

Short-lived Climate Pollutants in Countries' Intended Nationally Determined Contributions

A Background Paper for the CCAC Annual Science Policy Dialogue

1. Introduction

Prior to the U.N. Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP21) meeting in Paris, several countries publicly outline their post-2020 climate actions for mitigating global warming. These commitments, known as their Intended Nationally Determined Contributions (INDCs), reflects each country's ambition towards reducing emissions, taking into account their unique circumstances. Put together, the INDCs will largely determine whether the world is on a path toward a low-carbon, climate-resilient future. The purpose of this paper is to analyze and discuss the Short-lived Climate Pollutants (SLCPs)¹-relevant content in the INDCs that have been submitted to the UNFCCC.

2. Methodology

The analysis and contents of this paper were derived from the 189 INDCs that have been submitted to and published by the UNFCCC Secretariat as of 10 March 2016. Each of the INDCs was read specifically for reference to or pledges pertaining to SLCP and relevant SLCP source sectors. This information was collected in an excel spreadsheet, which accompanies this memo. Of the 189 INDCs, 167 pledged to address specific climate forcers such as CO₂, methane, or SF₆. However, 22 INDCs did not specifically reference any climate forcer. In the spreadsheet they are included a 'NL' or 'Not Listed,' and for the purposes of this analysis these INDCs are assumed to include the Kyoto basket of gases (CO₂, methane, N₂O, HFCs, PFCs, SF₆, and NF₃). One country, Mauritius, pledged to reduce "CO₂ and SLCFs," for the purposes of this analysis SLCFs is taken to include methane, HFCs, and black carbon.

Where countries included pledges on specific actions to reduce SCLPs, or where specific mention was made to co-benefits or other SLCP-relevant narratives, that information was also collected for further analysis.

It is important to note that, the information and analysis in this memo reflects only what countries included in their INDCs and therefore should not be considered a comprehensive review of the actions that each country is taking to address SLCPs. For example, Latvia on behalf of the 28 EU Member States chose not to include any descriptions of ongoing or planned actions or policies to address their climate emissions in their INDC. Therefore, while the EU does pledge to reduce HFCs and methane as part of their mitigation, which are accounted for in this analysis, they did not mention the EU's new F-Gas Regulation, which is expected to phase down HFCs by 79% by 2030. Prior to COP21, and continuing today, the methodologies and guidance for what to include in an INDC was extremely broad, which is reflected in the high level of diversity among the INDCs in terms of their content, language, form, and scope. The reasons why countries chose to include or not include specific elements in their INDCs are likely as much about the technical methodology employed, as the particular political environment and goals of each nation, and the status of climate negotiations at the time that each INDC was submitted.

¹ Short-lived climate pollutants are agents that have relatively short lifetime in the atmosphere - a few days to a few decades - and a warming influence on climate. The main short lived climate pollutants are black carbon, methane and tropospheric ozone. These short-lived climate pollutants are also dangerous air pollutants, with various detrimental impacts on human health, agriculture and ecosystems. Other short-lived climate pollutants include some hydrofluorocarbons (HFCs). While HFCs are currently present in small quantity in the atmosphere their contribution to climate forcing is projected to climb to as much as 19% of global CO₂ emissions by 2050.

3. Specific mention of SLCPs in the INDC Mitigation Pledges

3.1. CCAC Partner Countries

Six CCAC Partner countries specifically pledged to target SLCPs in their INDCs: Mexico, Chile, Nigeria, Central African Republic, Cote d'Ivoire, and Morocco.

In its INDC, **Mexico** states that “actions to abate SLCPs simultaneously contribute to climate change mitigation in the near term and to the immediate improvement of air quality, as well as to generate positive impacts on human health and ecosystems conservation.” Mexico is also the only country to specifically pledge conditional and unconditional emissions reductions targets for black carbon. Pledging an unconditional 51% reduction in black carbon emissions by 2030, compared business as usual, increasing up to 70% with additional support and technology transfer.

Chile recognized that reducing SLCPs can provide a “substantial contribution to the mitigation of the causes of Climate Change,” while also providing co-benefits such as “reducing the levels of local atmospheric pollution in urban centers.” Noting the important contribution of black carbon to PM_{2.5} air pollution, the Chilean Government is contemplating implementation of atmospheric decontamination plans for fine particulate matter as part of its 2014-2018 Atmospheric Decontamination Strategy.

