



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

Climate and Clean Air Coalition Municipal Solid Waste Initiative: Driving transformative changes in waste management practices in cities.

**Global Methane Initiative
Biogas Subcommittee Meeting
Baltimore, MD, September 27, 2017**

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Outline

- Introduction to the Climate and Clean Air to Reduce Short-lived Climate Pollutants (CCAC)
- Municipal Solid Waste Initiative
- Examples of work related to biogas



ORIGINS OF THE COALITION

The CCAC was formed on 16 February, 2012, to mitigate the impacts of short-lived climate pollutants and address near-term climate change. The Coalition is a unique initiative to support fast action and make a difference on several fronts at once: public health, food and energy security and climate.



The founding seven members of the CCAC: the governments of Bangladesh, Canada, Ghana, Mexico, Sweden and the United States, and the United Nations Environment Programme (UN Environment).





CLIMATE & CLEAN AIR COALITION

TO REDUCE SHORT-LIVED
CLIMATE POLLUTANTS

Objective: Leverage high-level engagement, and catalyze rapid and concrete action to address SLCPs as a global and collective challenge to protect the environment and public health, promote food and energy security, and address air pollution and near term climate change.

Strategy:

Voluntary and non-binding,
action-oriented,
partner-driven,
multi-stakeholders,
collaborative,
building on sound science,
catalytic,
targeting high level decision
makers,
building on and bringing
together existing efforts,
complementary to CO₂.

WHAT ARE SHORT-LIVED CLIMATE POLLUTANTS?

SLCPs are substances with relatively short lifetime in the atmosphere and a warming influence on near-term climate.

SUBSTANCE	ANTHROPOGENIC SOURCES	LIFETIME IN ATMOSPHERE	LOCAL	REGIONAL	GLOBAL
BLACK CARBON (BC)		DAYS	●	○	🌐
METHANE (CH₄)		12 YEARS	●	○	🌐
TROPOSPHERIC OZONE (O₃)		WEEKS	●	○	🌐
HYDROFLUORO-CARBONS (HFCs)		15 YEARS (WEIGHTED BY USAGE)			🌐



WHAT ARE THE IMPACTS OF SLCPs?



Harm public health



Reduce food security



Warm the atmosphere



Increase ice and snow melting



Disrupt weather patterns



WHY DO WE NEED TO ACT ON SLCPs URGENTLY?

