-----Original Message-----
From: EOIN FINN <email address removed>
Sent: March 2, 2016 2:54 AM
To: Woodfibre LNG / GNL Woodfibre (CEAA/ACEE)
Cc: Catherine.McKenna@parl.gc.ca; Jonathan.Wilkinson@parl.gc.ca; Pam.Goldsmith-Jones@parl.gc.ca
Subject: Woodfibre LNG: I oppose it

To: The Honourable Catherine McKenna, Minister of Environment and Climate Change CEAA – Woodfibre@ceaa-acee.gc.ca
CC: Pamela Goldsmith-Jones, MP, Parliamentary Secretary to the Minister of Foreign Affairs Jonathan Wilkinson, MP, Parliamentary Secretary to Minister of Environment Climate Change My Sea to Sky

Re: Woodfibre LNG – Public Comments Invited [February 9 th to March 1 st , 2016] Please accept my comment on the analysis of the anticipated GHG emissions associated with the proposed Woodfibre Liquefied Natural Gas [LNG] Project in the Report named 'Woodfibre Liquefied Natural Gas [LNG] Project – Review of Related Upstream GHG Estimates'.
The CEAA GHG Report dated February 1 st , publicly available February 9 th , for Public Comment until March 1 st , 2016: http://www.ceaa.gc.ca/050/documents/p80060/104688E.pdf
I oppose the Woodfibre LNG Project in Howe Sound due to increased GHG emissions that will create a significant adverse environmental impact.
Reasons for my opposition include:

* The facts outlined about GHG emissions in the letter attached. Recent science has suggested that LNG is , wellhead to burner tip, dirtier than coal, and a bridge fuel to nowhere.
* Canada's COP21 commitment to reduce GHG emissions will be compromised should the Woodfibre LNG project be approved. It must not be approved.
* The Woodfibre LNG project will emit about 1 million tonnes of GHGs per year - increasing Canada's overall GHG footprint at a time when GHG reduction is a pivotal commitment for Canada.
* The Report fails to consider the negative environmental impact of fugitive methane gases in its scope. Recent peer reviewed scientific studies have highlighted the underestimation and the importance of fugitive methane gases in the overall GHG footprint of LNG projects.
* Not factored into the Report is the increasing GHG footprint and its associated environmental degradation with mining more environmentally challenging Natural Gas resources over time.
* Current Research identifies that the 100 year GWP [Global Warming Potential] factor used in the Report, is out of date . The responsible measure is the much larger 20 year GWP factor supported by science.
* Inconsistent with current, and likely future, practice is the assumption of a 75%:25% BC:Alberta proportion of source gas. This underestimates the resulting GHG emissions.
* The Report suggests that Carbon Capture and Storage [CCS] is imminent. To date, the economics and technologies of CCS have proven a fruitless effort, at ongoing public expense. Though there are some promising technologies - none are at the proven operational stage.

Climate change is dangerous. GHG emissions accelerate climate change. Refuse Woodfibre LNG !

Signature: Eoin Finn, Researcher, My Sea to Sky, Howe Sound, BC _ Date: March 1st, 2016

