Assessing the Federal Government's Actions on Climate Change

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Executive Summary

This report analyzes Canada's progress towards achieving our Nationally Determined Contribution (NDC) of a 30 percent reduction from 2005 levels of greenhouse gas (GHG) emissions by 2030 and our fair share contribution to limit warming to 1.5°C. This analysis examines the emissions impact of federally approved fossil fuel infrastructure projects and the emissions impact of national policies designed to reduce GHG emissions. The first section of this analysis compares recently announced national policies to reduce GHG emissions with the projected upstream emissions from four major fossil fuel infrastructure projects but does not include the additional policies and regulations outlined in the Pan-Canadian Framework on Clean Growth and Climate Change (PCF). This section also evaluates the job creation potential of investments in the four major fossil fuel infrastructure projects compared to the job creation potential of the same investments in the One Million Climate Jobs Plan. The second section of this analysis examines the proposals outlined in the PCF and evaluates whether these measures are sufficient to meet Canada's climate change commitments and if the necessary policies are in place to ensure a Just Transition for workers, their families, and communities in the shift to a low-carbon economy.

The federal government has demonstrated a commitment to reducing GHG emissions through the announcement of several policies and regulations leading up to the establishment of the PCF. These priority actions for reducing emissions include phasing out coal-fired electricity, regulatory measures to reduce hydrofluorocarbons (HFCs), pricing carbon pollution, reducing methane emissions, and committing to develop a new clean fuel standard. The federal government has also approved four major fossil fuel infrastructure projects, which include Pacific NorthWest Liquefied Natural Gas (LNG), Trans Mountain Expansion, Line 3 Replacement, and Keystone XL. This analysis shows that there is a net increase in annual GHG emissions when the combined annual upstream emissions generated from the four approved projects are compared to the combined annual emission reductions from the five federal policies and regulations.

The PCF represents a historic federal commitment to action on climate change and includes additional GHG emission reduction measures. While the PCF includes many relevant and significant actions, timelines for implementation and benchmarks for job creation and increasing ambition to limit GHG emissions are lacking. The PCF is also weak on how the government plans to achieve a Just Transition and how fossil fuel infrastructure projects fit into the picture. Further, the emission reduction strategies in the PCF are insufficient for Canada to do its fair share to limit warming to 2.0°C, let alone 1.5°C. When all of the GHG reductions from previously announced measures are added to the measures in the PCF, there is still a gap of 44 megatonnes of carbon dioxide equivalent (Mt CO_2eq) to Canada's 2030 NDC and a gap of 167 Mt CO_2eq to Canada's 2030 fair share target to limit warming to 1.5°C.

As Canada transitions to a low-carbon future, it is important to evaluate which pathways present the best opportunities for job creation and economic growth. We must also ensure that the chosen pathways fulfil the government's promise of Indigenous Reconciliation, reduce poverty and inequality, and create the kind of environment that we want to leave for future generations.

Introduction

The global climate is undeniably warming as a result of anthropogenic forces, and almost every country agrees that urgent action must be taken. In December of 2015, nearly 200 nations reached an agreement to limit the impacts of climate change, signifying one of the most meaningful international commitment on the environment to date. The Paris Agreement is a global commitment to limit the rise in average global temperatures to "well below" 2.0°C above pre-industrial times, with an ambition to limit temperature rise to 1.5°C. It was signed by 194 countries and ratified in November of 2016, much faster than expected, which illustrates the urgency of this global challenge. On the same day that the Agreement was ratified, the United Nations Environment Programme (UNEP) released a report showing that even if all of the pledges under the Paris Agreement are fully implemented, the world will still be on track for a temperature rise of 2.9 to 3.4°C this century.[1] These alarming projections are contingent on each country meeting their targets, meaning that even if all countries achieve their Nationally Determined Contributions (NDCs), the projections for global average temperature increase will remain in exceedance of 2.0°C for the end of this century.

Canada's NDC is a 30 percent reduction below 2005 levels of annual greenhouse gas (GHG) emissions by 2030. According to Environment and Climate Change Canada's most recent National Inventory Report, Canada will have to reduce its annual GHG emissions by over 200 megatonnes of carbon dioxide equivalent (Mt CO_2eq) compared to 2014 emissions in order to meet this target. Additionally, for Canada to do its fair share to limit warming to 1.5°C, annual emissions will have to be reduced by over 300 Mt CO_2eq from current levels.[2]

Average annual global temperature increase is already hovering dangerously close to the more ambitious target of 1.5°C. The World Meteorological Organization recently released a provisional statement on the status of global climate change, showing that global temperatures for January to September 2016 were approximately 1.2°C above pre-industrial levels.[3] Accordingly, all countries must continue to increase the ambition of their contributions, as current pledges are insufficient to limit warming to 2.0°C above pre-industrial times, which is widely understood as the threshold to avoid the most dangerous impacts of climate change. It should be noted that we will still experience dramatic consequences from climate change with a global average temperature increase of only 2.0°C above pre-industrial levels. These impacts include an increase in the intensity and frequency of forest fires; increased risk of sea level rise; alteration of precipitation patterns, resulting in both an increase in heavy precipitation events and an increase in the duration and intensity of droughts, resulting in major risks to global and regional food security; substantial species extinction; and devastating health and displacement impacts for billions of people.[4]

In Canada's second biennial submission to the United Nations Framework Convention on Climate Change, Canada's annual GHG emissions for 2030 were projected to be 815 Mt CO_2eq, almost 300 Mt CO_2eq over the NDC target and more than double Canada's fair share contribution to limit warming to 1.5°C.[5] While a number of new climate policies have been announced that were not included in the biennial projections, recent analysis indicates that even when the new national and subnational policies are accounted for, there will be an emissions gap of 152 Mt CO_2eq to the 2030 NDC and a gap of 276 Mt

CO_2eq to the 2030 target to limit warming to 1.5°C.[6] The recently announced PCF presents new emissions projections for Canada to 2030 and will be examined in the second section of this document.