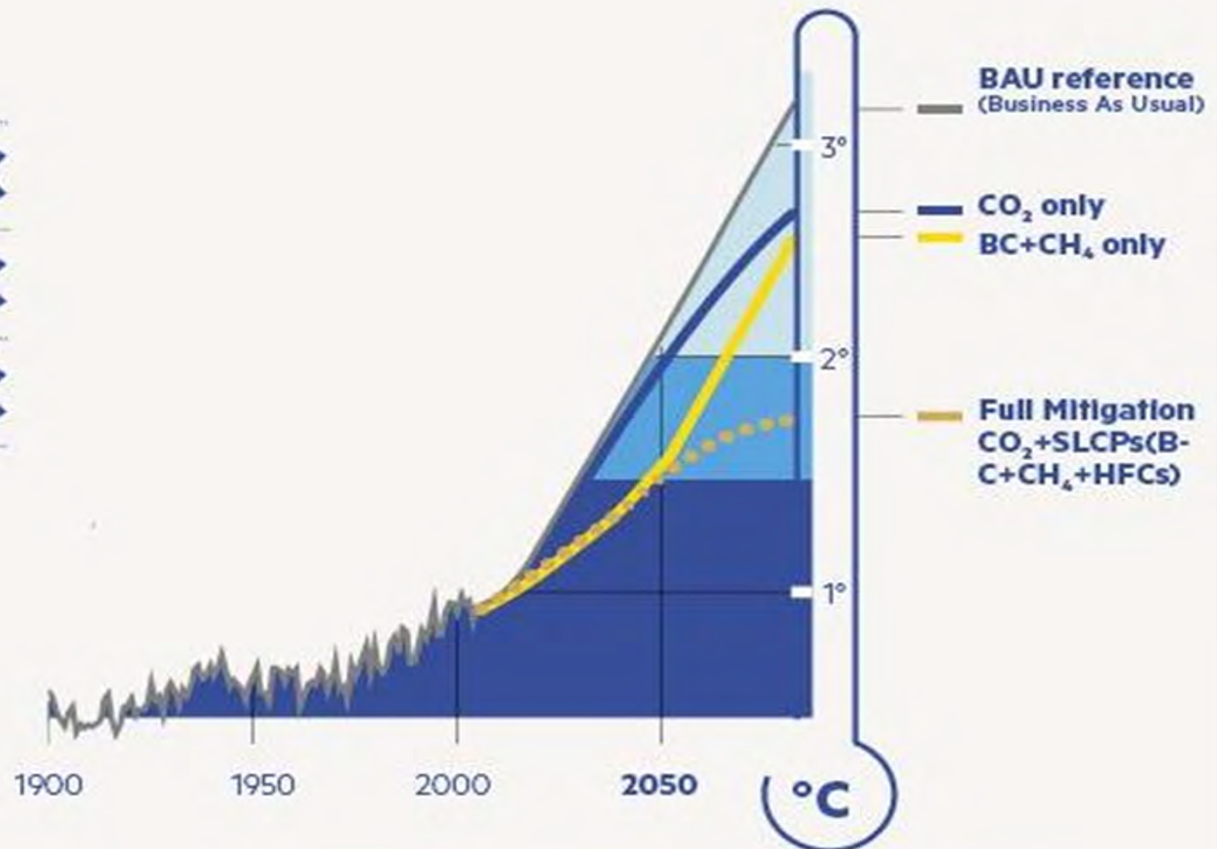
SLCP CLIMATE BENEFITS

Avoided Global Warming **by 2050**

BC + CH₄ **0.5°C**

HFCs **0.1°C**

SLCPs **0.6°C**



SIMULATED TEMPERATURE CHANGE
UNDER VARIOUS MITIGATION SCENARIOS

WHAT ARE THE BENEFITS OF CUTTING SLCPs EMISSIONS?

ANNUAL BENEFITS

From large-scale mitigation **by 2030**

CLIMATE



AVOIDED WARMING


REDUCED RATE
OF SEA-LEVEL RISE
BY ~20% BY 2050


REDUCED RATE
OF MELTING


REDUCED RATE
OF SEA-LEVEL RISE
BY ~20% BY 2050

HEALTH



**2.4
MILLION**


AVOIDED PREMATURE
DEATHS ANNUALLY
FROM OUTDOOR
AIR POLLUTION

REDUCED AIR POLLUTION
- WORLD'S LARGEST
ENVIRONMENTAL HEALTH RISK

CROPS



**52
MILLION**

TONNES OF AVOIDED
CROP LOSSES FROM
4 MAJOR STAPLES YEAR

HOW CAN SLCPs EMISSIONS BE REDUCED?

Control measures that involve already existing technologies and practices could significantly reduce SLCPs emissions if implemented around the world.

- 40% of methane emissions
- 80% of black carbon emissions



MEASURES aiming at reducing Black Carbon

BC

01.

Replace traditional biomass cookstoves with **modern fuel cookstoves**



02.

Replace traditional cooking and heating with **clean-burning biomass stoves**



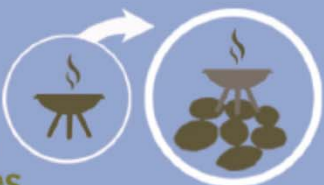
03.

Replace wood stoves and burners with **pellet stoves**



04.

Replace lump coal with **coal briquettes** for cooking and heating

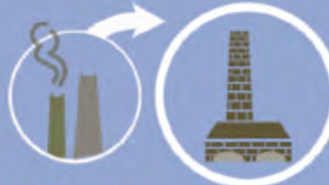


Residential Sector

Industry

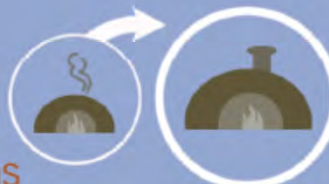
05.

