

**Preliminary Proposal: Independent Power Production
Contracts in British Columbia**

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good
job

Context and Question

BC Hydro (BCH) is a public utility, responsible for providing the majority of BC's electricity needs, and BCH largely uses hydro power, and with few exceptions BCH-owned assets are hydro. (BCH is a provincial crown corporation that operates under the mandate to provide power to the province of BC.) More specifically, they are also responsible for ensuring “customers receive...fair rates”, that the province can get a fair return on capital as the sole shareholder, and that heritage resources are publically owned (BC Hydro, 2019).

BCH began partnering with Independent Power Producers (IPPs) to diversify energy ^{when?} production and to help produce energy for off-grid locations. IPPs are on a fixed contract. Many IPPs are based on renewable energy (in particular wind, solar, and geothermal). In 2017, \$58 billion had been committed over 2017 to around 100 projects, and was flagged as the “provinces’ single largest contractual obligation.” BC was Canada’s province most dependent on IPPs to meet energy needs industry (“B.C. racks up \$58 billion in independent power producers contracts,” 2017). As of 2017, 90% of BC’s electricity was generated by hydro, 6% by biomass and geothermal, 2% by natural gas, and ~1% by wind and petroleum (Government of Canada, 2019).

The IPP program was controversial, and when the BC government switched from Liberal to NDP the program’s budget was significantly reduced (Bennett, 2019). Proponents of IPP spending claim that it will help BC become more sustainable, it provides economic and social benefits to remote and First Nations communities, and that the prices paid in the initial contracts were fair. Opponents of IPP spending claim that IPPs are producing energy BC does not need and thus have a neutral or even negative effect on sustainability (once building costs of the

energy projects are factored in), are awarded for political gain rather than any social benefit, and most importantly are too expensive (Bennett, 2019).

A further~~ing~~ complication is the claim that Site C will generate an electricity surplus, which can then be sold. Site C is a large hydroelectric dam project in the peace valley region, scheduled to be completed in 2020. (BC Hydro, 2017). A surplus of electricity would negate arguments that IPPs are required to make BC more environmentally friendly in terms of energy production. ✓

good set up.

RQ: *Should BCH increase IPP spending, decrease IPP spending, or keep it at the same level?* ✓

Paradigms and variables:

The arguments around the IPP program capture several dimensions: Financial, social, and environmental. Financial arguments consider the price of IPPs, in particular the fixed contract system that was implemented when the program started. The social paradigm considers the social consequences of IPPs, if there are any: Does the program benefit rural First Nation's groups? Or, is the program a way of handing out contracts to political allies? The environmental paradigm evaluates the environmental effects of investing in IPPs. There are differing opinions about the extent of the positive environmental effect that IPPs can achieve by displacing other forms of power, as well as potential other negative effects.

Throughout all the paradigms, Site C is a consideration. When considering the energy demands of BC, it has to be considered whether or not Site C is enough to meet them. If it is, is Site C a preferable alternative to IPPs? Or, if it is the case that with both Site C and IPPs there is an energy surplus, there is a trade off to be considered between the lost environmental damage

meet pt.?

and stakeholder concern (especially first nations), and potential financial gains and energy reliability.

While Site C considerations will be present throughout the discussion, for the sake of clarity the tradeoffs present with an energy surplus will be described in their own section. } under

Financial:

BCH has made a sound investment decision vs BCH has spent too much.

When it was initially introduced the IPP program used fixed contracts over a long period of time.

As the price of renewables is seen to be falling, it was considered that this was too much money. ✓

The crux of the financial debate is whether the contract prices for IPP are competitive within the market rates, or suffer from being on fixed contracts and overcharging BC residents. Variables to consider are the the length and price of the contracts, and the price of renewable energy over time.

But need l-t contracts to pay off high k requirements

Social:

BCH is connecting and investing with rural and First Nations communities vs no particular social benefit, merely a move towards privatizing the energy industry.