The analysis presented here seeks to reconcile Canada's NDC and 1.5°C targets for 2030 with four federally approved fossil fuel infrastructure projects and national policies to reduce GHG emissions. The first section of this analysis compares recently announced national policies to reduce GHG emissions with the projected upstream emissions from four major fossil fuel infrastructure projects but does not include the additional policies and regulations outlined in the PCF. The second part of this analysis will examine the proposals outlined in the PCF, which was announced in a Communique from the First Ministers of Canada on December 9th, 2016.

1. Emissions Impact Comparison of Federal Actions

Key Findings:

- **A significant increase in ambition for greenhouse gas reduction targets will be required in Canada and abroad to limit the most severe impacts of climate change;**
- **The upstream emissions from four federally approved fossil fuel infrastructure projects outweigh the emissions reductions from five recently announced federal emission reduction policies; and**
- **More jobs will be created through investments in the green economy than through investments in fossil fuel infrastructure projects.**

The federal government has demonstrated a commitment to reducing GHG emissions through the announcement of several policies and regulations. These priority actions for reducing emissions include phasing out coal-fired electricity, regulatory measures to reduce hydrofluorocarbons (HFCs), pricing carbon pollution, reducing methane emissions, and committing to develop a new clean fuel standard. The federal government has also approved four major fossil fuel infrastructure projects and provided the expected upstream GHG emissions impacts from these projects through assessments performed by the Canadian Environmental Assessment Agency (CEAA). These projects include Pacific NorthWest LNG, Trans Mountain Expansion, Line 3 Replacement, and Keystone XL. This section will illustrate how these federal policies and regulations to reduce emissions stack up against the approved fossil fuel projects.

1.1 Federal Actions to Reduce Emissions

This section gives a brief overview of each of the recently announced federal policies to reduce GHG emissions and quantifies the expected annual GHG emission reductions from each action. The expected annual decrease in GHG emissions for each policy and the total emissions decrease from all policies are summarized in Table 1 on the following page.

Coal Phase Out

The Liberal government has announced a federal plan to phase out coal-fired electricity. Provinces have the option of either completely phasing out coal and replacing it with lower-carbon sources, or they may use carbon capture and storage technology. This plan is expected to reduce emissions by 5 Mt CO_2eq by 2030, in addition to the 10 Mt CO_2eq of reductions that are expected from Alberta's early coal phase out.[7]

Hydrofluorocarbons (HFCs) Regulations

Canada joined 196 other countries in signing the Kigali Amendment to the Montreal Protocol, representing global action to phase out HFC emissions. The proposed regulatory measures to reduce HFCs are expected to result in cumulative reductions of about 176 Mt CO_2eq between 2018 and 2040, which would represent an annual emissions reduction of approximately 8 Mt CO_2eq.[8]

Carbon Pricing Mechanism

The Government of Canada has proposed a pan-Canadian approach to pricing carbon pollution. Under the new plan, all Canadian jurisdictions will have carbon pricing in place by 2018. The price on carbon pollution will start at a minimum of $10 per tonne in 2018 and rise by $10 a year to reach $50 per tonne in 2022. Provinces and territories may choose to either put a direct price on carbon pollution or they can adopt a cap-and-trade system.[9]

The level of GHG reductions achieved from pricing carbon will be dependent upon whether the price per tonne continues to escalate or remains flat at $50 per tonne. Continuing with a flat rate of $50 per tonne to 2030 will result in emission reductions of 18 Mt CO_2eq. If the price per tonne escalates at $10 per year to 2030, to reach a price of $130 per tonne, annual emission reductions will reach 47 Mt CO_2eq.[10]

Methane Regulations

Methane is a potent greenhouse gas with a global warming potential 25 times that of carbon dioxide over a 100 year period and 85 times that of carbon dioxide over a 20 year period. Canada and the U.S. have committed to reducing methane emissions from the oil and gas sector by 40-45 percent below 2012 levels by 2025. The Government of Canada has committed to publishing proposed regulations by early 2017. Achieving this target would result in an annual emissions reduction of 18.4-20.7 Mt CO_2eq.[11]

Clean Fuel Standard

The Government of Canada has recently announced that they will be holding consultations next year to develop a new clean fuel standard. The standard will be designed to limit the carbon intensity of fuels used in transportation, home and building heating, and by industry, and is expected to reduce annual GHG emissions by 30 Mt CO_2eq by 2030.[12]

The total annual emissions reductions that will be achieved through these five measures is expected to be 81.7 Mt CO_2eq, as illustrated in Table 1 below.

Table 1. GHG Emission Reductions from Recently Announced Federal Policies

	Coal Phase-Out	HFC Regulations	Carbon Pricing	Methane Regulations	Clean Fuel Standard	Total Reductions
Total Reduction (Mt CO_2eq)	-5	-8	-18	-20.7	-30	-81.7

1.2 Approved Fossil Fuel Infrastructure Projects

This section gives a brief overview of four federally approved major fossil fuel infrastructure projects and the projected contribution to upstream GHG emissions from each project. The expected annual GHG emissions for each project and the total emissions from all four projects are summarized in Table 2 on page 10 of this document.

