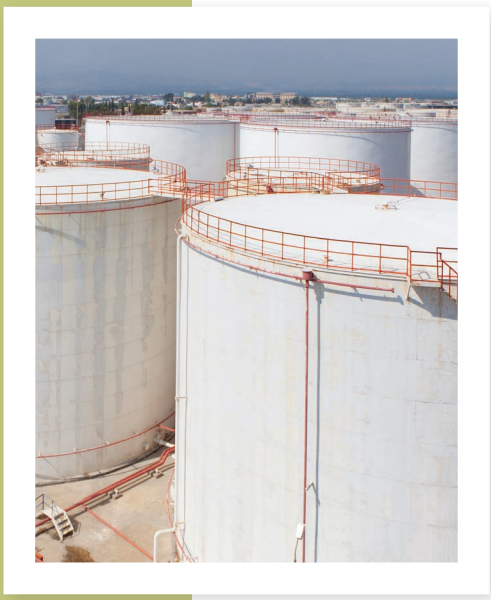
LNG Reality Check Series



A Clear Look at BC LNG

Energy security, environmental implications and economic potential

Download the full report at: policyalternatives.ca/clear-look-BC-LNG

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CCPA
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SUMMARY

LIQUEFIED NATURAL GAS (LNG) exports from the west coast of Canada have been heralded as economic salvation for the province of British Columbia. This report undertakes a reality check that reveals several major problems with this narrative, both in the stewardship of finite non-renewable resources by provincial and federal governments, and in the environmental implications of large-scale development.

Canada's long-term energy security may be compromised by LNG export plans:

- The National Energy Board has a mandate to ensure Canadian domestic supplies are met before approving exports, but is failing to do its job.
- The NEB has, to date, approved 12 terminals with a total capacity of 251 trillion cubic feet (tcf) of LNG exports over 20-25 years. However, the NEB's own modeling shows that only a small percentage of that amount—18 tcf—is available for export, even with a three-fold ramp-up in BC production.
- Medium to high levels of LNG exports from BC would require Canada to become a net importer of natural gas, simply to meet domestic needs.

The BC government's claims of available gas supplies for export are greatly exaggerated:

- The BC Oil and Gas Commission estimates BC's raw gas reserves at 42.3 tcf, with a total "marketable resource" of 442 tcf. (*Reserves* have been proven through drilling or are close to drilled areas, and are considered recoverable with current technology and economic conditions. *Resources* are much less certain, as they are probabilistic estimates based on broad extrapolations with limited drilling.)
- The BC government has publicly stated that marketable resources are six times higher than the Commission's estimate: 2,900 tcf available for export. This is not a credible claim.
- The amount of gas that must be produced at the well head is considerably greater than the amount that would be sold, due to losses in the conversion of raw gas to marketable gas, and to gas consumed in the extraction, liquefaction and transportation processes. About 1.44 units of raw gas must be extracted to deliver 1 unit to Asia.

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Were the BC government to realize its hoped-for export target, the scale-up in drilling and associated infrastructure required would be massive, and would fundamentally alter the landscape of northern BC:

- The gas required for export would come mainly from fracked wells in BC's Northeast. (Almost all of BC's future gas production is expected to involve fracking, which requires much more water and produces much more greenhouse gas emissions than conventional drilling).
- An extraordinary 37,800 to 43,700 new wells would need to be drilled by 2040, more than doubling to nearly tripling the number of wells drilled since 1954 in northeast BC.
- BC gas production would need to increase by four to five times. This would require the production of between 4.1 and 4.6 times BC's current proven raw gas reserves of 42.3 tcf by 2040.

A major public concern is the amount of water and the chemicals and other additives used in the fracking process, as well as the potential for contamination of surface water through surface casing failures and improper disposal of fracking wastewater:

- The rate of water consumption is a function of the play (area) the wells are drilled in. About 25 million gallons of water per well are required in the Horn River Basin, from which a large portion of BC gas will be sourced.
- This requires some 2,300 truck trips per well, followed by a further 700 truck trips to remove the fracking waste water produced in the process.
- In the BC government's proposed export target, water consumed in the ramp-up phase of drilling would equal about 22,000 Olympic-sized swimming pools per year, or about half of the annual consumption of Vancouver or Calgary.
- While the BC government has argued that water use will be a very small amount of the *total* runoff in northern BC, actual water use will be much more localized and therefore comprise a much larger proportion of available surface water in each drilling area.

