

Diane Roy Vice President, Regulatory Affairs

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July 5, 2021

Commercial Energy Consumers Association of British Columbia c/o Owen Bird Law Corporation P.O. Box 49130 Three Bentall Centre 2900 – 595 Burrard Street Vancouver, BC V7X 1J5

Attention: Mr. Christopher P. Weafer

Dear Mr. Weafer:

Re: FortisBC Energy Inc. (FEI)

Project No. 1599152

Application for a Certificate of Public Convenience and Necessity for the Okanagan Capacity Upgrade Project (Application)

Response to the Commercial Energy Consumers Association of British Columbia (CEC) Information Request (IR) No. 3

On November 16, 2020, FEI filed the Application referenced above. In accordance with the British Columbia Utilities Commission Order G-166-21 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to CEC IR No. 3.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary Registered Parties



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1 64. Reference: Exhibit B-18 CEC 2.54.2

54.2 Please discuss how the peak demand forecast is accounting for trends in electrification.

Response:

FEI acknowledges there are provincial and municipal policies that promote the use of electricity instead of natural gas as a means to reduce emissions; however, FEI believes these existing policies are reflected in its forecast in the Updated Application. For instance, any recent trends relating to fuel switching by FEI's customers from natural gas to electricity for space and water heating, along with other factors, are captured in FEI's historical data used to inform its long-term load forecasts. FEI continues to experience growth in both natural gas customers and demand and expects this to continue in the future (please also refer to the responses to BCUC IR1 5.7 and CEC IR1 7.1 and 7.2). While the CleanBC Plan sets out a framework for electrification in some sectors, such as through light-duty EV sales targets, it also provides direction on building energy efficiency improvements and sets a minimum percentage

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64.1 Does FEI expect electrification impacts to occur evenly throughout the Province, or does FEI expect that electrification may ramp up first in the Lower Mainland, and follow later in the Inland Transmission service area? Please explain and provide evidence to support FEI's position.

8 Response:

9 FEI expects that growth in electricity usage in the province may occur at different rates, 10 depending on the usage and policies in place. While the province has established GHG 11 emissions reduction targets and outlined its plan to achieve them within the CleanBC Plan, 12 municipalities within BC have developed their own climate action plans and targets which may 13 include improving building efficiency or promoting EV usage, for example. Therefore, electricity 14 usage growth may vary within these various municipalities, depending on their plans and how 15 they achieve them.

16 One example is the City of Vancouver updating its Building By-law requiring zero emissions 17 equipment for space and hot water heating in new low-rise residential buildings as of January 1, 18 2022. Other municipalities have offered more lenient building requirements for buildings that use 19 electricity versus fossil fuels. Depending on the province's requirements for the BC Energy Step 20 Code and the possibility of the addition of GHG reduction targets within it, there could be more 21 municipalities looking at implementing electrification measures like these. Therefore, electricity 22 usage growth may vary within these various municipalities, depending on their plans and how 23 they achieve them.

- For this reason, it is possible that electrification, in terms of residential buildings, may ramp up first in the Lower Mainland, specifically Vancouver, and follow later in other parts of BC such as
- the ITS service area. Given the uncertainty of when and how future municipal policies may be



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1 2	implemented, FEI is unable to determine the timing or quantify the impacts in terms of natural gas customer demand of this potential electrification in ITS service area.
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5 6 7 8 9	64.1.1 If FEI expects there to be a delay of electrification impacts for the ITS, please provide quantification for the delay.
10	Please refer to the response to CEC IR3 64.1.
11 12	
13 14 15	64.2 Please provide FEI's forecast trajectory for its RNG sales over the next 10 years.
16	Response:
17 18 19 20 21	At this time FEI expects its projected sales of RNG and new forms of renewable gas that FEI may supply in the future to grow to 30 PJ or more by 2030 and to continue increasing in 2031 (the ten year time frame requested) and beyond. FEI expects this supply to be a combination of primarily renewable natural gas ¹ and hydrogen ² over the next ten years as well as other potential renewable gases alternatives such as Synthesis gas (Syngas). ³
22 23	
24 25 26 27	64.2.1 Does FEI experience a difference in RNG sales in the ITS versus the Lower Mainland? Please explain and quantify any differences.
28	Response:
29 30	Yes, currently there is a difference in the volume of RNG sold to FEI customers in the Interior service region versus the volume sold to customers in the Lower Mainland. Approximately 80

- 31 percent of total sales volumes over the past three years have been in the Lower Mainland and
- 32 about ten percent in the Interior region over the same period, with the remainder in other parts

¹ RNG biomethane is upgraded biogas produced from farm or municipal organic biomass and/or upgraded Syngas.

