

Name: Rider Petch

Date: October 11, 2017

Thank you for reviewing the Site C Project. I am eternally grateful for this and the role BCUC continues to play in BC government accounting. This is likely the most important project review in our provinces history, based on several elements. Please find my pdf'd letter attached for the Site C preliminary review report (entitled 'Letter to the BCUC_Preliminary Report (11-Oct-17). Please advise if the report does not go through, as an extensive amount of time has gone into its production.

Thank you.

Sincerely,

Rider Petch

October 11, 2017

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RE: Review of the BCUC Site C Dam Preliminary Report

Dear BC Utilities Commission,

As a citizen of BC and ratepayer, I would like to extend deep thanks to the BCUC for undertaking this rigorous review of Site C. Thank you for assembling some well thought out critique, soliciting a financially robust audit from Deloitte LLP and for requesting that BC Hydro provide significantly more information in order to ensure a truly comprehensive review of Site C is undertaken. It is a breath of fresh air to read. I appreciate so many points made, such as simple conservation and the need for better Demand Side Management (DSM) efforts. I personally took the BC Hydro challenge in 2016 to reduce my annual power use by 10% and by simply buying LEDs and being aware, I am on track for a 15% energy savings this year. Quite remarkable if this is multiplied over all provincial households. I believe this Project Review is likely the most important review BCUC has done since the last Site C review in 1989, and likely the most important to come in a while. It is the one to get right.

I find so much wrong with this Project, I was initially not sure what I was going to focus on in this letter. In 2016, I submitted Project review comments to the Auditor General with my top 10 list of problems with this Project. Here however (as required), I will be commenting on the preliminary report published on September 20, 2017, and focusing on one key element within the terms of reference issued by the provincial government which relate to the **Current Load Forecast**; specifically, the concerns pertaining to disrupting trends (i.e., distributed energy generation and grid disruption via partial or full load defection). The Panel made the following comment:

Potential disrupting trends – The Panel is concerned that, given the long-life of the Site C asset, BC Hydro has only identified a potential upside risks to the load forecast from electrification, and has not identified any potential downside risks. The Panel requests that BC Hydro and other parties specifically address questions

related to potential disrupting trends.

Short background on my letter contribution:

I am an energy enthusiast and well versed in the history of this project, understanding key historical points:

- BCUC rejection of Project in 1983.
- BCUC rejection of Project in 1989.
- Submission of EAC Application for Site C in August 2010 (22 years after the last rejection, and coincidentally just 2 months after the new Clean Energy Act came into effect with the Order in Council exempting Site C from Review). In an era of professional reliance ushered in by the new government of 2002, it was the height of irony that political forces, rather than professional reliance would be the agent pulling this dead horse to life. This one fact alone shows the vulnerability of this Project right from the moment of conception. Professionals, armed with the facts, should have guided this decision. Financial review professionals, like BCUC, should ultimately decide these projects; not elected politicians working on preferential projects. Unfortunately, politically directed endeavours, unaccountable to professional inputs, become infected projects on all levels. The rationale that follows to keep the idea afloat, tends to continue to deteriorate and put the whole Project at risk. Proper check and balances were removed from the Site C process, and BC Hydro is now at great risk of financial failure if it is built.
- The Site C Joint Review Panel (JRP), made up of at least of some key stakeholders, developed a meaningful list of recommendations (of which some would have stopped this project). Numerous of the key recommendations were disregarded, and the JRP Chair resigned in frustration. Again, more professional inputs disregarded.
- Understanding that Premier Campbell had carefully crafted this Order in Council in 2010 (under best intentions to reduce greenhouse gases), this over-priced dam, at least has the perception of being politically fast-tracked without the due professional financial, social and environmental scrutiny it deserved. It is not in my interest, and I believe it is in no one's best interest - not even the supposed 2000 Site C workers who will be saddled with a stranded asset of over-priced provincial power that we will have to sell at a loss to the provincial coffers. We can't afford Site C now, and we certainly can't later.

I factor the above baseline elements into my thinking here.

