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Harnessing Nature's Power



**KLEANA
POWER
CORPORATION**

October 17, 2017

B.C. Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, B.C., V6Z2N3

RE: KLEANA POWER CORPORATION'S COMMENTS TO BCUC ON OCTOBER 11, 2017 DATED POST OF
ALTERNATIVE PORTFOLIO

Dear Mr. Wruck:

Attached to this letter is our comment.

Regards

for Alexander N. Eunall

Per. Kleana Power Corporation

KLEANA INPUT TO BCUC'S ALTERNATIVE PORTFOLIOS

On October 11th 2017, BCUC posted 3 portfolios for supply of electricity as alternatives to Site C. BCUC has invited input regarding these portfolios. In each of these portfolios, BCUC used wind-based projects as the lead technology. This may give an impression of wind versus water in utilizing our province's renewable resources.

Kleana Power Corporation (Kleana) has already made two submissions to BCUC (F53-1 [the "Kleana Initial Submission"] and F53-2 [the "Kleana Response"]). The Kleana Response contains alternative portfolios that include Kleana together with other technologies such as wind projects and also includes more detailed data about the value of Kleana for the province as an alternative resource. The Kleana Response is dated October 10th and was posted on the BCUC site on October 11th. It is, therefore, our assumption that BCUC did not have the opportunity to review the Kleana Response before preparing and posting the alternative portfolios.

Kleana is confident that F53-2, the Kleana Response, will still be reviewed by BCUC. However, in light of the BCUC new invitation for further input, we submit the following to highlight some of the key relevant information of our past submissions as well as providing new related information.

COST OF KLEANA PRODUCTION

Barton et al used a WACC of 7.4% for Kleana which can be broken down into 20% equity at 13% return and 80% debt at 6% return. Based on that, according to Barton et al, Kleana has a Unit Energy Cost at POI of \$80/MWh and an Adjusted UEC at Lower Mainland of \$90/MWh. Kleana has simulated Barton assumptions in its own model to arrive at a cost of \$90/MWh.

BCUC provided its own financial assumptions in their October 11th post for alternative portfolios (100% debt financing at a cost of 3.43% and 3.9% real discount rate).

Kleana has simulated BCUC assumptions in its own financial model to arrive at a cost of \$45/MWh.

Kleana will submit to BCUC full financial models for both scenarios upon request.

Above model runs are based on Kleana's Clean Call design and were optimized for those terms of reference (565 mw installation and 150 mw firm capacity). However, if Kleana was asked to be optimized for higher firm capacity and lower peak capacity, it can then be reconfigured as a 400 Mw installation with 180 Mw firm capacity (estimated). In this case, annual energy may drop to 1900 GWh. Freshet month comparison may look as in Table 1''

Table 1'' - Freshet Months Production versus Critical Winter Months Production (estimated) for reduced peak capacity, increased firm capacity (180 Mw) Kleana installation

Freshet Months Mean (GWH)..... 750

Winter Months Mean (GWH)..... 350

Total Annual Mean (GWH).....1,900

IMPACT OF CLIMATE CHANGE

BCUC alternative portfolios do not seem to include the impact of climate change, which is likely to be very significant, both on supply and demand. Kleana referred to and elaborated on these in its previous submissions. Potential impact of climate change on wind as a source for power in BC is studied even less than on water. This is a must before any planning for long term.

OPTIMIZATION FOR THE REQUIREMENTS

The terms of a call (its incentives and penalties) determines the design optimization and therefore the output profile and cost of a project. BC Hydro compares apples with oranges when it insists in comparing projects optimized for different parameters than those BC Hydro says it now needs when justifying building Site C.

KLEANA FOOTPRINT

Kleana is unique project with a surprisingly small footprint compared to the amount of electricity it can produce (Generation **footprint of merely 40 Ha** and transmission footprint of approx. 1000 Ha). All aspects of Kleana have been studied intensely including impacts on biology and the environment (it is a potential net gain project), hydrology, geology and engineering - to define and address all of its risks. Indeed Kleana, as reflected in its footprint, has similar risks to an average run of the river project in the province with nothing that stands out as a high risk concern. These are discussed in past submissions.