² Green hydrogen is derived from water using electricity that is generated primarily from clean or renewable resources, or waste hydrogen, as defined in the Clean or Renewable Resource Regulation.

³ Syngas is produced from biomass to be used by a customer to replace, at least in part, natural gas derived primarily from fossil fuels, and to be used at the site at which it is produced; "biomass" means non-fossilized plants or parts of plants, animal waste or any product made of either of these, other than a fuel product, and includes wood and wood products, agricultural residues and wastes, biologically-derived organic matter found in municipal and industrial wastes, black liquor and kraft pulp fibres.



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1 of FEI's service territory. This is in part due to the higher number of FEI customers in the Lower

2 Mainland compared to the Interior service region, as well as the location of a number of fairly

3 large individual RNG customers within the Lower Mainland.

The regional distribution of FEI's RNG customers, however, has limited relevance to the benefit of the OCU Project in delivering an increasing supply of RNG and other forms of renewable gas to customers in the coming years. FEI views its system as an integrated energy delivery mechanism which can support greenhouse gas (GHG) reductions across its entire service territory. It is therefore inappropriate to attribute GHG changes to specific regions within the province. This approach is consistent with how the Province treats GHG reductions in CleanBC at a provincial versus a regional or municipal level.



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1 65. Reference: Exhibit B-4, CEC 1.13.1 and Exhibit B-18, CEC 2.56.2

Table 4-3: Evaluation Criteria Weighting

Weight (Overall)	Evaluation Criteria - Specific	Weight (Within Category)	
40%	System Capacity Increase	tem Capacity Increase 50%	
	Operational Flexibility	50%	
30%	Environmental, Public, and Indigenous Impacts	45%	
	Schedule Risk	55%	
30%	Rate Impact	100%	
	Weight (Overall) 40% 30%	Weight (Overall)Evaluation Criteria - Specific40%System Capacity Increase40%Operational Flexibility30%Environmental, Public, and Indigenous Impacts30%Schedule Risk30%Rate Impact	

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Evaluation Criteria - Category	Weight (Overall)	Evaluation Criteria - Specific	Weight (Within Category)
		Resiliency Impact	
		Reliability Impact	Weight (Within Category)
Asset Management Criteria		Integrity Impact	
		System Capacity Impact	
		Operational Flexibility Impact	
		Environmental and Archaeological Impact	
		Indigenous Impacts	Weight (Within Category)
External Impact Criteria		Public Impacts	
		Health and Safety Impacts	
		Socio-Economic Impacts	
Einensiel Criterie		Rate Impacts	Weight (Within Category)
		PV of Annual Revenue Requirement	
		Engineering Complexity	
		Constructability	
Technical Oritoria		Operability	Weight (Within Category)
rechnical Chiena		Adjacent Infrastructure Impacts	
		Natural Hazards	
		System Interfacing	

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65.1 What factors are normally considered under 'Socio-Economic Impacts'?

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6 Response:

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Socio-Economic Impacts are defined as the effects of the Project on the cultural values,
economic well-being, and daily life for Indigenous groups, local stakeholders, and the public
during construction and during the life of the pipeline. The factors considered during evaluation
may include proximity to populated areas, roadway usage impacts, the number of commercial
accesses impacted, and agricultural impacts.

FORTIS BC^{**}

These Socio-Economic Impact factors are consistent with recent FEI CPCN applications, including the Lower Mainland Intermediate Pressure System Upgrade (LMIPSU) and Pattullo Gas Line Replacement (PGR) projects. FEI makes minor adjustments to the factors for project specific attributes such as land use, population density and adjacent community infrastructure.

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65.2 FEI appears to have developed a new category entitled "Project Execution and Lifecycle Operation". How frequently does FEI deviate from the regular template for its Alternative Analysis Criteria template?

