

April 30, 2014

Expert Panel on Hydraulic Fracturing in Nova Scotia  
The Verschuren Centre, Cape Breton University

Dear Dr. Wheeler and Expert Panel,

**Re: Fracking, greenhouse gasses, and climate change**

Some of what I have to say comes from studying the resources posted on your website, so I would like to start by acknowledging, with appreciation, both the transparency of the process you have chosen, and the opportunity to provide this input for your consideration.

I have two main points, both focussed on greenhouse gas (GHG) emissions and climate change. My first point is that this is a problem that your review seems unsure about how to address. Although it is the single greatest environmental threat we face, the review appears narrowly concerned only with local environmental impacts. The minutes to your January meeting set out the review's "super-arching" questions:

1. Does this technology work and is it being done safely to the satisfaction of communities anywhere?
2. Could this technology work and could it be done safely to the satisfaction of communities in Nova Scotia?

Then:

Important questions that remain include: How will we incorporate climate change mitigation as part of the external context?

I looked for an answer to this last question in the minutes to your February meeting but did not find one. I hope that I am mistaken but this seems to suggest an unnecessarily limited interpretation of your mandate. Are communities, in your view, safe from the impacts of climate change? Is climate change mitigation therefore just a remaining question after hydraulic fracturing is, or is not, otherwise considered safe?

Perhaps you are persuaded that the problem of climate change is beyond your contractual mandate. Although the contract with CBU does not specifically require consideration of GHG emissions or of climate change (an oversight that also begs explanation), it *does* say that you have an independent mandate and that "the process will be conducted within the context of the province's energy strategy and *Environmental Goals and Sustainable Prosperity Act*," which *does* have specific targets for GHG emissions.

If the review regards climate change just as an "important question that remains" and "part of the external context" rather than as a central concern, this would

render the rest of my submission peripheral to the review. However, assuming that you consider this topic relevant, I will proceed.

My second point is to challenge the notion that natural gas is a relatively clean “bridge” fuel needed to wean us from coal to renewables. I am not going to prove that it isn’t. I just want to add my voice to the chorus of experts who think that this assumption is based on some tenuous assumptions that have not been proven.

The Ecology Action Centre’s comprehensive report *Leave it in the Ground*<sup>1</sup> conveniently makes many of the arguments I was going to make so I will just summarize them briefly here:

- leaks of methane from fracked natural gas wells and the distribution system are far greater than industry experts would have us believe<sup>2,3,4,5,6,7</sup>
- as a greenhouse gas, methane traps 86 times more heat than CO<sub>2</sub> over a 20-year period<sup>8</sup>
- some estimates suggest higher life-cycle GHG emissions from fracked natural gas relative to coal, especially over shorter time horizons<sup>6,9</sup>
- shale gas development may delay or stall the transition away from coal.

Finally, I want to draw your attention to three issues that provide perspective on the threat that fracking poses for greenhouse gas emissions and climate change.

### 1. Industry spin

Where does the assertion that natural gas is a suitable transition fuel come from? Another document on your website is a response by Triangle Petroleum<sup>10</sup> to a critique of fracking by NOFRAC<sup>11</sup>. (As you are aware, Triangle is the company whose exploratory fracking near Windsor helped spark the current debate in Nova Scotia, and NOFRAC is the coalition of opponents to fracking in Nova Scotia.) On page 3 of Triangle’s response, they say:

While natural gas is not a renewable energy source, it is recognized as a transition fuel to replace coal in the short/medium term. Natural gas generates significantly less (50-70%) GHG emissions than coal on a combustion basis.

Note that the GHG emissions of natural gas are being compared with those of coal “on a combustion basis.” By referring *only* to the effect of combustion, the comparison ignores all the unintended *life-cycle* emissions of methane between exploration and the end use (combustion). My point here is not that these unintended emissions may tip the balance in favour of coal (a point made by *Leave it in the Ground* which I promised not to repeat), but to raise a serious question: Why do industry experts try to mislead us by selectively presenting only part of the truth?

