CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

ANNUAL REPORT

2016-2017

Climate and Clean Air Coalition Annual Report September 2016-August 2017

This report is an overview of the Coalition's progress from 2016 to 2017 and, because it is our 5th anniversary, includes information on the status of short-lived climate pollutants emissions, actions and policy trends. The report was prepared by the Coalition Secretariat based on reporting by initiatives through the Demonstrating Impacts Framework and information from Partners in Action. The data on global trends comes from partner institutions who work with and are supported by the Coalition.

All documents referenced in this report are available on the Coalition's website **www.ccacoalition.org**, solution centre, or intranet (TeamWorks).

Disclaimer

Design/layout: Anna Mortreux

Photo cover: © IRRI
A researcher in the Philippines uses the closed chamber method testing to quantify greenhouse gas emissions from rice production in the Philippines. Reducing methane and black carbon emissions from agriculture is a key focus for the Coalition this year.

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UNEP 147

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

UN environment

ANNUAL REPORT

2016 - 2017

MESSAGE FROM THE CO-CHAIRS

This year, we celebrate the Climate and Clean Air Coalition's (CCAC) fifth anniversary!

Looking back, we should applaud the progress we have achieved. In 2012, six original partners set their sights on addressing near term climate change and reducing harmful air pollutants in support of a low carbon, climate resilient and sustainable future. The work they started, with ever-growing support from other partners, has resulted in initiatives across a range of sectors to reduce short-lived climate pollutants globally.

Looking ahead, the 120 current partners recognize that – despite our progress – there is still much work to be done. Concerted efforts by the CCAC can improve the lives of millions of people, especially women and girls, by enhancing indoor and out-door air quality, increasing food and nutrition security, reducing waste, and supporting international action to confront the impacts of climate change. This involves building on important research by the Scientific Advisory Panel, continued political effort to develop policies and regulations, and securing additional funding to implement initiatives that have a transformative impact on peoples' lives and the environment.

The 2016-2017 Annual Report showcases the excellent work done by the Coalition. But the Annual Report also charts the CCAC's future, and highlights the importance of ongoing collaboration to meet our shared climate change and clean air objectives.

Alice Akinyi Kaudia
Environment Secretary,
Ministry of Environment and
Natural Resources, Kenya

Dany Drouin
Director, International Affairs Branch,
Environment and Climate Change
Canada

THE YEAR IN NUMBERS

- **120** partners and **11** initiatives

MOBILIZE ROBUST SUPPORT

- **61** political outreach events including **27** decision making meetings and **34** communication events
- High level commitments by **13** governments, development agencies and private companies

LEVERAGE FINANCE AT SCALE

- **$6.5 million** of co-funding and **$700K** of catalysed funding

ENHANCE SCIENCE AND KNOWLEDGE

- **19** guidelines and tools, **21** reports, case studies & assessments, **3** scientific publication.

CATALYSE AMBITIOUS ACTION

- **8,115** person-days of training
- **115** government, IGOs, NGOs, academic, research and private institutions strengthened
- Development and adoption of **11** national laws, regulations and/or standards supported by Bricks, Diesel and Waste initiatives
- **19** policy instruments including projects, programmes, actions plans, policies and strategies supported

CHANGES IN TECHNOLOGIES AND PRACTICES

- **Bricks**
  255 more energy efficient kilns, extruders and fans deployed in Brazil, Colombia, Mexico, and Peru. **3** Bangladesh brick entrepreneurs and the Pakistan Brick Kiln Association started implementing modified zig zag technology
- **Diesel**
  Jakarta procured **60** Compressed Natural Gas buses. Today, approximately **1,100** CNG-powered buses are operating in the city
- **Oil & Gas**
  Oil and Gas Methane Partnership company, PTT Public Company Limited, instituted a Directed Inspection and Maintenance Programme to manage fugitive methane emissions in its participating operations
- **Waste**
  Pilot project in Penang Island city for the separation and treatment of food waste
- **Cooling & Refrigerating**
  Chile saw its first supermarket adopt new alternatives to hydrofluorocarbons (HFCs) refrigeration technology

DEMONSTRATED IMPACTS

- The oil and gas sector reduced methane emissions by **14,103 tonnes** in 2015 and **12,668 tonnes** in 2016-2017
- **$53 million** in savings for a Mexican oil and gas facility in 2015-2016
- Net income increased by almost **$13 million** from technology and practice change in the brick sector in 2015-2016

POTENTIAL IMPACTS

- The full implementation of a Global Sulfur Strategy could prevent **1.9 million** tonnes of black carbon emissions and **1.4 million** premature deaths by 2030
- **$514.4 million** in potential savings from specific opportunities for recovering high value liquids in the oil and gas sector

WE HAVE COME A LONG WAY...

Prior to 2012, no global effort existed to simultaneously address the air quality and climate change impacts from short-lived climate pollutants (SLCPs). This changed with the launch of the Climate and Clean Air Coalition (CCAC). The last five years have firmly set short-lived climate pollutants – black carbon, methane, tropospheric ozone, and HFCs – on global, regional, and increasingly national and local agendas. The Coalition's work also benefits global climate, air quality, health, and development goals.

SHIFTING ATTITUDES. The Coalition has successfully raised awareness and knowledge about how short-lived climate pollutants impact our environment, health and a multitude of different sectors. This has led to global action. For example, many countries, cities and private sector entities are pushing for cleaner transportation by adopting cleaner fuels and vehicles or by moving to ban diesel engines altogether. Cities are exchanging ideas and knowledge through platforms like the BreatheLife campaign and Global Urban Air Pollution Observatory (GUAPO), in order to improve policies, increase monitoring, nurture innovation, and improve citizen awareness. Uruguay is introducing farming practices that will increase livestock productivity, while reducing methane emissions, and use lessons from their experience to help transform livestock management of other countries.

POLITICAL LEADERSHIP. Over the past 5 years leadership from Coalition partners has raised the profile of short lived climate pollutants on the global political agenda. This has led to regional air quality agreements, and air pollution resolutions by the World Health Organization and UN Environment Assemblies. Coalition partners were instrumental in achieving the Kigali Amendment to the Montreal Protocol to phase down HFCs and contributed to the Paris Climate Agreement. The Coalition has been especially active within the Global Climate Action agenda and the 'non-CO_2' space. The challenge now is to significantly scale up financing to mitigate short-lived climate pollutants.

ACTION THAT SHOWS. The Coalition has catalysed action by injecting resources into activities that have created enabling environments, connected actors, developed standards, and increased understanding via assessments and empirical evidence of pollution. An increasing number of initiatives have developed feasibility studies and financeable projects. For example, in Kenya, the Coalition's work is leading to a transformation of the waste sector through improved strategies, a new waste management bill, and incentives for private sector participation in waste management. Chile has championed both effective air quality abatement plans in cities, and included short-lived climate pollutants in their climate change policy and plan.

↑ Coalition partners at the UN Secretary General's Climate Summit, New York, September, 2014.

The Coalition is helping companies understand the financial benefits of action and helping drive innovation across sectors. Leading bus manufacturers are reacting to demand and as a result of Coalition efforts committed to supply 20 megacities with soot-free buses. Oil and gas companies are analysing their operations to find where they can prevent methane leaks. Supermarkets, car companies, and cities are experimenting with refrigeration and cooling technologies to replace high global warming potential HFCs.

Key ingredients for success:

▶ HIGH LEVEL POLITICAL LEADERSHIP

The Minister-led High Level Assembly is a forum to bring ideas and progress, set priorities, and launch calls for action.

▶ ROBUST SCIENTIFIC BASE

The Scientific Advisory Panel guides the Coalition's actions and keeps the Coalition up to date on the latest scientific developments and pathways.

▶ CATALYTIC ACTION

A Trust Fund and 11 results-focused and partner led initiatives have created an enabling environment, guidance, case studies - and started major policy shifts on short-lived climate pollutants mitigation measures.

This has been possible thanks to this partner-driven and committed 'Coalition of the working', where partners focus on fast action, quick results and multiple benefits.

FUTURE OUTLOOK

The Coalition's work is based on cost-effective measures and available solutions which provide incremental improvements to reduce black carbon, methane and HFCs. Going forward the Coalition initiatives will discuss options to leap-frog polluting technologies and practices, and move towards more transformative actions.

In line with its 5-Year Strategic Plan 2015-2020, the Coalition will catalyse ambitious action, leverage finance at scale, mobilise robust support and enhance science and knowledge. The aim is to maximize the limited resources to achieve the priority objective: "widespread adoption and implementation of policies, regulations and practices to substantially reduce short-lived climate pollutants in the near-to-medium term."

The Coalition is discussing a 'Pathway Approach' (see page 14) and metrics to promote early mitigation of short-lived climate pollutants to achieve both the Sustainable Development Goals by 2030 and the temperature target of the Paris Agreement, and complement early action to reduce carbon dioxide emissions. To do so means working with high-level champions and targeting leaders in strategic sectors (e.g. agriculture ministers and mayors).

THE COALITION WILL PURSUE A STRATEGY TO FACILITATE FINANCE AND ACTION AT SCALE

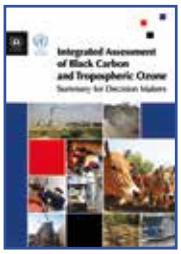
ENABLING CONDITIONS	ENGAGEMENT	PROJECT-LEVEL FOCUS	HEALTHY TRUST FUND	MULTILATERAL BANKS AND GREEN CLIMATE FUND
Support capacity-building, training, and research to improve the policy, regulatory, and financial actions that underpin successful outcomes, including in development planning and nationally determined contributions (NDCs).	Promote mainstreaming of short-lived climate pollutant projects in multilateral and bilateral development portfolios.	Encourage Coalition initiatives to move towards project-level funding outcomes, and support technical and feasibility activities that enable initiatives to access other resources.	Donor funding will remain the life-blood of the Coalition. Recapitalize the CCAC Trust Fund, targeting new donors and increasing levels of existing donors.	Support partner applications to the Global Climate Fund and similar funds, work with development bank partners on concessional financing, and engage the private sector.

CELEBRATING FIVE YEARS OF THE CCAC

14 JUNE 2011

"Integrated Assessment of Black Carbon and Tropospheric Ozone"

A team of scientists coordinated by UN Environment and the World Meteorological Organisation (WMO) publish an assessment pointing to the numerous climate, public health and food security benefits linked with tackling short-lived climate pollutants.



APRIL 2012

Stockholm, Sweden - 1st Ministerial meeting

The Coalition's first seven initiatives are launched on the occasion of the 40th anniversary of the UN Conference of the Human Environment.

DECEMBER 2012

Doha, Qatar - High Level Assembly

Ministers from 25 nations commit to scaling up voluntary action to reduce short-lived climate pollutants. The Coalition's Scientific Advisory Panel is established.

SEPTEMBER 2013

Oslo, Norway - 3rd High Level Assembly

An ambitious agenda is announced with the release of the Oslo Communique. The Coalition begins health-focused work, welcomes the WHO and calls on the World Back to set up a financing facility for SLCPs.

NOVEMBER 2013

Warsaw, Poland – 4th High Level Assembly at COP19

Ministers of the Coalition partner countries celebrate first successes and enhance actions.

SEPTEMBER 2014

New York, USA – UN Secretary-General's Climate Summit

Short-lived climate pollutants are a thematic area of focus. The Coalition launches four major commitments on oil & gas, HFCs, municipal solid waste, and green freight.

2011 2012 2013 2014

16 FEBRUARY 2012

Coalition launched

The Coalition is launched by founding members, Ghana, Bangladesh, Canada, Mexico, Sweden, the USA, and UN Environment.

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JULY 2013

Mexico City, Mexico - 5th Working Group meeting

The Agriculture Initiative is launched and the Coalition secretariat set up at UN Environment in Paris.

JUNE 2014

Nairobi, Kenya – UN Environment Assembly

Delegates adopt the UNEA resolution on Air Quality. The Coalition holds side events on bricks, municipal solid waste and diesel, and provides SLCP media training.

MAY 2015

Geneva, Switzerland – World Health Assembly

The 6th High Level Assembly is held on the margins of the World Health Assembly. The Coalition begins work to transform Nepal's bricks sector after a devastating earthquake.

APRIL 2016

Washington DC, USA – Global Methane Forum and 2nd Science Policy Dialogue

Event co-hosted by the Coalition and the Glboal Methane Initiative.

DECEMBER 2015

Paris, France – COP21

The Coalition runs the Lima-Paris Action Agenda SLCP day. Ministers adopt the Coalition's 5-Year Strategic Plan 2015-2020 during the 7th High Level Assembly.

JULY 2016

Vienna, Austria – Executive High Level Assembly

The special executive session calls for immediate action on an amendment to phase down HFCs under the Montreal Protocol.

OCTOBER, 2016

Quito, Ecuador – HABITAT III Conference

The BreatheLife campaign is launched with Chile, Norway, WHO and UN Environment.

NOVEMBER 2016

Marrakech, Morocco – 8th High Level Assembly at COP22

The Global Low-Sulfur Diesel and Cleaner Vehicle Strategy is endorsed and voluntary national black carbon inventories are launched. Several side events focus on SLCPs and mitigation.

OCTOBER, 2016

Kigali, Rwanda – Kigali Amendment

The Kigali Amendment to phase down HFCs under the Montreal Protocol passes.

MARCH 2017

Ottawa, Canada - Near Term Metrics for Accounting and Reporting in Black Carbon and Methane Interventions

The Coalition's Scientific Advisory Panel meets with experts to develop recommendations on metrics for evaluating the impacts and benefits of methane and black carbon interventions.

APRIL 2017

Santiago, Chile – 20th Working Group meeting and 3rd Science Policy Dialogue

The Pathway Approach is presented.

2015 2016 2017

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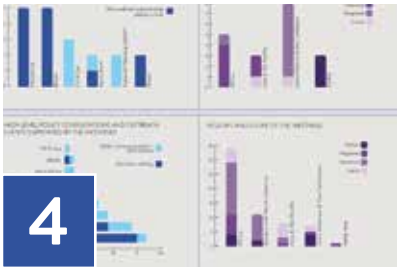


4 60 RESULTS

5 65 THE COALITION

1

A flooded village in Nadi, Fiji. Small island states are most vulnerable to the near-term impacts of climate change.

CASE FOR ACTION

BENEFITS OF FAST ACTION TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

FULL IMPLEMENTATION OF SLCP MEASURES BY 2030 COULD BRING MULTIPLE BENEFITS FOR CLIMATE, HEALTH, FOOD SECURITY AND ECOSYSTEMS ALSO SUPPORTING ACHIEVEMENT OF THE SUSTAINABLE DEVELOPMENT GOALS

0.6°C OF WARMING AVOIDED BY 2050

MELTING RATE REDUCED IN THE HIMALAYAS AND ARCTIC

SEA-LEVEL RISE SLOWED BY 20% BY 2050

IRREVERSIBLE CLIMATE TIPPING POINTS AVOIDED

2.4 million

ANNUAL PREMATURE DEATHS AVOIDED BY 2030

52 million tonnes

OF ANNUAL STAPLE CROP LOSSES AVOIDED AFTER 2030

Increased resilience

FOR THE MOST VULNERABLE

Improved energy efficiency

GREATER ACCESSIBILITY TO CLEAN ENERGY AND TRANSPORT

CHALLENGES AND OPPORTUNITIES

Short-lived climate pollutants, mainly black carbon (soot), methane, tropospheric ozone and high global warming potential hydrofluorocarbons (high-GWP HFCs), are responsible for a significant fraction of near term climate change. Many of these are also dangerous air pollutants detrimental to health, agriculture and the environment.

A 2011 assessment by the United Nations Environment Programme and the World Meteorological Organization (known as the UNEP/WMO assessment)[1] provided the scientific case for SLCP reductions that could complement drastic and immediate cuts in CO_2 emissions. The assessment identified measures that could achieve "win-win" results for the climate, air quality, public health, agricultural productivity, and human and ecosystems wellbeing over a relatively short timeframe.

It was followed by two UN Environment reports on the climate and clean air benefits from actions controlling short-lived climate pollutants[2] and how a HFC phase-down can protect the climate and ozone layer[3].

In 2012 this new evidence inspired six countries and UN Environment to found the Climate and Clean Air Coalition (CCAC) to reduce short-lived climate pollutants, bringing together countries, intergovernmental organisations, civil society, and other relevant actors. By increasing political will the Coalition aimed to catalyse large scale implementation of the SLCP reduction measures in ways that support the longer-term transition toward low carbon and sustainable production and consumption systems.

In the 5 years since the Coalition's launch the scientific case for action has grown.

In 2014, the World Health Organization (WHO) declared air pollution the "world's single biggest environmental health risk" with nine out of ten people breathing air polluted beyond acceptable levels.[4] Every year approximately 6,5 million people die prematurely from air pollution. The economic cost is also high. The World Bank estimated the global cost of air pollution in 2013 at $5.11 trillion, while an OECD report projected that by 2060 the cost of air pollution impacts could be as high as $3.5 trillion in OECD countries and $22 trillion in non-OECD countries.[5]

Scientists continue to confirm the important role SLCPs play in global warming, weather disruption, localized extreme weather events, and increased melting of glaciers and ice sheets.[6] But new research also shows impacts may have been underestimated. A recent study found methane's global warming potential (GWP) may be higher than previously thought,[7] while another found black carbon from biomass burning and sources containing nitrates and sulphates, also has a stronger warming potential.[8] There is a better understanding of long-term impacts with one report finding that SLCPs can cause sea level rise hundreds of years after they've left the atmosphere.[9]

The 2011 UNEP/WMO assessment identified 16 black carbon and methane measures that if fully implemented by 2030 could avoid 0.5°C of warming by 2050. Phasing down HFCs could avoid another 0.1°C by 2050, and up to 0.5°C by 2100.[10]

Work supported by the Coalition has since identified additional measures. These include: the elimination of kerosene lighting, preventing flaring and increasing capture and recovery of methane emissions in oil and gas production, reducing leakage in gas distribution systems, improving solid and liquid waste management, and improving livestock feed and management. Human dietary change may also significantly reduce methane and other greenhouse gases.[11]

The Coalition's Scientific Advisory Panel has proposed metrics to better quantify the multiple benefits. Although more research is needed to clarify some pending questions, this new scientific evidence has been promoted by the Coalition and supported by its partners and initiatives over the past five years, leading to more policy action.

Cooking and heat stoves on sale in Ulaanbaatar, Mongolia. The CCAC is working with Xac-Bank in Mongolia to finance clean household energy options.

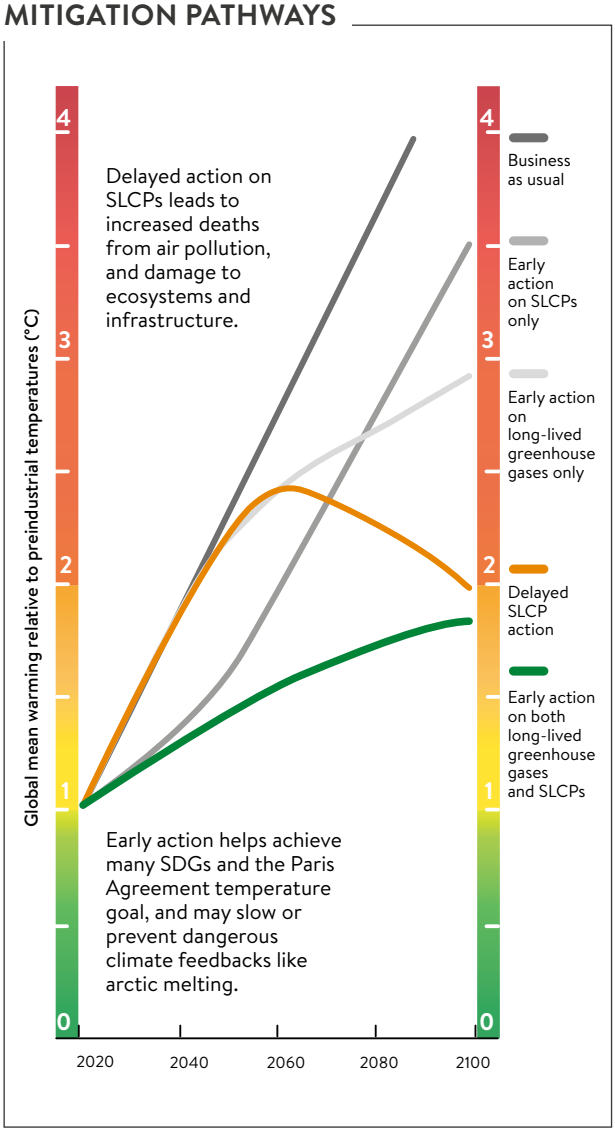
PATHWAY APPROACH AND SCIENCE UPDATE

Increased and rapid action to reduce SLCPs is still needed to deliver the bulk of near-term benefits for climate, air quality, public health, agricultural productivity, and human and ecosystems wellbeing. A recent study shows that immediate and simultaneous mitigation of SLCPs and CO_2 is essential for achieving the long-term climate target of the Paris Agreement and to avoid 'existential threats' to the planet.[12]

The text of the Paris Agreement commits the world to an ambitious long-term temperature target, and places this ambition within the context of "sustainable development and efforts to eradicate poverty." Through the lens of sustainable development, the path the world chooses to reach the long-term climate target is as important as achieving the target itself, particularly for those that are already suffering from the impacts of climate change.[13]

In this context, the Coalition's Scientific Advisory Panel (SAP) has proposed that "reducing short-lived climate pollutants enough to slow projected global warming by 0.5°C over the next 25 years be adopted as a near-term goal, with many potential benefits toward achieving Sustainable Development Goals (SDGs)". This could be achieved by reducing black carbon emissions by approximately 75%, anthropogenic methane emissions by 25%, and eliminating HFCs by 2030 (see graphic). Such a near-term goal, the SAP argues, provides a way to incorporate multiple benefits within climate action, and is a basis for establishing appropriate national ambition and actions.

MITIGATION PATHWAYS



Source: Shindell, 2017.

SCIENTIFIC ADVISORY PANEL UPDATE

Coalition activities are guided by a Scientific Advisory Panel (SAP) of eminent scientists and through its Regional Assessment Initiative. The SAP has prepared annual science updates since 2013 and convened three Science-Policy Dialogues to share the latest scientific developments and formulate policy questions for further investigation.

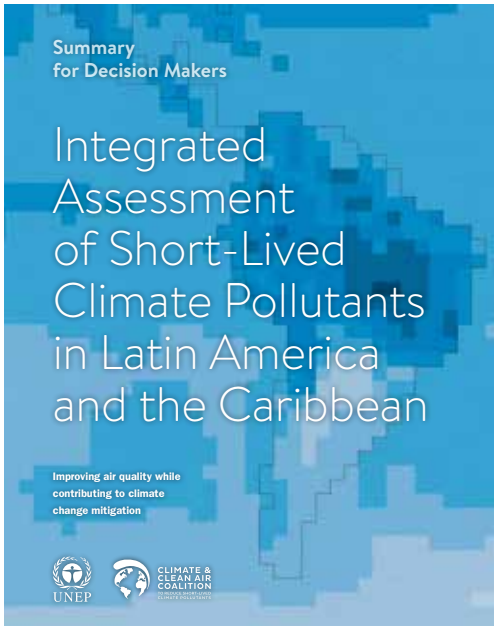
- In March 2017, 80 experts attended a workshop, organized by SAP and Canada, on Metrics for Evaluating and Reporting on Black Carbon and Methane Inventories. The result was an analysis of appropriate metrics to measure the multiple impacts and benefits of SLCP mitigation, and recommendations for future improvements and refinements.

- In April 2017, over 100 policy-makers, experts, and scientists attended the Third Annual Science Policy Dialogue in Santiago, Chile. Participants agreed to test near-term metrics for black carbon inventories and methodologies in a few countries and sectors.

REGIONAL ASSESSMENTS

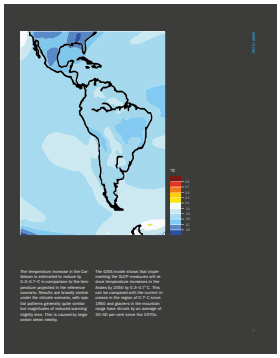
REGIONAL ASSESSMENTS OF SHORT LIVED CLIMATE POLLUTANTS

LATIN AMERICA AND THE CARIBBEAN



Through this assessment, policy makers and implementers will be able to better quantify and understand the relevant emissions in the region; identify which measures are most important for delivering near-term climate and air pollution benefits; and estimate the reductions in regional air pollutants that could be achieved by implementing these measures, with associated health and crop-yield benefits for the LAC region.

The reduction in regional temperature across LAC from the implementation of the SLCP measures relative to the reference scenario, according to long-term runs using the GISS model.



The Regional Assessment Initiative builds upon the global SLCP assessments by generating regionally relevant data and mitigation opportunities.

- The full Latin America and Caribbean (LAC) Assessment, and a technical report reviewing examples of successful SLCP measures from LAC countries was released in 2017. The report shows that implementing SLCP measures could reduce warming in the LAC region by up to 0.9°C by 2050, reduce premature deaths from $PM_{2.5}$ by at least 26% annually, and avoid the loss of up to 4 million tonnes of crops each year.

- Asia-Pacific Air Pollution Solutions Report is advancing and will be finalised in 2018. It is being produced with UN Environment and the Japan sponsored Asia-Pacific Clean Air Partnership.

↓ Students use a Ratnoze 2 sampling kit to measure black carbon emissions from a kiln for the CCAC's bricks initiative in Colombia.

PARTNER NEWS

ON 11 MAY 2017, ARCTIC COUNCIL STATES ADOPTED A COMMON GOAL TO REDUCE BLACK CARBON EMISSIONS BY AT LEAST 25–33% BY 2025.

2

A thin layer of smog obscures the Andes in Santiago, Chile. The Chilean government is putting in place a number of Coalition measures to improve air quality.

