

BC's Legislated Greenhouse Gas Targets vs Natural Gas Development

The Good, the Bad and the Ugly

IN 2007, BC PASSED THE GREENHOUSE GAS REDUCTION TARGETS ACT, which set targets for the province's greenhouse gas emissions (GHGs): a 33% decrease by 2020, 80% by 2050. This brief provides a reality check on these targets in light of proposals to dramatically increase natural gas production for shipment to Asia as liquified natural gas (LNG).

THE GOOD NEWS: As of 2010, BC's GHG emissions fell by 4.5%, due to a combination of climate policies and a flagging economy. BC would have already met its 2012 interim target of 6% below 2007 levels if not for emissions growth in the natural gas industry.

THE BAD NEWS: The BC government seems determined to break its own law on GHG emissions. This paper analyzes three possible scenarios for emissions growth under BC's *Natural Gas Strategy*, and finds that increased development of fracking and LNG exports will make it virtually impossible for the province to reach its legislated GHG targets.

THE UGLY: BC's targets do not count exports. The total amount of GHGs arising from natural gas production in BC by 2020 (much of it exported and burned in Asia) could range from 167 to 305 million tonnes per year. Increased global emissions would be equivalent to putting 24 to 64 million cars on the roads of the world.

Not only will expansion of the natural gas industry damage our environment and climate, but the economic benefits for ordinary British Columbians are incredibly small. There is still time to change course, as regulatory approvals and final investment decisions have not been made. Moreover, sticking to BC's GHG law would lead to more and greener jobs for British Columbians.

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INTRODUCTION

BC'S GREENHOUSE GAS REDUCTION TARGETS ACT, PASSED IN 2007, requires a 33% reduction in GHG emissions by 2020, and 80% by 2050. Interim targets of 6% below 2007 levels by 2012 and 18% by 2016 have also been set. To meet those targets a number of major initiatives have been launched by the BC government, including BC's carbon tax, the Carbon Neutral Government initiative, and the LiveSmartBC energy retrofit program.

Modeling undertaken as part of BC's 2008 Climate Action Plan estimates the plan would take BC about three-quarters (73%) of the way to the 2020 target.¹ The plan was envisioned as a first phase, but since 2008 no new climate actions have been tabled. Some other promised actions, such as major provincial transit investments and participation in the Western Climate Initiative regional cap-and-trade system, have not materialized.

Instead, increasing natural gas exports to meet growing energy demand from China and other Asian markets has captured the attention of policy makers. This policy brief reviews the latest data (up to 2010) on BC's greenhouse gas emissions, and provides a reality check on meeting the 2020 targets in light of plans to greatly expand extraction and production of natural gas in Northeastern BC and to develop a liquified natural gas (LNG) export sector.

THE GOOD: RECENT TRENDS IN BC EMISSIONS

In 2010, fossil fuel emissions were down 3.7% from 2007 levels. Emissions from both residential buildings and commercial/institutional buildings fell, as did overall transportation emissions.

In 2010, BC emitted 62 million tonnes of carbon dioxide equivalent (Mt CO₂e), down 4.5% from 2007 levels. Emissions data are typically two years behind, so 2012 data will not be available until mid-2014. Nonetheless, the release of 2010 data suggests that BC's first interim target of 6% below 2007 levels by 2012 is within reach.

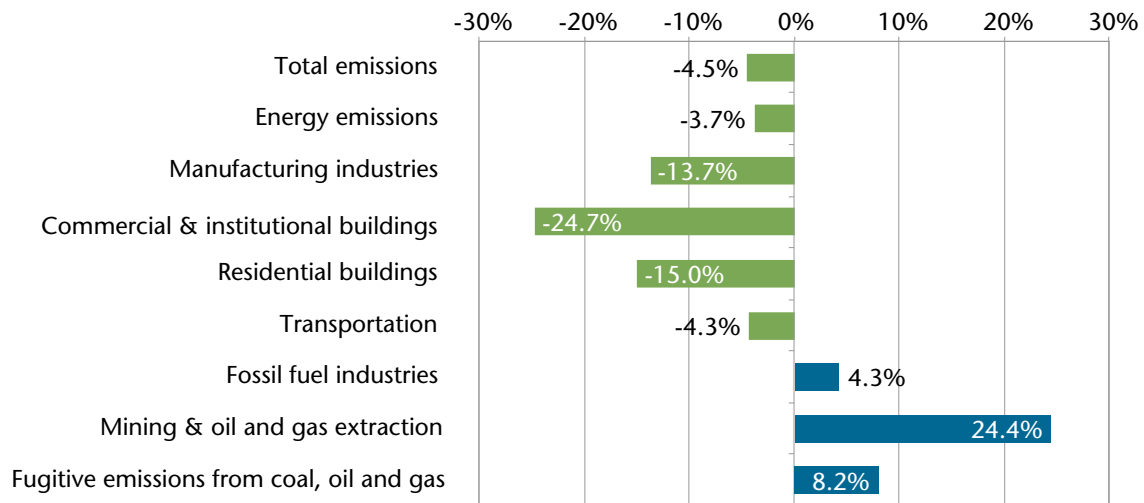
Almost 80% of BC's GHG emissions are from the use of fossil fuels in homes, offices, industry and transportation, as well as emissions from fossil fuel production. The remaining 20% comes from a variety of sources, including emissions from industrial processes (such as aluminum production), agriculture, waste management and net deforestation.

