

Policy issues relevant to the BCUC Inquiry Respecting Site C

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Rick Hendriks, Director

Camerado Energy Consulting

UBC Program on Water Governance

The Program on Water Governance is co-hosted by UBC's Department of Geography and Institute for Resources, Environment, and Sustainability. Dr. Karen Bakker, Professor and Canada Research Chair at the University of British Columbia, is the Co-Director of the Program, which has a mandate to conduct research to inform public policy debates. Dr. Bakker commissioned the submissions which we have filed with the BCUC. Due to a pre-existing travel obligation, Dr. Bakker could not be here in person, and sends her regrets.

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Outline

1. Employment
2. GHG emissions
3. LNG load forecast
4. Electrification

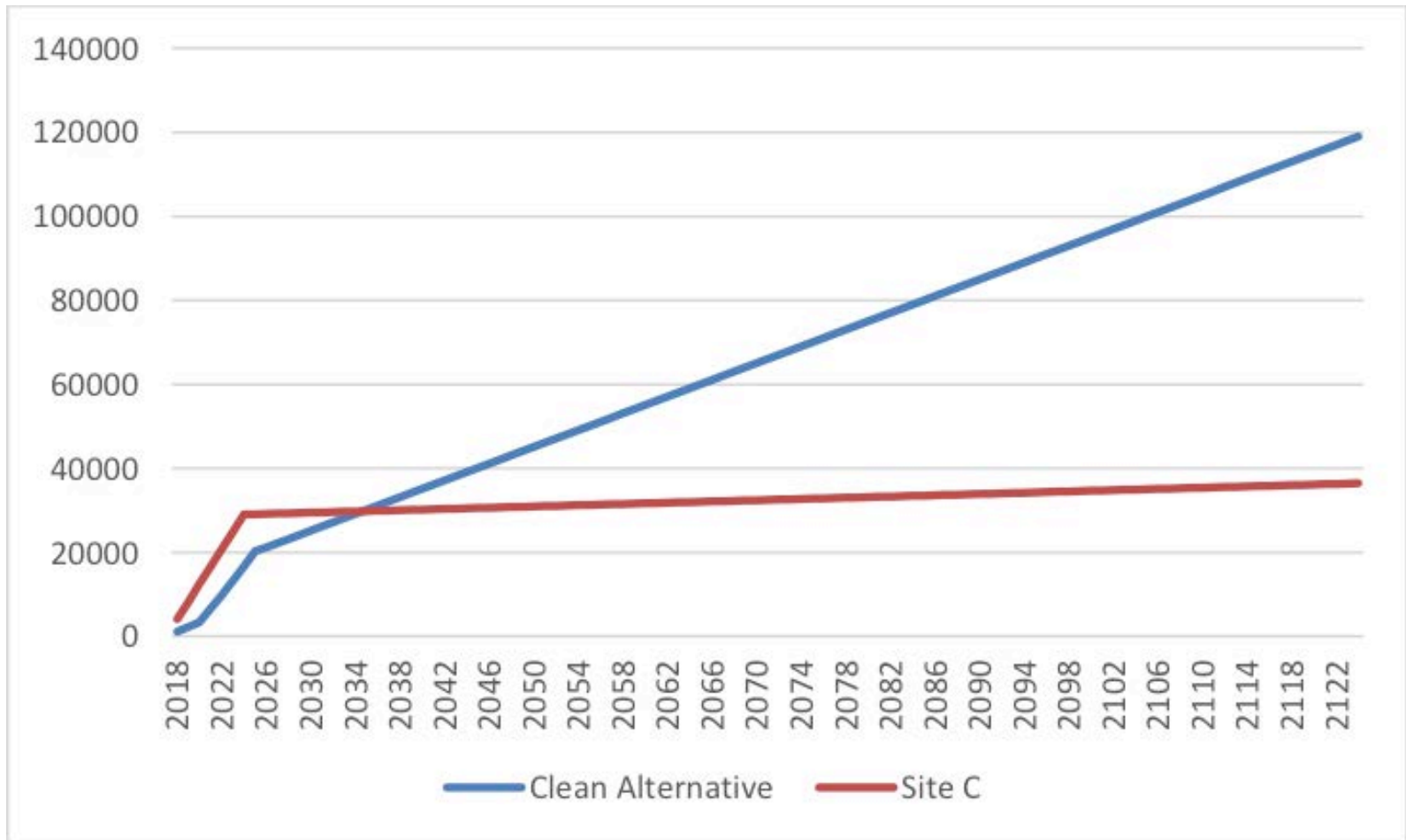
Employment

- The Panel must advise on the “implications” of continuing, suspending or completing Site C
 - “Given the energy objectives of the *Clean Energy Act*, what if any other portfolio...”:
 - **(k) to encourage economic development and the creation and retention of jobs**

