaws in the attribution of the benefit.
186. The BCUC requested that BC Hydro provide a recalculated NPV of the Discounted Cash Flows using the 0.5% scenario for closing Capability Gap #2 included in the Phase 1 application instead of the 1.5% used by BC Hydro and PwC in the Verification Report.
187. Using the original 0.5% scenario reverses the Project outcome, changing it from a positive NPV of \$41.8 million (expected costs/monetized benefits) to a negative NPV of \$-5.8 million⁸¹ using Expected Costs and Monetized Benefits.
188. Assuming ‘Authorized costs vs Monetized benefits’ the NPV of cash flows moves from \$31.9 million to \$-15.7 million.⁸²
189. With regard to revenue requirements the NPV goes from a positive value of \$25.1 million with expected costs and monetized benefits to \$-14.7 million. Considering Authorized costs and expected benefits the NPV moves from \$19.4 million to \$-24.0 million.

⁸⁰ Exhibit B-1, page 3-23

⁸¹ Exhibit B-3, BCUC 1.12.7

⁸² Exhibit B-3, BCUC 1.12.7

Revised Table 3-6:

Scenarios	NPV of Discounted Cash Flows (\$ million)	
	0.5 per cent scenario	3.0 per cent scenario
Expected Costs / Monetized Benefits	(5.8)	113.2
Authorized Costs / Monetized Benefits	(15.7)	103.3
Expected Costs / Expected Benefits	54.9	173.8
Authorized Costs / Expected Benefits	45.0	163.9

Revised Table 3-7:

Scenarios	NPV of Revenue Requirement (\$ million) (Increase) / Decrease in Revenue Requirements	
	0.5 per cent scenario	3.0 per cent scenario
Expected Costs / Monetized Benefits	(14.7)	93.6
Authorized Costs / Monetized Benefits	(24.0)	84.4

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190. The CEC submits that the Commission should provide significant weight to these negative realities of the business case assessment.
191. The CEC submits that the PwC and BC Hydro calculations increasing the benefits of Capability Gap 2 by \$10.3 million should be given very little weight by the Commission.
192. The CEC recommends that the Commission find that BC Hydro's Expected Costs are in the order of \$71.3 million⁸⁴ and the monetized benefits should be reduced by at least \$10.3 million to the order of \$12.7 million.⁸⁵
193. The CEC recommends that the Commission find that there is likely a negative NPV of \$5.8 million⁸⁶.
194. The CEC recommends that the Commission find that a risk scenario that costs will either escalate and/or that benefits are not realistic could lead, with a significant probability, to a negative NPV of \$15.7 million.

VII. SCOPE UPDATE REPORT

195. The Verification report was required to identify and describe any material scope changes compared to the SCA Project scope described in section 4.3 of the Application.
196. BC Hydro identified four minor scope changes in the Verification Report.

⁸³ Exhibit B-3, BCUC 1.12.7

⁸⁴ Exhibit B-1, page 2-8

⁸⁵ \$23 million less \$10.3 million

⁸⁶ Exhibit B-3, BCUC 1.12.7

197. These included:
- Unifier Interface
 - Cross-application timesheet function for contingent labour resources
 - Graphic work design project and
 - dynamic discounting.⁸⁷
198. The minor change in scope that removed the SAP to Unifier interface resulted in a reduction of \$0.3 million in the Expected Cost, but did not change the Authorized Cost because \$0.3 million reserve was included in the Authorized Cost due to the risk that the interface may still be required.
199. The other three minor scope changes had no impact on project costs.⁸⁸
200. The CEC has reviewed the evidence with respect to the Scope Update and has no comments on these changes because they do not materially affect the assessment of the business case.