In 2010, fossil fuel emissions were 49.3 Mt CO₂e, down 3.7% from 2007 levels. Of note, emissions from both residential buildings (3.8 Mt) and commercial/institutional buildings (2.5 Mt) fell, as did overall transportation emissions (23.8 Mt) in 2010 relative to 2007 levels (Figure 1). Emissions from manufacturing industries also dropped, although this likely reflects both the impact of the economic downturn and longer-term decline in the forest industry.²

1 BC Ministry of the Environment, *Climate Action Plan*, June 2008, www.livesmartbc.ca/attachments/climateaction_plan_web.pdf. Modeling by MK Jaccard and Associates Inc in Appendix I: A Quantitative Analysis of British Columbia's Climate Action Plan.

2 Some caution is required in interpreting results from two single years, especially given differences in economic conditions. Construction emissions, for example, were down substantially in 2010 relative to 2007 due to the end of the housing boom. Electricity and heat generation emissions appear to be up as of 2010, but 2007 levels were abnormally low given the decade-long trend. See Provincial Inventory Report and data tables at Ministry of Environment: www.env.gov.bc.ca/cas/mitigation/ghg_inventory/index.html

Figure 1: Change in BC GHG Emissions 2007–2010



Note: Manufacturing emissions include both stationary combustion and industrial process emissions.

Source: Author's calculations from BC Ministry of the Environment, *British Columbia Greenhouse Gas Inventory Report 2010*.

Trends moving in the wrong direction include emissions growth from the extraction and processing of fossil fuels. Combustion emissions from fossil fuel industries rose to 5.4 Mt (up 4.3%) and those from mining and oil and gas extraction rose to 1.7 Mt (up 24%). Fugitive emissions (non-combustion emissions from extraction, production and transportation) rose by 8.2% to 6.2 Mt (the bulk of these emissions are from oil and gas, plus some emissions from coal mining).

Growth in emissions from fossil fuel extraction and production is indicative of the challenge of meeting BC's 2020 GHG target. If these emissions in 2010 had remained flat at 2007 levels, BC's total GHG emissions in 2010 would already be 6% below 2007 levels (i.e., at the 2012 target level), given the decreases seen in other sectors.

It would be unreasonable to attribute all GHG reductions to climate actions, as a wide range of factors can influence annual emissions. In particular, the global economic downturn has played a role given that 2007 was the last full year of an economic boom and housing bubble. How large a role the downturn played is not entirely clear. Other initiatives in BC's Climate Action Plan should also be considered as drivers of reduced emissions.

How BC's GHG emissions profile across all economic sectors would respond to a new round of global economic growth is a central question. Policy choices around BC's energy consumption and broader economic strategies, such as promotion of fossil fuel exports, will determine whether BC can stay on track to meet its GHG reduction targets.

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THE BAD: UNCONVENTIONAL GAS AND LNG DEVELOPMENT

Two major provincial economic policy documents emphasize natural gas development as an economic driver for BC. Both the September 2011 *BC Jobs Plan* and the February 2012 *BC Natural Gas Strategy*³ aim to further exploit massive gas resources in BC's Northeast, and transport that gas by pipeline to the North Coast, where it will be compressed into liquified natural gas for export to Asia. The *Natural Gas Strategy* would see BC's gas production double by 2020 relative to current levels.

BC production of natural gas has already surged in recent years, from 32 billion cubic metres in 2007 to 41 billion in 2011.⁴ Not long ago, it seemed that natural gas reserves would soon be depleted. However, the application of horizontal drilling and hydraulic fracturing ("fracking") technology—where water, sand and chemicals are pumped under high pressure to fracture shale rock deep below the surface (shale gas) or in sand/silt formations (tight gas) to release pockets of gas—has been a game changer. About half of BC natural gas production is now from unconventional sources, and this could rise to more than 80% of production by 2020.⁵

Major increases in North American production have undercut the profitability of natural gas companies and the royalties accruing to the BC government, which dropped from a high of \$1.9 billion in 2005/06 to \$339 million in 2011/12.

