

Aligning Interests around Mitigating Short Lived Climate Pollutants (SLCP) in Asia: A Stepwise Approach*

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Key messages:

- Short-lived climate pollutants (SLCPs) are air pollutants such as black carbon, methane, and tropospheric ozone that degrade air quality, harm public health, suppress crop yields, and warm climate systems in relatively short atmospheric lifetimes.
- A high-profile United Nations Environment Programme (UNEP) report finds that the widespread adoption of 16 SLCP control measures in Asia could reduce mean global warming by ~0.3°C by 2050. The same measures could avoid 300,000 to 3 million premature deaths and increase crop yields by 20-100 million tonnes annually by and beyond 2030 in Asia.
- The estimated benefits of adopting these measures in Asia are much greater than other regions. However, policymakers in Asia have been slow to craft a coherent response capable of capturing these savings.
- This policy brief discusses some of the main challenges to formulating such a response in Asia, including:
 1. A failure to appreciate that reducing SLCPs can complement greenhouse gas (GHG) mitigation while offsetting near-term warming from the removal of cooling sulphur dioxide (SO₂);
 2. A lack of interagency coordination and a weak atmospheric science-policy interface;
 3. The absence of supportive policies that enable the scaling up of the cookstoves technologies that offer the greatest health benefits in Asia, and
 4. The continued use of high sulphur fuels and older diesel vehicles that prevent the second greatest health and most certain climate SLCP benefits from diesel regulations in Asia.
- This policy brief recommends steps for a more coherent response to mitigating SLCPs in Asia.
 1. Line agencies should be directed to regulate SLCPs as part of a shift toward more integrated multi-pollutant approaches to managing atmospheric pollution;
 2. These directives should be combined with institutional reforms that promote personnel exchanges between relevant agencies; administrative rules that tie a portion of funded activities to multiple benefits; and sustained support for interdisciplinary research to inform government officials about atmospheric pollution;
 3. Relevant agencies should work with non-government organizations (NGOs) and international partners to enable the scaling up of clean cookstove programmes; and
 4. The same agencies should work with transport officials and oil refineries on phased approaches to reducing sulphur levels in diesel fuels and inspection and maintenance programs that encourage self-reporting of superemitting vehicles.
- These steps will help align the diverse interests of stakeholders that would benefit from SLCP mitigation in Asia. Insufficient coordination and lack of recognition of common interests are major barriers to action.

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1. Introduction

In February 2012, Bangladesh, Canada, Ghana, Mexico, the United States, the World Bank and the United Nations Environment Programme (UNEP) joined forces to form a voluntary multilateral initiative known as the Climate Change and Clean Air Coalition (CCAC). The CCAC was established to spur action on pollutants known as short-lived climate pollutants (SLCPs). SLCPs—such as black carbon, tropospheric ozone, and methane—pose threats to public health, crop yields, and climate systems over relatively short atmospheric lifetimes. Mitigating SLCPs could hence deliver significant

co-benefits. In fact, a series of United Nations Environment Programme (UNEP) reports that led to the formation of the CCAC noted the widespread adoption of 16 SLCP control measures in Asia could avoid 300,000-3 million premature deaths and crop losses of 20-100 million tonnes annually by and beyond 2030. The same measures could reduce mean global warming by $\sim 0.3^{\circ}\text{C}$ by 2050. The estimated benefits of adopting these measures are much greater in Asia than other regions (UNEP, 2011). Policymakers in Asia have nonetheless been slow to craft a coherent policy response on SLCPs in the region.