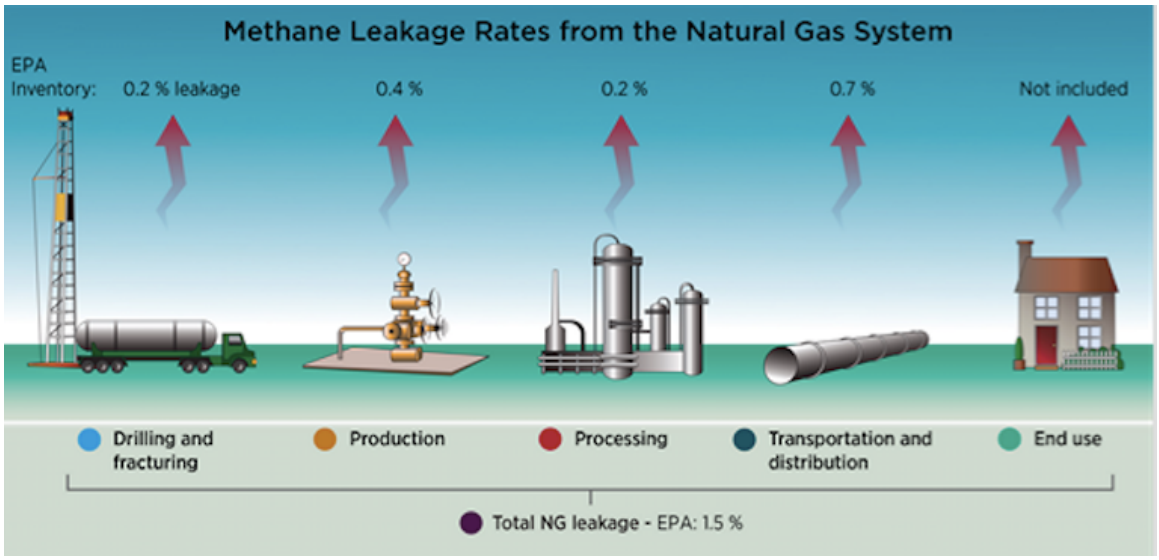
LNG is not "the cleanest fossil fuel on the planet"

Eoin Finn, B.Sc., Ph.D., MBA

Only if you had been banished from BC would you have missed the claim by the BC Government, repeated over and over in the past three years, that Liquefied Natural Gas is "the cleanest fossil fuel on the planet". "Cleaner than coal", "will clean up China's air", "part of the climate change solution", say LNG's avid cheerleaders. Trouble is – none of these claims is true - and the BC Government knew it three years ago.

Back in 2013, the BC Government's Climate Secretariat paid $16,000 of taxpayers' money to a Calgary consulting firm to prepare a report about greenhouse gas (GHG) emissions from natural gas exploration, fracking, pipelining and liquefaction. It was published in May of that year – the same time a long list of promises about the benefits of developing an LNG industry in BC became key to Liberal Premier Clark's election platform. The report had sobering things to say about the climate-changing effects of LNG emissions around the world, and BC's LNG in particular. Unsurprisingly, the report didn't see the light of day until much later, and has been wilfully ignored ever since.

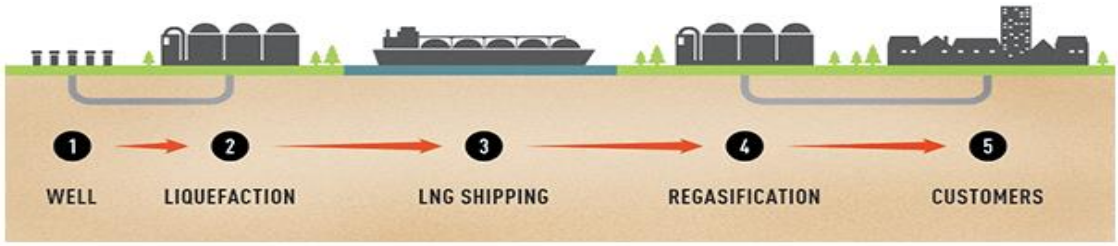
However, climate change has propelled the subject of LNG emissions back into the spotlight. The new Government in Ottawa has added a climate test for all fossil-fuel projects, including BC's 20-plus LNG proposals, all of which had excluded climate effects from their environmental assessments. Although natural gas (methane) is a clean-burning fuel, when it is leaked into the atmosphere as uncombusted methane, it is a highly potent greenhouse gas (86 times more potent than CO_2 measured over 20 years). That makes even small leaks a significant concern. And, as shown in U.S. studies (illustrated in the EPA diagram below), there are significant leaks in all parts of the gas extraction, cleansing and distribution chain.