### 2. Methane as a short-lived greenhouse gas

We know that methane is a more potent greenhouse gas than CO<sub>2</sub> but how much more potent is it? In its latest report the IPCC<sup>8</sup> revised the estimates upwards but

there is also a time dimension to this potency. Methane breaks down and disappears over decades while CO<sub>2</sub> sticks around for centuries. So the shorter the time horizon, the more potent methane is, both absolutely and relative to carbon dioxide. This is important because it is becoming more likely, with every year of delay in mitigation, that the 2-degree threshold will arrive well before the 100-year horizon usually assumed in assessing the global warming potential of methane. The point of mitigation is to avoid triggering a vicious cycle of warming and melting leading to “runaway” climate change. As the risk of this occurring moves forward, the risk posed by atmospheric methane increases.<sup>12</sup>

### 3. There are alternatives

Although consideration of other sources of energy (and prosperity) is not in your report structure, and may not be in your mandate, I know that you are well aware of these alternatives and of the rich opportunities available in Nova Scotia. The external context is that with the right policies we can develop enough renewable energy to transition away from fossil fuels. We have already shown that it works and is being done safely to the satisfaction of communities in Nova Scotia. We do not need to discover more natural gas so we do not need fracking, especially considering the risks entailed.

In conclusion, this is a plea to consider climate change as a risk to the safety of communities everywhere, and to dismiss as unproven the contention that we need fracked natural gas to help reduce GHG emissions.

Sincerely,

Jay Ross  
Antigonish, NS  
jayross@eastlink.ca

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<sup>1</sup> Ecology Action Centre, 2014. Leave it in the Ground: Impacts of Fracking in Nova Scotia. EAC, Halifax. [https://www.ecologyaction.ca/files/images-documents/press\\_releases/2014%20EAC%20Submission%20FINAL.pdf](https://www.ecologyaction.ca/files/images-documents/press_releases/2014%20EAC%20Submission%20FINAL.pdf)

<sup>2</sup> Nikiforuk A, 2013. Shale Gas: How Often Do Fracked Wells Leak? The Tyee. January 9, 2013. <http://thetyee.ca/News/2013/01/09/Leaky-Fracked-Wells/>

<sup>3</sup> Miller S, Wofsy S, Michalak A, et al., 2013. Anthropogenic emissions of methane in the United States. Proceedings of the National Academy of Sciences of the United States of America. <http://www.pnas.org/content/early/2013/11/20/1314392110.abstract?tab=author-info>

<sup>4</sup> Brandt A, Heath G, Kort E, et al., 2014. Methane Leaks from North American Natural Gas Systems. Science 343: 6172, 733-735. <https://www.sciencemag.org/content/343/6172/733>

<sup>5</sup> Tollefson J, 2013. Methane leaks erode green credentials of natural gas, Nature 493, 12 (January 3, 2013), <http://www.nature.com/news/methaneleaks-erode-green-credentials-of-natural-gas-1.12123>

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<sup>6</sup> Hughes JD, 2011. Life Cycle Greenhouse Gas Emissions from Shale Gas Compared to Coal: An Analysis of Two Conflicting Studies, Post Carbon Institute.  
<http://www.postcarbon.org/reports/PCI-Hughes-NETL-Cornell-Comparison.pdf>

<sup>7</sup> Karion A, Sweeney C, Pétron G, et al., 2013. Methane emissions estimate from airborne measurements over a western United States natural gas field. *Geophysical Research Letters* 40(16):4393–97. <http://onlinelibrary.wiley.com/doi/10.1002/grl.50811/pdf>

<sup>8</sup> Intergovernmental Panel on Climate Change, 2013. *Climate Change 2013: The Physical Science Basis*. (Table 8.7, p 714). <https://www.ipcc.ch/report/ar5/wg1/>

<sup>9</sup>Howarth R, Santoro R, Ingraffea A, 2011. Methane and the Greenhouse Gas Footprint of Natural Gas from Shale Formations. *Climatic Change* 106:679 - 690.  
<http://link.springer.com/article/10.1007%2Fs10584-011-0061-5>

<sup>10</sup> Hill PJ, 2013. Reality and Opportunity – Nova Scotia Future Energy Requirements, the Role of Shale Gas Developments. Open letter to the Nova Scotia Hydraulic Fracturing Review.  
<http://www.cbu.ca/sites/cbu.ca/files/docs/hfstudy/REALITY%20AND%20OPPORTUNITY%20%28May%203%202013%29.docx%20FINAL.docx>

<sup>11</sup> NOFRAC, 2013. Out of Control – Nova Scotia’s Experience with Fracking for Shale Gas  
<http://nofrac.files.wordpress.com/2013/04/out-of-control-full-report.pdf>

<sup>12</sup> Smith SM, Lowe JA, Bowerman NHA, et al., 2012: Equivalence of greenhouse-gas emissions for peak temperature limits. *Nature Climate Change* 2:535–538.  
<http://www.nature.com/nclimate/journal/v2/n7/full/nclimate1496.html>