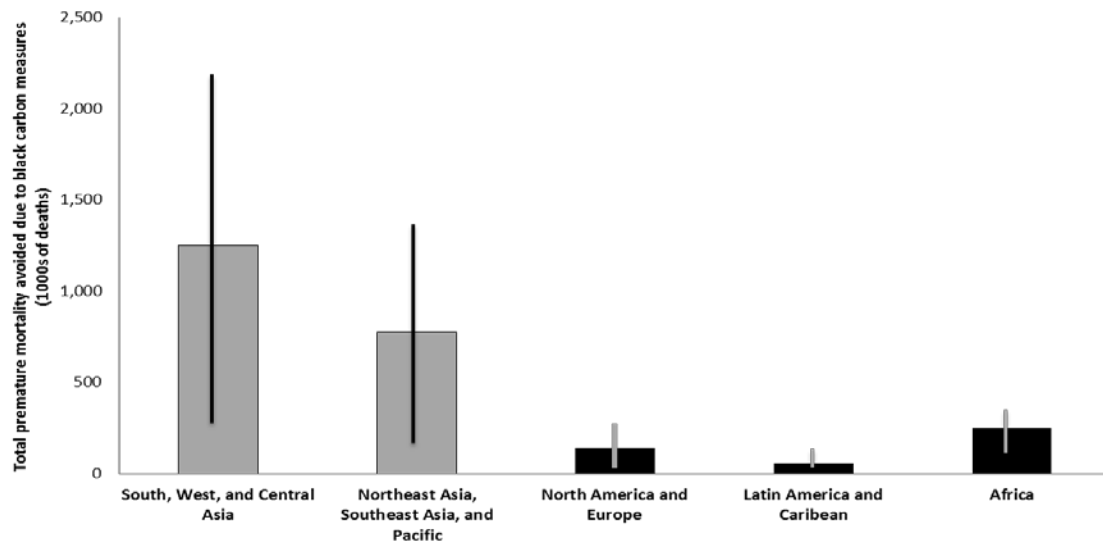


Figure 1: Estimated Benefits in Avoided Premature Mortality for Black Carbon Measures by Region

Source: Based on data from UNEP 2011

Note: The black lines represent the range of uncertainty around the estimated benefits.

Perhaps the greatest reason for the lag is the need to for stakeholders who typically do not work together on these issues to see and act upon common interests. This policy brief therefore proposes a response to SLCPs for policymakers in Asia intended to strengthen the alignment of these interests. At the core of this response lie several steps:

1. Line agencies should be directed to regulate SLCPs as part of a shift toward more multi-pollutant approaches to managing atmospheric pollution;
2. These directives should be combined with institutional reforms that promote personnel exchanges between relevant agencies; administrative rules that tie a portion of

funded activities to multiple as opposed to single benefits; and sustained support for interdisciplinary research to inform government officials about atmospheric pollution;

3. Relevant agencies should work with non-government organizations (NGOs) and international partners to enable the scaling up of clean cookstove programmes; and
4. The same agencies should work with transport officials and oil refineries on phased approaches to reducing sulphur levels in diesel fuels and inspection and maintenance programs that encourage self-reporting of superemitting vehicles.

The remainder of the brief is organized into six sections. The next three sections discuss how to overcome barriers that collectively undermine a coherent response to SLCPs in Asia. A fifth section addresses possible objections to these recommendations. The final section reiterates main arguments and outlines ways forward. The remainder of the policy brief focuses chiefly on black carbon, the SLCP that is “the second most important individual climate-warming agent after carbon dioxide” (Bond et al, 2013). At several junctures, the policy brief broadens its scope to include air pollution and climate change more generally.

2. SLCPs and GHGs are Complements not Substitutes: Overcoming Conceptual Barriers

One of the main messages from research on SLCPs is the estimated benefits will be a powerful motivator for action in Asia. The studies that led to the formation of the CCAC made this point unequivocally clear: the widespread adoption of 16 SLCP control measures in Asia could do more for the region’s climate and development than many existing environmental policies. However,

these messages has not resonates with key decision makers for many countries in Asia. This section describes some of the conceptual barriers that have thus far limited actions on SLCPs at a speed and scale one might anticipate given the estimated benefits.

An important reason that SLCPs have made limited inroads in Asia are leadership concerns that focusing on non-CO2 pollutants could distract from long-lived GHGs. Two considerations should temper these concerns. The first is that mitigating SLCPs protects the climate in the near-term while mitigating GHGs protects the climate in the long-term. This suggests that, unlike mitigating long-lived GHGs, curbing SLCPs could reduce the likelihood of crossing climate tipping points or leading to climate-related disasters over the next two to three decades. In fact, mitigating SLCPs is the only option facing policymakers that will have a direct effect on the climate within their lifetime. Mitigating SLCPs is hence a complement not substitute for mitigating GHGs. Both are needed, and only one will register immediate benefits for the climate (UNEP, 2011).

The second consideration involves the removal other forms of pollution. Many conventional air pollution policies and energy savings measures reduce sulphur dioxide (SO₂). Yet, as suggested by the direction of the off white and striped bars in Figure 2, the sulphates making up SO₂ do not have a positive radiative forcing or a warming effect on the climate. In fact, the SO₂ emitted from major emission sources in Asia such as power plants and heavy industries cool the atmosphere by scattering and reflecting sunlight. The removal of SO₂ therefore effectively peels back a layer of cooling, exposing previously hidden warming.

It would be theoretically possible to avoid this warming by stalling or weakening regulation of

SO2 emissions; this might possibly retain the cooling. But failing to regulate SO2 would result in significant socioeconomic and environmental costs. Rather than deliberately weakening SO2 regulations, a more cost-effective and environmentally-friendly response involves

seeking additional reductions in SLCPs to compensate for the added warming (ACP, 2012; Unger et al, 2009). Compensating for exposed cooling suggest consideration of interactions between climate change and air pollution policies (von Schneidemesser and Monks, 2013).

