

Will Canada Meet its New International Commitments on Climate Change? The Challenge Ahead

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ABSTRACT

Participants to the latest climate conference, held in Paris in December 2015, witness Canada once again, after a hiatus that lasted a decade, playing a leadership role in the making of a new international climate regime. However, beyond a more active role in the negotiation process, can Canada contribute to the deep reduction in emissions needed to avoid the worst impacts of climate change? This report investigates the emission targets of Canadian governments, at the provincial, territorial, and federal levels, and found that many provincial governments have committed to more ambitious emissions reduction targets than the international commitment announced by the federal government, Canada's intended nationally determined contribution (or INDC). This report suggests that a gap of about 55 million tonnes of carbon dioxides equivalent (Mt CO₂e) exists between Canada's INDC and the sum of provincial and territorial governments' targets. Moreover, although an increasing number of actions have been taken at the provincial level to reduce carbon emissions, their effectiveness remains to be seen as Canada's total emissions have recently stabilized rather than decreased. The challenge facing federal and provincial governments is therefore twofold: 1) more ambitious targets must be adopted by provincial and territorial governments to meet Canada's international commitment and 2) stronger policies must be implemented to effectively reduce emissions. While we recognize that this challenge could be daunting, this report also suggests a way to move forward by a better integration of current provincial and territorial policies, by starting with an harmonization of current carbon-pricing systems.

Keywords: intended nationally determined contribution, INDC, federal government, provincial and territorial governments, climate mitigation, carbon pricing, Canada, carbon emissions reduction target.

RÉSUMÉ

Les participants de la plus récente conférence du climat, tenue à Paris en décembre 2015, furent à nouveau les témoins du rôle de leader que le Canada a joué, après un répit de près de 10 ans, en faveur d'un nouveau régime international de protection du climat. Malgré un engagement plus actif dans le processus de négociation international, le Canada peut-il contribuer à la réduction des émissions de carbone afin d'éviter les impacts les plus graves des changements climatiques? Ce rapport examine les cibles d'émissions des gouvernements canadiens et montre que de nombreux gouvernements provinciaux se sont engagés à mettre en œuvre des cibles plus ambitieuses que celle du gouvernement fédéral. Cependant, il existe quand même un écart important entre les engagements internationaux du Canada, c'est-à-dire sa contribution prévue déterminée au niveau national (ou INDC en anglais) annoncée par le gouvernement fédéral, et la somme des cibles des gouvernements provinciaux et territoriaux. Cet écart est estimé à environ 55 million de tonnes de dioxyde de carbone équivalent (Mt CO₂e). De plus, malgré un nombre de plus en plus important de mesures prises au niveau provincial pour réduire les émissions de carbone, leur efficacité reste à être prouvée car les émissions totales du Canada viennent, dans les dernières années, de se stabiliser plutôt que de diminuer. Les défis auxquels les gouvernements canadiens sont confrontés sont de deux ordres : 1) des cibles plus ambitieuses doivent être adoptées par les gouvernements provinciaux et territoriaux pour atteindre l'engagement international du Canada et 2) des politiques plus contraignantes doivent être mises en œuvre pour réduire les émissions de manière efficace. En reconnaissant que ce défi est important, le rapport suggère aussi une nouvelle façon d'avancer grâce à de meilleures politiques provinciales et territoriales qui pourraient commencer par une harmonisation des systèmes existants de tarification du carbone.

Mots-clés : contribution prévue déterminée au niveau national, INDC, gouvernement fédéral, gouvernements provinciaux and territoriaux, atténuation du changement climatique, tarification du carbone, Canada, cible de réduction d'émissions de carbone.

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1. INTRODUCTION

In May 2015, the federal government, led at the time by conservative Prime Minister Stephen Harper, announced Canada's new national emissions target in the run-up to the 2015 Paris climate conference. Formally known as Canada's intended nationally determined contribution (INDC), the new target committed the country to a 30 per cent reduction of its greenhouse gas (GHG) emissions below 2005 levels by 2030. This new target appears ambitious when compared to Canada's previous reduction commitment, which was a reduction of 17 per cent below 2005 levels by 2020, but remains above Canada commitment under the Kyoto Protocol (an average of 6 % below 1990 levels over the 2008-2012 period). Given that the decision taken by the previous federal government to withdraw from the Kyoto Protocol in December 2011, the active role taken by the Canada during the negotiation of the Paris Accord signaled its return to a more active international role on climate change. However, Canada's ability to lead in the future will be determined, in good part, by its capacity to meet its reduction commitment.

