World Health Organization | WORLD BANK GROUP | UNEP | CLIMATE & CLEAN AIR COALITION TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

WHO Policy Brief

Short-lived Climate Pollutants (SLCPs)

Synopsis

Short-lived climate pollutants (SLCPs) have strong warming potential and significant impacts on health and the environment. The Intergovernmental Panel on Climate Change (IPCC) has recognized that achieving a 1.5°C consistent pathway that meets both global climate and sustainable development goals requires rapid mitigation of all climate forcing emissions, including SLCPs.[1] However, SLCPs are not an agenda item under the UNFCCC and, have historically not been comprehensively included in country emissions inventories and nationally determined contribution (NDC) mitigation pledges. Implementing actions to address SLCPs, in parallel with rapid progress towards net-zero CO_2 by mid-century, is critical to the successful implementation of the UN Framework Convention on Climate Change (UNFCCC) and its Paris Agreement and to reducing health risks, especially non-communicable disease (NCD) incidence.

Science

Many SLCPs are dangerous air pollutants that contribute to global warming. SLCP emissions can substantially affect the climate system in the near-term because they have significantly higher global warming potentials and shorter atmospheric lifetimes than CO_2. *This means fast action to reduce SLCPs will result in quick benefits for climate change and for human health.* SLCPs include black carbon (BC, i.e., soot), methane (CH_4), tropospheric ozone (O_3), and hydrofluorocarbons (HFCs). The inefficient **combustion** of fuel, **agricultural methods**, the **waste** sector, and **refrigeration and cooling** play a significant role in production of these pollutants.

Direct human sources	**77%** of anthropogenic BC: 51% - household fuel combustion responsible & 26% - transportation[2] **42%** of CH_4 - agriculture sector, 36% - fossil fuel operations, & 18% - waste sector[3] **80%** of HFCs - air conditioning & refrigeration[4]
Indirect sources	Tropospheric O_3 (i.e., the layer closest to Earth's surface) – is produced from chemical reactions involving various compounds, including CH_4 and nitrogen oxide pollutants[5]

SLCP emissions reduction potential[6]	
BC	70% by 2030
CH_4	40% by 2030
HFCs	56% by 2050

	Climate	Environment	Health
Impacts[6]	cause more than **45% of the net global warming since pre-industrial times** & emissions continue to increase across sectors	disrupt weather patterns, **damage ecosystems**, & accelerate the melting of snow and ice	increased incidence of **cardiovascular & respiratory conditions**, cause **premature deaths**, & affect **food security**

Globally, comprehensive mitigation measures targeting SLCPs could cut the rate of global warming in half (a 0.6°C reduction) while helping to prevent 7 million premature deaths from outdoor and household air pollution annually[7], and preventing 52 million tonnes of crop losses annually by 2030.[6] CH_4 mitigation measures alone could prevent 775,000 asthma-related hospital visits and 255,000 premature deaths every year.[8] SLCP mitigation would reduce the incidence of a range of conditions linked to exposure to fine particulate matter ($PM_{2.5}$) and ozone, including asthma, chronic obstructive pulmonary disease (COPD), ischaemic heart disease, and stroke (i.e., NCDs), as well childhood pneumonia and low-birth-weight babies.

Globally, **99%** of children under 18 live with air pollution levels above 2021 AQG

Action on SLCPs under the UNFCCC can reduce the local disease burden. Long-term exposure to air pollutants is the second-leading cause of non-communicable disease burden.[9] The health effects of air pollution had a global cost of US$8.1 trillion in 2019, equivalent to 6.1% of global GDP for that year.[10] In particular, BC and O_3 impact local and regional air quality and mitigation policies for these pollutants can have rapid, positive improvements on local and regional public health, which is an immediacy uncharacteristic of most climate policies.[11] This is particularly important in the case of BC, which is a component of $PM_{2.5.}$ $PM_{2.5}$ is a highly harmful type of air pollution affecting 99% of the global population breathing outdoor air which breaches WHO air quality standards[12], the WHO 2021 Global Air Quality Guidelines (2021 AQG). Research in high-income countries suggests particles emitted from coal and diesel-powered vehicles pose a larger cardiovascular disease risk than biomass particles or natural sources in both the short- and long-term, however more research is needed in low- and middle-income countries where biomass use is widespread.[13] Expanding the scope of pollutants addressed by UNFCCC inventory guidelines to include all SLCPs, and aligning their reporting methodology to capture their role in global warming and harmful air pollution, is important.

