



**ORDER NUMBER
G-78-19**

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

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

BEFORE:

R. I. Mason, Panel Chair
D. A. Cote, Commissioner
R. D. Revel, Commissioner

on April 9, 2019

ORDER

WHEREAS:

- A. On October 12, 2018, British Columbia Hydro and Power Authority (BC Hydro) filed its Supply Chain Applications Project (SCA Project) Phase Two verification report with the British Columbia Utilities Commission (BCUC) requesting acceptance of a cost range of \$38.5 million to \$45.4 million in Implementation Phase capital expenditures for the SCA Project, pursuant to section 44.2 of the *Utilities Commission Act* (UCA) (Phase Two Application);
- B. By decision and Order G-158-17 dated October 19, 2017, the BCUC accepted capital expenditures ranging from \$22.5 million to \$29.7 million required to complete work up to the end of the Definition Phase of the SCA Project (Phase One Decision). Order G-158-17 also directed BC Hydro to file, as soon as practicable, a Phase Two verification report at the end of the Definition Phase of the SCA Project;
- C. By Orders G-218-18, G-229-18 and G-28-19A, the BCUC established, among other things, a regulatory timetable for the review of the Phase Two Application, which included: intervener registration; submissions on further process; one round of information requests; and written final and reply arguments;
- D. On January 15, 2019, BC Hydro submitted errata to the Phase Two Application correcting errors in certain tables/figures and appendices that were identified during the course of responding to information requests; and
- E. The BCUC has reviewed the Phase Two Application and evidence filed in the proceeding and finds that the requested Implementation Phase capital expenditures for the SCA Project are in the public interest.

NOW THEREFORE pursuant to sections 44.2 of the UCA, and for the reasons attached as Appendix A to this order, the BCUC orders as follows:

1. Capital expenditures of \$38.5 million to \$45.4 million to complete the Implementation Phase of the SCA Project are accepted.
2. BC Hydro is directed to comply with all the reporting requirements and directives outlined in Section 4.0 of the reasons for decision attached as Appendix A to this order.

DATED at the City of Vancouver, in the Province of British Columbia, this *9th* day of April 2019.

BY ORDER

Original Signed By:

R. I. Mason
Commissioner

Attachment

British Columbia Hydro and Power Authority

Supply Chain Applications Project Phase Two Verification Report

Reasons for Decision

April 9, 2019

Before:

R. I. Mason, Panel Chair
D. A. Cote, Commissioner
R. D. Revel, Commissioner

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1.0 Background and Context

On October 12, 2018, the British Columbia Hydro and Power Authority (BC Hydro), which had carried out the planned definition phase (Definition Phase) activities of its Supply Chain Applications Project (SCA Project), filed its Phase Two verification report with the British Columbia Utilities Commission (BCUC) requesting acceptance of a cost range of \$38.5 million to \$45.4 million in implementation phase (Implementation Phase) capital expenditures for the SCA Project (Phase Two Application).

1.1 Supply Chain Applications Project

The SCA Project is BC Hydro's proposal to replace its existing PassPort supply chain information technology (IT) system with an SAP-based IT system and make improvements to BC Hydro's supply chain business processes for the acquisition of third-party materials and services.¹

BC Hydro stated that it expects the SCA Project will close 13 capability gaps identified in BC Hydro's current supply chain system and processes, enable BC Hydro to more efficiently and effectively manage its third-party materials and service acquisitions, meet current and future business needs, reduce risk, and provide benefits for supply chain activities used throughout BC Hydro.²

Following a public, multi-stage procurement process, BC Hydro selected PricewaterhouseCoopers (PwC) as the System Integrator to provide advisory and implementation services to help BC Hydro develop process and solution designs and implement the designed solution. BC Hydro also selected KPMG as the Quality Assurance (QA) Advisor to provide independent oversight and ongoing assessments of the governance structure, process and staffing and project status of the SCA Project.³

1.2 BCUC Prior Approval of Definition Phase Capital Expenditures in 2017

On December 21, 2016, pursuant to section 44.2 of the *Utilities Commission Act* (UCA), BC Hydro filed the Supply Chain Applications Project Application seeking acceptance of capital expenditures up to the end of the Definition Phase of the SCA Project (Phase One Application). In that application, BC Hydro proposed that the SCA Project be reviewed in a two-phase regulatory process, through which it applied for approval of capital expenditures associated with work up to the end of the Definition Phase, with acceptance sought for the remainder of the capital expenditures prior to the start of the SCA Project Implementation Phase. This approach to the project review was accepted by the BCUC by Order G-32-17 dated March 15, 2017.

After consideration of the Phase One Application and the evidence and submissions of the parties, the BCUC found that capital expenditures of \$22.5 million to \$29.7 million to complete work up to the end of the Definition Phase of the SCA Project were in the public interest. The schedule of expenditures was accordingly accepted in the BC Hydro Phase One Application decision and Order G-158-17 dated October 19, 2017 (Phase One Decision).

¹ Exhibit B-1, p. 1-1.

² Ibid., p. 1-1; British Columbia Hydro and Power Authority (BC Hydro) Supply Chain Applications Project Application (Phase One Application), Exhibit B-1, pp. 1-1–1-2, 2-8.

³ BC Hydro Phase One Application, Exhibit B-1, pp. 4-18–4-23.

The BCUC found that BC Hydro had provided sufficient justification of the need for the SCA Project, had reasonably examined the alternatives, and had completed sufficient work on the identification, analysis and valuation of project benefits to justify moving forward to complete the Definition Phase process.⁴ As the BCUC had previously determined that a two-phase approach to its review was warranted, the BCUC directed BC Hydro to file a Phase Two verification report at the end of the Definition Phase with updated information on the project costs, benefits, scope, risk and schedule, as well as the QA Advisor's Design Review Report, as outlined in Section 4.0 of that decision.⁵

1.3 Current Application and Approvals Sought

In the Phase Two Application, BC Hydro requests, pursuant to section 44.2 of the UCA, acceptance of between \$38.5 million and \$45.4 million in capital expenditures for the Implementation Phase of the SCA Project.⁶

BC Hydro also proposes the following SCA Project reporting for approval:

- Semi-annual progress reports filed with the BCUC on the SCA Project's scope, schedule, cost, benefits and risks, including a discussion of material variances, in the form and content consistent with other BC Hydro project-specific progress reports filed with the BCUC;⁷
- A Project Closure and Evaluation Report (PCER)⁸ to be filed with the BCUC three months after receiving Board of Director's approval of the PCER;⁹ and
- Reporting on the realization of project benefits in the PCER and in future revenue requirement applications (RRAs) until the SCA Project benefits have been fully realized.¹⁰

Subsequent to the filing of the Phase Two Application, on January 15, 2019, BC Hydro submitted errata to the Phase Two Application correcting errors in certain tables/figures and appendices which were identified during the course of responding to information requests (IRs). The errata had no impact on the Expected Cost, Authorized Cost, Expected Benefits or Monetized Benefits amounts discussed in the reasons for decision that follow.

1.4 Regulatory Process and Participants

By Orders G-218-18, G-229-18 and G-28-19A, the BCUC established and subsequently amended a regulatory timetable with a written public hearing process for the review of the Phase Two Application, which included: intervener registration; submissions on further process; one round of IRs to BC Hydro; and written final and reply arguments from interveners and BC Hydro.

Order G-229-18 also established the scope of this proceeding, as set out in Appendix B to that order.

⁴ BC Hydro Phase One Decision, p. 40.

⁵ Ibid., Section 4.0, pp. 42–43.

⁶ Exhibit B-1, p. 1-1.

⁷ Ibid., p. 1-13.

⁸ Also called the "final completion report."

⁹ Exhibit B-1, pp. 1-13–1-14.

¹⁰ Exhibit B-3, BCUC IR 1.1.2.

The following two interveners registered and actively participated in the proceeding:

- Commercial Energy Consumers Association of British Columbia (the CEC); and
- British Columbia Old Age Pensioners' Organization et al. (BCOAPO).

2.0 Review of the Proposed Implementation Phase Capital Expenditures

In its Phase Two Application, BC Hydro provides updated information on the SCA Project costs, benefits, scope, risk and schedule, as well as the QA Advisor's Design Review Report.

In reviewing the Phase Two Application, the Panel has considered this evidence and makes the following findings and directives with respect to the Phase Two Application for the capital expenditures for the Implementation Phase of the SCA Project.