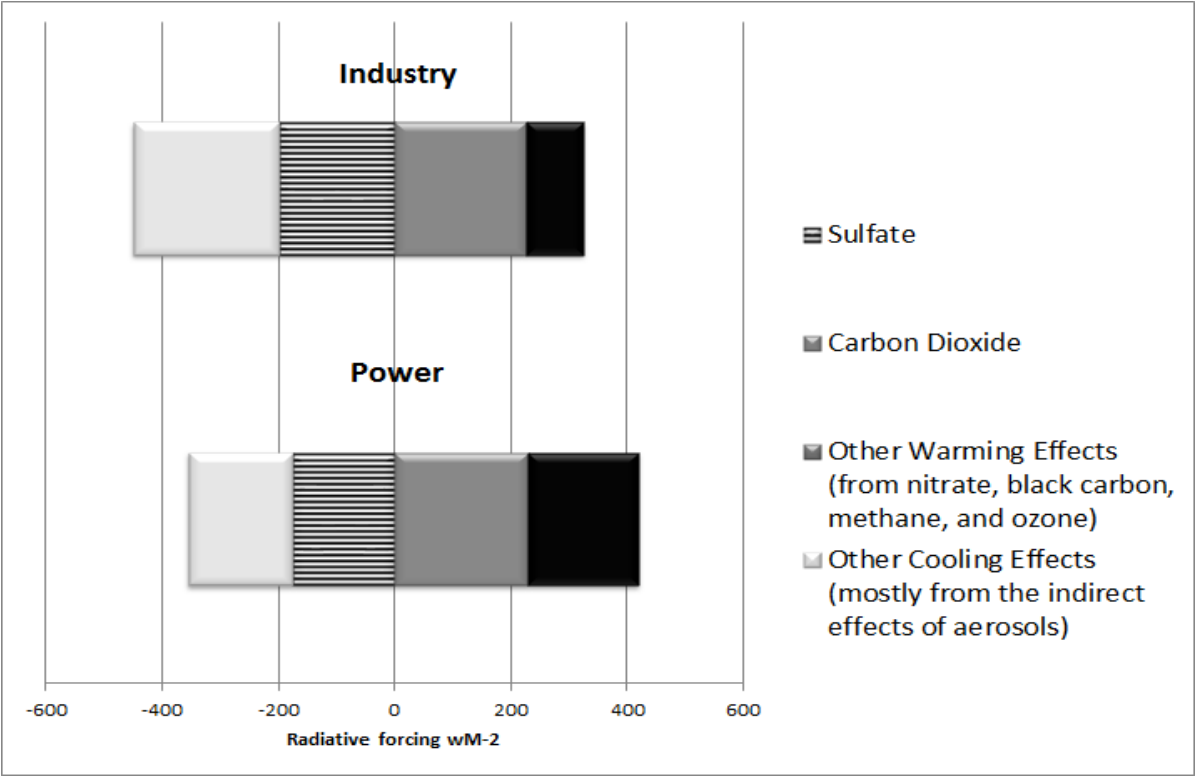


Figure 2: Impacts of Mitigating Different Sources and Pollutants on Radiative Forcing by 2020

Source: Unger et al, 2010

Note: The above figure extracts data from Unger et al 2009 for the industry and energy sectors (the original article covered 13 sectors). Unger et al 2009 looks at the radiative forcing for both long-lived GHGs and SLCPs based “on perpetual constant year 2000 emissions...in 2020.” The figure shows that not all pollutants warm the climate. Some have a negative radiative forcing and a cooling effect. This is particularly evident for SO2. The power and industrial sectors are major sources of SO2 and are already receiving significant attention in Asia’s industrializing countries. But most policymakers do not realize removing these cooling pollutants will also heat up the climate.

The next logical question is which policymakers should act on these messages. This presents the related challenge that in much of Asia it is not readily apparent whether SLCPs should be part of air pollution or climate change policies. While many countries have begun to strengthen air

pollution policies in Asia, few have recognized the impacts of these actions on the climate. Institutional reforms will be needed to enable more integrated approaches to both air pollution and climate.

3. Interagency Coordination: Overcoming Institutional Barriers

This integration between air pollution and climate policies promise to be challenging since different agencies and divisions are often tasked with the climate change and air pollution portfolios. To illustrate, China’s National Development and Reform Commission handles climate change, while the Ministry of the Environmental Protection (MEP) manages air pollution (see Table 2 for other examples). Though relevant agencies or divisions communicate, far greater institutional

coordination will be needed. While different countries will need to tailor solutions based on their own national contexts, an initial set of reforms could include: 1) regularly scheduled personnel exchanges between relevant air and climate agencies and divisions; 2) enhanced capacity building on relevant atmospheric science; and 3) linking budgeting to reductions in multiple as opposed to single benefits. The latter two proposed reforms will require overcoming a related set of divisions within the research community that has carryover effects on the atmospheric science–policy interface.