POLLUTANT TRENDS

ANTHROPOGENIC SOURCES OF SHORT-LIVED CLIMATE POLLUTANTS

BLACK CARBON

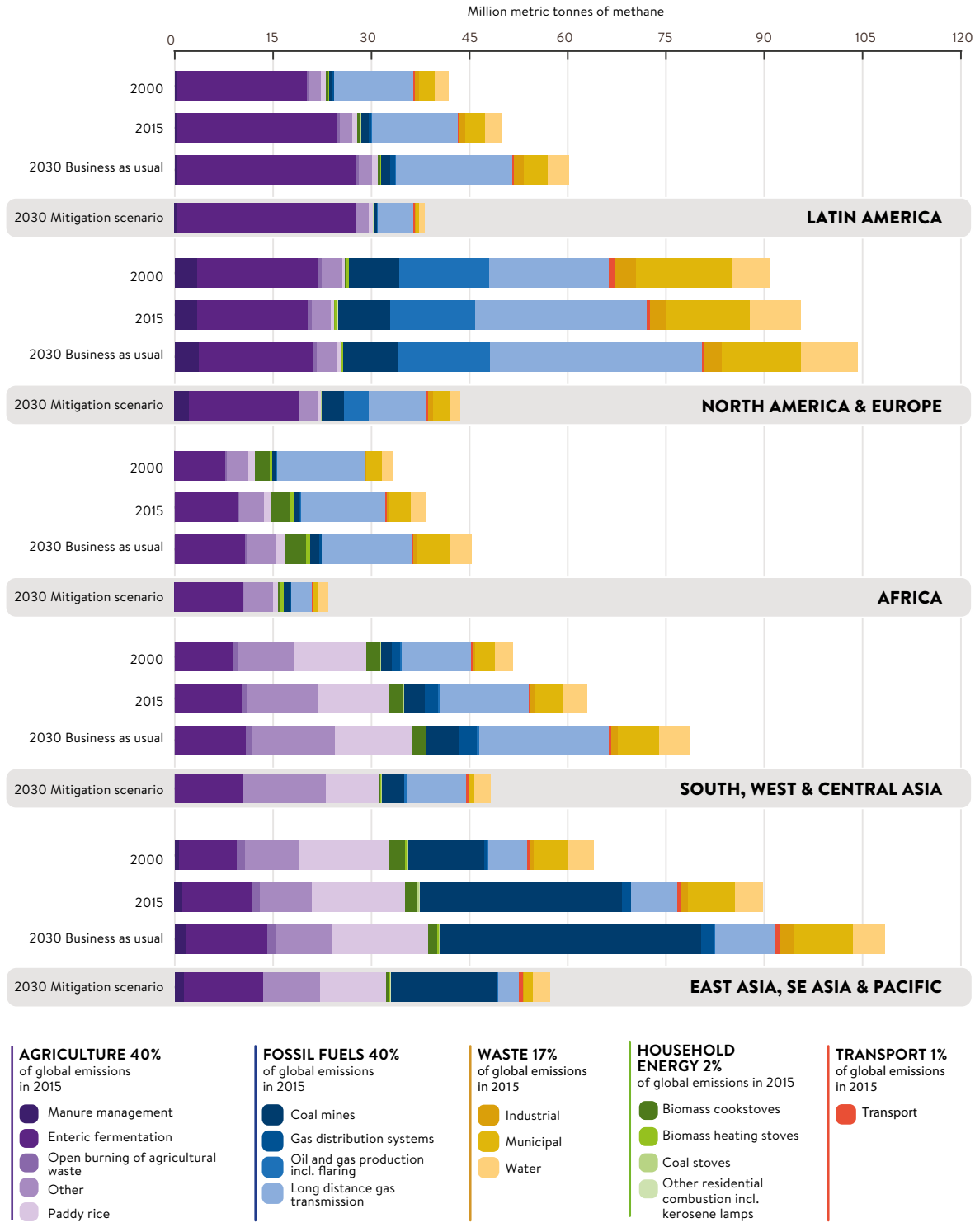
METHANE

HYDROFLUOROCARBONS

METHANE

METHANE EMISSIONS TRENDS

Historical methane emissions and projections to 2030 for Business-as-usual and full implementation of key SLCP measures



Note:

Agriculture anaerobic digestion emissions unknown for Africa and South, West & Central Asia

Source: IIASA GAINS, 2017

Methane emissions, and consequently its atmospheric concentration, continue to increase (see graphic). According to the World Meteorological Organization the concentration of atmospheric methane in 2015 was 256% higher than pre-industrial times.[14] Methane's global warming potential (GWP) may be 25% higher than previously estimated[15] and its social cost could be $3600 per ton.[16]

A review of recent studies show different conclusions on where increased methane emissions are coming from. While some studies suggest the increases are from biogenic sources, including agriculture, others indicate fossil fuel activities. These differences highlight the need for an assessment of methods used to estimate anthropogenic methane emissions.[17]

Since its inception, the CCAC raised awareness and political will for the large scale implementation of methane mitigation measures in the agriculture, oil and gas, and waste sectors (see initiatives section). These three main emitting sectors, represent respectively about 40%, 25% and 20% of 2015 global anthropogenic emissions (see graphic).

In agriculture, rapid and large scale implementation of improved livestock feeding strategies can reduce over 20% of global methane emissions by 2030, while full implementation of intermittent aeration of continually flooded rice paddies (known as alternate wetting and drying cultivation) could reduce emissions from rice paddies by over 30%.

Emissions from coal mining and the oil and gas sector could be reduced by over 65% by preventing gas leakage during transmission and distribution, recovering and using gas at the production stage, and by pre-mine degasification and recovery of methane during coal mining (see graphic).

→ Improved livestock feeding strategies can reduce over 20% of global methane emissions by 2030.

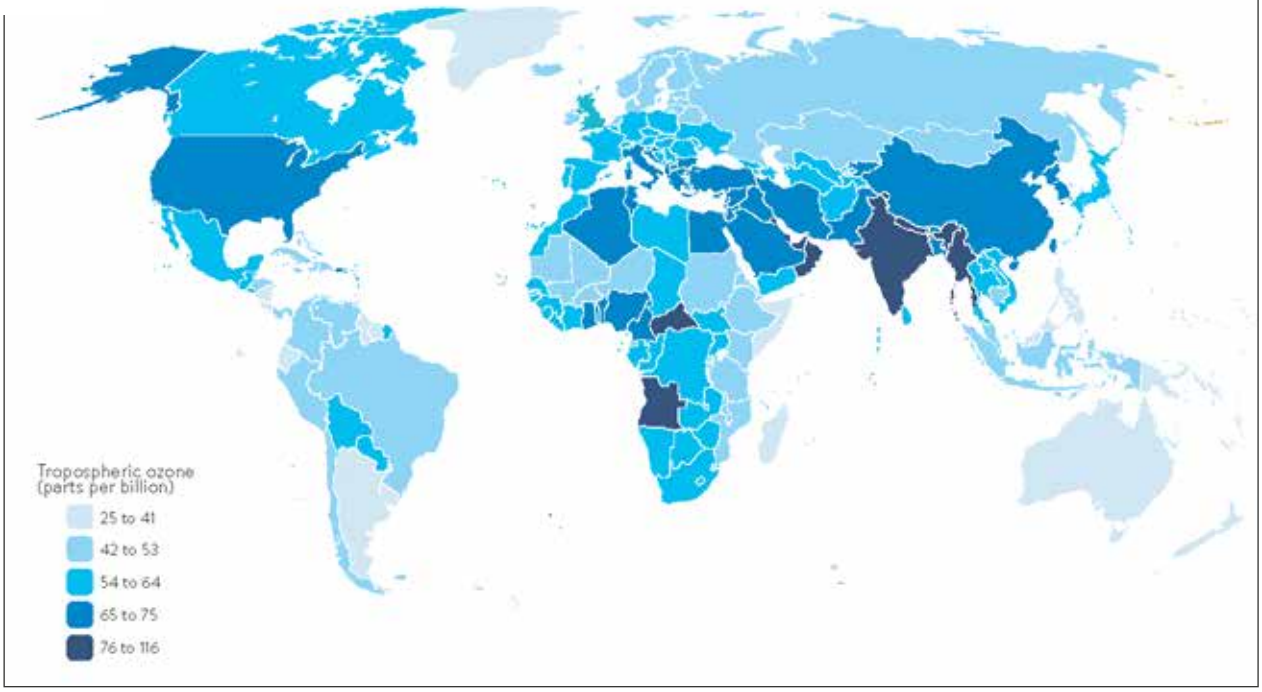
↓ Oil and gas production is responsible for 30% of man-made methane emissions.

PARTNER NEWS

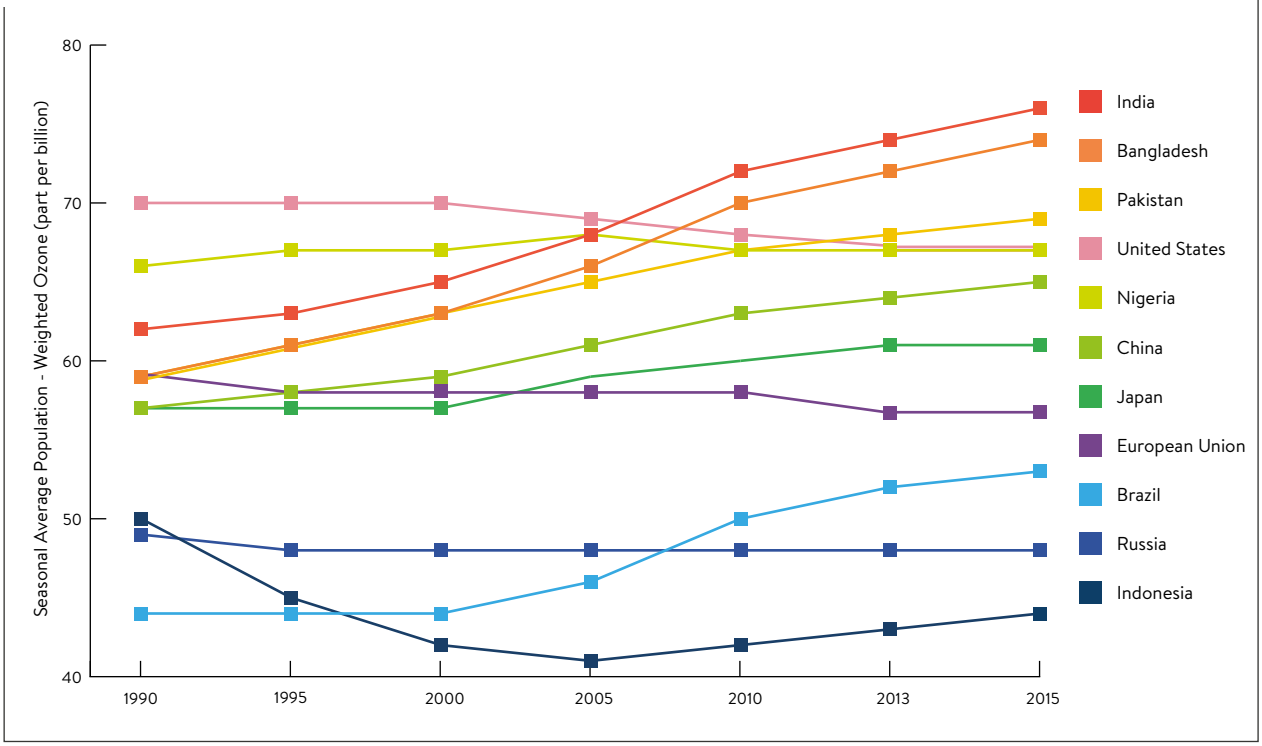
SWEDEN ADOPTED ITS NEW CLIMATE ACT ON 15 JUNE, 2017. IT INCLUDES A GOAL OF NET ZERO EMISSIONS OF GREENHOUSE GASES (GHGS), INCLUDING METHANE AND HFCS, BY 2045 AT LATEST. THE GOVERNMENT ALSO INTRODUCED AND STRENGTHENED A NUMBER OF MEASURES TO REDUCE GHG EMISSIONS, INCLUDING THE REINFORCEMENT OF ITS CLIMATE LEAP PROGRAMME, WHICH SUPPORTS INVESTMENT IN REGIONAL AND LOCAL INITIATIVES TO REDUCE GHG EMISSIONS (INCLUDING METHANE). EXAMPLES INCLUDE: SUPPORTING ELECTRIFICATION OF TRANSPORTATION AND BIOGAS PRODUCTION. THIS WILL ENABLE OVER $900 MILLION IN CLIMATE INVESTMENTS FROM 2015–2020. CO-BENEFITS, INCLUDING ON AIR POLLUTION, ARE INCLUDED AS SELECTION CRITERIA.

TROPOSPHERIC OZONE

SEASONAL AVERAGE POPULATION-WEIGHTED OZONE CONCENTRATIONS in 2015



TRENDS IN SEASONAL AVERAGE POPULATION-WEIGHTED OZONE CONCENTRATIONS in the most populous countries/regions



Source: Health Effects Institute. 2017.

Tropospheric (or ground level) ozone is not directly emitted in the atmosphere but is formed by sunlight-driven oxidation of "precursor gases", including methane, nitrogen oxide (NO_x), carbon monoxide, and non-methane volatile organic compounds, some of which are co-emitted with black carbon. In the troposphere, ozone is a climate warming agent with detrimental impacts for health and ecosystems. From 1990 to 2015, population-weighted ozone concentrations increased, due partly to increased emissions of precursors, warmer temperatures and growing populations, especially at mid-latitudes in rapidly developing economies.[18] A slight decrease has been observed in some countries, particularly in North America and Europe due to the implementation of air quality management strategies.

Several studies link ozone exposure with incidence of diseases and mortality. Increased concentrations has led to an increase in ozone-attributable deaths and a new study assessed that projected ozone concentration and exposure, partly due to methane emissions, could lead to increased global mortality burden ranging from 121,000 to 728,000 deaths per year in 2000 to between 1.09 million and 2.36 million deaths per year in 2100.[19]

Increasing numbers of publications also highlight ozone's damaging impact on crops and biodiversity.[20]

The CCAC – through initiatives focused on methane, black carbon and air pollution – is working to increase awareness of tropospheric ozone impacts, and support sthe rapid implementation of policies and measures to reduce emissions of some of its main precursors.

← Cities, like Paris, are adopting strong air quality regulations to reduce air pollution and smoggy days associated with ground-level ozone.

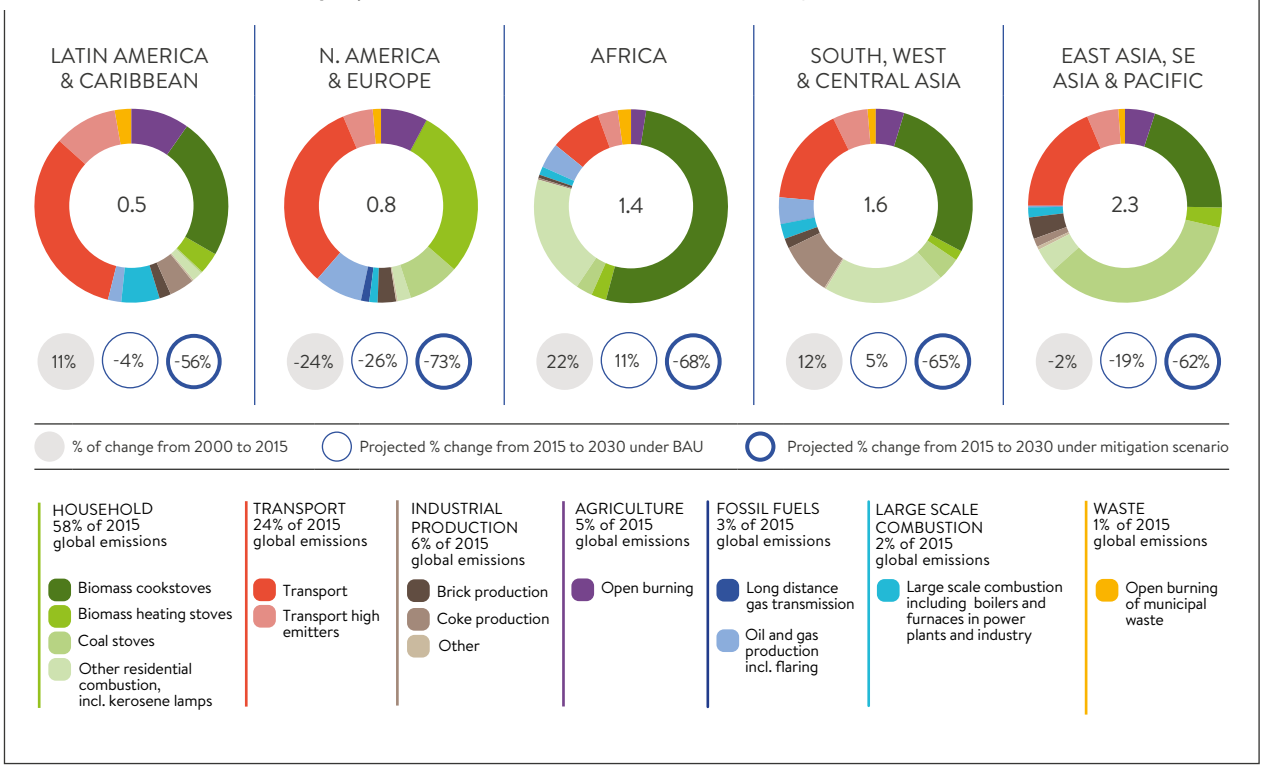
PARTNER NEWS

THE INSTITUTE FOR ADVANCED SUSTAINABILITY STUDIES (IASS) PUBLISHED TWO REPORTS IN 2016 ADDRESSING THE ISSUES OF CLIMATE CHANGE AND AIR POLLUTION, ENTITLED: "SUSTAINABLE POLICY—KEY CONSIDERATIONS FOR AIR QUALITY AND CLIMATE CHANGE"[21] AND "CLEAN AIR FOR ALL BY 2030?"[22]. THESE REPORTS AIM TO IMPROVE UNDERSTANDING OF LINKAGES BETWEEN AIR POLLUTION AND CLIMATE CHANGE AND HOW THE SUSTAINABLE DEVELOPMENT GOALS (SDGS) CAN IMPROVE SYNERGIES AND POLICY DECISIONS BETWEEN THESE DIFFERENT AREAS.

BLACK CARBON

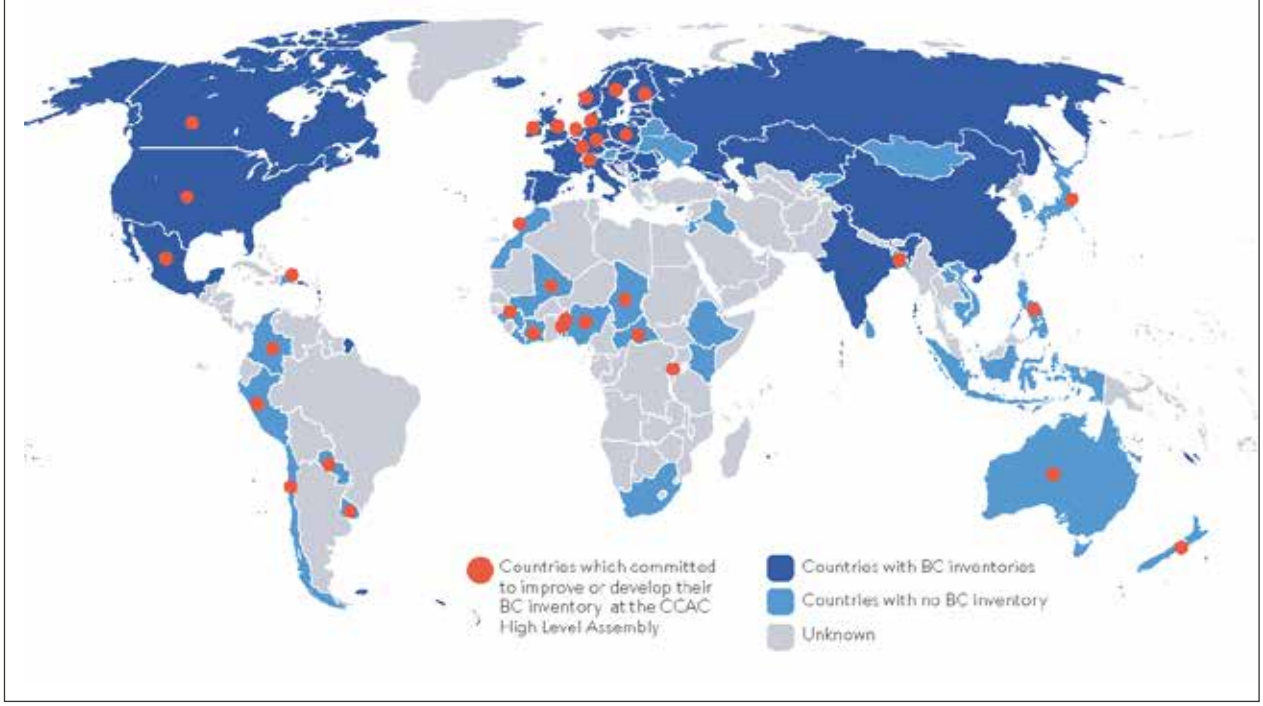
BLACK CARBON EMISSION TRENDS

2015 Black carbon emissions from main anthropogenic sources (in million tonnes) by region, historical trends and 2030 projections under BAU and full SLCP mitigation scenario



Source: IIASA GAINS, 2017

BLACK CARBON INVENTORIES



Source: Arctic council, UNECE, CCAC partners

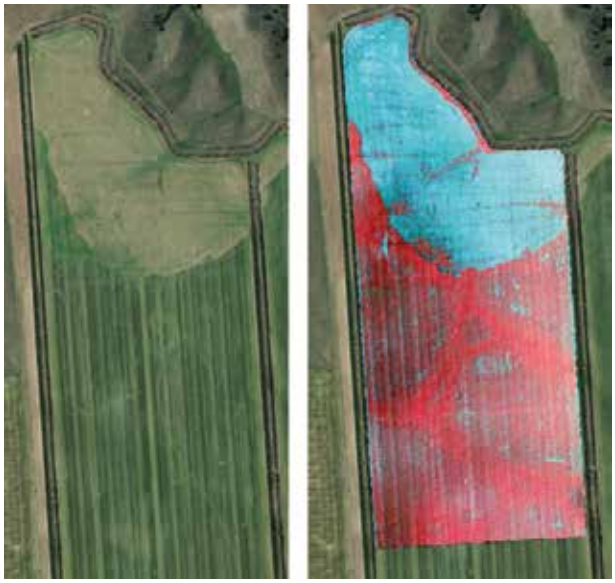
About 43% of the world cooks, heats and lights their homes with polluting fuels, like wood, crop residue, dung, coal, and kerosene.[23] Burning these fuels make households the largest source of black carbon in the world, responsible for up to 58% of emissions, followed by the transport sector, which emits up to 24% (see graphic). Black carbon is a major climate warming agent and, together with other dangerous pollutants, a key component of fine particulate matter ($PM_{2.5}$), the leading global environmental health risk factor.

East and South-East Asia and the Pacific account for 35% of global emissions followed by South-West and Central Asia, Africa, North America and Europe and Latin America and the Caribbean. Black carbon emissions have continued to increase (about 3%) over the past 15 years but are projected to start decreasing (-7%) globally over the next 15 years due to reductions in North America, Europe, and East and South East Asia. However emissions are projected to keep increasing in Africa and in South West and Central Asia (see graphic).

In order to deliver the bulk of environmental and health benefits, black carbon measures need to be fully and quickly implemented. This includes, switching to cleaner cooking and heating fuels and stoves, eliminating kerosene lamps, and a rapid transition to Euro 6/VI vehicle standards.

The CCAC is the only global initiative directly targeting black carbon and since 2012 has increased political will to address this dangerous climate and air pollutant. In November 2016, CCAC ministers committed to start developing, or improving, their black carbon inventories and to share information on mitigation actions. Black carbon reduction measures focused on the household energy, heavy duty diesel vehicles, brick production, urban health, municipal solid waste, agriculture, the oil and gas sectors, and national planning have paved the way for the adoption of new policies and large scale mitigation actions.

↓ An old diesel truck spews exhaust rich in black carbon and other dangerous pollutants.



PARTNER NEWS

THE EUROPEAN UNION'S NEW NATIONAL EMISSION CEILINGS DIRECTIVE 2016/2284/EU REQUIRES A 49% REDUCTION IN $PM_{2.5}$ EMISSIONS BY 2030 FROM 2005 LEVELS, AND THE PRIORITISATION OF BLACK CARBON IN THESE REDUCTION EFFORTS.

