

Integrating Short-Lived Climate Pollutants (SLCPs) into Nationally Determined Contributions (NDCs) in Asia:

A Survey with Recommendations

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Key points

- Following the Paris Agreement, more than 160 countries pledged nationally determined contributions (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC). Many countries included plans to pursue other development priorities beyond climate change mitigation in their NDCs.
- Much of Asia has significant potential to achieve cleaner air and control near-term climate change by integrating short-lived climate pollutants (SLCPs) into their NDCs.
- This paper analysed NDCs from Northeast, Southeast and South Asia to determine which countries are integrating SLCPs into the NDCs.
- The analysis revealed many countries' NDCs referenced methane and hydrofluorocarbons, while a few included black carbon. Some countries incorporated air pollution and co-benefits into their NDCs as part of broader climate change strategies.
- Follow-up interviews and surveys suggested some of the main reasons behind the inclusion of SLCPs were 1) sensitization strategies for high-level decision makers and operational staff; 2) interagency coordination mechanisms; and 3) concrete activities underlying work on SLCPs, especially creating and updating emissions inventories.
- Initiatives such as the Climate and Clean Air Coalition (CCAC) are well-positioned to reinforce some of these supporting actions through its Supporting National Action Planning (SNAP) initiative. The Asian Pacific Clean Air Partnership (APCAP) can also strengthen these activities by timing efforts to enhance the science-policy interface with the NDC implementation cycle.

1. Introduction

The Paris Agreement, adopted in December 2015 at the 21st Conference of the Parties (COP 21) to the United Nations Framework Convention on Climate Change (UNFCCC), seems destined to mark a turning point in the history of climate negotiations. Part of the reason it appears on its way to earning that distinction is it is the first agreement under the UNFCCC that explicitly aims to keep global temperature increases below 2 degrees Celsius relative to pre-industrial revolution levels. But the Paris Agreement might turn out to be even more transformational if it succeeds in encouraging countries “to pursue efforts to limit the temperature increase even further to 1.5 *degrees Celsius* (UNFCCC, 2015). Since many developing countries are experiencing rapid economic development and population increases, achieving the transformational 1.5 target will require concerted efforts from both developed but developing countries.

For many developing countries, pursuing this 1.5 goal could nevertheless create a tension. This tension reflects an understandable preference to place more immediate development priorities before mitigating climate change. Co-benefits—the results of actions that curb climate change while achieving other development priorities—may help achieve multiple objectives and thereby reconcile this tension. The co-benefits that arguably have the greatest potential in this regard are improvements in air quality. The benefits of cleaner air are anticipated to be particularly significant in Asia. Illustrating their magnitude is research showing the largest number of premature deaths from air pollution are located in South and East Asia (Landrigan et al., 2017); and the size of the benefits tends to be greatest where existing legislated and planned air pollution controls are weak (IPCC, 2014). This characterization unfortunately applies to many countries in Asia. There is hence significant scope for countries in Asia to achieve reductions in air pollution and a stable climate.

One area where Asia could achieve substantial co-benefits involves reducing air pollutants known as short-lived climate pollutants (SLCPs). SLCPs—including methane, tropospheric ozone and black carbon (which is emitted directly into the atmosphere in the form of fine particles (PM_{2.5}))¹—have significant warming impacts in short atmospheric lifetimes (typically between a week and a decade as opposed to the multi-decadal lifetimes of GHGs). Emissions of black carbon can also accelerate snowmelt and dull ice albedo, increasing their warming effects. Finally, black carbon and tropospheric ozone have a direct effect on air quality. As such, mitigating SLCPs can deliver multiple benefits for the climate and air quality. In so doing, they can help the world and many countries move along a 1.5 pathway while achieving other sustainable development goals (SDGs) (Shindell et al., 2017). Given the size of the population and levels of pollution, the possible gains from reducing SLCPs are particularly great in Asia (UNEP, 2011).