Many IPPs are located in rural and First Nation's communities. This program could allow these communities to set up energy projects that can increase their self sufficiency and bring economic gains. Variables to consider are the location and ownership of IPP companies. ✓

Environmental:

BCH is investing in better forms of sustainable energy to meet energy needs vs BCH is investing in unneeded assets; hydro power or bought power is suitable for BC energy needs.

An argument for IPPs is that they are a way of diversifying BC's electricity supply into more environmentally friendly sources. The question that arises from this argument is: More environmentally friendly then what? Hydro power does have environmental drawbacks in the form of flooding and ecosystem disruption, but is a still low emission source of power. If IPPs are replacing hydro power, that is a smaller environmental gain then if IPPs are replacing fossil fuel power. Variables to consider are the current and forecasted energy needs of BC, the energy capabilities of hydro (including with and without Site C), and the energy capabilities of the renewable sources provided by IPPs.

✓
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Surpl

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BCH is creating a surplus of electricity that will provide consistent and reliable energy for BC will also providing a source of income to the province vs BCH is needlessly taking on the social and financial costs of building new projects for an inadequate and uncertain gain.

BCH has stated that Site C is expected to create a surplus of electricity. Additionally, it is in their mandate to be able to provide BC with reliable power. Electricity can be sold on the spot market, to Alberta or to the United States, and electricity trade has been an ongoing source of revenue for BC. However, the spot market is unreliable. Variables to consider are the amount of projected surplus, historical track record of revenue on the sport market, and the social and financial costs of building new IPP projects.

✓
Need to consider
variables
in energy
projections

Literature

Data Sources

BC Hydro. (2013). *Overview of BC Hydro's Energy Procurement Practices*. Retrieved from <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/independent-power-producers/energy-procurement-practices.pdf>

Explains Energy Procurement Practices in detail, particularly the system used to evaluate potential IPPs for approval.

Government of Canada, N. E. B. (2019, August 15). *NEB – Provincial and Territorial Energy Profiles – British Columbia*. Retrieved September 16, 2019, from <https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html>

Provides basic numeric information on BC energy, including hydroelectric and renewables. Too high level to be used for a numeric analysis, but does provide a quick snapshot of BC, particularly in comparison to other provinces.

BC Hydro. (2018, February). *BC Hydro and Power Authority 2018/19—2020/21 Service Plan*. Retrieved from <https://www.bcbudget.gov.bc.ca/2018/sp/pdf/agency/bchydro.pdf>

Summarizes past and forecast values for energy generation and energy load, gives a high level overview of sustainability goals, and details major projects. IPPs are included in the energy generation data, representing about a third of forecast generation for 2019/2020.

BC Hydro. (2019, May). *IPP Supply List in Operation*. Retrieved from <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/independent-power-producers/ipp-supply-list-in-operation.pdf>

Provides a list of operational IPP projects (as of May 1, 2019) including name, owner, location, type, call process (includes date), capacity, and energy (GW/yr).

BC Hydro. (2019, May). *IPP Supply List in Development*. Retrieved from <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/independent-power-producers/ipp-supply-list-in-development.pdf>

Provides a list of planned IPP projects (as of May 1, 2019) including name, owner, location, type, call process (includes date), capacity, and energy (GW/yr).

British Columbia Utilities Commission. (1983). *Site C Report: Report and Recommendations to the Lieutenant Governor in Council*. Retrieved from <https://www.sitecproject.com/sites/default/files/19830500%20Report%20and%20Recomm>

[ndations%20to%20the%20Lieutenant%20Governor%20in%20Council%20-%20BCH.pdf](#)

The original report used by BC Hydro when considering Site C at its conception. A fair bit of detail is gone into on the different trade-offs and justifications for building Site C, including energy need forecasts and project alternatives. The BCUC criticized BCH for their forecasting methods, believing they were over-projecting provincial energy needs, and concluded that Site C had not been shown to be the best project candidate to meet energy needs. While the data is somewhat out of date, it clearly outlines both the reasons that Site C was considered and the reasons it was controversial.

