

Public Resources, Private Wealth

How B.C.'s natural gas royalty regime is
shortchanging British Columbians

Amy Taylor

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Contents

Public Resources, Private Wealth	1
1. Introduction	2
2. Background	3
2.1 The recent evolution of the royalty and spending regime	3
2.2 The citizens own the resource	3
3. A plan to spur development	6
3.1 B.C.'s natural gas royalty regime	6
3.1.1 Royalties.....	6
3.1.2 Lease sales	11
3.2 Direct government spending on natural gas in B.C.....	11
3.3 Indirect government spending on natural gas in B.C.	14
3.4 Summary of government spending on natural gas in B.C.....	16
4. Booming natural gas developments	18
5. Declining revenues for resource owners	21
6. Conclusion	26

List of Figures

Figure 1. Capital expenditure on natural gas in B.C., 2000 to 2008	19
Figure 2. Natural gas production in B.C., 2000 to 2008.....	19
Figure 3. Value of producer sales from natural gas in B.C., 2000 to 2008	20

Figure 4. Revenue from natural gas developments in B.C. (royalties and lease sales), 2000 to 2008	21
Figure 5. Revenue (royalties and lease sales) per cubic metre of natural gas production, 2000 to 2008	22
Figure 6. Contribution of lease sales to total natural gas revenue (%), 2000 to 2008	22
Figure 7. Implicit royalty rate (%) in B.C., 2006/07 to 2011/12	23

List of Tables

Table 1. Royalty programs applicable to natural gas developments in B.C.	7
Table 2. Direct spending on roads that service the natural gas industry in B.C.	12
Table 3. Value of direct spending on roads that services the natural gas industry in B.C.	13
Table 4. Direct spending on education related to the natural gas industry in B.C.	14
Table 5. Industrial employment, B.C., 2008	24

Public Resources, Private Wealth

In the past 10 years, the B.C. government has increasingly looked to natural gas development as a source of provincial revenue. At the same time, the government has introduced many royalty rate reductions and increased spending to attract investment in natural gas developments and increase production.

While the industry does play an important role in the province's economy — in 2008/2009, it contributed just over \$2 billion in royalty and lease sale revenue to provincial coffers, accounting for 6% of total provincial revenue — support for natural gas development comes with a price.

This report examines the existence of numerous royalty breaks, and significant spending on the gas industry by the B.C. government, and finds that while gas production has increased in the last decade (31% between 2000 and 2008), British Columbians are collecting on average 17% less revenue per unit of production.

Between 2003 and 2009 the value of foregone royalty revenue associated with the royalty programs for which estimates are available is \$1.047 billion. Committed government spending on natural gas roads in B.C. is estimated at \$575 million. Combining these figures gives a total cost estimate of more than \$1.6 billion — or \$360 for every British Columbian.

We found that while gas production has increased in the last decade, this increase in production has not translated into increased

revenue for British Columbians. Thus, the royalty reductions and direct spending on the gas industry that have taken place since 2000 may not be justifiable on the basis of increased revenue.

The financial cost of subsidizing the natural gas sector is just a fraction of the true price of natural gas development. Environmental degradation, greenhouse gas emissions, water use and community impacts in the resource-rich northeast quarter of the province are a few examples of that price.

We have not attempted to quantify the value of these ecosystem services, nor have we quantified the support provided to the industry in terms of mitigating negative environmental impacts, such as spending on carbon capture and storage, orphaned wells or land reclamation.

More natural gas development is taking place than would be economical if the government collected sufficient revenue from such development. Low royalty rates means that companies are getting more than their fair share of revenue at the expense of the citizens of British Columbia — the owners of the resource.

We conclude by recommending a broad review of the current royalty and spending regime to consider reforms that would better ensure that both British Columbians and companies are receiving a fair rate of return for the development of gas resources.

1. Introduction

The natural gas industry in B.C. plays an important role in the province's economy. In 2008/2009, it contributed just over \$2 billion in royalty and lease sale revenue to provincial coffers, accounting for 6% of total provincial revenue.¹ But, as will be described in this report, in an effort to increase gas production and revenue, the provincial government has introduced a series of royalty breaks and spending incentives targeted at natural gas companies. And while such measures may have contributed to increased gas investments and production, they have not resulted in increased revenue for British Columbians, the owners of this resource. In fact, as will be discussed in detail, revenue per cubic metre of gas produced in B.C. declined by 17% between 2000 and 2008 from \$78 per unit production in 2000 to \$65 per unit production in 2008.

The purpose of this report is to explore the series of incentives targeted at natural gas developments that the provincial government has introduced since 2000, and to examine these incentives in light of the trend in gas revenue.² The objective is to assess the effectiveness of these incentives from the perspective of the resource owners — British Columbians. To that end, this report identifies and describes the series of royalty breaks as well as direct and indirect spending targeted at B.C.'s gas sector between 2000 and 2008. Direct and indirect spending includes spending on roads, education and communities directly affected by gas developments.³ Part 2, *Background*, briefly describes the recent evolution of the current royalty and spending regime and reaffirms the importance of recognizing that it is British Columbians, and not gas companies, who own this important resource. Full details of the royalty breaks and direct and indirect spending are presented in part 3, *A Plan to Spur Development*, and trend data for natural gas capital expenditures, production and value of producer sales are presented in part 4, *Booming Natural Gas Developments*. Chapter 5, *Declining Revenue for Resource Owners*, explores the trend in gas revenue in light of production and price. The concluding chapter summarizes the report findings and recommends that the current royalty and spending regime be reviewed and reformed to ensure maximum return for British Columbians.

¹ Government of British Columbia, BC Ministry of Energy, Mines and Petroleum Resources, Personal communication, April 2010.

² The year 2000 was chosen as the base year for our study for a number of reasons. (1) There was a significant increase in the price of natural gas between 1999 and 2000. Choosing 1999 as the base year would have thus exaggerated recent trends which are characterized by a more volatile price for natural gas. (2) To provide a degree of overlap between this study and a previous study completed by the Pembina Institute that took a critical look at the royalty regimes applicable to oil and gas developments in B.C. as well as Alberta, Saskatchewan, the Northwest Territories, the Yukon Territory, Alaska and Norway (<http://www.pembina.org/pub/171>). (3) To choose a time period that spanned more than one political party in B.C. (4) To go back in time far enough to be able to show a sufficient trend in the data.

³ Note that we do not explore spending related to mitigating the negative environmental impacts of the gas industry, such as spending on carbon capture and storage, orphaned wells or land reclamation. Such spending could be significant as is exemplified by the \$1.6 million program announced in 2005 to reclaim 12 historic wells that were developed and later abandoned upon bankruptcy of the companies that owned them (<http://www2.news.gov.bc.ca/archive/2001-2005/2005EM0010-000341.htm>).

2. Background

2.1 The recent evolution of the royalty and spending regime

As will be described later in this report, the Government of British Columbia has introduced a series of incentives related to natural gas developments in the province in the last decade or so. To better understand the rationale for such support and thus be able to assess the legitimacy of the use of taxpayer dollars in this manner, it is useful to look back over the last decade at the trends in and interplay between gas production and price, and inter-jurisdictional developments.

In the late 1990s/early 2000s, there were some major natural gas discoveries in northern B.C. (e.g. Ladyfern).⁴ The timing of these discoveries coincided with the Alberta/B.C. gas market being directly tied into the United States via pipelines. Between 2000 and 2002, natural gas production in B.C. rose by 23%, and with the increase in the price of natural gas between 2000 and 2001, the provincial government realized a significant jump in natural gas revenue. Indeed, between 2001 and 2003, revenue from natural gas developments in B.C. increased by a significant 53%. The combination of the discovery of large new deposits and the integration into the North American gas market created a new growth sector for the government and an expanding source of provincial revenue.

Since 2000, the provincial government has become increasingly dependent on gas revenue to maintain and increase provincial revenue. In an attempt to continue to attract investment in natural gas developments in B.C., and to increase natural gas production and revenue generation, the government has introduced a series of royalty rate reductions and increased spending on gas developments, especially on roads. However, this kind of direct government support for natural gas developments comes at considerable costs to the environment, to the communities in the resource-rich northeast quarter of the province and to the province's goals of reducing greenhouse gas emissions.⁵ Furthermore, while gas production may have increased in the last decade (31% between 2000 and 2008), this increase in production has not translated into increased revenue for British Columbians. Thus the myriad of royalty reductions and direct spending on the gas industry that has taken place since 2000 may not be justifiable on the basis of increased revenue.