2.1 Scope Update Report

Evidence

BC Hydro submits that there have been "no material changes" to the scope of the SCA Project compared to the Phase One Application.¹¹ It identifies four items removed from the project scope: using SAP to procure and manage contract staff; building an interface between SAP and Oracle Primavera Unifier; consideration of a possible Graphic Work Design Project; and consideration of dynamic discounting.¹²

During the IR process, BC Hydro discussed the impact of each of the four scope changes on the SCA Project's cost, benefit, schedule and risk; stating no significant impacts were identified. BC Hydro provided further clarification on the SCA Project benefits, stating that "none of the changes in benefits between the Phase One Application and the [Phase Two Application] are as a result of these four minor scope changes."¹³ BC Hydro submits that the minor changes to scope have no material impact on the cost, benefit, schedule or risk and are inconsequential to the SCA Project.¹⁴

BC Hydro reports that although the interface between SAP and Oracle Primavera Unifier has been removed from the SCA Project scope, there is a concern that given the size and complexity of the Site C construction contracts, the lack of an interface might result in an unmanageable amount of manual effort for the Site C Project's contract managers. As a result, BC Hydro has included \$0.3 million in the SCA Project reserve to implement the interface in the event that it is later deemed necessary to support specific Site C processes.¹⁵

¹¹ Exhibit B-1, p. 4-1.

¹² Ibid., pp. 4-7-4-8.

¹³ Exhibit B-3, BCUC IR 19.1.6.

¹⁴ BC Hydro Final Argument, p. 7.

¹⁵ Exhibit B-1, p. 4-4; Exhibit B-3, BCUC IR 19.4.

Position of the Parties

BC Hydro argues that the scope of the project has not changed materially and continues to meet BC Hydro's business needs.¹⁶

The CEC and BCOAPO take no issue with the scope changes proposed by BC Hydro.¹⁷

Panel Determination

The Panel finds that the updated scope of the SCA Project is reasonable and continues to meet the needs identified for the project in the Phase One Application.

The Panel agrees with BC Hydro that the scope of the SCA Project has not changed materially, as the scope changes have had no material effect on the SCA Project cost or benefits, and notes that no intervenor has objected to the proposed updates to the scope. Further, BC Hydro has made financial allowance in the SCA Project reserve for the possibility that the interface between SAP and Oracle Primavera Unifier may need to be added back into the SCA Project's scope at a later date.

2.2 Risk Update Report

Evidence

In the Phase One Decision, BC Hydro was directed to provide: an updated project Risk Register at the end of the Definition Phase, highlighting the status of identified risks, changes in risks, BC Hydro's actions or proposed actions to address the risks, and the likely impact of the risks on the SCA Project's schedule and cost.¹⁸

In Table 5-1 in the Phase Two Application, BC Hydro provides the Risk Register as directed, which summarizes the remaining risks related to the project. The table includes updates to the risk assessment from the Definition Phase as well as an assessment of those identified in the Implementation Phase. For each risk, BC Hydro provides its updated mitigation plan and assessment, the status of the mitigation at the time of filing and the probability and impact of the risk event.¹⁹

BC Hydro notes that some risks are no longer a concern because the Definition Phase of the SCA Project is complete. As directed, BC Hydro further identified and added one new risk: the possibility that the existing supply chain data to be converted to the new system is of poor quality or is not ready in accordance with the project schedule. This risk is considered to be of medium probability and medium impact and BC Hydro's mitigation strategy is evolving as the project advances.²⁰

¹⁶ BC Hydro Final Argument, p. 4.

¹⁷ CEC Final Argument, p. 31; BCOAPO Final Argument, p. 4.

¹⁸ BC Hydro Supply Chain Phase One Decision, p. 43.

¹⁹ Exhibit B-1, pp. 5-4–5-15.

²⁰ Exhibit B-1, pp. 5-2–5-3, 5-13.

Position of the Parties

The CEC is “not satisfied” with the risk assessment and mitigation strategies for the SCA Project, as the CEC considers the greatest project risk is in the capture and attribution of benefits.²¹

BCOAPO considers the SCA Project to be at no greater risk than at the time of the Phase One Application.²²

In its reply argument, BC Hydro submits that neither the CEC nor BCOAPO takes issue with the SCA Project’s risk assessment. Rather, the CEC’s comments “are aimed at” BC Hydro’s benefits analysis. Since the SCA Project is complete at the end of the implementation activities, BC Hydro argues it is not appropriate for the risk analysis to consider events or outcomes beyond the end of the Implementation Phase, such as risks related to the capture and attribution of benefits.²³

Panel Determination

The Panel finds that the updated project risk analysis and mitigation strategies proposed by BC Hydro for the SCA Project are reasonable.

An updated SCA Project risk register has been provided by BC Hydro, as ordered by the BCUC in the Phase One Decision, and no interveners have challenged the risk analysis to the extent that it relates to project-specific risks. The Panel agrees with BC Hydro that the concern expressed by the CEC regarding the risk to benefits capture and attribution relates to the benefits analysis, which is addressed by the Panel in the benefits in Section 2.6 below.

2.3 SCA Project Schedule Update Report

Evidence

BC Hydro submits that the SCA Project schedule now shows a planned completion date of March 2021, eight months later than the planned completion date of July 2020 stated in the Phase One Application. BC Hydro ascribes the difference to receiving the Phase One Decision later than planned, spending longer than planned to complete the Definition Phase of the SCA Project, and expecting to spend longer to complete the Implementation Phase.²⁴

Position of the Parties

The CEC submits that the updated project schedule submitted by BC Hydro is inadequate as it does not include the capture and attribution of SCA Project benefits.²⁵

BCOAPO provides no comment on the updated project schedule.

²¹ CEC Final Argument, p. 32.

²² BCOAPO Final Argument, p. 19.

²³ BC Hydro Reply Argument, pp. 19–20.

²⁴ Exhibit B-1, pp. 6-2–6-3.

²⁵ CEC Final Argument, p. 33.

In its reply argument, BC Hydro argues that neither the CEC nor BCOAPO have raised any issues with the SCA Project schedule, to the extent that it addresses activities to be completed prior to project completion. BC Hydro takes the position that the ongoing capture and attribution of benefits is properly addressed in the benefits tracking process and not in the SCA Project schedule.²⁶

Panel Determination

The Panel finds that the updated SCA Project schedule submitted by BC Hydro is reasonable.

The Panel agrees with BC Hydro that the activities related to the ongoing tracking of benefits are appropriately addressed in the benefits tracking and reporting process and not in the project schedule.

2.4 Quality Assurance (QA) Advisor Design Review Report

Evidence

BC Hydro submits that, prior to the Design Phase, its QA Advisor, KPMG, submitted an Interim Project Readiness Assessment report, containing recommendations for the SCA Project. In a subsequent Final Addendum, BC Hydro states KPMG concluded that “adequate progress” had been made to address these recommendations, and that BC Hydro was “in a strong position” to move forward to the Design Phase. KPMG also made recommendations concerning project governance, the project plan, resourcing and change management. BC Hydro states that it has “developed an action plan to address these recommendations.”²⁷

Thereafter, BC Hydro states at the end of the Design and Implementation Planning Phase, KPMG provided a Design Review Report assessing the completeness of the work done to date and BC Hydro’s readiness to proceed to the Implementation Phase. The overall assessment of the Design Review Report was as follows:

Based on this ‘Design Review Report,’ KPMG’s observation is that the SCA Project has completed activities and deliverables in accordance with the project plan for the Design Phase. The project is in an adequate position to move into the [Implementation Phase]. Select risk areas, as described in this report, should be considered and addressed before or during the [Implementation Phase] to further mitigate project risk.²⁸

²⁶ BC Hydro Reply Argument, pp. 19–20.

²⁷ Exhibit B-1, p. 4-13.

²⁸ Ibid., Appendix K-1, p. 10.

The Design Review Report goes on to state:

In summary, KPMG has observed the following:

- **Completion of Design Phase activities and deliverables** based on the acceptance criteria and project plan put forth at the beginning of the Design Phase.
- **Strong leadership engagement from across the business.** Supply Chain, Business, and IT leaders in the Steering Committee and Working Group have demonstrated alignment and commitment to the success of the SCA Project.
- **Evidence that the project governance framework was diligently** followed at the Project Team, Working Group, and Steering Committee levels.
- **Proactive consideration for change management** throughout the Design Phase across the project team.
- **Project management challenges** during the Design Phase. KPMG observed key missing elements from project management artifacts, and received feedback that the project plan was built with limited input from the Project Team. In some cases, team members indicated that the SI PMO was unresponsive to feedback. This led to additional sustained effort required by team members to meet project deadlines. Lessons learned have been incorporated moving into the Realization Phase.²⁹

With respect to benefits management, KPMG made the following recommendation:

KPMG encourages the program to continue to refine the quantification of the benefits and to develop the realization plan as early in the [Implementation Phase] as is practical.³⁰

Position of the Parties

The CEC submits that the Design Review Report covers a “significant amount of assessment covering a broad range of activities.” However, the CEC argues that the Design Review Report did not provide a significant or adequate assessment of the value of Benefit ID No. 5 (Benefit #5), and particularly the attribution of benefits.³¹

BCOAPO provided no comment on the Design Review Report.