Nigeria specifically highlighted the importance of reducing emissions of SLCPs for improved air quality and public health calling poor air quality the “bane of urban residents and a health threat.” Nigeria identified a number of specific actions for reducing black carbon and methane from cars, trucks, small generators, industry, gas flaring, and oil and gas sector. Nigeria also highlighted the importance of preventing ‘dumping of HCFC and HFCs’ as they phased out or otherwise controlled by OECD countries.

Côte d'Ivoire states that it is reducing short-lived climate pollutants, in addition to long-lived greenhouse gases, and will develop a national action plan to address SLCPs by 2018. The **Central African Republic** lists SLCP measures as a conditional activity within its INDC, stating that “The Central African Republic’s INDC is a development policy with low carbon emissions and low emissions of short-lived climate pollutants.” **Morocco** pledges to develop a national plan to “combat short-lived climate pollutants with support from the Climate and Clean Air Coalition.”

3.2. Non-CCAC Countries

Two non-CCAC countries have also pledged to target SLCPs in their INDCs: Cameroon and Mauritius. **Cameroon** notes that reducing short-lived pollutants is a co-benefit of its energy-waste strategy. **Mauritius** is unique, having listed in the scope of gases covered in its INDC only “CO₂ and short-lived climate forcers (SLCFs)”.

4. Mention of CCAC’s targeted co-benefits without mention of SLCPs

4.1. CCAC Partner Countries

The INDCs of seven CCAC Partner countries included mention of relevant co-benefits, the importance of addressing air pollution, or mentioned the CCAC: Bangladesh, Benin, Ghana, Jordan, Mongolia, Togo, New Zealand.

Bangladesh used co-benefits, such as improved air quality, as criteria for selecting the actions included in their INDC. **Benin** included a *National Struggle Against Air Pollution Strategy* within its INDC pledge, which focuses primarily on reducing emissions from the transport sector. **Ghana** describes that health and indoor air pollution benefits of their proposed cookstove projects. As one of the concrete actions in its INDC, **Jordan** pledged to develop and share “real-time air quality monitoring data to establish the link between respiratory diseases and air pollution and climate change.” **Mongolia** notes that reducing air pollution is a co-benefit of its pledged action to improve household stove fuel efficiency. **Togo** pledges to take actions that “bring out the best co-benefits opportunities for reducing GHG emissions

that result from synergies between adaptation and mitigation.” While **New Zealand** does not include specific reference to SLCPs, co-benefits, or air pollution, it does state that New Zealand is a member of the Climate and Clean Air Coalition.

4.2. Non-CCAC Countries

Thirteen non-CCAC countries chose to include mention of relevant SLCP co-benefits, the importance of addressing air pollution in their INDCs. These eleven can be split into four groups. The first group includes countries that pledged future or ongoing actions to address air pollution specifically: India and Nepal. The second group identified reduced air pollution as co-benefit to other actions pledged in their INDCs: El Salvador, Senegal, Myanmar, Saint Lucia, Trinidad and Tobago, and Zambia. The third group took a different methodological approach to their INDCs than almost all other countries by defining climate mitigation as a co-benefit to other more nationally-relevant goals such as economic diversification. Finally, Lichtenstein is unique because of its pledge to use co-benefits as its primary criteria for selecting foreign aid projects.

Group 1: India lists the *National Air Quality Index*, launched in 2014, which is “based on six pollutants and is notified every day serving as public information tool to disseminate information on air quality in qualitative terms.” The *Continuous Emission Monitoring System (CEMS)* is another Indian program on pollution emissions which “mandates the highly polluting industries to install 24X7 real time monitoring of emission and effluent discharge points.” **Nepal** pledged to “decrease the rate of air pollution through proper monitoring of sources of air pollutants like wastes, old and unmaintained vehicles, and industries.”