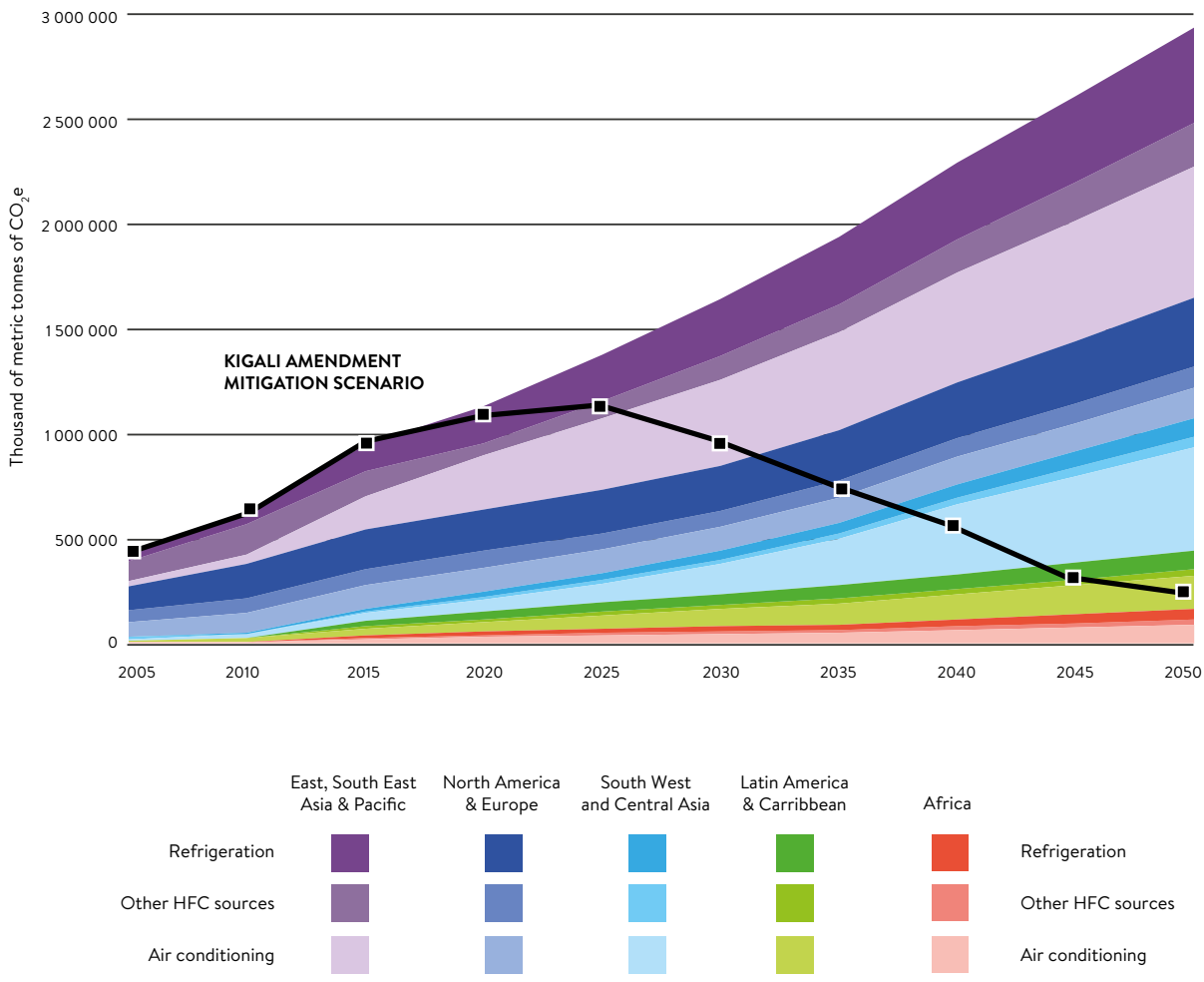
THE JUNE 2016 ISSUE OF THE WORLD METEOROLOGICAL ORGANISATION AEROSOL BULLETIN[24] ON INTEGRATED OBSERVATIONS OF ATMOSPHERIC AEROSOLS FOCUSED ON: THE ROLE OF BLACK CARBON IN ATMOSPHERIC AND CLIMATE RESEARCH, NOTING THAT BLACK CARBON HAS GAINED INCREASING ATTENTION DUE TO ITS WARMING EFFECT ON CLIMATE AND REFERENCING SOME CCAC INITIATIVES.

↑ Satellite imagery shows black carbon emissions from open agricultural burning as part of a CCAC initiative to measure the impact of these fires.

HYDROFLUOROCARBONS (HFCs)

HFC EMISSIONS TRENDS

Evolution of HFC emissions from main sources and Kigali amendment mitigation scenario



Source: IIASA GAINS, 2017

Between 2005 and 2015 HFC emissions increased by over 110%. The highest emitting regions were North America, Europe, East and South East Asia and the Pacific. Based on business as usual trends, emissions would continue to rapidly increase through 2050. China and India would dominate this growth, with stationary air conditioning and refrigeration the main emitting sectors followed by mobile air conditioning (see graphic).

In 2013, CCAC ministers meeting in Oslo committed to "work toward a phasedown in the production and consumption of HFCs under the Montreal Protocol". HFC mitigation commitments were taken at the UN Climate Summit in 2014 and as part of the Lima-Paris Action Agenda at COP21 in Paris in 2015. The Vienna Communique adopted at the High Level Assembly in Vienna in July 2016, called for an ambitious amendment to phase down HFCs under the Montreal Protocol.

On October 15, 2016, one of the most significant actions to protect the climate was achieved. In Kigali, Rwanda, countries agreed to amend the Montreal Protocol to Protect the Ozone Layer to phase down HFCs. Under the Kigali Amendment, countries will reduce HFC production and consumption gradually by 80% -85% by the late 2040s. This could help avoid up to 0.5 degree Celsius of global warming by 2100, while continuing to protect the ozone layer. A recent study emphasized the importance of taking early action to reduce HFC emissions, finding that more than 90% of climate change impacts and stratospheric ozone from HFCs can be avoided if emissions are stopped by 2030.[25] Once 20 countries ratify the amendment, it will enter into force on January 1, 2019.

↓ Phasing out HFCs from refrigeration and cooling will also have energy efficiency benefits.

↑ Ministers at the Coalition's High Level Assembly in Vienna, July 2016, call for an ambitious amendment to be adopted in Kigali to phase-down HFCs under the Montreal Protocol.

PARTNER NEWS

AUSTRALIA – IN JUNE 2017, AUSTRALIA ADOPTED THE OZONE PROTECTION AND SYNTHETIC GREENHOUSE GAS MANAGEMENT LEGISLATION AMENDMENT BILL WHICH, ONCE ENACTED INTO LAW, WILL IMPLEMENT AUSTRALIA'S COMMITMENT TO PHASE-DOWN IMPORTS, EXPORTS AND PRODUCTION OF HFCS FROM JANUARY 1, 2018.

3

A technician measures black carbon emissions from a brick kiln in Antioquia, Medellín, Colombia as part of a CCAC supported collaborative effort between Mountain Air Engineering, Corporación Ambiental Empresarial (CAEM), Climate and Health Research Network (CHERN), and the University of Illinois.

GLOBAL ACTIONS

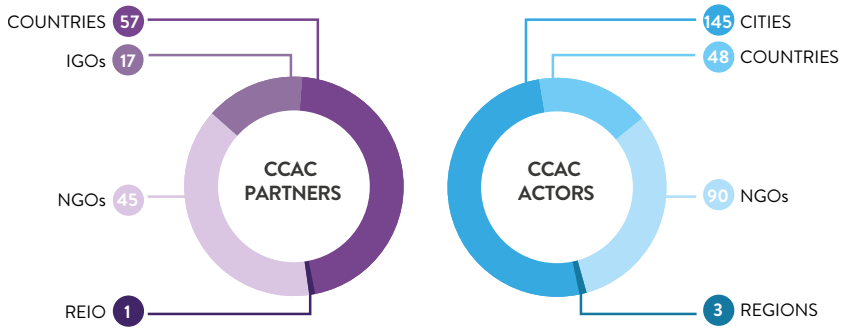
SHORT-LIVED CLIMATE POLLUTANT MITIGATION MEASURES

IF FULLY IMPLEMENTED BY 2030, THESE MEASURES COULD BRING MULTIPLE BENEFITS FOR CLIMATE, HEALTH, FOOD SECURITY AND ECOSYSTEMS IN WAYS THAT SUPPORTS ACHIEVEMENT OF THE SDGS

	**AGRICULTURE**	▶ Enforced ban of open burning of agricultural waste — BLACK CARBON ▶ Farm scale anaerobic digestion — METHANE ▶ Improved feeding strategies — METHANE ▶ Intermittent aeration of continually flooded rice paddies — METHANE
	**FOSSIL FUELS**	▶ Capture and recovery or improved flaring in oil and gas production — BLACK CARBON ▶ Coal mines recovery — METHANE ▶ Reduced gas leakage from gas distribution system — METHANE ▶ Extended recovery and utilization from gas and oil production — METHANE ▶ Reduced gas leakage from long-distance transmission — METHANE
	**HOUSEHOLD ENERGY**	▶ Clean burning biomass cooking stoves — BLACK CARBON ▶ Elimination of kerosene lamps — BLACK CARBON ▶ Pellet stoves and boilers (in OECD countries) or improved heating stoves (in other countries) — BLACK CARBON ▶ Replacing coal by coal briquetes and improved stoves — BLACK CARBON
	**INDUSTRIAL PRODUCTION**	▶ Modernized brick kilns — BLACK CARBON ▶ Modernized coke ovens — BLACK CARBON
	**LARGE SCALE COMBUSTION BOILERS AND FURNACES IN POWER AND INDUSTRY**	▶ High efficiency PM controls — BLACK CARBON
	**TRANSPORT**	▶ Fast transition to Euro VI/6 vehicles, incl. DPF — BLACK CARBON ▶ Elimination of high emitters — BLACK CARBON
	**WASTE**	▶ Food industry solid and liquid waste - anaerobic digestion — METHANE ▶ Separation of treatment of biodegradable municipal waste — METHANE ▶ Upgrading primary waste water treatment — METHANE
	**REFRIGERATION, AIR CONDITIONING, OTHER HFC SOURCES**	▶ Alternatives to high GWP HFCs — HFC

Source: IIASA, 2017

CCAC AROUND THE WORLD



INITIATIVE LEAD PARTNERS

COUNTRY
- Bangladesh
- Canada
- Colombia
- Finland
- Ghana
- Japan
- Mexico
- Morocco, Kingdom of
- New Zealand
- Nigeria
- Norway
- Poland
- Switzerland
- United states
- Uruguay

IGO
- Food and Agriculture Organization of the United Nations (FAO)
- International Centre for Integrated Mountain Development (ICIMOD)
- UN Environment Programme
- UN-Habitat
- World Bank
- World Health Organization (WHO)

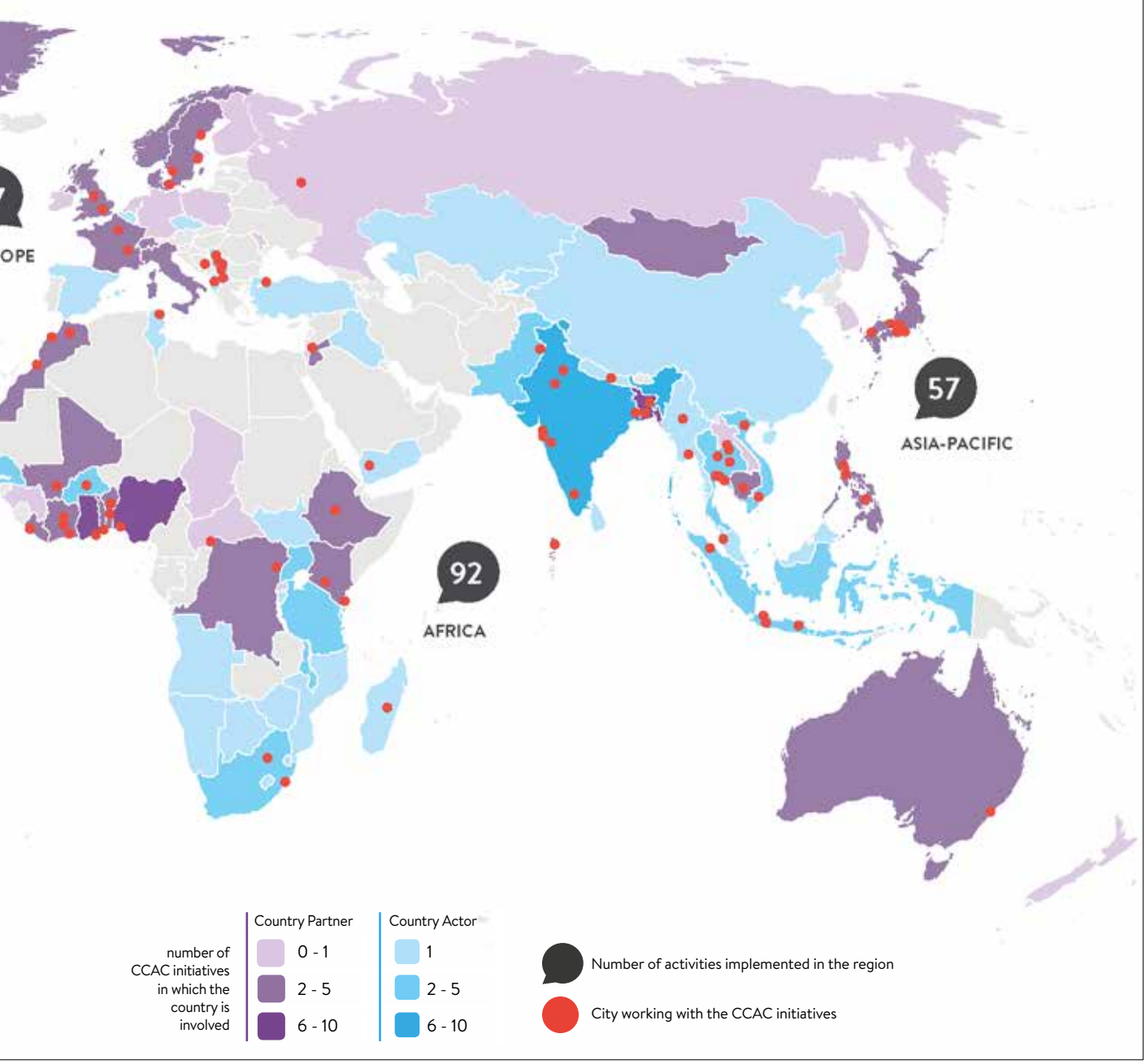
NGO
- C40 Cities Climate Leadership Group (C40)
- Center for Human Rights and Environment (CEDHA)
- Clean Air Asia
- Global Alliance for Clean Cookstoves
- Institute for Advanced Sustainability Studies (IASS)
- Institute for Governance and Sustainable Development (IGSD)
- International Council on Clean Transportation (ICCT)
- International Cryosphere Climate Initiative (ICCI)
- International Solid Waste Association (ISWA)
- International Union of Air Pollution, Prevention and Environmental Protection Associations (IUAPPA)
- Local Governments for Sustainability (ICLEI)
- Molina Center for Strategic Studies in Energy and the Environment
- Stockholm Environment Institute (SEI)

REIO
- European Commission

Since 2012, the Coalition launched 7 sectoral and 4 cross cutting initiatives to reduce SLCPs. These initiatives are implemented based on priorities identified by partners and new scientific developments. The 11 initiatives focus on the agriculture, bricks, diesel, HFCs, household energy, municipal solid waste, oil and gas, and urban health sectors, and on national planning, regional assessments and financing for SLCPs. Led by partners, they are the heart of the Coalition's work and bring together a wide range of committed actors from across the world.

These initiatives have received close to $50 million from the Coalition to raise awareness, strengthen stakeholder capacity, produce assessment tools, increase knowledge, stimulate political will, mobilise support, advance policy processes and catalyse large scale SLCP mitigation actions to reduce emissions in their respective sectors.

The following section, summarises each initiative's key achievements since launch and the latest reported progress. It also highlights relevant trends from each sector.



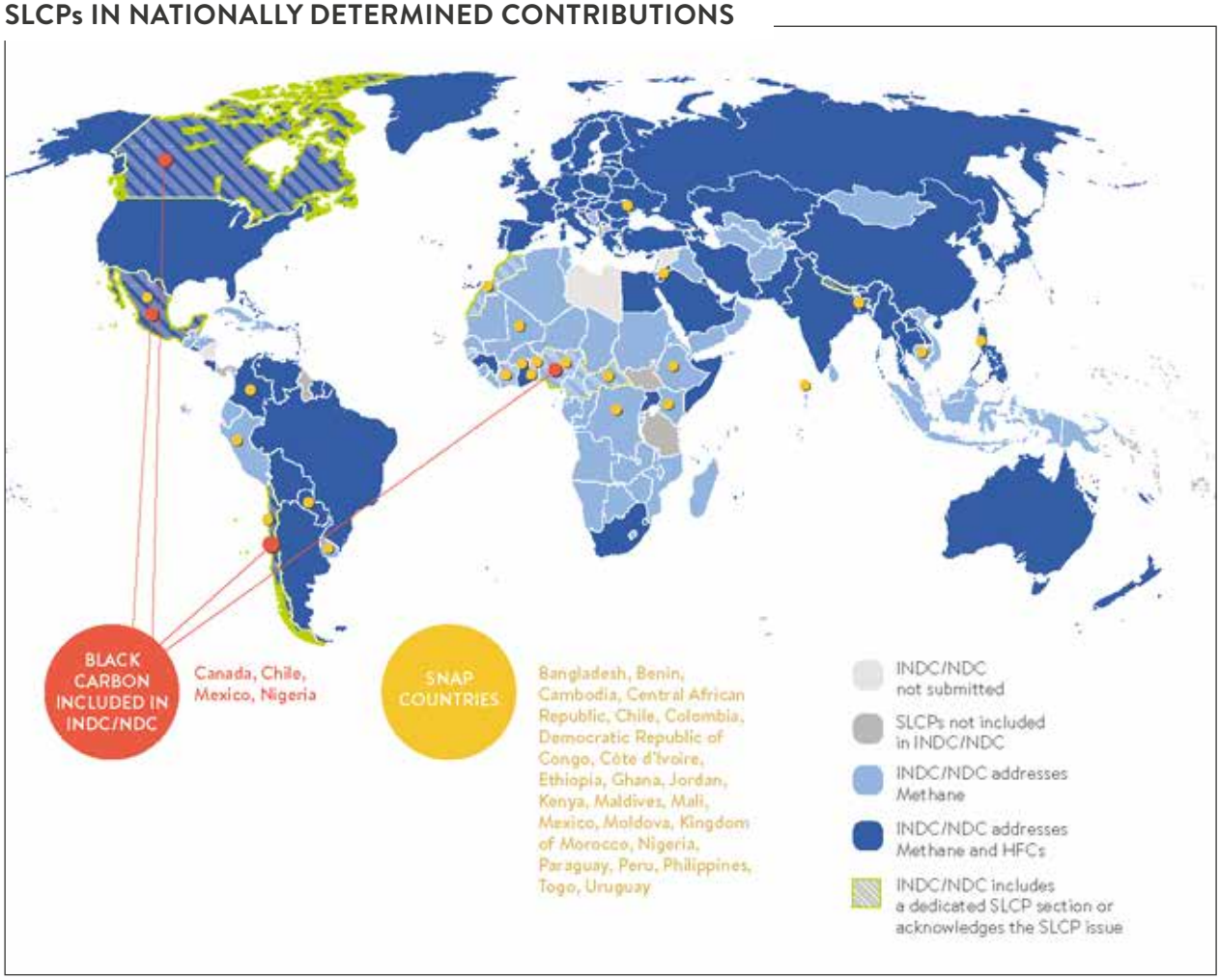
NATIONAL PLANNING FOR SLCPs

SUPPORTING NATIONAL ACTION AND PLANNING ON SHORT LIVED CLIMATE POLLUTANTS (SNAP)

By July 2017, 178 countries had included methane in their Intended or Nationally Determined Contributions (INDC/NDC), and 100 included HFCs. Methane and HFCs are both part of the basket of greenhouse gases controlled by the Kyoto Protocol under the UNFCCC. Black carbon is not, but the 4th and 5th IPCC Assessment Reports discussed its contribution to climate change and Canada, Chile, Mexico, Nigeria included it in their INDC/NDC.

Building on their work with the Supporting National Action and Planning on SLCPs (SNAP) initiative, Chile, Mexico and Nigeria have included black carbon in a separate section dedicated to short-lived climate pollutants. In addition, the Central African Republic, Cote d'Ivoire, and Morocco – all SNAP initiative countries – and Nepal, Canada, Mauritius and Cameroon explicitly refer to SLCPs in their INDC/NDC. 15 other countries included co-benefits for air quality and health for their pledges, while Benin and India underlined the importance of addressing air pollution generally. A number of countries will use the results of their national SLCP planning process to update their NDC and strengthen inclusion of SLCPs.

SLCPs IN NATIONALLY DETERMINED CONTRIBUTIONS



Source: The analysis and contents of this map were derived from the 193 INDCs or NDCs that have been submitted to and published by the UNFCCC Secretariat as of 1st July 2017.

5-YEAR MILESTONES

The SNAP initiative helps partner countries identify and implement the most cost-effective pathways to large-scale implementation of SLCP measures.

23 countries receive support from the SNAP Initiative.

13 countries have dedicated staff to coordinate SLCP mitigation (Institutional Strengthening support) – with 9 additional countries to come.

9 countries are working on national SLCP plans and another 4 will start shortly.

A toolkit – that includes the Long-range Energy Alternatives Planning - Integrated Benefits Calculator (LEAP-IBC) – and a guidance note were finalized and are used by countries to guide SLCP mitigation strategies.

Creation of a community of practice at regional and global level through peer-to-peer exchanges on national planning and SLCPs.

2016-2017 HIGHLIGHTS

Over the last year, the initiative expanded its training activities to help countries develop national SLCP mitigation strategies and use LEAP-IBC (500 person days of training in total). An awareness raising workshop for the Middle East and North African region brought together about 50 government officials from 16 countries across the MENA region. In response to the Coalition's Marrakech Communique, Chile and Peru presented their first black carbon inventories at the April 2017 Working Group in Santiago.

The initiative is developing a proposal to support countries develop black carbon inventories and integrate SLCPs into their NDCs, and strengthen links to the Long Range Transboundary Air Pollution (LRTAP).

↑ A site visit during the launch of the national planning process in Abuja, Nigeria.

← Participants at the 2017 SNAP Institutional Strengthening workshop, Paris, France.

TOTAL APPROVED FUNDING

$7.3 MILLION

PARTNER NEWS

IN MARCH 2017, CALIFORNIA, ADOPTED A SLCP REDUCTION STRATEGY, FOCUSED ON BLACK CARBON, METHANE AND HFCS.

IN JULY 2017, CANADA RELEASED ITS NATIONAL STRATEGY ON SHORT-LIVED CLIMATE POLLUTANTS, WHICH TAKES A HOLISTIC APPROACH ACROSS GOVERNMENT AND INTERNATIONALLY TO GENERATE SLCP REDUCTIONS FROM ALL KEY SOURCES.

CANADA'S NATIONAL SLCP STRATEGY

Canadians are experiencing the effects of climate change across the country, particularly in the climate sensitive North. Recent studies have shown that global action on carbon dioxide and short-lived climate pollutants (SLCPs) together is needed to keep average global temperatures to no more than 1.5 to 2°C above pre-industrial levels this century, and to meet the temperature goals in the Paris Agreement. Reducing SLCP emissions can also result in significant air quality benefits.

Mountain Road to Mount Cavell, Jasper, Alberta, Canada.

CANADA'S SLCP STRATEGY – A HOLISTIC APPROACH

To respond to the challenge and the opportunity of reducing SLCP emissions, Environment and Climate Change Canada published the country's first-ever Strategy on Short-lived Climate Pollutants in July 2017.

The Strategy outlines a holistic approach to addressing SLCPs through five pillars for action: 1) enhancing domestic mitigation efforts; 2) enhancing science and communications; 3) improving coordination of Government of Canada activities; 4) collaborating with provincial and territorial governments and other partners; and 5) engaging internationally to reduce SLCPs.

Implementation of the Strategy will generate reductions from all key SLCP emissions sources, and achieve health and climate benefits in Canada and beyond its borders. The Strategy is complementary to Canada's Pan-Canadian Framework on Clean Growth and Climate Change, which advances SLCP mitigation objectives through a wide variety of new actions across all sectors of the economy, including specific actions focused on methane and HFCs, as well as actions to foster innovation that will help catalyze the transition to a clean growth economy.

The expected benefits of SLCP mitigation are particularly relevant for Canada as an Arctic nation. Between 1948 and 2013, Canada's Arctic warmed by 2.2°C with significant impacts to local populations and sensitive northern ecosystems. Black carbon is of particular concern in the Arctic due to its additional warming effect when deposited onto snow or ice. Therefore, black carbon emissions emitted near or within Arctic nations have a particularly significant impact on Arctic climate.

The Strategy outlines current and future actions being taken by the Canada's national and provincial governments on black carbon, methane, hydrofluorocarbons and ozone, and whether or not the measures deployed are regulations, other control measures, incentives and programs, or technology and demonstration support.

Strategies to enhance science and communications are also highlighted and include:

- Refining climate and air quality models to better determine the potential impact and efficacy of mitigation scenarios.

▶ Reconciling estimates of methane and VOC emissions from oil and gas emissions through atmospheric observations and detailed emissions measurements of equipment and facilities. This would improve the quantification of fugitive emissions from the sector, support development of emissions reduction scenarios, and improve understanding of SLCP emission impacts from the sector.

▶ Further refining Canada's black carbon inventory to support the development of priority mitigation measures. This includes improving quantification for poorly understood emissions sources like biomass burning, flaring, and diesel combustion in stationary and mobile equipment.

▶ Communicating the science and importance of mitigation will be enhanced through website update and content renewal and communications aimed at the policy community and the general public that emphasizes the need to act.

Under the SLCP Strategy, Canada will also continue to work actively through the Climate and Clean Air Coalition, the Global Methane Initiative, the Arctic Council, the UNECE Convention on Long-Range Transboundary Air Pollution, and other multilateral and bilateral fora to address SLCPs on a global scale.

SOME KEY MITIGATION MEASURES OUTLINED IN CANADA'S SLCP STRATEGY

BLACK CARBON

Reduce black carbon emissions over the longer term through new federal investments that support clean technologies in place of those that rely on fossil fuels.

METHANE

Work with provinces and territories to reduce methane emissions from the oil and gas sector, including offshore activities, by 40-45% below 2012 levels by 2025.

HFCS

Develop final regulations for the proposed 2016 HFC regulatory measures. This will allow Canada to comply with its Montreal Protocol HFC obligations and ratify the Kigali amendment.

OZONE

Multi-sector Air Pollutants Regulations (finalized in June 2016) will reduce emissions of ozone precursors from industrial boilers and heaters, the cement sector, and natural gas-fired stationary engines.

Kaskawulsh Glacier in Kluane National Park, Yukon, Canada is threatened by climate change.Black carbon emissions increase melting of glaciers and arctic ice.