Table 1: Agencies/Divisions Responsible for Climate Change and Air Pollution in Asia

Country	Climate	Air
China	National Development and Reform Commission (NDRC)	Ministry of Environmental Protection
Thailand	Thailand Greenhouse Gas Office	Ministry of Natural Resources and Environment (MONRE)/ Pollution Control Department (PCD)
India	Ministry of Environment and Forests (Climate Change Division)	Ministry of Environment and Forests (Central Pollution Control Board)
Pakistan	Ministry of Climate Change (MOCC)	Environmental Protection Agency (Pak EPA)

Source: Authors

Indeed the weak interface between policy and science on atmospheric pollution presents a sizable hurdle in and of itself for quick and comprehensive action on SLCPs. To a certain extent, this hurdle stems not just from difficulties of communicating between researchers and policymakers but difficulties communicating between researchers from different disciplines. Greater cooperation between researchers will be needed to provide policymakers with the evidence-based solution required for more integrated approaches to SLCPs. This will necessitate stepping up efforts to ensure,

inter alia, atmospheric scientists, economic modelers and policy researchers can communicate with each other and then persuade policymakers. Current proposals for an Asia Pacific Clean Air Partnership (APCAP) Science Panel and an Asia CCAC Regional Assessment could help ensure relevant information for more integrated research is communicated clearly to policymakers (see also discussion in conclusion). Especially for large countries in Asia, interdisciplinary research that can help bridge some of the institutional divides will be needed.

4. Clean Cookstoves and Diesel: Cases for No-Regrets Action

The most policy-relevant research to date on SLCPs has focused on estimating the benefits of introducing and implementing control measures. But modelling can make it seem deceptively simple to achieve estimated benefits. After models identify the costs and benefits of control technologies, implementing and scaling up the key technologies is the next step. Experience has shown that the options with the most attractive

benefit ratios and most certain impacts have also been difficult to implement and scale up. Once control options are chosen, relevant line agencies to ensure that policies contain implementing provisions that can help overcome barriers to implementation and upscaling for many of the key SLCP measures. This is illustrated by the case of the black carbon control options with low costs and sizable benefits: clean cookstoves (see the green segments in Figure 3).

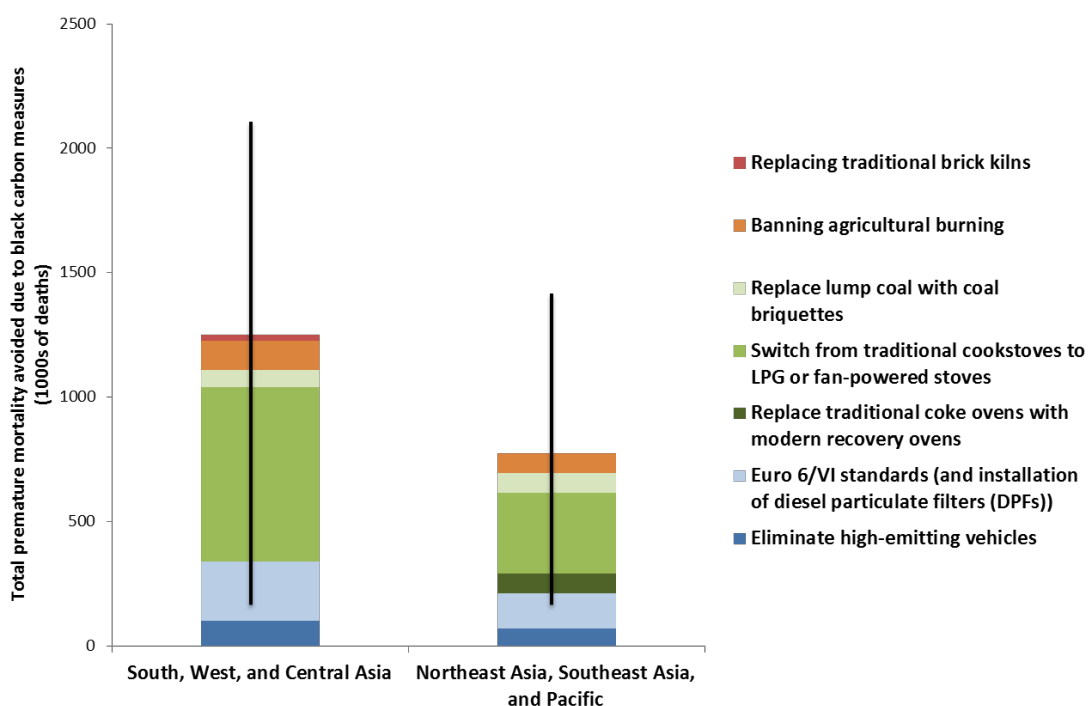


Figure 3: Estimated Benefits of Mitigation Measures for Avoided Premature Mortality in Asia

Source: UNEP 2011

Note: The blue segments cover the reductions from the implementation of measures related to diesel vehicles; the green segments covers the reductions from the implementation of measures related to cooking and heating. The black lines represent the range of uncertainty around the estimated benefits.