Canada's federal government was not alone in updating its climate mitigation target. Also ahead of the Paris climate talks, Canadian provinces published updated emission reduction targets independent of the federal government commitment. Given the central role Canadian provinces have played in climate change over the past decade and their jurisdiction over key sectors for climate change mitigation—including transportation, energy, cities, industry, and natural resources—provincial targets are important for understanding the credibility of Canada's new international commitment (Houle, 2013; Houle, Lachapelle & Purdon, 2015; Houle, Lachapelle & Rabe, 2014; Purdon, 2014). Most of the efforts to meet Canada's national emission reduction commitment under the Paris Accord will depend, for the most part, on provincial actions and measures

The main objective of this paper is to assess whether provincial emission reduction targets are consistent with Canada's commitment under the Paris agreement or not. Our main finding is that the sum of the provinces' commitment is insufficient to meet Canada's INDC. Even if all the provinces respect their stated emission reduction targets, a gap of approximately 55 megatonnes of carbon dioxide equivalent (Mt CO₂e) remains between Canada's international commitment and provincial emission reduction targets. That is despite the fact that Quebec, Ontario, British Columbia and Manitoba have published 2030 emission reduction targets that are more ambitious than Canada's newest international commitment. Extrapolating the province's 2020 target through to 2030, Saskatchewan's target is also more ambitious than the federal objective. However, Saskatchewan has yet to provide a 2030 target and have not given any indication about the level of ambitious of such target. Using a similar method, we have also linearly extrapolated the 2030 targets for the Atlantic provinces based on their current targets. These targets are above Canada's emissions reduction objective, except for Newfoundland & Labrador and Prince Edward Island. Finally, the province of Alberta is still planning an increase of its GHG emissions to accommodate the expansion of its oil and gas sector.

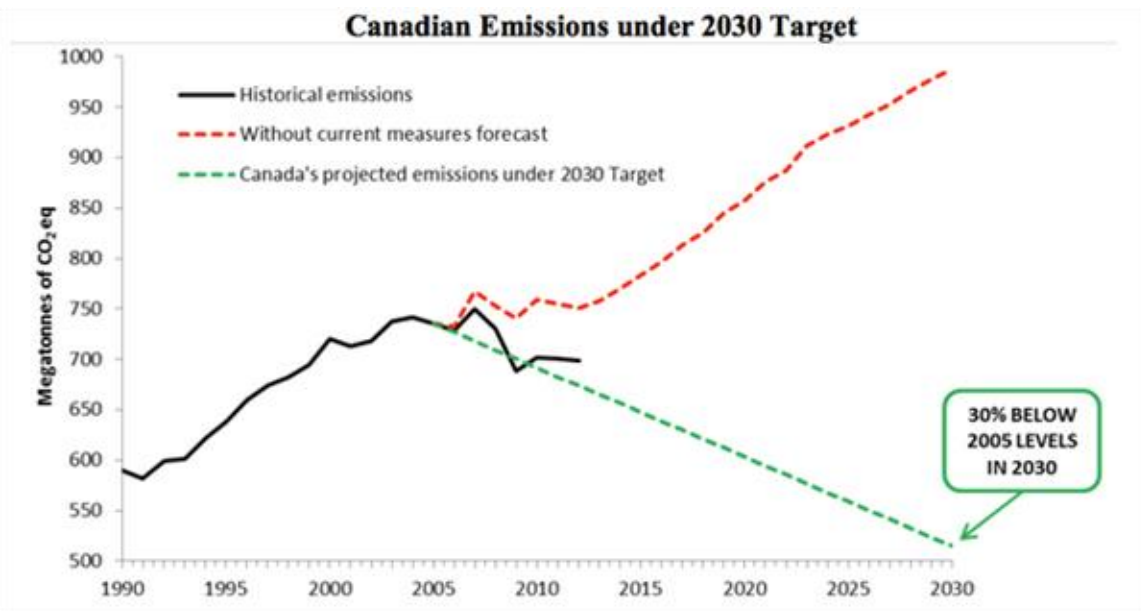
We conclude that, given the difficulties provincial governments faced in reducing their emissions in the past and the fact that most provinces have yet to implement a comprehensive broad-based carbon pricing system, provincial governments will need to take additional action to reach their existing targets and, in the cases of the provinces that have yet to publish 2030 targets, update their current objectives. More support from the federal government would likely increase the chances that provincial

targets will be met and prevent the gap between Canada’s stated emission reduction target and future emissions from widening. However, in order to close this gap, provincial governments will also need to take further commitments. The harmonization of current climate policy and the creation of linkages between carbon pricing mechanisms could help distribute the burden of reducing emission more equitably between provinces and lower overall the emissions abatement costs.

