

Alberta's New Climate Leadership Plan: A provincial response to climate change

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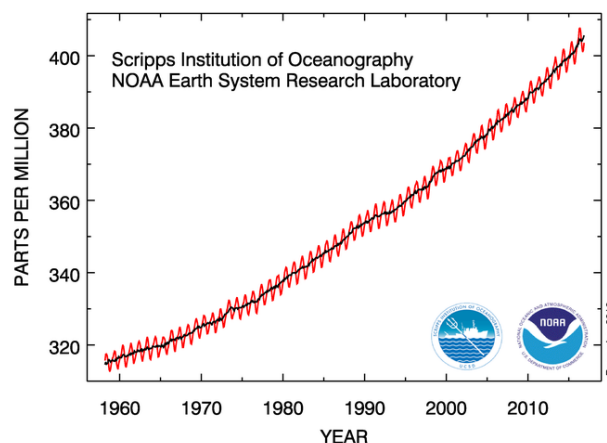
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### 1. INTRODUCTION

The industrial revolution marked the start of society's romance with fossil fuels, and beginning of the anthropogenic injection of significant quantities of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) into the atmosphere. Our gluttonous love of fossil fuels has resulted in an increase in the global average concentration of CO<sub>2</sub> from pre-industrialization levels of 280 ppm to, for the first time in 2016, just over 400 ppm<sup>1</sup>. Data obtained from ice cores in Greenland and Antarctica, shows that GHGs such as CO<sub>2</sub>, methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) are present today in the atmosphere in concentrations that are higher than any observed from samples dating back for the last 800, 000 years<sup>2</sup>. On top of ice core data, ambient data collected at the Mauna Loa Observatory in Hawaii (Figure 1)<sup>1</sup>, demonstrates that in the last 70 years, atmospheric concentration of CO<sub>2</sub> have increased, associated with industrialization of the western world and in more recent decades, third world countries in Asia and Africa. With the last three decades being warmer than any other on record since 1850<sup>2</sup> there is growing consensus between scientists and policy makers that something must be done to ensure that impacts from climate change are kept at a minimum.



*Figure 1: Atmospheric CO<sub>2</sub> at Mauna Loa Observatory, Hawaii (Source: NOAA, ESRL).*

Since the early 1990s, the Canadian government has established legislation to cap and reduce emissions; most recently through the Kyoto Protocol in 1997 and the Paris Accord in 2015<sup>3</sup>. In an attempt to ratify and help maintain commitments made during these accords, legislation to cap and reduce emissions and fuel use has been proven to be the most effective means of introducing change<sup>3</sup>.

## 1.2 CARBON PRICING

GHG regulation has been shown to be successful using a number of systems including carbon pricing, cap-and-trade, command and control, and flexible regulations. The introduction of environmental taxes has a long history in Europe, of providing an effective means at decreasing fossil fuel consumption without having negative effects on a governments GDP (Figure 2). After the initiation of environmental and fuel taxes in several European countries in the mid-1990s an increase in the overall GDPs of the countries can be seen<sup>4,5</sup>.