Pacific NorthWest LNG

The Pacific Northwest LNG is an approved proposal for a natural gas liquefaction and export facility that will be located on Lelu Island. The CEAA estimates that the annual upstream GHG emissions from this project will range from 8.8 to 9.3 Mt CO_2eq. This estimate includes all upstream emissions preceding the liquefaction process and includes natural gas production, processing, and pipeline transmission.[13] The Pembina Institute (2016) estimates that the annual GHG emissions from the Pacific NorthWest LNG project, combining facility emissions and upstream operations, could account for 74 to 81 percent of the emissions permitted under B.C.'s 2050 target, leaving insufficient room and flexibility for emissions from other sectors of the economy.[14]

Figure 1. Petronas Pacific NorthWest Liquefied Natural Gas
Source: CBC News[15]

Trans Mountain Pipeline Expansion

The approved Trans Mountain Pipeline Expansion involves the construction of a new pipeline that will twin the existing pipeline through Alberta and British Columbia. The project also includes the construction of additional associated infrastructure. The expansion will increase the capacity of the pipeline system by 590,000 barrels per day, which the CEAA estimates will add 13 to 15 Mt CO_2eq of upstream GHG emissions each year. The expansion will bring total capacity to 890,000 barrels per day, with total existing and additional annual upstream GHG emissions calculated to be between 21 and 26 Mt CO_2eq.[16]

Figure 2. Kinder Morgan Trans Mountain Expansion
Source: CBC News[17]

Line 3 Replacement

Line 3 Replacement is an approved proposal to replace sections of the existing Line 3 pipeline between Alberta and Manitoba. The project involves the installation of new infrastructure, the replacement of existing infrastructure, and the decommissioning of the existing pipeline. The CEAA estimates that the annual upstream GHG emissions associated with the project will be between 21 and 27 Mt CO_2eq. This estimate includes the upstream emissions associated with the current capacity of Line 3, as well as the upstream emissions associated with the additional pipeline capacity that would be enabled by this project. The replacement will increase the average capacity of Line 3 from 390,000 barrels per day to 760,000 barrels per day.[18]

Figure 3. Enbridge Line 3 Replacement

Source: Global News[19]

Keystone XL

Keystone XL is a proposed 1,897 km pipeline between Alberta and Nebraska.[20] This expansion of the Keystone pipeline system will increase capacity by 830,000 barrels per day. The Keystone XL pipeline was approved prior to the announcement of the Government of Canada's interim approach for environmental assessments in late January of 2016. Therefore, the CEAA did not provide an assessment of the upstream greenhouse gas emissions associated with the Project. Analysis performed by the U.S. Environmental Protection Agency found that the Keystone XL project would cause up to 27.6 Mt CO_2eq in additional upstream greenhouse gas emissions compared to existing sources of crude oil.[21] The Pembina Institute estimated that the upstream emissions of the project would be 22.4 Mt CO_2eq per year.[22] Other studies have estimated the annual upstream GHG impact of the Keystone XL pipeline to be between 19 and 29 Mt CO_2eq.[23]

Figure 4. TransCanada Keystone XL Pipeline

Source: Global News[24]

Upstream and Downstream Emissions

The CEAA only measures upstream emissions from projects requiring an environmental assessment.[25] Depending on pipeline capacity, as well as the type and density of the fuel being transported, the midstream and downstream emissions from an oil or gas project may account for over 80 percent of emissions.[26] Accordingly, the global impact of the midstream and downstream emissions resulting from these approved fossil fuel infrastructure projects will significantly exceed the upstream emissions that have been quantified by the CEAA for each project.