British Columbia Utilities Commission. (2017). *Site C Inquiry Final Report*. Retrieved from <https://www.bcuc.com/Documents/wp-content/11/11-01-2017-BCUC-Site-C-Inquiry-Final-Report.pdf>

The more recent report done by the BCUC on the costs and benefits of Site C, done at request of the NDP before they decided whether or not to allow the project to continue. Considers questions of: Costs of continuing, suspending, or of terminating the project, what feasible alternatives the province has to meet energy needs, and stakeholder evaluations (including First Nations).

Raphals, P. (2014). *Need for, Purpose of and Alternatives to the Site C Hydroelectric Project (Abridged Version)*. Retrieved from Helios Centre website:
https://s3.amazonaws.com/academia.edu.documents/36553882/2014_EN_NeedAlternatives_Abridged_Helios_Raphals.pdf?response-content-disposition=inline%3B%20filename%3DNeed+for+Purpose+of+and+Alternatives+to.pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWOWYYGZ2Y53UL3A%2F20191001%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20191001T125946Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-Signature=bd01fa91e130380f2b8eac94f6112d2f3a5fb11075b14ea40ad547ef45089b4

A report prepared for the Joint Review Panel for the Site C project, on behalf of the Treaty 8 First Nations. The report goes through its own detailed analysis of energy load projections, eventually concluding that there is not sufficient load demanded to justify the building of Site C.

Financial Paradigm

Davidson, K. (2019). *Zapped: A Review of BC Hydro's Purchase of Power from Independent Power Producers conducted for the Minister of Energy, Mines, and Petroleum Resources*. Retrieved from https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/electricity/be-hydro-review/bch19-158-ipp_report_february_11_2019.pdf

A third party report on BCH's IPP program, which concludes that BC Hydro has overinvested in IPP projects, and is overproducing for what demand requires. Supports view that the IPP

program is not useful for sustainability, view that IPP program is not sound investment, and that the social benefits were really just political maneuvers.

“Zapping” Back: Clean Energy BC Responds to Critical Review of BC Hydro’s Purchase of Power from BC IPPs. (n.d.). Retrieved September 12, 2019, from McCarthy Tétrault website: <https://www.mccarthy.ca/en/insights/blogs/canadian-energy-perspectives/zapping-back-clean-energy-bc-responds-critical-review-bc-hydros-purchase-power-bc-ipp>

Clean Energy BC argues that Zapped was a political document designed to attract attention to practices done by the Liberals, and that in fact BC Hydro’s contracts with IPPs were competitively priced. Further goes on to argue that the cost for renewable energy sources used by the IPPs would be cheaper than the electricity provided by Site C. Supports view that IPP program is financially sound, good for the environment.

Social Paradigm

Merrimack Energy Group Inc. (2011). *Final Report on BC Hydro’s Energy Procurement Practices*. Retrieved from https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/acquiring_power/2011q3/Merrimack-Report.pdf

Third party review into BCH’s energy procurement plan as a whole, but emphasizes bid process for IPPs. Praises fair contract management and calls, but criticizes transparency, risk allocation, evaluation criteria, over emphasis on price, and the domination of wind and hydro in winning bids. Also address First Nations as a stakeholder group, including their concerns that the Ministry of Energy decisions around procurement prices are not optimal.

BC Hydro. (2011, September 23). *BCH Response to Merrimack Report*. Retrieved from https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/planning_regulatory/acquiring_power/2011q3/Merrimack-Report-BCH-Response.pdf

Short summary and response to the Merrimack Energy Group report, detailing BCH’s resolutions to increase transparency, seek stakeholder feedback on a new Integrated Resource Planning (IRP) process, and several other Merrimack recommendations. The one recommendation BCH rejects is creating an Advisory Group including non-supplier stakeholders and First Nations to consult on procurement activities, arguing that the IRP process already includes adequate dialogue opportunities.

Karanasios, K., & Parker, P. (2016). *Recent Developments in Renewable Energy in Remote Aboriginal Communities, British Columbia, Canada. Papers in Canadian Economic Development, 16(0), 65–81. <https://doi.org/10.15353/pced.v16i0.70>*

15 out of 23 remote aboriginal communities are either currently or planning to participate in renewable electricity generation. Goes into detail as to how different remote aboriginal countries relate to BCH—either integrated into the main grid, not-integrated but receiving energy at the

same price from BCH through the Remote Community Electrification (RCE) Program, or operating their own electricity system. Many of these communities are either serviced from an IPP, or have some ownership stake in them.

