

Yukon Energy Corporation 2017-2018 General Rate Application Yukon Conservation Society Information Requests

YCS-YEC-1 Carbon Pricing and Social Cost of Carbon

- a) Please describe YEC's understanding of the difference between carbon pricing, carbon tax and the social cost of carbon.
- b) Please describe how YEC factored in carbon pricing to the models used in making decisions around thermal generation.
- c) How does or will carbon pricing affect electricity rates in Yukon?
 - i) Explicitly: with carbon tax rates starting at \$10/T, to \$50/T as has been indicated by Canada.
 - ii) Implicitly: incorporating carbon reduction policies that do not rely on a direct tax, such as clean energy policies or electric vehicle policies. These policies can result in an implied carbon price as high as \$210/T.
 - iii) In the following scenarios:
 - (1) No mines
 - (2) Minto mine only
 - (3) Minto plus Victoria Gold
 - (4) Minto plus Victoria Gold plus Alexco

YCS-YEC-2 Demand Elasticity

What will be the predicted effect on electricity consumption (demand) when/if the rate increase is granted?

YCS-YEC-3 Decentralization and digitalization

The relationship between utilities and their rate base (customers) is rapidly changing, as customers also become suppliers. As the nature of the grid changes from a hub and spoke model to a network of multiple suppliers and customers, there will be changes to the income and expenses of YEC.

- a) Please provide an analysis of YEC's understanding of this shift, and how a transition to an energy management network will be implemented by YEC. A smart grid will be integral to accommodating the above change. This will involve smart meters and other, more complex changes to manage the rapidly changing flows of electricity from multiple intermittent sources.
- b) Please provide a thorough exploration of how this will work, how much this will cost, and how will it be paid.

YCS-YEC-4 Cost Overruns

What was the average percent cost over run for past capital projects?

YCS-YEC-5 Mayo A and Mayo B

- a) Please describe the capacity and annual yearly energy output of Mayo A prior to construction of Mayo B for the past twenty years.

- b) Please describe the capacity and annual yearly energy output of Mayo B since its construction/in-service.
- c) Please describe the annual yearly energy output of Mayo A and Mayo B combined since the latter's construction.
- d) Was the imminent end of life of Mayo A understood at the time of Mayo B's proposal?
- e) What was the net benefit or increase in capacity and energy output of Mayo A and B combined after Mayo B was constructed, considering and including various constraints of water use and availability.
- f) What is the cost of the downstream flooding remediation? Please include all costs incurred by ratepayers and work done by Yukon Government.
- g) What is the annual cost to service the debt?
- h) After including the above costs (flooding mitigation/remediation and servicing the debt), please provide an analysis of the value of the project to ratepayers and taxpayers when the "no-cost money" of federal government grants are included.
- i) After all costs (those added to rate base as well as government grants) are considered, what was the cost per MW of net increase of capacity?

YCS-YEC-6 Aishihik Hydro 3

According to information supplied in the GRA, cost to YEC to settle the action was \$1.6M, of which \$0.96M was legal fees. YEC indicates it is appealing this decision, on advice from legal counsel (which will benefit from continuing the action).

- a) What would the cost have been to YEC to settle instead of continuing the action with associated legal fees?
- b) Please explain why it would not be more prudent to cut the losses and accept the decision now rather than incur yet more legal fees.
- c) Please provide an estimate of the costs to continue to pursue this action to YEC's legal counsel's advised conclusion.

YCS-YEC-7 SCADA communications upgrade

The SCADA project for Dawson, Faro and Carmacks is described as allowing YEC to run many new services and protocols to these sites.

- a) Please provide a list of these services and protocols.
- b) How does the addition of these services and protocols advance the 20 year Resource Plan?
- c) How will the addition of these services and protocols enable integration of EV charging, storage and dispatching, IPPs and the multiple micro gen projects likely to come on line in the near future?

YCS-YEC-8 LNG facility

The failure by YEC to fully consider the YESAB process and the requirements of YOGA resulted in cost overruns of approximately \$5.45M.

- a) Please describe the lessons learned and actions taken so that future capital projects will not incur similar unanticipated but predictable cost overruns.

- b) Please confirm whether the demolition costs and the transportation and FN benefit costs are part of this \$5.45M or, as it was indicated that they were removed, should they be added to the \$5.45M cost overrun.
- c) Given that capital projects managed by YEC almost always incur unanticipated extra costs, how much confidence should we have that installing the third LNG generator will come in on budget?
- d) Please summarize the reasoning behind YEC pursuing the LNG facility.
- e) Does YEC believe that the LNG plant was a prudent investment?
- f) During the extensive work done for the 2016 20 Year Integrated Resource Plan, YEC determined that the Levelized Cost of Capacity (LCOC) for diesel was lower than the LCOC of LNG. This is counter to what YEC argued in the LNG proceeding, when YEC was determined to construct the LNG facility as a capacity project. Please explain what has changed in the few short years that would explain why diesel is the thermal/capacity choice moving forward, as described in the new Resource Plan, when it was not at the time LNG was being actively pursued by the public utility.
- g) When decisions around opting for an LNG facility were made, the price gap between the price of natural gas and diesel was at an all time high. Please provide an analysis of the payback of an LNG over diesel plant under current conditions.
- h) Please include scenarios where overall demand does not increase and scenarios where increasing amounts of intermittent renewable electricity feeds into the grid.