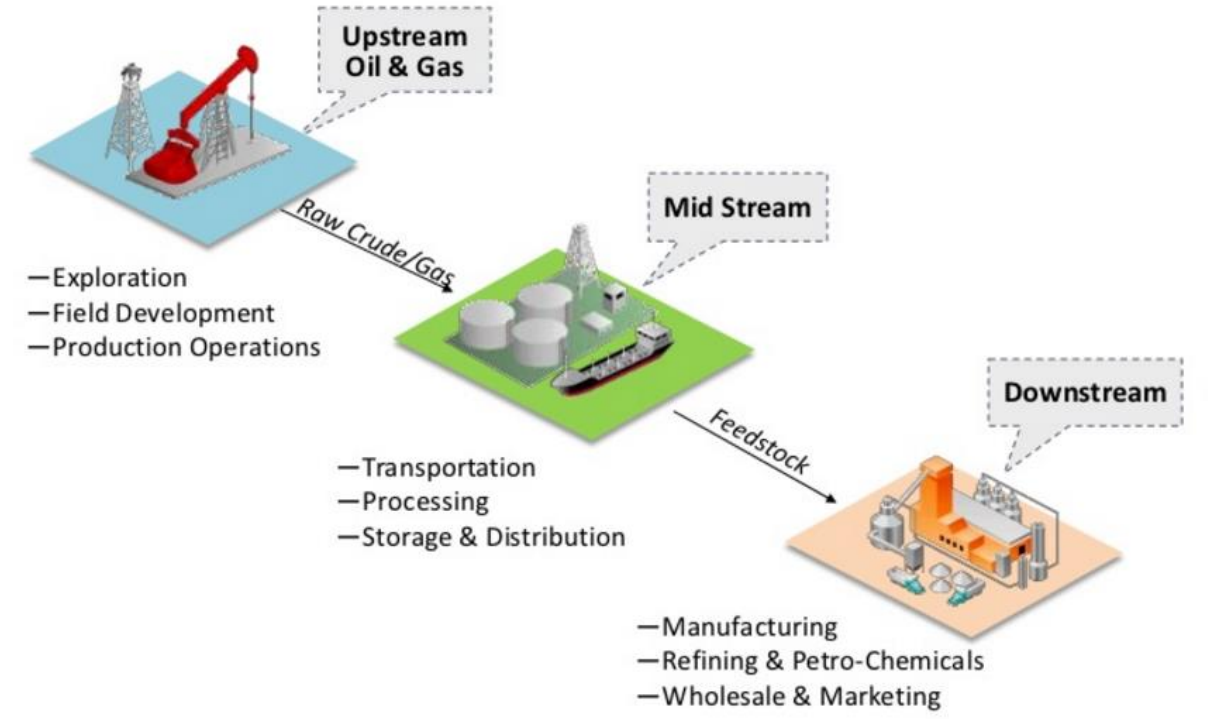


Figure 5. Oil and Gas Value Chain

Source: Acheampong, T. (2011)[27]

The total annual emissions impact of these fossil fuel infrastructure projects is expected to be an increase of 64.9 Mt CO_2eq, bringing the total annual emissions for all four projects to 89.9 Mt CO_2eq, as illustrated in Table 2 below.

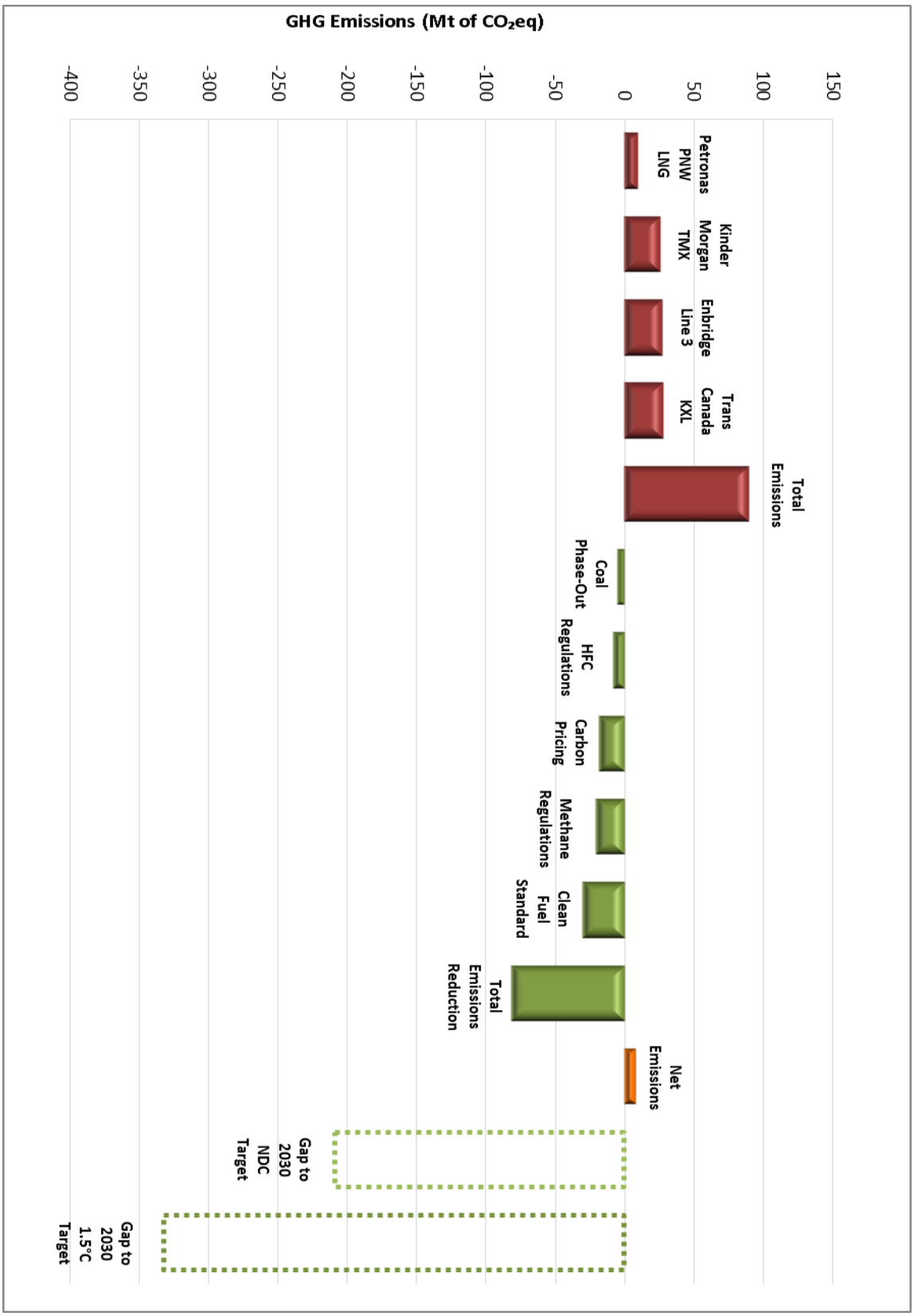
Table 2. Upstream Emissions from Four Approved Fossil Fuel Infrastructure Projects

	Petronas PNW LNG	Kinder Morgan TMX	Enbridge Line 3	Trans Canada KXL	Four Project Total
Existing Upstream Emissions	-	11	14	-	25
Additional Upstream Emissions	9.3	15	13	27.6	64.9
Total Emissions (Mt CO_2eq)	9.3	26	27	27.6	89.9