Fitzgerald, E. (2018). *Powering self-determination: Indigenous renewable energy developments in British Columbia* (Thesis). Retrieved from <https://dspace.library.uvic.ca/handle/1828/10475>

Presents Indigenous participation in renewable energy as a method of self-determination, in particular when selling energy back into the main grid (ie, acting as an IPP). In this framework, the decision of the BC government to cut back on IPP spending is seen not as “simply a barrier”, but an injustice.”

Rezaei, M., & Dowlatabadi, H. (2016). Off-grid: Community energy and the pursuit of self-sufficiency in British Columbia’s remote and First Nations communities. *Local Environment*, 21(7), 789–807. <https://doi.org/10.1080/13549839.2015.1031730>

Considers the case of remote communities who use diesel generators to meet energy needs, arguing that the push from the provincial government to switch to a renewable source as a kind of “low hanging fruit” for GHG emissions is in fact reducing independence. In this framework, IPP spending is not necessarily socially beneficial, particularly when it’s done in conjunction with high environmental goals.

Environmental Paradigm

See also—“Zapped” report, “Zapping Back” report.

Sopinka, A., Cornelis van Kooten, G., & Wong, L. (2013). Reconciling self-sufficiency and renewable energy targets in a hydro dominated system: The view from British Columbia. *Energy Policy*, 61, 223–229. <https://doi.org/10.1016/j.enpol.2013.05.068>

Uses mathematical modeling to consider BC’s ability to be self sufficient on hydro power, including in scenarios where a LNG plant is requiring steep energy input. Conclude that BC will be forced to import power in order to meet demand. This study was done using 2008 data, so is not entirely up to date, but the model still provides a good basis for looking at where BC’s energy projections are coming from.

Sopinka, A., & Pitt, L. (2013). British Columbia Electricity Supply Gap Strategy: A Redefinition of Self-Sufficiency. *The Electricity Journal*, 26(3), 81–88. <https://doi.org/10.1016/j.tej.2013.03.003>

This paper re-emphasizes that whether or not BC takes on LNG loads will be a crucial part of BC being self-sufficient. More than that, it addresses the different options BC can take to increase energy production under the 2013 regulatory framework, and points out that choosing to import energy can have effects on overall carbon production. Energy imported from the United States is often created by fossil fuels. Overlaps slightly with the other Sopinka paper, but is slightly more up to date.

Jaccard, M., Melton, N., & Nyboer, J. (2011). Institutions and processes for scaling up renewables: Run-of-river hydropower in British Columbia. *Energy Policy*, 39(7), 4042–4050. <https://doi.org/10.1016/j.enpol.2011.02.035>

Considers the local trade-offs for renewable energy (land use, noise, etc) against the global benefit of reduced emissions. A framework for evaluating and approving projects in a way that balances this trade-off is developed, noting that a project-based approval system is able to get green projects through without delay, but a more inclusive approval system will ultimately gain greater public support.

Kiani, B., Rowe, A., Wild, P., Pitt, L., Sopinka, A., & Pedersen, T. F. (2013). Optimal electricity system planning in a large hydro jurisdiction: Will British Columbia soon become a major importer of electricity? *Energy Policy*, 54, 311–319. <https://doi.org/10.1016/j.enpol.2012.11.040>

Explores the ability of BC to meet electric load projections up until 2040 using Hydro supply, considering in addition: electricity trade between BC, Alberta, and the US; influence of a carbon emissions tax; contributions from Burrard Thermal plant, and contributions from Site C. Concludes that even with Site C and Burrard Thermal plant operating at full capacity, BC will need to import electricity within a few decades. Would support view that further, non-hydro sources of power are required for BC to be ‘energy self sufficient.’