Portfolio employment (person-years)

	Clean Alternative	Site C Project
Construction (total)	30,788	44,249
Construction (remaining)	30,788	33,187
Operations (per year)	998	74
Total to 2030	24,346	33,631
Total to 2050	42,263	34,371
Total to 2094	97,155	38,367

Employment – Summary (cumulative)



GHG Emissions

- Inquiry Terms of Reference
 - Alternative portfolio requires “...*maintenance or reduction of 2016/17 greenhouse gas emission levels*”
 - Not applied to Site C, which has emissions
 - Include social cost of Site C emissions

Site C GHG emissions benefit – Appendix G

		Site C energy in BC	Site C energy exported	Total
Generation (100 years)	(GWh)	476,300	33,700	510,000
Avoided GHGs – Clean portfolios	(kt)	19,000	15,000	34,000
Avoided GHGs – Clean+thermal portfolios	(kt)	61,000	15,000	76000

Comparing Options

- Assumes Site C emissions are 0 Mt
- Site C GHG emissions (100 years)
 - “Likely” 4.3 Mt
 - “Conservative” 5.8 Mt
- Used Appendix Q portfolios
 - No MSW generation
 - Updated surplus energy generation
- Updated the WECC emissions intensity

GHG emissions – Summary

Scenario	Site C Domestic GHG Reductions	Site C Export GHG Reductions	Site C GHG Emissions	Total GHG Reductions (Increase)
Site C “likely” emissions	0	3,713	-4,300	(587)
Site C “conservative” emissions	0	3,713	-5,800	(2,087)

Forecast load for LNG

- **What has changed or will change in future years that will favour development of BC LNG exports over LNG exports from competing regions?**
 - Cannot conclude that any LNG will proceed
 - Included Tilbury and Woodfibre in our modelling

Electrification

- Panel's request:
 - “identify any potential downside risks to the load forecast”
- F1-1 Table 20 – Benefit of Site C continuation
 - Base case - \$7.3 billion benefit
 - Electrification case - \$11.1 billion benefit

