

The role of SLCPs in Achieving the Sustainable Development Goals

Background Paper for CCAC Science Policy Dialogue

1. Introduction

The post-2015 development agenda is dominated by a set of Sustainable Development Goals (SDGs) which differs in a number of respects from the Millennium Development Goals (MDGs) that precede them. While there have been many critics of the MDGs, they did lead to a number of significant successes including making a major contribution to mobilizing global resources to reduce extreme poverty by half. However, the MDGs did not consider environmental issues in a broad way, limiting the possibility to understand the underlying causes and the proper mechanisms to find sustainable and integrated options for solving and harnessing environmental and development challenges and opportunities.

The SDG development process arose from the 2012 Rio+20 UN Conference on Sustainable Development. The final text of the SDGs was adopted by all UN Member States on 25 September 2015. The 17 Goals and 169 Targets improve upon the MDGs in a number of important ways. For example, the SDGs apply to both high and low income countries and cover a much wider spectrum of sectors and policies compared to the MDGs. Although the SDGs are global in scope, countries will be able to set national targets that reflect their range of capabilities and aspirations. The SDGs also clearly recognise the significance of the environmental dimension of sustainable development including its interlinkage and contribution to achieving the social and economic dimensions of sustainable development. For example, Target 3 of Goal 2 aims to ensure sustainable food systems... that help maintain ecosystems and strengthen capacity to adapt to climate change, extreme weather, drought, flooding... and that progressively improve land and soil quality. Also, Target 9 of Goal 3 on good health and wellbeing, seeks to 'substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution from contamination'. Similarly, Target 4 of Goal 8 aim to achieve sustained, inclusive and sustainable economic growth through improved global resource efficiency in consumption and production and decoupling of growth from environmental degradation.

Following the adoption of the goals and targets, a process was put in place for the development of relevant indicators for assessing progress towards achieving the SDGs. Currently, 229 indicators have been developed with 149 of them approved, and 80 still being worked on. The full list will be presented to the UN Statistical Commission in early March 2016, and then will be submitted to ECOSOC and the UN General Assembly for adoption. These global indicators will be complemented by indicators at the regional and national levels, to be developed by Member States.

The agreed goals and target draw from diverse aspects of human and planetary needs and challenges, and achieving them by 2030 would require coordinated actions on diverse fronts. One of such needed actions is the mitigation of short-lived climate pollutant (SLCP) emissions¹. This is because SLCP emissions can impact on many of the goals and targets due to their climate-warming and air-polluting properties. This paper seeks to highlight the interlinkages between SLCPs and the SDGs and argues that actions to reduce SLCPs can directly and indirectly support the achievement of many of the proposed SDGs. The paper also presents some activities of the Climate and

¹ Short-lived climate pollutants (SLCPs) 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.

Clean Air Coalition (CCAC) that can contribute towards achieving the SDGs and the possible roles of CCAC's Scientific Advisory Panel (SAP) in supporting CCAC's contribution towards the achieving the SDGs.

2. How are Short-lived Climate Pollutants (SLCPs) interlinked with the Sustainable Development Goals (SDGs) and Targets?

For each relevant SDG and target, this section summarizes how reducing SLCP emissions can contribute to achieving the goal or targets and vice-versa.

 <p>1 NO POVERTY</p>	<p>Goal 1: End poverty in all its forms everywhere</p> <p>Policies and measures to reduce SLCP emissions can contribute to ending poverty indirectly by empowering people through promotion of local solutions and capacity strengthening, job creation in clean technologies, and by increasing crop yield and reducing the economic effects of ill-health due to air pollution. Improving public health by reducing the burden of disease from air pollution also increases the resilience of populations to environmental shocks and disasters. Furthermore, improved air quality and decrease in the rate of global warming, through SLCP emissions reduction, could help reduce the rate of sea-level rise² and the intensity and frequency of extreme weather events, which have been linked to air pollution climate change³. This would allow vulnerable populations critical time to adapt. Reducing near-term warming will also reduce temperature-driven losses of labour productivity, particularly of outdoor labourers⁴.</p>
--	--