Development of these unconventional sources of natural gas has led to major increases in North American production in recent years,⁶ so much so that North American prices have plummeted from over \$7 per gigajoule (GJ) in 2005 to under \$2 per GJ in 2012.⁷ This has undercut the profitability of natural gas companies and the royalties accruing to the BC government, which dropped from a high of \$1.9 billion in 2005/06 to \$339 million in 2011/12 and forecasted at \$157 million for 2012/13.⁸ While more natural gas is being pumped out of the ground, the public is receiving much less revenue because BC's royalty system is, in part, a function of market price.

While natural gas has historically been a continental market, industry and the BC government have been captivated by the prospect of selling LNG in Asian markets at a substantial mark-up over North America. So far, two projects have been awarded export permits to ship LNG to Asia. BC LNG Cooperative has a license to export up to 1.8 million tonnes of LNG per year (the first phase will lead to initial production of about 700,000 tonnes), and the Kitimat LNG partnership will build out in two phases, each of which will have capacity of about 5 million tonnes per year.⁹ In addition, a third project, proposed by a consortium led by Shell, aims to export another 12 million tonnes per year.¹⁰ All three operations could be fully built out by 2020, with several other LNG plants possible.¹¹ That

3 BC's *Natural Gas Strategy*, February 13, 2012, www.gov.bc.ca/ener/natural_gas_strategy.html

4 BC Ministry of Energy and Mines, Supply & Distribution of Natural Gas in British Columbia, www.empr.gov.bc.ca/OG/oilandgas/statistics/Documents/GasNew.xls. Note that natural gas is measured and reported in a number of ways, including volume (cubic metres and cubic feet), mass (tonnes) and energy content (gigajoules, or GJ).

5 Estimated at 83% by G. Dauncey, *BC's Natural Gas Strategy: Bad for the climate, weak on jobs*, BC Sustainable Energy Association, February 6, 2012, www.bcsea.org/blog/guy-dauncey/2012/02/06/bc%E2%80%99s-natural-gas-strategy-bad-for-climate-weak-on-jobs

6 US Energy Information Administration, US Natural Gas Gross Withdrawals, www.eia.gov/dnav/ng/hist/n9010us2m.htm

7 BC Ministry of Finance, *2011 Financial and Economic Review and BC Budget and Fiscal Plan, First Quarterly Report*, September 2012.

8 Royalty data from *BC Budget and Fiscal Plan, First Quarterly Report*, September 2012.

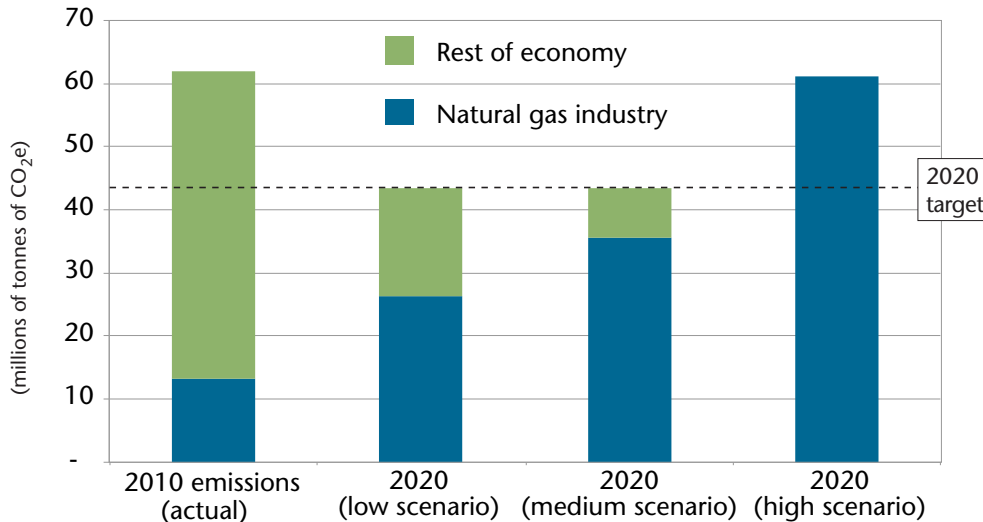
9 BC Hydro, Draft Integrated Resource Plan 2012, Appendix 2A: Electric Load Forecast F12-32.