VIII. RISK UPDATE REPORT

201. BC Hydro's Verification report must include a:
- a) A summary description of any material Project risks that were not identified in the Application but were identified during the Definition Phase, including an assessment of the impact of each risk, the proposed risk mitigation strategy, and to the extent known, the financial and schedule impacts if the risk is realized; and
 - b) An updated project Risk Register as at the end of the Definition Phase, highlighting the status of identified risks, changes in risks, the actions that BC Hydro is taking or planning to deal with the risks, and the likely impact on the Projects' schedule and cost.
202. BC Hydro's Project Risk is reviewed in Section 5 of the application and the Risk Register is provided in Appendix P of the application.
203. Key Risks are summarized as follows:

⁸⁷ Exhibit B-4, BCOAPO 1.5.1

⁸⁸ Exhibit B-4, BCOAPO 1.5.1

Key Risks	Risk Status	Risk and Response Summary
Project Delivery Risk – poor quality by the System Integrator	In progress	Updated quality procedures based on lessons learned during Design Stage
Project Delivery Risk – poor project management	In progress	Replaced PwC Project Manager and revised project management procedures based on lessons learned Use of External Quality Assurance Advisor (KPMG)
Business Risk – scale of business process changes	In progress / planned	Detailed change management plans Transition plans to reduce business impact Extended stabilization and onboarding period
Project Delivery Risk – low data quality / availability	Planned	Detailed planning in early Implementation to mitigate

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204. The CEC has reviewed the evidence and is not satisfied with the risk assessment and mitigation strategies as provided.
205. The CEC is of the view that the greatest risk to the Project is not in the execution of the Project, but in the capture and proper attribution of benefits and hence the value of the Project overall, which the CEC considers to be poorly justified on a cost/benefit basis.

IX. PROJECT SCHEDULE UPDATE REPORT

206. BC Hydro's Verification report must provide an updated Project schedule, identifying and detailing any significant changes (i.e. greater than 4 months) compared to the Project schedule described in section 4.7 and Appendix M of the original Application.
207. The planned completion date for the Project is now March 2021, which is approximately 8 months longer than originally anticipated. This is partly as a result of a delay in Phase 1 activities which took 11 months instead of 8 months originally anticipated, plus a lag in commencement due to wait times for Commission approval. Additionally, there is a 2-3 month increase in the time expected to complete implementation activities.⁹⁰
208. BC Hydro provides the following updated Milestones and Activities table.

⁸⁹ Exhibit B-1, Appendix E Board Briefing page 5 of 12

⁹⁰ Exhibit B-1, Section 6

Table 6-2 Supply Chain Applications Project Key Milestones and Activities

Stage	Phase One Key Milestones and Activities	Verification Report Key Milestones and Activities
Board of Directors approval of Implementation Phase funding	N/A	September 2018
BC Hydro files Phase Two Verification Report	March 2018	October 2018
British Columbia Utilities Commission Phase Two Decision Issued	April 2018	TBD
BC Hydro releases Implementation Phase work to System Integrator and Quality Assurance Advisor	May 2018	October 2018
Implementation - Build Solution	May 2018 to March 2019	October 2018 to November 2019
Target In-Service Date	Late March 2019	November 2019
Committed In-Service Date	Late July 2019	March 2020
Implementation – Stabilization	August 2019 to November 2019	March 2020 to Mid July 2020
Implementation – Onboarding	December 2019 to July 2020	July 2020 to March 2021
Project Completion	End of July 2020	March 2021

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209. The CEC submits that the revised Project schedule is inadequate in that it does not include capture of benefits and distinguish proper attribution of benefits between IT system contribution to benefits and contract management contribution to benefits.

X. QUALITY ASSURANCE ADVISOR DESIGN REVIEW REPORT

210. BC Hydro was required to provide a copy of the Quality Assurance Advisor’s Design Review Report.⁹²

211. KPMG was selected as the SCA Project’s independent Quality Assurance Advisor.

212. BC Hydro provides selections from KPMG’s report at pages 4-13 to 4-15 in its Application, and the reports are attached as Appendices K1, K2 and K3. BC Hydro also points out several instances in which KPMG made recommendations that BC Hydro has implemented.⁹³ BC Hydro provides its responses in Appendices L1 and L2.

213. The CEC has reviewed the reports.

⁹¹ Exhibit B-1, page 6-4

⁹² BCUC Order and Decision G-158-17

⁹³ Exhibit B-1, page 4-15

214. The CEC submits that the KPMG reports cover a significant amount of assessment covering a broad range of activities.
215. The CEC believes that the report evaluation on benefits did not provide a significant or adequate assessment of the benefits assigned in Benefit ID #5 and particularly proper attribution of benefits.
216. The CEC submits that the BCUC should give a low weight to the KPMG report in verifying the benefits of Benefit ID #5.