 <p>2 ZERO HUNGER</p>	<p>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p> <p>Target 2.3 of this goal aims to double agricultural productivity and incomes of small-scale food producers while Target 2.4 seeks to ensure sustainable food production systems that increase productivity and production and help maintain the ecosystem. The UNEP/WMO assessment⁵ indicates that mitigating SLCPs emissions, in particular tropospheric ozone, can help avoid the loss of 52 million tons of four staple crops – maize, rice, soybean and wheat. Hence reducing SLCP emissions will contribute to increased agricultural productivity. Furthermore, measures aimed at mitigating SLCP emissions, including intermittent aeration of continuously flooded rice paddies and farm-scale anaerobic digestion of manure from cattle and pigs, as well as ban of open field burning of agricultural waste will contribute to achieving sustainable food production systems. Also, reducing SLCP emissions will contribute to improved crop yields through reducing the rate of climate change which is projected to have adverse impacts on crop yields, particularly in low latitude regions⁶.</p>
---	---

² Hu et al (2013). Mitigation of short-lived climate pollutants slows sea-level rise.

http://www.nature.com/nclimate/journal/v3/n8/full/nclimate1869.html?WT.ec_id=NCLIMATE-201308

³ See for example IPCC 2012. Managing the risks of extreme events and disasters to advance climate change adaptation. http://www.ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf; Fan et al. 2015. Substantial contribution of anthropogenic air pollution to catastrophic floods in Southwest China. <http://www.pnnl.gov/science/highlights/highlight.asp?id=4042> and Fan et al (2016). Mechanisms contributing to suppressed precipitation in Mt. Hua of Central China, Part I - Mountain Valley circulation. <http://journals.ametsoc.org/doi/abs/10.1175/JAS-D-15-0233.1>

⁴ For example, Park 2014. Will we adapt? Temperature shocks, labor productivity, and adaptation to climate change in the United States (1986-2012) http://belfercenter.ksg.harvard.edu/files/dp81_ipark_hpca.pdf

⁵ http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf

⁶ See for example Kang et al. 2009. Climate change impacts on crop yield, crop water productivity and food security – A review. <http://www.sciencedirect.com/science/article/pii/S1002007109002810>

**3 GOOD HEALTH
AND WELL-BEING**



Goal 3: Ensure healthy lives and promote well-being for all at all ages

Reducing SLCP emissions can improve health directly and indirectly through a range of pathways and mechanisms as described in the recent WHO/CCAC report⁷. The most important direct pathway is through the contribution of SLCPs (particularly black carbon) to fine particulate matter air pollution which contributes to approximately 7 million deaths annually. Strategies to reduce use of diesel powered vehicles, and consequently reduce black carbon emissions, in cities and promote public transport from clean energy sources together with active travel (walking and cycling) can both reduce air pollution exposure and increase physical activity, thereby contributing to improved human health. Furthermore, there are also important links between SLCPs and the SDGs through the food and agricultural systems. High consumption of animal products (particularly from ruminants) is associated with higher emissions of GHGs – particularly methane. Diets that conform to WHO guidelines can reduce SLCP emissions as well as improving health, largely as a result of increased consumption of vegetables, fruit, nuts and seeds and decreased animal product consumption.¹

**5 GENDER
EQUALITY**



Goal 5: Achieve gender equality and empower all women and girls

Globally, the impacts of SLCPs often disproportionately affect women and children, due in large part to their proximity to major SLCP source sectors and their vulnerable societal and economic status in many parts of the world. In particular, household air pollution (HAP) from cooking, heating, and lighting with biomass or fossil fuels disproportionately affects women and small children⁸. While biomass fuels can often be gathered locally, considerable time can be spent collecting fuel. This limits time available to engage in income-generating activities, or in the case of children, to focus on education. Since women and children are often responsible for fuel collection, this also places them at greater risk of injury or gender-based violence outside the home. Actions to address HAP from traditional cooking that take into consideration gender issues can directly support multiple targets within Goal 5 by simultaneously reducing HAP, reducing household fuel costs, supporting education, and providing women opportunities for income generation through local entrepreneurship.