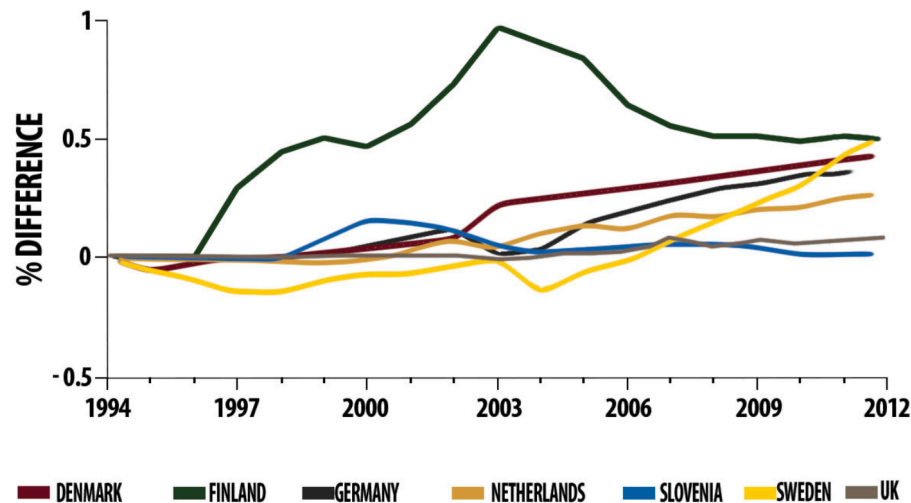


Figure 2: The effect of environmental tax shifts on GDP in European Countries<sup>4,5</sup>.

Unlike the popular cap-and-trade system that limits the total level of GHG emissions and allows lower emitting industries to sell their surplus to larger emitters, the installation of a carbon tax puts a price on carbon and aims to induce reductions through giving polluters a choice to either reduce emissions or continue to emit but pay a tax which can be funneled back into investing in clean technologies and innovation. For this reason, carbon pricing has become increasingly popular as a flexible and least-cost way of inducing change<sup>6</sup>. More recently, British Columbia's Climate Action Plan, the first carbon tax of its kind to be introduced in North America, has proven to decrease the per capita use of fossil fuels, without harming the provincial GDP.

### 1.3 BRITISH COLUMBIA'S CLIMATE ACTION PLAN

In July 2008, British Columbia's Liberal government ratified its revenue-neutral carbon tax. It started off at \$10/tonne CO<sub>2</sub> equivalent (CO<sub>2</sub>e) and progressively increased over the next 4 years to \$30/tonne, with the goal of reducing up to 3 million tonnes of CO<sub>2</sub> emissions by 2020 (Figure 3). In order to ensure the success of the program and limit over-taxation of the public, the revenue-neutral carbon tax was designed to funnel funds obtained through the carbon levy into lowering other personal taxes, i.e. income tax<sup>5,7</sup>.

	UNITS FOR TAX	TAX RATE JULY 1, 2012
Gasoline	¢/litre	6.67
Diesel (light fuel oil)	¢/litre	7.67
Jet Fuel	¢/litre	7.83
Natural Gas	¢/cubic metre	5.70
Propane	¢/litre	4.62
Coal - high heat value	\$/tonne	62.31
Coal - low heat value	\$/tonne	53.31

*Figure 3: Selected 2012 carbon tax rates by fuel type (Source: Government of British Columbia)<sup>7</sup>.*

Just over 8 years after its ratification, it has proven to be a highly effective legislation, which is studied internationally for its success. Although initially lower than the national average, BC's use of petroleum based fuels followed similar trends to the rest of the country. While, an overall reduction in fossil fuel use occurred following the recession in 2008, there was a noticeable decline in purchase of taxed petroleum products in comparison to the rest of Canada even after the economy had begun to recover.

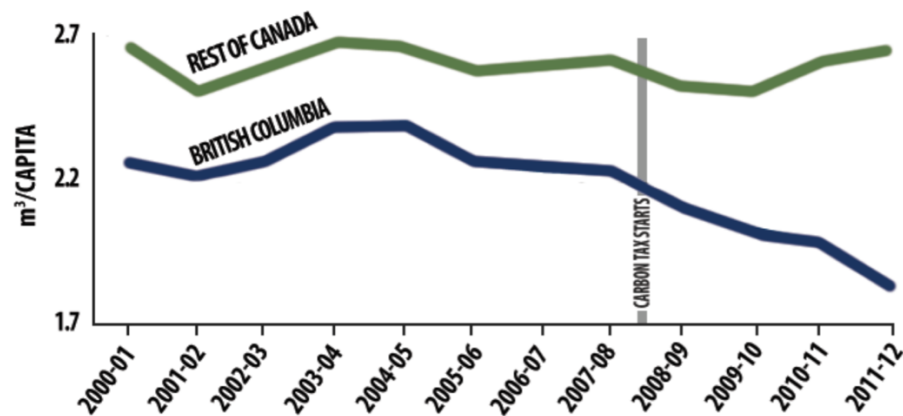


Figure 4: Sale of Petroleum fuels subject to BC Carbon Tax (2000-2012) (Source: Statistics Canada, calculations by Elgie and McClay)<sup>5</sup>.