In its reply argument, BC Hydro responds to the CEC by stating that the Design Review Report should provide “significant comfort” to the BCUC that the benefits assessment process was reasonable. BC Hydro argues that KPMG’s assessment of the benefits assessment process was detailed and specific, and a “clear endorsement of the process undertaken by PwC and BC Hydro.”³²

²⁹ Exhibit B-1, Appendix K-1, p. 5.

³⁰ Ibid., Appendix K-1, p. 8.

³¹ CEC Final Argument, p. 34.

³² BC Hydro Reply Argument, p. 10.

Panel Discussion

The Panel is satisfied with the Design Review Report provided by KPMG to BC Hydro and supports the use of an independent party to verify the process and outcomes of a complex undertaking such as the SCA Project. The evidence suggests that where KPMG has made recommendations, BC Hydro and PwC have responded appropriately, such that KPMG's overall assessment in the Design Review Report was that BC Hydro was in an "adequate position" to begin the Implementation Phase.

The Panel addresses the specific issue of benefits realization raised by the CEC in Section 2.6 of these reasons for decision.

2.5 Cost Update Report

Evidence

As of the end of August 2018, BC Hydro submits that the expected cost to complete the Definition Phase for the SCA Project is now \$25.4 million, comprising of \$24.0 million in actual recorded cost (including interest during construction [IDC]) at the time of the Phase Two Application and \$1.4 million in costs remaining to be spent.³³ The \$25.4 million is \$0.7 million less than the mid-range cost estimate and \$7.0 million less than the upper-bound cost estimate provided in the Phase One Application for expected Definition Phase costs.³⁴

During the Definition Phase, BC Hydro states that it spent \$1.5 million out of the forecasted \$2.3 million which was included in the contingency for the Definition Phase mid-range cost estimate in order to cover increases in the System Integrator's costs (\$0.8 million) and additional BC Hydro internal costs (\$0.7 million). These costs were due to extra design workshops and additional project benefits analysis, among other things.³⁵

BC Hydro further submits that the total expected cost of the SCA Project is now \$71.3 million (Expected Cost), which is \$5.4 million higher than the mid-range cost estimate of \$65.9 million from the Phase One Application. The upper end of the cost estimate is now \$79.3 million (Upper Bound Cost)³⁶, which remains the same as that in the Phase One Application.³⁷

The Expected Cost of \$71.3 million includes the SCA Project's actual recorded Definition Phase costs including IDC which were previously accepted by the BCUC in Order G-158-17 (\$24.0 million), the forecasted remaining balance of the Definition Phase costs (\$1.4 million) and the direct and indirect forecasted costs for the Implementation Phase (\$37.9 million and \$8.0 million, respectively). The capital cost component of the Expected Cost is \$61.1 million and the operating cost is \$10.2 million. These figures are presented in Table 2-7 of the Phase Two Application as shown below:³⁸

³³ Exhibit B-1, p. 2-4.

³⁴ Ibid., p. 2-7.

³⁵ Ibid., p. 2-5.

³⁶ BC Hydro uses the term "Authorized Cost" to represent the upper end of the cost estimate of the SCA Project which is approved by BC Hydro's Board of Directors. The Panel uses the term "Upper Bound Cost" to avoid confusion with the BCUC's approval.

³⁷ Exhibit B-1, pp. 2-8–2-16.

³⁸ Exhibit B-1, p. 2-16; Exhibit B-1-2, p. 2-15.

Table 2-7 Total SCA Project: 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)
R	Supply Chain Transformation Blueprint (Early Design Costs) (A from Table 2-2)	7.3	7.3	-	-	7.3	7.3	0.0
S	Identification (B from Table 2-2)	-	-	1.2	1.2	1.2	1.2	0.0
T	Definition (Early Definition as of November 2016) (C from Table 2-2)	3.0	3.0	0.1	0.1	3.1	3.1	0.0
U	Definition (Early Definition post November 2016) (D from Table 2-2)	1.0	0.7	0.3	0.0	1.2	0.7	-0.6
V	Definition (Mobilization, Design & Implementation Planning) (E from Table 2-2)	9.4	9.7	0.8	1.4	10.2	11.0	0.9
W	Total Life-to-Date Cost as of August 31, 2018 (R + S + T + U + V)	20.7	20.6	2.4	2.7	23.1	23.4	0.3
X	Direct Future Costs to End of Definition (G from Table 2-2)	-	1.3	-	0.1	-	1.4	1.4
Y	Contingency (% * Direct Future Costs to End of Definition) (H from Table 2-2)	2.1	0.0	0.2	0.0	2.3	0.0	-2.3
Z	Interest During Construction (Definition Phase) (I from Table 2-2)	0.8	0.7	-	-	0.8	0.7	-0.1
AA	Total Definition Phase Expected (Mid-range) Cost Estimate (W + X + Y + Z)	23.5	22.6	2.6	2.8	26.1	25.4	-0.7
AB	Implementation (Costs to Go Live)	22.9	25.9	2.2	4.9	25.1	30.7	5.6
AC	Implementation (Stabilization & Completion)	4.9	5.6	1.2	1.6	6.1	7.2	1.1
AD	Contingency (% * Direct Future Costs)	5.6	4.7	0.7	1.0	6.3	5.7	-0.6
AE	Interest During Construction	2.2	2.3	-	-	2.2	2.3	0.1
AF	Total Expected (Mid-range) Cost Estimate (AA + AB + AC + AD + AE)	59.2	61.1	6.7	10.2	65.9	71.3	5.4
AG	Project Reserve - Reserve For Known Risks (from P in Table 2-5)	5.2	1.3	0.0	0.0	5.2	1.3	-3.9
AH	Project Reserve - Incremental Contingency (from Q in Table 2-5) (Table 2-4)	6.9	5.4	0.8	1.1	7.7	6.5	-1.2
AI	Incremental Interest During Construction on project reserve	5.20.5	4.30.2	0.0	0.0	5.20.5	4.30.2	-3.90.3
AJ	Total Project Reserve (AG + AH + AI)	12.6	6.9	0.8	1.1	13.4	8.0	-5.4
AK	Total Authorized Cost Estimate (AF + AJ)	71.8	68.0	7.5	11.3	79.3	79.3	0.1

Notes:

1. Minor differences attributable to rounding.
2. Contingency in Phase One Application was 20 per cent of Direct Future Costs of \$42.7 million. Contingency in the Verification Report is 15 per cent of Direct Future Costs of \$37.9 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.

BC Hydro states that the direct cost forecast for the Implementation Phase of \$37.9 million (\$31.5 million capital and \$6.4 million operating) was computed using a “bottom up” approach based on the fixed-price contract between BC Hydro and the System Integrator, the contract between BC Hydro and the QA Advisor, and an estimate of the cost of BC Hydro’s resources.³⁹ The direct cost forecast for the Implementation Phase is \$6.6 million higher than the estimate of \$31.3 million which was provided in the Phase One Application. This was due to an “overall increase in the complexity and understanding of the solution,” leading to an extension of the project schedule and an increase in the estimated staffing levels required to complete the work.⁴⁰

The indirect cost forecast for the Implementation Phase of \$8.0 million consists of a contingency of \$5.7 million for unidentified cost items and \$2.3 million for IDC. The contingency is calculated as 15 percent of the direct cost forecast for the Implementation Phase and is consistent with BC Hydro’s standard contingency rate for IT projects advancing to an implementation phase. In the Phase One Application, the contingency was calculated using a rate of 20 percent. BC Hydro explains that the reduction in the contingency rate from the Phase One

³⁹ Exhibit B-1, p. 2-9.

⁴⁰ Ibid., p. 2-9.

Application amount of 20 percent to 15 percent is due to a better definition of scope at this stage of the SCA Project which results in an expected lower variation in project costs. The forecast IDC is also lower than that submitted in the Phase One Application (which was \$3 million) due to lower actual and forecast weighted average cost of debt rates for fiscal 2016 to fiscal 2022 as shown in the following table:

Table 1 – IDC Rates from Fiscal 2016 to Fiscal 2022⁴¹

A	B	C
Fiscal Year	Phase One Interest Rates (%)	Verification Report Interest Rates (%)
2016	4.1	4.05
2017	4.05	4.05
2018	4.12	4.05
2019	4.23	4
2020	4.41	3.86
2021		3.83
2022		3.61

BC Hydro submits that the Expected Cost of \$71.3 million has been assigned an accuracy range of +15 percent / -10 percent, which is the same estimating accuracy range as an AACEI Class 3 estimate and is “analogous to a P50 estimate.”⁴²

As noted above, BC Hydro states that the Upper Bound Cost is now \$79.3 million. The Upper Bound Cost is the sum of the Expected Cost and a project reserve of \$8.0 million (SCA Project Reserve). BC Hydro states that the SCA Project Reserve consists of: (i) \$1.3 million for two discrete known risks (SCA Project Reserve for Discrete Known Risks); namely the risk that the project cannot be completed using offshore staff and that an additional interface (between Unifier and SAP) may be needed; (ii) \$6.5 million contingency for unknown risks (SCA Project Reserve Contingency); and (iii) \$0.2 million for incremental IDC on the SCA Project Reserve. Of these amounts, the SCA Project Reserve Contingency is calculated as 15 percent of the \$37.9 million in forecast direct costs for the Implementation Phase plus 15 percent of the \$5.7 million contingency in forecast indirect costs included in the Expected Cost.⁴³

The table below shows that contingencies and reserves comprise a total of 35.6 percent of the direct cost forecast for the Implementation Phase:

⁴¹ Exhibit B-1, pp. 2-10–2-11; Exhibit B-1-2, p. 2-15; Exhibit B-3, BCUC IR 6.1.

