

September 27, 2017

The Panel

BCUC – Inquiry Respecting Site C

TIME/BUDGET/POWER REQUIREMENTS

In the preliminary report, the Panel seems to agree the project is on time. BC Hydro and Deloitte's agree the project is on time and on budget.

Will it go over budget? NO ONE can answer that question definitively. There was reference to a study in the preliminary report (Ansar) that shows many hydro electric projects going over budget. As BC Hydro pointed out, only two of these of these projects (unnamed) were in Canada. The Panel has placed little weight to the report.

Since alternate sources of energy are open for discussion, the Ansar study might have had some relevance if it had also included alternate sources such as wind, solar, other. How many of these projects were under, on or over budget?

Do we need the power? The mayor of Vancouver aspires to 'electrify' the city. The Premier of British Columbia is confident that the BC economy will grow and wants to build more hospitals and more schools. Electric vehicle's? All will require power.

Is Site C too much power for 2024? If it is, what is wrong with overbuilding, and planning for the future?

ALTERNATE ENERGY

There is a lot of opposition to Site C, with suggestions of alternate sources. To my knowledge, no group has submitted a budget for wind, solar, geothermal, or other to provide the equivalent of Site C's output of 5100GW year-round. There have been many charts and graphs submitted, but not one submission with a budget for alternate energy. These groups have the resources.

The alternate energy budget would have included: (in today's dollars, as is Site C)

- all capital costs including turbines, solar panels, transmission lines, transformers, breakers, (dc to ac converters as required by solar), batteries, buildings, design costs, etc.
- all construction costs, including access road construction, power line construction, drilling (geothermal)
- costs to purchase/lease lands for the turbines, solar arrays, roads, transmission lines, substations
- legal fees, which could be millions of dollars, over a period of years, while negotiating access to these lands and seeking and receiving environmental and regulatory approvals
- the cost to decommission Site C and remediate

How many hectares will the wind (or solar) sites require, including access roads, transmission lines (which may or not be the same)? What is the ongoing maintenance costs, such as maintaining the access roads, maintaining the turbines, blades, gear boxes, etc.? Life expectancy of blades and gearboxes is 20-25 years. Solar panels about 30-35 years, but after 20 years they are down to about 80% of the original capacity. There were concerns about GHG emissions during construction of Site C. Can wind/solar/geothermal be installed without GHG emissions? I think not.

No one can answer any of the preceding questions because sites have not been chosen, only a few suggested as possibilities. So why suggest alternatives without a comprehensive plan?

No one can predict the future prices of wind turbines or solar panels. The prices could decrease or increase. One thing is for certain, the cost of installation will increase.

BIRD KILL.

The report mentions bird kill only in passing. It requires further discussion.

Consider this. A hundred birds might land in an oil sands tailing pond, and it is a national news story. A thousand birds die because of collision with turbine blades, but only silence. Why is that?

Everyone agrees birds (and bats) are killed or injured by turbine blades. How many, no one seems to know, (or wants to know). Worldwide it is estimated in the millions each year. The attitude is 'So what, millions of birds die each year colliding with windows, what is a few million more?'. Some attitude! Some excuse!

Others suggest that the number of raptors killed is greatly exaggerated. If that is true, why did the Obama administration, in January of this year, approve windfarm owners a permit to kill up to 4200 bald eagles over the life of the farms (30 years), without penalty. Who is counting? The bald eagle and the golden eagle are not labeled as endangered in the US, but are 'protected'.

It is possible that hundreds of kilometers of power lines might have to be constructed for wind or solar. These, too, pose a danger.

In British Columbia birds are protected under the ***B.C. Wildlife Act, Section 34*** "*It is an offense to possess, take, injure, molest, or destroy a bird*" Has the provincial government a similar arrangement for wind farms here in BC?

INFRASOUND

What affect does infrasound (very low frequencies) generated by wind turbines have on humans or animals? Does infrasound from offshore turbines have any affect on whales?

The 'jury' is still undecided. But this must also be deliberated.

PHOTOVOLTAIC (SOLAR)

There is very little sunshine over the winter months in British Columbia when demand for power is the greatest. And solar works only when the sun is shining (and of course, turbines work only when the wind is blowing).

Roof panels make little sense in most parts of BC. Who wants to, or can, sweep off a panel after every snowfall? Yes, sweep, a shovel cannot be used on a panel! And, yes, it does snow in many parts of BC from November until the end of March. That may come as a surprise to the lower mainland rulers. Panels have to be kept clean. Solar panels are only a portion of the expense. Some of the other components required are a bank of batteries, a dc to ac converter, a transfer switch.

Green house gases (some quite toxic) are produced in the manufacturing of panels and batteries. Lithium-ion battery life is about 8 years, with proper care and use, but may only be at 70%-80% of the original capacity.

What about the disposal of the panels and batteries at end of life?

GEOHERMAL.

Geothermal is probably the most environmental friendly alternative. Iceland (about 1/10th the size of British Columbia) has a considerable amount of volcanic activity, which makes the country ideal for geothermal power generation. Nevertheless, Iceland still generates three-quarters of it's power from hydro-electric.

Geothermal would be a gamble in BC. Some associate earthquakes with drilling, and in some cases, drilling was suspended. Is it possible?

More research, more time, more legal expenses. After receiving regulatory approval, many dollars could be wasted drilling many holes with little success.

Or not.

Some Final Comments

One need to look no further than Ontario to see how their “Green Energy Plan” has worked out. Electricity now so heavily subsidized that future generations will be paying (and paying).

Ontario has about 40 wind farms, designed to supply about 11% of Ontario’s requirements, but delivers only about 6%. Hydro delivers about 24% (designed for about 24%). Solar/other supplies less than 1%. About 60% is nuclear generation (2016 data).

(There is a great deal of information on the *ieso.ca* site)

Those opposed to Site C have not provided viable alternatives or accurate costs. All they have provided is conjecture (and a whole bunch of charts and graphs and pretty pictures).

In the preliminary report, words such as assume (assumed, assumption) are used over 200 times. The word ‘expected’ over 90 times, ‘forecast’ over 400 times, future almost 90 times. The same can be said for a least one of the submissions (but with slightly different numbers). How can anyone draw any conclusions with so many ‘assumptions’, ‘expectations’, ‘forecasts’?

The Panel has been assigned a very difficult task to fully justify a complete review in such a short amount of time. In turn, the Panel has assigned an even greater (impossible, I suggest) task to BC Hydro (emphasis on Hydro) to come up with alternate sources, etc., etc., etc. And why is the onus on BC Hydro to provide all the answers?

This review has placed a great deal of unnecessary stress on the BCUC, many BC Hydro employees and over 2000 hard working souls at Site C.

There is far too much unknown about the alternatives: wind, solar, geothermal, the Columbia River Treaty Entitlement.

We **do** know it will take years for regulatory approvals.

We **do** know there will be years of legal battles.

Why, when know so much, but not all, about Site C, and so very little about alternatives, would anyone consider terminating this project?

For the record, I do not work, nor have I ever worked, for BC Hydro. I do not know anyone working at Site C.

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