2.2 The citizens own the resource

In British Columbia, the vast majority of non-renewable resources, including natural gas, are owned by the citizens of the province. The Ministry of Energy manages these publicly owned

⁴ For an overview of the Ladyfern play, see Nikiforuk, Andrew, "Northern Greed", Canadian Business Online, May 12, 2003. http://www.canadianbusiness.com/article.jsp?content=20030512_53695_53695

⁵ Ben Parfitt, *Foot Off the Gas: Regulating BC's Oil and Gas Industry as if the Environment Mattered*, (Canadian Centre for Policy Alternatives, 2007), <http://www.policyalternatives.ca/publications/reports/foot-gas>.

natural gas resources on behalf of the citizens.^{6 7} In its role as resource manager, the government allows companies to acquire rights to develop natural gas. These companies incur development costs and if they are successful and produce gas, they also receive revenue from its sale. The government is responsible for ensuring that an appropriate portion of the revenue, determined by the amount of economic rent available (see sidebar), from the sale of the gas goes to the citizens of British Columbia as resource owners.

What Is economic rent?

Economic rent is the difference between the value of a resource and the cost of producing that resource, including a normal rate of return on investment. It represents the revenue that is available to the owners of the resources for their development. It is important that the amount of revenue obtained by governments in return for the development of resources reflects a significant portion of the available rent in a particular region. This is necessary to ensure that the citizens of that region are being appropriately compensated for the development of their resources. The amount of rent that is collected by governments depends on the rate of royalties as well as the amount of money obtained through lease sales. When governments do not collect an appropriate amount of economic rent, they are leaving excess profits with corporations and are in essence providing a subsidy to the companies that undertake the resource developments.

The government collects the revenue through the use of royalties and lease sales. The royalty rates and the amount of revenue collected through sales must ensure that the companies retain a fair return on their investment and that other revenue is returned to the citizens of the province. When the government sets royalties too low, and does not obtain sufficient revenue through lease sales or offer significant royalty breaks (credits, exemptions, rebates), the government is short-changing the owners of the resource, and companies get more than their fair share.⁸ While there is no universally accepted definition of a fair return on investment for oil and gas developments, a rate of return in the range of 10% to 15% is considered acceptable by the Government of Alberta.

In the case of British Columbia's natural gas resources, the existence of numerous and significant royalty breaks, as well as significant spending on the gas industry, could mean that more natural gas developments are taking place than would be economical were the government collecting sufficient revenue from such developments. Furthermore, low royalty rates may mean

⁶ Government changes announced in October 2010 changed the name of several ministries. The Ministry of Energy, Mines and Petroleum Resources is now the Ministry of Energy, but we have not revisited all of the footnote references in this report.

⁷ The role of the Ministry of Energy, Mines and Petroleum Resources is distinct from that of the Oil and Gas Commission (<http://www.ogc.gov.bc.ca/>), which is responsible for regulating the oil and gas industry once development activity is underway.

⁸ See for example, the Government of Alberta's royalty review that took place in 2007, the Alberta Department of Energy identified a 12% internal rate of return (IRR) as breakeven economics for oilsands projects. An IRR of less than 10% was considered to be too low for projects to proceed while an IRR above 15% was considered a high return on investment. See the Alberta Department of Energy's *Technical Royalty Report OS#1: Alberta's Oil Sands Fiscal System – Historical Context and System Performance* for additional details.

that companies are getting more than their fair share of revenue at the expense of the citizens of British Columbia — the owners of the resource.

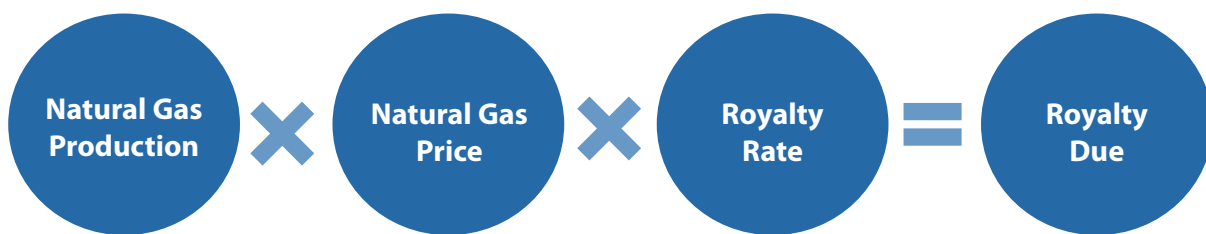
3. A plan to spur development

3.1 B.C.'s natural gas royalty regime

Once a company obtains the right to develop natural gas resources and begins producing natural gas for sale, it is the government's responsibility to obtain revenue from companies on behalf of British Columbians. Revenue is obtained through royalties and lease sales.

3.1.1 Royalties

The royalty rate applicable to natural gas in B.C. varies depending on when the land rights were acquired and when the well was drilled. There are three basic natural gas royalty regimes in B.C., referred to as Base 15,⁹ Base 12¹⁰ and Base 9.¹¹ Most new wells are Base 9, which means that the lowest applicable natural gas royalty rate is 9%. Through a formula, the rate gradually increases to reach a maximum of 27% when prices are higher than \$3 per thousand cubic feet.¹² Given that the price of natural gas has been consistently above \$3 per thousand cubic feet of late, the base royalty has been in the 27% range for many years now.¹³ The diagram below is a high-level depiction of how royalties are calculated for natural gas production in British Columbia. The natural gas price is that at the plant inlet, which is lower than the market price for natural gas (because it does not include the cost of transporting and processing the gas for sale).



A number of natural gas royalty programs are applied to the calculation presented in the diagram above. These programs, designed to increase investment in natural gas developments in B.C.,

⁹ Base 15 royalty regime applies when rights were issued before June 1, 1998, and drilling started before June 1, 1998.

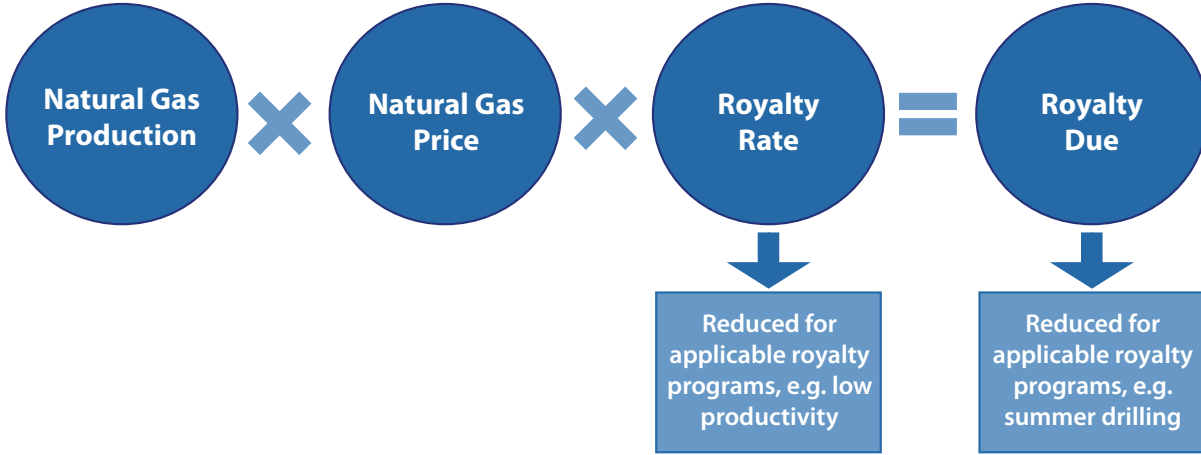
¹⁰ Base 12 royalty regime applies when a) rights were issued before June 1, 1998, and drilling started after June 1, 1998, and b) rights were issued after June 1, 1998, and drilling started more than five years after the rights were issued.

¹¹ Base 9 royalty regime applies when rights were issued after June 1, 1998, and drilling started within 5 years of the rights being issued.

¹² 1 cubic foot is the equivalent of 0.02832 cubic metres.

¹³ B.C. Ministry of Energy, Mines and Petroleum Resources, personal communication, April 2010.

either reduce the royalty rate applicable to natural gas production or generate dollar deductions to royalties due by a producer for eligible wells. Royalty programs that reduce the final rate that producers pay include the low-productivity, marginal and ultra-marginal royalty programs. Royalty programs that generate a deduction to royalties owed to the province include the summer drilling, deep gas exploration and infrastructure development programs. The diagram below depicts how the royalty programs are applied to the royalty formula.