⁴² Exhibit B-1, pp. 2-11–2-12; In response to CEC IR 2.2, BC Hydro stated that its estimating practice defines a P50 cost estimate as the cost estimate that will not be exceeded 50 percent of the time.

⁴³ Ibid., pp. 2-12–2-14.

Table 2 – Total Project Contingencies and Reserves

Ref (Table 2-7)	Cost Component	Total Cost
AD	Contingency	\$5.7 million
AH	SCA Project Reserve Contingency	\$6.5 million
AG	SCA Project Reserve for Discrete Known Risks	\$1.3 million
AD + AH + AG	Total SCA Project Contingencies and Reserves	\$13.5 million
AB + AC	Direct Cost Forecast for the Implementation Phase	\$37.9 million
(AD + AH + AG) / (AB + AC)	% Total Contingencies and Reserves	35.6 percent

In addition to the Implementation Phase costs, BC Hydro estimates that the SCA Project will incur incremental annual operating and capital costs of between \$2.3 million and \$3.4 million (Ongoing Costs). These Ongoing Costs are not included in the applied-for capital amounts in the Phase Two Application. However, they are incorporated in the calculation of the net present value (NPV) of discounted cash flows and revenue requirements.⁴⁴

Position of the Parties

BC Hydro submits that the SCA Project costs are on track, that the revised cost range is robust and reasonable, and that the cost estimate has not changed materially since the Phase One Application.⁴⁵

The CEC submits that the evidence supports a total cost range of \$71.3 million to \$79.3 million, and recommends that the BCUC use these figures when analysing the SCA Project.⁴⁶ BCOAPO has no issues with BC Hydro's Upper Bound Cost for the SCA Project.⁴⁷

Panel Determination

The Panel is aware that BC Hydro is not seeking acceptance of any operating costs in the Phase Two Application, but has considered all costs related to the SCA Project because, consistent with the Phase One Decision, the operating cost portion of the project is relevant to the Panel's determinations regarding the overall value of the SCA Project.

The Panel is satisfied with BC Hydro's "bottom-up" estimating approach, whereby direct forecast cost items are identified individually, and a contingency is added for unidentified items. The Panel also notes that the cost of the Systems Integrator has been fixed, which reduces the risk of cost over-runs.

⁴⁴ Exhibit B-1, p. 2-17.

⁴⁵ BC Hydro Final Argument, p. 19.

⁴⁶ CEC Final Argument, p. 12.

⁴⁷ BCOAPO Final Argument, p. 8.

The Panel finds that a contingency of 15 percent of direct forecast costs included in the total Expected Cost is reasonable because the scope of the project is better known at the end of the Definition Phase. **The Panel also finds that the IDC is reasonable** because it is calculated based on the current actual and forecast interest rates.

The Upper Bound Cost includes total project contingencies and reserves of \$13.5 million, or 35.6 percent of the \$37.9 forecast direct costs for the Implementation Phase. This figure includes the SCA Project Reserve (\$7.8 million, excluding IDC) in addition to the project contingency of \$5.7 million. The Panel considers that this is an excessive amount of contingency for a project which has completed its definition phase, which should have allowed for a more precise estimate of actual costs. However, since the SCA Project Reserve may only be accessed with the financial authority of the president of BC Hydro and the company's board of directors, the Panel is satisfied that the \$8.0 million in the SCA Project Reserve will only be spent if absolutely necessary to complete the project and the realization of its benefits.

For these reasons, **the Panel finds that the range of estimated costs for the SCA Project is \$71.3 million to \$79.3 million.**

2.6 Benefits Update Report

Evidence

BC Hydro states that it has updated its analysis of the benefits resulting from the SCA Project by working collaboratively with PwC, BC Hydro's chosen Systems Integrator. The objectives of the update were to validate the quantified and non-quantified benefits based on the SCA Project's design work, to assess the attainability of the benefits based on the experiences of industry peers, and to provide documentation for the tracking and analysis of future benefits.⁴⁸

As in the Phase One Application, the benefits of the SCA Project are categorized as cost-reduction, effort-reduction and risk-reduction benefits. BC Hydro has not quantified any of the risk-reduction benefits but notes that they may address certain safety, reliability, financial and reputational risks.⁴⁹

Since the Phase One Application, BC Hydro has increased its estimate of the benefits it can both quantify and realize (Expected Benefits) from a mid-range estimate of \$26.2 million per year to \$34.8 million annually. In the Phase One Application, the quantifiable benefits were discounted by 50 percent in the base case to account for the degree to which the benefits might be realized in practice (the realization ratio).⁵⁰ In the Phase Two Application, BC Hydro states that it has applied a discrete realization ratio for each benefit, yielding a weighted average realization ratio of 54 percent.⁵¹

⁴⁸ Exhibit B-1, p. 3-4.

⁴⁹ Ibid., p. 3-6.

⁵⁰ BC Hydro Phase One Decision, pp. 28, 30. In the Phase One Application, the base case was defined as the mid-range benefit and mid-range cost estimate scenario.

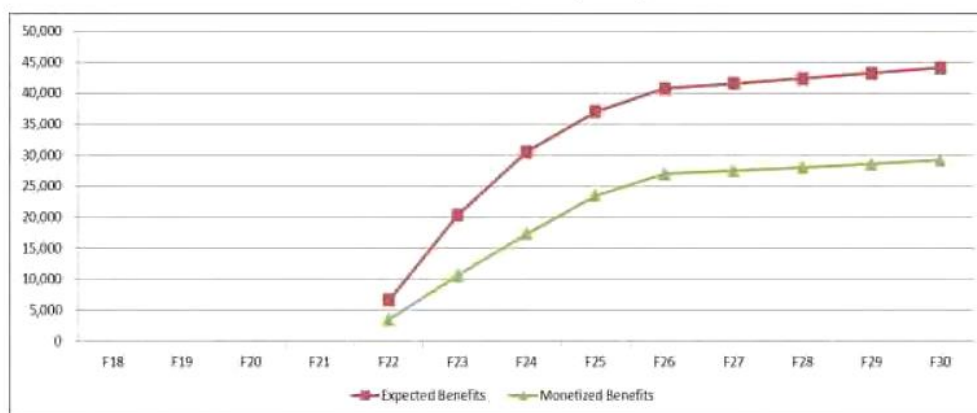
⁵¹ Exhibit B-1, p. 3-8.

In the Phase Two Application, BC Hydro has added a further refinement to its benefits estimation approach and reduced the Expected Benefits to account for the degree to which benefits may actually be monetized. BC Hydro explains that “effort reductions in short time increments distributed across large working groups” have not been monetized, even though they can be quantified and have value. Overall, BC Hydro estimates that it can monetize approximately 18 percent of the Expected Benefits related to effort reduction, and 100 percent of the Expected Benefits related to cost reduction. Of the \$34.8 million in Expected Benefits from the SCA Project, BC Hydro estimates it can monetize \$23.0 million per year (Monetized Benefits).⁵²

To calculate the NPV of the Monetized Benefits, BC Hydro assumes the benefits will not all be achieved immediately, but rather will “ramp up” over several years, stabilizing by the fiscal year ending 2026. Specifically, BC Hydro assumes that cost-reduction benefits will ramp up over five years and effort-reduction benefits will ramp up over three years.⁵³

Further, BC Hydro assumes that the value of the benefits will grow at 2 percent per annum in line with BC Hydro’s forecast for inflation. The ramp up of Monetized Benefits is shown in the following graph in Figure 3-1 of the Phase Two Application:⁵⁴

Figure 3-1 Ramp Up of Expected and Monetized Benefits Cash Flow (\$ '000)



BC Hydro has also assumed that the benefits will cease at the end of the ten-year accounting life of the IT asset, but that it is reasonable to expect the software will continue to be in use beyond the ten-year period.⁵⁵

Of all the changes to the Expected Benefits between the Phase One Application and the Phase Two Application, the changes to Benefit #5 are the most significant and have raised the greatest concern to interveners. The Panel will now evaluate the reasonableness of Benefit #5 in the context of overall benefit analysis because of its high significance in justifying the expenditures for the Implementation Phase.