**6 CLEAN WATER
AND SANITATION**



Goal 6: Ensure availability and sustainable management of water and sanitation for all.

According to the Centre for Disease Control and Prevention, around 800,000 children under 5 years of age die from diseases associated with inadequate water supply and poor sanitation, in particular, diarrhoea⁹. Water scarcity and poor water quality negatively impact food security, livelihood choices, and educational opportunities. Untreated wastewater is also a significant source of methane emissions that contribute to the formation of tropospheric ozone, further impacting food security and public health. Capturing methane by upgrading primary wastewater treatment to secondary/tertiary treatment with gas recovery and overflow control can reduce many of these impacts while producing natural gas which can be used for energy thereby contributing to Goal 7. Furthermore, mitigating SLCPs, in particular black carbon, could also help in regulating the hydrological cycle and consequently water

⁷ WHO/CCAC 2015. Reducing global health risks through mitigation of short-lived climate pollutants.

<http://www.who.int/phe/publications/climate-reducing-health-risks/en/>

⁸ See for example: Household air pollution from cookstoves: Impacts on Health and Climate. <http://ramanathan.ucsd.edu/files/brt41.pdf> and Household air pollution and the sustainable development goals. <http://www.who.int/bulletin/volumes/94/3/15-155812.pdf?ua=1>

⁹ See: http://www.cdc.gov/healthywater/global/wash_statistics.html

availability, since black carbon has been shown to lead to drought in some world regions¹⁰ and SLCP mitigation could result in increased rainfall in drought-prone regions¹¹. Additionally, efforts to reduce methane emissions from household waste can also contribute to achieving adequate and equitable sanitation and hygiene.

**7 AFFORDABLE AND
CLEAN ENERGY**



Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Targets 7.1 of this goal, ensuring universal access to affordable, reliable and modern energy services by 2030 offers major opportunities for integrating SLCP mitigation within the SDGs. Two examples are the introduction of clean-burning biomass stoves for cooking and heating in developing countries and substitution of traditional biomass or coal cookstoves with stoves using clean-burning fuels or cookers powered by electricity from renewable or low carbon sources. SLCP emissions reduction actions can also contribute to improved energy efficiency or vice versa. For example, results from a recent study have show that implementing HFC refrigerant transition and energy efficiency improvement policies in parallel for room air conditioning could save between 340-790 gigawatts (GW) of peak power load globally. This action is also expected to lead to an avoided CO₂ emissions of up to approximately 98 billion tonnes of CO₂ by 2050¹², thereby also contributing to Goal 13 on climate change.

**8 DECENT WORK AND
ECONOMIC GROWTH**



Goal 8: Promote sustained, inclusive and sustainable economic growth, employment and decent work for all

Many SLCP measures promote high efficiency technologies and practices which support the goal of decoupling economic growth from environmental degradation. Replacing traditional biomass cooking and heating stoves with more efficient alternatives can improve resource efficiency, which can reduce deforestation by reducing or eliminating biomass fuel demand. It can also reduce consumer costs by reducing fuel use as well as emissions per unit of energy. As mentioned under Goal 7, measures to reduce HFC emissions, when paired with technical improvements in appliance efficiency, can provide significant energy efficiency benefits which reduce consumer costs and can avoid greenhouse gas emissions from electricity production. Furthermore, implementing integrated waste management strategy, which is being promoted as mean for SLCP emissions reduction from the waste sector, would lead to improved resource efficiency in consumption and production as advocated in Target 8.4.

**9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE**



Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Measures to reduce SLCP emissions can contribute to achieving Target 9.4 of this goal aimed at upgrading infrastructure and retrofitting industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes... by 2030 and therefore offers the potential to integrate SLCP reduction with the SDGs. For example, by replacing traditional brick kilns with vertical shaft brick kilns and replacing traditional coke ovens with modern recovery ovens, a cleaner and environmentally friendly technology would be adopted in this economic sector.