BC HYDRO'S RISK ASSESSMENT FOR KLEANA

BC Hydro suddenly (in their September 29th BCUC submission) referred to unidentified risks for the Kleana project which we believe serves the purpose of trying to dismiss our project without appropriate focus on its economics. It may be useful to remind BCUC that in BC Hydro's technical presentation, (Technical input proceedings, October 14th) it said the development of what it refers to as, small, lower resources around the province is outside the core competence of BCH (pg1648). We agree. Klinaklini

River, on which the Kleana project is located, was once reserved by BC Hydro for its own development but apparently was abandoned because of the inability to build a large reservoir due to environmental factors. Note that our design of Kleana does not include a reservoir.

It may be useful to highlight BC Hydro's history on Kleana to provide perspective. The development risks were never a concern other than the conservancy boundary issue, nor has BC Hydro identified to Kleana any other concern during the 2008 Clean Call. BC Hydro kept Kleana in their favoured short list until the very end of the Call hoping the conservancy issue is resolved to no avail. After the amendment of the conservancy boundary when the Minister finally directed BC Hydro to negotiate in good faith with Kleana (2012), BC Hydro then told Kleana it was not valuing the electricity as it did before and furthermore, BC Hydro stated it had no need for it. BC Hydro prepared and made presentations to Kleana about electricity demand projections, which BC Hydro suggested showed the lack of need for any new generation. BC Hydro asked Kleana to wait until the BC Hydro projections indicated a change in their need for power. BC Hydro made no further complaint and raised no concern about any additional development risks. Throughout 2012 and 2013 Kleana made with prejudice commercial offers to BC Hydro for sale of electricity from Kleana. Perceived risk associated with the Kleana project was never declared as the basis of BC Hydro's reluctance to enter into negotiations. During the Site C Joint Review panel hearings of 2013 Kleana also made a submission and verbal presentation in the presence of BC Hydro staff. At no point did BC Hydro raise any risk issue during this presentation, even when the Chair gave BC Hydro the opportunity to respond to Kleana at that meeting. BC Hydro did provide a written response to Kleana's Joint Review Panel presentation and complained about the cost and energy delivery profile (all of which are addressed in our BCUC submissions to date) but made no mention of any specific perceived risk regarding the project. All of this is on public record.

In short, there has never been any communication from BC Hydro to Kleana about any possible remaining development risks until September 29, 2017.

THE BEST SOLUTION

The best solution for additional generation of electricity in BC is likely a portfolio with complimenting and diverse production profiles, similar to ones referenced in Kleana submissions, coupled with some dedicated storage capacity from BC Hydro or through employment of other storage technologies and options referred to in BCUC alternative portfolios. Kleana production profile is specifically complimentary with wind-based projects. In a properly designed Call for power, Kleana can potentially partner with other technologies in a consortium to deliver firm and ideally shaped, reliable, staggered multiple delivery point power. It is in the best interest of BC rate payers that BC Hydro stop competing with the private sector and work with them towards the optimum solution. This will also reduce risk to and the ever increasing debt burden on rate payers.

The Commission may not be able to determine a specific optimal solution in the limited time provided to deliver its report. But the information submitted to BCUC thus far strongly suggests that BC Hydro's Site C is not the optimum solution for rate payers. Only an all technology open Call that defines BC Hydro's

needs (as a delivery profile) will solicit optimum solutions that the private sector can (if they are given the time and incentive) provide to the rate payers. We ask BCUC to recommend in its report that BC Hydro allows all potential suppliers of alternative power to submit such proposals for consideration and definitely include Kleana project as a legitimate and strong alternative source for power for the province. **The direction of Minister to BC Hydro to negotiate with Kleana in good faith is outstanding and still applies.**