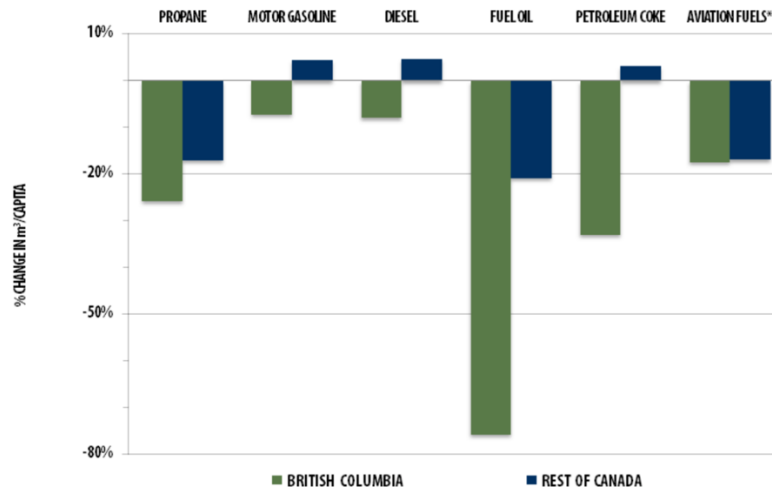
TABLE 1: PER CAPITA CONSUMPTION OF PETROLEUM FUELS SUBJECT TO BC CARBON TAX (% CHANGE)					
	2008/09	2009/10	2010/11	2011/12	2008-12 Total
<b>BRITISH COLUMBIA</b>	-5.4%	-3.6%	-2.4%	-7.1%	-17.4%
<b>REST OF CANADA</b>	-3.4%	-0.7%	3.9%	1.7%	1.5%
<b>DIFFERENCE</b>	-2.1%	-3.0%	-6.3%	-8.8%	-18.8%

Source: Statistics Canada, author calculations. Figures may not add, due to rounding. Years beginning July 1.

Figure 5: Per Capita consumption of petroleum fuels subject to BC carbon tax (in % change)

(Source: Statistics Canada, calculations by Elgie and McClay)<sup>5</sup>.

This trend was not limited to one type of fuel, which might suggest targeting of a specific industry. On a per fuel basis it could be seen that in comparison with the rest of Canada, consumption of all major petroleum based fuels decreased in BC after the initiation of the carbon tax in 2008. In particular motor gasoline, diesel and petroleum coke all saw decreases in BC, and increases in the rest of the country.