¹⁰ See for example: Fan et al (2016). Mechanisms contributing to suppressed precipitation in Mt. Hua of Central China, Part I - Mountain Valley circulation. <http://journals.ametsoc.org/doi/abs/10.1175/JAS-D-15-0233.1>

¹¹ Stohl et al. (2015). Evaluating the climate and air quality impacts of short-lived pollutants. <http://www.atmos-chem-phys.net/15/10529/2015/acp-15-10529-2015.pdf>

¹² Shah et al (2015). Benefits of Leapfrogging to Superefficiency and Low Global Warming Potential Refrigerants in Room Air Conditioning. <http://eetd.lbl.gov/publications/benefits-of-leapfrogging-to-superef-0>

**11 SUSTAINABLE CITIES
AND COMMUNITIES**



Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Many SLCP reduction measures can be addressed through Goal 11 which aims to 'make cities and human settlements inclusive, safe, resilient and sustainable. Target 11.1 'by 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums' clearly interlinks with, for example with Goal 7, and the potential to provide affordable clean energy for deprived households for cooking and lighting purposes. Target 11.2 'by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all' can foster policies to reduce SLCPs through elimination of high-emitting vehicles and support for safe, active travel in cities. SLCP emissions reduction policies can also contribute to the achievement of Target 11.6 on reducing the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management 'for example through separation and treatment of biodegradable municipal waste through recycling, composting and anaerobic digestion as well as landfill gas collection with combustion/utilization.

**12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION**



Goal 12: Ensure sustainable consumption and production patterns.

Goal 12 seeks to encourage the sustainable management and efficient use of natural resources. Actions on SLCP are interlinked with achieving this goal. For example, Target 12.3 aims to halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 2030. Organic wastes, which are the focus of this target are a major source of SLCP emissions including methane from waste dumps/landfills and black carbon from waste combustion. Policies targeted at mitigating SLCPs from these sources will therefore contribute to achieving this target. Similarly, Target 12.4 aims to achieve environmentally sound management of chemicals and all wastes by 2020 and reduce their release to air, water and soil... HFCs, an SLCP is one of such chemicals; hence, actions geared toward reducing HFCs emission would inevitably contribute to meeting this target. In addition, Target 12.5 hopes to substantially reduce waste generation through prevention, reduction, recycling and reuse by 2030. Success in achieving this target will significantly reduce the emissions of SLCPs from wastes.

**13 CLIMATE
ACTION**



Goal 13: Take urgent action to combat climate change and its impacts.

According to the UNEP/WMO assessment, mitigation of two SLCPs, methane and black carbon would help slow down the rate of global warming in the near-term. Furthermore, actions on HFCs would further contribute to reducing the rate of global warming. If quick action to foster SLCP emissions reductions are undertaken with deep reduction in CO₂ emissions, there is an increase chance of meeting the target of keeping the global temperature rise to 2°C or less during the 21st century. Apart from contributing to the reduction in the emissions of greenhouse gases/substances thereby contributing to mitigation efforts, reduction in SLCP emissions would also contribute to climate change adaptation. This is because by slowing down the rate of warming, the ecosystem and living organisms are more able to adapt to the impacts of climate change compared to a situation of rapid warming. Furthermore, recent knowledge has shown that black carbon is a major contributor to increased intensity

and frequency of extreme events which is one of the expected impacts of climate change¹³. Hence, black carbon emissions reduction efforts would also contribute to mitigating climate-related extreme events.

3. What are CCAC's ongoing efforts and activities that can contribute to achieving these SDGs?

As shown above, efforts to reduce SLCP emissions are clearly interlinked with the SDGs and their targets. Hence, ongoing actions and activities of the Climate and Clean Air Coalition (CCAC) targeted at SLCP emissions abatement can contribute to achieving some of the SDG targets, especially when scaled up. CCAC actions and activities are highlighted in this section.