Group 2: El Salvador will require that actions to address emissions report on the co-benefits for adaptation and vice-versa and notes specifically that low-carbon urban development will reduce the incidence of diseases associated with pollution. Within its current mitigation strategies, **Senegal** notes that “Measures to reduce CO₂ emissions in the areas of power generation, biomass and waste are likely to provide the following benefits: Reduction of local air pollution and thus lower adverse effects on health; Use of modern forms of energy in homes thus reducing the workload of women and helping to improve school performance of children.” One of **Myanmar’s** specific mitigation strategies includes “reduc[ing] the increasing rate of GHG emissions and air pollution caused by the transport sector, especially from road transport.” **Saint Lucia** states that its pledged mitigation actions will provide benefits to human health and are consistent with its medium-term development vision. **Trinidad and Tobago** notes that National Climate Change Policy will reduce carbon emissions while also providing significant additional co-benefits such as improved air quality and associated public health costs. **Zambia** includes an analysis of co-benefits for all of their pledged contributions which include improving air quality and public health for many actions.

Group 3: Bahrain pledged to diversify its economy by reducing its dependence on the oil and gas sector, which will produce “co-benefits in the form of emission reductions” as well as minimizing pollution. **Qatar** as well pledged to take action to diversify its economy which will provide mitigation co-benefits. **Saudi Arabia** pledged to act to achieve goals of economic diversification and adaptation which will result in the co-benefit of avoiding 130 MtCO₂eq annually by 2030. The **UAE** also pledged to pursue a strategy of economic diversification which will provide co-benefits for both climate mitigation and adaptation. The UAE also stated that is working to improve air quality measuring and reporting, noting the impact of air pollution on human health.

Group 4: Lichtenstein was unique among the submitted INDCs, not because it included SLCPs or air pollution activities, but because of its methodology for prioritizing emission reduction projects to provide co-benefits beyond reducing GHG emissions.

5. SLCPs within the scope of pledged gases

While many countries that did not include specific mention of SLCPs or co-benefits in the text of their INDCs, they did however address SLCPs within the scope of the gases and forcers they pledged to reduce. This is true for both CCAC and Non-CCAC Partner countries. This is likely to be at least in part because two SLCPs, methane and HFCs, are

included in the basket of seven Kyoto gases. However, many countries also chose to include gases and climate forcers outside the scope of the Kyoto Protocol. See Appendix I for a full breakdown of covered climate forcers.

Across all the pledged gases, CCAC Partner countries included SLCPs more frequently than non-CCAC countries (see Figure 1). 100% of CCAC Partners included methane within the scope of their INDCs compared to 89.9% for non-Partner countries. Similarly for HFCs, 64% of CCAC Partners included them compared to 47.5% for non-Partners. Out of 189 submitted INDCs, only four countries specifically included black carbon, and of those four, three are CCAC Partners (Mexico, Chile, Nigeria).

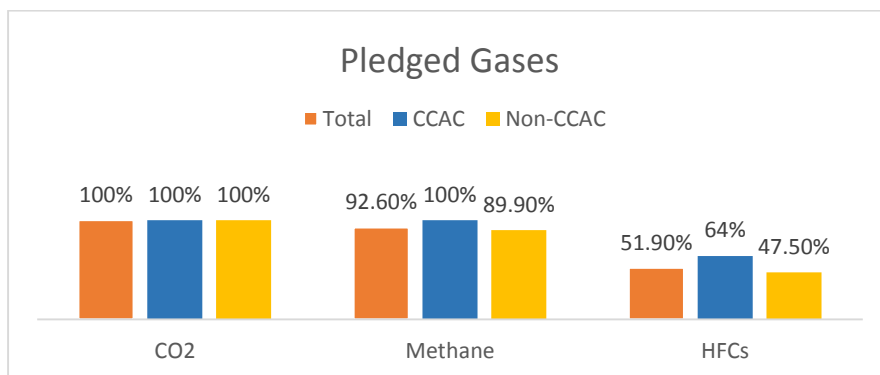


Figure 1: Percentage of total INDCs that included CO₂, Methane, and HFCs within their scope of pledged emissions reductions, broken down by CCAC and Non-CCAC Partner countries.

5.1 Comparing Annex I and Non-Annex I countries

While comparing CCAC and non-CCAC countries provides an interesting context, further separating these groups into Annex I and non-Annex I countries reveals some additional context for comparison (Table 1). There are 43 countries in Annex I of the UNFCCC (including the EU), which is made up of industrialized countries that were members of the OECD in 1992 plus a number of countries with economies in transition.² Nearly 100% of Annex I countries, regardless of their membership in the CCAC, listed the Kyoto basket of greenhouse gases within the scope of their INDC pledges. The only Annex I country that did not include all of the Kyoto gases was Belarus (NF₃). Further, none of the Annex I countries included any gases or climate forcers outside of Kyoto basket in their INDCs, including black carbon. Due to the significant level of uniformity between Annex I country INDCs, the increased coverage of SLCPs among CCAC Partner countries, discussed in the previous section, comes entirely from non-Annex I countries.