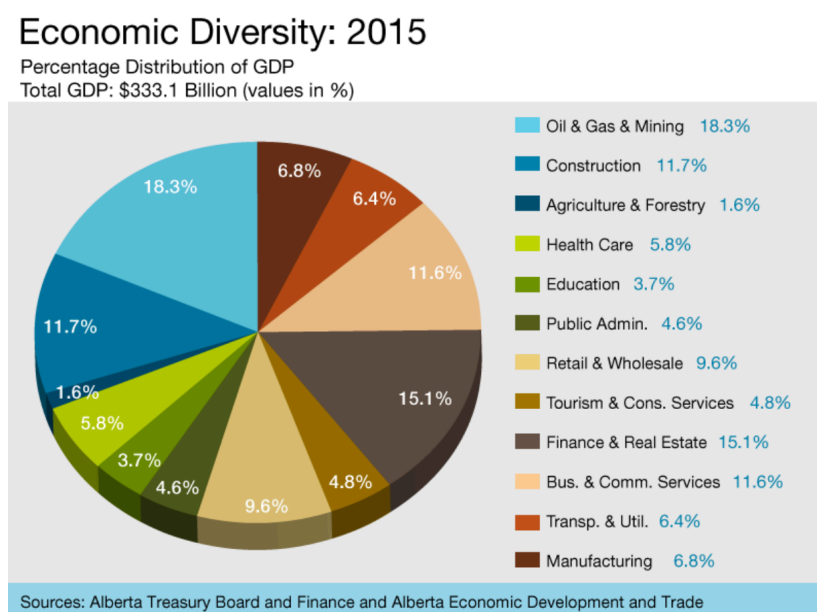
*Figure 6:* Consumption of petroleum fuels subject to BC carbon tax, in comparison to the rest of Canada (Source: Statistics Canada, calculations by Elgie and McClay)<sup>5</sup>.

In implementing a carbon tax, BC was able to reduce their emissions by 33% below the 2007 rates, which was equivalent to removing 800,000 cars from the road every year. The province of Alberta has chosen to focus their policy on instating carbon pricing for all fuels that results in the release of Greenhouse Gases (GHG) upon combustion.

#### 1.4 ALBERTA’S RELATIONSHIP WITH FOSSIL FUELS

Since the discovery of oil in Alberta in 1947, the province has relied on the local abundance of this natural resource to fuel its economy. In 2013, the oil, gas and mining sector was directly

responsible for 18.3% of Alberta's GDP (Figure 7); this does not account for additional sectors such as construction and infrastructure development (11.7%), and all other industries associated with the economies of oil cities like Fort McMurray<sup>8</sup>.



*Figure 7: Percentage Distribution of Alberta's GDP in 2015. (Source: Alberta Treasury Board and Finance and Alberta Economic Development and Trade)<sup>8</sup>.*

## 2. ALBERTA'S CLIMATE LEADERSHIP PLAN

In May 2015, the New Democratic Party was elected to the Alberta legislature, which marked the first time since 1971 that a party other than the Progressive Conservatives had run government. Since their historic election, the New Democratic Party has made strides towards improving Alberta's environmental policy, including the introduction of the Climate Leadership Plan during their 2016 budget. Alberta's new Climate Leadership Plan has four main pillars: i) phasing out coal emissions and development of renewable energy, ii) implementation of a new carbon price on GHG emissions, iii) legislation of an oil sands emission limit and iv) implementation of a new

methane emission reduction plan for the oil and gas sector, which will be achieved through a carbon levy on fuels and new performance standards for large final emitters. On top of these four focuses, the government has proposed using revenue from the Climate Leadership plan to invest in energy research and technology, green infrastructure and programs aimed at citizen energy reduction; this includes the introduction of rebates for lower and middle class families, and financial support for small businesses, Indigenous communities and communities whose economy relies on the coal industry<sup>8,9</sup>. This work will focus on the recently announced carbon pricing policy by the Alberta government, and will compare to legislation released by the government of British Columbia, in an attempt to analyze the potential for success of this new plan.

## 2.1 THE CARBON LEVY

A summary of the initial fuel taxation rates is found in Figure 8. Prices for 2017 are based on \$20/tonne of CO<sub>2</sub> equivalent and increase to \$30/tonne in 2018. Due to a recent crash in oil prices, the NDP announced that these will be subject to change in order to protect the provincial economy until things rebound. Given current market conditions the newly introduced carbon levy is predicted to raise \$274 Million in 2016-2017, \$1.2 Billion in 2017-2018 and \$1.7 Billion in 2018-2019<sup>8,9</sup>.

