

## Climate Change PBL #8: Fracking

B.C.'s multi-billion dollar shale gas industry is booming. Two large northeast B.C. deposits could sustain 100 years of supply at current levels of demands, a "game changer," according to the Canadian Association of Petroleum Producers. However, the controversial drilling practice used to extract shale gas, horizontal high-volume slick water hydraulic fracturing (commonly known as "fracking"), has drawn wide-spread criticism for its environmental impacts. Provincially, both the Liberals and the New Democrats have supported the industry. In this PBL, you will be tasked to examine the environmental impacts of hydrological fracturing. Could this be a "clean energy" source, as Premier Christy Clarke has suggested? Is the existing regulatory framework sufficient for the scale of the industry? Are the available fracking technologies safe? What are the alternatives?

### Background

The discovery of enormous deposits like the Marcellus shale have led American commentators to place their faith in natural gas as the key to America's energy future. Proponents have claimed natural gas to be a clean, cheap, and readily available energy source. However, the controversial extraction method, "fracking," has worried environmental activists, residents, and law-makers alike.

In essence, the process is as follows: you drill a hole deep down into the earth and pump it with a solution consisting mainly of water, sand, and a chemical solution. The pressure pushes out the gas, which surges back up to the surface along with the wastewater.

However, there have been extensive reports that this toxic wastewater has contaminated local water sources. The documentary film *Gasland* shows some particularly sensational cases, including one man's flammable tap water. The local outcry from such stories prompted a series of investigative pieces from the *New York Times*, *Pro Publica*, the CBC, and other major news sources. Opinions are very divided, and some jurisdictions, like the state of New York, have considered all-out bans. In response, the industry has claimed to have improved their technologies and tinkered with their drilling solutions. However, for competitive reasons, there has been a reluctance to disclose the chemical ingredients of these proprietary solutions. Freshwater contamination has not been the only concern raised by environmental groups. Blow-backs, seismic activity, water consumption, high methane emissions, and other issues have been cited.

Provincially, the government has put their faith in this massively expanding industry, defining it a "clean energy" source. This is significant because that law commits B.C. to get 93 per cent of its electricity from clean energy sources. The government is seeking to have three liquified natural gas plants operating in B.C. by 2020, which could create thousands of jobs and over a billion dollars a year in government revenues, according to some estimates.<sup>1</sup>

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<sup>1</sup> <http://www.theglobeandmail.com/news/british-columbia/bc-liberals-declare-natural-gas-a-clean-energy-source/article4362331/>

## Guiding Question

Because of the large scope of this topic and numerous directions this PBL can be taken, we ask you to choose from one of the following topics to focus your analysis on. However, if you have other ideas or suggestions for directions this topic can be taken, please speak to someone from the teaching team, we are happy to discuss alternatives to the questions below.

### 1. Alternatives to shale gas development

Is this truly a "clean energy" source? Are the existing regulatory frameworks, labour laws, and drilling technologies sufficient to ensure safety? Are the worries about groundwater contamination founded, or over-blown? How do the total greenhouse emissions compare to traditional energy sources, like coal and fossil fuels?

### 2. The benefits for British Columbia

What are the economic benefits to British Columbians? If so, what are the social, political, or environmental costs? Is it worth it? If not, is there an alternative?

Resources (Do NOT directly contact individuals in these organizations).

## Multimedia

The fracking song

[http://youtu.be/timfvNgr\\_Q4](http://youtu.be/timfvNgr_Q4)

"Game Changer," an episode of *This American Life*

<http://www.thisamericanlife.org/radio-archives/episode/440/game-changer/>

Gaslands, a documentary on fracking

<http://topdocumentaryfilms.com/gasland/>

## Investigative Journalism

CBC Series on natural gas development in British Columbia.

<http://www.cbc.ca/daybreaknorth/cornering-gas/>

*New York Times* series on fracking

[http://www.nytimes.com/interactive/us/DRILLING\\_DOWN\\_SERIES.html](http://www.nytimes.com/interactive/us/DRILLING_DOWN_SERIES.html)

*Propublica* series on fracking

<http://www.propublica.org/series/fracking>

*Propublica on fracking in Canada*

<http://www.propublica.org/article/oh-canadas-become-a-home-for-record-fracking>

## **Studies and Reports**

Science

<http://www.sciencemag.org/content/328/5986/1624.full>

An extensive University of Texas study on fracking

[http://energy.utexas.edu/images/ei\\_shale\\_gas\\_regulation120215.pdf](http://energy.utexas.edu/images/ei_shale_gas_regulation120215.pdf)

Scientific American

[http://www.nature.com/scientificamerican/journal/v305/n5/full/scientificamerican1111-80.html?WT.ec\\_id=SCIENTIFICAMERICAN-201111](http://www.nature.com/scientificamerican/journal/v305/n5/full/scientificamerican1111-80.html?WT.ec_id=SCIENTIFICAMERICAN-201111)

Cornell University study on methane emissions related to fracking

<http://thehill.com/images/stories/blogs/energy/howarth.pdf>

US Congressional report on the fracking solution

<http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic%20Fracturing%20Report%204.18.11.pdf>

A report on fracking in the United States

[http://www.netl.doe.gov/technologies/oil-gas/publications/EPreports/Shale\\_Gas\\_Primer\\_2009.pdf](http://www.netl.doe.gov/technologies/oil-gas/publications/EPreports/Shale_Gas_Primer_2009.pdf)

Province of British Columbia's Natural Gas Strategy

[http://www.gov.bc.ca/ener/natural\\_gas\\_strategy.html](http://www.gov.bc.ca/ener/natural_gas_strategy.html)