4.1. Clean Cookstoves

The control option from the UNEP reports with the greatest public benefits in Asia is clean cookstoves. The estimated benefits in the green segments in the bar chart on Figure 3 are for just “the Northeast Asia, Southeast Asia and Pacific region” and “outdoor air pollution”; the estimates

would be significantly greater if other parts of Asia and indoor air pollution were included in the calculations (UNEP 2011). For much of developing countries including Asia, clay and ceramic cookstoves are an integral part of daily life. The stoves are not only used for preparing meals but heating homes. Both processes rely on burning

firewood, animal dung, and other biomass. But the unevenness and weaknesses of combustion coupled with the lack of a chimney often leads to smoke-filled rooms and cloud-covered villages. These conditions are behind recent World Organization estimates of seven million premature air pollution related deaths annually (UNEA, 2014). This threat looms particularly large for women and children who spend disproportionately more time near the stoves (Rehfuess, Mehta, and Prüss-Üstün, 2006).

Cleaner technologies such as liquefied petroleum gas (LPG) and improved cookstoves equipped with fan-assisted vents could improve air quality at low or even negative costs (costs run negative when fuel savings are factored into the bottom line). However, due to the often underappreciated need for social, economic, and technical enablers, clean

cookstove programs have frequently struggled to move forward (see Figure 4). While barriers such as the lack of supportive infrastructure to deliver LPG require what amounts to improvements in supporting technologies, arguably the most formidable obstacles are socioeconomic—that is, making sure the stove fits the need of the user. One of the ways of improving this fit has involved subsidies that adjust the user prices downward but do not give a full discount on purchase. China’s clean cookstove dissemination programme, for instance, used partial subsidies to help enhance ownership while also building local markets around their manufacture and repair; India’s track record has been less successful due in part to programs that offered full subsidies that discouraged both ownership and market development (Smith et al 2005).

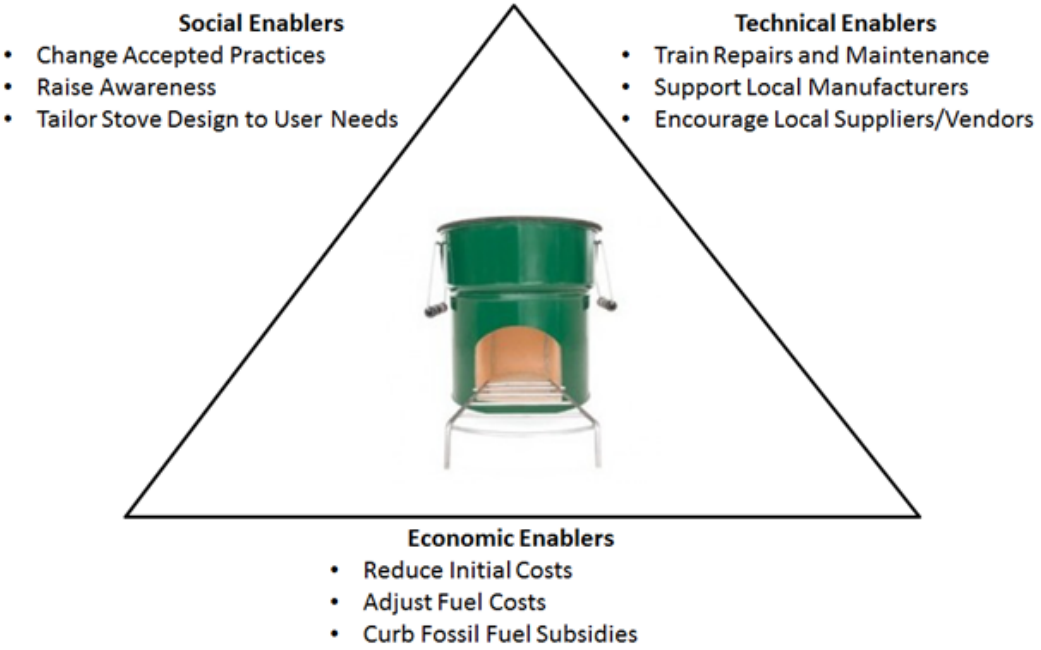


Figure 4: Creating an Enabling Environment for Improved Cookstoves

Source: Authors

A related consideration is that ensuring a good fit between the stoves and the implementing context is also critical for scaling successful

approaches. Upscaling requires that not only users but multiple actors see a value in the use of cleaner stoves, including local industries that

manufacture and customize stoves as well as local maintenance that can quickly address operational issues. To a certain extent, recommending that the stoves generate values for stakeholders, including and beyond the user are not new; the cookstove issue has drawn attention from different policy communities over a four decade period.