2. CANADA’S INTERNATIONAL EMISSION REDUCTION COMMITMENT

As Figure 1 illustrates, and according to the 2014 National Inventory Report (NIR) used to produce Canada most recent emission reduction commitment, the country emissions stood at 736 Mt CO₂e in 2005 and rose to 749 Mt CO₂e in 2007, after which there was a sharp decline to 701 Mt CO₂e in 2011. This decline was to be expected given the slowing of the Canadian economy in the aftermath of the 2007-2008 economic crisis. Moreover, during the same period, the carbon intensity of the Canadian economy also improved, meaning that Canadian businesses were able to generate the same level of activities with fewer emissions, which could be a result of a greater use of low carbon electricity, technological innovation, and government policy, especially at the provincial level. However, in recent years, emissions have stabilized following the improvement of the Canadian economy.

FIGURE 1: CANADA’S EMISSION CURRENT EMISSION FORECAST AND CURRENT TARGET



Notes: The emissions trends presented in Figure 1 do not include those associated with the land-use, land-use change and forestry (LULUCF), where there has been concern that Canada’s forests and land-base might be a net emitter given increased risks of natural disturbances in the forest sector under climate change (Kurz et al., 2008). However, the Canadian INDC states that Canada intends to include LULUCF in calculating future GHG emissions. Discussion of Canada’s LULUCF sector is however beyond the scope of the current research note.

Source: Canada’s Intended Nationally Determined Contribution, available on the UNFCCC website (<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Canada/1/INDC%20-%20Canada%20-%20English.pdf>)

The new emission reduction commitment put forward by the federal government, means that the government intends to cut emissions from 736 Mt CO₂e in 2005 to 515 Mt CO₂e within 25 years. However, this target will most likely become even more ambitious in the coming years as Canada has committed, along with other countries who have signed the Paris Accord, to review its objective with the goal of ratcheting up its INDC target every five years.

2. PROVINCIAL EMISSION REDUCTION COMMITMENTS

This section reviews provincial emission reduction targets and compares them with Canada's commitment under the Paris Accord in order to assess whether they are consistent with the federal government's objective. In order to do so, each provincial target is compared with the 30 per cent federal objective applied to each province's emissions. Of course, this does not mean necessarily that such approach will insure fairness between provincial governments, as provinces do not all have the same capacity to reduce emissions and their abatement costs vary (Rivers, 2010). Our goal here is to establish whether current provincial reduction commitments will be enough to meet Canada's international obligation, recognizing that concerns about fairness might involve the creation of a burden sharing agreement, such as the agreement adopted by European Union countries, or other intergovernmental institutions or processes (Macdonald & al., 2013).

To be consistent with Canada's INDC calculation, we use data from Canada's 2014 National Inventory Report (NIR) to provide estimates of provincial current and future emissions, if the current provincial and territorial targets were to be successfully implemented (called here targeted emissions). Finally, we also note that implementation will be key and that the announcement of emissions reduction targets does not guarantee their achievement.

Announced by the Minister of Environment in 2015, Quebec's target for 2030 corresponds to a reduction of 37.5 % of emissions below 1990 levels by 2030, which corresponds to a reduction of 38.7 % from 2005 levels. This emission reduction commitment appears ambitious in the Canadian context and goes beyond the target set by the federal government. The fact that Quebec continues to use 1990 as the reference year, instead of the year 2005 now used by the federal government, also increases the level of reduction that must be achieved. In 2030, Quebec intends to reduce its emissions by 7.4 Mt CO₂e more than what would have been achieved if the province simply adopted Canada's international commitment as its own.