Type of Fuel	January 1, 2017 Rate (\$20/tonne)	January 1, 2018 Rate (\$30/tonne)
Diesel	5.35 ¢/L	8.03 ¢/L
Gasoline	4.49 ¢/L	6.73 ¢/L
Natural Gas	1.011 \$/GJ	1.517 \$/GJ
Propane	3.08 ¢/L	4.62 ¢/L

*Figure 8:* Carbon levy rates for major fuels as proposed by Alberta government (Source: Alberta Treasury Board and Finance).



Fuels currently covered under the Specified Gas Emitters Regulation, will be exempt from taxation since they are already regulated. On top of these fuels, fuels used by farmers, biofuels, fuels used for inter-juristical flights and fuels used by indigenous communities will not be taxed<sup>8,9</sup>.

## 2.2 THE EFFECTS ON CONSUMERS

Due to the intimate connection of the Albertan economy to oil industry, many Albertans feel fiercely protective of the oil and gas sector; any opposition to it is viewed as a personal attack on their livelihood. Since the unveiling of the Albertan Climate Leadership Plan, there has been significant negative feedback from the public. In a recent poll published by ThinkHQ 63% of Albertans did not support the soon to take effect carbon tax and 53% disapproved of the NDP's Climate Leadership Plan<sup>10</sup>. Although more political opponents claim the tax is just another way for the government to take money from the public, Alberta's Climate Leadership Plan was designed to give rebates to lower and middle income families. The overall costs to the public were broken into natural gas and gasoline consumption, and were estimated based on average consumption rates. For most consumer products such as gasoline and diesel, the carbon tax will be included in the price shown at the pump. For other such as natural gas, the tax will appear as a separate tax on utility bills. The provincial government estimates that the total cost for a single individual in 2017 will be \$191 and will rise in 2018, to \$286. In 2017, this cost will equal approximately \$338, and increase to \$508 by 2018 (outlines below in Figure 9)<sup>8,9</sup>.

	Single	Couple	Couple with 2 Children
<b>Consumption Assumptions</b>			
Natural gas (GJ)	100	123	135
Gasoline (litres)	2,000	3,000	4,500
<b>2017 Impacts</b>			
Natural gas (@ \$1.011/GJ)	\$101	\$124	\$136
Gasoline (@ 4.49 ¢/L)	\$90	\$135	\$202
<b>Total 2017 Costs</b>	<b>\$191</b>	<b>\$259</b>	<b>\$338</b>
<b>2017 Maximum Rebate Amount</b>	<b>\$200</b>	<b>\$300</b>	<b>\$360</b>
<b>2018 Impacts</b>			
Natural gas (@ \$1.517/GJ)	\$152	\$186	\$205
Gasoline (@ 6.73 ¢/L)	\$134	\$202	\$303
<b>Total 2018 Costs</b>	<b>\$286</b>	<b>\$388</b>	<b>\$508</b>
<b>2018 Maximum Rebate Amount</b>	<b>\$300</b>	<b>\$450</b>	<b>\$540</b>

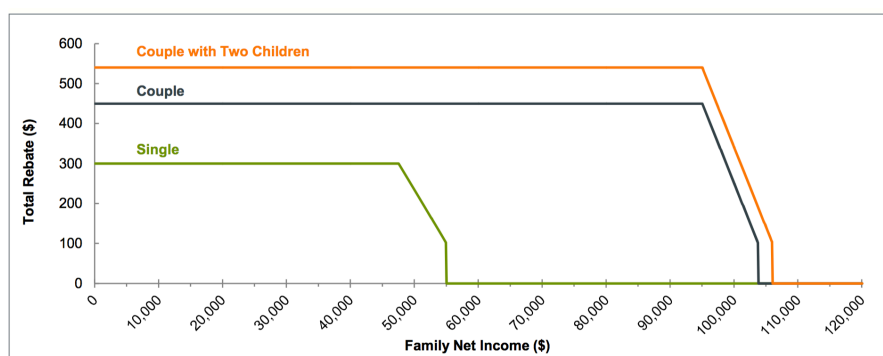
Figure 9: Estimate Impacts of the carbon levy on Albertan households (Source: Alberta Treasury Board and Finance)<sup>8,9</sup>.