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12 Response:

13 FEI does not simply apply a general template or use the same categories for its evaluation 14 criteria but uses the general template as a guideline to provide examples of broad categories 15 and possible criteria. This is because each project has its own unique complexities and 16 associated specific challenges, which may not be adequately captured by the criteria in the 17 general template. Also, the inclusion of criteria that are not relevant to a specific project has the 18 effect of diluting the impact of evaluation criteria on the alternative selection process. Therefore, 19 FEI evaluates each project individually and categories and/or criteria are added, modified, or 20 removed from the general template to create the project-specific set of criteria. For the OCU 21 Project, FEI added categories and criteria as appropriate.

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65.2.1 How do the two different sets of criteria above relate?

26 27 **<u>Response:</u>**

The first set of criteria provided above is the specific set of evaluation criteria used to select a preferred alternative for the OCU Project. The second set is FEI's general evaluation criteria template, which illustrates the various evaluation categories and examples of specific criteria within those categories. As the key drivers and differentiators are identified for a specific project, categories and/or criteria are added, modified, or removed from the general template to create the project-specific set of criteria.

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 37 65.2.2 Why did FEI deviate from its established template in this instance and create a new Evaluation Criteria Category? Please explain.
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1 **Response:**

- 2 Please refer to the response to CEC IR3 65.2.
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65.3 The CEC notes that Schedule Risk is not normally identified as a separate specific criterion. Please explain why or why not, and discuss whether or not it would normally be included under any of the other 'Technical Criteria' items.

10 **Response:**

11 The OCU Project is necessary to address the expected capacity shortfall in the ITS prior to the 12 winter peak of 2023/2024. There would be significant consequences to FEI's customers (in the 13 form of potential gas outages) should the OCU Project not be completed on schedule. For this 14 reason, FEI determined that including Schedule Risk in the evaluation criteria was necessary 15 and appropriate. As explained in the response to CEC IR3 65.2, FEI selects the project-specific 16 evaluation criteria from a general template once the key drivers and differentiators for a project 17 are identified.

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21 65.4 FEI included Schedule Risk in FEI's Evaluation Criteria Weighting, which 22 ultimately accounts for 16.5% of the total Weighting. (55% of Project Execution 23 and Lifecycle Operation * 30% of Total Weight). To what extent is 'Schedule 24 Risk' affected by FEI's own decision-making? Please explain.

26 Response:

27 The Schedule Risk listed in Table 4-3 refers specifically to the evaluation of the three feasible 28 alternatives leading to the selection of the preferred alternative.

29 In the case of the OCU Project, the schedule risk stems from the lack of timing flexibility 30 associated with the capacity shortfall in the ITS. The probability of experiencing the 31 consequences of a schedule risk (a capacity shortfall resulting in customer outages) is reflected 32 in the Schedule Risk scores.

33 FEI's decision-making was able to affect the Schedule Risk outcome by giving a higher score to 34 the alternative that could be completed within the allotted timeframe and with the most schedule 35 certainty, and therefore leads to the lowest probability of experiencing a capacity shortfall. While 36 Alternatives 1 and 2 could be completed within the allotted timeframe, they had higher schedule 37 uncertainty due to the inherent unpredictability of the re-hydrotesting process, and thus resulted



ты	FortisBC Energy Inc. (FEI or the Company) Application for a CPCN for the Okanagan Capacity Upgrade (OCU) Project (Application)	Submission Date: July 5, 2021
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- 1 in a lower score. Consequently, FEI's decision-making affects schedule risk in how it ranks and
- 2 evaluates project alternatives.



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1 66. Reference: Exhibit B-18, CEC 2.58.1

- 58.1 Recognizing that no additional direct costs are expected to be incurred as a result of the limited flexibility in the schedule, would FEI have had a lower contingency cost if there was less schedule risk? Please explain.
 - 58.1.1 If yes, please quantify.

Response:

FEI confirms that if there is less schedule risk, there can be a corresponding reduction in project costs and associated contingency because cost and schedule are closely linked. The methodology used to compute the impact on cost and schedule is described in Confidential Appendix C-2. If the overall schedule risk was reduced, the Project would most likely be completed at a lower probability of underrun on the schedule outcome distribution curve; effectively, a shorter duration would be achieved as shown in Table 5 in Confidential Appendix C-2. That reduction in schedule translates into a lower Project cost and a lower contingency. While the preceding describes the general relationship, FEI is unable to quantify the reduction in contingency with any certainty.

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66.1 Please elaborate on why there would be a lower probability of underrun.

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5 **Response:**

6 The risk analysis considers the sum of all the cost and schedule impacts for all risks in the 7 Project's risk register. Each risk in the register is characterized by the chance of occurrence 8 (expressed as a probability) and the associated potential impact (expressed as the low, 9 medium, or high consequence, or a mathematical distribution). The contingency analysis 10 methodology described in Confidential Appendix C-2 simulates the probability and impact of all 11 the Project risks over the range of cost and schedule impacts. The simulation outputs are the 12 outcome distribution curves and tables shown graphically in Figures 1 and 2, and numerically in 13 Tables 5 and 6 of Confidential Appendix C-2 (Validation Estimating Contingency Analysis).

For example, a P40 Probability of Underrun in Table 5 means that the actual outcome (when compared to actual) has a 40 percent chance of underrunning that P40 value and a 60 percent chance of overrunning that P40 value. In other words, should the impacts of some or all of the risks have a low impact consequence or do not occur, the Project's actual outcome would be on the lower side of the distribution curve (i.e., a lower P-value). Conversely, if the impacts of the risk have high consequences and do occur, the actual Project outcome will be the higher side of the curve (i.e., a higher P-value).

Therefore, in a hypothetical scenario where the schedule risk is reduced (i.e., the impact is reduced, all the risks do not occur, or the risk is managed and controlled), the actual schedule and cost outcome would be on the lower side of the distribution curve. Put another way, the project would be completed ahead of schedule and below the project estimate, since the risk did not materialize, the impacts were lower, or the risk was adequately managed and controlled.



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1 2			
3 4 5 6	66	Would that correspond to a lower probability of overrun as well? Please explainly or why not.	ain
7	Response		
8	Please re	to the response to CEC IR3 66.1.	
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10 11			
12 13 14 15 16	66 Respons	What steps if any could FEI have taken to reduce schedule risk, such undertaking the project at an earlier date? Please discuss.	as
10	Response		
17 18 19 20	As discus Applicatio forecast c address th	a in the response to CEC IRT 10.2, FEI considers that it has filed the Opdat at the appropriate time by optimally utilizing existing system capacity to meet t hand requirements and by comprehensively examining all potential alternatives Project need in the most cost-effective manner.	the to
21 22 23	Neverthel the Projec FEI intenc	s, once a CPCN application is filed FEI continues to manage and control the risks schedule as described in the response to CEC Confidential IR2 67.1. In summa o manage and control the schedule risk by:	; to ıry,
24 25	1. Ас Ар	ncing the engineering design work prior to receiving the BCUC's decision on t cation;	the
26 27	2. Er as	ging specialists to evaluate means to address the unique construction constrain ciated with the alignment to minimize schedule impacts;	nts
28 29	3. Te av	ering long lead items prior to receiving the BCUC's decision to ensure materials a able prior to the start of construction; and	are
30 31	4. Te pri	ering and negotiating mainline construction and other construction related contractor to receiving the BCUC's decision.	cts
32 33 34	Therefore continue schedule	EI has taken appropriate steps to manage and control the schedule risk, and wimplement risk management activities prior to the start of construction to mitigates.	will ate
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1 67. Reference: Exhibit B-18, CEC 2.59.1.1

59.1.1 Would any of the companies FEI is already working with in this project be capable of contributing to the weighting and evaluation? Please explain and identify those individuals/corporations.

Response:

If required, each of the companies FEI retained to support the OCU Project is capable of contributing to specific portions of the evaluation. FEI incorporates input provided by external expertise to assess feasible Project alternatives. However, FEI has sufficient internal knowledge, experience, and resources to complete the weighting, decision-making, and final selection of a preferred alternative.