It is important to note that these royalty programs do not represent cash outlays by the government, but instead result in foregone revenue by either reducing the royalty due or reducing the royalty rate applied to the development. They also allow companies to make money on natural gas activities that might not otherwise have been economical. By offering breaks on what companies pay to the government for each unit of gas produced, the government hopes to increase natural gas investment, development and revenue.¹⁴ Note that royalties are only paid on marketable natural gas (i.e. gas that is sold) and not on gas that is vented, flared or leaked.¹⁵

Descriptions of the full suite of royalty programs are presented in the table below.

Table 1. Royalty programs applicable to natural gas developments in B.C.

Royalty Program (year of implementation)	Brief Description	Noteworthy/Value
Coalbed Gas Royalty Credit (extended from	A \$50,000 royalty credit for each coalbed methane well drilled up to 2008. ¹⁶	The program also allows produced-water handling costs to be included in the producer cost of service

¹⁴ Parfitt, *Foot Off the Gas*.

¹⁵ B.C. Ministry of Energy, Mines and Petroleum Resources, personal communication, September 2010.

¹⁶ For development on freehold land, a tax credit of \$30,000 is available.

A plan to spur development

2004)		allowance to address the added water management costs. ¹⁷
Infrastructure Royalty Credit Program ¹⁸ (2004)	A deduction against royalties owed. This royalty credit can be as much as 50% of the cost of constructing roads, pipelines or associated facilities.	Total credits offered to date (2004 to 2009) are valued at \$485 million (including \$50 million allocated through the stimulus package described below). ¹⁹
Low-Productivity Royalty Reduction (2001)	Reduced royalty for well events with average raw gas production less than 5000 m ³ per day during a month. It was intended to prevent the government's royalty from causing gas wells to be shut in when they reached rates of production that were too low to cover their operating costs. ²⁰	The Low-Productivity Royalty Reduction as well as the programs for marginal and ultra-marginal wells (described below) progressively reduce the applicable royalty rate when the average daily rate of natural gas production is below prescribed amounts.
Marginal Well Royalty Reduction (MWRR) ²¹ (2003)	Reduced royalty rate for gas wells that are marginally economic. Replaces the low-productivity royalty reduction for some qualifying wells. The rate reduction depends on the average daily production rate per metre of depth of a well event.	Program was implemented to foster investment in the energy industry and maximize the use of natural resources. ²²
Ultra-Marginal Royalty Program ²³ (2006)	Reduced royalty rate for gas wells that are marginally economic. This program is intended to increase the development of shallow (up to 2,500 metres for vertical wells and up to 2,300 metres for horizontal wells) gas wells with low rates of production. The ultra-marginal rate reduction is more significant than	The Ultra-Marginal Royalty Program allows B.C.'s less productive wells to remain attractive investments even when well returns decline after initial drilling and production.

¹⁷ Note that there are only two projects in B.C. currently producing coalbed gas and thus paying royalties. This means that there is still too little information associated with this program to report on the foregone revenue associated with it.

¹⁸ Infrastructure Royalty Credit Program:

<http://www.empr.gov.bc.ca/OG/oilandgas/royalties/infdevcredit/Pages/default.aspx>

¹⁹ Scott Simpson, *B.C. Offers \$120 million in natural gas royalty incentives to investors*, Vancouver Sun, March 11, 2010.

²⁰ B.C. Ministry of Finance, "Royalty Programs for Marginal Gas Wells" July 2004, Bulletin PNG 003, www.gov.bc.ca/sbr

²¹ Marginal Royalty Program:

<http://www.empr.gov.bc.ca/OG/oilandgas/royalties/MarginalRoyaltyProgram/Pages/default.aspx>

²² B.C. Ministry of Finance, "Royalty Programs for Marginal Gas Wells" July 2004, Bulletin PNG 003, www.gov.bc.ca/sbr

²³ Ultra-Marginal Royalty Program: <http://www.empr.gov.bc.ca/OG/oilandgas/royalties/Ultra-MarginalRoyaltyProgram/Pages/default.aspx>

	the rate reduction for marginal well events (above) because it takes effect at higher rates of production. However, the conditions for a well event to qualify for the ultra-marginal rate reduction are more stringent. ²⁴	
Deep Royalty Program (2003, amended 2009) ²⁵	Provides a royalty credit of approximately 23% of the drilling and completion costs for wells deeper than 2,500 m for vertical wells, and deeper than 1,900 m for horizontal wells. ²⁶ Amended in 2009 to encourage more exploratory drilling.	Encourages producers to drill deep wells by providing a royalty credit equivalent to the crown's share of the drilling costs. Between 2003 and 2009 credits taken through the Deep Royalty Program amounted to \$322.2 million. ²⁷
Deep Re-entry Program ²⁸ (2003, amended 2009)	This program provides royalty credits to companies when they drill deep re-entry wells. The royalty credits cover a portion of the drilling and completion costs for these wells.	
Deep Discovery Royalty Program (2003) ²⁹	Royalty program applied to companies drilling deep discovery wells. Deep discovery wells qualify for either a three-year royalty holiday or 283 million m ³ of royalty-free gas, whichever is less.	
Summer Drilling Credit Program (2003) ³⁰	This program provides a deduction against royalties owed. The value of the credit is 10% of the drilling and completion costs to a maximum of \$100,000.	Between 2003 and 2009 credits taken through the Summer Drilling Credit Program amounted to \$212.6 million. ³¹

²⁴ B.C. Ministry of Small Business and Revenue, "Royalty Rates for Ultra-marginal Gas Wells" Information Letter 2006-05, June 2006.

²⁵ Deep Royalty Program: <http://www.empr.gov.bc.ca/OG/oilandgas/royalties/DeepRoyaltyProgram/Pages/default.aspx>

²⁶ B.C. Ministry of Energy, Mines and Petroleum Resources. "British Columbia Natural Gas and Petroleum – Yours to Explore 2010."

²⁷ B.C. Ministry of Energy, Mines and Petroleum Resources, personal communication, June 2010.

²⁸ Deep Re-entry Program: <http://www.empr.gov.bc.ca/OG/oilandgas/royalties/DeepRe-entryProgram/Pages/default.aspx>

²⁹ Deep Discovery Royalty Program: <http://www.empr.gov.bc.ca/OG/oilandgas/royalties/DeepDiscoveryRoyaltyProgram/Pages/default.aspx>

³⁰ Summer Drilling Credit Program: <http://www.empr.gov.bc.ca/og/oilandgas/royalties/summer%20drillingcreditprogram/Pages/default.aspx>

³¹ B.C. Ministry of Energy, Mines and Petroleum Resources, personal communication, June 2010.

<p>Net Profit Royalty Program (2008)³²</p>	<p>This program provides a four-tier royalty rate. Pre-payout rate of 2% of gross revenue. Tier one rate (at a return allowance equal to the long term bond rate (LTBR) of the higher of 15% of net revenue or 5% of gross revenue. Tier two rate (at return allowance equal to the LTBR plus 25%) of the higher of 20% of net revenue or 5% of gross revenue. Final tier rate (at return allowance equal to LTBR plus 100%) of the higher of 35% of net revenue or 5% of gross revenue.</p>	<p>Royalty program designed to stimulate the development of complex natural gas and oil resources by having government share in the risk of such projects. The royalty is awarded through a “Request for Applications” process where companies apply to receive the royalty program. Since the royalty is awarded to companies based on an application process, public information and data pertaining to the royalty program (e.g. how much revenue is being earned through it, how many projects are taking advantage of it) are currently lacking.</p>
<p>Oil and Gas Stimulus Package – Royalty components (2009)</p>	<p>There are several components to the stimulus package:</p> <p>One-year 2% royalty relief for new gas wells drilled between September 1, 2009, and June 30, 2010;</p> <p>A 15% increase in all the deep royalty credit tables (excluding deep re-entry);</p> <p>Expanded qualifications for horizontal wells for the Deep Royalty Credit Program; and</p> <p>\$50 million for the Infrastructure Royalty Credit Program.</p>	<p>Package intended to enhance B.C.’s competitive business climate, create momentum in the oil and gas industry and attract significant new investment in the province.</p>
<p>Royalty Roads Program (2003)</p>	<p>Under the government’s Oil and Gas Development Strategy for the Heartlands, the Royalty Roads program provides annual royalty credits for resource road development. Oil and gas companies provide matching funds.³³</p>	<p>Program provides \$30 million in royalty credits annually.³⁴</p>