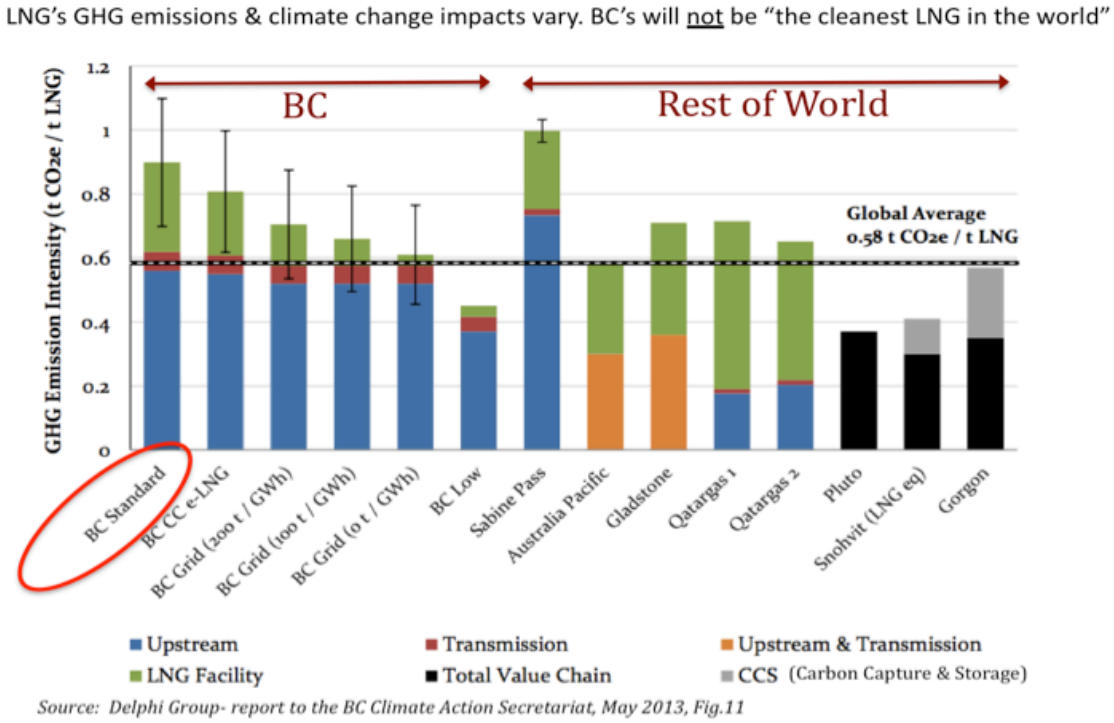
Source: http://www.carbonbrief.org/are-we-underestimating-natural-gas-emissions

The LNG lifecycle (pictured following) starts in the fracking fields of Northeast BC where the gas is extracted by fracking. That brute force technique uses fracking fluids, water and sand to shatter the shale formations and release the gas. From

wells there, it is piped to cleansing stations, where the by-product gases (CO_2, propane, pentane etc.) other than methane are removed - the CO_2 is vented and the others flared off. From there, the gas is sent via pipelines using gas-powered compressor stations to a liquefaction plant, chilled to a frosty -162^{0}C, and loaded into tankers for shipment to (mostly) Asia, where it is regasified for (mostly) industrial uses.



The 2013 Climate Secretariat report concluded that all parts of this chain leak methane - significantly more than industry admits. For power, the chain also burns the methane to CO_2 and produces huge amounts of GHGs into BC's air. The wells, pipeline compressor stations and liquefaction plants will all be powered by cannibalizing the fracked gas supply – over 20% of it. That combustion will release plumes of planet-warming CO_2 (BC's proposed 20 million tonne LNG plants will each