¹ PM_{2.5} is made up of carbon components, nitrate, sulfate, ammonium salt, inorganic elements such as silicon, sodium, aluminum etc. (Government of Japan., 2017)

Table 1 Short-Lived Climate Pollutants

Short-lived Pollutants	Climate	Anthropogenic sources	Lifetime in Atmosphere	Impacts
Black Carbon (BC)		diesel cars and trucks residential stoves forest fires agricultural open burning industrial facilities	Days	ice and snow melting rainfall patterns human health
Methane (CH ₄)		natural processes coal mines natural gas and oil systems landfills	12 years	climate system (direct) human health (indirect)
Tropospheric Ozone (O ₃)	Ozone	not emitted directly but formed by sunlight-driven oxidation of ozone precursors	Weeks	atmospheric warming agricultural production human health
Hydrofluorocarbons (HFCs)		air conditioning refrigeration solvents foam blowing agents aerosols	15 years	atmospheric warming

Source: CCAC

The potential from mitigating SLCPs in Asia raises an important question: how can countries in Asia strengthen the legislation and policies that can support the implementation of actions that mitigate SLCPs? A possible solution involves nationally determined contributions (NDCs). NDCs are the sets of nationally driven actions that countries pledged to the UNFCCC in the wake of the Paris Agreement. Countries in Asia could capitalize on the political and financial support flowing from the Paris Agreement and NDCs to help mitigate SLCPs and curb air pollution. This, however, necessitates that countries in Asia integrate SLCPs into their NDCs.

This paper has three objectives intended to help countries achieve that goal.

- First, it provides an overview of which countries in Asia have integrated SLCPs (or related terms) into their NDCs.
- Second, it offers pragmatic recommendations on how to strengthen that integration at the national level.
- Third, it suggests ways that the Climate and Clean Air Coalition (CCAC) (an international partnership promoting action on SLCPs) the Asia Pacific Clean Air Partnership (APCAP) (a regional initiative promote science-based solutions to air pollution) can support integration at the national level.

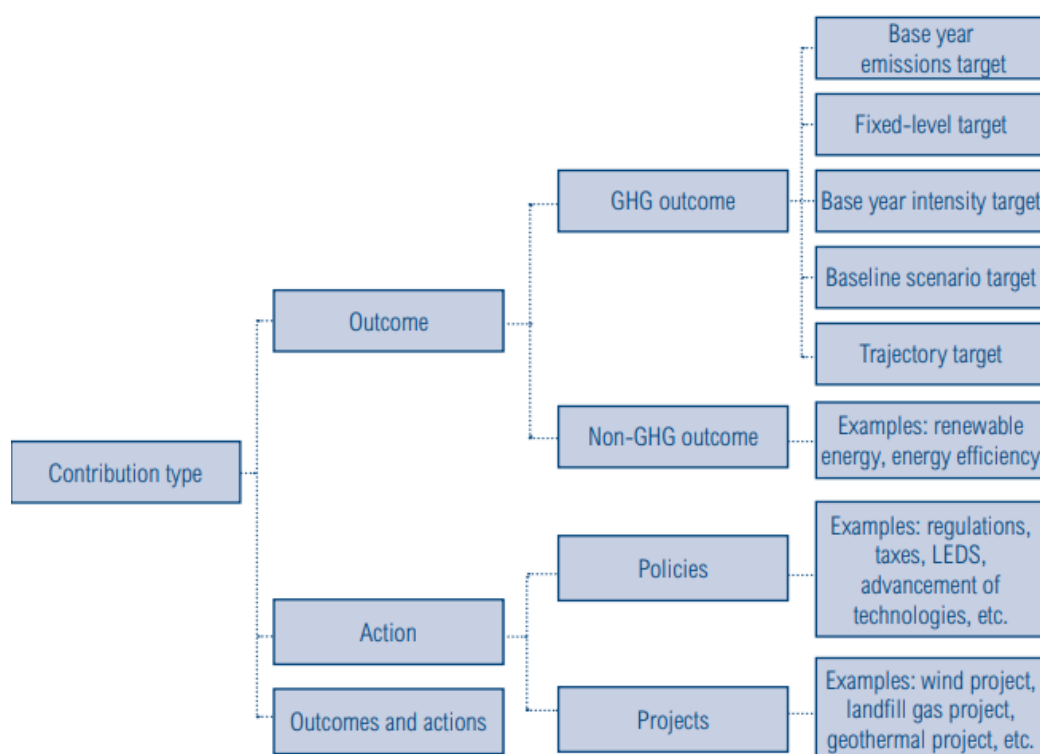
It is hoped that findings from this analysis will not only prove useful to countries that are already incorporating SLCPs into their NDCs but other countries (in and beyond Asia) considering integrating SLCPs into NDCs

and other sector-specific or subnational climate actions. The study draws upon an examination of original INDC/NDC text submitted to UNFCCC as well as interviews and follow-up surveys with policymakers.