Kyoto Gas		Annex I Countries		Non-Annex I Countries	
		CCAC	Non-CCAC	CCAC	Non-CCAC
CO ₂		100%	100%	100%	100%
	Methane	100%	100%	100%	87.8%

² Annex I countries include: Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, European Union, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, UK, US.

N ₂ O	100%	100%	93.5%	83.5%
HFC	100%	100%	41.9%	36.5%
PFC	100%	100%	38.7%	31.3%
SF ₆	100%	100%	35.5%	32.3%
NF ₃	100%	95.8%	12.9%	21.7%

Table 1: Percentage coverage of Kyoto gases in the INDCs between CCAC and non-CCAC countries and Annex I and Non-Annex I countries.

6. Countries intended actions/activities in the INDCs related to SLCP emission reduction

In addition to the countries listed above, many more countries included projects and activities in their INDC submissions that are directly relevant to the work of the CCAC and SLCP reductions. Table 2 shows the number of INDCs that included specific projects or activities related to CCAC initiatives or measures. While many countries did not include specific measures in their INDCs, analysing those that did reveals opportunities for the CCAC both to work with its Partner countries to better account for CCAC activities within the climate agreement, and to reach out to countries interested in ongoing CCAC activities.

Initiative or Measure	# of INDCs	CCAC Partners	Non-Partners
Diesel Initiative	24	3	21
Oil & Gas Initiative	18	5	13
Waste Initiative	65	11	54
Bricks Initiative	3	2	1
HFC Initiative	25	5	20
Cookstove Initiative	33	10	23
Agriculture Initiative	31	7	24
Urban Health Initiative	1	0	1
Coalmine Methane	2	0	2
Kerosene Lighting	1	0	1

Table 2: INDCs with specific projects related to CCAC initiatives or SLCP measures

Looking at the Bricks Initiative provides a good example of where the CCAC has an opportunity to work with its Partners to ensure that CCAC/SLCP relevant activities are fully accounted for in future INDCs. Only three INDCs included intended actions to address emissions from brick kilns: Bangladesh, Cambodia, and Iraq. Two of which are CCAC Partners: Bangladesh and Iraq. The CCAC Bricks Initiative currently has activities taking place in ten countries: Brazil, Chile, Colombia, Mexico, Peru, Morocco, Nepal, Pakistan, India, and Bangladesh. While not all ten of these countries listed specific activities in their INDCs (Colombia for example did not, but did pledge to reduce emissions from all

economic sectors) the fact that only Bangladesh included a bricks project in its INDCs suggest a significant opportunity for future INDCs to include these specific projects.

7. What are the barriers to including SLCP in the countries INDCs and how can the CCAC overcome them?

HFCs and Methane are both included in the original basket of Kyoto gases and therefore can be included in all INDCs without any significant difficulty. Nearly 93% of all INDCs included methane among their pledged reductions which indicates that there are few if any barriers to addressing this gas within the INDCs. In contrast, only slightly more than half (51.3%) of the INDCs pledged to address HFCs. A number of countries that chose not to address HFCs specifically noted that emissions of HFCs and other f-gases were too small to be included in their pledges. This indicates that increasing the number pledges to reduce HFCs may require better understanding and communication of the impacts and benefits of addressing HFCs not only based on current emissions but future projections.

Only four countries specifically included black carbon in their INDCs, and only one (Mexico) made a specific mitigation pledge for black carbon. As an aerosol, black carbon is not covered by the UNFCCC and countries are not required to produce inventories or report on emissions. Notably however, the Paris Agreement makes no mention of a specific basket of gases that must be reduced, only the goal of “*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.*” This potentially leaves the discussion open to finding a path for including and accounting for pledges to reduce black carbon and other aerosols within the INDCs.