XI. BC HYDRO BOARD APPROVAL FOR \$15 MILLION IN IMPLEMENTATION ACTIVITIES

217. The Board of Directors, in advance of a Commission Decision, approved the expenditure of an additional \$15 million for Implementation Activities above what had previously been approved for the SCA Project for Definition Phase Activities (\$26.1 million).⁹⁴ The total approved amount is now \$41.1 million of an expected Project cost estimate of \$71.3 million.⁹⁵ BC Hydro states that they did so to avoid a roughly 6-9 month delay in the SCA Project had it decided to pause work until a Decision had been made by the Commission.⁹⁶ The impact of such a delay is discussed by BC Hydro in CEC 1.3.9 series of Information Requests.
218. BC Hydro does not believe there is any impact on the Commission's decision-making ability with respect to the Application, based on BC Hydro's decision to commence implementation prior to the Commission issuing its decision. They point out that the Commission can accept the expenditure schedule, reject the expenditure schedule, or approve or reject a part of the expenditure schedule.⁹⁷
219. BC Hydro states that if the Project did not proceed, BC Hydro expects that the Commission would allow for the recovery of the Definition Phase costs approved by Order No G-158-17. Additionally, the Commission could determine if the Implementation Costs were prudently incurred if BC Hydro were to seek recovery of those expenditures. If BC Hydro were permitted to recover the costs, the costs would be to the account of the ratepayers. If BC Hydro were not permitted to recover the costs, the cost would be to the account of the taxpayer.⁹⁸ There is no risk to BC Hydro's Board of Directors.⁹⁹
220. The CEC recognizes that BC Hydro has the option of making such approvals.

⁹⁴ Exhibit B-1, page 1-8 and Exhibit B-4, BCOAPO 1.2.1

⁹⁵ Exhibit B-4, BCOAPO 1.2.1

⁹⁶ Exhibit B-4, CEC 1.3.7

⁹⁷ Exhibit B-4, CEC 1.3.2

⁹⁸ Exhibit B-4, CEC 1.3.3

⁹⁹ Exhibit B-4, CEC 1.3.4

221. However, the CEC submits that the additional approval of \$15 million for Implementation activities runs counter to the intent of the BCUC Order, which specifically did not approve expenditures in excess of that for the Definition Phase. Additionally, the CEC submits that the Commission provided a considered decision which would have appropriately considered the possibility of delay when determining that BC Hydro should provide significant reporting prior to receiving full Project approval.
222. The CEC submits that delay of a project without a positive cost benefit ratio is beneficial to ratepayers and potentially puts taxpayers at risk for a poorly and inadequately justified project.
223. The CEC is of the view that Director approval of an additional \$15 million can have the tendency to box the Commission into an affirmative decision by increasing the risk to ratepayers and/or taxpayers of denying the application. If the Commission were to deny the application, either ratepayers or ratepayers and taxpayers together would be on the hook for \$41.1 million (over half the cost of the Project), whereas they were only at risk for approximately \$26.1 million¹⁰⁰ under the Commission's Phase 1 determination. The CEC submits that this detracts significantly from the value of the two phase process, which was intended to ensure viability of the Project prior to further spending commitments.
224. The CEC submits that if utilities consistently make significant expenditure commitments in advance of Commission determinations, the decision-making value of the regulator could be seriously undermined.
225. The CEC is of the view that it is important that the Commission make its determinations based on the financial and other evidence before it related to the Project. The CEC is not supportive of approval for this Project because of the serious flaws in its justification and the significant probability that the Project is not cost-effective.
226. The CEC recommends that the Commission explicitly avoid considering or making determinations based on BC Hydro's advance approval of the additional \$15 million.

¹⁰⁰ Exhibit B-1, page 2-15 Phase 1 - Total Definition Phase Expected Cost Estimate Mid Range

XII. CONCLUSION

227. The CEC recommends that the Commission find that there is not sufficient justification to approve the Supply Chains Project at a cost of approximately \$70 million at this time given the inadequacy of the benefits justification provided and the significant probability of a negative NPV.

ALL OF WHICH IS RESPECTFULLY SUBMITTED

David Craig

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Consumers Association of British Columbia



Christopher P. Weafer, Counsel for the Commercial
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