1.3 Greenhouse Gas and Employment Impact

A comparison of the total projected upstream emissions from the three recently approved fossil fuel infrastructure projects, and the previously approved Keystone XL, is illustrated in Figure 6 on the next page. These projections include the cumulative emissions from current capacity and projections for the upstream emissions that will be created from new and increased capacity. These emissions are compared to recently announced federal policies and regulations to decrease GHG emissions. The net emissions from comparing these federal actions are also presented in relation to the emissions reductions required to meet Canada's 2030 NDC and the target for Canada's fair share to limit warming to 1.5°C. The emission reduction gaps presented in the graph represent the difference between Canada's total annual emissions in 2014 (732 Mt CO2eq) and Canada's 2030 NDC target (524 Mt CO_2eq, -209 Mt CO_2eq from 2014) and 1.5°C target (400 Mt CO_2eq, -332 Mt CO_2eq from 2014).

Figure 6. GHG Emissions Impact of Federal Actions



The total investment for the four fossil fuel infrastructure projects will be $60.3 billion. A generous estimate of the direct, indirect, and induced person job years of employment that will be created from this investment would be 380,900 jobs over five years, which is illustrated in Table 3 below. The job estimates for the fossil fuel infrastructure projects are provided by the proponents and do not necessarily reflect person job years, as many of the jobs counted in these estimates are part-time and/or short-term. It is important to note that the job creation numbers provided by the proponents of these projects have repeatedly been criticized. It is equally important to realize that many of the jobs created by Enbridge Line 3 Replacement, and the majority of the jobs created by Keystone XL, will be created in the United States, not in Canada.

Table 3. Major Infrastructure Projects and Jobs

Fossil Fuel Infrastructure Project	Cost in Billions of Dollars	Number of Jobs Created
Petronas PNW LNG	**$36 billion** (entire project including drilling and natural gas production, LNG terminal, and related pipelines)[28]	• Up to 4,500 jobs during peak construction • Up to 330 direct operational long-term jobs • Approximately 300 local spin-off jobs[29]
Kinder Morgan TMX	**$6.8 billion**	• 15,000 jobs a year during construction • A further 37,000 direct, indirect, and induced jobs for every year of operation[30] • The Corporate Mapping Project (2016) argues that these job creation numbers are grossly overestimated and based on flawed economic modelling[31]
Enbridge Line 3	**$7.5 billion** ($4.8 billion capital investment)	Over the three years it will take to replace Line 3, approximately 44,400 temporary full-time equivalent jobs will be required: • 24,275 direct jobs in Canada and the US • 10,958 indirect jobs in Canada and the US • 9,183 induced jobs in Canada and the US[32]

Trans Canada KXL	**Up to $10 Billion**[33]	• U.S. State Department: 42,100 jobs in the U.S. (direct, indirect, and induced)[34] • TransCanada: 20,000 (13,000 in construction, 7,000 in manufacturing)[35] • These job creation numbers have repeatedly been refuted[36]
Total	**$60.3 Billion**	**380,900**

The same investment of $60.3 billion in the One Million Climate Jobs Plan would create 784,570 person job years of employment over five years while reducing annual GHG emissions by up to 190 Mt CO_2eq after ten years.[37] The One Million Climate Jobs Plan is a concrete plan of action to use targeted public investments and existing skills and technologies to create one million person job years of employment in five years, reduce poverty and inequality, and put Canada on track to exceed our 2030 NDC. A comparison of the employment and environmental impact of each investment option is presented in Table 4 below.

Table 4. Comparison of Job Creation by Infrastructure Project Type

Infrastructure Project Type	Total Investment	Person Job Years Created Over Five Years	Annual Emissions Impact
Fossil Fuel (pipelines and associated infrastructure for oil and natural gas)	$60.3 Billion	380,900	+89.9 Mt CO_2eq
One Million Climate Jobs Plan (renewable energy, energy efficiency and building retrofits, public transportation, and high-speed rail)	$60.3 Billion	784,570	-190 Mt CO_2eq

Fossil fuel infrastructure projects have historically raised controversy, but as awareness of the environmental implications of fossil fuel extraction rises, perceptions of these projects appear to be more divisive than ever before. While the federal government is taking meaningful action to reduce

emissions from the oil and gas sector, including reducing methane emissions by 40-45 percent below 2012 levels by 2025 and imposing a price on carbon pollution, it is unclear whether these measures will be sufficient to offset the increase in emissions from the approved projects. It is also questionable if these projects are aligned with Canada's commitment under the Paris Agreement and how exactly we can achieve our 2030 target if these projects progress. The federal government is making major infrastructure decisions today that will determine Canada's future economy and environment. As members of civil society, we must evaluate which types of infrastructure projects present the best opportunities for job creation and growing the economy, while assessing if these decisions fulfil the government's promise of Indigenous Reconciliation, reduce poverty and inequality, and create the kind of environment that we want to leave for future generations.