10 G. Hamilton, "Shell, Asian energy giants to build largest LNG plant in BC: Partnership will bring massive plant to Kitimat" in *The Vancouver Sun*, May 15, 2012, <http://tinyurl.com/9b7yc7m>

11 According to Hamilton's article, Malaysian energy company Petronas is undertaking a feasibility study of a 7.4 million tonne per year LNG facility in Kitimat in partnership with Calgary-based Progress Energy. Other global corporations are also considering investments in BC LNG.

Figure 2: BC's 2020 GHG Target – Three Scenarios

BC's legislated GHG emissions target is 43.5 Mt CO₂e in 2020. In the low and medium scenarios, growing emissions from the natural gas industry crowd out space available for the rest of the economy. In the high scenario, these emissions alone are much higher than the target.



Note: Figures do not count natural gas burned in residential or commercial buildings or related domestic consumption – they represent only emissions from the production of natural gas in BC, whether for domestic or export markets.

Source: Author's calculations based on BC Provincial GHG Inventory Report 2012, Horne (2012) and Dauncey (2012).

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said, any successful projects still need to complete regulatory reviews, including environmental assessment, and negotiations with First Nations in order to move forward.

This expansion of natural gas production and the development of an LNG industry is at odds with climate action objectives and targets. Based on the *Greenhouse Gas Reduction Targets Act*, BC must reduce its emissions to 43.5 Mt CO₂e in 2020, compared to 62 Mt in 2010 (and a baseline of 64.9 Mt in 2007). Figure 2 shows the target under three scenarios of increased natural gas production.

The low scenario assumes a doubling of 2010 emissions from the natural gas industry to 26.3 Mt in 2020.¹² As a result of this growth, some 61% of the allowable 2020 emissions under the target are taken up by natural gas production. This means that to meet the 2020 target all other sectors of the economy would have to reduce emissions by almost two-thirds of 2010 levels.

The middle scenario is based on a bottom-up analysis by the Pembina Institute,¹³ which estimates that for one plant producing 10 million tonnes of LNG per year, and powered by natural gas, incremental GHG emissions would be 9.4 Mt CO₂e per year, breaking down as follows:

- 2 Mt per year for the operation of the LNG plant, based on information from turbine manufacturer ABB;

¹² This is a conservative assumption, as the *Natural Gas Strategy* would increase production by 2.3 times 2011 production levels.

¹³ M. Horne, *Claims of Climate Leadership in BC's Natural Gas Strategy Leave Much to be Desired*, Pembina Institute blog, February 15, 2012, www.pembina.org/blog/611

- 0.6 Mt per year from additional pipeline capacity, based on the Alliance pipeline, purported to be one of the least emitting pipelines; and
- 6.9 Mt per year from upstream extraction and processing of natural gas in the Montney and Horn River basins.

For the three LNG plants contemplated by the *Natural Gas Strategy by 2020*—a total production of 23.8 million tonnes of gas per year—the incremental impact of the LNG industry on BC’s emissions is 22.4 Mt CO₂e per year.¹⁴ Until recently provincial policy would have reduced the impact on BC’s emissions by powering the first two LNG plants with clean electricity. This policy was abandoned in June 2012, due to substantial costs it would have imposed on BC Hydro ratepayers. New LNG facilities will now be permitted to use natural gas turbines for processing.

Total emissions from BC gas production of 35.5 Mt leave only 8 Mt available for the rest of the economy if BC is to meet its GHG target for 2020. This is equivalent to an 81% reduction for all other sectors.

In addition to LNG production, we can add emissions from current levels of natural gas production, assuming no increase in BC consumption or increased exports to the US or Alberta. Total emissions from BC gas production of 35.5 Mt leave only 8 Mt available for the rest of the economy if BC is to meet its GHG target for 2020. This is equivalent to an 81% reduction for all other sectors.

The high scenario in Figure 2 contemplates growing concerns that the emissions footprint from unconventional gas could be even larger due to leakages of methane (the principal hydrocarbon of natural gas, which has much greater warming potential than CO₂). There is some controversy over the amount of additional fugitive emissions from fracking. One widely-reported estimate put methane leakages at between 3.6% and 7.9% of life cycle production, including leakages during the well completion stage, as well as leaks from equipment, plus other fugitive emissions associated with processing, transport by pipeline and distribution.¹⁵ Recent fieldwork in Colorado by the US National Oceanic and Atmospheric Administration appears to validate these estimates.¹⁶

If this finding is applied to BC, it suggests reported fugitive emissions in 2010 of 5.5 Mt are too low and could in fact range from 13 to 22 Mt, according to estimates from the BC Sustainable Energy Association.¹⁷ Estimated fugitive emissions in 2020 from BC’s natural gas sector (not including LNG plants) range from 42 to 86 Mt per year. Figure 2’s high scenario adds the lower amount of 42 Mt to other LNG plant and pipeline emissions from the middle scenario. Gas production emissions of 61 Mt CO₂e exceed the 2020 target by a large margin, with emissions slightly lower than all of BC’s emissions in 2010.