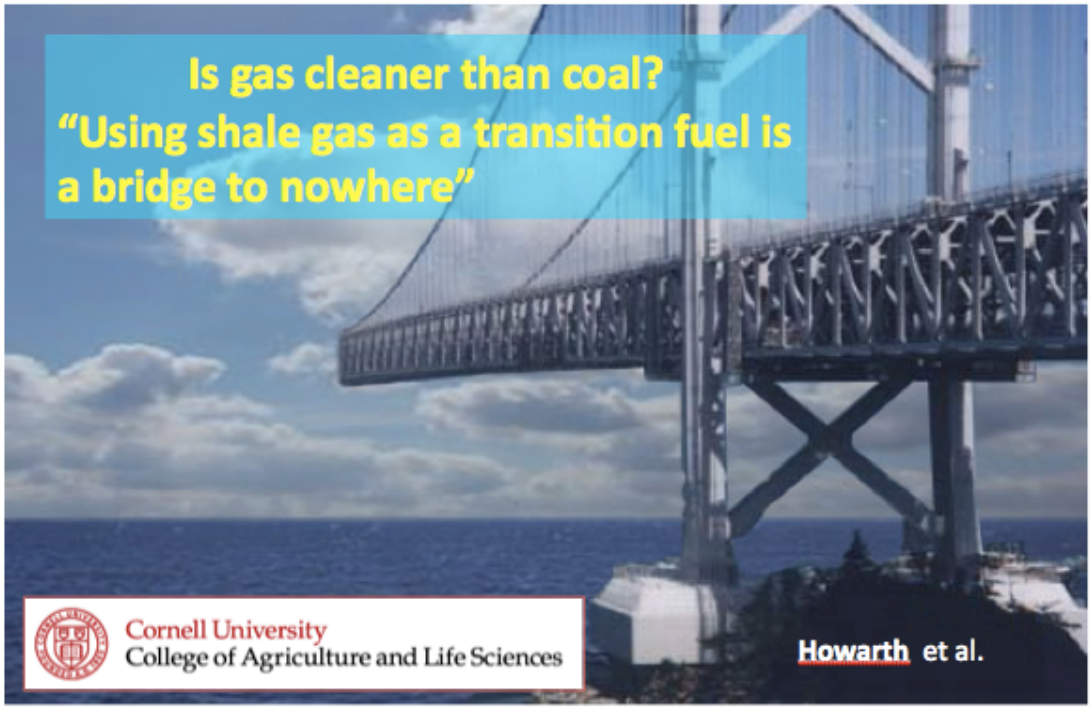


Source: Delphi Group- report to the BC Climate Action Secretariat, May 2013, Fig.11

emit over 5 million tonnes of it annually- 9% of BC's total emissions) –adding hugely to the effects of the methane leaks along the way. The report shows (above) that, when upstream, transmission and liquefaction leakages and emissions are combined, BC's gas-powered LNG ("BC-standard") would release significantly more GHGs than most others, worldwide. Even grid-powered LNG production ("e-LNG") would exceed the global average and be a significant contributor to global warming,

and only one small LNG plant (Woodfibre LNG in Howe Sound) will be grid-powered, but will still emit 150,000 tonnes of direct GHGs annually.

These figures – which do not include downstream burning and leakage emissions - make BC's LNG a worse climate changer than coal over a full wellhead-to-wheels lifecycle analysis. Cleaner-burning- yes - but not "cleaner" overall. Promises to make Beijing's air cleaner would be possible but for the fact that China is far busier pursuing renewable energy than switching-out existing coal-powered plants for new LNG ones. And, were that to happen, BC's air quality would be made significantly worse. From that perspective, LNG seems a bridge to nowhere., as peer-reviewed scientific research at Cornell University has established.



Source: http://www.acsf.cornell.edu/Assets/ACSF/docs/attachments/Howarth-EtAl-2011.pdf

For "direct" emissions from the downstream LNG plants, BC has set an emission intensity guideline of 16%– 16 tonnes of CO_2 emitted for every 100 tonnes of LNG produced. As most plants will exceed 28% intensity, the 16% is an "aspirational" guideline – these plants will pay a penalty of roughly $17.70 for every tonne of the excess. This might seem an incentive to go electric, but is not, because burning its own gas to generate power is a far cheaper alternative than capturing the CO_2 (currently costing around $100-plus per tonne), or using grid electricity to power the plant (BC Hydro grid power rates are 2-3 times costlier than using onsite gas turbines to generate power. These rates are subsidized by BC Hydro's residential customers).

Clearly, BC's nascent LNG industry has a long way to go before it can pass any reasonable climate test. So says peer-reviewed science. The current swan-dive of the economic fundamentals of the LNG industry worldwide will give it time to clean up its climate act. Whether that can happen before our inevitable transition to renewable energies renders LNG obsolete, is questionable. Our LNG-cheerleading provincial government needs to ponder this as it meets with the PM this week.