⁵² Exhibit B-1, pp. 3-13–3-15.

⁵³ Ibid., p. 3-9.

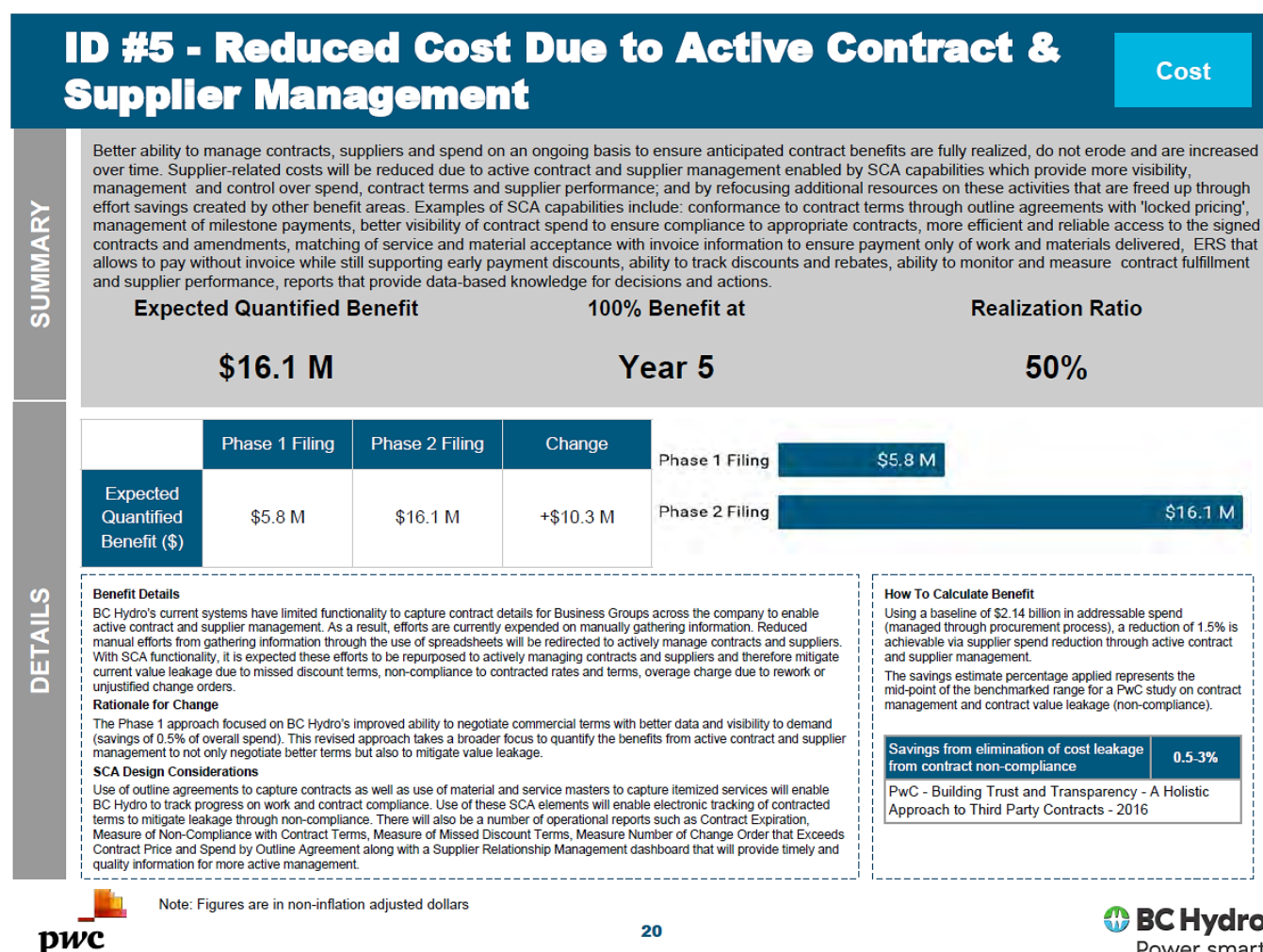
⁵⁴ Ibid., p. 3-19.

⁵⁵ Ibid., pp. 3-18–3-19.

2.6.1 Evaluation of Benefit #5

BC Hydro explains that the increase of \$10.3 million in the estimated value of Benefit #5 since the Phase One Application is due to the “increased ability to better manage contracts and suppliers to ensure anticipated contract benefits are fully realized, do not erode, and are increased over time.” In contrast, in the Phase One Application the value of Benefit #5 included only the “improved ability to negotiate commercial terms with better data and visibility to demand.”⁵⁶

The following definition and an estimate of the value of Benefit #5 are provided in the description below:⁵⁷



⁵⁶ Exhibit B-1, p. 3-11.

⁵⁷ Ibid., Appendix H, p. 20.

BC Hydro provided the PwC report⁵⁸ used as the basis for the estimated value of Benefit #5 (PwC Report) in its response to a CEC IR.⁵⁹ BC Hydro states that the PwC Report provides a benchmarked range of cost savings of between 0.5 percent and 3 percent of spending from the elimination of cost leakage from contract non-compliance.⁶⁰ BC Hydro added that, subsequent to the publication of the PwC Report in 2016, PwC reports:

...recent 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.⁶¹

BC Hydro submits evidence from KPMG, the QA Advisor for the SCA Project, regarding KPMG's assessment of the benefits analysis process. KPMG makes the following observations and comments:

Based on KPMG's observation, the SCA Project followed a suitable approach for identifying and validating benefits. During Design, the SCA Project team engaged an SI team separate from the core SI project delivery team (i.e. the Benefit Assessment Team) to assess and validate the benefits.⁶²

BC Hydro adds that KPMG made the following detailed observations about the benefits analysis:

KPMG observed that the project followed two approaches for updating and validating monetized benefits.

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.⁶³

⁵⁸ Called PwC Building Trust and Transparency - A Holistic Approach to Third Party Contracts 2016.

⁵⁹ Exhibit B-4, CEC IR 23.1, Attachment 1.

⁶⁰ Exhibit B-1, p. 3-11.

⁶¹ Exhibit B-3, BCUC IR 12.5.

⁶² Exhibit B-1, Appendix K-1, p. 31.

⁶³ Ibid.

Position of the Parties

BC Hydro argues that the update to the benefits analysis for the SCA Project increases the credibility of the estimates and that the benefits continue to be significant.⁶⁴

The CEC submits that the evidence does not provide sufficient foundation to approve the SCA Project “because of the weakness in the financial justification”. Specifically, the CEC points to the estimated value of Benefit #5, which it submits is “inflated by nearly 200%” since the Phase One Application and is “unsupported by the evidence.” In the absence of the increased value of Benefit #5, the CEC argues that the NPV of the SCA Project, assuming the Expected Costs and Monetized Benefits, would be negative \$5.8 million.⁶⁵

The CEC observes that the value of Benefit #5 in the Phase Two Application is now \$16.1 million per year, 70 percent of the recomputed Monetized Benefit of \$23.0 million per year, compared to an estimate of \$5.8 million per year in the Phase One Application.⁶⁶ The CEC does not believe the evidence to be compelling that the cost reduction savings included in Benefit #5 are available, nor that they are “directly attributable to the [SCA] Project, or even a portion of the [SCA] Project.” Rather, the CEC considers that the benefits of both active contract and supplier management and reducing contract non-compliance are available to BC Hydro without investing in the SCA Project.⁶⁷

The CEC expresses concern about PwC’s “significant financial and reputational interest in the continuance of the Project,” and submits that the BCUC could “reasonably find the [PwC benefits analysis] report upwardly biased by a significant conflict of interest.”⁶⁸

The CEC further submits that the PwC Report does not provide an adequate foundation for the acceptance of the value of Benefit #5.⁶⁹ In the view of the CEC, the PwC Report is vague, cannot be verified, has no relationship to BC Hydro and does not relate savings to an IT project. To quote the CEC:

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.⁷⁰

The CEC also argues that the benefits attributed by BC Hydro to the SCA Project are not clearly identified as to whether they could be achieved by other means and at a lower cost. The CEC repeats its concern from the Phase One Application proceeding that it “does not find the evidence supporting many of the expected benefits to be of good quality.”⁷¹

⁶⁴ BC Hydro Final Argument, p. 20.

⁶⁵ Ibid., p. 1; The CEC actually says “Expected Benefits and Monetized Costs,” however the CEC’s reference to IR 1.12.7 clearly indicates that the CEC meant to say “Expected Costs and Monetized Benefits.”

⁶⁶ CEC Final Argument, p. 19.

⁶⁷ Ibid., p. 20.

⁶⁸ Ibid., pp. 1–2.

⁶⁹ Ibid., p. 22.

⁷⁰ Ibid.

⁷¹ Ibid., p. 2.

The CEC considers that “there is no significant comfort to be gained from the generic nature of the comments” in the KPMG evaluation of the benefits analysis process.⁷²

In summary, the CEC believes the evidence on record is insufficient for the BCUC to find that the SCA Project is in the public interest:

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.⁷³

BCOAPO generally takes no issue with BC Hydro’s update to the benefits analysis. With respect to Benefit #5, BCOAPO considers that the calculation is reasonable when considering the 50 percent realization ratio that has been applied.⁷⁴

BC Hydro replies that its assessment of the value of Benefit #5 is “reasonable, supported by the expertise and experience of PwC, and endorsed by the QA Advisor, KPMG.”⁷⁵

Furthermore, BC Hydro responds to the CEC’s claim that the benefits could be achieved by other means by noting:

There is no evidence to support the CEC’s assertion that a new supply chain system is not required for BC Hydro to achieve the benefits of [Benefit #5], or that the benefits ‘should be largely achievable with various policy changes accompanied by dedicated staff members and supporting process at significantly lower cost that [sic] the proposed IT system.’ The CEC’s assertions are contradicted by the evidence on the record from both BC Hydro and PwC personnel who have specific expertise in supply chain management.⁷⁶

The value of Benefit #5 has not been “inflated,” according to BC Hydro, but rather the scope of the benefit has increased to include active management of contract non-compliance as well as negotiating lower contract prices.⁷⁷

While BC Hydro admits that the PwC Report is generic, BC Hydro further submits that many of the organizations to which the report relates were “comparable in size, scale and technological maturity” to BC Hydro.⁷⁸ BC Hydro adds that PwC also tested and corroborated the value of Benefit #5 by reference to “other available market intelligence and PwC’s experience at industry peers.”⁷⁹ Further, BC Hydro reports that PwC considers the

⁷² CEC Final Argument, p. 16.

⁷³ Ibid., p. 3.

⁷⁴ BCOAPO Final Argument, p. 13.

⁷⁵ BC Hydro Reply Argument, p. 2.

⁷⁶ Ibid., p. 12.

⁷⁷ Ibid., p. 3.

⁷⁸ Ibid., p. 7.

⁷⁹ Ibid., p. 8.

potential for success in achieving the value of Benefit #5 to be higher due to BC Hydro's high service-to-goods ratio, a wide variety of products, services and vendors, and lower supply chain technological maturity.⁸⁰

BC Hydro disagrees with the CEC that the value of Benefit #5 is upwardly biased by any conflict of interest on the part of PwC. It notes that PwC's analysis has led to decreases in the estimated value of some benefits as well as increases, and most notably it was based on PwC's advice that BC Hydro reduce the value of the effort-related benefits to account for the lack of ability to monetize them.⁸¹

BC Hydro also notes that KPMG's Design Review Report should provide "significant comfort" to the BCUC that the benefits assessment process was reasonable.⁸² Quoting from KPMG's Design Review Report, BC Hydro submits:

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.⁸³

Thus, BC Hydro argues that both the benefits and the process by which they were validated "have been confirmed by two reputable firms that have experience in implementing similar projects."⁸⁴

BC Hydro submits that the SCA Project is required for it to manage contracts more actively, by providing "more visibility, management and control over spend, contract terms and supplier performance."⁸⁵ BC Hydro adds that the SCA Project consists of new business processes, as well as a new IT system, and that it is the combination of the two which will bring the required benefits to their supply chain.⁸⁶

Panel Determination

The Panel acknowledges that it can be challenging to estimate the future benefits of investments and to attribute those benefits definitively to the investment under consideration. The question for the Panel is whether the efforts made by BC Hydro to estimate the benefits of the SCA Project and the range of likely benefits that might be achieved, are reasonable.

⁸⁰ BC Hydro Reply Argument, pp. 8–9.

⁸¹ Ibid., pp. 16–17.

⁸² Ibid., p. 10.

⁸³ Ibid., pp. 11–12.

⁸⁴ Ibid., p. 12.

⁸⁵ Ibid., p. 6.

⁸⁶ Ibid., p. 13.

For the following reasons, **the Panel finds that the Monetized Benefits estimated by BC Hydro are reasonable, and represent the most appropriate estimate of future benefits with which to assess the financial worthiness of the SCA Project.**

The CEC has raised the issue of whether the advice from PwC with regards to the estimated value of future benefits is potentially biased. The Panel agrees that the Systems Integrator for the project, PwC, does have a financial interest in the continuance of the SCA Project as outlined by the CEC. However, in our view, PwC staff assigned to the project have in-depth knowledge of the benefits that could be attained by BC Hydro, and thus it is appropriate that they contribute this knowledge to the benefits analysis. BC Hydro also sought out the knowledge of other PwC staff, who have familiarity with improvements to other utilities' supply chains. BC Hydro might have avoided any appearance of potential conflict of interest had it chosen to seek its advice from a supplier other than PwC. However, BC Hydro ensured that KPMG, its QA Advisor, was satisfied with PwC's benefits analysis process and outcomes. Further, PwC's advice to BC Hydro to reduce the value of the Expected Benefits to account for difficulties in monetizing them satisfies the Panel that, whatever the possible conflicts of interest, there was no systemic upwards bias in PwC's contribution to the benefits analysis. For these reasons, the Panel is satisfied BC Hydro's process for estimating the benefits of the SCA Project is reasonable.

That said, the Panel does share some of the CEC's concerns regarding the reliability of the estimated value of Benefit #5. BC Hydro has explained that the scope of Benefit #5 has expanded since the Phase One Application to include the benefits of ongoing management of contractual compliance. The Panel accepts this and acknowledges that the value of Benefit #5 is likely to increase. However, we note that the \$16.1 million estimated value of Benefit #5 is now 70 percent of the \$23.0 million total Monetized Benefits. Therefore, any material shortfall in the realized value of Benefit #5 would accordingly reduce the financial benefits of the SCA Project. Both the Phase One Application estimate of the value of Benefit #5, based on a reduction of 0.5 percent of BC Hydro's total spending, and the calculation in the Phase Two Application using a reduction of 1.5 percent of spending, are based on professional judgement and comparisons with situations that may not be completely comparable to BC Hydro's current status. In addition, the successful realization of the predicted benefit depends on many factors, both external and internal to BC Hydro, some of which cannot be anticipated. If, for example, BC Hydro were to reduce significantly its total spending in the coming years, the benefits resulting from improved contract management might fall accordingly.

While the Panel has concerns about the attainability of the full value of Benefit #5, we nonetheless consider the approach taken by BC Hydro to its analysis and quantification of Benefit #5 to be reasonable. As noted, BC Hydro has made the decision to have two external firms participate in the process to estimate the value of Benefit #5. Therefore, while the PwC Report provides a basis upon which the value of Benefit #5 is estimated, this has been further reviewed by KPMG, the SCA Project's QA Advisor, who has observed that a suitable approach for identifying and validating benefits has been followed during the SCA Project. The Panel takes some comfort from the fact that PwC's verification, which itself was verified by KPMG, provides some offset for the non-specific nature of the information in the PwC Report.

BC Hydro states that the basis for its estimate of the value of Benefit #5 is the PwC Report. However, in its reply to the CEC, BC Hydro adds that the findings of the PwC Report were verified by PwC staff. BC Hydro has relied on the mid-point of the estimating range provided by PwC rather than taking the high point of 3 percent reduction.

In addition, BC Hydro has further reduced the estimated value of this benefit by 50 percent. And finally, rather than taking the full benefit value in the first year, BC Hydro has ramped up the benefits over a five-year period and, in addition, excluded any benefits beyond the ten-year accounting life of the asset. Given these measures, the Panel is persuaded that the approach taken by BC Hydro in its benefit calculation is conservative and therefore achievable. Therefore, while these multiple layers of conservatism do not guarantee that the predicted benefits will be achieved, we do consider the estimated value of Benefit #5 to be sufficiently robust to use when estimating the financial viability of the project.

3.0 Evaluation of the SCA Project from the Perspective of the Public Interest

Evidence

BC Hydro presents two sets of NPV analyses: one based on discounted cash flows; the other based on revenue requirements. Common to the analyses are: the Ongoing Costs; an assumed inflation rate of two percent; the expected ramp-up period for the benefits as discussed in Section 2.6 of these reasons for decision; a six percent nominal discount rate; and a ten-year economic life of the software from an anticipated in-service date of March 2020.⁸⁷

For the NPV of the discounted cash flows, BC Hydro presents four scenarios:⁸⁸

**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

BC Hydro considers that the “Expected Costs / Monetized Benefits” is the base case for NPV analysis. In the base case, the NPV of discounted cash flows is \$41.8 million, compared to a figure of \$68.3 million in the corresponding mid-range scenario in the Phase One Application. The reduction in the NPV is primarily due to the reduction in the effort-related benefits that BC Hydro believes can be monetized.⁸⁹

⁸⁷ Exhibit B-1, pp. 3-19–3-20.