It is informative to sum the value of the royalty programs for which such estimates are available (shown in the table above). This includes the infrastructure royalty credit program (\$485 million between 2004 and 2009), the deep well program (\$322.2 million between 2003 and 2009) and

³² Net Profit Royalty Program:

<http://www.empr.gov.bc.ca/OG/oilandgas/royalties/NetProfitRoyaltyProgram/Pages/default.aspx>

³³ B.C. Ministry of Energy and Mines, “Royalty Road to Increase Oil and Gas Activity” July 28, 2004,

<http://www2.news.gov.bc.ca/archive/2001-2005/2004EM0023-000613.htm>

³⁴ B.C. Ministry of Energy and Mines, “Resource Roads to Accelerate Oil and Gas Developments” December 15, 2003, <http://www2.news.gov.bc.ca/archive/2001-2005/2003EM0021-001110.htm>

the summer drilling program (\$212.6 million between 2003 and 2009). The combined cost of these programs between 2003 and 2009 is more than \$1 billion in foregone royalty revenue for British Columbians.

3.1.2 Lease sales

In addition to royalties, the Government of B.C. obtains revenue from natural gas developments through lease sales. The box below briefly describes the process by which lease agreements are sold to gas companies in the province.

Natural gas tenure process

Almost all of the natural gas rights in B.C. are owned by the citizens of the province and are thus managed by the provincial government. As manager, the B.C. Ministry of Energy is responsible for issuing and administering rights, and collecting and accounting for revenues. Private natural gas companies explore, develop, produce and market natural gas through tenure agreements, which are granted by the province. Such agreements are granted in exchange for cash bids by companies who wish to undertake such developments. Three types of agreements are used in British Columbia:

- Permits, which carry an obligation to conduct exploration.
- Drilling licences, which convey the exclusive right for permission to drill oil and gas wells in a defined area.
- Leases, which allow production and provide exclusive drilling rights.

British Columbia’s natural gas tenure disposition process is summarized in the table below.

Stage 1: Sale Posting	Industry requests that parcels of petroleum and natural gas be made available for sale.
Stage 2: Referral Phase	B.C. Ministry of Energy issues referral package to First Nations, local government and government agencies, seeking input and comment within 20 working days on proposed parcels to be auctioned.
Stage 3: Notice of Sale	Notice of sale or advertisement of proposed petroleum and natural gas parcels for auction is published six weeks in advance of auction for interested parties to review prior to submitting bids.
Stage 4: Auction	Proponent secures natural gas tenure and has the right to apply to explore and develop the resource.

Source: B.C. Ministry of Energy, Mines and Petroleum Resources, *British Columbia Oil and Gas 2009 – Yours to Explore*, http://www.canadaspacificgateway.com/shared_cpg/documents/oil_gas_explore.pdf

3.2 Direct government spending on natural gas in B.C.

In addition to the incentives offered to natural gas companies in B.C. through the royalty regime, the provincial government supports this sector in a number of other ways. In this sub-section of

the report the details of government spending on roads and education directly targeted at the natural gas sector are presented.

Table 2 contains details of government expenditure on roads that service the natural gas industry.

Table 2. Direct spending on roads that service the natural gas industry in B.C.

Program (year of implementation)	Brief Description	Noteworthy/Value
Phase 2 of the Oil and Gas Initiative (OGI2) (2000)	Launched in 1998 to increase natural gas production and investment in the province's oil and gas industry.	\$103 million over six years from the B.C. Transportation Financing Authority. \$20 million annually from 1999/2000 to 2003/2004.
Heartlands Economic Strategy (2003)	The government invested a total of \$609 million over three years to help revitalize the economy by improving roads connecting B.C.'s northeast communities.	\$37 million (of the \$609 million) spent on roads that specifically support the B.C. oil and gas industry. ³⁵ This \$37 million includes the \$20 million OGI2 spent in 2003/2004 and \$17 million in Ministry of Transportation and Infrastructure Peace District spending.
Heartlands Oil and Gas Resource Roads Strategy (HOGRRS) (2005)	A five-year investment initiative in northeast B.C.'s public roads. To improve public roads and allow industry to operate in areas that might have been off-limits due to seasonal road bans. ³⁶	2004/2005: \$17.8 million 2005/2006: \$32.5 million 2006/2007: \$42 million 2007/2008: \$42 million 2008/2009: \$42 million
North Peace and Northern Rockies regions (2006)	Funding for road upgrades in the North Peace and Northern Rockies regions.	\$36 million: \$20 million from the HOGRRS 2006/2007 funding noted above, and \$16 million in Ministry of Transportation public road spending.
Upgrades to the Sierra-Yoyo-Desan (SYD) Road (2009)	Funding provided over four years to upgrade the SYD Road to access the Horn River Basin. Upgrades are required to deal with traffic associated with the development of the Horn River and Cordova Embayment areas.	On March 13, 2009, the government announced a commitment of \$16 million for 2008/2009, \$21 million in 2009/2010, \$86 million in 2010/2011 and \$64 million in 2011/2012. Total funding of \$187

³⁵ Office of the Premier, B.C. Ministry of Transportation, "Transportation Investments to Open Up Heartlands" February 12, 2003, <http://www2.news.gov.bc.ca/archive/2001-2005/2003OTP0010-000161.htm>

³⁶ B.C. Ministry of Energy and Mines, B.C. Ministry of Community, Aboriginal and Women's Services, "\$400M to Support Communities, Oil and Gas Developments" March 22, 2005, <http://www2.news.gov.bc.ca/archive/2001-2005/2005EM0010-000341.htm>

		million over four years to upgrade the SYD Road.
Oil and Gas Rural Road Improvement Program (OGRRIP) (2009)	Building on the HOGRRS program which ended in 2008/2009, new public road upgrade funding for roads heavily used by the natural gas sector and the public in the Peace District.	2009/2010: \$47 million 2010/2011: \$47 million

Table 3 summarizes the cost figures for the initiatives identified above. Total expenditure committed to natural gas roads in B.C. is estimated at \$575 million (note that some of the expenditures have not yet been incurred).

Table 3. Value of direct spending on roads that services the natural gas industry in B.C.

Program	Value	Timeframe
Phase 2 of the Oil and Gas Initiative	\$103 million	Over six years, starting in 2000
Heartlands Oil and Gas Resource Roads Strategy	\$17.8 million	2004/2005
	\$32.5 million	2005/2006
	\$42 million	2006/2007
	\$42 million	2007/2008
	\$42 million	2008/2009
North Peace and Northern Rockies regions	\$15 million	2006
Upgrades to the Sierra-Yoyo-Desan Road	\$16 million	2008/2009
	\$21 million	2009/2010
	\$86 million	2010/2011
	\$64 million	2011/2012
Oil and Gas Rural Road Improvement Program	\$47 million	2009/2010
	\$47 million	2010/2011
TOTAL	\$575.3 million	

The Government of B.C. has also invested significant dollars in education and training related to the natural gas sector in the province. Table 4 provides details of such public spending.

Table 4. Direct spending on education related to the natural gas industry in B.C.

Program (year of implementation)	Brief Description and Support Amount
Oil and Gas Centre of Excellence (2005)	The provincial government partnered with industry to build the \$12 million Oil and Gas Centre of Excellence at the Fort St. John campus of Northern Lights College. The centre allows the college to more than double the number of students training for jobs in the oil and gas industry. The Province provided \$6 million in capital funding towards the design and construction of the \$12 million oil and gas training centre. ³⁷
B.C. Oil and Gas Education and Training Consortium (2004)	The consortium provides advice and recommendations to the Ministry of Advanced Education and the Ministry of Energy regarding a comprehensive and coordinated approach to meeting the education and training needs of the oil and gas industry and increasing the number of British Columbians employed in the industry. It led to the development of programs under the Education and Training Initiative (E&TI) (see below).
Education and Training Initiative (E&TI) (2003)	The Education and Training Initiative was established in 2003 to allocate funds towards the development and expansion of training programs relating to oil and gas. The initiative was a partnership between the Ministry of Energy, Mines and Petroleum Resources (MEMPR) and various oil and gas companies. MEMPR and industry each contributed \$500,000 annually. The goal of the MEMPR funding was to increase the number of B.C. residents trained for, and employed by, the oil and gas industry. Funding provided through E&TI extended into 2008/09.