An important caveat is that there are no real-world data for BC (at least, not in the public domain). Given the warnings above, primary research is sorely needed to better understand the potentially massive consequences of additional fugitive emissions from fracking. It is imperative that the BC government support such research before rushing into its *Natural Gas Strategy*. Indeed, if government and industry truly believe that natural gas is a relatively “clean” energy source and a necessary “bridging fuel” to a low-carbon economy, then they should prove that claim in the form of an acceptable study by an independent third party that identifies all associated emissions.

14 Horne’s analysis was based on provincial policy at the time, which called for the first two plants to be powered with clean electricity. Horne’s spreadsheet was amended by the author for the change in policy, and Shell LNG projected emissions of 12 Mt, to come up with 22.4 Mt of GHG emissions.

15 R.W. Howarth, R. Santoro and A. Ingraffea, “Methane and the greenhouse-gas footprint of natural gas from shale formations: A letter” in *Climatic Change*, Letters, April 2011, DOI 10.1007/s10584-011-0061-5, www.eeb.cornell.edu/howarth/Howarth%20et%20al%20%202011.pdf. The latter sources are common to both conventional and unconventional gas.

16 J. Tollefson, “Air sampling reveals high emissions from gas field: Methane leaks during production may offset climate benefits of natural gas” in *Nature*, Vol. 482, 139-40, February 9, 2012, www.nature.com/news/air-sampling-reveals-high-emissions-from-gas-field-1.9982

17 G. Dauncey, 2012, supra note 5. Estimates are based on Howarth et al., 2011, supra note 15.

The BCSEA raises additional concerns that fugitive emissions could be still higher, ranging from 54 to 360 Mt CO₂e, due to measurement issues in the treatment of methane. First, the global warming potential relative to CO₂ is likely to be larger, based on recent scientific measurement. Moreover, because methane breaks down in the atmosphere into CO₂ over time, the time frame chosen when converting into CO₂ equivalents matters. Annual CO₂ equivalent emissions are lower if a 100-year time frame is used and higher with a 20-year time frame. The shorter time frame is arguably more relevant because in the near-term additional warming could push ecosystems—in particular, retreating glaciers, melting permafrost, dying forests and shrinking Arctic sea ice—past “tipping points” that trigger feedback loops of rising temperature. For example, reduced sea ice means oceans absorb more solar energy, which raises temperatures, which reduces sea ice further, and so forth.

Nonetheless, even without accounting for potentially larger emissions from fracking, expanding the natural gas industry on the scale proposed by the BC government is inconsistent with BC’s GHG targets for 2020. In other words, the *Natural Gas Strategy* is contrary to the intent of BC law. We are already well into 2012, and making deep reductions requires long time frames for planning, capital stock turnover, investments in infrastructure, and behavioural change to occur. Meeting the 2020 GHG targets is essentially impossible if we must simultaneously accommodate growth in the oil and gas sector.

THE UGLY: EXPORTED GHG EMISSIONS

By accounting convention, the carbon content of fuels exported from BC is not counted in the province’s GHG inventory, but rather in the inventory of the jurisdiction where the fuel is combusted. BC could theoretically reduce its provincial emissions to zero, while at the same time allowing tens of millions of tonnes per year of carbon, currently underground, to be released into the atmosphere. Clearly, such emissions are not consistent with the spirit of BC’s GHG targets even if they are not counted domestically.