Grid Disruption:

I am focusing this letter on one element – **Grid disruption (i.e., the trend in distributed energy generation and the related partial and/or full load defection)**. I believe this element has been grossly underestimated and this agent alone has at best the capacity to strand Site C power, and at worst impoverish BC Hydro to the point of insolvency with Projects like Site C on the books. That is, if the threat is not managed assertively. Grid disruption is here, even for hydro-based (rather than fossil-based) energy generating regions. I commend the BCUC panel on recognizing that BC Hydro was observing potential upside risks to the load forecast from electrification, but had not identified any potential downside risks. I strongly agree with the Panel in requesting that BC Hydro and other parties specifically address questions related to potential disrupting trends. When BC Hydro replies to this information request, I would recommend that the following terms be well considered:

- 1) Has BC Hydro been made aware of the following global “Grid Disruption” trends? There is a significant risk of load defection (partial loss of load revenue) and/or grid defection (full loss of load revenue), as demonstrated below:
 - a. **First, three terms to clarify: (1) Grid disruption** (a general term where energy storage, when combined with solar power, disrupts utilities to the extent that customers move to an off-grid approach); **(2) Load defection** (a home-based solar-plus-battery system remains grid-connected but supplies a portion (or the majority) of a customers' electricity needs); vs **(3) Grid defection** (solar plus battery in the home makes the utility optional (unneeded)). Has BC Hydro developed a report to assess load loss potential, and a subsequent plan on how to internalize the potential loss (as a gain) before it occurs? Comments are presented below.
 - b. **Disruption Trend.** The Edison Electric Institute (the association that represents all U.S. investor-owned electric companies) in 2015 has started citing the “End of the Large Utility” era. This is a time when it becomes cheaper for distributed energy resources (DER) to generate at source. It is where large energy generation utilities begin to transition from power generation companies to power distribution companies if they hope to survive. BC Hydro has a well-established grid, so has it considered re-focusing on its assets in distribution, rather than expanded generation to be inline with the global trend?
 - c. **Grid Disruption Scenarios.** Has BC Hydro solicited grid defection scenarios from other Jurisdictions and financial implications? In the last year, countries like Australia and the US are reporting phenomenal increases in distributed energy generation, and concurrently

phenomenal losses to utility power generation. In an emerging grid disruption model, projects like Site C will be toxic.

- d. **48% of Grid Demand provided by PV (September 17, 2017).** RenewEconomy just produced a remarkable article saying that in South Australia, on September 17, 2017, a phenomenal share (47.8 %) of the state's electricity demand was being met by rooftop solar and is clearly a record for South Australia. Rooftop solar is exploding. The Australian Energy Market Operator has predicted that within 10 years, the grid demand may fall to zero because of the increasing amount of rooftop solar. It also goes on to say, South Australia is the first region where rooftop solar PV has caused a shift in minimum demand from night time to the middle of the day. Go to: <http://reneweconomy.com.au/rooftop-solar-provides-48-of-south-australia-power-pushing-grid-demand-to-record-low-47695/>
- e. **Renewable Energy Disrupting Markets at Unprecedented Pace.** The following report is referenced: *Global Electricity Utilities in Transition. Leaders and Laggards: 11 Case Studies. Institute for Energy Economics and Financial Analysis (IEEFA). October 2017 Report.* Some key findings about renewable energy and disruption from the Executive Summary:
 - i. Renewable energy is disrupting electricity markets worldwide.
 - ii. The pace of this change has surprised almost everyone, and indeed would have been difficult to imagine just a few years ago.
 - iii. Across Europe, lower wholesale electricity prices have created significant disruption and have shown how late-arriving major utilities are at risk of financial loss by not seizing the renewable-energy mantle quickly enough.
 - iv. Electricity utilities that perform best going forward will be those that transition to renewable energy-based business models in a way that avoids the financial damage typically incurred by late movers. Those that avoid or work against the roll-out of renewables will be met by a future that does not include them.Go to: <http://ieefa.org/wp-content/uploads/2017/10/IEEFA-Global-Utilities-in-Transition-11-Case-Studies-October-2017.pdf>
- f. **Accenture Consulting** released its, 2017 *Power Surge Ahead - How Distribution Utilities can get smart with Distributed Generation* Report. Information is based on surveys with utility executives and consumer research. The report covers various key topics: (1) anticipated revenue reductions from Distributed Energy Resources (DER) – up to 58% this year; (2) Moving to smarter distributed generation integration is a non-negotiable task; (3) Accenture's New Energy Consumer research shows that more than half (57 percent) of consumers would