In May 2015, a few months before Quebec's most recent emission reduction pledge, Premier Kathleen Wynne's Liberal government announced that Ontario was committed to a reduction that also goes beyond Canada's INDC of 37 % below 1990 by 2030, which is equivalent to a reduction of 46.1 % from 2005 levels. Since Ontario's emission grew rapidly from 1990 to 2005, the choice of the 1990 reference year is particularly ambitious for the province. To achieve its objective, Ontario intends to reduce its emissions by 33.4 Mt CO₂e more than what would be required by the application of federal government commitment to the province.

TABLE 1. PROVINCIAL 2030 TARGETS AND CANADA 2030 TARGETS APPLIED TO EACH PROVINCE (MtCO₂e)

	2030 Target	Reference year	Emissions during the reference year (Mt CO ₂ e)	2030 Objective (%)	Targeted emissions (Mt CO ₂ e)
Quebec	Provincial target	1990	84	- 37.5	52.5
		2005	85.6	- 38.7	52.5
	Canada (applied to Quebec)	2005	85.6	- 30	59.9
				Gap	7.4
Ontario	Provincial target	1990	177	- 37	111.5
		2005	207	- 46.1	11.5
	Canada (applied to Ontario)	2005	207	- 30	144.9
				Gap	33.4
British Columbia	Provincial target	2007	60.9	- 40*	36.5*
		2005	62.3	- 41.4	36.5
	Canada (applied to BC)	2005	62.3	- 30	43.6
				Gap	7.1
Manitoba	Provincial target	2005	20.9	- 33	14
	Canada	2005	20.9	- 30	14.6
				Gap	0.6
Saskatchewan	Provincial target	2006	69.4	- 34	45.8
		2005	71.1	-35.6	45.8
	Canada	2005	71.1	- 30	49.8
				Gap	4
New Brunswick	Provincial target	1990	16	- 13.1**	13.9**
		2005	20.1	- 30.8**	13.9**
	Eastern premiers and New England (applied to NB)	1990	16	- [35; 45]	9.6*** ~ [8.8;10.4]
	Canada	2005	20.1	- 30	14.1
				Gap	0.2
Nova Scotia	Provincial target	1990	19.1	- 26.7	14
		2005	23.1	- 39.4	14
	Eastern premiers and New England (applied to NS)	1990	19.1	- [35; 45]	11.5*** ~ [10.5;12.4]
	Canada	2005	23.1	- 30	16.2
				Gap	2.2

TABLE 1 (CONTINUING)

	2030 Target	Reference year	Emissions during the reference year (Mt CO2e)	2030 Objective (%)	Targeted emissions (Mt CO2e)
Newfoundland and Labrador	Provincial target	1990	9.2	- 18.5	7.5
		2005	9.9	- 24.2	7.5
	Eastern premiers and New England (applied to NL)	1990	9.2	- [35; 45]	5.5*** ~ [5.1;6.0]
	Canada	2005	9.9	- 30	6.9
				Gap	- 0.6
Prince Edward Island	Provincial target	1990	2	- 25	1.5
		2005	2.1	- 28.6	1.5
	Eastern premiers and New England (applied to PEI)	1990	2	- [35;45]	1.2*** ~ [1.1;1.3]
	Canada	2005	2.1	- 30	1.5
				Gap	0
Alberta	Provincial target	2005	232	+ 16.3	270
	Canada	2005	232	- 30	162.4
				Gap	- 107.6
Yukon	Canada (applied to Yukon)	2005	2.1	- 30	0.3
				Gap	- 0.3
Northwest Territories	Canada (applied Northwest Territories)	2005	1.6 Mt	- 30	1.1
				Gap	- 0.5
Nunavut	Canada (applied to Nunavut)	2005	0.3 Mt	- 30	0.2
				Gap	- 0.1

Notes: *As recommended by the Climate Leadership Team **Extrapolated target ***The mean value of the interval is shown. **Source:** Provincial and territorial governments climate change plan (see references).

British Columbia's current GHG emission reduction target is set at 33 per cent below 2007 levels by 2020, which corresponds to a reduction of 41.4 % from 2005 levels. The province has also established a long-term reduction target of 80 per cent below 2007 levels by 2050. The province is however in the process of revising its emission reduction objective. In 2015, BC premier Christy Clark appointed a Climate Leadership Team—an advisory group of government, industry, academics, environmental groups, and First Nations—that has recommended a 2030 GHG emissions reduction target of 40 % below 2007 levels based on a target of 80 % by 2050 below 2007. Following the publication of the 32 recommendations of the Climate Leadership Team, the province is currently conducting a public consultation on this recommendation and it is expected to publish soon an updated climate plan and legislation.