- Water supply impacts can vary markedly with the seasons, with increased stress during dry periods or droughts.

The BC government is understating the amount and intensity of land disturbance and water consumption in the development of upstream supply for LNG exports:

- Land use disturbance is significant, and includes well pads, roads, pipelines and facilities. It also includes seismic impacts.
- The target export scenario would see 4.2 per cent of the land area in the Horn River and Montney plays disturbed.
- As with water, land disturbance will be concentrated in the plays being exploited, and not spread out over the entire northeastern BC landscape.

Exporting BC LNG will not reduce global greenhouse gas emissions:

- LNG is an energy-intensive way to move gas, requiring some 20 per cent of the gas to be consumed in the liquefaction, transport and regasification process (assuming gas-drive facilities which are the most common).
- From wellhead to final combustion, there are substantial leakages of methane, a much more potent greenhouse gas than CO_2. Given this, liquefied fracked gas from BC actually has GHG emission rates similar to coal.
- Contrary to the notion that BC LNG would be "doing the world a favor" by displacing coal use in Asia, BC LNG exports to China would increase GHG emissions over at least the next fifty years, compared to building state-of-the-art coal plants. Considered on a 100-year basis, burning imported LNG would provide only a marginal improvement compared to best technology coal.

There are considerable risks to companies entering BC's nascent LNG industry.

- Chief among them are the potential for rising domestic gas prices and lowering international prices, eliminating the arbitrage needed to pay off the multi-billion dollar investments required.
- The structure of BC's LNG Tax, recently halved, means that British Columbians, the public owners of the resource, will not see peak revenue flows until these capital investments are paid off, making them the back stoppers of these risks, as well as the recipients of the impacts on public infrastructure and the environment.
- It is unlikely that anything close to the revenue projected by the BC government for its coffers will ever be realized.

Oil and gas represent a one-time legacy that underpins virtually every aspect of modern society. Notwithstanding the desirability of replacing fossil fuels with lower emitting alternatives, it is highly likely that fossil fuels will be needed at some level for the foreseeable future. Canada and British Columbia have adopted a *de facto* strategy of liquidating these resources as quickly as possible in the name of the economic prospects of the government of the day. These resources are precious, non-renewable and come with collateral environmental impacts. They demand more balanced stewardship in view of the needs of future generations of Canadians.

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This paper is part of the Climate Justice Project, a research alliance led by the CCPA-BC. The Climate Justice Project studies the social and economic impacts of climate change, and develops innovative green solutions that are both effective and equitable. Thanks to Vancity for its support of the project, and special thanks to the Vancouver Foundation for its financial support of the LNG Reality Check series.

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Hughes has published widely in the scientific literature and his work has been featured in *Nature*, *The Economist*, *LA Times*, *Bloomberg*, *USA Today* and *Canadian Business*, as well as other press, radio, and television. Most recently he published *Drilling Deeper: A Reality Check on U.S. Government Forecasts of a Lasting Shale Gas and Tight Oil Boom*, which is an in-depth review of major U.S. shale gas and tight oil plays, including forecasts of future production. This was preceded by *Drilling California: A Reality Check on the Monterey Shale*, which critically examined the U.S. Energy Information Administration's (EIA) estimates of technically recoverable tight oil in the Monterey Shale, and predicted the subsequent 96% downgrade of tight oil resources. In early 2013, Hughes authored *Drill, Baby, Drill: Can Unconventional Fuels Usher in a New Era of Energy Abundance?*, which took a far-ranging look at the prospects for various unconventional fuels to provide energy abundance for the United States in the 21st century. Over the past decade, he has researched and lectured widely on global energy and sustainability issues in North America and internationally.