URBAN HEALTH

REALIZING HEALTH BENEFITS FROM ACTION ON SHORT-LIVED CLIMATE POLLUTANTS (SLCPS) AND CO-EMITTED AIR POLLUTANTS

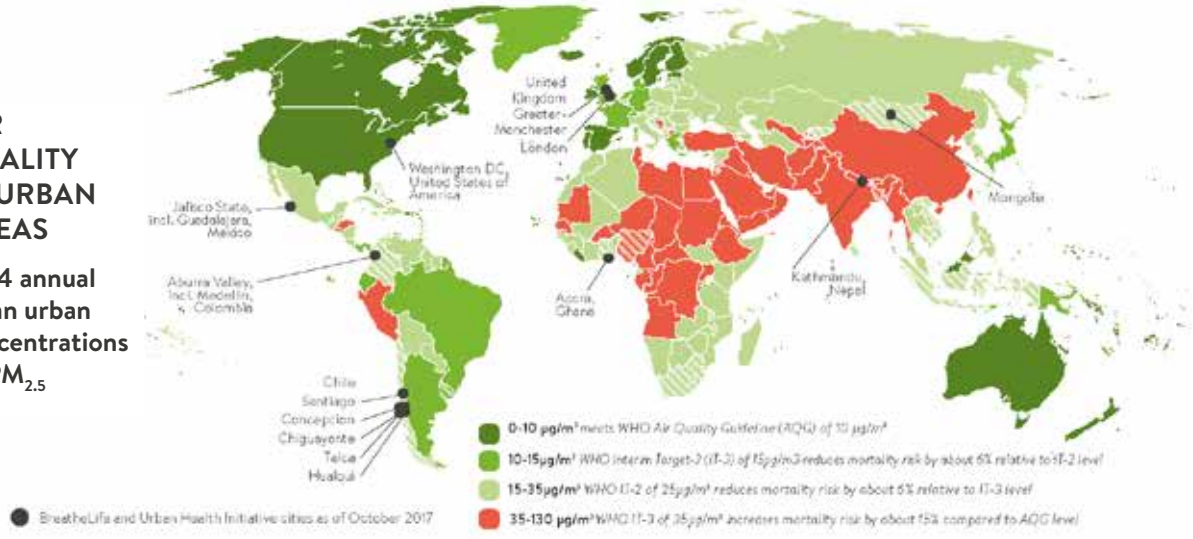
Global urban air pollution levels continue to rise and 80% of people living in cities that monitor air quality now breathe polluted air.[26] Although many high income countries have managed to reverse the trend, low and middle income countries are experiencing high urban air pollution levels. About 90% of air-pollution-related deaths occur in these countries, with almost two third in South-East Asia and Western Pacific regions.[27]

Air pollution is now the world's largest single environmental health risk.[28] According to recent research exposure to outdoor $PM_{2.5}$ (very fine particulate matter) is the leading environmental risk factor for death and the fifth overall global risk factor for all causes of death for all ages and sexes.[29] A 2015 report by WHO and the CCAC for policy makers summarized the state of evidence linking SLCPs to human health and outlined priority areas for mitigation action.[30]

This evidence underpins the need to significantly increase efforts to develop and implement air quality standards and policy instruments in transport, energy, waste management and other sectors at the city and national levels to reduce air pollution and protect health. WHO's Air Quality Guidelines indicate that by reducing ($PM_{2.5}$) pollution from 35 to 10 micrograms per cubic metre (µg/m), long-term air pollution-related deaths could be reduced by about 15%.

AIR QUALITY IN URBAN AREAS

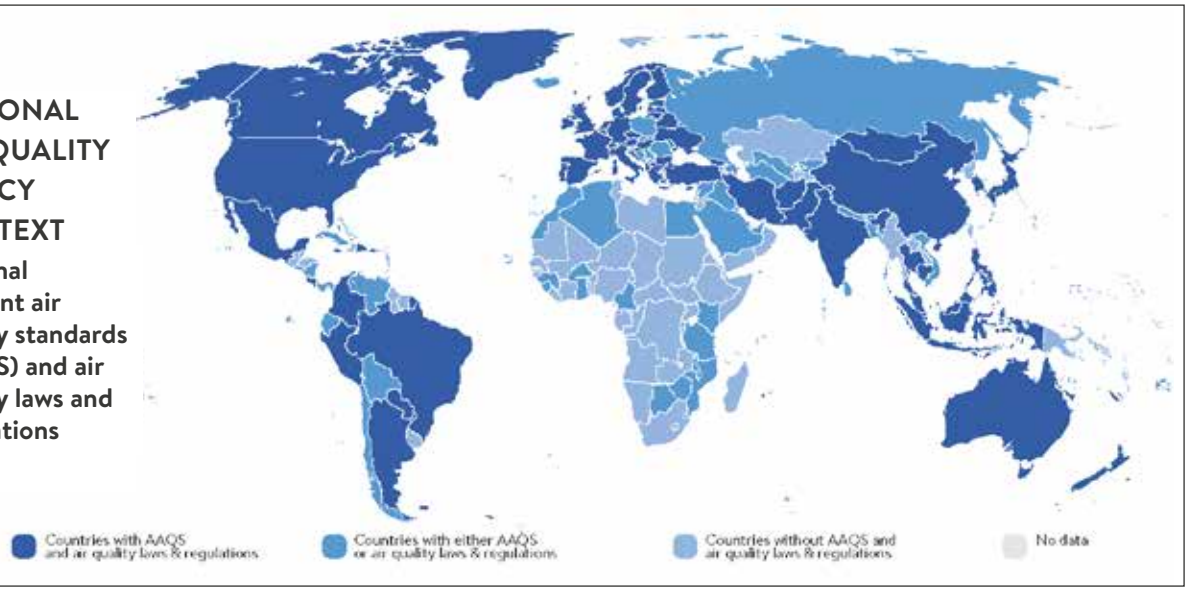
2014 annual mean urban concentrations of $PM_{2.5}$



Source: WHO, 2016; WHO, 2006; CCAC, 2017

NATIONAL AIR QUALITY POLICY CONTEXT

National ambient air quality standards (AAQS) and air quality laws and regulations



Source: UNEP, 2016

5-YEAR MILESTONES

The Coalition's Urban Health Initiative supports national, city and sub-regional efforts to improve air quality and focuses on strengthening capacity of the health sector and creating health and cost evidence for rapid mitigation action. The Coalitions's BreatheLife Campaign, led by WHO and UN Environment, is raising global awareness of the health and climate impacts of air pollution in cities (see map) and supports local action to mitigate pollution – including work by other city-based initiatives, such as in the Diesel Initiative's soot-free bus program and the Municipal Solid Waste Initiative's work to cap and close open dumps, and capture and use landfill gas for energy.

May, 2015
World Health Assembly passes Resolution on Air Pollution and Human Health.

2016
Accra becomes first Health and SLCP mitigation pilot project.

36 cities, sub-regions and national governments joined the BreatheLife campaign.

BreatheLife social media channels have reached 21 million people in its first year.

2016-2017 HIGHLIGHTS

Santiago and other cities of Chile, were the flagship leaders of the BreatheLife campaign, driving development of the global campaign through its local Santiago Respira campaign to promote newer heating systems, improve its mass transit fleet and practice more efficient waste management, combining vigorous policy actions with a strong commitment to raising awareness.

Since its official launch at Habitat III in October 2016, 36 cities, sub-regions and national governments, representing 33.7 million people, have joined the BreatheLife campaign with official commitments to work towards achieving WHO Air Quality Guidelines by reducing short-lived climate pollutants. These include Santiago, Talca (and the Maule region), Concepcion, Hualqui and Chiguayante (Greater Concepcion area), Chile; Jalisco State, Mexico; Greater Manchester, United Kingdom; and Aburrá Valley, Colombia, Washington DC, United States and the national government of Mongolia. In addition, London, United Kingdom made its announcement on 4 October 2017 and Paris, France has announced that it will join the campaign in November 2017.

← WHO Director General, Dr. Tedros Adhanom (2nd from right), at BreatheLife exhibit during the 29th Pan American Sanitary Conference.

TOTAL APPROVED FUNDING

$2.2 MILLION

PARTNER NEWS

WITH SUPPORT FROM THE CLEAN AIR INSTITUTE, LARGE METROPOLITAN AREAS LIKE COLOMBIA'S ABURRÁ VALLEY, MEXICO'S JALISCO STATE AND MEXICO CITY ARE DEVELOPING NEW AIR QUALITY MANAGEMENT PLANS THAT SET HEALTH-BASED AIR QUALITY GOALS. THEY ARE ALSO USING THE BREATHELIFE CAMPAIGN TO BUILD BROAD PUBLIC SUPPORT FOR LOCAL AIR QUALITY STANDARDS.

CHILEAN CITIES IN THE BREATHLIFE CAMPAIGN

In October, 2016 Santiago became the first city to join a global campaign to raise awareness on the danger of air pollution for urban residents and the global climate. Many other Chilean cities soon followed.

The BreatheLife campaign launched at Habitat III in Quito, Ecuador, calling on people and leaders to imagine a future without air pollution. The solutions oriented campaign calls on cities to take action and offers practical policy solutions to improve air quality.

↑ Marcelo Mena, Chile's Minister of Environment, at BreatheLife campaign launch

Marcelo Mena, Chile's Minister for Environment, an early champion of the campaign, said that many people in Santiago recognize air pollution as the city's greatest environmental health threat and that the *Santiago Respira* (Breathe Santiago) campaign is helping people understand and take steps to improve air quality.

"In Chile four thousand people die prematurely every year due air pollution. There are many cities with bad air quality but we have concrete plans to decontaminate 14 cities. We are putting in place structural measures to reduce emissions in every single sector that contributes to air pollution," Mr Mena said. "It is also about raising awareness and education. On high pollution days we ensure that citizens know the air quality and the measures that need to be taken."

The *Santiago Respira* campaign is working to reduce emissions from the transportation, residential, industrial, waste management, agricultural and energy sectors. The campaign promotes measures like banning the use of wood for heating, stringent emissions standards for industry, and regulating ammonia emissions from agriculture. Santiago will be the first Latin American city to have Euro 6 standards for light and heavy duty vehicles and the first to reduce off-road diesel machinery emissions.

Santiago has inspired other Chilean cities to take action and in April, 2017 four additional cities – Talca, Concepción, Hualqui, and Chiguayante – joined.

> The world's cities are the worst affected and this is where we need find solutions. The technology to solve the problem is known and action will have immediate effect.
>
> *Tone Skogen, State Secretary, Ministry of Foreign Affairs, at the launch of the BreatheLife Campaign.*

Strong national government leadership on air quality has translated into on-the-ground activities in cities where air pollution affects citizens the most and where benefits are immediately recognised. These cities in turn are helping the government achieve its national atmospheric decontamination strategy.

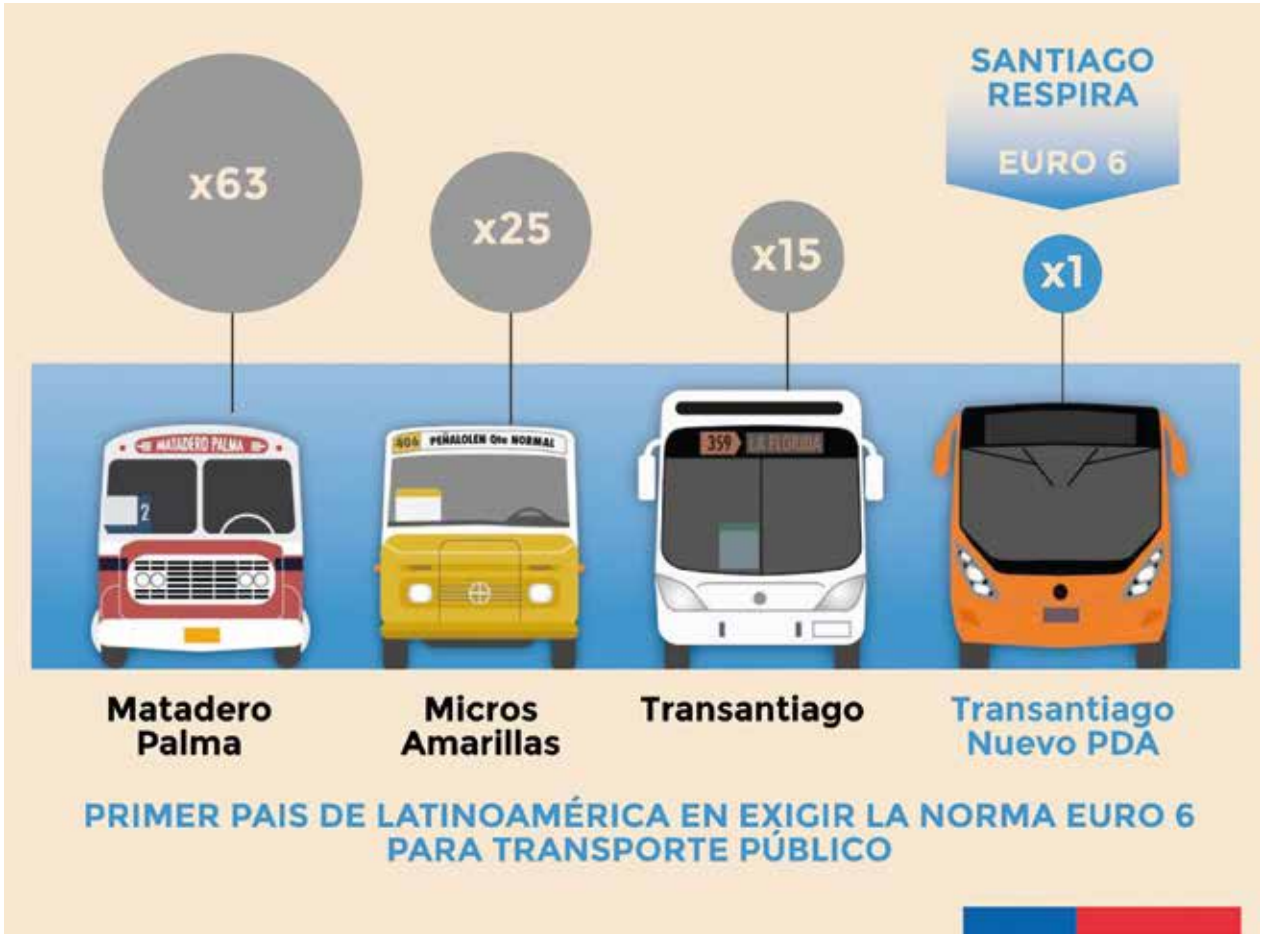
Since Santiago signed on as BreatheLife's first city the campaign has continued to grow. There are now 36 cities, which includes individual cities, like Washington DC and London, and cities in large metropolitan areas like the United Kingdom's Greater Manchester region and Colombia's Aburrá valley.

The BreatheLife campaign is a Climate and Clean Air Coalition initiative led by the WHO and UN Environment. This global campaign aims to mobilize cities, individuals and the health sector to protect our health and our planet from the effects of air pollution.

↓ Mayors sign onto the BreatheLife campaign in Concepción, Chile.

↓ Local children perform at the Talca Respira launch.

↓ An Infographic from the Santiago Respira campaign shows the emissions from different bus types.



FINANCE

FINANCING MITIGATION OF SHORT LIVED CLIMATE POLLUTANTS

FUNDS ARE FLOWING AND AWARENESS IS RISING

Climate change funding is increasing. The finance industry – hedge funds, banks and insurance companies – is increasingly aware of climate change risks and the economic benefits of mitigation from actions like investing in clean technology. There are also more public incentives like tax reductions and an increasing demand for disclosure and accountability from both regulators and consumers. The challenge is to ensure that there are investment ready projects and conducive regulatory frameworks in place.

To date the Green Climate Fund has approved $2.2 billion in project funding. Many of these projects are in clean energy and energy efficiency and will reduce both CO_2 and SLCPs. Since its establishment the Coalition trust fund has allocated close to $50 million for SLCP reductions. Important co-funding and in-kind contribution from partners were also provided in support of these activities. Over the past two years the initiatives have secured over $30 million of co-funding and catalysed funding.

THE POTENTIAL FOR SLCP PRICING

Carbon pricing and market-based approaches are becoming increasingly prevalent and more sophisticated. Several Coalition partners have adopted new or improved pricing and market approaches, and are working to advance more widespread adoption. The Coalition worked with The Gold Standard to develop black carbon estimation methodologies that may be used for pay-for-performance approaches.

DID YOU KNOW?

ENERGY EFFICIENCY AND CLEAN ENERGY INVESTMENTS SAVE 53 "FORTUNE 100 COMPANIES" OVER

$1 BILLION

PER YEAR

COMPANIES THAT MITIGATE AND MANAGE FOR CLIMATE CHANGE ARE

67%

MORE PROFITABLE

BUSINESSES COMMITTED TO CLIMATE ACTION HAVE AN

18%

HIGHER RETURN ON INVESTMENT

Source: The New Climate Economy, 2016.

THE ECONOMIC ARGUMENT FOR SLCP ACTION

IT'S ABOUT CREATING JOBS

According to the Natural Resources Defense Council, nearly 1.5 million new jobs could be created if all US states committed to 75% waste diversion by 2030.

Improved cookstoves, which constitute a crucial upgrade for sustainable bioenergy use, are also a source of employment. The partners of the Global Alliance for Clean Cookstoves, for instance, manufactured almost 10 million cookstoves, employing 76,000 people in 2012, of which 54% were women.

IT'S ABOUT SAVING MONEY

Half of SLCP reduction measures can be achieved at low or no cost.

Some, like capturing and using methane from landfills and rice cultivation, can be achieved at negative cost. And if monetized benefits for health and avoided crop losses are accounted for, all measures are cost effective.

Source: NDRC, 2011;IRENA, 2016

5-YEAR MILESTONES

5 Global and Regional Development banks become CCAC partners

Finance institutions supported in 4 countries (Bangladesh, India, Mongolia and Nigeria) to tackle barriers to SLCP finance in the bricks, cooling and household energy sectors

Pilot Auction Facility launched by World Bank Group as innovative, pay-for-performance mechanism for reducing methane emissions, raised $53 million from donor countries

2016-2017 HIGHLIGHTS

The Asian Development Bank (ADB) joined the Coalition as its newest finance institution partner.

Recognizing that landfill emissions are expected to rise in the foreseeable future, the World Bank and the CCAC commissioned a report describing how local authorities, private landfill owners, and project developers can finance systems that mitigate these emissions. The report used insights from existing projects, including key enabling conditions and risk mitigation strategies.

The Coalition established a Finance Task Team to build on partner contributions and ensure our financing matches the ambition of our political commitment.

↑ Mongolia's XacBank is helping people pay for cleaner transport and household energy products.

← Solar panels for sale on the streets of Ulaanbaatar, Mongolia.

TOTAL APPROVED FUNDING

$1.6 MILLION

PARTNER NEWS

GERMAN INTERNATIONAL CLIMATE INITIATIVE SUPPORT FOR COMPLETED AND ONGOING SHORT-LIVED CLIMATE POLLUTANT RELATED PROJECTS TOTALLED CLOSE TO $67 MILLION.

THE ARCTIC COUNCIL PROJECT SUPPORT INSTRUMENT (PSI) ADMINISTERED BY THE NORDIC ENVIRONMENT FINANCE CORPORATION RAISED $16 MILLION TO FUND ACTIONS AGAINST POLLUTION IN THE ARCTIC.

AGRICULTURE

ADDRESSING SHORT LIVED CLIMATE POLLUTANTS FROM AGRICULTURE

The agriculture sector generates almost half of all global anthropogenic methane emissions – mainly from enteric fermentation in livestock, manure, and paddy rice cultivation – and significant black carbon emissions from agricultural open burning. As the global population increases and becomes wealthier demand for foods rich in animal protein is expected to increase, leading to steep increases in methane emissions.

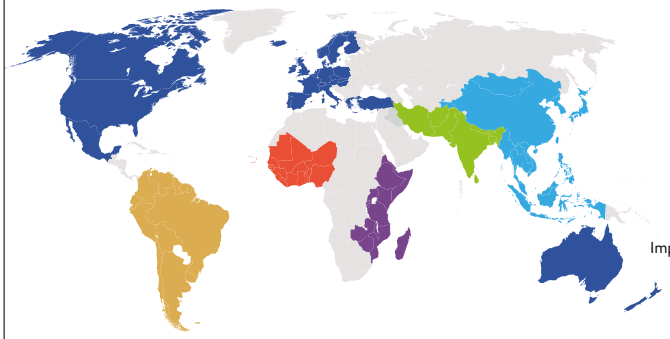
According to Food and Agriculture Organization (FAO) estimates, in 2010, livestock produced 102 million tonnes of methane from enteric fermentation and manure, and of this, 80% was produced in developing country regions.

The CCAC agriculture initiative aims to reduce methane and black carbon emissions while enhancing food security and livelihoods by improving manure management, preventing open burning, reducing methane emissions from paddy rice production, and by transforming ruminant livestock production systems to reduce enteric methane emissions.

Annual livestock sector methane emissions can be reduced by 4.5-47.5% (up to 8.6 million tonnes annually) relative to 2005, by 2030 with improvements to production practices. Improvements in animal feed quality, animal health and husbandry, manure management and energy use efficiency can lead to significant reductions in emissions per unit of product. In Uruguay, for example, applying a combination of herd and health management, nutrition and feeding management strategies, and selective breeding has the potential of reducing emission intensity by 23% to 41% and increasing production (expressed in live-weight terms) by 80%.[31]

MITIGATION OPTIONS FOR THE LIVESTOCK SECTOR

Methane mitigation potential from implementation of key livestock management measures in specific regions



MIXED DAIRY OECD - 11% OECD countries
Fat supplementation 2.1- 2.3%
Manure management 8.9%

BEEF CATTLE - 47.5% South America
Improved feed quality 25.7%
Improved fertility and reduced mortality 21.8%

SMALL RUMINANTS - 4.5% West Africa
Improved fertility and reduced mortality 2.65%
Improved feed quality 1.85%

MIXED DAIRY - 2.8-10.9% East Africa
Improved feed quality 2.2 - 9%
Improved fertility and reduced mortality 0.6 - 1.9%

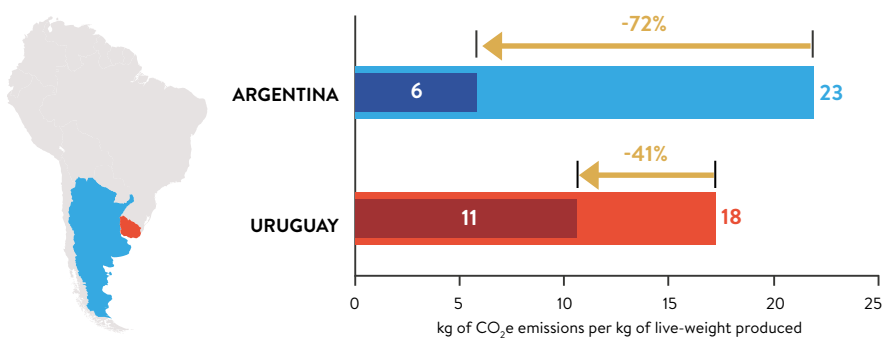
DAIRY CATTLE - 38% South Asia
Improved feed quality 23.4%
Improved fertility and reduced mortality 3.3%

COMMERCIAL PIGS - 20-28% South East Asia
Improved fertility and reduced mortality 17.1%
Manure management 15.4%

Source: Mottet et al., 2016.

ENTERIC METHANE MITIGATION POTENTIAL IN BEEF SYSTEMS

in Argentina and Uruguay



REDUCTION MEASURES

- Improved feed availability and quality
- Improved control of reproductive diseases
- Better heard management through defined mating season and early weaning

Source: FAO & New Zealand Agricultural Greenhouse Gas Research Centre, 2017.

5-YEAR MILESTONES

Manure management practice changes identified for Argentina, Bangladesh, Ethiopia, Malawi, Vietnam, and regionally in Central America.

3 countries – Vietnam, Bangladesh, Colombia – participate in suitability assessments for alternate wetting and drying rice production.

Alternatives to open agricultural burning projects started in India and Peru.

13 countries developed baseline and mitigation assessments for enteric fermentation in the dairy and livestock sector using the Global Livestock Environmental Assessment Model (GLEAM).

Strategic Support Groups created in the Andes and Himalayan countries to help governments and local farmers find alternatives to open burning.

Tools developed for Vietnam to measure, report, and verify greenhouse gas emissions from paddy rice and support NDC implementation in the rice sector.

2016-2017 HIGHLIGHTS

In collaboration with the FAO, World Bank and Global Environment Facility, the initiative is supporting three large national livestock management programmes worth more than $460 million in Uruguay, Ethiopia and Bangladesh. The programmes will incorporate the mitigation options for the livestock sector assessed by the initiative and have the potential to reduce approximately 4 million tonnes of methane per annum.

↑ The Coalition partnered with the International Rice Research Institute (IRRI) to promote alternate wetting and drying farming to reduce methane from rice paddies.

← Agricultural burning is a large source of air pollution and black carbon emissions.

TOTAL APPROVED FUNDING

$6.5 MILLION

PARTNER NEWS

CANADA ALLOCATED AN ADDITIONAL $27 MILLION FOR PHASE TWO OF THE AGRICULTURAL GREENHOUSE GASES PROGRAM WHICH PROVIDES CANADIAN FARMERS WITH TECHNOLOGIES TO MITIGATE LAND AND LIVESTOCK GREENHOUSE GAS EMISSIONS.

URUGUAY ENTERIC METHANE

Uruguay is livestock country. 70% of its total area is natural grassland that supports 12 million cattle and 8 million sheep. Livestock is the backbone of the economy, but methane generated by enteric fermentation in these animals is a large source of the country's greenhouse gas emissions.

Agriculture represents 70% of all Uruguay's exports and contributes to about 80% of Uruguay's greenhouse gas emissions, of which 55% is from enteric fermentation.

Reducing these emissions is a challenge but many also see it as a big opportunity to increase the livestock industry's productivity and efficiency while reducing emissions intensity, sequestering carbon in soils, and increasing the system's adaptation and resilience.

Uruguay is working with the Climate and Clean Air Coalition, the Global Research Alliance on Agricultural Greenhouse Gases (GRA) and the United Nations Food and Agriculture Organizations (FAO) on a project called "Reducing enteric methane for improving food security and livelihoods".

The strategy combines improved livestock health with improved land management to increase the carbon sequestration potential of natural grasslands. It is seen as a win-win-win scenario, as it increases efficiency, productivity, and incomes for farmers.

This collaborative effort is helping Uruguay improve the quality of its emissions inventory, better define reduction targets in terms of emissions intensity, and improves the understanding of the impacts of their measures.

The project is data driven and uses the Global Livestock Environmental Assessment Model (GLEAM) – a geographic information systems (GIS) modelling framework developed by FAO that simulates the interaction of activities and processes involved in livestock production and the environment. It is used to evaluate a broad perspective of opportunities, potential productivity gains, and emissions intensity reductions for the beef sector.