3.3 Indirect government spending on natural gas in B.C.

There are several avenues by which the provincial government supports natural gas developments indirectly. These include, for example, spending on Geoscience BC. Geoscience BC is an industry-led, not-for-profit, applied geoscience organization. Geoscience BC works in partnership with industry, academia, government, First Nations, and communities to fund applied geoscience projects with the objective of attracting mineral and oil and gas exploration to British Columbia.³⁸ In 2008, the Ministry of Advanced Education provided Geoscience BC with \$5.7 million for geoscience projects with a particular focus on shale gas in the Horn River Basin in northeast B.C. According to the relevant press release, the funding was to provide geoscience data for the exploration and development of shale gas and other oil and gas projects.³⁹

Indirect support for the natural gas sector in B.C. has also come in the form of economic measures for Treaty 8 First Nations. Oil and gas development causes environmental degradation,

³⁷ Office of the Premier, B.C. Ministry of Advanced Education, B.C. Ministry of Energy and Mines, “New \$12 Million Centre to Boost Oil and Gas Training” February 4, 2005, <http://www2.news.gov.bc.ca/archive/2001-2005/2005OTP0011-000101.htm>

³⁸ Geoscience BC website: <http://www.geosciencebc.com/s/Home.asp>

³⁹ B.C. Ministry of Energy, Mines and Petroleum Resources, B.C. Ministry of Advanced Education, “BC Invests \$5.7 million in oil and gas resource data” April 21, 2008

having an impact on land, wildlife, water and air. First Nations traditionally rely on the environment to exercise and maintain traditional values and rights and title. Over the past 50 years, the ability of First Nations, particularly those in Treaty 8 territory, to exercise traditional ways of life, has been severely compromised by oil and gas activity. By establishing formal agreements with First Nations, the government is essentially compensating First Nations for infringement to their rights and title, and for their diminished ability to exercise their traditional ways of life. For example, a series of measures totalling almost \$1.9 million over three years announced in April 2002 was intended to foster partnerships between Treaty 8 First Nations and industry and to increase employment opportunities for First Nations in B.C.'s northeastern oil and gas sector.⁴⁰ More recent agreements with Treaty 8 First Nations specify lump sum equity payments and annual payments based on increased activity in the region for oil, gas, forestry and mining. The agreements establish minimum and maximum payments that Treaty 8 First Nations will receive from government.⁴¹ Because the government, and not industry, is incurring the costs associated with these compensation measures, such agreements are another form of government spending on the natural gas industry in B.C. The cost of these agreements should be borne by industry, the agents causing the infringement of rights.

Another example of indirect support is the provincial government providing funding for First Nations to help them establish agreements with natural gas companies that give them an equity stake or direct interest in natural gas developments. More specifically, First Nations receive funding from the provincial government to ratify agreements with development companies and further funding to ensure their equity position in the particular project. For example, First Nations along the proposed 463 km pipeline from Summit Lake to Kitimat (the KSL Project) received \$3 million as an incentive to ratify an agreement with Pacific Trail Pipelines Limited Partnership (the company developing the pipeline) and an additional \$32 million to obtain an equity stake in the pipeline.⁴² While this public money is intended to benefit First Nations, this money is then paid to the company to help provide the capital to build the pipeline, so the actual benefit to First Nations is much less direct than it would initially appear.

The provincial government also indirectly supports the gas industry in B.C. by providing funds to communities affected by gas developments through the Fair Share agreement. The Peace River Regional District (PRRD) and its local governments signed a Memorandum of Understanding (MOU)⁴³ with the provincial government in 1998⁴⁴ that requires the provincial government to provide payment to the PRRD. The funds are then distributed to relevant municipalities and the regional district based on a special funding formula. The Fair Share MOU was designed to address the situation in northeast B.C. where a large amount of oil and gas

⁴⁰ B.C. Ministry of Energy and Mines, Treaty Negotiations Office, "\$1.9 Million for First Nations Oil and Gas Opportunities" May 16, 2003, <http://www2.news.gov.bc.ca/archive/2001-2005/2003EM0007-000492.htm>

⁴¹ See <http://www.devlingailus.com/litigation/Treaty8/treaty8.html> for more information on agreements signed in 2008. Details on these agreements are not included in this report as they are outside the timeframe of the study period.

⁴² B.C. Ministry of Energy, Mines and Petroleum Resources, "First Nations to Join KSL Pipeline Project" April 8, 2009.

⁴³ Memorandum of Understanding, <http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/324088/memorandum.pdf>

⁴⁴ Municipal Affairs and Housing, "Province Signs Historic Deal on Peace River Fair Share" 04/05/1998, <http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/324088/0935.htm>

activity takes place, with an impact on the provision of regional services, and affected municipalities have limited access to the industry tax base. The objectives are to support communities needing to address historical deficits in local infrastructure and to meet the needs of the rapidly growing oil and gas sector in the region.⁴⁵ As is stated in the MOU:⁴⁶

The objective of this agreement and undertaking is to ensure that, through the implementation of an Oil and Gas Revenue Reallocation Program, the infrastructure within the regional district is raised to an adequate level, and in particular can respond to the demands placed on it by recent oil and gas industry growth, and is funded in such a way that achieves a fair balance among local government jurisdictions, taxpayers and sources of revenue.

The agreement, signed in 1998, committed the government to injecting \$133 million over 10 years to northeastern communities. In that year, \$6 million was transferred to the regional district. The amount increased to \$11.5 million the next year and \$12 million in subsequent years through to 2007/2008. In addition to this funding, in the 2004/05 budget, the government provided a one-time payment of \$40 million to the Peace Region.⁴⁷ At the same time, they committed to annual payments of \$20 million,⁴⁸ to replace the previous on-going funding of \$12 million.

3.4 Summary of government spending on natural gas in B.C.

In the sub-sections above, the myriad of royalty breaks provided to the natural gas sector in B.C. are described. The significant support provided to this sector through government spending on roads, education and communities affected by natural gas developments. Between 2003 and 2009 the value of foregone royalty revenue associated with the royalty programs for which estimates are available was \$1.047 billion. Government spending on natural gas roads in B.C., including that which has been committed to but not yet incurred, is estimated at \$575 million. Combining these figures gives a total cost estimate of more than \$1.6 billion.

The reality is that \$1.6 billion is a fraction of the true value of support provided to the natural gas sector in British Columbia. This figure does not include foregone royalty revenue associated with programs that reduce royalty rates (as opposed to royalty due), of which several are currently in place. This figure does not include funding for natural gas education or indirect support provided to the sector in the form of spending on Geoscience BC and First Nations and other affected communities. This report does not attempt to quantify the value of support provided to the

⁴⁵ B.C. Ministry of Community, Aboriginal and Women's Services, "Province Supports Northeast Economy and Communities," media release, February 15, 2005, <http://www2.news.gov.bc.ca/archive/2001-2005/2005MCAWS0011-000144.htm>

⁴⁶ Memorandum of Understanding.

⁴⁷ B.C. Ministry of Community, Aboriginal and Women's Services, "Province Supports Northeast Economy and Communities."

⁴⁸ B.C. Ministry of Energy and Mines, B.C. Ministry of Community, Aboriginal and Women's Services, 2005, "\$400M to Support Communities, Oil and Gas Developments" <http://www2.news.gov.bc.ca/archive/2001-2005/2005EM0010-000341.htm>

industry in terms of mitigating the negative environmental impacts of the gas industry, such as spending on carbon capture and storage or orphaned wells or land reclamation. Nor does this figure account for other environmental costs that instead of being borne by industry are being absorbed by society at large. This includes, for example, costs associated with environmental degradation, greenhouse gas emissions and water use.