2. Evaluating the Pan-Canadian Framework on Clean Growth and Climate Change

Key Findings

- **The emission reduction strategies in the Pan-Canadian Framework on Clean Growth and Climate Change are insufficient for Canada to do its fair share to limit warming to 2.0°C, let alone 1.5°C;**
- **When all of the GHG reductions from previously announced measures are added to the measures in the PCF, there is still a 44 Mt CO_2eq gap to Canada's 2030 NDC and a gap of 167 Mt CO_2eq to Canada's 2030 fair share target to limit warming to 1.5°C;**
- **The measures in the PCF would be strengthened with incremental targets for GHG emission reduction and job creation;**
- **It is unclear how the emissions from federally approved fossil fuel infrastructure projects are factored into the PCF;**
- **There are no specific measures outlined in the PCF to ensure that workers and their families are supported in the transition to a low-carbon economy; and**
- **The PCF lays the groundwork for transitioning to a low-carbon economy but requires a significant increase in ambition to do our part to limit warming to 1.5°C and to achieve deep decarbonization by mid-century.**

The Pan-Canadian Framework on Clean Growth and Climate Change (PCF) was developed with the provinces and territories, and in consultation with Indigenous Peoples, as a way to grow the economy while reducing emissions. The development of the PCF began with the Vancouver Declaration on March 3, 2016, when the First Ministers launched a federal-provincial-territorial process to identify options for action, leading to the creation of four working groups: the Working Group on Specific Mitigation Opportunities; the Working Group on Adaptation and Climate Resilience; the Working Group on Carbon Pricing Mechanisms; and the Working Group on Clean Technology, Innovation and Jobs.[38] Each working group developed a final report, considering input from Canadians, including meeting with Indigenous

Peoples and key stakeholders, as well as reviewing ideas and comments that were submitted through an online portal.[39] Climate Change Town Halls were also held across the country, focusing on the same four categories as the Working Groups, and reports from these town halls were compiled and submitted to the online portal.

The Green Economy Network made a submission to the Working Group on Clean Technology, Innovation and Jobs, outlining how targeted public investments in the priority areas of the One Million Climate Jobs Plan will create over one million person job years of employment over five years, and reduce annual GHG emissions by up to one-third after ten years, while reducing poverty and inequality.[40] Many of the proposals included in the PCF are aligned with the pillars of the One Million Climate Jobs Plan, including updating building codes, increasing energy efficiency and retrofitting buildings; renewable energy and upgrading electrical grid infrastructure; reducing reliance on diesel for remote, northern, and Indigenous communities; electrifying transportation and increasing public transportation; and pricing carbon pollution. However, the PCF allows for several significant measures to be put off for years, which is no longer an option, as urgent action is required immediately.

While the PCF includes many relevant and significant actions, timelines for implementation and benchmarks for job creation and increasing ambition to limit GHG emissions are lacking. The PCF is also weak on how the government plans to achieve a Just Transition and how fossil fuel infrastructure projects fit into the picture. This section provides an analysis of these issues, as well as other concerns with measures included in the PCF.

2.1 Emissions and Employment

The PCF quantifies the expected emissions reductions from announced measures and regulations as of November 1st, 2016 (-89 Mt CO_2eq) and expected emissions reductions from the measures in the PCF (-86 Mt CO_2eq). This still leaves a gap of 44 Mt CO_2eq to Canada's 2030 NDC of a 30 percent reduction below 2005 levels, and a gap of 167 Mt CO_2eq to Canada's 2030 fair share target to limit warming to 1.5°C. The PCF does list "additional measures" to achieve the remaining 44 Mt CO_2eq of reductions, but the details of these measures are vague and the particular reductions from each measure are not specified.[41] The beginning of the PCF states a commitment to "meeting or exceeding Canada's 2030 target," yet the PCF alone is insufficient to meet this goal. Additionally, the PCF makes reference to the need to "increase the level of ambition over time" but does not set out a timeline for the reassessment of Canada's NDC. Under the Paris Agreement, Canada must increase the ambition of its 2030 NDC in advance of the first global stocktake to assess the collective progress towards achieving the long-term goals of the Agreement, which will take place in 2023. Therefore, a strategy to increase the ambition Canada's 2030 NDC should have been included for this timeframe as part of the PCF.

The PCF outlines actions to reduce emissions but does not have a timeline for implementation for many of the measures. GEN recommends that in addition to a timeline for implementation, benchmark targets for emission reductions are created to assess the efficacy of the proposed measures and to provide opportunities for additional reductions. The federal government must implement the PCF's policy recommendations quickly in order for the maximum emission reduction benefits to be realized in time

to meet our 2030 NDC and to allow time to ratchet up ambition for deep decarbonization by mid-century. Establishing concrete targets for emissions reductions from each policy recommendation is essential to ensure that meaningful progress is achieved.

The PCF set targets for the federal government to reduce GHG emissions from its operations to 40 percent below 2005 levels by 2030, and to use 100 percent clean power by 2025. GEN commends the federal government for these targets but emphasizes that these initiatives need to include incremental targets for implementation, estimates and targets for GHG reductions, estimates for energy cost savings, and concrete targets for job creation. An example of the quantification of benefits is illustrated by a similar initiative in the U.S., where the government had set aggressive targets to reduce energy use and pollution from federal agencies. Analysis of these initiatives shows that investments in energy efficiency and building retrofits for federal buildings, including incorporating renewable energy, are expected to reduce energy spending by $8 billion over the next 18 years; create 30,000 jobs; and reduce annual emissions by 1.4 million tons.[42] The PCF includes dates to achieve the federal government's targets, but does not clearly outline how these targets will be achieved. Also, while the emissions reductions from these initiatives are lumped into the 86 Mt CO_2eq of reductions achieved through measures in the PCF, it is not clear what the specific reductions will be from these measures alone. The Canadian targets for greening federal operations would be further strengthened if they included targets for job creation, as illustrated by the parallel example from the U.S.