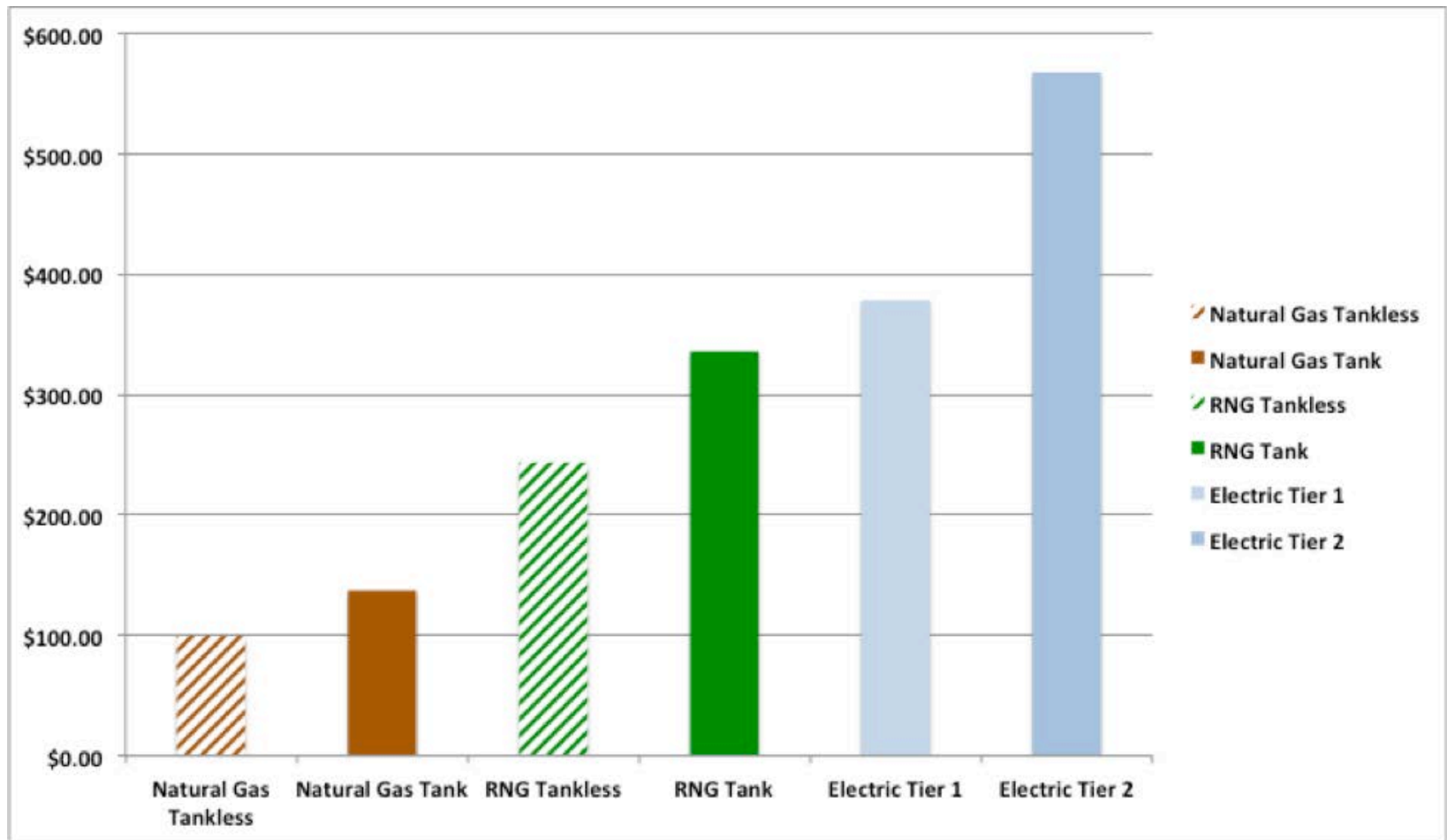
Low-carbon electrification

- Low-carbon electrification
 1. Decarbonizing electricity generation
 2. Using decarbonized electricity
- Electrification is **a part of** decarbonization
 - Began with the 2007 BC Energy Plan
 - **Away from least-cost planning**
 - Contributes to – and will continue to contribute to
 - rate increases

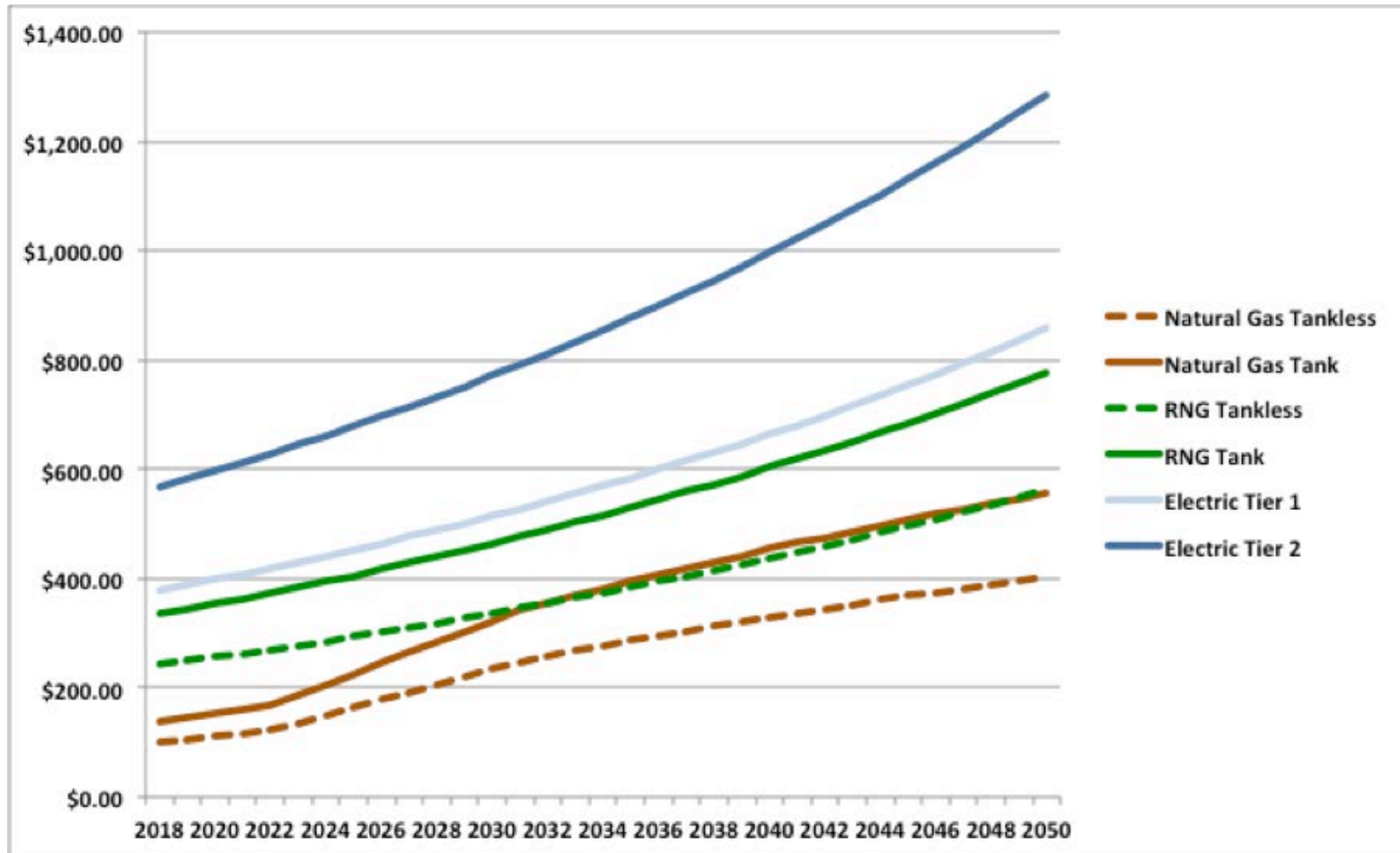
Electrification 2020-2040 (TWh/year)