The following companies were retained on the Project at the time of evaluating alternatives:

- McElhanney Ltd.
- Golder Associates Ltd.
- Solaris Management Consultants Inc.
- Yohannes Project Services Inc.
- Okanagan Mountain Helicopters Ltd.
- Saluc Group Inc.
- Innovative Pipeline Projects Ltd.
- BBA Engineering Ltd.
- Hemmera Environmental Consulting
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- 4 67.1 Would it be reasonable for FEI to have any of the above companies issue a 'sign off' on the Alternatives evaluation and weighting criteria? Please explain why or why not.
- 7

8 Response:

9 FEI considers and values the input from its external experts and consultants, but FEI believes 10 that it must take ownership of the alternatives evaluation process and that it is ultimately 11 responsible for ensuring a project is evaluated appropriately to meet the project objectives. For 12 that reason FEI does not believe "sign off" from its consultants on the alternatives evaluation 13 and weighting is appropriate for the OCU Project.

14 Notwithstanding this, Solaris Management Consultants Inc. provided FEI with a Pipeline Routing

15 Criteria and Evaluation Report, P-00760-PIP-REP-0005, which was included in Confidential



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Appendix A-1 of the Application. The report documented the decision making process and
 results completed by FEI with support from various subject matter consultants for the pipeline
 route evaluation and weighting criteria development.

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 67.1.1 Which company would FEI consider as most suitable for conducting such a task? Please explain why.
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 10 <u>Response:</u>
 11 Please refer to the response to CEC IR3 67.1.
- 12



1 68. Reference: Exhibit B-18, CEC 2.60.1

60. Reference: Exhibit B-4, CEC 1.22.3.1

- 22.3 Did FEI include financial considerations in establishing the weightings?
 - 22.3.1 If no, please explain why not.
 - 22.3.2 If yes, please explain how the financial considerations were included, in what category, and what weight they were given.

Response:

FEI implicitly included financial considerations by incorporating all factors of routing a pipeline which typically drive costs in a project.

For example, more complex construction practices would cost more than simpler construction practices. FEI would not undertake a project in an environmentally damaging way, and so working in a more sensitive environmental area would be more costly due to the safeguards and restoration required than a less sensitive area. Thus, if a route option scores well (high number) against the various criteria related to complexity of project execution, it will be less expensive than an option which receives poor (low number) scores against these criteria due to the costs associated with mitigating the challenges associated with ensuring successful execution.

For this reason, FEI determined that including an explicit financial criteria would result in counting cost considerations twice.

60.1 Is it standard practice for FEI to address financial considerations only 'implicitly? Please explain.

Response:

It is common for FEI to address financial considerations only implicitly during the routing process.

FEI did not consider financial considerations as a route evaluation criterion on its own as the impacts on cost are inherent to any challenges associated with a specific criterion. Through the scoring process, any negative impact would naturally increase the Project's cost or delay its schedule, or both.

As the routing process considers multiple variations, using this implicit cost methodology is the most effective way to ensure cost-effective routing. A route selection that minimizes impacts to all criteria without adding extensive length or scope would result in selection of the lowest cost solution.

68.1 Please confirm that certain activities requiring specialized equipment or personnel may sometimes be conducted more quickly, but also cost more than a slower option.

7 **Response:**

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8 FEI agrees that in some instances certain activities requiring specialized equipment or 9 personnel may sometimes be conducted more quickly, but also cost more than a slower option.



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1 Notwithstanding this, the Pipeline Route Evaluation Criteria considers the use of non-standard,

2 higher-risk construction techniques that may sometimes be conducted more quickly and cost

3 more than a slower option. FEI confirms that the current alignment for the Project will utilize

standard open trench pipeline construction techniques where possible. The only specialized
equipment and resources that may be required for the Project, are to complete the horizontal

6 directional drill (HDD) under the Penticton Creek canyon. As outlined in Table 7 of Appendix A-

7 1, an HDD was identified as the best method of crossing Penticton Creek for multiple reasons,

8 some of which were attributable to the challenges associated with the open trench construction

9 technique in this location and the cost savings realized from using an HDD.



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1 69. Reference: Exhibit B-18, CEC 2.61.1

61.1 What actions, if any, does FEI undertake to evaluate its project delivery methodologies after the fact? Please explain.