IN ITS NATIONALLY DETERMINED CONTRIBUTION (NDC) URUGUAY IS COMMITTED TO REDUCING METHANE EMISSIONS PER KILO OF BEEF PRODUCED BY 33% TO 46% IN 2030, AND TO REDUCE GROSS EMISSIONS WHERE POSSIBLE.

← The agriculture sector contributes to about 80% of Uruguay's greenhouse gas emissions, of which 55% are from enteric fermentation.

The project identified a set of five to six practices that have a real impact. These include to diet, reproductive indicators, genetics, and the commercial efficiency of feed. Most of these practices are knowledge intensive with no increased cost to farmers and, because they are efficiency measures, can result in cost savings. This means that incomes can increase without the need for assistance or subsidies from the government, making the practices more sustainable because farmers do not need permanent government assistance. The challenge now is to introduce these practices to a larger number of farmers.

The Coalition, Global Research Alliance, and FAO play an important role, not just in Uruguay but also by helping transfer information and experiences to other countries and to help identify collective projects or multi-country projects, in order to exploit synergies between countries that have similar goals, similar problems, and similar challenges. Working together is a much more efficient way to achieve better results.

> “Access to reliable data has built Uruguay’s confidence that its contribution to food security does not compromise food production but rather increases productivity.”
>
> *Tabaré Aguerre, Minister of Agriculture and Fisheries of Uruguay*

↓ Farmers in Uruguay can increase production, reduce emissions and save money by adopting new farming practices.

BRICKS INITIATIVE

MITIGATING BLACK CARBON AND OTHER POLLUTANTS FROM BRICK PRODUCTION

Despite the availability of modern brick kiln technology, bricks are still fired using traditional methods in many parts of the world. Close to 90% of black carbon emissions from the sector come from Asia. The mitigation potential is significant, with recent estimates showing that switching to more efficient technologies, mainly during brick firing, can reduce pollutant emissions by more than 90%, depending on the process, scale, and fuel used. There are also additional social and economic benefits for local communities and brick producers.

In 2012, the CCAC launched its Bricks Initiative to help make the traditional brick kiln sector cleaner and more sustainable while providing local economic development, improved health, and better working conditions.

COLOMBIA: AN EXAMPLE OF A BRICK INDUSTRY TRANSFORMATION PROCESS

1. SECTOR ANALYSIS

ALL STAKEHOLDERS IDENTIFIED, BARRIERS AND OPPORTUNITIES ANALYSED, AND MITIGATION POTENTIAL ESTIMATED.

2. INVENTORY CREATION

AN INVENTORY OF BRICK KILN LOCATIONS, PRODUCTION, TECHNOLOGIES, AND FUEL TYPES USED IS CARRIED OUT IN 16 REGIONS.

3. FIELD MEASUREMENTS

PORTABLE MONITORING EQUIPMENT USED TO MONITOR DIFFERENT EMISSION FACTORS FROM DIFFERENT TECHNOLOGY TYPES, INCLUDING ARTISANAL KILNS. DATA ALSO USED FOR COLOMBIA'S BLACK CARBON INVENTORY.

4. TECHNICAL TRAINING

96 PRODUCERS TRAINED IN BEST PRACTICES, OPTIMAL OPERATING CONDITIONS, AND ENVIRONMENTAL REGULATIONS.

5. POLICY ACTIONS

CONSULTATIVE DIALOGUES HELD WITH ALL STAKEHOLDERS LEADS TO REGULATORY REFORM OF COLOMBIA'S AIR POLLUTION FROM STATIONARY SOURCES RESOLUTION (909/08). BRICK SECTOR REFORM IS INCLUDED IN COLOMBIA'S NATIONALLY DETERMINED CONTRIBUTIONS (NDCS) TO MITIGATE CLIMATE CHANGE.

92%*

POTENTIAL REDUCTION IN BLACK CARBON EMISSIONS

GOVERNMENT

IMPROVED AIR QUALITY, REDUCED HEALTH COSTS, CLIMATE CHANGE MITIGATION

INDUSTRY

COST SAVINGS, MORE EFFICIENT PRODUCTION, HIGHER QUALITY PRODUCTS

BRICK PRODUCERS

INCREASED PERSONAL SAFETY, BETTER HEALTH, IMPROVED SKILLS

* Full implementation of modernized brick kilns globally by 2030 could reduce current emissions levels by 92% by 2050

Source: IIASA GAINS, 2017

5-YEAR MILESTONES

The initiative has produced knowledge tools, policy guidance tools, brick kiln emission and efficiency standard measurement protocols, and economic analyses to support a transition toward cleaner brick production. In Latin America this has led to buy in and concrete actions from policy makers and environment ministers. In Mexico, for example, business plans are being developed for traditional producers and new financial tools are being investigated for use in the sector.

Coalition support to Nepal following the 2015 earthquake has seen improved kilns with a 60% decrease in particulate matter and a 40-50% reduction in coal consumption

Established expert groups in South Asia and Latin America to improve production efficiency.

Real world black carbon emissions monitoring carried out in India, Nepal, and Colombia.

Practice change in Latin America and South Asia have led to reduction in black carbon emissions and increased revenue for producers.

Policy guidance tools, information products, economic analysis, and brick kiln emission and efficiency standard measurement protocols produced.

2016-2017 HIGHLIGHTS

A key highlight from the past year was Latin American commitment to national policy development for sustainable brick production. Colombia and Peru are developing brick sector Nationally Appropriate Mitigation Actions (NAMAs) that aim to reduce emissions by 20% and 30% respectively by 2030. In Colombia the Coalition supported on site emissions measurements using top-of-the-line instrumentation to develop emission factors and emission inventories. This measurement work and analysis produced a robust emissions inventory of $PM_{2.5}$ and black carbon emissions factors that other countries in the region are using to formulate brick sector policies. Mexico finalized a brick market study which the government will use to frame sustainable policies. Jalisco State in Mexico is hosting the next Policy and Advocacy Network (PAN) Meeting for Latin America to determine how to implement sector reforms for over 1,000 producers.

Last year the Coalition supported trainings under the Energy Efficiency Program in Latin America´s brick sector to mitigate climate change (EELA Program) which closed with significant environmental, social and economic benefits. The program used a market based approach, which reduced more than to 1 million tons of carbon dioxide equivalent (CO_2e) emissions, saved $15 million in costs, and led to 3,975 Latin American brick producers investing $49 million in green brick production technologies.

The initiative will use the approach taken in Colombia and Latin America to increase mitigation efforts in Asia, which is responsible for the bulk of black carbon emissions from brick production.

← Measuring Black carbon emissions from an artisanal kiln in Nemocon, Cundinamarca, Colombia.

TOTAL APPROVED FUNDING

$3.9 MILLION

PARTNER NEWS

THE SUCCESS OF THE COALITION SUPPORTED TECHNOLOGY TRANSFER TO REBUILD KILNS IN NEPAL AFTER THE 2015 EARTHQUAKE LED TO A FUNDING COMMITMENT FROM THE DEPARTMENT OF INTERNATIONAL DEVELOPMENT (DFID) OF GBP 4.5 MILLION TO MOVE 60% OF NEPAL'S KILNS TO CLEANER TECHNOLOGY.

COOLING AND REFRIGERATION

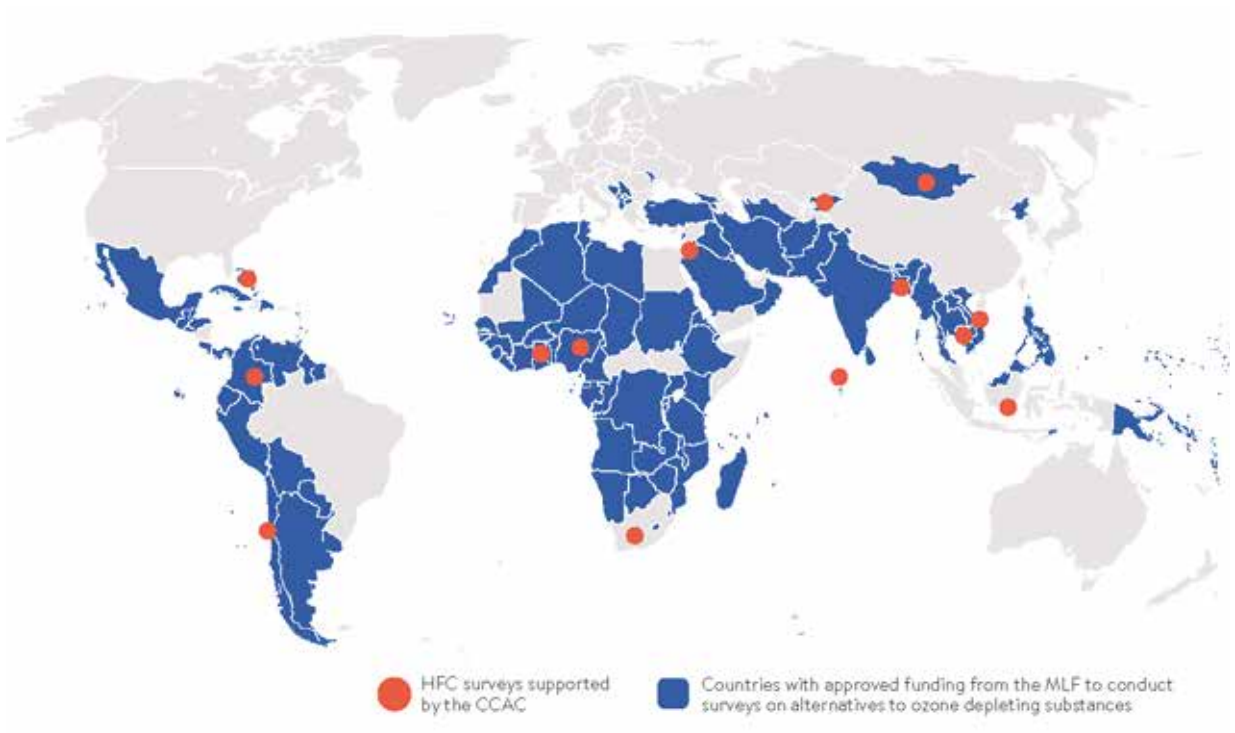
PROMOTING HFC ALTERNATIVE TECHNOLOGY AND STANDARDS

HFC PRODUCTION AND CONSUMPTION SURVEYS IN DEVELOPING COUNTRIES

THE CCAC SUPPORTED THE FIRST HFC CONSUMPTION AND PRODUCTION SURVEYS IN 14 COUNTRIES

BAHAMAS
BANGLADESH
CAMBODIA
CHILE
COLOMBIA
GHANA
INDONESIA
JORDAN
KYRGYZSTAN
MALDIVES
MONGOLIA
NIGERIA
SOUTH AFRICA
VIETNAM

THE MULTILATERAL FUND HAS SINCE APPROVED FUNDING FOR HFC SURVEYS OF THE SAME KIND IN 127 COUNTRIES



5-YEAR MILESTONES

The Coalition's HFC initiative aims to significantly reduce the projected growth and emissions of high Global Warming Potential (GWP) Hydrofluorocarbons (HFCs) in coming decades. It has done this by looking at the growth and distribution of HFCs in developing countries and by working with manufacturers and industry to promote and test HFC alternative technology through pilot projects.

The initiative has also pushed for political action through policies and the global adoption of an amendment to phase-down HFCs under the Montreal Protocol. This amendment, known as the Kigali Amendment, was passed in October, 2016, at the 28th Meeting of Parties to the Montreal Protocol in Kigali, Rwanda.

In order to increase understanding of the use and potential growth of HFCs the initiative produced fourteen HFC consumption and production surveys in developing countries. These surveys are critical to help countries identify national HFC consumption and sectors most exposed in order to help prioritize where they can best start implementing the Kigali Amendment. The Multilateral Fund is building on this work and has approved funding for similar surveys in 127 developing countries.

Alternative technology pilot projects carried out in Chile, Jordan, and India.

CCAC ministers pushed for the adoption of an ambitious Kigali amendment in Vienna, July, 2016. The amendment was adopted in October 2016.

Supported national HFC inventories in 14 countries, which led to the Multilateral Fund funding for similar work in an additional 127 developing countries.

2016-2017 HIGHLIGHTS

Over the last year the initiative continued to support the HFC agenda through publications and workshops, political outreach events, and investment projects that demonstrate alternative technologies. 2016-2017 initiative highlights include:

- A supermarket in Chile became the first in the country to adopt new refrigeration technology, demonstrating the viability of HFC alternatives and Chile's commitment to climate-friendly refrigeration.
- At the International Air-Conditioning, Heating, Refrigerating Exposition (AHR Expo) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Winter Conference, the initiative ran a workshop on "Sustainable Technologies for Stationary Air Conditioning", promoting climate-friendly and cost-effective technologies.
- The report "Lower-GWP Alternatives in Commercial and Transport Refrigeration: An expanded compilation of propane, CO_2, ammonia and HFO case studies" was launched on the margins of the 3rd Extraordinary Meeting of the Parties to the Montreal Protocol in Vienna.
- A summary of the key findings from the first tranche of CCAC supported HFC inventories was released.
- The Maldives Feasibility Study for District Cooling was completed and concluded that substantial reductions of greenhouse gases can be achieved by introducing district cooling to the Hulhumale development area.

← Jumbo Supermarket in Valdivia, Chile, was the first in the country to use transcritical CO2 as an alternative refrigerant to HFCs.

TOTAL APPROVED FUNDING

$3.2 MILLION

PARTNER NEWS

IN JUNE 2016, ALTERNATIVES TO HIGH-GWP HFCS WAS APPROVED FOR USE IN THE NEW ULAANBAATAR INTERNATIONAL AIRPORT, MONGOLIA.

DIESEL

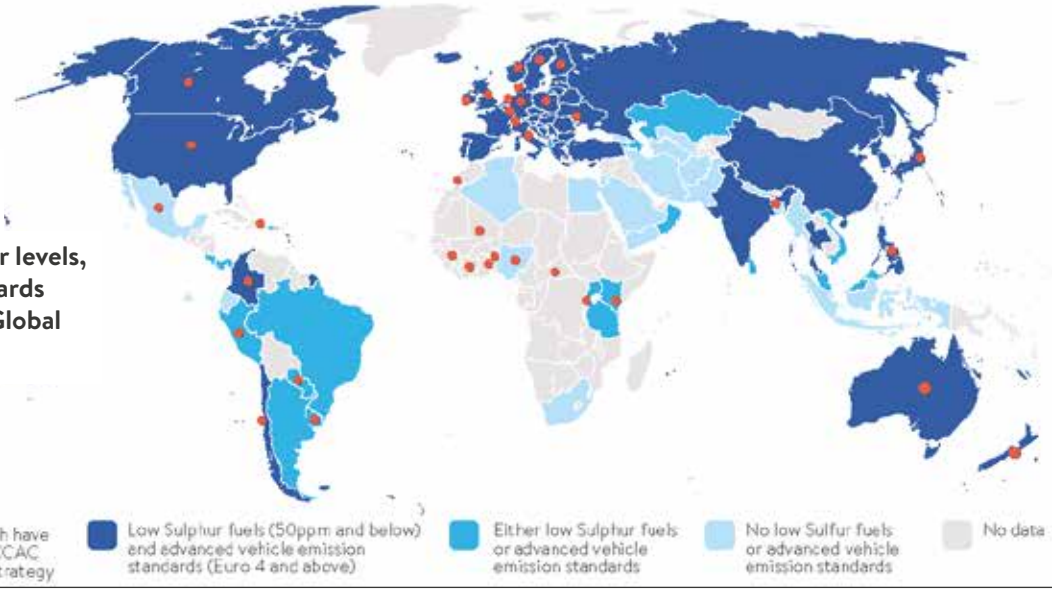
REDUCING BLACK CARBON EMISSIONS FROM HEAVY-DUTY DIESEL VEHICLES AND ENGINES

Over 24% of global anthropogenic black carbon emissions come from the transport sector. From 2005 to 2015, the number of vehicles in the world grew by 35%. This is set to triple by 2050, with a large part of this increase coming from East and South East Asia. Between 2010 and 2015, black carbon emissions from the transport sector declined slightly and are now back to 2005 levels. This is partially attributed to advancing fuel and vehicle emissions standards in Europe and North America, which have the largest number of vehicles on the road today. Developing markets are catching up: in 2016 Western Africa countries adopted low-sulfur fuel standards, and major markets like China and India are moving to ultra-low standards. Despite this progress, over half of the world still uses high-sulfur fuels and/or high-emitting vehicles.

In 2012, the CCAC launched its heavy-duty diesel initiative to eliminate fine particle and black carbon emissions from new and existing heavy duty diesel vehicles and to support the adoption of clean fuel and vehicle regulations. The initiative supports this work with tools like the free global online Port Emissions Inventory Tool (goPEIT) to help ports in developing countries calculate emissions from port equipment, harbour craft, and ocean-going vessels. National freight assessments were developed for Brazil, Mexico, Vietnam, and under development for China, laying the foundation for green freight programs, and Australia, Brazil, China, Mexico and Thailand are all working toward nationwide shifts to soot-free buses and trucks.

STANDARDS & POLICIES

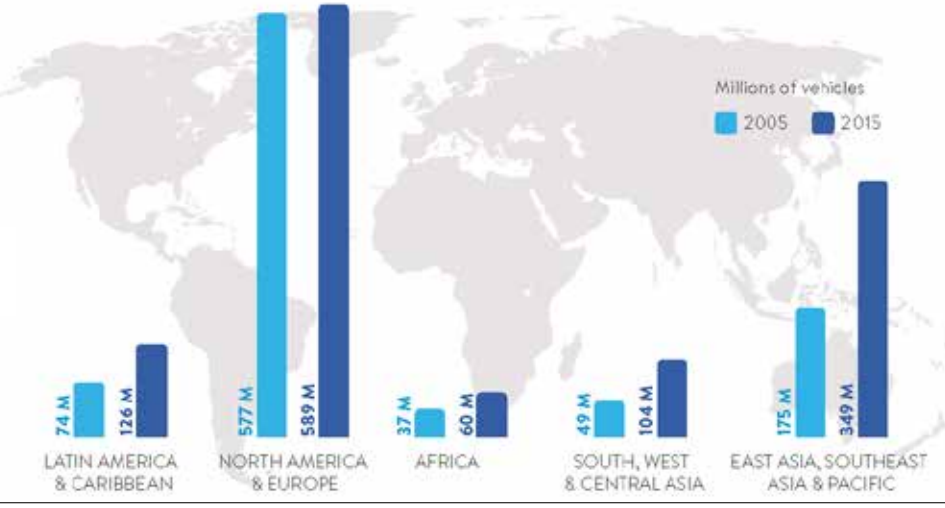
Diesel fuel sulfur levels, emissions standards and the CCAC Global Sulfur Strategy



Source: UNEP transport unit, 2017

REGIONAL VEHICLE STOCKS

Cars, trucks and buses in use



Source: ICCT Roadmap Model, 2015

5-YEAR MILESTONES

35 countries and East, West and Southern Africa supported to introduced strict low sulfur diesel and vehicle emissions standards.

57 countries, companies and organisations support the Global Green Freight Action Plan.

Global marine black carbon emissions inventories and baseline air emissions inventories produced for major ports in Indonesia, Ghana, Bangladesh, Kenya and Chile.

20 cities worldwide transitioning to soot-free urban bus fleets.

Foundations for green freight programs developed in Brazil, Mexico and Vietnam, and under development in China.

4 global bus manufacturers – BYD, Cummins, Scania, and Volvo – commit to providing 20 megacities with soot free bus technology.

← Fuel imports harmonised to 50ppm in Nigeria, Togo, Benin and Ghana in July 2017.

2016-2017 HIGHLIGHTS

At COP 21 in Paris, the Diesel Initiative launched the Coalition's ´Global Strategy to Introduce Low Sulphur Fuels and Cleaner Diesel Vehicles´, the first global plan to reduce black carbon emissions from the global on-road diesel fleet by over 90%. At the Coalition's 2016 High Level Assembly 38 countries endorsed the strategy. The strategy sets a global timeline: most countries adopt low sulfur diesel by 2020, all countries to 50 ppm by 2025, and most countries go to ultra-low (10 ppm) sulfur in fuels by 2030. If fully implemented by 2050, it would result in 500,000 avoided deaths per year and reduce cumulative emissions of diesel black carbon by an estimated 7.1 million metric tons. The initiative is now working with a number of countries toward these goals.

Other key initiative highlights include:

- Development and adoption of more stringent fuel and/ or vehicle emission standards at the regional and national levels, including in Barbados, China, Colombia, Costa Rica, Indonesia, Mexico, Panama, Paraguay, Uruguay, East Africa, West Africa and Southern Africa
- Nigeria, Togo, Benin, Cote d'Ivoire and Ghana adopted low sulfur diesel fuel standards; Mozambique, Malawi and Zimbabwe switched to low sulfur diesel fuels and Nigeria agreed to import low sulfur diesel fuels (50ppm) in 2017
- Indonesia's state-owned Pertamina signed contracts to upgrade 5 of its refineries to produce 50 ppm fuels (down from 500 ppm) and the government adopted Euro4/IV equivalent vehicle standards nationwide for implementation in 2018.
- The International Marine Organization (IMO) reaffirmed its marine global 0.5% sulfur limit for 2020, and restarted work on a potential Heavy Fuel Oil (HFO) ban under the Polar Code. In China, ports in the Bo Sea, Yangtze River Delta, and Pearl River Delta began early implementation of the 0.5% sulfur limits.

TOTAL APPROVED FUNDING

$8 MILLION

PARTNER NEWS

IN JUNE 2017, THE PHILIPPINE DEPARTMENT OF TRANSPORTATION LAUNCHED THE PUBLIC UTILITY VEHICLE (PUV) MODERNIZATION PROGRAM. THE PROGRAM WILL REDUCE DIESEL EMISSIONS BY HAVING EURO IV VEHICLES AND FUELS STANDARDS IN ALL PUVS.

IN 2016 AND 2017, THE BELLONA FOUNDATION PUBLISHED A SERIES OF REPORTS ON THE TRANSITION FROM CONVENTIONALLY FUELLED ROAD TRANSPORT TO ELECTRIC MOBILITY. THE LATEST ONE *'POWER TO LIQUIDS TRAP'* PROVIDES A REALITY CHECK TO THE PROPOSED EU 'POWER TO LIQUIDS' POLICY.

IN MAY 2017, NATURAL RESOURCES CANADA, BRAZIL'S NATIONAL TRAINING SERVICE (SENAT), BRAZIL'S NATIONAL TRANSPORT CONFEDERATION (CNT), AND THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION (ICCT) SIGNED A TECHNICAL COLLABORATION AGREEMENT TO SHARE ECO-DRIVING BEST PRACTICES FOR GREEN FREIGHT PROGRAMS. ADEQUATE TRAINING OF TRUCK DRIVERS CAN SUBSTANTIALLY REDUCE FUEL CONSUMPTION AND EMISSIONS FROM HEAVY-DUTY TRUCKS.

HOUSEHOLD ENERGY

REDUCING SHORT LIVED CLIMATE POLLUTANT EMISSIONS FROM HOUSEHOLD COOKING, DOMESTIC HEATING AND LIGHTING

With households representing 58%[32] of manmade black carbon emissions globally, the CCAC is working to support the transition toward clean and efficient cooking, lighting and heating technologies.

Access to clean household energy solutions has increased over the past ten years with over 53 million cleaner and/or more efficient cookstoves and fuel distributed in 2015 and an increase in sales of off-grid solar lighting products with 20.5 million quality verified products sold since 2010.[33]

However, 2.7 billion people still lack access to modern or advanced cook stoves, mostly in Asia and Sub-Saharan Africa. Biomass stoves represent a significant, and growing, source of air pollution, and predominate in areas close to snowpack and glaciers where black carbon's climate impacts are greatest, as these dark particles cause faster warming and melting.

Using polluting and dangerous fuels indoors for cooking, heating and lighting is responsible for 3.5 million premature deaths annually.[34] Access to electricity has increased at a faster pace, yet 1.2 billion people are still without a reliable source.

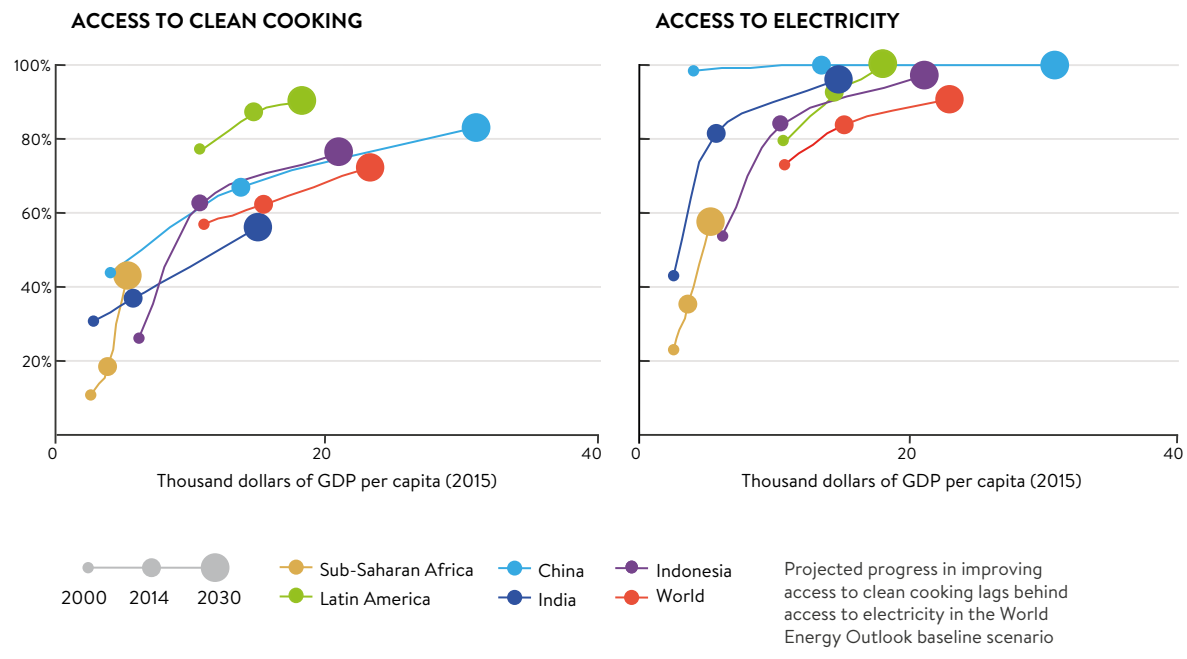
Under the International Energy Agency (IEA) current policy scenario, by 2030 the number of people without access to clean cooking is projected to decrease by only 15%, those without electricity by 35%, falling short of SDG target 7.1: universal access to affordable, reliable and modern energy.