	GHG Price	Natural Gas Price	TWh/year
MKJA Study	Low	Low	10
	Mid	Low	17
	Mid	Mid	20
	High	High	30
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BC Hydro	Mid – load forecast		17
	Electrification forecast		40

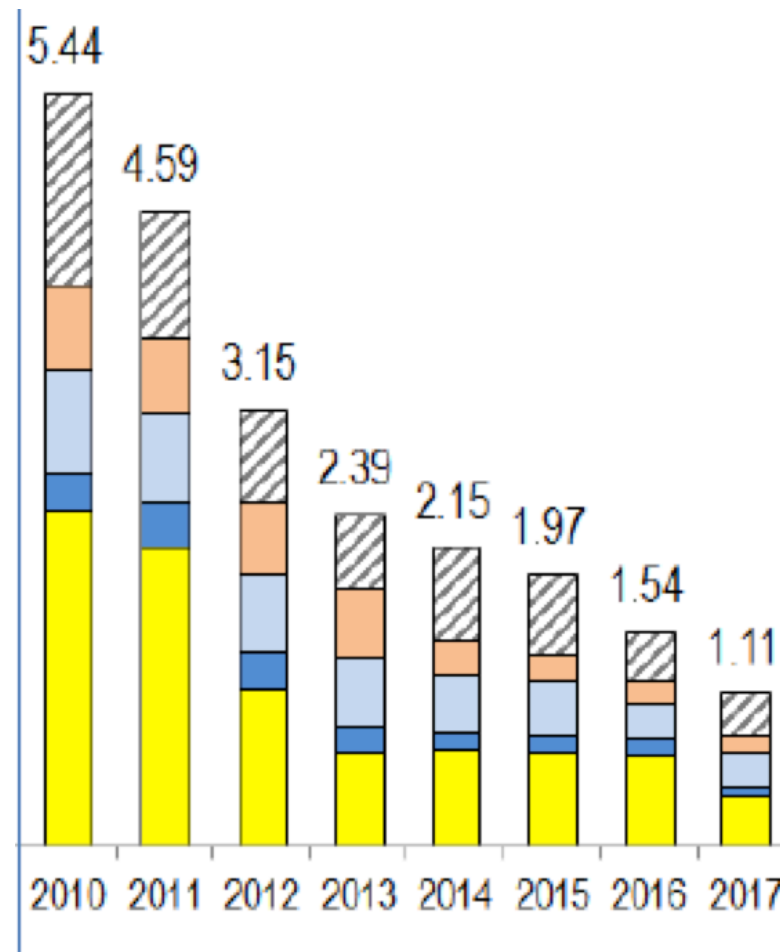
Disruption – Water heating (2018)



Disruption – Water heating (to 2050)



Single-axis tracker (NREL 2017)



Power-to-gas