Stronger action on SLCPs supports health equity, development of children, adolescents, and youth, the health economy and environmental justice in line with the human right to a clean, healthy, sustainable environment.[14] Globally, over 99% of children under 18 live with outdoor air pollution levels above 2021 WHO AQG values, with the highest exposures in low- and middle-income countries.[15] Emerging evidence suggests that early life exposure (inhalation, ingestion, or in utero) can lead to development and behavior disturbance and increased susceptibility to communicable and non-communicable disease, including cancer – these are lifelong challenges and long-term economic burdens for individuals and the economy.[16] Air pollution reduces worker productivity, inhibits child development, and reduces the overall standard of living. As a result, cities with better environmental quality can have a competitive advantage in attracting and retaining the skilled.[17] Given the central role that human capital plays in urban economic growth, cities with strong environmental attributes will be more likely to achieve sustainable long-term growth.[18]

Policy

Views of health, climate and environmental professionals converge on the need to strengthen policies on SLCPs. The WHO supports a **precautionary approach to SLCPs** and provides good practice guidance to safeguard against health costs (lives, illness, health economy) from SLCPs.[19] The IPCC promotes **comprehensive consideration of all anthropogenic forcing agents.**[20] The IPCC also acknowledges the need for improved SLCP emission inventories to inform national and global climate policy[21] and for internationally agreed, globally applicable methodological guidance that consolidates and harmonizes greenhouse gas (GHG) and SLCP inventories. While CH_4 and HFCs are included in national GHG inventories reported to the UNFCCC, their scope and reporting methodology are limited.

More support for implementation to address air pollution and SLCPs is needed at the national level. The number of countries with air quality legislation is growing, but most low- and middle-income countries lack the air quality and SLCP emissions data needed to address the growing health impacts of air pollution and climate change. Increasing air quality monitoring using a combination of emerging technologies, adaptation to country-specific conditions, and building capacity for the development of lasting institutions can fill the air quality monitoring gap.[22] At the same time, the number of countries that included air pollution and SLCPs in their NDCs has more than doubled (from 16 to 47) from the first round of submissions starting in 2015 to the updates submitted since 2020.[23]

The need for cross-sectoral approaches to addressing air pollution is well-acknowledged. At the global level, support for addressing environmental drivers of air pollution and its effect on health has been reinforced by several resolutions of the World Health Assembly (e.g., **WHA** 51.29, 68.8, 69.18, 74.16), of the UN Environment Assembly (e.g., **UNEA** 1/7, 2/21, 3/8), and the UN General Assembly (e.g., **UNGA** 73/2). In resolution 73/2, the UNGA called for enhanced international cooperation to address environmental risk factors and determinants of health, and health-in-all-policies approaches. Enhanced action on SLCPs also

supports the Sustainable Development Goal 3[1] Global Action Plan (**SDG3 GAP**) proposals for joint action on determinants of health, namely to "leverage global platforms to prioritize and jointly act on determinants of health relating to climate change, communicable diseases and NCDs."[24]

Comprehensive mitigation ensures that the implementation of the Paris Agreement maximizes air quality and public health. The WHO, the World Bank and UN Environment Programme (UNEP) are already cooperating on SLCPs within the framework of the UNEP-convened Climate and Clean Air Coalition, as well as through the BreatheLife Campaign. Opportunities for scale up of policy alignment and joint action need to be harnessed, including elevating the interrelation of climate, clean air, health and sustainable development in the UNFCCC contexts. Increased policy coherence is needed on SLCPs to protect public health from the adverse effects of the anthropogenic drivers of climate change and harness multiple co-benefits.

Key Messages to UNFCCC parties on SLCPs:

It is critical that UNFCCC Parties recognize that the stabilization and reduction of atmospheric greenhouse gas concentrations, as well as **reduction of all anthropogenic sources of emissions promotes health and well-being**. Under the UNFCCC, there is significant room to expand the scope of pollutants under consideration and the methodology for SLCP assessment, and to strengthen the focus on sector approaches to climate action. The 2021 WHO Air Quality Guidelines (AQG), including its good practice guidance, are important to achieving mitigation ambition and robust implementation of the Paris Agreement. Clean and renewable technology transfer to support a just transition that safeguards human health of vulnerable populations is important.