Long-term energy outlook a story of energy, capacity needs. (2017). Retrieved September 16, 2019, from <https://www.bchydro.com/news/conservation/2017/long-term-energy-capacity-needs.html>

A short BCH ‘feature’ from 2017, arguing that BC’s electricity needs are going to expand beyond what existing heritage assets and IPPs will be able to provide for, unless Site C goes online. Briefly compares Site C to other energy source (wind, solar, and run of river), before asserting that concerns with intermittency makes Site C a better choice. Also mentions future plans for critical maintenance for already existing assets, to further support the idea that Site C is necessary. While it doesn’t provide the calculation details, it does show BC Hydro’s expectation of future power needs.

Surplus Paradigm

Sopinka, A., & van Kooten, G. C. (n.d.). *Is BC a Net Power Importer or Exporter?* 24.

Evaluates the reasons for conflicting stories about whether or not BC is generating an electric surplus, concluding that it is due to inconsistent measurements that do not take into account the difference between power production and generating capacity, and the difference between revenues and volumes. However, the authors believe that overall BC is likely to be generating a surplus, with the future addition of Site C likely to increase that surplus even further.

Other References

- BC Hydro. (2017). Long-term energy outlook a story of energy, capacity needs. Retrieved September 16, 2019, from <https://www.bchydro.com/news/conservation/2017/long-term-energy-capacity-needs.html>
- BC Hydro. (2019). About us. Retrieved September 16, 2019, from <https://www.bchydro.com/toolbar/about.html>
- B.C. racks up \$58 billion in independent power producers contracts. (2017). Retrieved September 12, 2019, from Business in Vancouver website: <https://biv.com/article/2017/03/bc-racks-58-billion-independent-power-producers-co>
- Bennett, N. (2019). BC Hydro proposes one per cent rate cut, followed by hikes. Retrieved September 17, 2019, from Vancouver Courier website: <https://www.vancourier.com/news/bc-hydro-proposes-one-per-cent-rate-cut-followed-by-hikes-1.23926144>
- Government of Canada, N. E. B. (2019, August 15). NEB – Provincial and Territorial Energy Profiles – British Columbia. Retrieved September 16, 2019, from <https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/bc-eng.html>

Research Topic and Annotated Bibliography Worksheet

Prepared by Andy Hira, updated: Sept. 2017

Author: Fajber

1 Is the Topic Important, Policy Relevant, and of Current Interest?

-Have they identified a clear research question?

The topic is of considerable importance, as it is a continuing controversy in the province with important ramifications for the possibilities of supply diversification (this point should be reinforced).

2. Is the Topic/Objective Clear?

-eg multiple topics, no clear question at hand

-rhetorical statement or pure critique- no problem/issue of contention, biased, or no proposal

The objective is clear- to see if the IPP process should be reopened.

3. Does the Author Show Adequate Background Research to Understand the Topic?

-Has the author moved beyond asking basic questions to building on existing knowledge?

-Has the author located the frontier of knowledge, finding a topic that does not yet have a clear answer?

You are missing the variables in the equation, particularly how/if the projected surplus will happen, but also the potential projected costs of renewables.

3. Is the Scope Appropriate and Feasible for the Output and Time Available?

-too general or too narrow

-feasibility unclear

-inconsistent literature vs. problem identified

The project is feasible.

4. Does the Author present the Key Paradigms, or possible Answers, to the Question?

- Does their discussion follow as logical answers to the research question?
- Do they find key literature that falls into each category?
- Do they identify the major variables that explain why different authors have reached different conclusions?

There are other potential paradigms, but this seems like a reasonable list for the time and space available.

5. Is there a Review of Potential Data Sources?

- Are the data readily available?
- Are there both quantitative and qualitative data?
- Are the data likely to help answer the research question?

Missing

6. Does the Annotated Bibliography Seem Complete?

- Does there seem to be a representative sample of the relevant works?
- Are all the major literature and logical perspectives considered?
- Are the entries divided into paradigmatic categories?
- Are there notes and categories of the literature included with the paper?
- What does the bibliography indicated about the topic?

Well done

6. Other

Good starting point- clean up the missing factors above and you will have a great foundation for a solid writing sample.

Grade: A-

Late Penalty: