

# CONTROLLING **SHORT-LIVED CLIMATE POLLUTANTS**



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Short-lived climate pollutants (SLCPs) pose a problem with tangible solutions that will provide – in many cases at a relatively modest cost – an opportunity to address near-term warming and reap health, environment and development benefits.

In February 2012, officials from Sweden, Ghana, Bangladesh, Mexico, USA and Canada came together in Washington DC to launch an ambitious initiative: the Climate and Clean Air Coalition to Reduce Short Lived Climate Pollutants (CCAC).

They were drawn to action by a major assessment sponsored by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), *An Integrated Assessment of Black Carbon and Tropospheric Ozone* (2011), which showed that sharply reducing emissions by implementing measures focused on methane and black carbon could reduce global warming between now and 2050 by 0.5°C, and could help avoid 2.4 million premature deaths and the loss of tens of millions of tonnes of food crops each year after 2030.

The report identified 16 specific measures, using existing technologies that, if fully implemented,

would help to achieve those multiple benefits. Shortly before COP17, UNEP published an analysis of the costs and benefits of each measure, to help policy-makers develop strategies that would bring the greatest benefits to their own regions and countries: *Near-term Climate and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers* (2011).

The analysis also showed that the measures would often pay for themselves within a few years. And it reinforced the message that countries that tackle SLCPs would not only help slow down climate change in the near term, but could reap major health, crop yield and regional climate benefits.

It was a compelling case, and the CCAC founders – the six countries plus UNEP – committed to closely collaborate and promote fast action to reduce SLCPs. Some partners also pledged to invest millions of dollars to jump-start global

action. They also began to rally international support, so that by August 2012 a total of 27 partners had joined the effort, including 18 countries, the United Nations Development Programme (UNDP), the World Bank, as well as NGOs and research institutions. Coalition partners agree to some simple but important terms: they recognise the science, and they commit themselves to act to reduce SLCPs, collectively and individually.

### THE SCIENCE OF SHORT-LIVED CLIMATE POLLUTANTS

The term ‘short-lived climate pollutants’ covers several substances: methane, black carbon (soot), tropospheric ozone and some hydrofluorocarbons (HFCs). What they all have in common is that they remain in the atmosphere for a relatively short time compared with carbon dioxide – between a few days for black carbon and weeks for ozone in the lower atmosphere (troposphere), about 12 years for methane and on average 15 years for different short-lived HFCs. They also all have a climate impact. Methane, tropospheric ozone and HFCs are greenhouse gases that absorb the infra-red radiation reflected by the earth and warm the atmosphere; black carbon in the atmosphere or on snow is heated directly by sunlight.

Black carbon and tropospheric ozone are also important air pollutants. As residents of polluted and smog-filled cities experience at first hand, black carbon particles and ground-level ozone are both major threats to human health, contributing to asthma, respiratory infections and other problems. Ground-level ozone also reduces crop yields, forest growth and net primary productivity of vegetation.

The sources of these pollutants are well known. Black carbon is directly emitted by incomplete combustion of biomass, fossil fuels etc., while tropospheric ozone is formed in the atmosphere when the sun shines on specific gases. So-called ‘ozone precursors’ include carbon monoxide, nitrogen oxides, volatile organic compounds, and methane – which thus not only contributes to global warming, but indirectly harms human health and vegetation.

### SIXTEEN MEASURES TO REDUCE SLCPs

The UNEP-WMO assessment, which was conducted by an international author team

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chaired by Drew Shindell of NASA-GISS, with scientific co-ordination by the Stockholm Environment Institute (SEI), identified 16 key measures to reduce black carbon and tropospheric ozone which would have both significant climate and air-pollution reduction benefits. They were classified into two broad categories: ‘black carbon measures’, to reduce products of incomplete combustion, and ‘methane measures’, to reduce methane and, indirectly, tropospheric ozone formation. The black carbon measures would significantly reduce particulate-matter emissions as well as ozone precursors including carbon monoxide, methane and nitrogen oxides.

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The assessment showed that if fully implemented by 2030, the 16 measures would reduce global warming between 2010 and 2050 by about 0.5°C (note that uncertainties remain, in particular in relation to the warming associated with black carbon and co-emitted substances). About half this benefit would come from reducing emissions resulting from incomplete combustion (black carbon measures), mainly in Asia and Africa, and the rest from implementing the methane measures, mainly in Asia, Europe and North America.

It is important to realise that while SLCPs and long-lived greenhouse gases all warm the atmosphere, reducing SLCPs represents a strategy that can achieve reductions in warming in the near term – over the next 20-40 years – whereas only a modest contribution to long-term goals would be made. Attaining the long-term objectives will

be largely determined by reductions in carbon dioxide (CO<sub>2</sub>). Therefore, SLCP reductions must be viewed as a complement to, and in no way a replacement for CO<sub>2</sub> reduction. The assessment showed that curbing SLCPs can improve the chances of keeping global temperature increases under 2°C, but this is contingent on deep and immediate cuts in CO<sub>2</sub>.

Addressing SLCPs could help us avoid some projected near-term climate changes that are of deep concern, such as the thinning Arctic ice cover, melting of permafrost and of glaciers globally, and projected regional-level climate changes with implications for food production and disaster risk. SLCPs have disrupted the South Asian monsoon, for example; implementing these measures could help return weather patterns to a less disturbed state.

The health benefits are also significant. A total of 2.4 million premature deaths (within a range of 0.7–4.6 million) could be avoided globally each year by 2030 from reductions in outdoor pollution through black carbon measures, with additional benefits from cleaner indoor air. The biggest health benefits would be felt in Asia, with 1.9 million premature deaths avoided each year. Africa, Asia and in Latin America and the Caribbean would see the greatest health gains from cleaner cooking stoves, and also benefit substantially from reduced transport emissions.

The SLCP measures would also reduce tropospheric ozone concentrations, and this

### PRACTICAL SOLUTIONS

One of the best things about the 16 measures identified in the assessment is that they are not ‘pie in the sky’ – they all involve existing technologies and practices that just need to be more widely applied. The greatest methane reductions, for example, would come from curbing emissions from coal mines, especially in North East Asia, South East Asia and the Pacific, from oil and gas production in all regions, and from gas leakage from pipelines in North America and Europe. The crop-yield benefits from black carbon measures stem largely in all regions from measures implemented in the transport sector, especially the wider implementation of Euro 6/VI standards.

would avoid crop yield losses for wheat, rice, maize and soya beans alone by an estimated 32 million tonnes per year (range of 21–57 million). Additional benefits could come from avoided regional climate change (such as reduced drought and heat stress).

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### CONVERGING ENVIRONMENTAL AND DEVELOPMENT GOALS

In this context, it is clear that addressing SLCPs is a development issue. Slowing climate change, avoiding the disruption of important rainfall patterns and improving air quality will all bring tangible, near-term gains. In fact, the 16 measures are already part of development agendas around the world, for different reasons. For example, clean cooking stoves are promoted for health and to reduce deforestation; reducing the burning of agricultural residues will also reduce health impacts and promote soil carbon sequestration; reducing methane from oil and gas industries, and hence ozone concentrations, will improve food production; tackling traffic congestion and the resulting air pollution is a priority for many cities. All 16 measures would provide development benefits, and half the emissions, the assessment found, could be reduced at zero net cost over the lifetime of the measure concerned.

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That is the appeal of tackling SLCPs: the challenge they pose can be met with tangible solutions that will yield multiple benefits in many cases at a relatively modest cost. To encourage prompt action,

the Climate and Clean Air Coalition is focusing on a few priority areas: raising awareness of SLCPs; developing national action planning processes to address SLCPs; exploring how best to finance SLCP activities, and targeting key sectors and sources, such as diesel engines, the oil and gas industry, brick kilns and waste, and HFCs with high global warming potential and for which there are alternatives.

The idea is not to reinvent the wheel, but to put a spotlight on these issues while encouraging governments to mainstream SLCP measures into ongoing development, air quality and climate strategies and programmes. The Coalition will help fill gaps and monitor progress, and it will support countries and continue to mobilise international action. It will also work to highlight and bolster existing efforts to address key SLCP sources. And all Coalition partners recognise that this work is complementary to the global efforts to reduce carbon dioxide, in particular under the United Nations Framework Convention on Climate Change (UNFCCC).

Coalition partners are optimistic that a real difference can be made, but also recognise that implementing many of these measures will not be easy. People have been working on clean cooking stoves for decades, for example, yet at the global scale, about 3 billion people still rely on traditional biomass for cooking. Changing this situation will require sustained effort, and an understanding of what makes policy interventions succeed (or fail) on a large scale. There is a great deal of work involved – legislation, awareness-raising, capacity-building, financing and investment – and a need to engage a wide range of actors in both the public and private sectors.

One important step in this regard is the development of national action planning processes for SLCPs. This will allow countries to identify the measures that best fit their needs and priorities – drawing from the list already

highlighted in the UNEP reports, or exploring additional options that might yield similar benefits. The Coalition is also encouraging high-level regional discussions; for example, in September 2012, it hosted a three-day conference in Ghana that brought together policy-makers, environmental experts and industrial stakeholders from 15 African countries and around the world, to raise awareness of issues.

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The Coalition provides an opportunity to deal with important problems, and by working together, we can start to solve them. The Coalition welcomes new partners; to learn more, visit [www.unep.org/ccac](http://www.unep.org/ccac). ■

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*The Stockholm Environment Institute (SEI) is an international nonprofit research organization that has been engaged in environment and development issues at the local, national, regional and global policy levels for more than 20 years. Its goal is to bring about change for sustainable development by bridging science and policy. SEI has seven centres worldwide, in Stockholm; Oxford and York, U.K.; the United States; Bangkok, Thailand; Dar es Salaam, Tanzania; and Tallinn, Estonia.*