During COP21, Manitoba announced both its intention to develop a cap-and-trade system along with Ontario and Quebec, and to cut emissions by 33 % by 2030 below 2005 levels, an objective slightly more ambitious than the federal government commitment. The gap between Manitoba and Canada targets is 0.6 Mt CO₂e.

In 2009, Saskatchewan introduced climate change legislation that included a target of 20 % below 2006 emissions by 2020. We have extrapolated linearly this target to 2030, which represents a 34 % reduction below 2006 levels, or a reduction of 35.6 % compared to 2005 levels. This target would be in line with both Saskatchewan's current emissions and its 2020 reduction objective. However, the province has not yet announced a 2030 target and it remains possible that the province will adopt the Canadian target (Sask Wind, 2015). Such target would be less ambitious than the extrapolated target by 4 Mt CO₂e.

New Brunswick released its Climate Change Action Plan for 2014-2020 in 2014. The stated targets are a 10 % reduction below 1990 levels by 2020, which extrapolated to 2030, corresponds to a target of 13.1 % below 1990 and referred to 2005, represents a reduction of 13.9 %. New Brunswick also aims towards a 75–85 % reduction below 2001 levels by 2050. In August 2015, Eastern premiers and New England governors, which include all Canada's Atlantic provinces and Quebec, established a target of 35-45 % below 1990 in 2030 (CBC, 2015).

In April 2015, Nova Scotia announced its intention to reduce its GHG emissions by 10 % under 1990 levels by 2020 (MDDELCC, 2015), which by extrapolation represents a reduction of 26.7 % below 1990 and 39.4 % below 2005 by 2030. Nova Scotia is also part of the Eastern premiers and New England governors' conference.

Newfoundland and Labrador's GHG reduction targets are set at a reduction of 10 % below 1990 levels for 2020 (Department of Environment and Conversation, 2015). This target extrapolated to 2030 corresponds to a reduction of 18.5 % below 1990 and 24.2 % below 2005 by 2030. No target for 2030 has been announced but the province is a member of Eastern premiers New England governors' conference. The gap between Newfoundland & Labrador and Canada targets is - 0.6 Mt, as Canada's target would be more ambitious than Newfoundland & Labrador's one.

Prince Edward Island has a target of 10 % below 1990 levels for 2020, a reduction of 28.6 % from 2005 levels (Department of Communities, Land, and Environment, 2015). As for Newfoundland and Labrador, the PEI government has yet to announce a specific 2030 target. The province participated in the Eastern premiers and New England governors' conference. There is no gap between Prince Edward Island and Canada's targets.

In 2008, the government of Alberta set a goal of reducing emissions by 50 Mt CO₂e below 2020 business-as-usual (BAU) emissions estimates. In 2011, The Pembina Institute (2011) estimated the BAU emissions would stand around 322 Mt CO₂e in 2020, which suggested a target of 272 Mt CO₂e. In November 2015, Alberta announced its new Climate Leadership plan, which includes a target of 270 Mt. This represents a reduction of 70 Mt CO₂e compared to BAU forecast published by Environment Canada for Alberta in 2030, which is 340 Mt CO₂e (Leach et al. 2015). The target announced by the Alberta government means that the provincial emissions will be 16.3 % *above* 2005 levels in 2030. Alberta Premier Rachel Notley also indicated her intention to limit oil sands emissions at 100 Mt CO₂e per year. Oil sands related emissions were 62 Mt CO₂e in 2013. Alberta is the only province that is planning to

increase its GHG emissions in the coming decade, largely because of intended expansion of the oil and gas industry. The gap between Alberta and Canada targets is - 107.6 Mt.

3. TERRITORIAL EMISSION REDUCTION COMMITMENTS

The three territories, which are under the jurisdiction of the federal government and enjoy much less fiscal and administrative autonomy compared to the provinces, have not yet stated an emissions reduction. In 2009, Yukon published a Climate Change Action Plan (Government of Yukon, 2009). However, the governments of the Yukon and the Northwest Territories declared that their emission reduction target applies only to government operations. Nunavut has not yet present any target and could reach Canada's target by using liquefied natural gas instead of completely relying on diesel fuel for electricity generation.