In China, where full electrification was reached in 2015, 450 million people still rely on traditional biomass cookstoves and heatstoves, illustrating the complexity of transitioning to clean household solutions[35]. There is also a need to systematically assess performance and impacts of cooking and heating technologies through standards, labelling, and testing.

The Household Energy Initiative aims to reduce SLCPs by promoting clean cookstoves, heatstoves and lighting fuels.

EVOLUTION OF ACCESS TO CLEAN COOKING AND ELECTRICITY BY SELECTED REGIONS

based on policy commitments and plans announced by countries (World Energy Outlook baseline scenario)



Source: IEA, 2016.

5-YEAR MILESTONES

Designed and developed standards and testing protocols to ensure improved performance of clean cookstoves, heatstoves and clean fuels.

Contributed to the Global Alliance of Clean Cookstoves Spark Fund, to support clean fuel entrepreneur projects in Tanzania and Nigeria.

"Burn Right" campaigns launched in Andes and Nordic countries to reduce black carbon emissions from heat-stoves.

Developed ISO standards for clean cookstoves and Gold Standard Methodology on quantifying SLCP emission reductions.

Launched energy efficient lighting activities to phase out kerosene in Nigeria.

Funded the first summit on black carbon and other emissions from combined cooking and heating stoves, in Warsaw, Poland.

↓ Women from Notarpali village, India, teach Nigerian women how to make improved clay stoves as part of a CCAC knowledge exchange.

2016-2017 HIGHLIGHTS

The Gold Standard Foundation, with funding from the CCAC, has completed a market assessment to identify potential institutions willing to pay for climate, health and gender impacts of clean cooking projects.

The Global Alliance for Clean Cookstoves, under the initiative, has provided recommendations for standards and labels for cookstoves in Ghana and Uganda and is developing standards and labelling implementation strategies in Guatemala, Kenya, and Nigeria. A first of its kind Consumer Study on labelling in Ghana was conducted and will be used to guide Ghanaian policymakers on how to design a cookstove label that's effective in conveying relevant performance information to consumers, so that they can make more-informed purchase decisions.

The International Cryosphere Climate Initiative (ICCI) has published the first testing protocol for black carbon emissions from wood fuelled heat stoves. Called the Protocol for Measuring Emissions of Black Carbon and Organic Carbon from Residential Wood Burning, it has been beta-tested in Denmark, Sweden, Norway, and the Czech Republic.

↓ A demonstration of the Nexleaf system, which provides real time monitoring of clean cookstove use in order to help users earn climate credits.

TOTAL APPROVED FUNDING

$4.8 MILLION

PARTNER NEWS

IN JUNE 2017, NIGERIA LAUNCHED A NATIONAL CLEAN COOKING SCHEME (NCCS) TO PREVENT BLACK CARBON EMISSIONS BY REDUCING, AND EVENTUALLY ELIMINATING, COOKING WITH FUELS LIKE FIREWOOD AND KEROSENE.

ANTI-POLLUTION PROGRAMME IN THE PHILIPPINES

A Public Private Partnership for Cleaner Energy and Better Air Quality in Iloilo City, Philippines.

Cities are working with private sector suppliers to get clean fuels to households.

Climate and Clean Air Coalition partner, Clean Air Asia, is working with cities to reduce air pollution by linking air quality improvements to cities' economic and quality-of-life decisions.

Clean Air Asia is doing this through a certification scheme – the Cities for Clean Air Certification– that recognizes cities for actions taken to address air pollution, while providing guidance to ensure actions are targeted and impactful. It focuses on the following areas:

- Engaging people to take action
- Consolidating and communicating data
- Implementing actions that address air pollution

Certification is a valuable mechanism for public and private stakeholders to support a city's unique challenges and action plan, and maximize the impact of their contributions. The initiative's outreach strategy links public and private stakeholder groups with cities to pool available resources and achieve recognition for their actions on air quality through certification.

Reducing emissions from a selected pollution source is one of the actions cities need to do to receive Cities for Clean Air Certification. Iloilo City in the Philippines is working to provide clean energy alternatives for household cooking after an assessment identified the burning of wood and charcoal for food preparation as the city's main source of particulate matter.

Since May, 2017, with support from the Cities for Clean Air Certification scheme, Iloilo City has worked with Gaz Lite – the social enterprise arm of PR Gaz, Inc., a Philippine LPG fuel provider – to provide cleaner cooking alternatives. Through this collaboration Gaz Lite plans to provide cleaner fuel to 30,000 Iloilo City households by 2018.

Gaz Lite's vision is to be present in 1 million Philippine households by 2021. To this end, the company developed the world's first refillable aluminium LPG canister as an affordable, cleaner-fuel alternative to wood and charcoal. It is easy-to-use, lighter and more affordable than other LPG tanks.

Clean Air Asia and the Iloilo City Government do not promote Gaz Lite or LPG over other companies or clean fuel/cooking options, and all information materials provided to the public are product neutral. Iloilo City is responsible for organizing awareness-raising activities in *barangays* (local villages) where Gaz Lite canisters presented as a cleaner fuel option.

Gaz Lite sees word-of-mouth advocacy as the best approach to reaching local people and during *barangay* meetings, Gaz Lite Clean Energy Advocates use key targeted messages agreed upon by the city and the company to talk about household air pollution and present LPG as a cleaner energy option.

Gaz Lite is supporting the roll-out of LPG canisters in Iloilo by:

- **Improving logistics:** Coordinating with different parties along the supply chain to improve business permitting, storage, distribution and sales activities in the city.
- **Improving the product's financial accessibility:** Identifying partnerships with appropriate microfinance institutions.
- **Addressing product-related safety issues:** Creating a mechanism (e.g., coordination with the Bureau of Fire Protection) to monitor and resolve product-related safety issues.

The City, Clean Air Asia, and Gaz Lite are monitoring and communicating the impacts of their collaboration, using the following indicators:

- Cleaner cooking technology product uptake.
- Economic benefits, such as micro-entrepreneur activity.
- Health and environmental impacts.

TIMELINE

MAY 2017

Iloilo City and Gaz Lite present clean cooking products at two barangay meetings. A majority of the residents express willingness to purchase the product.

MAY - AUGUST 2017

Gaz Lite partners with two microfinance institutions: Taytay sa Kauswagan, Inc. and Negros Women for Tomorrow. Forging partnerships with other microfinance institutions is expanding reach to more members.

AUGUST 2017

Gaz Lite sign a warehouse lease agreement for product storage and sets up stores in Iloilo City.

27 SEPTEMBER 2017

Official start of product promotion and sales.

OIL AND GAS

ACCELERATING METHANE AND BLACK CARBON REDUCTIONS FROM OIL AND NATURAL GAS PRODUCTION

Over the last five years the CCAC Oil and Gas initiative has worked to firmly establish methane reductions from the global oil and gas industry as a major opportunity and a necessary ingredient of any comprehensive response to address climate change.

The oil and gas sector is the largest source of global methane emissions after agriculture. However, better data is needed to further understand the scale of these emissions, with local studies suggesting that they could be bigger than previously thought.[36] Oil and gas companies, policy makers, and investors are beginning to understand the importance of reducing oil and gas methane emissions, but the absence of robust policy action in many countries continues to represent a major missed opportunity to tackle near-term warming.

Reducing emissions from the oil and gas sector can be straightforward and cost-effective. A study supported by the Environmental Defense Fund (EDF) found that North American oil and gas methane emissions can be reduced by 42% for less than one cent per million cubic feet of gas, using existing technologies.[37]

SIGNIFICANT GLOBAL METHANE LEAKAGE

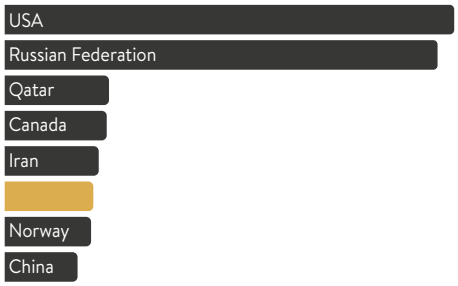
OIL AND GAS SECTOR EMITTED AROUND

22%

OF ANTHROPOGENIC METHANE IN 2015

Source: Saunois, M. et al (2016)

IN 2012 LEAKED NATURAL GAS (MOSTLY METHANE) FROM THE OIL AND GAS SECTOR WAS 3% OF PRODUCTION, EQUIVALENT TO THE OUTPUT OF NORWAY THAT YEAR.



Source: Rhodium Group, 2015

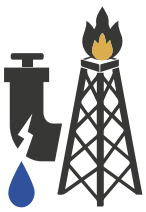
SUBSTANTIAL LOST REVENUES

AROUND **3.6 TRILLION** CUBIC FEET OF NATURAL GAS WASTED GLOBALLY IN 2012, REPRESENTING LOST REVENUES VALUED AT

$30 billion

Source: Rhodium Group, 2015

COST-EFFECTIVE MITIGATION OPPORTUNITIES



RECOVERING AND USING GAS AND FUGITIVE EMISSIONS

REDUCING LEAKAGE FROM OIL AND GAS PRODUCTION, GAS DISTRIBUTION SYSTEMS AND LONG-DISTANCE TRANSMISSION PIPELINES

18%

OF AVOIDED WARMING FROM SLCP REDUCTIONS IN 2050, ACHIEVED WITH NET SAVINGS OR LITTLE COST OVER THE LIFETIME OF THE MEASURES

Source: Time to act, 2014

40-50%

OF CURRENT OIL AND GAS RELATED METHANE EMISSIONS COULD BE AVOIDED AT NO NET COST

Source: IEA, 2017

5-YEAR MILESTONES

10 oil and gas companies, responsible for 12.5% of global oil and gas production, joined the Oil and Gas Methane Partnership and committed to systematically survey and report their participating operations for the 'core' methane emission sources.

Surveys for leaks from nine core sources were done at 50 operations in 9 countries.

OGMP partner companies reported on first year operations and emission reductions in their annual reports.

Technology demonstrations in 2 countries, Mexico and Colombia, introduced innovation and change that reduced black carbon emissions.

10 Technical Guidance documents to address core methane sources were produced and are becoming the standard for cost-effective methane management.

2016-2017 HIGHLIGHTS

At COP22 Ministers from 21 countries said oil and gas methane reductions are "the next big climate opportunity" and agreed to implement national methane reduction strategies, regulations, policies, or enhanced actions, including those that encourage energy efficiency and fuel shifts.

The initiative is overseeing a series of independent, peer-reviewed methane emissions studies to learn more about the sources and scale of methane emissions and to guide mitigation actions. EDF and the 10 OGCI companies committed over $6 million to the studies over two years. Safeguarding mechanisms were set to ensure scientific independence of the researchers.

The initiative is also developing a peer-to-peer support programme for regulating methane emissions in the oil and gas industry, starting with 3 developing-country jurisdictions.

Repsol and Shell joined the Oil and Gas Methane Partnership (OGMP) in 2016.

↑ A majority of methane emissions from oil and gas production can be reduced by preventing leaks from 9 core sources along the production chain.

TOTAL APPROVED FUNDING

$4.1 MILLION

PARTNER NEWS

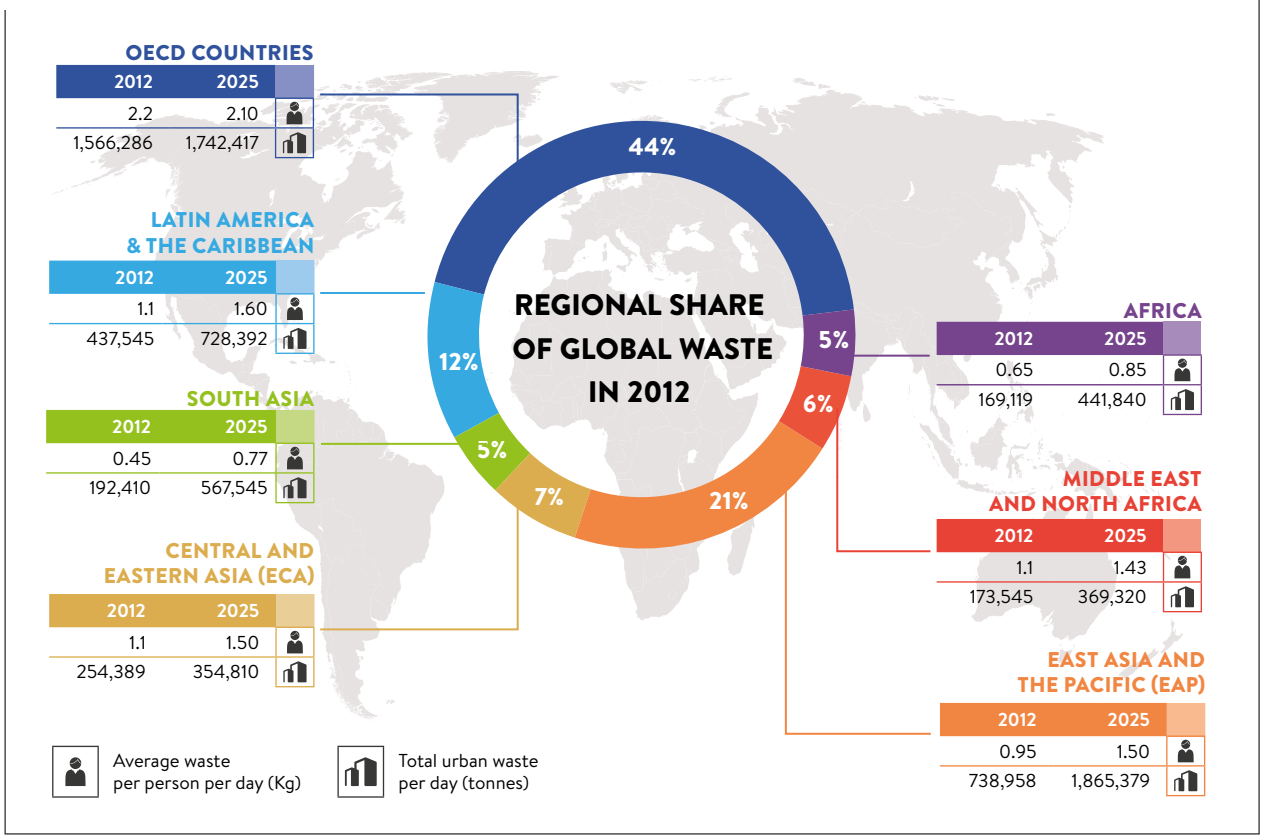
IN JUNE 2016, CANADA, MEXICO AND THE UNITED STATES COMMITTED TO REDUCE METHANE EMISSIONS IN THE OIL AND GAS SECTOR BY 40% - 45%. THIS COMMITMENT HAS LED TO REGULATORY PROCEEDINGS IN BOTH MEXICO AND CANADA. IN THE LAST YEAR, CALIFORNIA AND OHIO ALSO ANNOUNCED REGULATIONS, JOINING OTHER US STATES REDUCING OIL AND GAS METHANE, AND THE LARGEST OIL AND GAS PRODUCER IN THE UNITED STATES (EXXON MOBILE) HAS ANNOUNCED AN ENHANCED METHANE REDUCTION PROGRAM. IF ALL THREE COUNTRIES ACHIEVE THE GOAL, NORTH AMERICA COULD SEE A 20-YEAR CLIMATE BENEFIT EQUAL TO TAKING ABOUT 85 MILLION CARS OFF THE ROAD.

THE UNITED NATIONS-SUPPORTED PRINCIPLES FOR RESPONSIBLE INVESTMENT (UNPRI) LAUNCHED A GLOBAL INITIATIVE WHERE INVESTORS REPRESENTING OVER $4 TRILLION IN ASSETS WILL WORK WITH OIL AND GAS OPERATORS ACROSS THE GLOBE TO IMPROVE THEIR METHANE MANAGEMENT AND DISCLOSURE.

WASTE

MITIGATING SHORT LIVED CLIMATE POLLUTANTS FROM MUNICIPAL SOLID WASTE

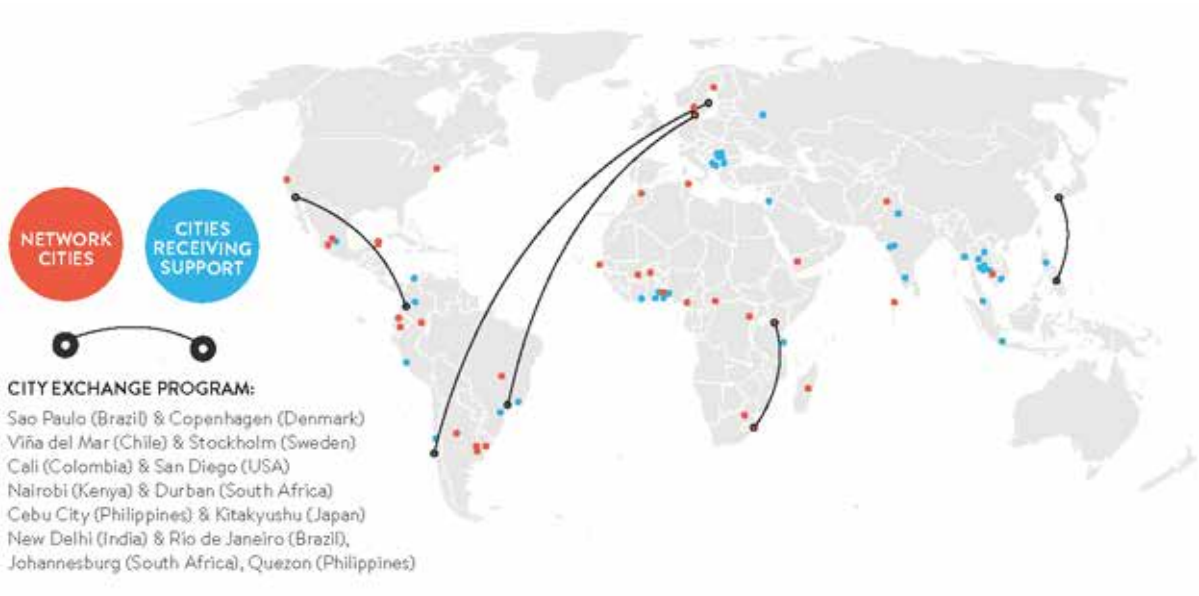
URBAN WASTE GENERATION AROUND THE WORLD 2012-2025



Source: World Bank, 2012

CCAC MUNICIPAL SOLID WASTE NETWORK

The Municipal Solid Waste initiative brings together cities, governments, organisations, and the private sector to take action on SLCPs from the waste sector.



For many cities uncollected and/or untreated waste has a deleterious impacts on human health, the environment and social issues. It is a growing burden that is becoming increasingly difficult to tackle. From 2002-2012 waste generation increased from 680 million tonnes to about 1.3 billion tonnes per year. By 2025, it is estimated to grow to 2.2 billion tonnes per year.[38]

As the third largest source of manmade methane emissions, waste contributes to climate change and ozone pollution, but there are solutions to reduce these emissions from waste. Generating energy from biogas captured from landfills – from which up to 90% of emissions can be feasibly recovered – and from anaerobic digestion reduces dependency on fossil fuels and avoids climate-forcing methane emissions.

Actions like separating organic waste and turning it into compost or bioenergy improves soil fertility, reduces the costs of developing or expanding landfills, and prevents methane emissions.

Avoiding food waste has important benefits like conserving important resources, mitigating greenhouse gas emissions and providing food to disadvantaged communities.

The CCAC Waste Initiative works with cities to develop robust and sustainable waste management systems to reduce short-lived climate pollutants and achieve development benefits. It aims to get emissions from waste reduced in at least 100 cities and work with national governments to strengthen enabling conditions. The initiative has created an online knowledge platform that brings together information from its vast cities network.

Since its inception the Waste Initiative has increased commitments on sustainable waste management including at the UN Secretary-General's Climate Summit in 2014 and as an example of concrete climate action on the UNFCCC's NAZCA platform.

5-YEAR MILESTONES

- 73 cities actively participating in a global waste network.
- Peer-to-peer exchange network with six collaborative cities: San Diego, Stockholm, Kitakyushu, Copenhagen, New Delhi, and Durban.
- 4 regional city networks scaling up activities and encouraging city cooperation.
- Guidance tools developed to guide climate friendly waste management and facilitate city waste assessments, planning, financing and waste projects implementation.
- 35 city baseline assessments and 18 city waste management workplans completed.
- Results based finance mechanism piloted in Penang, Malaysia.

2016-2017 HIGHLIGHTS

Sao Paulo, Brazil, is a partner city moving towards action. The city has started a program to develop small scale composting at all municipal schools by 2020. A handbook to guide schools was published and distributed. By properly disposing of organic waste, Sao Paulo's 1,500 municipal schools can contribute 4% of Sao Paulo State's 2020 emission reduction target.

↓ Representatives from Nairobi, Kenya, Dar es Salaam, Tanzania, and Murang'a County, Kenya visit a landfill in Durban, South Africa.

TOTAL APPROVED FUNDING

$6.3 MILLION

PARTNER NEWS

IN NOVEMBER 2016, COLOMBIA ADOPTED A NEW NATIONAL POLICY FOR THE COMPREHENSIVE MANAGEMENT OF SOLID WASTE.[x] THE POLICY FOCUSES ON CONTROLLING POLLUTING EMISSIONS, AND WILL IMPLEMENT A COMPLETE BAN ON OPEN BURNING OF WASTE.

KENYA'S WASTE TRANSFORMATION

The Coalition is helping develop policies and laws to improve waste management in Kenya and drive business and development opportunities in the sector.

Waste management is a key national priority for Kenya. The government considers improving waste management both a constitutional right – Article 42 of Kenya's constitution says every person has the right to a clean and healthy environment – and a key pillar of Kenya Vision 2030 sustainable development plan to deliver better health, air quality, improved livelihoods and economic opportunity.

↑ Waste pickers at Dandora dump, Nairobi, Kenya.

The waste crisis in Kenya is complex. Dumpsites are overflowing and poorly managed; waste leachate and fumes from waste fires threaten the health of waste pickers and neighbouring communities. Illegal dumping fouls waterways and roadsides. In Kenya's sprawling poor communities there is often no waste collection at all. Pilot waste collection, separation and recycling initiatives have been launched but must be massively scaled up. The 2010 Constitutional reforms devolved the responsibility for waste management to the county level, but thus far counties have been unable to effectively collect, transport and dispose of waste. Scant data has hampered planning and decision making. Kenya's National Environment Management Authority (NEMA) took a critical step forward in 2015 with the publication of a national Solid Waste Management Strategy, part of Kenya's Vision 2030 submission to the Sustainable Development Goals. And more recently, on August 28, 2017, Kenya's plastic bag ban, one of the world's toughest, came into force, attacking one of the biggest challenges to solid waste management in Kenya at the source.

The Climate and Clean Air Coalition is working with Kenya to deliver a project to help transform waste management across the country. The government has taken measures to intensify public and private sector led efforts and, together with Coalition implementers like Earthjustice and the Center for Clean Air Policy, draft environment, laws, regulations and strategies to institute enforceable waste management regulations, support private sector investment in the waste management industry, and promote collection, separation and recycling initiatives by non-state actors.

The first component of the project was to create a national enabling legal framework to facilitate and incentivize good county level waste regulations and practices.

The Waste Act is a key step to reducing methane and black carbon emissions from the sector through improved waste collection and separation at source, recycling of industrial wastes and consumer plastics and paper, and separation and composting of organic waste.

Additional Coalition support includes capacity building and knowledge exchange with South African waste management experts, and providing on the ground support to model counties to implement effective waste management solutions.

ROSELINE'S STORY

Management of waste at any scale is a lucrative business Kenya.

Roseline hails from Migori County in South western Kenya. She moved to Migori in 2008, from the Rift Valley as an internally displaced person. Without a source of income, she decided to invest in waste recycling. Her group of eight women and six youths are transforming plastic waste into useful products, and helping prevent SLCP emissions from the open burning of plastic.

Since 2014, Roseline has displayed her products at major international and local exhibitions. In 2015 she won first place at the Zambia International Show, and in 2016 she was featured by the National Environment Management Authority's Rapid Results Initiative as a prominent example of low level but transformative investment in waste management.

Roseline has demonstrated that investment in recycling of waste is a viable income generating venture for low income groups. With increased investment and training in skills like business plan development the group's waste recycling start-up could be scaled up.

↑ Rosalie shows off products produced from recycled waste. Encouraging private enterprise is one solution to Kenya's waste problem.

↓ Children smile during a CCAC fact-finding mission to Kajiado dumpsite, Kenya.

4. RESULTS

In 2015, the Coalition approved the Demonstrating Impacts Framework and its set of 19 standard indicators to be used as a "common currency" to monitor and communicate impacts across CCAC initiatives and workstreams, and document partner actions beyond CCAC activities in line with the 5-Year Strategic Plan priority areas. This section summarises information collected under these indicators between July 2016 and June 2017.

Almost 400 entries were submitted from 40 partner countries and institutions through the new Demonstrating Impacts online tool (launched in May 2017). This included approximately 250 entries on progress from initiatives, and 150 on new actions by partners beyond the Coalition's activities.*

Initiative reported achievements are a result of collaboration between multiple stakeholders, from governments to cities, international organisations, NGOs, research institutions and the private sector. Some are a direct result of activities funded or co-funded by the Coalition, while others are indirect achievements in which the Coalition's catalytic action played a role.

Analysis of the reported results shows that capacity building, awareness raising and outreach activities are central components of the initiatives' work. Training is the most reported indicator followed by knowledge resources and tools, political outreach and strengthened institutions. These outputs are paving the way for technology and practices changes, policy shifts and mobilisation of funding for upscaling of the Coalition's activities. Since the indicators were adopted in 2015, some initiatives have already reported impacts including SLCP emissions reductions.