⁸⁸ Ibid., p. 3-21.

⁸⁹ Ibid.

For the NPV of the revenue requirements, BC Hydro presents two scenarios:⁹⁰

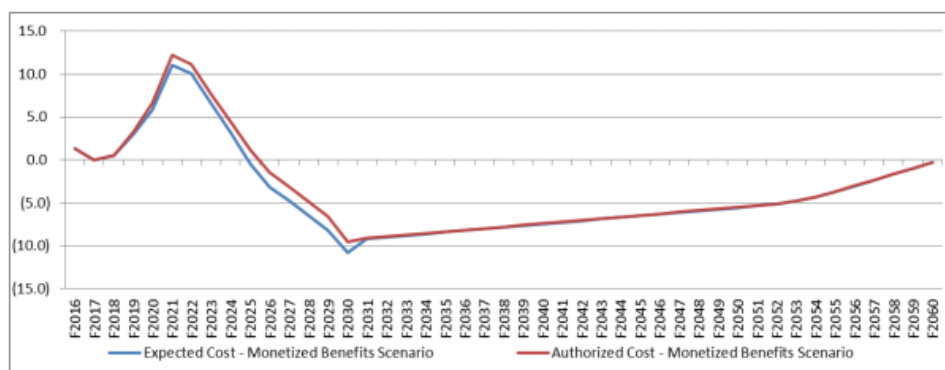
**Table 3-7 NPV of Revenue Requirements:
Sensitivity and Breakeven Analysis**

Scenarios	NPV of Revenue Requirement (\$ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.4 28.6	67 64
Authorized Cost / Monetized Benefits	19.4	75

BC Hydro explains that it uses an amortization period of 30 years for the Monetized Benefits in the NPV of the revenue requirements, based on the average life of 30 years for the assets procured using the new supply chain.⁹¹

The revenue requirement impact is also presented on an annual basis:⁹²

**Figure 3-2 Revenue Requirement Impact (\$ million)
Fiscal 2016 – Fiscal 2060**



BC Hydro adds that favourable impacts to the revenue requirements continue beyond fiscal 2030, but these have been excluded for the purposes of calculating the NPV of revenue requirements.⁹³

The NPV analysis in Table 3-7 above includes the value of Benefit #5 estimated at 1.5 percent of BC Hydro's planned spending. In IR responses, BC Hydro provided alternative analyses of the NPV of discounted cash flows and NPV of revenue requirements on the alternative assumptions that Benefit #5 is valued at the level of the Phase One Application (the "0.5 per cent scenario") and at the high point of the range estimated by PwC (the "3.0 per cent scenario").⁹⁴

⁹⁰ Exhibit B-1-2, p. 3-23.

⁹¹ Ibid., p. 3-23.

⁹² Ibid., p. 3-24.

⁹³ Ibid., p. 3-24(i).

⁹⁴ Exhibit B-3, BCUC IR 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

Position of the Parties

BC Hydro argues that the updated NPV analyses show that the benefits are sufficient to justify the SCA Project.⁹⁵

BC Hydro states that its base case, with an NPV of \$41.8 million, represents the most likely cost scenario and the more conservative estimate of the benefits. It adds that in the base case scenario, BC Hydro only needs to achieve 60 percent of the Monetized Benefits for the SCA Project to break even and that these Monetized Benefits themselves represent only 54 percent of the Expected Benefits. BC Hydro points out that there are non-quantified risk-reduction benefits that are not accounted for in the NPV analyses.⁹⁶

The CEC submits that the BCUC should give BC Hydro's NPV analyses little weight as they are "overly optimistic and unreasonable."⁹⁷ The CEC points to the \$10.3 million increase in the estimated value of Benefit #5, which it argues has little merit, and observes that in the base case the NPV of the discounted cash flows without this increase is negative \$5.8 million. The CEC recommends that the BCUC find there is "likely a negative NPV of \$5.8 million" and there is a significant probability of an NPV of negative \$15.7 million.⁹⁸

BCOPO agrees with BC Hydro that the SCA Project provides positive financial benefits, although it cautions that the sensitivity analysis "highlights the importance of achieving and maintaining the anticipated cost savings."⁹⁹

In reply, BC Hydro submits that its NPV analysis for the SCA Project is reasonable and should be accepted. BC Hydro argues that the increased estimate of the value of Benefit #5 is justified, and that using the Phase One Application estimate of its value would suggest that there are no benefits at all to be gained from improving the management of contract compliance, which would be "an unreasonable assumption on the evidence."¹⁰⁰

⁹⁵ BC Hydro Final Argument, p. 38.

⁹⁶ Ibid., pp. 34–38.

⁹⁷ CEC Final Argument, p. 29.

⁹⁸ Ibid., p. 30.

⁹⁹ BCOPO Final Argument, pp. 16–17.

¹⁰⁰ BC Hydro Reply Argument, p. 19.

Panel Determination

For the following reasons, the Panel finds that capital expenditures in the amount of \$38.5 million to \$45.4 million required to complete the Implementation Phase of the SCA Project are in the public interest and accepts them.

In the Phase One Decision, the BCUC accepted the need for the SCA Project based on BC Hydro's identification of 13 "capability gaps" in its supply chain system and processes. The BCUC further accepted that the selection of SAP software was justified. The Panel does not consider there to be any information provided in the Phase Two Application which undermines those findings and finds there is still a need for the Project.

The Panel is satisfied that the level of risk has not changed significantly since the Phase One Application and that BC Hydro's risk analysis and proposed mitigation strategies are reasonable.

The Panel has already found that the range of total estimated costs for the Project is \$71.3 million to \$79.3 million and that the Monetized Benefits estimated by BC Hydro are reasonable. Assuming that BC Hydro achieves the Monetized Benefits, the NPV of the discounted cash flows for the Expected Cost and Upper Bound Cost scenarios are \$41.8 million and \$31.9 million respectively. If the investment in the SCA Project yields an outcome in this range, the result is ultimately positive for ratepayers.

That said, the Panel has acknowledged the difficulty of estimating the value of benefits and accurately attributing them to the SCA Project, and hence the possibility that the Monetized Benefits will not be achieved. The estimated value of Benefit #5, representing 70 percent of the total Monetized Benefits, clearly has the most impact on this figure. Should it transpire that the value of Benefit #5 is only one-third of that included in the Monetized Benefit, BC Hydro calculates that the NPV of the discounted cash flows for the Expected Cost and Upper Bound Cost scenarios would be negative \$5.8 million and negative \$15.7 million, respectively.

In the view of the Panel, the potential for a financially disadvantageous outcome to the SCA Project cannot be discounted. However, we have already expressed ourselves satisfied with the degree of rigour with which the benefits estimate was prepared. We also note that BC Hydro has taken a conservative approach to estimate the value of the benefits and has discounted its benefit estimates in numerous ways, including taking only 54 percent of their value and ramping up the benefits over three to five years. These all serve to mitigate some of the potential problems which could occur with a shortfall in the achievement of benefits. Moreover, in our view, BC Hydro's cost estimates include sufficient contingency to make a cost over-run unlikely, and the history of the project to the end of the Definition Phase demonstrates that BC Hydro has succeeded so far in managing within its project budget.

The Panel considers the most likely scenario is that BC Hydro incurs the Expected Cost and achieves the Monetized Benefits, which would result in a positive NPV for the SCA Project of \$41.8 million. In the event that the full value of the Monetized Benefits is not achieved, BC Hydro calculates that the break-even point, where the NPV falls to zero, is achieved when the actual benefits earned are only 60 percent of those estimated. The

Panel considers this outcome to be unlikely. On the balance of probabilities, therefore, the Panel concludes that the project is likely to be beneficial for ratepayers.

The Panel also considered the merits and potential benefits to the public of those benefits whose value BC Hydro, in consultation with PwC, chose not to monetize. The Panel was persuaded that this is a justifiable consideration in making its decision. Many of these non-monetized benefits are likely to have direct financial benefits during the life of the software. In addition, it is the Panel's view that the current system in place is dated, needs a greater degree of integration with BC Hydro's operations and thus needs replacing. When one replaces software, it is difficult to have absolute confidence in the merits of a new system, but failure to update software where there is a need runs the risk of failing to serve the public interest.