consider investing in becoming power self-sufficient; (4) Close to the same proportion (45 percent) say that they are planning to sign up for rooftop solar in the next five years. Go to: <https://www.accenture.com/us-en/acnmedia/PDF-50/Accenture-Power-Surge-Ahead--How-Distribution-Utilities-Can-Get-Smart-With-Distributed-Generation.pdf>

- g. **Global Energy Transformation.** The *State and Future of the Power Industry (2017) Report* covers how to position for the global energy transformation that's now underway. More than 400 participants were surveyed about the future of electricity. Key findings revealed the industry perspective on mounting challenges, emerging technologies, and distributed energy resources. Findings included:
- i. Nearly half of the respondents see increased penetration of DER as the most disruptive threat to traditional utility business models over the coming decade, and more than 60 percent believe it will force a major shift in business models in the next decade.
 - ii. Over 40 percent of respondents agree that wind and solar, combined with storage, are the most viable resource alternatives to backfill declining baseload generation.
 - iii. And, over two-thirds of the respondents see energy platform provider or network orchestrator as the role for the future utility to pursue. Go to: <https://www.navigant.com/insights/energy/2017/state-and-future-of-the-power-industry>
- 2) Has BC Hydro drafted a thorough "Grid Disruption" report on managing some of the above risks of load defection (partial loss of load revenue) and/or grid defection (full loss of load revenue), and developed an assertive plan on how to manage each?
- a. **Disruption as Threat to BCH Business Plan.** Has BC Hydro recognized the magnitude of the external threat that distributed power generation (e.g., rooftop solar, small-scale utility solar, solar carports) could play to BC Hydro's business plan? Has a financial assessment been done comparing the feasibility of allowing externally generated power to be delivered to the grid vs. developing programs like those at Solar City or Alberta's Enmax that internalize the cost of distributed energy generation (solar) to BCH, but also thus the gains? In one model, a solar panel is purchased by the landowner and delivers all savings to the landowner. In another model where BC Hydro buys the solar equipment and drafts up a creative contract, BCH could provide the solar panel to the landowner's unused roof space and lock in the profits (while guaranteeing consistent or slightly cheaper power in perpetuity to the

landowner). Are these types of conversations occurring? If not, they should be quickly prioritized.

- b. **Net Metering Program (Solar Projects up to 100 kW) Promoted?** How is BC Hydro's Net Metering Program being advertised and promoted? It has been around since 2006, and yet I only learned about it a year and a half ago. It seems like a small effective niche program that could be easily expanded with key policy modifications to become a major platform at BC Hydro.
- c. **Micro-SOP Program (For larger Solar Projects 100 kW – 1 MW):** Currently, this affordable program application allows larger-scale utility solar to be generated by only two main groups: Community groups (Municipality, Non-profit, Public sector, or Biomass facility) or a group with First Nations involvement). While this is a good start, private landowners (e.g., farmers, residential landowners) and business's should be allowed to participate individually. It is an extremely limiting policy that hinders provincial solar development (i.e., distributed generation), but which could easily be revised to help solar explode (and eliminate the need for expensive, spatially destructive projects like Site C). For instance, how can other business's be encouraged to participate in installing solar generation (e.g., large department stores with parking lots, companies with roof space; farmers with a portion of fallow land that could be dedicated to solar as a valuable augment to their primary income and to make our farming community flourish)? Alberta has a program that gives a discount to farmers to build solar called *On-Farm Solar Photovoltaics – On-Farm Energy Management Sub-program*. With a good sensitive agricultural solar policy in B.C.'s ALR, modest projects could be designed for limited parcels of unused land, while facilitating the primary agricultural land use. This would help to address the age-old ALR problem of land going unused. Alberta's On-Farm Photovoltaics program is here: http://www.growingforward.alberta.ca/Programs/index.htm?contentId=ON_FARM_SOLAR_PRG&useSecondary=true
- d. **Solar Generation Potential Quantified?** Has BC Hydro assessed the number of single family dwellings in the province and determined just how much power could be generated by an appropriate portion of the roof pitch? Currently, I plan to make my next house a net zero house with solar. How much utility generated power could potentially be lost to distributed generation on the existing housing stock?
- e. **BC Energy Step Code – All houses will have solar.** Here's a big one. Has BC Hydro spoke to the BC Energy Step Code Council or the Canadian Homebuilders Association

(CHBA) about BC's new 2017 Energy Step Code that will mandate all-houses to be Net Zero ready by 2032 (i.e., have solar on the roof). We have legislated policy now that all new houses will be built with thick envelopes to conserve energy and will generate their own power onsite with solar. Have energy savings forecasts been made by the BC Energy Step Code Council that could offer insight on just how much home energy use is expected to decline? Go to: <http://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/energy-efficiency/energy-step-code>

- f. **Solar Financing the Key to Distributed Energy Expansion.** Has BCH recognized the financial risk that solar financing scenarios could play on the utility? I know many people that want a solar system for their house, but don't quite have the \$10 - 20K they need to buy-in (and thus with net metering, get rid of their annual BC Hydro bill). These are the people that BCH is just one financing model away from losing. For example, just last year (2016), Fannie Mae Mortgage Company in the U.S. developed a loan program, that essentially allows landowners to roll the cost of solar right into their mortgage with nothing extra down. Once the first Canadian bank realizes this lending windfall, it could be another tipping point for distributed energy generation. See attached reference here: <http://www.greenbuildingadvisor.com/blogs/dept/guest-blogs/fannie-mae-s-financing-solar-game-changer>.
- g. **Electric cars and electrification.** There is a perspective at first glance that more electric cars are going to mean more electricity requirements. This would seem to be the perspective of BC Hydro (in their potential upside risk). There is however a compelling alternate view that cars will essentially become giant mobile batteries. They will be able to communicate in a 'smart' manner with the grid taking as well as giving back energy. The key is in the cycle of use. Currently, most cars lie dormant for 90% of the day and active for 10% of the day. Furthermore, cars are often dormant in the peak sun hours of the day. It is this large dormant daily periods where parked cars will become connected to solar as battery storage. Once operators and/or smart entrepreneurs see the power of the "mobile battery" as a huge market for solar (in sunny places like parking lots during the day), these mobile batteries will essentially become a huge boom in storage and thus a net plus, rather than net user of grid generated energy. An example is given in the next point.
- h. **Energy Storage on Wheels.** On Oct 2, 2017, the Guardian released an article in which The UK announced the start of a new program that will incentivize car batteries to become grid storage. This is exactly what I have spoken about above. Electric car owners will be paid for

letting an energy company use their vehicle's battery in a pioneering scheme to increase take-up of the cleaner vehicles and help power grids manage the growth in green energy. Nissan and one of the UK's biggest challenger energy suppliers, Ovo, will offer the "vehicle-to-grid" service. See the link here: https://www.theguardian.com/business/2017/oct/02/electric-car-battery-savings-nissan-leaf-ovo?utm_source=Clean+Energy+Review&utm_campaign=dbf010ba7f-EMAIL_CAMPAIGN_2017_10_09&utm_medium=email&utm_term=0_08b98425f1-dbf010ba7f-347663333

- i. **Has BCUC considered asking BC Hydro to consider incorporating a distributed energy solution as part of Halting Site C and Doing Site Reclamation?** As one final last consideration (in a scenario where Site C is halted), to save costs on site reclamation, parts of the Site C location (already cleared and outside the riparian zone) could be developed into a model Utility Solar Farm (with the support of locals and First Nations). This could serve as a perfect test case of what the future could hold. The Sunmine Project (City of Kimberley) shows how beneficial utility solar can be, and this option would be the perfect kick-off to BC Hydro's first Utility Scale Solar Project. It would be a grand example of how dynamic and robust BC Hydro, the crown corporation can be, under BCUC's ongoing strong financial leadership. The BCUC could consider requesting a modest utility solar generation project (e.g., 1-10 MW size) cost estimate as an option to full site reclamation, and one which would offer future ongoing generating potential. Locals could get behind the Project and benefit from employment.