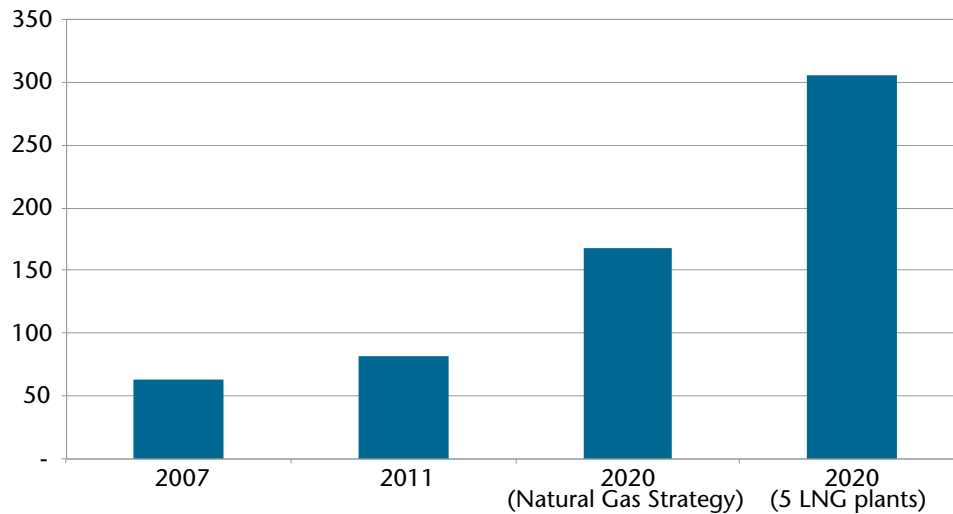
This is an important point as gas development is promoted not to meet BC’s own domestic needs, but as an export industry. Figure 3 shows that BC’s total natural gas production in 2011 of 41 billion cubic metres is equivalent to 82 Mt CO₂, up from 63 Mt in 2007. This is the amount of gas extracted from the ground and combusted into CO₂, whether in BC or outside the province’s borders.¹⁸ In 2011, the contribution of BC’s natural gas to global GHG emissions was about one-third larger than all of the emissions within BC’s borders. After processing into marketable gas, only 15% of that gas stays in BC for domestic consumption, while the remainder is exported to the US and Alberta.

Expansion along the lines proposed by BC’s *Natural Gas Strategy* would see global GHG emissions originating in BC rise to 167 Mt CO₂e in 2020—nearly four times greater than BC’s own legislated GHG target for that year. As staggering as these numbers are, global interest in LNG development has grown, and the BC government is considering the possibility of five LNG plants by 2020,

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¹⁸ Note that this does not consider fugitive emissions (leakages of methane) in production. Given the discussion above, this is a perhaps an unrealistically conservative assumption. Adding fugitive emissions would lead to an even higher GHG emission estimate.

Figure 3: Global GHG Emissions from BC's Natural Gas Production (Mt CO₂e)



Sources: Author's GHG estimates based on BC Ministry of Energy and Mines, Supply & Distribution of Natural Gas in British Columbia, www.empr.gov.bc.ca/OG/oilandgas/statistics/Documents/GasNew.xls, BC *Natural Gas Strategy*, and BC government estimates. Emission factors from Environment Canada, *National Inventory Report 1990–2009: Greenhouse Gas Sources and Sinks in Canada*, Annex 8: Emission Factors.

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producing a total of 113 billion cubic metres per year.¹⁹ This is equivalent to 223 Mt CO₂e, and added to BC's 2011 emissions, sums to 305 Mt in global GHG emissions originating in BC in 2020 (last column of Figure 3). And this assumes no increased exports to the US, or more importantly, to Alberta, which seeks fuels like natural gas for (expanded) oil sands production.

This increase in global emissions would be equivalent to putting 24 to 64 million cars on the roads of the world (at an average of 3.5 tonnes of CO₂ per car per year).

The BC government has argued that exporting natural gas to China and elsewhere will displace coal-fired production, and because natural gas is a cleaner burning fuel—half the emissions per unit of energy relative to coal in combustion—this activity will serve to reduce emissions outside of BC. Gas, it is argued, is a “transition fuel” off of coal and eventually to renewable sources.

As noted above, leakages of methane in the extraction and processing phase of unconventional gas development could mean that, on a life-cycle basis, natural gas from unconventional sources is equivalent to or even worse than coal per unit of energy. Clearly, there is more empirical research needed to estimate actual leakages in BC shale and tight gas fields. It is estimated that if 3.2% of gas leaks, that wipes out any GHG advantage relative to coal.²⁰

Nor is it obvious that exporting LNG to China will displace any coal-fired electricity production, as opposed to just adding to China's growing demand for energy. The International Energy Agency's

¹⁹ BC government estimates, originally stated as 4 trillion cubic feet per year, converted by author.

