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Revisiting the Economic Case for Site C: Appendix

AUGUST 30, 2017

The following is an appendix to *Revisiting the Economic Case for Site C: Submission to the BC Utilities Commission Inquiry Respecting Site C*,¹ published August 30, 2017 by Marc Lee, Senior Economist, Canadian Centre for Policy Alternatives, BC Office. The content that follows was originally published in 2012 Climate Justice Project report by John Calvert and Marc Lee, *Electricity, Conservation and Climate Justice in BC: Meeting Our Energy Needs in a Zero-Carbon Future*.²

APPENDIX: SPEAKING ELECTRIC

In this paper, we are interested in electricity in BC, most of which is provided by BC Hydro. *Electricity* is a type of *energy* that travels down wires to our homes and other buildings. Electricity is typically created by spinning a turbine with steam, water or wind, and can be made from renewable sources (like hydro power) or by burning fossil fuels. Energy is a broader concept that includes generating electricity, but also the burning fossil fuels (oil, gas and coal) to power our vehicles, heat our buildings and so forth. As we seek to reduce greenhouse gas emissions causing climate change, we will need to produce more electricity to power our energy needs without burning fossil fuels.

Electricity terminology and measurement can be challenging for many people to follow. For households, the basic unit on BC Hydro bills is the kilowatt-hour (kWh), which is the amount of energy it takes to light a 100-watt bulb for 10 hours. Residential consumers in BC, for example, pay 6.67 cents per kWh for the first 1,350 kWh over a two-month period, and 9.62 cents per kWh for consumption above that threshold.

¹ <https://www.policyalternatives.ca/publications/reports/revisiting-economic-case-site-c>

² <https://www.policyalternatives.ca/electricity-justice>

Broader system-wide measurements are in bigger units. The cost of energy purchased by BC Hydro is priced in dollars per megawatt-hour (MWh). One MWh is equal to 1,000 kWh and is approximately the energy requirement of one BC home for one month.

On an annual basis, the total amount of power provided by BC Hydro is measured in gigawatt-hours (GWh). A GWh is 1,000 MWh, and is an amount that would power 90 BC homes for a year.

Capacity to produce electricity in power plants is generally rated in megawatts (MW). Some small renewable options may only have one MW (that is, at peak capacity they can produce 1 MWh per hour, though they may not be near peak capacity much of the time). At the other extreme, the WAC Bennett dam has a capacity of 2,730 MW, and produces 14,179 GWh per year.

KWh, MWh and GWh are measurements of the amount of energy we use, like the amount of gasoline in a car's gas tank. On the other hand, MW is a measure of the instantaneous ability of the electricity system to generate this energy, like the size of a car's engine. Both these measures are important in understanding our electricity system works. To function successfully, an electricity system must have sufficient energy (GWh) to meet customer needs, while being able to supply it when customers need it (MW).

Energy measurements are also made in Joules (J, which is one Watt per second). Natural gas bills are typically priced in dollars per billion joules (gigajoules or GJ). One MWh is equal to 3.6 GJ. For the BC economy as a whole, total energy use is reported in petajoules (PJ). One PJ equals one million GJ.