The CCAC could potentially take two actions to support including black carbon within the INDCs:

- The Paris Agreement established an Ad Hoc Working Group on the Paris Agreement (ADWGPA) which is responsible for negotiating and developing recommendations on a number of components of the Agreement, to be approved at COP22. Part of its authority is to develop guidance on features of the INDCs. The CCAC and its Partners could actively participate in the ADWGPA and its meetings to ensure that SLCPs play an important part in the Paris Agreement implementation including to ensure that the INDC methodology for recording and reporting integrates SLCPs.
- In 2015 the CCAC prepared a *Guidance Note on Short-Lived Climate Pollutants for Intended Nationally Determined Contributions*. The CCAC working with the SAP could continue to develop and refine the guidance note to help interested countries pledge, report, and appropriately account for their actions to reduce SLCPs.

8. Summary

The numerous ways in which countries have included SLCPs and their co-benefits in the INDCs shows the significant positive impact that the CCAC has had on the climate narrative. However, there are still significant opportunities to further embed SLCPs within the INDCs. Eight countries, including two non-CCAC partner countries, pledged to address SLCPs by name and an additional twenty INDCs included the narrative of co-benefits important to SLCPs. But only Mexico submitted a formal pledge to reduce black carbon.

It is also significant to note that a higher percentage of CCAC countries included methane and HFCs within the scope of their pledges than did non-CCAC countries. However, it is also interesting that no Annex I countries, both CCAC and non-CCAC partners, pledged to reduce black carbon and they almost universally focussed on the Kyoto gases. Since many Annex I countries actively work within the CCAC and in their countries to address black carbon and other air pollutants, it is likely that the content and focus of their INDCs is a reflection of the status of the climate negotiations at the time of their submission more than anything else.

	TOTAL (189)						CCAC PARTNERS (50)						NON-CCAC PARTNERS (139)					
			Annex I Total		Non-Annex I Total				Annex I Total		Non-Annex I Total				Annex I Total		Non-Annex I Total	
	Total #	% of Total	Total #	% of Total	Total #	% of Total	Total #	% of Partners	Total #	% of Total	Total #	% of Total	Total #	% of non-Partners	Total #	% of Total	Total #	% of Total
FORCERS																		
CO2	189	100%	43	100.0%	146	100%	50	100%	19	100.0%	31	100%	139	100%	24	100.0%	115	100%
CH4	175	92.6%	43	100.0%	132	100%	50	100%	19	100.0%	31	100%	125	89.9%	24	100.0%	101	87.8%
N2O	168	88.9%	43	100.0%	85.6	71.0%	48	96.0%	19	100.0%	29	93.5%	120	86.3%	24	100.0%	96	83.5%
HFCs	98	51.9%	43	100.0%	55	37.7%	32	64.0%	19	100.0%	13	41.9%	66	47.5%	24	100.0%	42	36.5%
HCFC	1	0.5%	0	0.0%	1	0.7%	0	0.0%	0	0.0%	0	0.0%	1	0.7%	0	0.0%	1	0.9%
PFCs	91	48.1%	43	100.0%	48	32.9%	31	62.2%	19	100.0%	12	38.7%	60	43.3%	24	100.0%	36	31.3%
SF6	91	48.1%	43	100.0%	48	32.9%	30	60.2%	19	100.0%	11	35.5%	61	43.9%	24	100.0%	37	32.3%
NF3	71	37.6%	42	97.7%	29	19.9%	23	46.0%	19	100.0%	4	12.9%	48	34.5%	23	95.8%	25	21.7%
CF4	1	0.5%	0	0.0%	1	0.7%	0	0.0%	0	0.0%	0	0.0%	1	0.7%	0	0.0%	1	0.9%
VOC	3	1.6%	0	0.0%	3	2.1%	0	0.0%	0	0.0%	0	0.0%	3	2.2%	0	0.0%	3	2.6%
CO	3	1.6%	0	0.0%	3	2.1%	0	0.0%	0	0.0%	0	0.0%	3	2.2%	0	0.0%	3	2.6%
SO2	2	1.1%	0	0.0%	2	1.4%	0	0.0%	0	0.0%	0	0.0%	2	1.4%	0	0.0%	2	1.8%
BC	4	2.1%	0	0.0%	1	0.7%	3	6.0%	0	0.0%	3	9.7%	1	0.7%	0	0.0%	1	0.9%

Appendix I – Pledged Gases in the INDCs