2.2 Just Transition

The PCF identifies several priority economic sectors including those recommended in the One Million Climate Jobs challenge: renewable energy, energy efficiency and building retrofits, and sustainable transportation options. While the PCF includes measures and regulations to reduce emissions from these sectors and acknowledges the opportunities for job creation, many of the measures do not have timelines for implementation, and none of the measures include targets or benchmarks for job creation.

The word 'jobs' appears 30 times in the document but specific linkages between the proposed measures and the creation of employment are missing. GEN recommends that job creation targets be established to complement the aforementioned emission reductions targets to demonstrate Canada's commitment to reducing emissions while creating decent jobs. The absence of this information is concerning because this PCF is intended to explain pathways for clean growth in addition to reducing emissions and mitigating climate change. Further, the PCF does not address occupations that will be transformed or eliminated in the transition to a low-carbon economy. There is one reference to Just Transition: "It will also be important to ensure a commitment to skills and training to provide Canadian workers with a just and fair transition to opportunities in Canada's clean growth economy".[43] However, there are no specific measures outlined to ensure that workers and their families are supported in the transition to a low-carbon economy. This is a major shortcoming of the PCF and the implementation of a Just Transition strategy must be a top priority.

Without proper planning, including a Just Transition strategy, policies and regulations to tackle climate change have the potential to cause massive social and economic destruction. Just Transition cannot

simply be added at the end; it needs to be integrated from the beginning, with voices from labour and under-represented groups, including Indigenous Peoples, involved from the outset. The strategy must embody social support, re-employment and compensation measures, advanced skills training programs, and investment in apprenticeships. This strategy must also guarantee the increased participation of equity-seeking groups to ensure that everyone is able to access and benefit from the labour market opportunities created by the transition to a low-carbon economy.

We cannot achieve a Just Transition without targeted investments for creating new lines of employment designed to reduce GHG emissions and address issues of equity. The federal government has the opportunity to implement the recommendations in the PCF in a way that addresses the impending threat of climate change, while ensuring a Just Transition for all, including workers and their families. As previously mentioned, the federal government has committed to greening its operations by cutting emissions from vehicle fleets and buildings, setting a goal to use 100 percent clean power by 2025, and working with provincial and territorial governments to modernize procurement practices. These new actions represent an opportunity to show how major public infrastructure projects can be designed to include Just Transition measures, including integrating mandatory requirements for contractors to sponsor apprenticeships, which will aid in increasing the apprenticeship completion rate and ensure that our workers have the skills that they need to build the new low-carbon economy.

A Just Transition strategy must include investing in the workforce of tomorrow by cultivating the skills and strengths of the workers of today. In order to anticipate the future demand for skills and occupations, we will need a more complete understanding of labour market trends in the emerging low-carbon economy. Establishing a clean technology data strategy is included as a 'new action' in the PCF, which emphasizes generating more comprehensive data on Canada's clean technology capacity and potential, as well as developing clear metrics for measuring the impacts of government initiatives. However, the collection of labour market data is not mentioned as a component of this strategy.[44] While the recommendations included in the PCF are essential components of a clean technology data strategy, the exclusion of labour market data renders the strategy incomplete. The Canadian Labour Congress recommends that the federal government invest $45 million in a new Green Economy and Skills survey to collect accurate, reliable, and timely labour market information about the green economy. This information will also clarify areas for improvement and aid in the development of policies, as well as guiding investment priorities as we transition our workforce and our economy.

The principles of a Just Transition must be translated into concrete action, secured in legislation, and backed up by financial commitments. A Just Transition strategy is an essential component for the successful implementation of the policies and measures outlined in the PCF. Only by pursuing a Just Transition can we ensure that we are simultaneously addressing the problem of anthropogenic climate change while also addressing the persistent issues of unemployment and inequality. Anticipating and mitigating the social consequences of the transition to a low-carbon economy will require that we adequately prepare and support our workers and communities. Securing a Just Transition will position Canadians to successfully overcome the challenges that will arise as we transform our industries and our economy.

2.3 Fossil Fuel Infrastructure Projects

Several major fossil fuel infrastructure projects were approved in the months preceding the establishment of the PCF, but the Framework contains no mention of the specific fossil fuel infrastructure projects. This omission is out of step with messaging from the federal government, which has made linkages between the recently announced pipelines and the emissions cap of 100 Mt CO_2eq on the oil sands, going so far as to say that the fossil fuel projects are "part of our plan to reduce greenhouse gas emissions" and that Alberta's 100 Mt CO_2eq emissions cap on the oil sands is "built into our climate plan."[45] While the oil sands cap is referenced several times, the specific pipelines and how they fit into the oil sands cap are not mentioned at all. It should also be noted that Alberta's 100 Mt CO_2eq annual emissions cap for oil sands production by 2030 allows for emissions to increase by over 42 percent from today's levels.[46]

Liquefied natural gas (LNG) is mentioned several times in the PCF, including reference to increasing the availability of LNG fueling infrastructure as an option to lower carbon intensity in the transportation sector.[47] The PCF also includes BC's Climate Leadership Plan as part of the 89 Mt CO_2eq of GHG reductions to be achieved from announced measures as of November 1st, 2016.[48] The actions proposed in B.C.'s Climate Leadership Plan are expected to reduce annual GHG emissions by up to 25 Mt CO_2eq below current forecasts by 2050.[49] Analyses from Clean Energy Canada and the Climate Leadership Team show that even if all measures in the Plan were implemented, B.C.'s annual GHG emissions would be very similar to today's levels (62.9 Mt CO_2eq) by 2050.[50] Further, it appears that the PCF includes the expected emission reductions from B.C.'s plan in its calculations for the pathway to meet Canada's 2030 target, but does not include the predicted increase in emissions from the approved LNG terminal. In fact, reference to the LNG terminal or any other LNG infrastructure is entirely absent from the PCF itself, relegated to brief mention in the sections for B.C. and Ontario in Annex II.[51]