Additionally, the Panel has considered the costs of the SCA Project to date, noting that BC Hydro has already spent \$25.4 million in accepted costs during the Definition Phase.¹⁰¹ At this point, if these costs incurred to date are excluded from financial consideration, the Panel observes that the NPV of the discounted cash flows would be higher than those calculated by BC Hydro and that the SCA Project would still be financially beneficial for ratepayers (i.e. have an NPV of revenue requirements greater than zero) even if the actual benefits achieved were less than the break-even point calculated by BC Hydro. Further, the \$25.4 million in accepted costs to date will potentially be included in rates regardless of whether the Implementation Phase capital expenditures are accepted. While this analysis is not determinative, it demonstrates that even if the future benefits from the project were not entirely realized, the decision now to proceed with the Implementation Phase is likely to have positive financial impacts.

4.0 SCA Project Reporting, Benefits Tracking and Baseline Information

Evidence

As noted in Section 1.3 of the reasons for decision, BC Hydro proposes to file semi-annual progress reports with the BCUC on the SCA Project, as well as a "Project Closure and Evaluation Report" (PCER)¹⁰² three months after receiving Board of Director's approval of the SCA Project's PCER. BC Hydro submits that the form and content of the semi-annual progress reports will be consistent with other project-specific progress reports filed with the BCUC and that it will continue providing these reports to the BCUC up until the filing of the PCER.¹⁰³ With respect to the PCER, BC Hydro submits that this report will include a breakdown of the final costs of the SCA Project, updated benefit tracking information, and a detailed explanation and justification of any material benefit, scope and schedule variances.¹⁰⁴

As it relates to the benefits tracking process, BC Hydro submits that it will be using benefits tracking sheets to monitor and measure progress towards achieving the forecasted benefits of the SCA Project. A benefit tracking sheet will be prepared for each effort-reduction benefit with an estimated value of over \$500,000 per year at

¹⁰¹ Exhibit B-1, p. 2-4.

¹⁰² Also called the "final completion report."

¹⁰³ Exhibit B-1, p. 1-13; Exhibit B-3, BCUC IR 1.1.

¹⁰⁴ Exhibit B-1, p. 1-14.

stabilization and for every cost-reduction benefit. At this level of materiality, BC Hydro submits that the value of twelve benefits will be tracked, representing approximately 99 percent of the total Monetized Benefits.¹⁰⁵

BC Hydro further explains that each benefits tracking sheet will include the baseline against which progress is made for the associated benefit, as well as the target benefits and the measures used to assess the benefits achieved. BC Hydro states, “[a]s assessing business impacts and establishing metrics and measures and setting baselines measures are iterative processes,” it proposes to finalize the baselines during the Implementation Phase.¹⁰⁶

In response to an information request from BCOAPO, BC Hydro presents the following analysis of its proposed benefits showing that the tracked benefits will be updated with actual time and motion study baselines prior to the project going into service:¹⁰⁷

Benefit Description		A	B	C	
		Phase 2 - Expected	Phase 2 - Expected	Current Baseline Type	Future Measure
ID	Benefit Quick Name	Quantified Benefit	Monetized Benefit	Actual or Estimate	Actual or Estimate
2	PO automation	\$ 537	\$ 84	Estimate	Actual
5	Active contract management	\$ 16,073	\$ 16,073	Actual	Estimate
7	Eliminating non-Supply Chain time in PassPort managing contracts	\$ 3,988	\$ 624	Estimate	Actual
14	Reduced carrying costs for material via improved inventory turn	\$ 2,677	\$ 2,677	Actual	Actual
16	Eliminate manual material reservations in MMBU	\$ 433	\$ 433	Actual	Actual
26	Reduced effort to approve invoices	\$ 4,407	\$ 689	Estimate	Actual
29	Automated invoice accruals	\$ 1,858	\$ 292	Estimate	Actual
67	Request standard services via catalogue	\$ 596	\$ 93	Estimate	Actual
102	Excess Project Materials Benefit	\$ 816	\$ 816	Estimate	Estimate
103	Wire Core Reel Return	\$ 400	\$ 400	Actual	Actual
104	Inventory Obsolscence Write-Off	\$ 425	\$ 425	Actual	Actual
105	Project forecasting effort	\$ 1,121	\$ 175	Estimate	Actual
Grand Total		\$ 33,330	\$ 22,781		

BC Hydro submits evidence from KPMG, the QA Advisor for the SCA Project, regarding KPMG’s assessment of the benefits tracking process:

KPMG has observed that the SCA Project team has initiated activities towards completing a benefit realization plan. The SCA Project has developed a ‘Benefit Tracking Form’ for the end of Design, which identifies how project benefits can potentially be measured. Given the size and complexity of enterprise system implementation projects, work will need to continue to quantify and validate the benefits to incorporate any new findings identified during the Realization Phase for the business and technology solution. The SCA Project has identified that this is a part of the project plan for Realization, which also includes the development of a Benefits Realization Plan. Because of the relative significance of benefits realization as a part of the KPMG assessment criteria, the final rating will be dependent on the work planned during Realization. As a result, the assessment finding for this dimension is currently rated as having been “partially met” at this stage of the review.¹⁰⁸ [Emphasis added]

¹⁰⁵ Ibid., pp. 3-17–3-18.

¹⁰⁶ Ibid.

¹⁰⁷ Exhibit B-4, BCOAPO IR 12.1.

¹⁰⁸ Exhibit B-1, Appendix K-1, p. 31.

Position of the Parties

BC Hydro argues that it has presented a reasonable benefits-tracking process for the project, and the initial set of baselines, metrics and measures are reasonable and sufficient to enable accountability.¹⁰⁹ BC Hydro adds that it will report to the BCUC on the realization of benefits in the PCER and in future RRAs until the benefits have been fully realized.¹¹⁰

The CEC takes no position regarding benefits tracking as it is the CEC's position that the expenditure should not be approved as being in the public interest.

BCOAPO notes that out of the twelve benefits BC Hydro plans on tracking, almost 75 percent of the forecasted Monetized Benefits from those benefits will be assessed against estimated rather than actual baselines, and concludes that the establishment of credible baselines for the two benefits involved (i.e. Benefit #5 - Reduced costs due to active contract and supplier management and Benefit #102 - Improved excess project material visibility) is critical to the benefits reporting process. Accordingly, BCOAPO submits that "one condition of any approval" is that the BCUC should direct that "full documentation regarding the benefits tracking plan and, in particular, the baselines and metrics to be used for benefits tracking be provided as part of the first revenue requirements application following [SCA] Project completion and that BC Hydro be prepared to address any concerns or issues as part of the associated proceeding."¹¹¹

In reply to BCOAPO, BC Hydro states that the BCUC has previously determined that it does not have the jurisdiction to order conditional approvals to applications made under section 44.2 of the UCA, but that the BCUC may direct BC Hydro to report on its projects.¹¹²

Panel Determination

For the following reasons, **the Panel finds that the project reporting and benefits tracking process proposed by BC Hydro is reasonable, with the exception of BC Hydro's proposed timing for reporting on the realization of benefits to the BCUC.**

The Panel accepts BC Hydro's proposal to use benefits tracking sheets for each effort-reduction benefit with an estimated value of over \$500,000 per year, and for every cost-reduction benefit, since this accounts for 99 percent of the Monetized Benefits. Further, the Panel accepts BC Hydro's proposal to report, among other matters, on the status of benefits realization in its semi-annual project-specific progress reports for the SCA Project, and in the PCER.

¹⁰⁹ BC Hydro Final Argument, p. 41.

¹¹⁰ Ibid., pp. 40–41.

¹¹¹ BCOAPO Final Argument, pp. 19–20.

¹¹² BC Hydro Reply Argument, p. 22.

However, the Panel is not satisfied that reporting on the project's benefits realization as part of BC Hydro's RRA will allow for sufficient scrutiny. RRA proceedings take place on an irregular basis and the SCA Project may not receive the scrutiny it requires.

The Panel agrees with BCOAPO that the credibility of the benefits tracking process depends at least in part on the level at which the baselines are set. Therefore, the Panel considers it important for the BCUC to review the baselines as soon as possible, and likely prior to the next RRA. As BC Hydro will develop the benefit baselines during the Implementation Phase, the baselines will be available from the SCA Project's in-service date.

Accordingly, the Panel directs BC Hydro to file with the BCUC:

- a) Semi-annual progress reports on the SCA Project, as described in Section 1.5.3 of the Phase Two Application;**
- b) An SCA Project PCER within three months after receiving Board of Director's approval of the PCER; and**
- c) Annual updates on benefits realization information from the in-service date of the SCA Project until the estimated Monetized Benefits have been achieved or the tenth anniversary of the in-service date, which ever is the sooner. The first update is to include the baselines developed during the Implementation Phase, and the metrics and measures for tracking the realization of benefits against the developed baselines which will be applied to each subsequent update.** For clarity, this annual reporting is in addition to the reporting proposed by BC Hydro whereby the progress towards benefits realization is reported with the PCER.