²⁰ Quote from NOAA study in J. Romm, “Natural Gas Is A Bridge To Nowhere Absent A Carbon Price AND Strong Standards To Reduce Methane Leakage” in Climate Progress blog, April 12, 2012, <http://thinkprogress.org/climate/2012/04/09/460384/natural-gas-is-a-bridge-to-nowhere-absent-a-carbon-price-and-strong-standards-to-reduce-methane-leakage/>

2011 World Energy Outlook projects that China's coal consumption will grow by one-third up to 2020 then flatten out to 2035.²¹ World energy demand is expected to grow by one-third between 2010 and 2035, with China responsible for 30% of incremental demand.

While China has garnered much of the attention regarding LNG exports, in the near term Japan may be a bigger customer for BC, due to post-Fukushima nuclear decommissioning. It is not clear which direction the Japanese government will go, but there is strong popular sentiment against nuclear power. Replacing nuclear capacity with imported LNG would lead to a substantial increase in emissions in Japan's inventory.²²

Moreover, there is good reason to question how much ordinary British Columbians gain from this massive expansion of a dirty industry. The reality is that the vast bulk of economic growth from LNG development will be in the form of super-profits accruing to global corporations. The BC government claims that the *Natural Gas Strategy* will create 800 new long-term jobs in the LNG sector, up to 9,000 more jobs during construction, and several thousand more indirect jobs.²³ It has refused to make studies in support of such numbers available in the public domain, so the numbers cannot be verified. But even at face value, the *Natural Gas Strategy* creates very few jobs at a massive environmental cost. Even if grander government ambitions for five LNG plants come to fruition by 2020, creating 2,500 new long-term jobs,²⁴ this is equivalent to a mere 0.1% of BC's total employment in 2011.

What the BC government is not counting are the costs imposed on third parties (known as external costs or "externalities") due to climate change, such as the impact of drought on food production or flooding on infrastructure. A recent study on the external costs of GHG emissions (known as the "social cost of carbon") put them in the range of \$150 to \$500 per tonne of CO₂, and potentially as high as \$893 per tonne.²⁵ Based on Figure 3 and these estimates, a low estimate of 167 Mt of CO₂ into the atmosphere per year, using estimates from the *Natural Gas Strategy*, with external costs of \$150 per tonne, would imply \$25 billion per year in externalized costs. A higher estimate of 305 Mt for five major LNG plants, as per current BC government planning, at \$500 per tonne implies external costs of \$152 billion per year. By comparison, BC's GDP is about \$200 billion per year. Corporate gains from natural gas development should thus be viewed as odious profits garnered by imposing massive climate-change-related costs on others, present and future.

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21 Under a mid-range "New Policies" scenario. See www.worldenergyoutlook.org/media/weowebsite/2011/factsheets.pdf

22 For estimates, based on three scenarios for Japan's electricity system, see T. Bryant and R. Kadowaki, Would exporting BC LNG reduce global greenhouse gas emissions?, David Suzuki Foundation blog, July 17, 2012, www.davidsuzuki.org/blogs/panther-lounge/2012/07/would-exporting-bc-lng-reduce-global-greenhouse-gas-emissions/

23 Government of BC newsroom, "Natural gas fuelling new economic opportunities," February 3, 2012, www.newsroom.gov.bc.ca/2012/02/natural-gas-fuelling-new-economic-opportunities.html. Note: An infographic accompanying the release claims an even larger but unsupported number, 40,000 jobs. Its *Natural Gas Strategy* document claims 1,500 construction and 125 permanent jobs for the Kitimat LNG terminal alone, and 1,500 pipeline construction jobs for the Kitimat to Summit Lake pipeline project.

24 Modeling done for the BC government, via personal communication. Again, these numbers have not been verified. Cautions about such modeling include assumptions that workers would otherwise be unemployed, and that the price margin between North America and Asia holds for coming decades.

25 F. Ackerman and E. Stanton, *Climate Risks and Carbon Prices: Revising the Social Cost of Carbon*, published by Economics for Equity and Environment network, 2011, www.e3network.org/social_cost_carbon.html. The study reconsiders flawed assumptions about the measurement of health and mortality impacts, and about climate impacts, made in previous (lower) estimates of the social cost of carbon. But even these estimates are limited in that they count costs only as they relate to human economic activity.

CONCLUSION: RETHINKING THE NATURAL GAS STRATEGY

It is not surprising that reducing GHG emissions, which are predominantly from the use of fossil fuels, is not compatible with the expansion of fossil fuel industries. This has always been a contradiction at the heart of BC's Climate Action Plan. And yet, even as mounting evidence of droughts and fires, floods and tornados has accumulated in recent years, attention to climate change among political leaders has waned. Instead, interest has grown in promoting economic development and capturing government revenues from an expanded fossil fuel sector.