A transparent and comprehensive plan for Canada's transition to a low-carbon economy must include the approved fossil fuel infrastructure projects, given the profound cumulative impact of their annual upstream emissions, which are equal to the total combined annual emissions of Saskatchewan and Newfoundland and Labrador.[52] Their deliberate exclusion raises questions as to how these emissions were factored in to the December 2016 Emissions Projections of 742 Mt CO_2eq by 2030, where these projects fit in the PCF's Pathway to Meeting Canada's 2030 Target, and exactly how the emissions from these projects will be offset by other measures.[53]

2.4 Carbon Pricing

In the PCF, the federal government committed to review the comparability of carbon pricing across jurisdictions in 2020. This presents an opportunity to increase ambition and escalate the price per tonne beyond 2022, which will be necessary to achieve greater emission reductions to 2030 and beyond.

An escalating price on pollution will provide deeper emission reductions and bring Canada closer to achieving its international obligations. GEN recommends that a portion of the revenue from pricing pollution be used to support the transition to a low-carbon economy, including the priority areas of investment recommended in the One Million Climate Jobs Plan. Revenues should also be used to alleviate the unintended consequences of carbon pricing, including adverse impacts on vulnerable populations. The Canadian Centre for Policy Alternatives recommends that a share of the revenues raised be used for a green tax refund, which would ensure that middle class and low-income families receive quarterly credits to offset the increase in expenditures.[54]

The PCF's calculations for emission reductions include international cap-and-trade credits as part of the 89 Mt CO_2eq of GHG reductions to be achieved from announced measures as of November 1st, 2016.[55] However, the PCF does not specify how many megatonnes of emissions are expected to be reduced through these credits from international carbon markets.

There are also concerns that cap-and-trade may violate Indigenous People's rights. For example, California's offset program has been heavily criticized for allowing its industries to purchase offsets from projects in Brazil and Mexico without the free, prior and informed consent of the peoples affected.[56] Free, prior and informed consent is a fundamental principle enshrined in the United Nations Declaration on the Rights of Indigenous Peoples which provides a framework to meet the minimum international standards to protect and include Indigenous Peoples' rights in carbon policy development. Therefore, Indigenous Peoples must have meaningful and equal involvement in the development of carbon markets that may impact their traditional and current territories. It is also essential to recognize the critical importance of traditional ecological knowledge (TEK) and the historical and ongoing contributions of Indigenous Peoples towards conserving forests and protecting biodiversity.[57]

Finally, carbon pricing cannot be examined in isolation from the direct subsidies given to the fossil fuel sector, which exceed $3 billion annually.[58] Fossil fuel subsidies undermine putting a price on carbon pollution as well as preventing the renewable energy industry from realizing its full potential. The Liberal Government's election platform[59] promised to fulfill Canada's G20 commitment to phase our subsidies to the fossil fuel industry, but they have yet to eliminate these subsidies, which currently equate to paying polluters $19 per tonne to emit greenhouse gases.[60] Reallocating these subsidies to the renewable energy sector would increase the competitiveness of renewables, reduce GHG emissions, and create more jobs than if the subsidies remained in fossil fuels.[61] The G7 has called for fossil fuel subsidies to be eliminated by 2025, but we need to see a scaling back and redirection of those subsidies starting now in order to achieve that target.

3. Moving Forward

The PCF is a good start, but it is not a concrete plan of action to meet and exceed Canada's climate change commitments or to transform the economy while ensuring a Just Transition. It also does not lock in the long-term GHG reductions required for deep decarbonisation by mid-century. While the majority of the measures in the PCF are essential for transitioning Canada to a low-carbon economy, there remains a lack of urgency on some measures and there are many opportunities to increase ambition. We need a new national conversation that focuses on a clear vision for the future that includes a fundamental transformation of our economy and creates new lines of employment based on much more sustainable modes of production and consumption, while reducing economic and social inequalities. This vision must include incremental targets for public investments, job creation, and emissions reductions, and must not push decisive action to later years.

We will not achieve a Just Transition if we are not planning for and securing the growth of employment in new economic sectors that contribute to the reduction of greenhouse gases. The One Million Climate Jobs Plan illustrates how targeted investments in priority areas of the low-carbon economy can create meaningful employment and transition opportunities using existing skills and technologies, while also significantly reducing GHG emissions. This plan is the initial kick-start that our country needs to put people back to work and achieve our international climate change obligations, as well as laying the groundwork for deep decarbonisation by mid-century, in accordance with Canada's Mid-Century Long-Term Strategy.

One Million Climate Jobs is a plan to tackle climate change while creating jobs and shows how the measures and strategies included in the PCF can achieve significant economic, environmental, and social benefits through targeted public investments. It also provides a strategy to address poverty and inequality. The proposals outlined in the plan will not only serve displaced workers from polluting industries, but will also create opportunities for workers from industries suffering the impacts of climate change, the unemployed, the working poor, as well as Indigenous Peoples, racialized communities, women, LGBTI individuals, and people who are differently abled. The One Million Climate Jobs Plan complements the policies and recommendations in the PCF, and provides a vision for the future that combines industrial transformation with Just Transition to create jobs and lower emissions immediately while giving our children the future that they deserve.

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