But what is recommended here is that cookstoves would become a core of a larger high-profile discussion of strengthening air pollution and climate change strategies. This shift may bring not only more resources but the type of sustained engagement from policymakers at multiple levels needed to adjust subsidies and engage beneficiaries across the value chain.

4.2. Diesel Vehicles

The importance of supporting regulations also applies to the black carbon control option with the second greatest health and more certain climate benefits in Asia, clean diesel (see Figure 3). Diesel fleets make up a large and fast growing share of the vehicle population in Asia. Many of the vehicles are in the freight and logistics sector. This because the greater power from diesel fuel is needed to move heavier loads; smaller diesel passenger vehicles are also gaining popularity in some countries—namely India—due to relatively greater fuel efficiencies. Diesel is nonetheless a significant source of black carbon-rich PM. While cleaner technologies such as diesel particulate filters (DPFs) could reduce these emissions, they require low-sulphur fuels to operate effectively. This, in turn, necessitates a supportive set of emissions and fuel quality standards. The latter fuel quality adjustment often necessitates adjusting subsidies so as to compel refineries to

produce fuels with levels of sulphur that will not harm after-treatment devices. In many countries in Asia, this will require a sustained dialogue with transport agencies and refineries. It may also benefit from a gradual approach that provides clarity over the direction of policy but offers time and financial support to adjust to that direction.

If strengthening emissions and fuel quality standards are two core components of a diesel regulation strategy, a third essential element is inspection and maintenance programs (I&M). I&M programs remove “superemitters” from the vehicle fleet. “Superemitters” are so-named because poor maintenance and old age lowers their operating efficiencies and increases emissions (Reynolds, Grieshop, and Kandlikar, 2012). Yet, due to insufficient administrative oversight, human resource constraints, and financing shortfalls, these programmes have also struggled to gain ground. There have nonetheless been examples in Mexico and Chile of I&M programs that a “phased approach that allows learning, adaptation, and capacity building along the way” can provide a foundation for gradually ratcheting up program stringency (Hausker, 2010). In a similar vein, greater incentives such as guarantees on reduced maintenance can be offered to older diesel operators to self-report. Here again, the diesel issue is not entirely new; but sustained attention across agencies and other stakeholders could help in enhancing implementation. As such, implementing provisions that aim to strengthen all three components of a clean diesel regulatory strategy—emissions standards, fuel quality standards, and I&M programs—could make the diesel fleet cleaner (see Figure 5).