4. Booming natural gas developments

The combination of royalty breaks, direct spending and indirect support for the natural gas sector in B.C. has contributed to a booming gas industry in the province. Indeed, capital expenditure related to gas developments in the province increased 174%, after correcting for inflation, between 2000 and 2008 (see

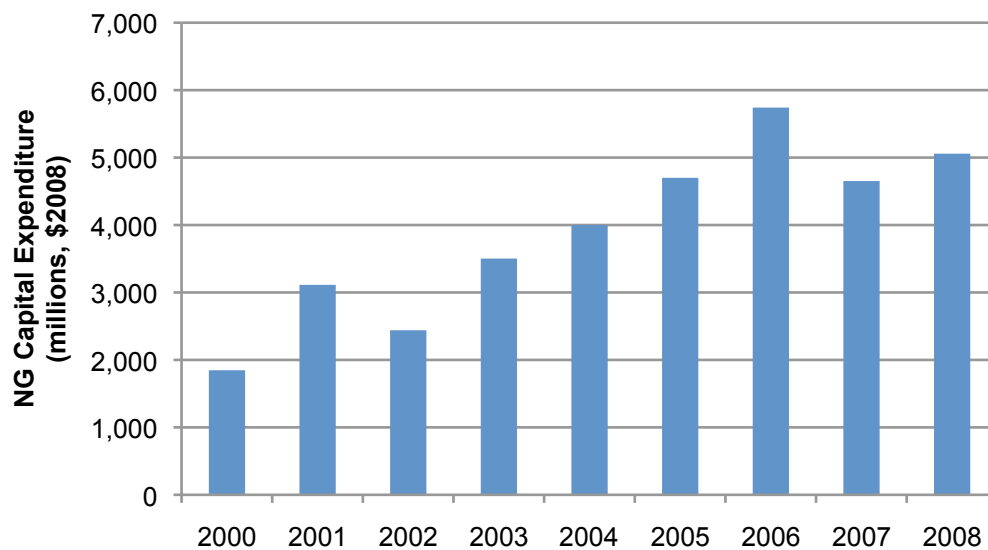


Figure 1).

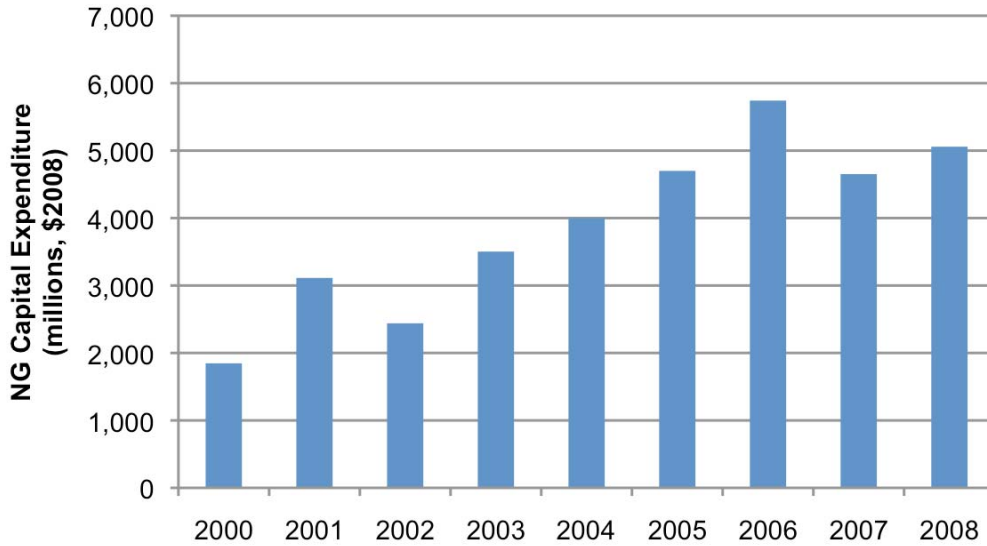


Figure 1. Capital expenditure on natural gas in B.C., 2000 to 2008⁴⁹

During the same time period, natural gas production in the province increased 31%, from 25,526 million cubic metres in 2000 to 33,466 million cubic metres in 2008 (see Figure 2).

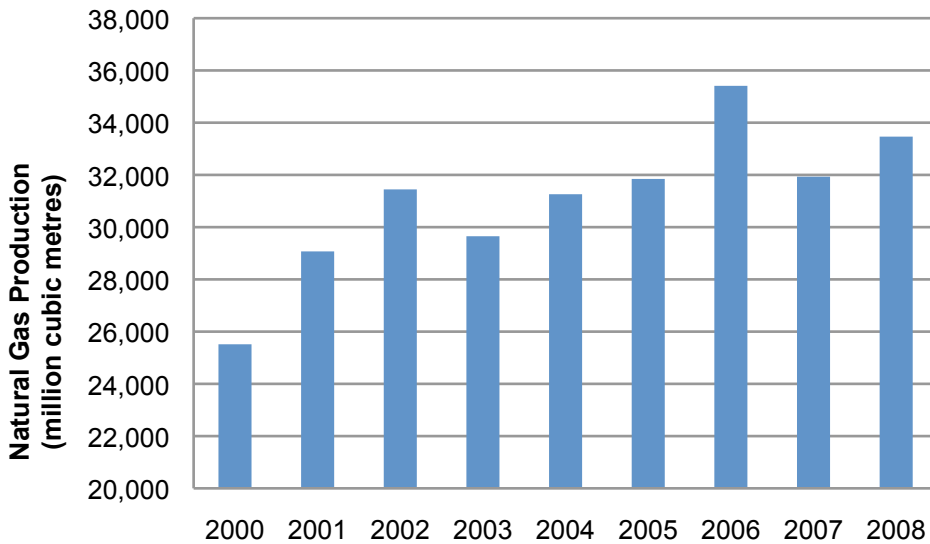


Figure 2. Natural gas production in B.C., 2000 to 2008⁵⁰

Significantly, after correcting for inflation, the value of producer sales⁵¹ increased 72%, between 2000 and 2008 (see Figure 3).

⁴⁹ Statistics Canada, CANSIM Table 029-0005, Capital and repair expenditures by sector and province.

⁵⁰ Canadian Association of Petroleum Producers (CAPP), *Statistical Handbook for Canada's Upstream Petroleum Industry*, April 2010.

⁵¹ The value of producer sales is the product of price and quantity sold and does not account for costs, including royalty payments.

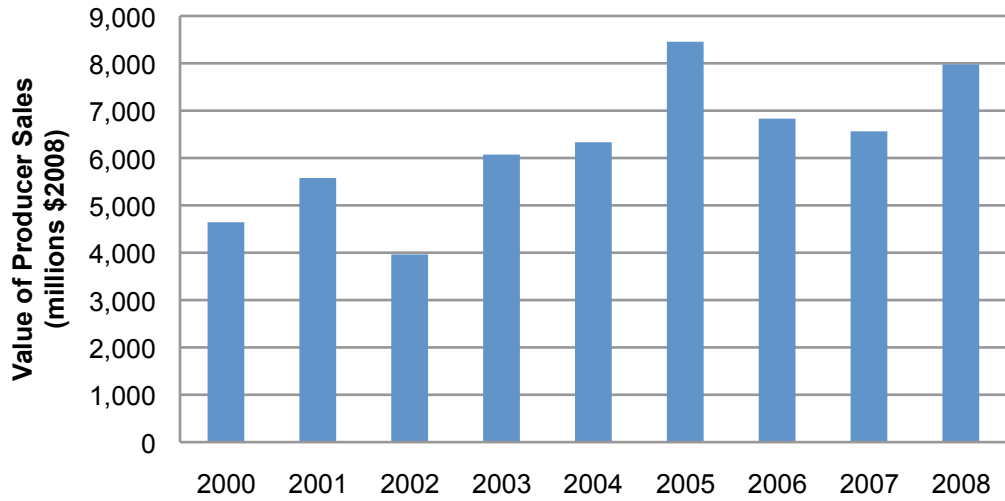


Figure 3. Value of producer sales from natural gas in B.C., 2000 to 2008⁵²

The measures cited above exemplify a growing natural gas industry in B.C. But how is this booming industry translating into revenue generation for British Columbians — the owners of this non-renewable resource? Is all of the government spending and support translating into increased revenue for British Columbians? Does the royalty and spending regime result in a win-win where companies earn a fair return on their investment and revenue generation is maximized for British Columbians?

⁵² CAPP, *Statistical Handbook for Canada's Upstream Petroleum Industry*.

5. Declining revenues for resource owners

Natural gas revenues are declining for British Columbians, the resource owners. Figure 4 shows the trend in revenue, after correcting for inflation, from royalty and lease sales from natural gas in the province of B.C. between 2000 and 2008. In 2000, revenue from gas developments amounted to \$2,002 million and in 2008 that amount was only slightly higher at \$2.169 billion. The increase in revenue from gas developments in B.C. between 2000 and 2008 was just 8%. Recall that during the same time period, the increase in production was 31% and the increase of the value of producer sales was 72%. The increase in revenue from gas developments is not keeping pace with that of production or the value of producer sales.