In order to reduce the taxation of lower and middle income families, the provincial government introduced tax breaks, aimed at targeting the bottom 60% of provincial residents.

	2017	2018
<b>Benefit Amounts</b>		
First adult	\$ 200	\$ 300
Spouse/Equivalent to spouse	\$ 100	\$ 150
Child (max. 4)	\$ 30	\$ 45
<b>Phase-out Thresholds (Family Net Income)</b>		
Single	\$ 47,500	\$ 47,500
Couple	\$ 95,000	\$ 95,000
Families	\$ 95,000	\$ 95,000
<b>Income at which Rebate is Fully Phased Out (Family Net Income)</b>		
Single	\$ 51,250	\$ 55,000
Couple	\$ 100,000	\$ 103,750
Couple with 2 children	\$ 101,500	\$ 106,000
Couple with 4 children	\$ 103,000	\$ 108,250
<b>Phase-out Rates</b>		
Single	2.67%	2.67%
Couple	4.00%	4.00%
Families	4.00%	4.00%

Figure 10: Climate leadership adjustment rebate parameters<sup>8,9</sup>.

This translates to rebates for individuals making a net income of \$55,000 or less, couples making \$103,750 or less, families with 2 children (\$106,000 or less) and families with 4 children making \$108,250 or less (Figure 10)<sup>8,9</sup>. With rebates, close to 60% of Albertans should notice no appreciable increase in their expenditures due to the added taxes. This can be compared to British Columbia, where an estimated 80% of the population benefited from tax cuts given by the carbon tax<sup>11</sup>.



*Figure 11: Climate leadership adjustment rebate benefits by income, 2018 (Source: Alberta Treasury Board and Finance)<sup>8,9</sup>.*

Although much of the negative focus has been on the impact a new provincial tax will have on the average family, the main target of Alberta's carbon pricing is the oil and gas industry. The implementation of carbon pricing will have both physical and financial implications.

## 2.3 PERFORMANCE STANDARDS FOR LARGE FINAL EMITTERS

On top of carbon pricing, Alberta's Climate Leadership Plan aims at targeting large final emitters, which are currently covered under the Specified Gas Emitters Regulation. In 2018, this system will be replaced with the Carbon Competitiveness Regulation (CCR). Emitters that produce more than 100,000 tonnes of GHG per year will be required to reduce their emissions by 15%; this

will increase to 20% in 2018<sup>8,9</sup>. Discussions between the province and oil and gas industry are still on going, in order to ensure that effective, obtainable legislation is created.

## 2.4 THE EFFECT ON INDUSTRY

On top of physically reducing emissions through facility improvements, companies will have the opportunity to offset their emissions through emission performance and Alberta-based carbon offset credits, through contributions to Alberta's Climate Change and Emissions Management Fund. The initial prices will be set a \$20/ tonne over pre-set reduction targets with the price increasing to \$30/tonne in 2018. In 2023 a levy of on-site combustion of conventional oil and gas will be initiated as part of the Joint Initiative on Methane Reduction and Verification<sup>8,9</sup>.