The activities of the CCAC sectoral initiatives which have an ultimate objective of reducing SLCP emissions from agriculture¹⁴, bricks production¹⁵, household cooking and heating¹⁶, diesel vehicles and engines¹⁷, oil and natural gas production¹⁸, municipal solid waste¹⁹ and from devices using hydrofluorocarbons²⁰, would ultimately contribute to achieving the SDGs, especially when scaled up. For example, by promoting alternative and affordable chemicals and technologies in the refrigeration sector, the HFC initiative could help avoid food waste and contribute to food security (Goal 2), while also improving energy efficiency (Goal 7) as well as mitigate climate change (Goal 13). Furthermore, by promoting black carbon emissions reduction from the diesel engines, through promotion of better emissions standards, the CCAC diesel vehicle and engines initiative contributes to the Goal 3 on healthy lives and wellbeing, as well as Goal 11 on sustainable cities and Goal 13 on climate change.

Also, the activities of the CCAC Urban Health Initiative²¹ which aims to empower cities to take effective action on air quality with support from the health sector contributes to Goal 11 on cities and human settlements, in particular, Target 11.6 on reducing per capita environmental impact of cities, through assisting in development of policies that support SLCP emissions reduction and harness the associated multiple benefits in cities; Goal 3 by preventing premature death and non-communicable disease; and Goal 7 by supporting policy development for a wide range of sectors to transition to energy efficient cities.

Additionally, the CCAC's "Supporting National Planning for Action on SLCPs (SNAP) initiative²² aim to help build capacity for effective national planning as a foundation for rapid and large-scale implementation of SLCP mitigation. The initiative supports countries in embedding SLCP mitigation in on-going activities and policies and in building capacity. It also help foster linkages and collaboration between national SLCP planning and global and regional processes, initiatives and approaches. The SNAP initiative can contribute to the various capacity building targets listed in the SDGs including those related to Target 13.2 on the integration of climate change measures into national policies and strategies, Target 13.3 and 17.9 on human and institutional capacity on climate change and sustainable

¹³ Fan et al. 2015. Substantial contribution of anthropogenic air pollution to catastrophic floods in Southwest China.

<http://www.pnnl.gov/science/highlights/highlight.asp?id=4042>

¹⁴ <http://www.ccacoalition.org/en/initiatives/agriculture>

¹⁵ <http://www.ccacoalition.org/en/initiatives/bricks>

¹⁶ <http://www.ccacoalition.org/en/initiatives/cookstoves>

¹⁷ <http://www.ccacoalition.org/en/initiatives/diesel>

¹⁸ <http://www.ccacoalition.org/en/initiatives/oil-gas>

¹⁹ <http://www.ccacoalition.org/en/initiatives/waste>

²⁰ <http://www.ccacoalition.org/en/initiatives/hfc>

²¹ <http://www.ccacoalition.org/en/initiatives/health>

²² <http://www.ccacoalition.org/en/initiatives/snap>

development, and Target 17.6 and 17.7 on technology and knowledge development, transfer, and dissemination, including for environmentally sound technologies.

4. What more can the CCAC do?

Many CCAC Partners have been involved in the processes leading to the development of the SDGs, their targets and in the development of the SDG indicators. The work of CCAC Partners, led by the WHO, was particularly instrumental for ensuring that the SDG indicators included specific language on air pollution, which as the SDGs are applied, will drive resources and interest toward SLCP measures that address air pollution particularly in households and urban environments. While the complete list of 229 global indicators are expected to be completed and submitted to the ECOSOC and UN General Assembly following the UN Statistical Commission meeting in mid-March 2016, there are still a number of opportunities for the CCAC and its Partners to work to ensure that SLCPs are appropriately embedded in the SDG indicator framework, and in other relevant global, regional and national platforms. This include through the CCAC Demonstrating Impact framework which is composed of a set of 19 standard indicators for assessing and improving performance internally; and for reporting and demonstrating progress and showing the effectiveness of the CCAC as a vehicle for meaningful, rapid and scalable action. The flexibility and the fact that the framework build on and recognize existing methodologies, provide the possibility of linking the framework to the SDG indicators.