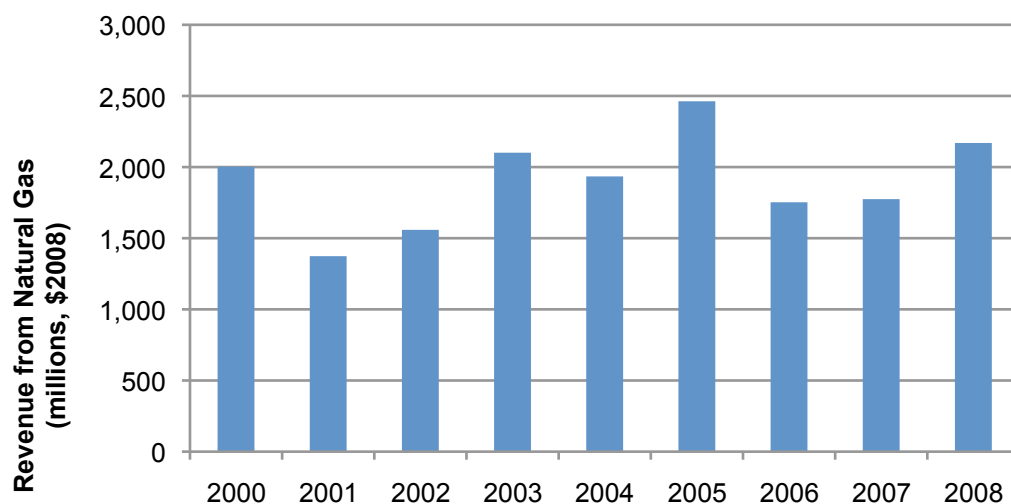


Figure 4. Revenue from natural gas developments in B.C. (royalties and lease sales), 2000 to 2008⁵³

It is useful to take a closer look at the trend in revenue generation in the context of the trend in production. To that end, Figure 5 shows natural gas revenue (royalties and lease sales after correcting for inflation) per unit production of natural gas. As the figure demonstrates, British Columbians, as resource owners, are getting less revenue today for each unit of natural gas produced than they were in the past. Revenue per cubic metre of natural gas declined from \$78 to \$65 between 2000 and 2008. That is a decline of 17%, which stands in stark contrast to the 31% increase in natural gas production and the 72% increase in the value of producer sales from gas that took place during the same time period.

⁵³ Government of British Columbia, personal communication, April 2010.

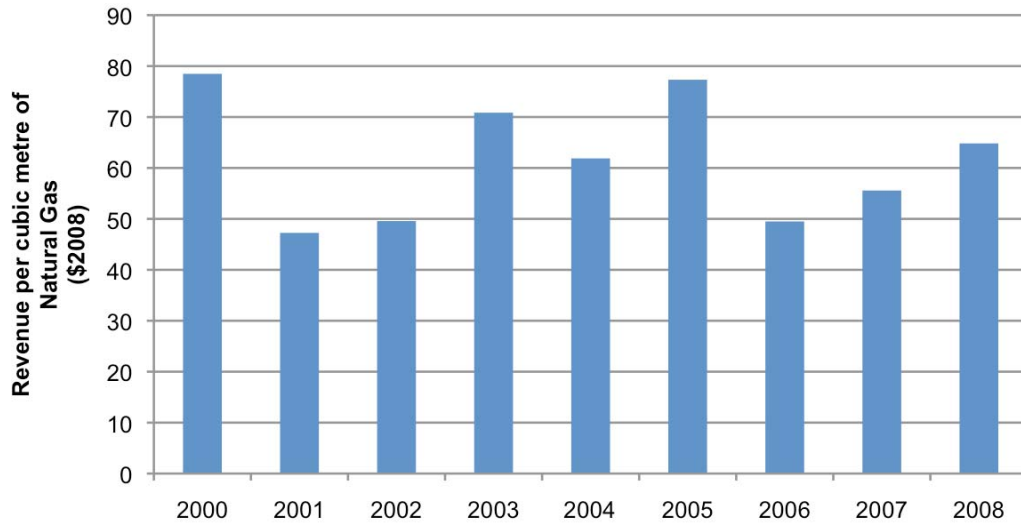


Figure 5. Revenue (royalties and lease sales) per cubic metre of natural gas production, 2000 to 2008

The royalty breaks and spending on the natural gas industry, intended to increase investment, spur production and maintain or increase resource revenues, appear to be of more benefit to companies than to British Columbians. While production has increased, it has not translated into increased revenues for resource owners. In fact, a closer look at the trend in natural gas revenue from royalties and lease sales reveals that the majority of the increase in revenue has been driven by lease sales and not by royalties at all. Between 2000 and 2008, after correcting for inflation, royalty revenue actually declined by 10% while that from lease sales increased by a significant 58%. Figure 6 shows the contribution that lease sales made to total natural gas revenues (royalties plus lease sales) between 2000 and 2008. The upward trend, especially since 2005, in this contribution is noticeable.

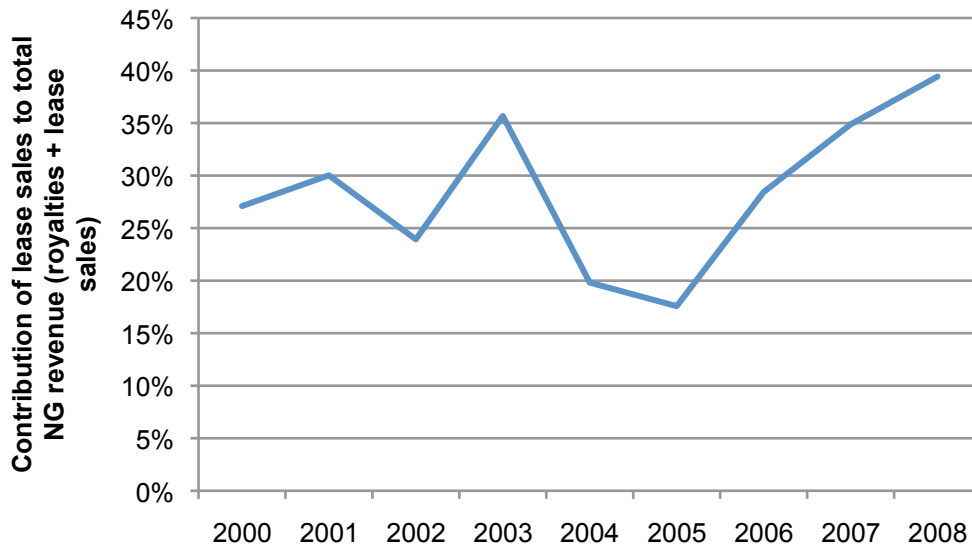


Figure 6. Contribution of lease sales to total natural gas revenue (%), 2000 to 2008

The declining nature of royalty revenue is also demonstrated by the trend in the implicit royalty rate⁵⁴ for natural gas developments in B.C. of late. Figure 7 shows the trend in the implicit royalty rate in B.C. from fiscal year 2006/2007 to fiscal year 2011/2012. During that time period, the implicit royalty rate is projected to decline from 22.5% to 13.3%; a decline of 41% in just five years.