## 3. THE FUTURE OF ALBERTA'S CARBON TAX

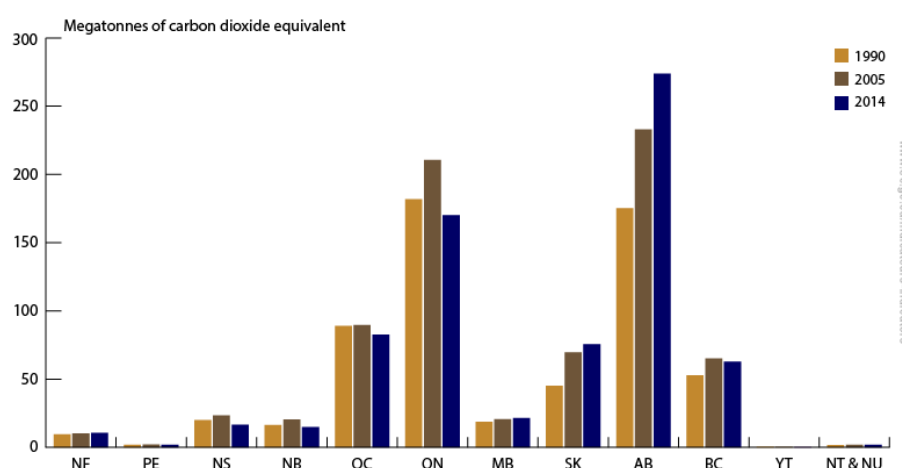
The introduction of the Climate Action Plan in British Columbia proved to be a successful legislative move that made an appreciable impact of the provincial emissions of GHGs. However, many skeptics wonder if similar success will be seen in Alberta. Alberta has a strong economic ties with its oil and gas industry, and a public who associate economic prosperity with the success of this sector. Recent polls show that the majority of Albertans do not approve of the governments new legislation, despite efforts by the province to alleviate the effects of taxation on lower and middle class citizens<sup>10</sup>.

In a price by price comparison of the proposed carbon levy prices with British Columbia's rates, Alberta's new levy's are either on par or greater than those in BC (Figure 12). On a consumer basis these prices, should be enough to at least encourage some decrease in fossil fuel use.

Type of Fuel	Alberta (Jan. 2017) (\$20/tonne)	Alberta (Jan. 2018) (\$30/tonne)	B.C. (current) (\$30/tonne)
Diesel	5.35 ¢/L	8.03 ¢/L	7.67 ¢/L
Gasoline	4.49 ¢/L	6.73 ¢/L	6.67 ¢/L
Natural Gas	1.011 \$/GJ	1.517 \$/GJ	5.70 ¢/cubic meter
Propane	3.08 ¢/L	4.62 ¢/L	4.62 ¢/L

*Figure 12:* Comparison between carbon pricing introduced in British Columbia and those proposed in Alberta (Source: Province of Alberta and Province of British Columbia)<sup>7,8,9</sup>.

However, unlike British Columbia, the majority of Alberta's emissions come directly from a single industry, the oil and gas sector. In 2014, Alberta's GHG emissions were at 273.8 megatonne of CO<sub>2</sub> equivalent, which was over 100 megatonne higher than the next highest province, Ontario (at 170.2 megatonne CO<sub>2</sub>e)<sup>12</sup>. If real reductions in emissions are to be achieved, and help Canada accomplish its COP21 commitments to reduce emissions 30% below 2005 levels by 2030<sup>13</sup>, then the fossil fuels industry will need to comply and make serious commitments in regards to reducing their GHG footprints.



*Figure 13:* Greenhouse gas emissions by province and territory, Canada, 1990, 2005 and 2014

(Source: Environment and Climate Change Canada).

Preliminary discussions between the province and oil industry have proven promising<sup>11</sup>; still, it has yet to be seen whether legislation will be effective. Despite the current efforts being made by the provincial government, one of the major challenges will be whether the NDP can stay in power long enough to ensure that the Climate Leadership Plan has time to establish and show that it can be successful. The recent announcement from the federal Liberal's that provinces must adopt a carbon tax or cap-and-trade system or there will be initiation of a national carbon tax of \$50/ tonne CO<sub>2</sub> equivalent by 2022<sup>14</sup>, may help to encourage the success of Alberta's Climate Leadership Plan. Whether Albertans are happy or not with the concept of carbon pricing, the true success of Alberta's Climate Leadership plan will hinge on industry compliance and mandates from the federal government.

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