2. Integrating SLCPs into NDCs

The NDCs are a set of national responses to climate change that countries pledged to the UNFCCC following COP 21 in 2015. According to Article 4 paragraph 2 of the Paris Agreement, each party shall prepare, communicate, and maintain a succession of NDCs. In general, NDCs consist of a single or combination of actions such as policies or projects aimed at achieving a specific result such as reducing GHG emissions to a particular level (a GHG outcome) or increasing energy efficiency to another level (a non-GHG outcome) (World Resources Institute, 2015). The NDCs are the most recent illustration of a trend wherein countries pledge to take bottom-up actions to mitigate climate change. This trend began a decade ago when countries agreed to take Nationally Appropriate Mitigation Actions (NAMAs) in the Bali Action Plan (2007) that concluded COP13. The NDCs, however, are broader in scope than NAMAs as their contents often refer to both mitigation and adaptation actions. They also elicited relatively more support from countries participating in climate negotiations: as of October 2017, 163 parties have submitted NDCs (UNFCCC, 2017). Many of those countries have begun implementing domestic mitigation measures as they reviewed every five years with the “peer pressure” generated from the sharing of actions meant to motivate countries to “ratchet up” emission reductions.

Figure 1. Types of Mitigation Contributions



Source: WRI, 2015



While the NDCs have therefore generally drawn more participation from countries than past bottom-up climate actions, they vary in the specific issues they address. Some have expressed concerns that this flexibility has resulted in a lack of standardization over the scope and content as well as implementation costs and financing of actions (Pauw, Klein, et al., 2017). Others have described this flexibility more objectively, noting it has allowed countries to include only the gas that contribute most to the national GHG inventory or all seven GHGs covered under the Kyoto Protocol (WRI, 2015). Yet others have cast this flexibility in an even more favorable light, suggesting it enabled countries to make links to core development needs such as 17 SDGs that are to be implemented over the timeframe as the NDCs (TERI, 2017).

A complementary group of studies to this more favorable literature has sought to provide guidance on how to create links between NDCs. To illustrate, the Global Alliance for Clean Cookstoves has sought to help least developed countries (LDCs) and small island developing states (SIDs) to mainstream clean energy concerns into their NDCs (GCCA, 2016). Others have pointed to the potential to integrate climate and gender equality and highlighted the challenges of converting that potential into action (UNDP, 2009). Last but not least, some researchers have offered guidance on strengthening synergies between NDCs and sustainable transport priorities (GIZ, 2017)

Many previous studies therefore underline that potential to leverage NDCs to advance other development needs. Further, in several key sectors such as transport and waste management, development partners and international organizations are offering guidance into how to make these links with the NDCs. A final noteworthy point is that the five-year review cycle and the pledging of NDCs creates what may be the greatest possibility for making NDCs more compatible with other development concerns. That is, the comparisons of NDCs could help countries to learn from each other about how to link different policy areas (Pauw et al., 2017), including air pollution and climate change.

3. SLCPs in NDCs in Asia

The section analyses NDC texts submitted to the UNFCCC from countries in Northeast, Southeast and South Asia to see if they are making the links between their climate actions and SLCPs. Not surprisingly, the pollutant that receives the most references in the region's NDCs among the SLCPs is methane. Methane is in the basket of UNFCCC GHGs but doubles as an SLCP because it has a relatively shorter atmospheric lifetime and contributes to the formation of tropospheric ozone (an SLCP as well as pollutant that impacts human health and ecosystems). Bangladesh, Cambodia, China, Indonesia, Japan, Malaysia, Nepal, South Korea, Sri Lanka, Thailand, and Viet Nam outline plans to reduce methane in the NDCs in the waste, agriculture, and energy sectors. In the waste sector specifically, Bangladesh set clear targets for landfill gas to be captured and used for electricity generation. An even more tangible example can be found in language in Sri Lanka's NDC that suggests it will reduce methane through waste-to-energy programmes.

Another important SLCP are hydrofluorocarbons (HFCs). HFCs are slightly different than methane and black carbon in that reductions in their emissions do not necessarily influence air quality; however, they can often be reduced through energy efficiency measures that can have air quality impacts as well as effects of long-term climate change from mitigating carbon dioxide. Further, HFCs, as an SLCP, also stays in the atmosphere for relatively short lifetimes and have significant nearer-term warming impacts on the climate. Last but not least, like methane, HFCs are covered under the UNFCCC (and recently have been placed under the Montreal Protocol following the passage of the Kigali amendment). Several countries such as Bangladesh, China, Japan, South Korea, Thailand and Viet Nam expressed their intention to reduce HFCs. While Japan is introducing refrigerant control technology and some other measures to control emissions of fluorinated gases, other countries do not discuss specific measures to reduce HFCs in their NDCs. Japan's relatively greater concreteness might be attributable to its comprehensive plan to regulate HFCs domestically.