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In order for the industry to expand as planned *and* for the 2016 and 2020 targets to be met, the rest of BC's economy would have to undertake emission reductions that are not plausible. BC must therefore abandon its natural gas development strategy, and in its place pursue a next-generation Climate Action Plan that gets BC to its 2020 targets, and that seeks to decouple economic development from the consumption and production of fossil fuels. There is good reason to believe that many times more jobs would be created in the greening of BC's economy.²⁶

Although the *GHG Reduction Targets Act* is the law of the land, there is no penalty for missing targets. At the time the Act was introduced, the BC government argued its commitment to climate action was serious, based on the fact that targets were enshrined in legislation. Several years later, the Act resembles the climate equivalent of BC's balanced budget legislation, which had to be revoked when the economic downturn hit in 2008/09. Indeed, LNG development and unconventional gas development make a mockery of the *GHG Reduction Targets Act*.

Ultimately, natural gas is not a "transition fuel" unless there is meaningful climate policy that is serious about the need to shift away from fossil fuels. Without that policy it is just another cheap fossil fuel that contributes to the problem. Environmentally responsible development must include:

- Primary research in BC's Northeast to develop a true picture of fugitive emissions from unconventional gas;
- Regulatory action to greatly reduce fugitive emissions from fracking and ensure that LNG plants implement the same carbon capture and storage requirements that apply to coal-fired electricity generation in BC;
- Application of BC's carbon tax to all lifecycle emissions from gas development and the LNG sector, including the carbon content of exported fuel;
- A new royalty regime that ensures British Columbians actually benefit, through government revenues, from gas development;
- Approval of exports only if there are guarantees they will displace dirtier forms of energy; and
- Finally, no public subsidies should go to the natural gas industry in the form of tax breaks, infrastructure development or BC Hydro rates that are much lower than the cost of new supply.²⁷

26 M. Lee and K. Carlaw, *Climate Justice, Green Jobs and Sustainable Production in BC*, CCPA-BC, September 2010, www.policyalternatives.ca/greenjobs

27 For more detailed analysis of energy policy in BC and further recommendations, see related reports by B. Parfitt, *Fracking up our Water, Hydro Power and Climate: BC's Reckless Pursuit of Shale Gas*, CCPA and Wilderness Committee, November 2011, www.policyalternatives.ca/fracking and J. Calvert and M. Lee, *Clean Electricity, Conservation and Climate Justice in BC: Meeting our Energy Needs in a Zero-Carbon Future*, CCPA-BC Climate Justice Project, June 2012, www.policyalternatives.ca/electricity-justice

The real conversation BC needs to have is around how we are going to meet our 2020 GHG targets. This means thinking about how to wind down the fossil fuel industry over the coming decades, while strategically using the resource during the transition period. This is precisely the opposite of the profit-driven frenzy around LNG at the moment – profits that amount to stealing quality of life from people around the world and generations to come.

There is still time to change course. No final regulatory approvals on the part of the BC government, nor investment decisions on the part of corporations, have been made. Indeed, given the concerns raised above, it is clear that a thorough regulatory review, including environmental and GHG assessment, is needed. With tens of billions of dollars of looming investment in LNG and pipeline infrastructure, it is worth considering cleaner directions. Even if a fraction of those funds—collected through a carbon tax or higher royalties, for example—were put directly into renewables, energy efficiency and conservation, and other public infrastructure, it would greatly accelerate the transition to a zero-carbon BC while creating more jobs.

As of 2010, BC was on course to meet its 2012 GHG reduction targets, and would already be at the 2012 target of 6% below 2007 levels if not for the growth of emissions from fossil fuel production. A Climate Action Plan 2.0 is now needed to ensure BC adopts the aggressive policies and green investments needed to stay on track through to 2020.

BC needs to think about how to wind down the fossil fuel industry over the coming decades, while strategically using the resource during the transition period. This is precisely the opposite of the profit-driven frenzy around LNG at the moment.

CLIMATE JUSTICE PROJECT

The Climate Justice Project is a multi-year initiative led by the CCPA and the University of British Columbia in collaboration with a large team of academics and community groups from across BC. The project connects the two great “inconvenient truths” of our time: climate change and rising inequality. Its overarching aim is to develop a concrete policy strategy that would see BC meet its targets for reducing greenhouse gas emissions, while simultaneously ensuring that inequality is reduced, and that societal and industrial transitions are just and equitable. The project is supported primarily by a grant from the Social Sciences and Humanities Research Council through its Community-University Research Alliance program. Thanks also to Vancity and the Vancouver Foundation.

For more reports from the Climate Justice Project, see www.climatejustice.ca



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