DEMONSTRATED IMPACTS

METHANE EMISSIONS REDUCTION IN THE OIL AND GAS SECTOR

14,103 TONNES
IN 2015

12,668 TONNES
IN 2016-2017

REALISED SAVINGS FOR A MEXICAN OIL AND GAS FACILITY

$53 MILLION
IN 2015-2016

NET INCOME INCREASE REALISED FROM CHANGES IN TECHNOLOGIES AND PRACTICES IN THE BRICK SECTOR

ALMOST
$13 MILLION
IN 2015-2016

POTENTIAL IMPACTS

1.9 MILLION
METRIC TONS OF BLACK CARBON

1.4 MILLION
PREMATURE DEATHS

PREVENTED BY 2030 FROM FULL IMPLEMENTATION OF THE GLOBAL SULFUR STRATEGY

$514.4 MILLION
IN POTENTIAL SAVINGS FROM SPECIFIC IDENTIFIED OPPORTUNITIES FOR RECOVERING HIGH VALUE LIQUIDS IN OIL AND GAS SECTOR

Outcomes and impacts, often materialising after the initiatives' intervention, can be difficult to monitor. Initiatives are also at various stages of development, with different theories of changes and different levels of funding. This can explain the unequal levels of reported results across initiatives**.

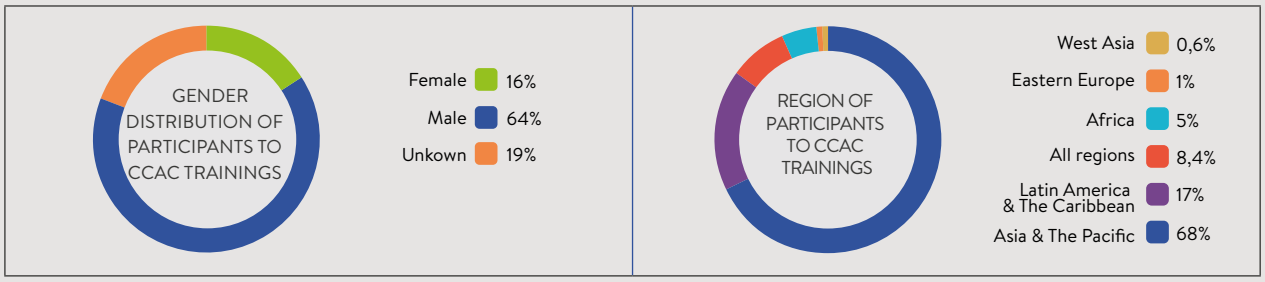
Updates on new measures by 'Partners in Action' were collected from 15 countries and the European Commission, 14 NGOs and 5 IGOs. Examples of these can be found throughout the report as "Partner News". Partners in Action reporting will be promoted in Coalition outreach materials and on the CCAC website's partner pages and Solution Centre.

* The latest version of the Demonstrating Impacts Framework is accessible to partners from : https://ccac.teamwork.com/#projects/248265/overview/summary. Please also follow this link to report some new results through the online tool (open throughout the year).

** The detailed demonstrating impacts reports by initiative are provided on the Coalition's website. For any question, please contact the CCAC Secretariat or the relevant initiative.

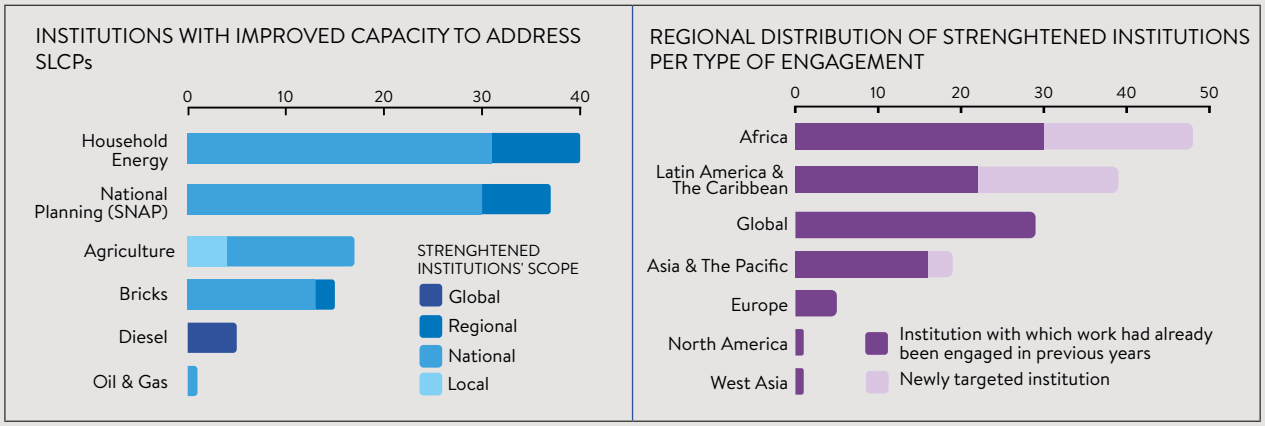
TRAINING

Approximately 5,300 people participated in **8,115 person-days** of SLCP mitigation training, the majority from the Asia and Pacific region. The Bricks, Agriculture and National Planning (SNAP) initiatives trained the most people, followed by in descending order, the Household Energy, Diesel, Waste, Cooling & Refrigerating, Regional Assessments and Urban Health initiatives.



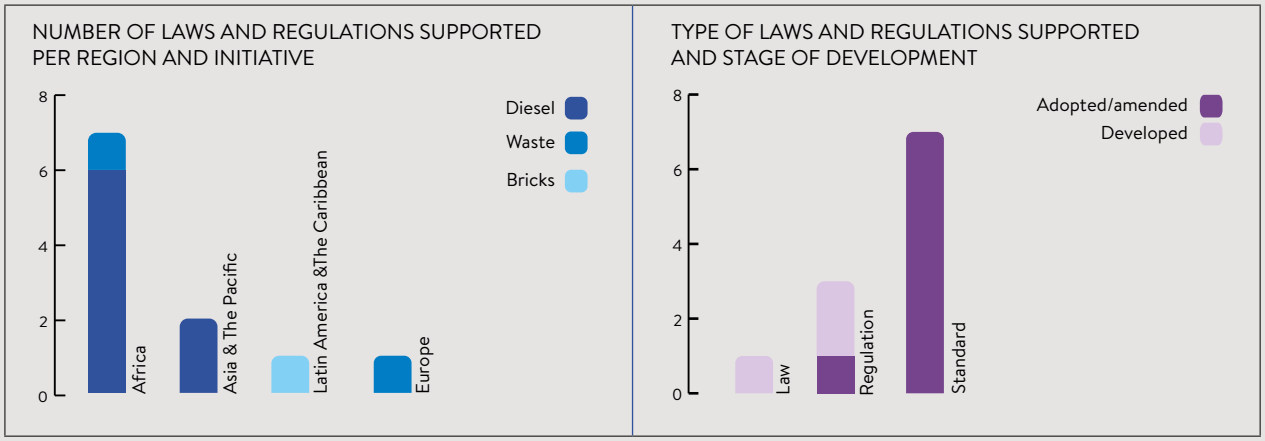
STRENGTHENED INSTITUTIONS

CCAC initiatives worked to support the **strengthening of 115 institutions.** These were mainly national institutions in Africa, Latin America and the Caribbean's and Asia and the Pacific, including, governmental agencies, IGOs, NGOs, as well as academic and research institutions, and one private sector company: PEMEX. Among these, 38 institutions were newly targeted organisations.



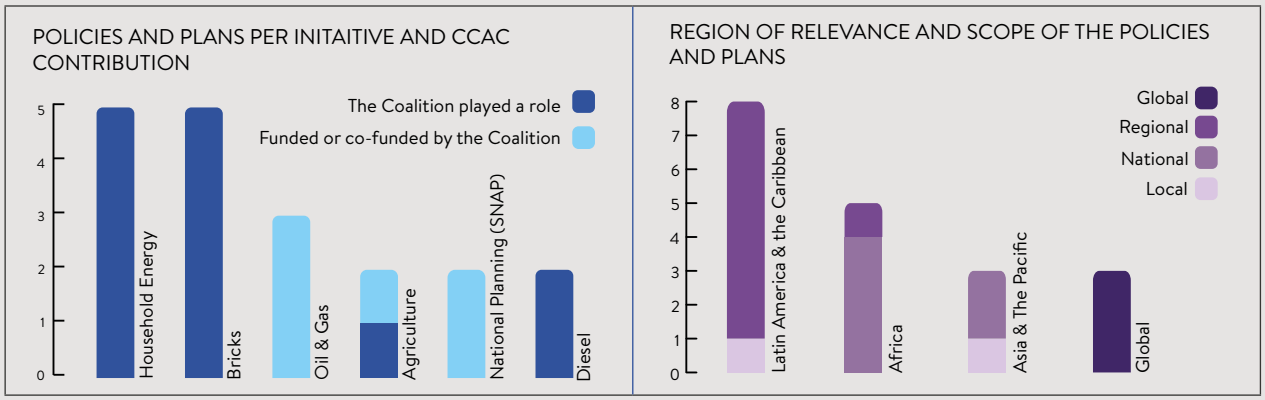
LAWS & REGULATIONS

The diesel, waste and bricks initiatives supported the development and adoption of **11 national laws, regulations and/or standards** in Australia, Colombia, Georgia, Ghana, Indonesia, Kenya, Mozambique, and Nigeria. In Georgia for instance, the waste initiative backed the development of a technical regulation on the design, construction and operation of incinerators.



POLICIES AND PLANS

19 policy instruments, including 8 strategies, 8 action plans, 2 policies and 1 programme were supported through different stages of the policy process from development to implementation. Of these, 13 beneficiated from direct financial support from the Coalition. For example, the bricks initiative assisted the development of national brick sector Strategies in Colombia, Mexico and Paraguay and the Household Energy initiative helped develop cookstove standards implementation strategies for Nigeria, Guatemala, and Kenya.



CHANGES IN TECHNOLOGIES & PRACTICES

BRICKS
- 255 MORE ENERGY EFFICIENT KILNS, EXTRUDERS AND FANS IN BRAZIL, COLOMBIA, MEXICO AND PERU.
- 3 BANGLADESH BRICK ENTREPRENEURS AND THE PAKISTAN BRICK KILN ASSOCIATION STARTED IMPLEMENTATION OF ZIG ZAG TECHNOLOGY.

DIESEL
- JAKARTA COMPLETED PROCUREMENT OF 60 COMPRESSED NATURAL GAS BUSES.

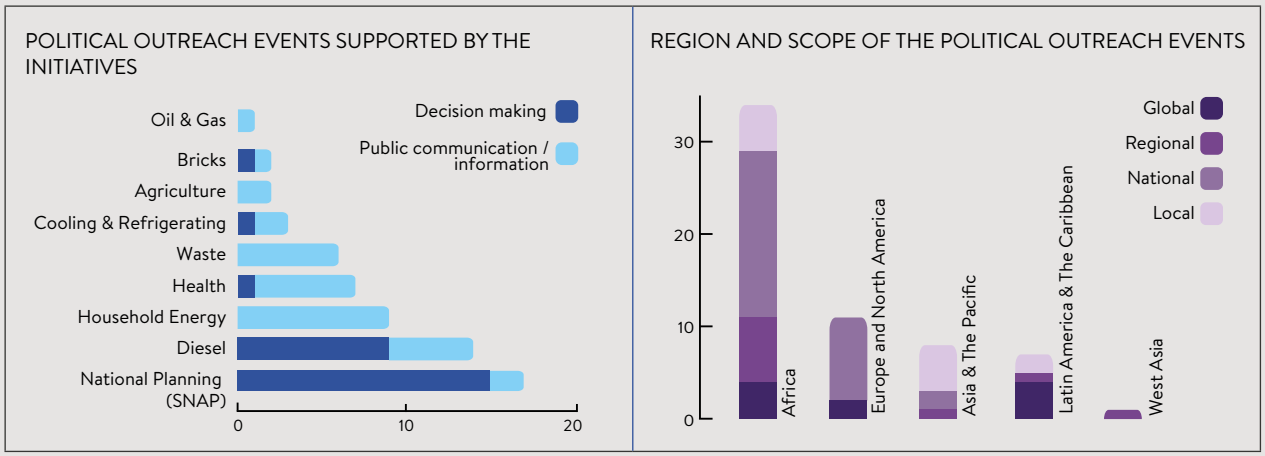
OIL & GAS
- THE THAI ENERGY COMPANY PTT INSTITUTED A DIRECTED INSPECTION AND MAINTENANCE PROGRAMME TO MANAGE ITS FUGITIVE METHANE EMISSIONS.

WASTE
- PENANG ISLAND CITY COMPLETED A PILOT PROJECT FOR THE SEPARATION AND TREATMENT OF FOOD WASTE .

COOLING & REFRIGERATING
- A SUPERMARKET IN CHILE IS THE FIRST TO ADOPT NEW ALTERNATIVES TO HYDROFLUOROCARBONS (HFCS) REFRIGERATION TECHNOLOGY.

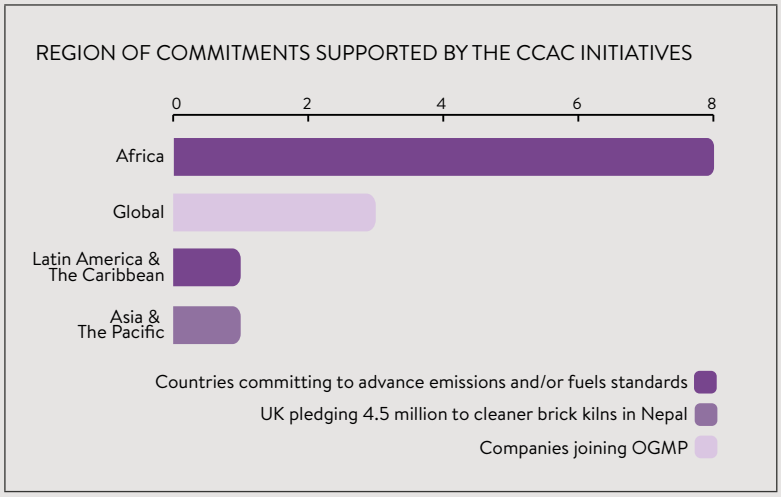
POLITICAL OUTREACH

61 political outreach events were supported by the initiatives across the globe. 27 of these were decision making meetings attended by 555 participants in total while the remaining 34 were public communication and information events joined by 1,620 participants.



COMMITMENTS

10 government and development agencies made high level commitments supporting SLCP mitigation in Benin, Brazil, Côte d'Ivoire, Ghana, Malawi, Mozambique, Nepal, Nigeria and Togo.



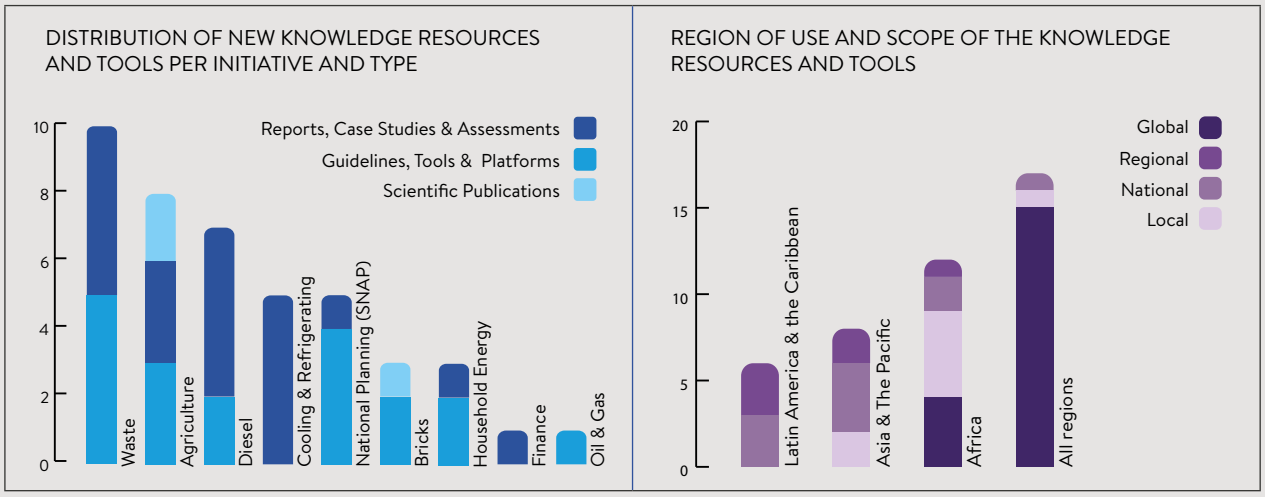
Initiatives also continued their work on media coverage of CCAC-supported or SLCP-relevant activities (indicator 2.2.1.) and to improve considerations of SLCP issues in relevant Multilateral Environmental Agreements (indicator 2.2.3.).

CO- AND CATALYSED FUNDING

Initiatives secured **$6.5 million in co-funding** for their activities, including $6 million from oil and gas companies for methane studies. Initiatives also helped **catalyse approximately $700k** of funding for SLCP mitigation beyond their activities.

KNOWLEDGE AND TOOLS, KNOWLEDGE DISSEMINATION, TOOL USE

Initiatives supported the production of 19 guidelines, tools & platforms, 21 reports, case studies & assessments and 3 scientific publications and worked actively toward their dissemination and use.



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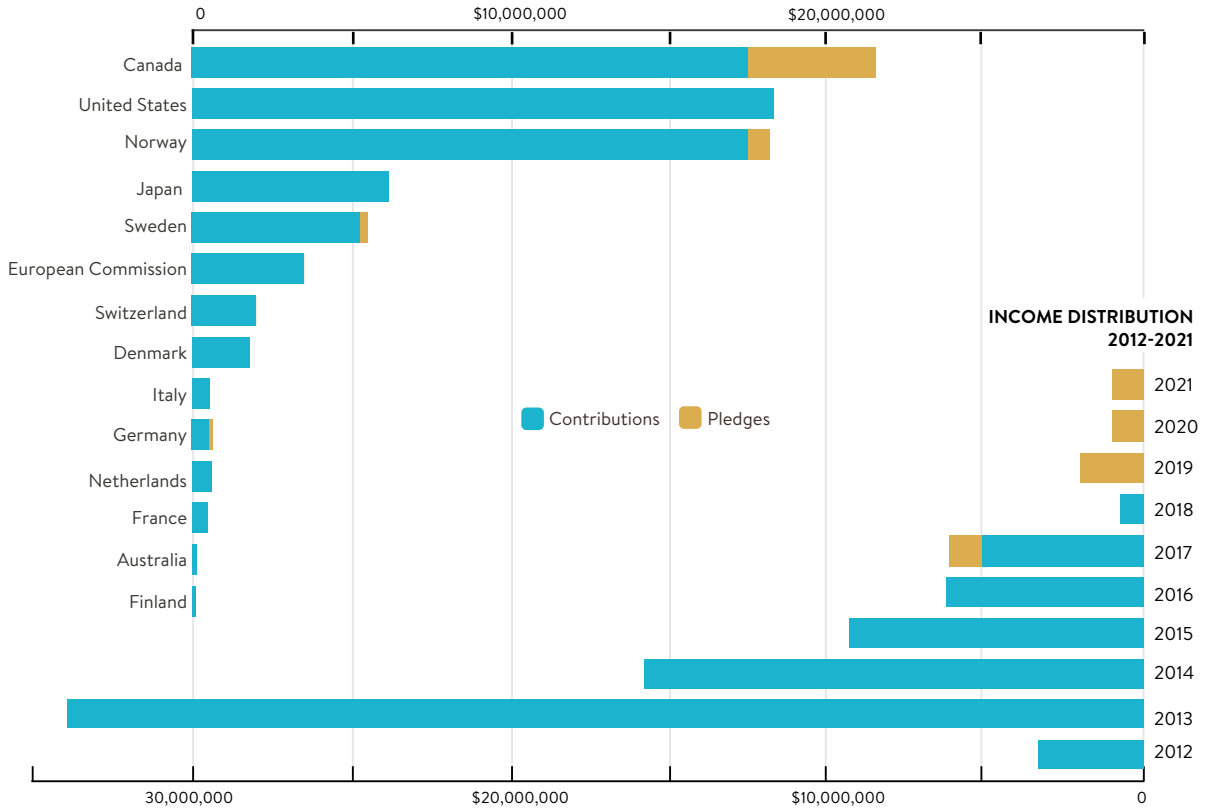
20th Working Group meeting in Santiago, Chile.

THE COALITIO

TRUST FUND

by September 2017

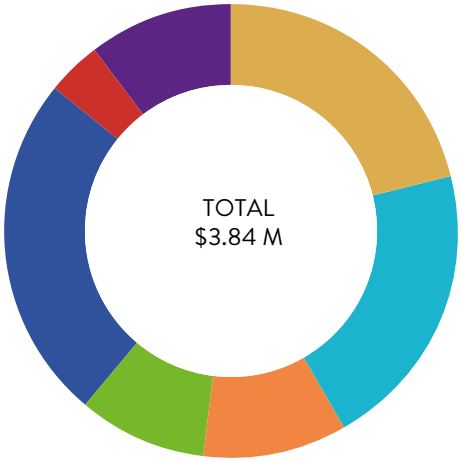
CONTRIBUTIONS TO THE TRUST FUND, RECEIVED AND PLEDGED 2012 - 2022



COUNTRY	TOTAL	CONTRIBUTIONS	PLEDGES
Canada	$21,435,067	$17,435,067	$4,000,000
United States	$18,244,574	$18,244,574	-
Norway	$18,125,499	$17,427,173	$698,326
Japan	$6,167,000	$6,167,000	-
Sweden	$5,502,393	$5,272,393	$230,000
European Commission	$3,526,049	$3,526,049	-
Switzerland	$2,018,199	$2,018,199	-
Denmark	$1,817,223	$1,817,223	-
Italy	$554,896	$554,896	-
Germany	$657,827	$544,827	$113,000
Netherlands	$625,829	$625,829	-
France	$500,279	$500,279	-
Australia	$148,134	$148,134	-
Finland	$112,740	$112,740	-
TOTAL	**$79,435,709**	**$74,394,383**	**$5,041,326**

Notes: Amounts indicated for Canada, Norway and Germany contributions in year 2017 are approximate since this is pledged to be received

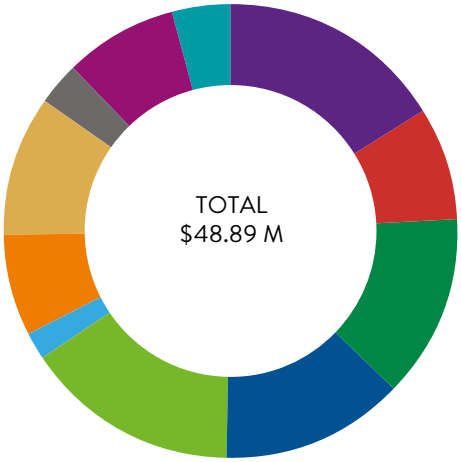
SECRETARIAT BUDGET



	ITEM	2016 EXPENSES	2017 BUDGET	2018 BUDGET
21%	Governance (incl. SC, WG, HLA, SAP meetings, travel support, partner engagement)	$876,300	$814,537	$845,264
13%	Trust Fund management (incl. contracting, donor relations, monitoring/evaluation)	$784,666	$797,852	$844,744
10%	Communication (incl. website, annual report, events, press)	$492,372	$387,666	$417,299
9%	Science (incl. SAP support, quality assurance, SPD, annual science update)	$290,156	3$51,923	$379,769
25%	Initiatives (incl. coordination)	$980,392	$951,972	$961,972
4%	SLCP Solution Centre	$80,763	$150,000	$150,000
10%	Operational costs *PSC Secretariat (13%)* *PSC Activities (8%)*	$455,604 *$455,604*	$393,915 *$305,757* *$88,158*	$412,278 *$323,320* *$88,958*
TOTAL		**$3,960,253**	**$3,847,865**	**$4,011,326**

Graphic corresponds to 2017 Secretariat Budget
PSC = UN Programme Support Cost

ALLOCATION BY INITIATIVE



	INITIATIVE	SPENT/ALLOCATED (WITHOUT PSC)
13%	Agriculture	$6,545,227
8%	Bricks	$3,872,435
16%	Diesel	$7,999,346
3%	Finance	$1,647,577
4%	Urban Health	$2,155,224
7%	Cooling and Refrigeration	$3,199,590
10%	Household Energy	$4,759,107
13%	Waste	$6,336,350
15%	National Planning for SLCPs	$7,290,230
8%	Oil and Gas	$4,062,033
2%	Regional Assessments	$1,025,100
TOTAL		**$48,892,218**

Includes April 2017 WG funding decisions on concept notes; without PSC

TRUST FUND

INITIATIVE FUNDING BY COMPONENT

AGRICULTURE $6,545,227

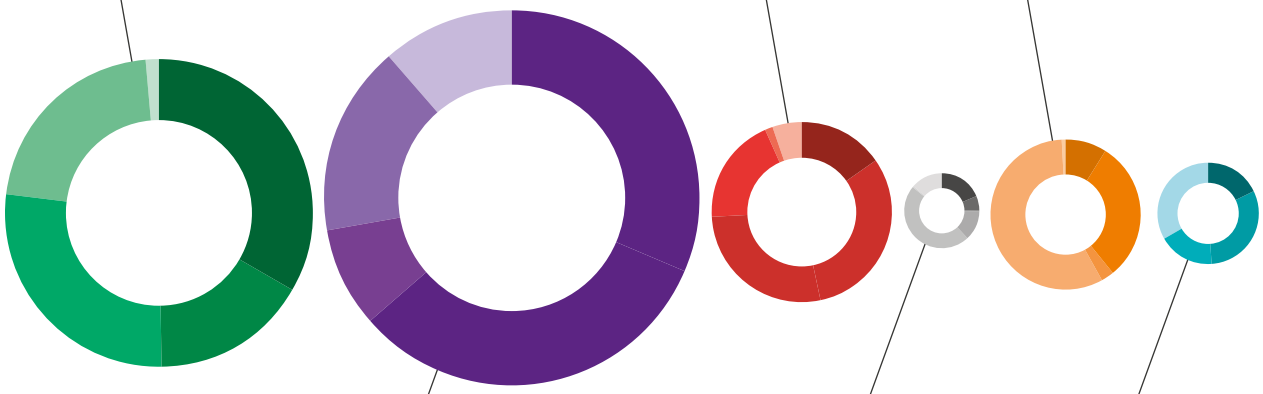
2,190,800	Manure Management
1,081,700	Open burning
1,779,373	Paddy Rice
1,416,354	Enteric Methane
77,000	Initiative-wide activities