Help develop Work Plans for indicators: During its third meeting 28 March-1 April 2016 the IAEG-SDG will separate the 229 indicators into three Tiers: Tier 1 for indicators with an established methodology and available data; Tier 2 for indicators with an established methodology but lacking widely available data; and Tier 3 for indicators where an internationally agreed methodology has not yet been developed. The IAEG-SDG will establish a work plan to increase data coverage of Tier 2 indicators, and to further develop Tier 3 indicators. The CCAC and Partners could support the development and success of these work plans, particularly as they relate to air pollution and other SLCP-relevant indicators, including to support alignment with the CCAC Demonstrating Impacts indicator framework.

Help develop nationally-relevant SLCP indicators: The 229 global SDG indicators will be supplemented by regional and national level indicators created by Member states, guided by the global level of ambition but taking into account national circumstances. Thematic indicators will also be developed but it is currently unclear how and in what areas. The CCAC could work with its Partners to develop guidance for states interested in developing nationally-relevant SLCP-specific indicators using the CCAC Demonstrating Impact indicator framework as a basis for this work. The CCAC, through the SNAP and other relevant initiatives could also provide technical support for states that express an interest and a need for nationally-relevant SLCP-specific indicators. The CCAC should also stay abreast of developments on thematic indicators and could consider proposing SLCPs as a thematic area of focus.

Highlight multiple benefits: The SDGs, like the MDGs before them, are expected to focus and mobilize significant global, regional, and national resources over the next fifteen years. To capitalize on the inherent synergies between SLCP mitigation and the SDGs, the CCAC could consider highlighting and embedding these identified linkages and quantify their benefits in all of its materials including reports (e.g. CCAC Annual Report, Regional Assessments), communications materials, and presentations. The CCAC could also consider developing targeted data, analysis, and communications tools, including as part of the Demonstrating Impacts framework, to highlight the specific benefits of these synergies within each of its initiatives and within important ongoing global, regional, and national

platforms such as the Intended Nationally Determined Contributions under the UNFCCC, or the Regional Action Plan for the Intergovernmental Cooperation on Air Pollution in Latin America and the Caribbean.

Finally, to support and guide any action, whether recommended here or otherwise, in the most strategic, efficient, and transparent way possible, the CCAC should consider forming a special Taskforce on the Sustainable Development Goals, which part of its objective would include working with relevant ministries and departments in its member states in integrating SLCP mitigation into their country's SDGs objectives and implementation.

5. What are the possible roles of the CCAC Scientific Advisory Panel (SAP)?

The SAP can play a number of roles in developing the evidence base linking SLCP mitigation with the SDGs. It would be useful to quantify the likely contributions of SLCP mitigation policies to the achievement of the SDG targets as reflected by modelled changes in the chosen indicators from a range of policy options. SAP could advise on the methodology that would be appropriate and the priorities for analysis. These decisions also need to be guided by the views of national policy makers about priorities in different national contexts. The analyses could also encompass economic evaluations of different policies to assess their cost-effectiveness.

The SAP, in conjunction with national policymakers, may also be able to provide advice on where natural experiments such as those arising from major investments in relevant sectors such as energy, housing, industry, agriculture and transport etc. could be evaluated for the effects on SLCP emissions, potential co-benefits and economic implications.

Furthermore, the SAP may be able to support national SLCP/SDG scoping programmes which aim to map out the potential linkages for countries at different levels of development, by integrating the relevant SDG targets and indicators into the current Supporting National Planning for action on SLCPs (SNAP) activities.

SAP could also keep under review emerging evidence and advice where new research is needed to assess the magnitude of effects of SLCP mitigation strategies as well as to study additional pathways by which SLCP reductions and SDGs may be linked. Finally SAP could synthesize the evidence on trends in SLCPs and their effects on health, the economy and the environment and contribute to assessments of progress towards the SDGs.