4. DISCUSSION

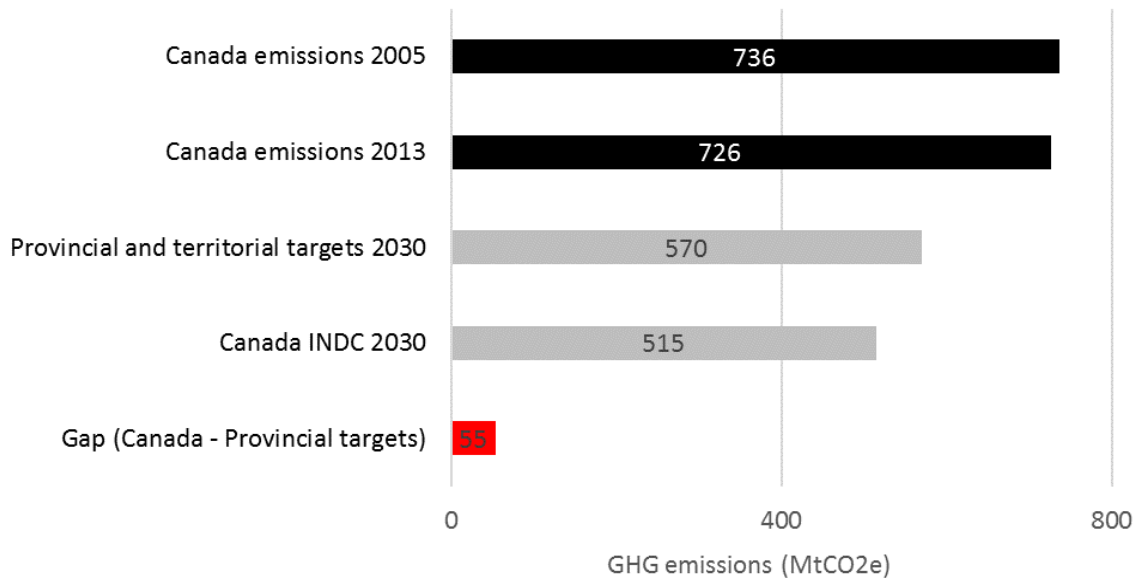
We have calculated the gap between federal emission reduction objectives and the provincial or territorial targets. By identifying the gap between commitments made at the two levels of government, it is possible to evaluate the level of ambition in terms of emissions for each province or territory in relation to Canada's overall target (see Table 2). Our analysis suggests that Ontario is the most ambitious province, in terms of emission reductions, with a ratio of gap/target of 23 %, which means that the province is ready to go well beyond Canada's 2030 target. Then come British Columbia, Nova Scotia and Quebec, respectively.

Ontario, British Columbia, Quebec and Manitoba have already adopted provincial targets that are more ambitious than the federal government's target. The Atlantic provinces have not yet provided any targets for 2030, despite their commitment to do so under a recent resolution made at the latest New England Governors and Canadian Premiers' conference (CBC, 2015). Saskatchewan has also not updated its 2020 target. Finally, Alberta is the only province that is still planning to increase its GHG emissions associated with the growth of its economy in the oil and gas sector.

The current gap between the published and extrapolated targets and Canada's target is approximately 55 Mt CO_{2e} and represents 10.6 % of Canada's INDC (see Figure 2). Closing the gap will require more ambitious policies, which could be facilitated by an integration of current provincial government actions and emerging carbon markets in a context in which most provinces have now committed to the implementation of various forms of carbon pricing. Harmonizing current carbon pricing policies would allow more flexibility in how and where emission reductions are made. Such flexibility will lower the costs of achieving Canada's targets by allowing investors to seize emission reduction opportunities in sectors and provinces where the cost of emission reductions is the lowest.

Although carbon pricing could play an important role in helping the provinces to reduce their emissions, far reaching climate mitigation also require governments to engaged with a broader set of policy instruments, such as regulation and financial incentives, to foster the diffusion of low carbon technologies (Houle, 2015).