BRICKS $3,872,435

594,390	Awareness raising and communication
1,221,453	Policy support
1,059,891	Technology Training Nodes
742,004	Climate accounting, measurement and analysis
60,000	Emergency relief funds for Nepal
194,696	Targeted Sector Support

COOLING AND REFRIGERATION $3,199,590

292,090	Conferences
965,910	HFC Inventories
86,200	Good Practice Case Studies
1,836,590	Technology Demonstration Projects
18,800	HFC Ville



DIESEL $7,999,346

2,519,140	Emission Standards
2,575,036	Global Sulphur Strategy
704,350	Green Freight
1,300,790	Ports/Marine
900,030	Bus Fleets

FINANCE $1,647,577

310,113	Black Carbon Finance Study Group
100,000	Finance Innovation Facility
9,887	Roster of experts
210,323	Targeted Assistance to CCAC sector initiatives
787,562	Targeted Assistance to financing institutions
10,000	Mainstreaming SLCPs to 144 commercial banks
219,692	Develop Pilot Auction Facility for cook stoves

URBAN HEALTH $2,155,224

388,057	Scoping Study
668,205	Breathe Life Health Campaign/Pilot City communications
381,723	Including SLCPs in health assessment tools
717,240	Pilot City - Analysis of health co-benefits/ capacity building

HOUSEHOLD ENERGY $4,759,107

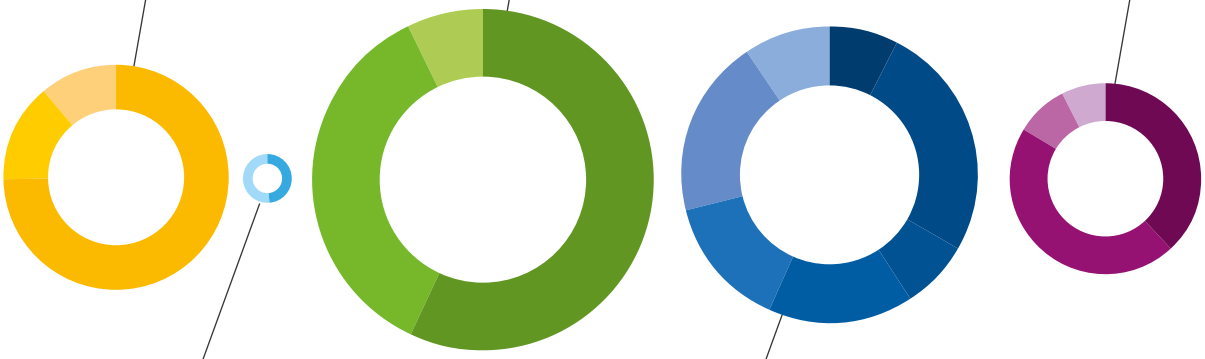
3,558,056	Clean Cooking
679,800	Domestic heating
521,250	Lighting

NATIONAL PLANNING FOR SLCPS $7,290,230

4,161,746	National Action Planning and inventories
2,618,000	Institutional Strengthening
510,485	Promoting SLCP planning through interaction with global and regional processes

OIL AND GAS $4,062,033

1,550,000	Oil and Gas Methane Partnership
1,852,033	Tech Demo
360,000	Methane studies
300,000	Regulatory Support



REGIONAL ASSESSMENTS $1,025,100

500,000	Latin America and the Caribbean
525,100	Asia Pacific

WASTE $6,336,350

488,053	City Assessments
1,626,999	City Work Plans
476,000	City and Expert Exchanges
1,010,000	Implementation and Business Plans
914,170	Workshops and conferences
1,230,928	Tools and Training materials
590,200	National action

CCAC IN SHORT

GOVERNANCE STRUCTURE AND SECRETARIAT

The Coalition's governance structure brings together state partners, non-governmental organisations (NGOs), intergovernmental organisations (IGOs) and the business community (*see CCAC Framework Document HLA/SEP2014/04A*).

The Coalition elects two co-chairs on a rotational basis from state-partner countries. They have played an important leadership role, together with their ministers.

Since its start in 2012, the following co-chairs have led the Coalition:

- Nigeria, Bahijjahtu Abubakar
- U.S.A., Jonathan Pershing
- Sweden, Annika Markovic
- Norway, Hanne Bjurstrom
- Chile, Marcelo Mena Carrasco
- Canada, Rita Cerutti & Dany Drouin
- Kenya, Alice Kaudia

HIGH LEVEL ASSEMBLY (HLA)

Ministers of state partners and the heads of non-state partners meet at least once per year to provide strategic direction and leadership to the Coalition.

WORKING GROUP (WG)

Focal points are appointed by each Coalition partner, and come together at least twice a year to strategize, share experiences and oversee all Coalition activities.

STEERING COMMITTEE (SC)

The Steering Committee is made up of the two co-chairs, six state partners, two IGO representatives, and two NGO representatives elected for staggered two-year terms. The SC provides oversight support and recommendations to the HLA and WG. The current SC members are: Canada and Kenya (co-chairs), Chile, Liberia, Norway, the Philippines, Switzerland, the United States, the International Centre for Integrated Mountain Development (ICIMOD), the Inter-American Development Bank (IDB), the Institute for Governance and Sustainable Development (IGSD), and the International Union of Air Pollution, Prevention and Environmental Protection Associations (IUAPPA).

SCIENTIFIC ADVISORY PANEL (SAP)

Up to fifteen renowned scientists are members, the UN Environment Chief Scientist serves ex officio.

↑ Opening of the 21st Working Group meeting in Paris, France.

SECRETARIAT

The Secretariat is hosted by UN Environment in Paris, France, and works to support the Coalition in the administration of the CCAC Trust Fund, governance, initiative support, the SLCP Solution Centre, the Scientific Advisory Panel, and advocacy & communication work with partners.

Head of Secretariat
Helena Molin Valdes

Senior Programme & Science Officer
Valentin Foltescu

Programme Management Officer
Seraphine Haeussling

Partnership & Programme Officers
James Morris
Tatiana Kondruchina

Senior Fellow
Dan McDougall

Communication Officers
Tiy Chung
Carrie Dodds

SNAP Initiative Coordinator & Solution Centre Officer
Elsa Lefèvre

Agriculture and Bricks Initiatives Coordinator
Catalina Etcheverry

Household Energy and Finance Initiatives Coordinator
Yekbun Gurgoz

Heavy Duty Diesel Vehicles and Engines and HFC Initiatives Coordinator
Denise Sioson

Oil and Gas Initiative Coordinator and Global Methane Partnership Administrator
Philip Swanson

Regional Assessment Initiative Coordinator
Nathan Borgford-Parnell

Waste Initiative Coordinator
Sandra Mazo-Nix

Urban Health Initiative Coordinator
Sandra Cavalieri

Special Advisor/Demonstrating Impacts
Sophie Bonnard

Administrative Team

Financial Management Officer
Rima Dabbagh

Tara Bukow
Eduardo Sanchez Mera
Isabelle Simedou
Nadine Zimper

→ CCAC secretariat at a municipal solid waste treatment plant in Paris.

MEETINGS

WORKING GROUP MEETINGS

18th Working Group (20-21 September 2016, Paris, France) – main topics included: first conversation on the "Global Pathway Approach" and preparations for the Marrakech, November 2016, High Level Assembly. The meeting also: discussed findings of and closed the Task Team on Partnership & Process, elected new SAP members; and launched the "SLCP Solutions Centre".

19th Working Group (12 November 2016, Marrakech, Morocco) – met to finalise preparations for the High Level Assembly, finalising the text of the Marrakech Communiqué. A new way forward for the CCAC's funding process was approved in principle.

20th Working Group (26-27 April 2017, Santiago, Chile) – main topics included: updates on SLCP science, including outcomes of a workshop on near-term metrics; approval of funding decisions following the newly agreed process; agreement on the process for country Partner reporting on the Marrakech Communiqué voluntary commitments; advanced preparations for the 2017 High Level Assembly, including proposals for voluntary commitments related to the agriculture and municipal solid waste sectors.

HIGH-LEVEL ASSEMBLY

8th High Level Assembly (14 November 2017, Marrakech, Morocco) adopted the "Marrakech Communiqué" with individual country Partners making voluntary commitments on black carbon inventories, support to the CCAC "Global Strategy to Introduce Low-Sulfur Fuels and Cleaner Diesel Vehicles" and/or action to reduce methane and black carbon from oil and gas operations.

STEERING COMMITTEE MEETINGS

The Steering Committee met monthly throughout the year to prepare the ground for Working Group and High Level Assembly discussions. For example, the Steering Committee over the last year concluded the work of the Task Team on Partnership and Process (leading to reform of the funding process, among other things); raised the issue of SLCP financing and fundraising, establishing a dedicated Task Team to address this important topic. They also established a Funding Proposal Task Team, that will convene anew for each funding cycle (with invitations to all donors) to help prepare sound recommendations on funding.

FINANCE STRATEGY TASK TEAM

Established in June 2017, this group of Partners is analysing the best approach to attract more funding to SLCP projects. The Task Team met in August 2017 in Washington DC, hosted by the Inter-American Development Bank.

DEMONSTRATING IMPACTS TASK TEAM

The work by the Demonstrating Impacts Task Team was completed over the reporting period. Approved by the HLA in December 2015 the demonstrating impacts framework was tested by initiatives and partners from June to December 2016. Following the testing period the revised framework was finalized in May and launched in June 2017. In parallel an online demonstrating impacts tool was developed and applied by the partners for their 2016-2017 reporting. In addition to the annual call for voluntary 'Partners in Action' submissions, the Secretariat now actively tracks country/organisation action on SLCPs.

HEALTH TASK FORCE

The Health Task Force supports the development of the BreatheLife campaign, and met on the margins of the CCAC Working Group meetings on 26 September 2017 and 24 April 2017 (together with the Household Energy Initiative). Task Team members will support outreach to bring cities and countries to the BreatheLife Campaign Network.

PATHWAY APPROACH TASK TEAM

The Pathway Approach Task Team was established by decision of the Working Group in April 2017. The Task Team developed a discussion paper addressing key questions and facilitated a discussion at the September 2017 Working Group meeting. The Task Team will continue its work to the end of April 2018 and work with partners to collect case studies and perform practical tests of the pathway approach in more coalition countries.

→ Charles Haines, Canada, Dany Drouin, Working Group Co-Chair, Helena Molin Valdes, Head, CCAC Secretariat, and Dan McDougall, CCAC Secretariat working on the draft Bonn Communique.

PARTNERS AND ACTORS

120 PARTNERS, 57 STATE AND REIO, 17 IGO AND 45 NGO PARTNERS (as of September 2017)

STATE AND REIO (58)

- Australia
- Bangladesh
- Belgium
- Benin
- Cambodia
- Canada
- Central African Republic
- Chad
- Chile
- Colombia
- Congo, Democratic Republic of the
- Costa Rica
- Cote d'Ivoire
- Denmark
- Dominican Republic
- Ethiopia
- ECOWAS Commission*
- European Commission
- Finland
- France
- Germany
- Ghana
- Guinea, Republic of
- Iraq, Republic of
- Ireland
- Israel
- Italy
- Japan
- Jordan
- Kenya
- Korea, Republic of
- Laos
- Liberia
- Luxembourg*
- Maldives, Republic of the
- Mali
- Mexico
- Moldova, Republic of
- Mongolia
- Morocco, Kingdom of
- Netherlands
- New Zealand
- Nigeria
- Norway
- Pakistan*
- Paraguay
- Peru
- Philippines
- Poland
- Russian Federation
- Rwanda
- Sweden
- Switzerland
- Togo
- United Kingdom
- United States
- Uruguay
- Vietnam*

IGOS (17)

- Asian Development Bank (ADB)
- European Investment Bank (EIB)
- Food and Agricultural Organisation of the United Nations (FAO)
- Inter-American Development Bank (IDB)
- Inter-American Institute for Cooperation on Agriculture (IICA)
- International Centre for Integrated Mountain Development (ICIMOD)
- Nordic Environment Finance Corporation (NEFCO)
- Organisation for Economic Co-operation and Development (OECD)
- Regional Environmental Center (REC)
- UN-Habitat
- UN Development Programme (UNDP)
- UN Economic Commission for Europe (UNECE)
- UN Environment Programme
- UN Industrial Development Organization (UNIDO)
- World Bank
- World Health Organization (WHO)
- World Meteorological Organization (WMO)

NGOS (45)

- Asian Institute of Technology (AIT)
- Bellona Foundation
- BSR
- C40 Cities Climate Leadership Group
- Caucasus Environmental NGO Network (CENN)
- CDP
- CEID Colombia
- Center for Human Rights and Environment (CEDHA)
- Centre for Clean Air Policy (CCAP)
- Centre for Science and Environment (CSE)
- Centro Mario Molina Chile
- Clean Air Asia
- Clean Air Institute
- Clean Air Task Force
- Climate Markets & Investment Association (CMIA)
- ClimateWorks Foundation
- Earthjustice
- Environmental Defense Fund (EDF)
- Environmental Investigation Agency (EIA)
- EvK2CNR Committee
- FIA Foundation
- Global Alliance for Clean Cookstoves
- Global Methane Initiative (GMI)
- GLOBE Foundation
- Guraghe Development Association (Ethiopia)
- Institute for Advanced Sustainability Studies (IASS)
- Institute for Energy and Environment (IEMA)
- Institute for Global Environmental Strategies (IGES)
- Institute for Governance and Sustainable Development (IGSD)
- International Climate Change Partnership (ICCP)
- International Council on Clean Transportation (ICCT)
- International Cryosphere Climate Initiative (ICCI)
- International Institute for Sustainable Development (IISD)
- International Network for Environmental Compliance and Enforcement (INECE)
- International Solid Waste Association (ISWA)
- International Union of Air Pollution, Prevention and Environmental Protection Associations (IUAPPA)
- Local Governments for Sustainability (ICLEI)
- Molina Center for Strategic Studies in Energy and the Environment
- Natural Resources Defense Council (NRDC)
- Network for Environment and Sustainable Development in Africa (NESDA-REDDA)
- Stockholm Environment Institute (SEI)
- Smart Freight Centre
- Swiss Foundation for Technical Cooperation (Swisscontact)
- TERRE Policy Centre
- The Energy and Resources Institute (TERI)

*4 partners in final stages of approval as of September 1

ACTORS (as of September 2017)

AGRICULTURE
- Climate Change, Agriculture and Food Security Research Program (CCAFS)
- Eastern Research Group (ERG)
- Global Research Alliance on Agricultural Greenhouse Gases (GRA)
- Great Lakes Climate Network (RCGL)
- International Center for Tropical Agriculture (CIAT)
- International Livestock Research Institute
- International Rice Research Institute (IRRI)
- Livestock & Poultry Environmental Learning Center (LPELC)
- Michigan Technological University
- Transparency and Economic Development Initiatives (TEDI)
- Tropical Agricultural Research and Higher Education Centre (CATIE)
- University of Vermont
- Wageningen University

BRICKS
- Arcadis
- Centro de Innovación Aplicada en Tecnologías Competitivas (CIATEC)
- Climate and Health Research Network (CHeRN)
- Corporación Ambiental Empresarial (CAEM)
- Great Lakes Climate Network (RCGL)
- Greentech Knowledge Solutions (GKSPL)
- MinErgy Nepal
- Skat Inc.
- Stratus Consulting
- The Brooke Organisation
- The Gold Standard Foundation
- University of Illinois

DIESEL
- Gibraltar
- City of Jakarta
- Vietnam
- Abidjan-Lagos Corridor Organization (ALCO)
- Association for Southeast Asian Nations
- Fundación Centro de Gestión Tecnológica e Informática Industrial (CEGESTI)
- Deutsche Umwelthilfe e.V. (DUH)
- Gadjah Mada University Center for Transportation and Logistics Studies
- Mexican Center for Environmental Law (CEMDA)

FINANCE
- AURAIA
- ClimateCare
- ClimateKIC
- Global Fund for Cities Development (FMDV)
- Gold Standard Foundation
- Frankfurt School of Finance & Management
- I4CE
- Standard Microfinance Bank
- TeamCobyNigeria
- UN Environment DTU Partnership
- Xac Bank

COOLING AND REFRIGERATION
- ASHRAE, Inc.
- Air-Conditioning, Heating, and Refrigeration Institute (AHRI)
- Alliance for Responsible Atmospheric Policy
- Australian Refrigeration Association
- Centro Studio Galileo
- CLASP
- The Coca-Cola Company
- Chemours (formerly DuPont)
- European Partnership for Energy and the Environment (EPEE)
- Honeywell
- Ingersoll Rand
- North American Sustainable Refrigeration Council (NASRC)
- Refrigerants Australia
- Refrigerants, Naturally!
- Shecco

URBAN HEALTH
- Abidjan-Lagos Corridor Organization (ALCO)
- ClimateCare
- Health and Environment Alliance (HEAL)
- Health Care Without Harm
- The Global Climate and Health Alliance
- Vital Strategies
- World Medical Association

HOUSEHOLD ENERGY
- Abidjan-Lagos Corridor Organization (ALCO)
- Argentina
- ClimateCare
- Deutsche Umwelthilfe e.V. (DUH)
- ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREE)
- Envirofit
- FairClimateFund
- Frankfurt School of Finance and Management
- Fundacion Solar
- Gold Standard Foundation
- Hivos
- Microsol
- Project Gaia
- UN Environment DTU Partnership

OIL & GAS
- Carbon Limits
- Carleton University
- Clearstone Engineering Ltd
- Eastern Research Group (ERG)
- Further by Design
- Gas Technology Development Center (CDT de GAS)
- GHGSat | Global Emissions Monitoring
- Mansarovar
- Pacific Rubiales
- Pembina Institute
- Petroleum Technology Alliance of Canada (PTAC)

Partner companies of the CCAC Oil & Gas Methane Partnership
- BP
- ENGIE E&P
- ENI
- PEMEX
- PTT
- Southwestern
- Statoil
- Total
- Repsol
- Shell

REGIONAL ASSESSMENTS
- Centre for Climate Research and Development (CCRD)
- NASA Goddard Institute for Space Studies (NASA-GISS)
- USP

NATIONAL PLANNING FOR SLCPs
- Oxfam

WASTE
- Abt Associates
- Brazilian Association of Urban Cleansing and Waste Management Companies (ABRELPE)
- Eastern Research Group (ERG)
- Gevalor
- Global Environment Center Foundation (GEC)
- Fundación Centro de Gestión Tecnológica e Informática Industrial (CEGESTI)
- Network of Associations of Local Authorities in South-east Europe (NALAS)
- SCS Engineers
- Serbian Solid Waste Association (SeSWA)
- WASTE advisers on urban environment and development
- United Nations Centre for Regional Development (UNCRD)

Together with the cities of
- Abidjan (Cote d'Ivoire)
- Accra (Ghana)
- Addis Ababa (Ethiopia)
- Amman (Jordan)
- Avellaneda (Argentina)
- Bangkok (Thailand)
- Bangui (Central African Republic)
- Barranquilla (Colombia)
- Battambang (Cambodia)
- Boras (Sweden)
- Brasilia (Brazil)
- Cali (Colombia)
- Cancun (Mexico)
- Cebu (Philippines)
- Concepcion (Chile)
- Copenhagen (Denmark)
- Cordoba (Argentina)
- Cotonou (Benin)
- Cuenca (Spain)
- Curitiba (Brazil)
- Dar es Salaam (Tanzania)
- Dehli (India)
- Dhaka (Bangladesh)
- Durban (South Africa)
- Fes (Morocco)
- Ho Chi Minh City (Vietnam)
- Jakarta (Indonesia)
- Johannesburg (South Africa)
- Lagos (Nigeria)
- Lahore (Pakistan)
- Lima (Peru)
- Lome (Togo)
- Male (Maldives)
- Maptaphut (Thailand)
- Nairobi (Kenya)
- Naucalpan (Mexico)
- Panvel (India)
- Penang (Malaysia)
- Phitsanulok (Thailand)
- Puerto Morelos (Mexico)
- Queretaro (Mexico)
- Quezon (Philippines)
- Rayong (Thailand)
- Rio de Janeiro (Brazil)
- Sanaa (Yemen)
- Sao Paolo (Brazil)
- Siem Reap (Cambodia)
- Stockholm City (Sweden)
- Surabaya (Indonesia)
- Temuco (Chile)
- Toluca (Mexico)
- Tunis (Tunisia)
- Umea (Sweden)
- Ventiane (Lao PDR)

Vina del Mar (Chile)
Yangon (Myanmar)

LEAD PARTNERS AND IMPLEMENTERS BY INITIATIVE (as of September 2017)

INITIATIVE	LEAD PARTNERS	IMPLEMENTERS
AGRICULTURE	• Bangladesh • Canada • European Commission (EC) • Food and Agriculture Organization of the United Nations (FAO) • Ghana • International Cryosphere Climate Initiative (ICCI) • Japan • New Zealand • Nigeria • United States • World Bank	• Center for Tropical Agricultural Research and Education (CATIE) • Dienst Landbouwkundig Onderzoek (DLO) • Food and Agriculture Organization (FAO) of the United Nations • International Center for Tropical Agriculture (CIAT) • International Cryosphere Climate Initiative (ICCI) • International Livestock Research Institute (ILRI) • International Rice Research Institute (IRRI) • New Zealand Agricultural Greenhouse Gas Research Centre (NZAGGRC) • Punjab Agricultural Management & Extension Training Institute (PAMETI) • Stockholm Environment Institute (SEI)
BRICKS	• Center for Human Rights and Environment (CEDHA) • Colombia • Institute for Advanced Sustainability Studies (IASS) • Institute for Governance and Sustainable Development (IGSD) • Mexico • Switzerland • World Bank	• Corporación Ambiental Empresarial (CAEM) • Center for Human Rights and Environment (CEDHA) • Climate and Health Research Network (CHRN) • Federation of Nepalese Brick Industries (FNBI) • International Centre for Integrated Mountain Development (ICIMOD) • Green Tech Knowledge Solutions • National Institute of Ecology and Climate Change (INECC) • MinErgy Pvt. Ltd. Nepal • Mountain Air Engineering • Swiss Foundation for Technical Cooperation (Swisscontact) • University of Illinois
DIESEL	• Canada • International Council on Clean Transportation (ICCT) • Switzerland • UN Environment • United States	• International Council on Clean Transportation (ICCT) • UN Environment
COOLING AND REFRIGERATION	• Canada • United States	• UN Development Programme (UNDP) • UN Environment • UNIDO • Institute for Governance and Sustainable Development (IGSD) • World Bank
HOUSEHOLD ENERGY	• Colombia • Finland • Global Alliance for Clean Cookstoves/United Nations Foundation (GACC) • International Cryosphere Climate Initiative (ICCI) • Nigeria • Poland • TERRE Policy Centre • UN Development Programme (UNDP) • UN Environment	• International Cryosphere Climate Initiative (ICCI) • Global Alliance for Clean Cookstoves (GACC) • Stockholm Environment Institute (SEI) • UN Development Programme (UNDP) • UN Environment
OIL & GAS	• Netherlands • Nigeria	• Clearstone Engineering Ltd • Petroleum Technology Alliance (PTAC) • UN Environment

INITIATIVE	LEAD PARTNERS	IMPLEMENTERS
WASTE	• C40 Cities Climate Leadership Group • Canada • International Solid Waste Association (ISWA) • Japan • Mexico • UN Environment Technology Center • United States • World Bank	• C40 Cities Climate Leadership Group • International Solid Waste Association (ISWA) • Brazilian Association of Solid Waste Management (Abrelpe) • Global Environment Center Foundation (GEC) • Institute for Environmental Strategies (IGES) • Center for Clean Air Policy (CCAP) • Gevalor • TERI • Swedish EPA • Cegesti • TERRE Policy Centre • UN Environment International Environmental Technology Center • Regional Resource Centre for Asia and the Pacific (RRCAP) • World Bank
FINANCE	• Inter-American Development Bank • Nordic Environment Finance Corporation (NEFCO) • UN Environment Finance Initiative • World Bank	• UN Environment Finance Initiative • World Bank • FS-UNEP Collaborating Centre of Frankfurt School of Finance and Management gGmbH, UNEP DTU Partnership • Microsol
URBAN HEALTH	• Clean Air Asia • International Centre for Integrated Mountain Development (ICIMOD) • Norway • UN Environment • UN Habitat • United States • World Bank • World Health Organization • ICLEI	• World Health Organization • UN Environment • UN Habitat • ICLEI
REGIONAL ASSESSMENT	• Institute for Advanced Sustainability Studies (IASS) • International Centre for Integrated Mountain Development (ICIMOD) • International Union of Air Pollution, Prevention and Environmental Protection Associations (IUAPPA) • Mexico • Stockholm Environment Institute (SEI) • UN Environment	• Institute for Environmental Strategies (IGES) • Stockholm Environment Institute (SEI) • UN Environment
NATIONAL PLANNING FOR SLCPS	• International Union of Air Pollution, Prevention and Environmental Protection Associations (IUAPPA) • Institute for Governance and Sustainable Development (IGSD) • Mexico • Molina Center for Energy and the Environment (MCE2) • Morocco • Stockholm Environment Institute (SEI) • UN Environment • United-States	• Bangladesh • Benin • Cambodia • Central African Republic • Chile • Colombia • Cote d'Ivoire • Ethiopia • Ghana • International Union of Air Pollution, Prevention and Environmental Protection Associations (IUAPPA) • Institute for Governance and Sustainable Development (IGSD) • Jordan • Kenya • Liberia • Mali • Maldives • Mexico • Moldova • Molina Center for Energy and the Environment (MCE2) • Morocco • Nigeria • Paraguay • Peru • Philippines • Stockholm Environment Institute (SEI) • Togo • UN Environment • Uruguay

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