Response:

As part of FEI's phase gate system, a review is conducted prior to commencing project execution to evaluate and review the adequacy of the project delivery method (PDM), among other aspects of the project. In addition, during project closeout, a lessons-learned exercise is often completed to review the project, including adequacy of the PDM, to capture learnings for application to future projects. FEI plans to conduct such a review during close-out of the OCU Project.

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- 69.1 For how long has FEI been conducting lessons-learned reviews?
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5 Response:

FEI has conducted lessons learned reviews for a number of years at different phases of a
project's lifecycle. As part of the phase gate process, lessons learned reviews are being
formalized to correspond to key decision points.

- 9 10
- 12 69.2 How does FEI keep track of the information that is acquired in the lessons-13 learned review process?
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15 Response:

16 For each project that completes a lessons learned review, FEI stores the information in 17 electronic format within each major project's document collaboration site.

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 21 69.3 Please give examples of the types of lessons-learned that FEI has found in the past.
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 24 <u>Response:</u>
- 25 Some examples of the type of lessons-learned from previously completed projects include:
- Early discussions should be held with municipalities regarding their proposed works in the same area of construction as the project's scope;



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- Discussions with municipalities and impacted stakeholders should explore constructability issues in detail prior to commencing works;
- Feedback should be requested from permitting agencies on what may constitute a deficient application as early as possible;
- Document management for change orders can be improved by linking correspondence
 to the applicable contract section; and
 - Cost estimate preparation should include input from contractors to better understand productivity rates specific to the project location and these learnings should be incorporated in FEI's assurance process when developing project estimates.
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- 69.4 Does FEI conduct any further evaluation after the Project Closeout to determine
 if the Project did meet the need or have the desired outcome in the long-term?
 Please explain.
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17 <u>Response:</u>

18 FEI has a project close-out process for all projects including major projects. The close-out

- 19 process includes sign off that the project was completed and met all of the initial requirements
- 20 outlined within the project scope, satisfied the original business objectives, and will meet the
- 21 desired outcome as planned in the long-term.



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1 70. Reference: Exhibit B-18, CEC 2.61.1.1

61.1.1 If FEI does undertake to make such an analysis, please provide any lessons learned from the IGU, LMIPSU or CTS projects.

Response:

The IGU Project is not yet complete and therefore a formal lessons learned review has not been conducted; however, the project is progressing well compared to the forecast cost and schedule. With respect to the LMIPSU Project, the PDM was not identified as requiring improvement following a project completion review. FEI did not conduct a formal lessons learned review for the CTS Project, however that project was completed on time and budget and there were no concerns with the PDM.

Please also refer to the response to CEC IR1 26.2 which provides various PDMs considered by FEI and the evaluation criteria FEI used to select the PDM.

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- 70.1 What considerations factor in to whether or not FEI conducts a formal 'lessons learned' review?
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6 Response:

FEI clarifies that the response cited in the preamble relates specifically to the Project Delivery
Method (PDM) lessons learned review. There are multiple factors potentially driving the need
for a PDM review such as: issues with the contractor that led to excessive change orders,
issues with meeting the design and construction schedule, and issues with risk allocation.

As part of FEI's phase gate system, FEI will conduct broad lessons-learned reviews for all major
 projects to review the successes and identify areas that require improvement.

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16 70.2 If FEI only conducts reviews when issues are identified, how can FEI determine whether a budget or timeline assessment process could be improved upon? Please explain.
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20 <u>Response:</u>

For clarity, FEI's response to CEC IR2 61.1.1 relates to the PDM methodology only and was not intending to imply that reviews are only conducted when issues are identified. FEI has financial, enterprise, and other systems in place which track, amongst other things, cost, schedule, project execution issues, and risk. These systems are used to record, monitor, and control the performance of all aspects of project performance. On a monthly basis, formal assessments



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- 1 are conducted to evaluate cost and schedule variances and determine the causes of the 2 variances. In addition, issues and risks are managed continuously by maintaining a live project
- 3 risk register and project teams are kept apprised of events or conditions that result in changes
- 4 or impacts to the project. Additionally, any new risks identified are logged in the project's risk
- 5 register along with any risk responses to address and mitigate issues and risks.