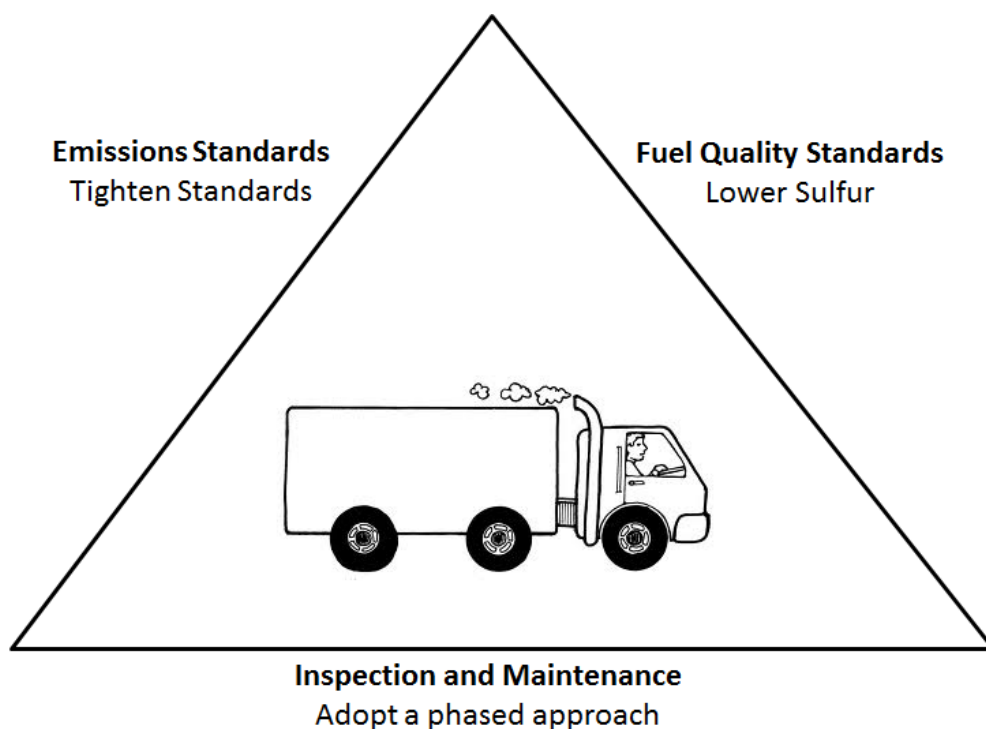


Figure 5: Three Core Elements of a Cleaner Diesel Strategy

Source: Authors

5. Possible Objections and Responses

To be sure, not all of the proposed reforms are likely to be agreeable to affected stakeholders. For instance, staff working in relevant line agencies may find it challenging to work on multiple objectives and standard operating procedures (SOPs) may prove similarly inflexible to operationalizing regulatory approaches targeting multiple benefits. These concerns are justifiable; however, they need to be considered in light of two other points. The first is that line agencies must be given not only greater incentives but better knowledge upon which to base these decisions. Agency officials need to insist that new incentives for action are paired with a firmer evidence base that can support their efforts. A second consideration is that the proposed reforms are designed to not only make line agencies more accountable but to share that accountability

across multiple stakeholders—perhaps most importantly higher level officials.

A second set of objections may also come from stakeholders who stand to lose from policy change. Most notably, tightening and enforcing diesel fuel standards are likely to impose costs on politically connected refineries. These costs may be particularly high for resource-constrained refineries and/or passed on to consumers. Coordinating the interests of different stakeholders would be easier by using a multi-pollutant strategy which could offset costs in one area with gains in another area. This may not be possible if the main focus is narrowly on improved fuel quality, but it may become easier through a broader, high-profile, sufficiently resourced effort to align climate change and air pollution policies.

6. Conclusions and the Way Forward

This policy brief began with the contention that no other region in the world could benefit more from coherent response to SLCPs. It nevertheless suggested that important reasons for the slow response to research on those benefits are several barriers, including:

1. A failure to appreciate that reducing SLCPs can complement greenhouse gas (GHG) mitigation while offsetting near-term warming from the removal of cooling sulphur dioxide (SO₂);
2. A lack of interagency coordination that is compounded by a weak atmospheric science-policy interface; and
3. The absence of supporting policies that enable the scaling up of the cookstoves technologies that offer the greatest health benefits in Asia, and
4. The continued use of high sulphur fuels and older diesel vehicles that prevent the second greatest health and most certain climate SLCP benefits from diesel regulations in Asia.

It then provided a set of recommendations to overcome conceptual barriers at the leadership level, institutional barriers at the line agency level, and socioeconomic barriers at the operational level. It further suggested that this multilevel response might also address concerns from stakeholders who may object to the proposed reforms (See Figure 6 for a diagram of the key elements of the recommended approach).

This section addresses four remaining issues. The first is whether it is feasible to expect countries in Asia to move forward with a multi-tiered response.

On this point, it merits underlining that the state of California has recently begun to integrate SLCPs into its statewide Global Warming Solutions act. Importantly, that policy has built into provisions for regularly scheduled research on cost-effective measures, interagency coordination mechanisms and a panel that reviews the distribution as opposed to the overall impacts of measures. Building in these channels for consultation with the research community and affected stakeholders has helped broaden support and legitimize the policy. It might therefore serve as a useful model for other countries in Asia.

A second issue is how should policymakers carry forward the key recommendations in this policy brief in different countries in Asia? Clearly different countries will have different priorities when it comes to SLCPs specifically and integrating climate change and air pollution policies generally. For example, India has a fast growing population of diesel passenger cars that will need to be regulated to capture climate and air pollution benefits. In contrast, the diesel fleet in China is limited to mostly freight and logistics vehicles, suggesting it should take a different approach. Moreover, in some smaller countries in Asia other sources of SLCPs might be more important. To illustrate, Bangladesh, policymakers are looking at emissions from rice parboiling units. A unifying theme that cuts across many of the countries, however, is that there is reforms that help different interests recognize context-appropriate actions that would benefit from multiple stakeholders working together.