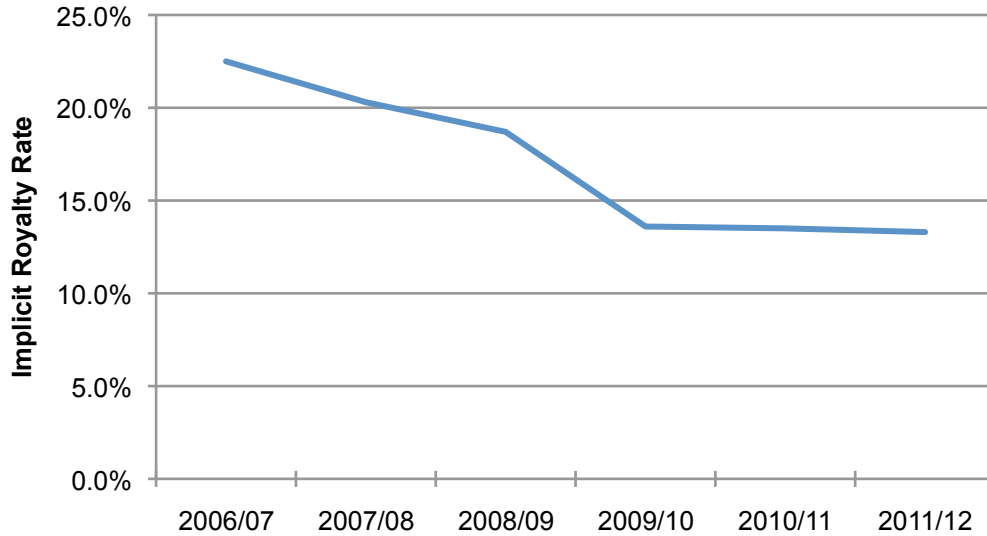


Figure 7. Implicit royalty rate (%) in B.C., 2006/07 to 2011/12⁵⁵

This analysis reveals that while gas production in B.C. may be increasing, the revenue to British Columbians, the owners of the resource, is not. It appears that these royalty breaks and spending programs are neither directly spurring production, nor are they increasing revenue to the B.C. government.

If the increase in production is not translating into increased revenue for resource owners, yet the value of producer sales continues to increase, it would appear that the primary beneficiary of the royalty scheme is the energy companies. Despite increasing costs, energy companies continue to make sizeable lease payments to the province for the right to access new pools of natural gas. Revenue from gas lease sales in B.C. increased by 58% between 2000 and 2008, from \$542 million to \$855 million. Likewise, companies undertaking gas developments in the province continue to experience high rates of profitability. For example, the internal rate of return for the Horn River Basin, a significant development located in the northeastern part of B.C., is estimated

⁵⁴ The implicit royalty rate is the royalty rate that companies face after accounting for royalty programs such as those identified and described in this report.

⁵⁵ B.C. Ministry of Finance “Budget and Fiscal Plan” annual reports for years 2007/08, 2009/10, 2010/11, and 2012/13, <http://www.bcbudget.gov.bc.ca/2010/>

at a profitable 21%⁵⁶ and the after-tax net present value⁵⁷ of a well in this basin is estimated at \$2.71 million.⁵⁸

Encana Corporation, one of Canada’s largest and most profitable energy companies, reported net earnings in 2006 of US\$5.65 billion.⁵⁹ In 2010, Encana reported to its investors that in 2007 it cost the company \$4.3 million per frack⁶⁰ at its shale gas wells in the Horn River. By 2010 its forecast average cost per frack had declined massively to \$540,000.⁶¹ Indeed, B.C. is considered by the natural gas exploration and production industry to offer gas development incentives that are superior to those in Alberta.⁶² It would appear as though a high portion of the value of B.C.’s developed gas resource is being captured by the companies undertaking such developments at the expense of British Columbians, whose own rate of return is declining. This trend is even more concerning given that gas company profits are strong, raising real questions about whether this declining revenue per unit of natural gas produced is a reasonable price to pay for increased production in the province.

It is important to recognize that the benefits of increased production go beyond revenue generation for the province. Natural gas developments in the province lead to economic and employment gains, especially in northeastern B.C. where the bulk of such developments are currently taking place. Such benefits, however, may not be as significant as one would think. Table 5 compares employment figures for key industrial sectors of the B.C. economy. As the data in the table demonstrate, the contribution of the gas sector to employment in B.C. is relatively minimal; only the electricity and forestry sectors contribute less to total employment than does the natural gas sector.

Table 5. Industrial employment, B.C., 2008⁶³

Industry	Employment (thousands)	% of Total Employment
Services	1,692,700	73.1
Construction	220,800	9.5
Manufacturing	187,400	8.1

⁵⁶ Assuming a price of natural gas of \$6 per mcf.

⁵⁷ Discounted at 10%.

⁵⁸ Oil and Gas Inquirer, December 2009, “Big Stuff- British Columbia’s shale and tight gas plays are already world-class, and there may be more to come”

http://www.oilandgasinquirer.com/profiler.asp?article=profiler%2F091201%2FPRO2009_D10000.html

⁵⁹ Parfitt, *Foot Off the Gas*.

⁶⁰ Hydraulic fracturing, or “fracking”, is a process of injecting chemicals, sand and additives into rocks on a repeated basis in order to break open the rocks that hold unconventional gas deposits, thereby increasing output from a well.

⁶¹ Encana Corporation, Investor Day: March 16 and 18, 2010.

⁶² Scott Simpson, “B.C. Offers \$120 million in natural gas royalty incentives to investors”, Vancouver Sun, March 11, 2010.

⁶³ Marc Lee and Kenneth Carlaw, 2010, *Climate Justice, Green Jobs and Sustainable Production in BC*, Vancouver, B.C.: Canadian Centre for Policy Alternatives.

Declining revenues for resource owners

Freight and transportation	122,300	5.3
Agriculture	35,900	1.6
Mining and oil and gas	28,100	1.2
Forestry and logging	17,400	0.8
Electricity	9,700	0.4

Furthermore, the economic benefits derived from natural gas developments are not without costs. The nature of natural gas reserves in the province has changed in the last decade. There is now less gas on average per well than there was a decade ago. According to one industry estimate, today it takes four wells to produce the equivalent amount of gas that one well produced 10 years ago.⁶⁴ Thus, the increase in production that has been realized in the last decade has been associated with ever increasing negative environmental impacts. More energy is required and more greenhouse gases are emitted because more wells are drilled. And more forest and important wildlife habitat is disturbed because of the expanding infrastructure of roads and pipeline corridors required to link the proliferating number of smaller wells.⁶⁵ While shale gas developments may alter this somewhat, as companies are drilling multiple wells off of one well pad, the impacts associated with the water use in shale gas production are significant and poorly understood. The B.C. government's quest to spur production and increase revenue will accelerate such negative impacts and increase threats to some of northeast B.C.'s most important wilderness areas.⁶⁶

In addition, royalty breaks and direct spending geared towards attracting investment, spurring production and increasing revenue will accelerate the depletion of a resource upon which much of northeast B.C. is currently dependent. If the plethora of government incentives targeted at natural gas developments in the province are not translating into increased revenue per unit of production for resource owners, British Columbians should be more cautious about the incentives that are being provided to develop gas deposits in the province.

If current economic conditions do not support the economical extraction of B.C.'s gas resource and substantial government, or in other words, taxpayer support is needed for the companies to undertake the developments, the B.C. government should consider leaving the gas in the ground to be extracted at a later time, when the economics are more favourable. Every cubic metre of gas that is produced now is one less that is available later. The objective should be maximum return for resource owners. As Ben Parfitt, a policy analyst with the Canadian Centre for Policy Alternatives, put it, "if high development costs prohibit moving ahead unless subsidies are provided, then perhaps development should be delayed until such time as companies feel economic conditions are in their favour once again. After all, the gas isn't going anywhere if it's in the ground."⁶⁷

⁶⁴ Parfitt, *Foot Off the Gas*, p. 18.

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid.

6. Conclusion

This report has examined current government support, in the form of royalty breaks and direct and indirect spending, provided to the natural gas industry in B.C. This analysis has been conducted in the context of the revenue trends for natural gas development in B.C., to provide a sense of the revenue trends for British Columbians – the resource owners. British Columbians received less revenue per unit of gas produced in 2008 than they did in 2000. Revenue per cubic metre of natural gas production declined by 17% between 2000 and 2008, from \$78 to \$65. This decline occurred despite a 31% increase in gas production, a 72% increase in the value of producer sales, substantial royalty breaks and significant spending on the gas sector in the province over the same period of time.

Meanwhile, the increase in production that has been realized in the last decade has been associated with ever increasing negative environmental impacts in the form of increased energy consumption, greenhouse gas emissions and land disturbances. The decline in revenue for resource owners and the increase in environmental impacts are occurring in the context of high profits for gas companies operating in B.C. It is apparent that the many government incentives targeted at natural gas developments in the province are resulting in increasing environmental impacts and declining revenue for resource owners. The B.C. government should consider leaving more of this finite gas resource in the ground to be extracted at a later time, when development can take place without significant government support.

This analysis raises real questions about the effectiveness of the royalty regime in achieving a solid rate of return for British Columbians. We recommend the B.C. government undertake a thorough, transparent and public review of all government support for gas developments in B.C. to ensure that both resource owners and companies are receiving a fair rate of return for the development of gas resources.