Final Comments:

Thank you for recognizing the seriousness that disrupting trends (i.e., distributed energy generation causing partial load or full grid defection) impose on BC Hydro's business plan in your preliminary review of Site C. BC Hydro can either miss the boat with Site C on the books, or act now and internalize the unstoppable global distributed energy trend as an opportunity and a big windfall. Time is critical. Final points are below:

- **Summary.** I have focused my input on the *Site C Dam Preliminary Report* terms of reference issued by the provincial government which relate to the **Current Load Forecast** provided by BC Hydro, and specifically the substantial financial risks of "disrupting trends" (i.e., distributed energy generation and grid disruption via partial or full load defection). I believe distributed energy generation has been grossly underestimated, and this agent alone has at best, the capacity to strand Site C power, and at worst, impoverish BC Hydro to the point of insolvency with Projects like Site C on the books.
- **Disrupting trends (i.e., distributed power generation) represent an alarming risk to BC Hydro's financial security if it is left unconsidered and unembraced.** That is, approving Site C could sink this utility under a perfectly reasonable scenario where load defection (partial loss of load revenue) and/or full grid defection (total loss of load revenue) becomes commonplace. We will have a network of functional existing dams to draw on, but grid defection is real, it is happening now, and I have presented several other references herein that show utilities around the world are already suffering intensively. An assertive plan to mitigate grid disruption trends is critical – now. BC Hydro must demonstrate to the BCUC that they have full comprehension of all aspects of load/grid defection and how it could cause loss in load revenue generation. If they cannot do this, then need for Site C has not been demonstrated and it should be cancelled. All losses to date will be negligible against other scenarios.
- **Site C not part of the new distributed energy model.** It will be critical that BC Hydro initiate immediately a broad range of financial studies on the potential implications of grid disruption, before the Site C is even considered as a real long term option. On September 17, 2017 South Australia saw almost half of the state's energy demand being met by distributed energy resources (rooftop PV). As discussed above, disruption is happening now, and it is almost unfathomable, how quickly it is happening. BC Hydro needs to act swiftly to internalize potential revenue losses in distributed energy generation, or risk losing access to the new incoming revenue streams. Site C is not part of this model. Stopping Site C will unquestionably be the cheapest long-term option.
- **1950s idea.** The Site C is a 1950's idea running on a 1920's power distribution model. It lacks foresight and vision, and puts one of our last great remaining Crown corporations at great risk of insolvency. The

winning Utility model will embrace conservation and DSM opportunities, embrace distributed energy by internalizing it with sensible residential and commercial solar programs (and avoid fighting it with ultra-expensive mega-projects), will build on smart grids, will leverage the distribution assets for DER (distributed energy resources), will utilize EV batteries creatively in storage, and will let the taxpayers prosper alongside greener, more sustainable development.

- **Credit downgrade.** Site C (and the debt to build it) will put our province at risk of credit downgrades and further financial duress of increased lending rates.
- **Fail.** Site C does not meet the B.C. government's economic, social or environmental goals. The development of the Site C has advanced under a sequence of strategic, political tools and has failed to integrate professional, scientifically-sound rationale (in a sincere manner) at all stages, including BCUC's financial review – a review certainly worthy of the most expensive infrastructure project in B.C.'s history.

Thank you for considering the significant risk of grid disruption, and I hope the considerations presented prove useful in the BCUC's review of the Site C project.

Most respectfully,

Rider Petch, B.Sc.


Cumberland BC