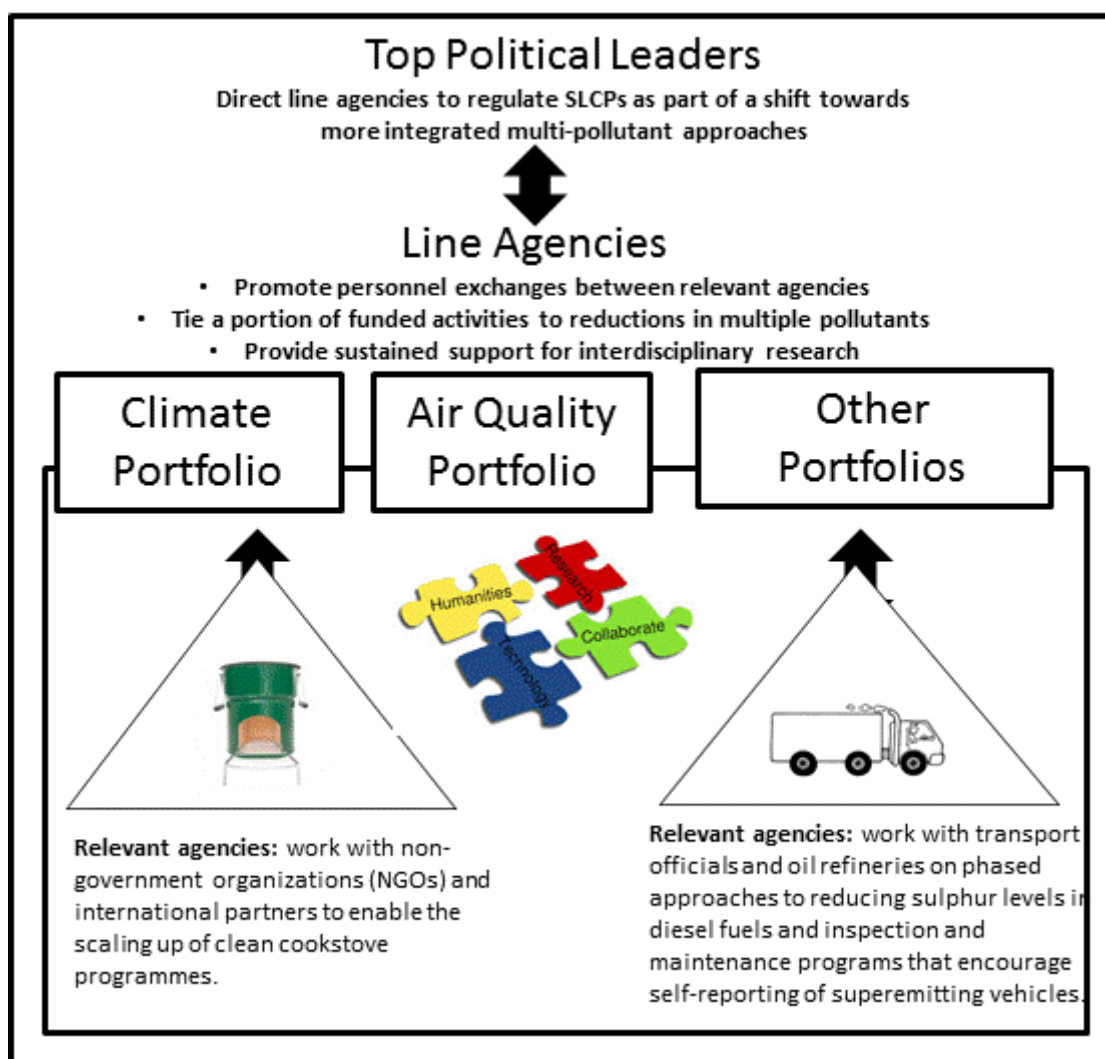


Figure 6: Illustrating a Coherent Response to SLCPs in Asia

Source: Authors

The third issue involves the role that international initiatives may play in supporting the above recommendations. The CCAC—the recently launched multilateral initiative promoting action on SLCPs—may be particularly well placed to advance these recommendations. This is because it the CCAC’s operational core is a set of seven sector specific initiatives that are intended to encourage action on the SLCP technical measures; as well as four larger cross-cutting initiatives that aim to strengthen the regional science, national action planning, city-level work and financing for

the other initiatives. In the future, it will be useful if the CCAC also advocates approach that leverages the collective weight of its own initiatives and provides partner countries with a coherent model for action on SLCPs in Asia. As more countries move toward such a model, they may also capture other politically salient benefits such as green jobs and reputational gains from participating in a global network of state and non-state actors committed to action on climate change and air pollution.

The final issue is the role that regional initiative may play in supporting the recommendations. The United Nations Regional Office for Asia and the Pacific (UNEP-ROAP) will be launching an Asia Pacific Clean Air Partnership (ASPAC) in 2015 that is designed to support a Science Panel and Joint Forum. The ASPAC Science Panel will be convened to provide policymakers in Asia with a single voice on the latest scientific and policy research on atmospheric pollution. Its first significant output will be a synthesis report that will be generated in cooperation with the CCAC assessing the state of atmospheric pollution in Asia and identifying regionally relevant actions. In so doing, the Science Panel may look at a broader range of

pollutants, including, for instance, non-methane precursors of tropospheric ozone such as Nitrous Oxides (NO_x). These pollutants are beyond the scope of the CCAC because of their negligible effect on climate change; they nonetheless remain a significant problem in Asia (Akimoto, 2012). The ASPAC Joint Forum will help bring together existing air pollution agreements in Asia under a single umbrella. In so doing, it has the potential to align several currently disparate interests working on atmospheric pollution in Asia. It could also push for greater alignment between these varying interests at the national level and reinforce the main message of this brief.

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