Black carbon is the pollutant where there is arguably greatest effort needed to make the link between the SLCPs and NDCs. Due to differences in its chemical makeup, atmospheric lifetime, and climate impacts, black carbon is *not* one of the seven GHGs covered by the UNFCCC. Given that it is not under the UNFCCC umbrella, it is noteworthy that three countries in Asia directly reference reductions to black carbon in their NDCs: namely India, Sri Lanka and Laos. These three countries focus on achieving these reductions in the transport sector through measures targeting diesel emission reductions such as upgrading of fuel quality standards and implementing new vehicle emission standards.

In other instances, countries reference actions that would clearly lead to reductions in black carbon but do not directly mention the term in their NDC. In the case of Bangladesh, for example, there is no direct mention of black carbon but there is discussion of taking mitigation actions that are meant to result in cleaner cooking environments. Bangladesh's NDC states that from a business-as-usual (BAU) baseline it aims to achieve 70% market share of improved biomass cookstoves (reaching 20 million households in 2030); 40% market share of improved gas cookstoves; and 10% market switch from biomass to LPG for cooking. This is not the only area where Bangladesh intends to achieve reductions in black carbon. In the transportation sector, Bangladesh also seeks to shift in passenger traffic from road to rail of 20% by 2030 through the development of infrastructure that could shift passengers from diesel-consuming public transport.

Another arguably more indirect way that countries might end up reducing SLCPs through their NDCs involves references to air pollution. Countries like India, Laos, Mongolia, Myanmar, Nepal, and Sri Lanka all refer "air pollution" or "air quality" in their NDC. In some instances, countries elaborated on the relationship between air pollution and socioeconomic development. For example, Sri Lanka expressed concerns about the linkages between air pollution and expansions in urban planning and human settlements. Other countries make reference to efforts to ensure that words in their NDC are supported by action. To illustrate, Nepal introduced a new fuel tax system in the Kathmandu Valley that is intended to improve air quality. Meanwhile, Mongolia articulated an interest in abating air pollution and achieving air quality co-benefits by improving household stoves. India goes one step further in both discussing the need for the abatement of pollution as well as mentioning its

National Air Quality Index (AQI) that was launched 2014 to help achieve cleaner air. The AQI is based on six pollutants and serves as a tool to disseminate information on air quality in easy-to-understand qualitative terms that can help improve communication with the general public on a technically complex topic.

A final subset of countries use the term “co-benefits” in their NDCs in a more general sense, suggesting broader links between climate and development. In this case, Bangladesh’s NDC clarifies that its mitigation options are expected to have some co-benefits (including improving air quality). It further provides the examples of increasing renewable energies and reducing traffic congestion to suggest what kind of actions could deliver those benefits. Paralleling the approach of Bangladesh, the Philippines notes that, when it considered mitigation options, it used assumptions that could help realize co-benefits in the form of environmental or socioeconomic improvements. India also mentions co-benefits but uses the term to refer to co-benefits of mitigating climate change as a desirable side effect of economic growth. Table 2 below summarizes which countries include which SLCPs in their NDCs.

Country	Black Carbon	Methane	HFC
Bangladesh		○	○
Cambodia		○	
China		○	○
India	○		
Indonesia		○	
Japan		○	○
Lao	○		
Malaysia		○	
Nepal		○	
South Korea		○	○
Sri Lanka	○	○	
Thailand		○	○
Viet Nam		○	○

Table 2: SLCP Reduction mentioned in NDCs in Asia (as of Aug.2017)

Before turning to discussion that synthesizes these findings, it is worth noting that the notion of integrating SLCPs into NDCs is visible outside the region. Countries such as Mexico and Chile are among a list of several

non-Asian countries integrating SLCPs into their NDCs. In the case of Chile, for example, this was achieved by government introduced the 2014-2018 Atmospheric Decontamination Strategy that included implementation of PM 2.5 reduction measures. This effectively meant that Chile was incorporating black carbon into its NDC as it is one of the components making up PM2.5 and comes from diesel transport, heating and residential wood fire cooking.