YCS-YEC-9 Battery project

It is unclear from the GRA which battery option is preferred. A 4.6MW or 8MW lead acid or an 8MW Li ion option are all on the table.

- a) Please present: the capacity of these options, the energy available and for how long, the capital costs, the cost per MW and MWh and the discussion around arriving at a decision.
- b) If a 15MW battery had been in place, the four grid failures of July/August 2017 may have been avoided. A 15MW battery would reduce or even eliminate the need for spinning reserve, preserving water for winter months. Why is the maximum battery size proposed for Takhini 8MW rather than 15MW (adequate to replace the #4 turbine at Whitehorse)?
- c) Battery prices are falling by about 15% per year. The most expensive option identified is \$27.4M, and its replacement cost is estimated at \$22.1M. This is a reduction of \$5.2M or just under 20%. What are the underlying assumptions behind this estimate?
- d) The cheapest option identified appears to be the 4MW lead acid at \$21.7M and the most expensive is presumably the 8MW Lithium ion at \$27.4M. On the face of it, this is a very modest difference (a doubling of capacity for a 28% increase in price). Will this remarkably flat price curve continue with larger battery packs?

YCS-YEC-10 Southern Lakes (Marsh Lake) Enhanced Storage

- a) Why has the estimated cost of the Marsh Lake Storage risen from \$4M to \$17M?
- b) What does YEC anticipate paying to waterfront homeowners for mitigations for shoreline erosion, landscape architecture, septic system retrofits, etc.
- c) Please break down the mitigation costs for waterfront properties on Marsh Lake, Tagish Lake, Nares Lake and Bennett Lake.
- d) How do mitigation costs affect the financial viability of the project?
- e) Does YEC believe any of this mitigation is required and justified even if the Southern Lakes Storage Concept does not proceed? How would YEC propose that work and those costs be covered?
- f) What is the threshold and analysis that YEC will use to determine if and when the project has no net economic benefit to ratepayers?
- g) Please run the calculations without an assumption that YDC will pay for the project in the way it did for the LNG project.

YCS-YEC-11 Mayo Lake Enhanced Storage

This project has been found to be non-viable because the outlet to the lake is silting up. Reservoir siltation is a normal feature of hydro projects.

- a) What is planned to address this issue and what is the cost?
- b) How long will it take for siltation to affect the viability of this project again?

YCS-YEC-12 Gladstone Project

The Gladstone project included a diversion of water between watersheds, which requires several significant authorizations from DFO and from First Nations. Predictably, these authorizations did not materialize, so this project is effectively dead. The 2017 GRA identifies \$4.521M to be added to the rate base for this project.

- a) Please explain how the difficulties in permitting were not identified in advance of the work done.

YCS-YEC-13 Future thermal capacity project

The 2016 20 year resource plan clearly lays out how the decision to select a 20MW diesel plant over a 20MW LNG plant was made, primarily on the difference in capital costs (\$62.2M vs. \$100M).

- a) Please explain why the LNG option is now being explored for this 20 MW thermal capacity project (as discovered in the GRA Workshop presentation), and why these considerations were not included in the 2016 Resource Plan – which concluded without a doubt that diesel is the cheaper capacity choice of the two thermal options.
- b) Is LNG back on the table for the 20MW capacity project because of possible mining loads being added to the system, and as a result, a new 20MW LNG facility would be used as an energy project to service industrial mining loads?

YCS-YEC-14 DSM

The YUB disallowed most of the proposed DSM program presented at the last GRA. YEC's analysis of the allowed programs (inCharge) indicates that they are very cost effective. AEY has nonetheless withdrawn from the program.

- a) Please explain how YEC is repackaging its DSM program to comply with the current YUB directives (including the stipulation that YEC and AEY jointly submit the proposals).
- b) If these programs are as cost effective as indicated, please provide an analysis of why they were not as cost effective for AEY.
- c) How will YEC's approach to DSM be different to address the capacity shortfalls?

YCS-YEC-15 Integrating renewables:

- a) Please describe the planning for a smart grid to manage home based PV systems, ETS, EVs and home based battery storage.
- b) As more and more customers become providers of electricity as well as consumers, it is logical to assume that net sales of electricity by YEC will drop. Please provide an analysis of the effect on sales of electricity from the micro generation and the IPP programs.

YCS-YEC-16 Transmission line vegetation management.

YEC proposed to switch from mechanical brushing to herbicide treatment of brush under much of its transmission lines. After the public raised concerns, YEC contracted Yukon College to investigate more deeply the issues around using herbicides and to explore other vegetation management options.

- a) Please provide a copy of the Yukon College study.

YCS-YEC-17 Stewart-Keno Transmission Line and mining loads

- a) What is YEC's business case for the significant public investment in this transmission line?
- b) How does YEC plan to provide electrons to existing and potential new industrial customers?
- c) In YEC's 20-year Resource Plan, the values survey indicated that ratepayers held environmental concerns and considerations in the highest regard. How does YEC anticipate reconciling the wishes of ratepayers for renewable energy, and the possibility that industrial loads will be met with LNG generated electrons?