At COP 26, the **Glasgow Climate Pact** invited UNFCCC Parties "to consider further actions to reduce by 2030 non-carbon dioxide greenhouse gas emissions, including methane" (para 37).[25] The UNFCCC subsidiary bodies for scientific and technological advice (SBSTA) and implementation (SBI) jointly consider three items that provide priority entry points for strengthening SLCP considerations: **scaling up mitigation ambition and implementation**, the **Koronivia Joint Work on Agriculture** (KJWA), and the **Global Stocktake** (GST).

The following key policy advancements on SLCPs under UNFCCC workstreams would promote and strengthen public and global health:

Strengthen ambition:

- recognize different **air pollutants have different lifetimes in the atmosphere as well as warming potentials** against different timeframes
- include **stand-alone reduction targets on SLCPs** in NDCs that specify the types of pollutants reviewed, aim for **a sustained decrease in SLCP emissions over time**, and encompass **sector and economy-wide emissions** reduction
- reflect the **2021 AQG as a component to and baseline for minimum mitigation** ambition
- incorporate the **2021 AQG good practice guidance on BC** and elemental carbon (EC))
- agree to anchor a new and permanent **workstream on food systems** under the UNFCCC[26]

Improve data reporting:

- in line with the 2021 AQG, ensure reporting aims for measurement of the **black carbon and elemental carbon component to $PM_{2.5}$** in addition to **total $PM_{2.5}$ mass** concentrations, and assess **spatial hotspots** of **$PM_{2.5}$**, to better target primary BC/EC combustion sources[19]
- encourage establishment of ground-based air quality monitoring networks with rigorous quality assurance and quality control protocols[27]
- improve measurement and monitoring of CH_4, including through the **UNEP International Methane Emissions Observatory**

Require integrated assessments:

- encourage integrated health-environment risk and impact assessments for air pollution, and, in line with the 2021 AQG, ensure they include **concentration/response relationships**

[1] *Sustainable Development Goal 3 (good health and wellbeing)*

Take a rights-based approach:

- highlight that mitigation options should **reflect a just transition** while balancing and **safeguarding against public health risks** of short-term, seasonal, and long-term air pollutant exposure at local, sub-national, and national levels

At the international level, stakeholders should also raise awareness of other recent efforts to address non-CO_2 drivers of climate change under another multilateral environmental treaty – specifically, within the Kigali Amendment of the **Montreal Protocol** on Substances that Deplete the Ozone Layer. Through this Amendment, in 2016, parties to the Protocol agreed to phase down up to 85% of HFCs by 2050. As of July 2022, this Amendment has been ratified by 137 parties.[28] All parties should **ratify the Kigali Amendment to protect public health.**

The Climate and Clean Air Coalition annual **Climate and Clean Air Ministerial**, convenes partner ministers and invited leaders to ratchet up ambition to build political momentum on SLCPs.[29] To advance this work, **a high level joint environment-health ministerial meeting on SLCPs would be valuable.**

**Sustainable Development Goal 3 (good health and wellbeing)*

Practice

Public health practice can reinforce the implementation of the UNFCCC and climate-resilient development. At the same time, stronger climate policy and action on SLCPs at global and national levels supports public health. In resolution (73/2), the UNGA called on the WHO to "promote healthy communities by addressing the impact of environmental determinants on non-communicable diseases, including air, water and soil pollution, exposure to chemicals, climate change and extreme weather events, as well as the ways in which cities and human settlements are planned and developed…"[30]

At the national level, **development of National SLCP Action Plans**[6] and their integration into other national environment and health strategies is essential. Further, countries should **establish or update national air quality standards**, ensuring that SLCPs and other non-CO_2 pollutants and coverage of short- and long-term exposures are included, and that standards consider the adverse effects they aim to address. There is significant room to **expand the evaluation of risks, impacts, and costs of air pollution-related disease burden and reduction potential**[19] in health impact and health risk assessments.

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