4. The Reasons for Integration: A Synthesis of Survey Results

The previous section suggests that many countries in Asia have made some linkages to SLCPs in their NDCs. Methane and HFCs are incorporated in the greatest number of countries with black carbon (and sector-specific actions that control black carbon) referenced in a fewer number of countries. On the other hand, tropospheric ozone is not mentioned directly in any of the NDCs. There are also several more indirect references to air pollution and co-benefits that open opportunities for mitigating SLCPs as part of a broader climate change strategy.

The varying degrees of the integration raises an important question: how can the integration of the SLCPs into the NDCs be facilitate above beyond methane and HFCs? This section draws upon interviews and responses to a questionnaire (attached in the Appendix) from several policymakers to assess the reasons behind the varying degrees of integration. It also highlights possible interventions that could strengthen that integration.

1. Awareness raising efforts that sensitize policymakers to the language of SLCPs are much needed

The survey found that the term SLCPs is still relatively recent part of the vocabulary for environmental policymakers. The term came to prominence in 2012 with the creation of the CCAC. While SLCPs has seen more usage globally over the past six years following the establishment of the CCAC, it will require significantly more awareness raising before those negotiating climate change are conversant in, for example, the sources and impacts of black carbon. Part of the challenge is that SLCPs are inherently complex. This complexity is illustrated by the considerable uncertainty surrounding the warming and cooling impacts of black carbon. In countries interviewed for this project that made the most progress in “sensitizing officials,” there were references through a top-down and bottom-up channel that proved useful for raising awareness.

The top-down channel involved senior-level officials who possessed significant experience and knowledge of air pollution and could therefore communicate to others the importance of controlling SLCPs for climate change. The bottom-up channel involved considerable efforts to understand SLCPs among staff involved in policy analysis and the implications of bringing SLCPs into a national and international climate strategy. That awareness has then moved up to the senior ranking officials. In spreading information about SLCPs among relevant staff, one interviewee pointed to the framing of SLCPs. In particular, he noted that the language of co-benefits or multiple benefits could help to make the case for taking action on SLCPs and perhaps reduce concerns over technical complexity among officials without an air pollution background. It was also suggested by the same respondent that the language of co-benefits would be easier to convince higher-level champions on the importance of making linkages between SLCPs and NDCs. In yet another instance, an interviewee

spoke about the ongoing effort to create a coherent narrative that brought together work on GHGs and SLCPs as being critical to factoring SLCPs into the currently GHG-centered NDCs.

2. Interagency coordination mechanisms that help integrate SLCPs into NDCs are also critically important


Above and beyond awareness and understanding, a related challenge is the lack of coordination or information sharing between air pollution and climate change divisions. Bureaucratic sectionalism exists in many countries; the walling-off of divisions can sometimes be an unfortunate casualty of budgeting and staffing procedures that narrowly define tasks and responsibilities in the name of specialization. At the same time, countries have made progress in lowering these barriers. Some of the progress is due to the use of existing interagency coordination mechanisms; the crosscutting nature of climate change has led many countries to set up climate change commissions (or similarly titled coordination mechanisms) that offer a natural entry point for making the link between climate change and other development priorities (including air pollution). In other cases, countries have created a special national steering committee on SLCPs with technical, climate, air quality, and environmental management divisions playing active roles. In yet another interesting and possibly replicable practice, the environmental ministry that is overseeing the work on SLCPs has reached out to government funded research institute to support its efforts to bring SLCPs into the NDCs. This research institute is therefore offering a skilled fora that officials within and beyond the agency could turn to get technical information but also learn other divisions and agency views.

In yet a final set cases, there have also been efforts to address both the awareness and coordination issues (mentioned above) at the same time by working with a communication expert from public communication department. These efforts were intended to not only promote better communication among relevant government stakeholders but to give the business and the general public a clearer understanding of SLCPs; this clearer understanding at the local level is particularly important since many of the SLCP actions require changing at a relatively small scale. Hence, if it will help to ensure that there are actually implementable actions that can back up the insertion of the SLCP language in NDCs.

3. Concrete activities such as the creation of emissions inventories can complement efforts to integrate SLCPs into NDCs

In addition to good institutional coordination, several of the interviews pointed to the importance of having a concrete set of activities underlying the work on the NDC. The activity that referenced most frequently was the development and refinement of emissions inventories. In several countries, there is an ongoing effort to bring black carbon into emissions inventory development process. This was viewed as important because it gave multiple relevant stakeholders a common and concrete focal point for their collective actions. Moreover, in one country there was references to including black carbon not only in national but also city level inventories.