FIGURE 2. COMPARISON OF CANADA EMISSIONS, INDC, PROVINCIAL AND TERRITORIAL TARGETS



As might be expected, the growth of emissions in Alberta is one of the main challenges for achieving Canada’s national emission reduction target. The province is planning to increase its emissions by 16.3 % till 270 Mt CO₂e, which would add to the 232 Mt CO₂e that the province emitted in 2005. This increase would offset the joint efforts made by all the other provinces. If the current provincial targets are met and remain unchanged, Alberta’s share of Canada total emissions, which was 41 % in 2005, would increase to 52 % by 2030. However, Alberta could also be part of the solution. Already, the NDP government have announced a new \$30 per ton CO₂e carbon tax that would be applied both to the transportation sector and industrial emissions, using a product-based approach. Moreover, Alberta has been investing since 2007 in a fund aimed at supporting the research on low carbon technologies. The province has also developed an expertise on carbon offsets (Cameron and Trevor, 2015), that could be useful to other provinces, especially Quebec and Ontario. Although carbon offsets are allowed under the Western Climate Initiative emissions trading framework, only a few projects have been implemented so far in Quebec.

Linking current provincial carbon-pricing systems would allow businesses across Canada to finance emission reductions in Alberta, either in the oil and gas sector or elsewhere, such as in the power generation sector. However, in exchange for Canadian federal assistance, Alberta would need to set a regulatory cap for its emissions, as well as implement more aggressive emission reduction targets.

TABLE 2. PROVINCIAL & TERRITORIAL EMISSION REDUCTION TARGETS AND ASSESSMENT OF THEIR LEVEL OF AMBITION

Prov.& Terr.	Prov./terr. Emissions in 2005 (Mt CO ₂ e)	Prov./terr. target (%)	Prov./terr. targeted emissions in 2030 (Mt CO ₂ e)	Canada's 2030 target applied to prov./terr. (- 30 %) (Mt CO ₂ e)	Gap (Mt CO ₂ e)	Ambition (gap/target) (%)
Quebec	85.6	- 38.7	52.5	59.9	7.4	12.4
Ontario	207	- 46.1	111.5	144.9	33.4	23
British Columbia ¹	62.3	- 41.4	36.5	43.6	7.1	16.3
Manitoba	20.9	- 33	14	14.6	0.6	4.1
Saskatchewan ^{2*}	71.1	- 35.6	45.8	49.8	4	8
New Brunswick*	20.1	- 30.8	13.9	14.1	0.2	1.4
Newfoundland & Labrador*	9.9	- 24.2	7.5	6.9	- 0.6	- 8.7
Prince Edward Island*	2.1	- 28.6	1.5	1.5	0	On Canada's target
Nova Scotia*	23.1	- 39.4	14	16.2	2.2	13.6
Alberta	232	+ 16.3	270	162.4	- 107.6	- 66.2
Yukon	0.5	-	0.5	0.3	- 0.2	- 66.7
Northern Territories	1.6	-	1.6	1.1	- 0.5	- 45.5
Nunavut	0.3	-	0.3	0.2	- 0.1	- 50
Total			569.6	515	- 54.6	- 10.6

*Note: *The target has been extrapolated linearly to get the 2030 target.*

¹ To get the GHG emissions for British Columbia in 2007 for the NIR 2014, we applied the same difference in GHG emissions between 2005 and 2007 that existed between 2005 and 2007 for the NIR 2013.

² To get the GHG emissions for Saskatchewan in 2006 for the NIR 2014, we applied the same difference in GHG emissions between 2005 and 2006 that existed between 2005 and 2006 for the NIR 2012.

5. CONCLUSION

Summing up the targets set by the provinces and territories in Table 2, they yield a total emission of 569.6 Mt CO₂e. As Canada's target is 515 Mt CO₂e for 2030, the remaining gap is therefore approximately of 55 Mt CO₂e. All provinces, except Alberta, have announced their commitment to reduce their emissions, albeit at varied levels of ambition and detailed action plans. Even if Alberta is the only province to expect an increase in emissions above its 2005 levels, the province has committed to a new carbon tax though many of the details remained to be seen. However, provincial actions alone, uncoordinated and unsupported will most likely be insufficient to close the 55 Mt CO₂e gap. We conclude that a coherent national climate change strategy is needed, one involving an active role of the federal government along with efforts to harmonize and foster provincial actions both in terms of carbon pricing, complementary policies, and regulation for the promotion of low carbon technologies and renewable energy.

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