Other interviews pointed to the important role that the CCAC is playing to supplement these awareness raising and coordination efforts. The work of the Supporting National Action Planning (SNAP) initiative not only



engages with countries to formulate a national action plan but also has a capacity-building component that aims to employ an official in the relevant government agency to oversee the SLCP portfolio. Initiatives such as the CCAC Regional Assessment and Urban Health Initiative also have intentions to provide national and subnational officials information about the SLCPs.


At the same time, there may be potential for the CCAC to make the links between these initiatives and NDCs even stronger. This could be achieved by using the tools employed for SNAP to look at the current and possible additional elements for the NDC. It may also make sense to engage with countries who are not in the CCAC but are referencing SLCPs (or related terms) in their NDCs. Engaging CCAC countries that are not making this link may also be a useful strategy for all parties involved. Among non-CCAC countries, the review in the previous section of the paper shows that Myanmar, Nepal, and Sri Lanka have been implementing relevant projects or indicated their intentions to reduce SLCPs.

The Asian Pacific Clean Air Partnership (APCAP) -an UNEP initiative founded in 2015 to help bringing together air pollution agreements in Asia and create a science panel that offers Asia's policymakers updates on relevant science—may also have an expanding role in this context. APCAP may want to look at ways that countries can share information and experiences on the integration of SLCPs into NDCs. Considering that APCAP has been collaborating with CCAC in the Regional Assessment report for the last couple of years, there may also be scope to support the development of capacity building programs with relevant partners on SLCP integration into NDCs. Such capacity building could include an introduction to tools that are used for SLCP planning as well as linkages between air pollution. To make this support more effective, it is essential to ensure that the support provided is timely and linked to the NDC cycle so that more countries would be able to increase the level of ambition of their GHG mitigation efforts and support implementation (GIZ, 2017).

5. Conclusion

This paper has demonstrated that several countries in Asia have incorporated SLCPs in their NDCs. The inclusion of SLCPs in NDCs holds promise to bring more resources and support to efforts to clean the air and mitigate near-term climate change in Asia. At the same time, the study found that there is considerable potential for more countries in Asia to make these climate-air pollution links in their NDCs, particularly for black carbon. Sensitization programs for policymakers at different levels of decision making, interagency coordination mechanisms, and initiating complementary activities could help advance this integration in more countries in Asia.

The study also raised some important areas for future inquiry. One such promising channel is whether countries decide to bring in SLCPs into revised versions of their NDCs as they prepare for the five-year review cycle. The flexibility inherent in the NDCs allows for just such a possibility. Another interesting area of research involves whether cities or businesses make efforts to build SLCPs into their climate mitigation strategies. These two sets of actors will likely be tasked with implementing concrete actions as part of the SLCP process.



A final potentially fruitful area of research would involve looking across regions to see what lessons learned could be transferred between countries and policymakers.

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Appendix 1: Survey Questions

1. General Questions

- Can you briefly describe your work and primary job responsibilities?
- Did your country integrate short-lived climate pollutants (SLCPs), air pollution, or other co-benefits into its national determined contributions (NDCs)?
 - If yes, go to section 2. If no, go to section 3.

2. Yes: Have Integrated SLCPs into NDCs

- What were the key factors that led to the inclusion of air pollution or SLCPs in the NDC?
- How much do you think decision makers in your country understood SLCPs (and co-benefits more generally)? In what ways, were you or other relevant colleagues raise awareness of these issues?
- What kind of inter-agency communication and coordination mechanisms were created to facilitate the integration of SLCPs into NDCs?
- How did your country encourage/promote awareness raising for business, the general public and/or civil-society organizations on SLCPs?
- What is the status of efforts to implement parts of the NDCs related to SLCPs?
- What are remaining challenges, if any, to strengthening the integration of SLCPs?
- What kinds of recommendations would you offer to other countries that have not integrated SLCPs into their NDCs?

3. No: Have not Integrated SLCPs into NDCs

- What were main barriers or challenges to integrating air pollution and SLCPs into NDCs?
- What do you think is needed to overcome these challenges?
- What kind of support could the Climate Change and Clean Air Coalition (CCAC) and other international initiatives provide to strengthen the integration of SLCPs into your NDC? What kind of support could other countries provide for the same purposes?
- Are there any plans to strengthen the integration of SLCPs into NDCs in future revisions of the NDC?



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