Replace traditional brick kilns with **improved kilns**



06.

Replace traditional coke ovens with **modern recovery ovens**



Transport

07.

Diesel particulate filters for road and off-road vehicles (EURO VI)



08.

Eliminate **high-emitting diesel vehicles**



Agriculture

09.


Ban **open-field burning** of agricultural waste




MEASURES aiming at reducing Methane emissions


CH₄


Agriculture


10. Intermittent aeration of continuously flooded rice paddies 

11. Improve manure management and animal feed 

Fossil Fuel

12. Pre-mine degasification, recovery, and oxidation of CH₄ from ventilation⁴ air from coal mines 

13. Recovery and utilization of gas and fugitive emissions from oil and natural gas production 

14. Reduce leakage from long-distance gas transmission pipelines 

Waste Management

15. Separation and treatment of biodegradable municipal waste and landfill gas collection 

16. Upgrade wastewater treatment with gas recovery and overflow control 

MEASURE aiming at reducing HFC emissions

+HFC measures
Replacement of high climate impact HFCs with **low impact alternatives**



CCAC INITIATIVES



AGRICULTURE



BRICKS



COOKSTOVES &
HEATSTOVES



DIESEL



OIL & GAS



HFCs



WASTE



ASSESSMENTS



FINANCE



SNAP



URBAN HEALTH

7 sectoral and 4 cross-cutting initiatives



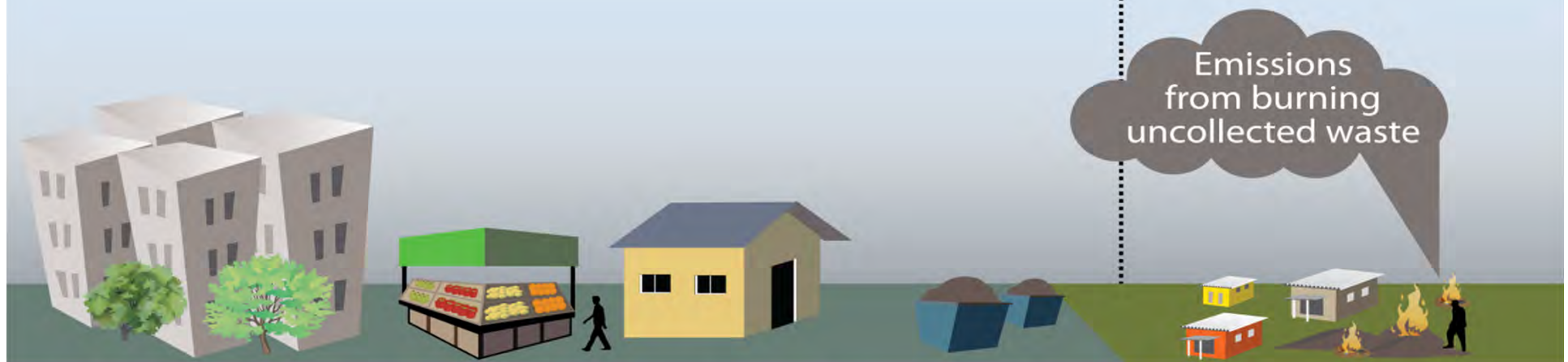


MUNICIPAL SOLID WASTE

 Methane  Black Carbon

METHANE AND BLACK CARBON EMISSIONS FROM THE WASTE SECTOR

.....WASTE GENERATION>



INNER CITY

PRODUCE MARKET

RESIDENTIAL AREA

TEMPORARY STORAGE LOCATION

INFORMAL AREA
(outside the formal waste collection, transportation, and disposal process)



 Methane  Black Carbon

METHANE AND BLACK CARBON EMISSIONS FROM THE WASTE SECTOR

← WASTE COLLECTION AND TRANSPORTATION →

Emissions from
waste handling
equipment

Emissions from
trucks

TRANSFER
STATION

SECONDARY
COLLECTION

TEMPORARY
STORAGE
LOCATION

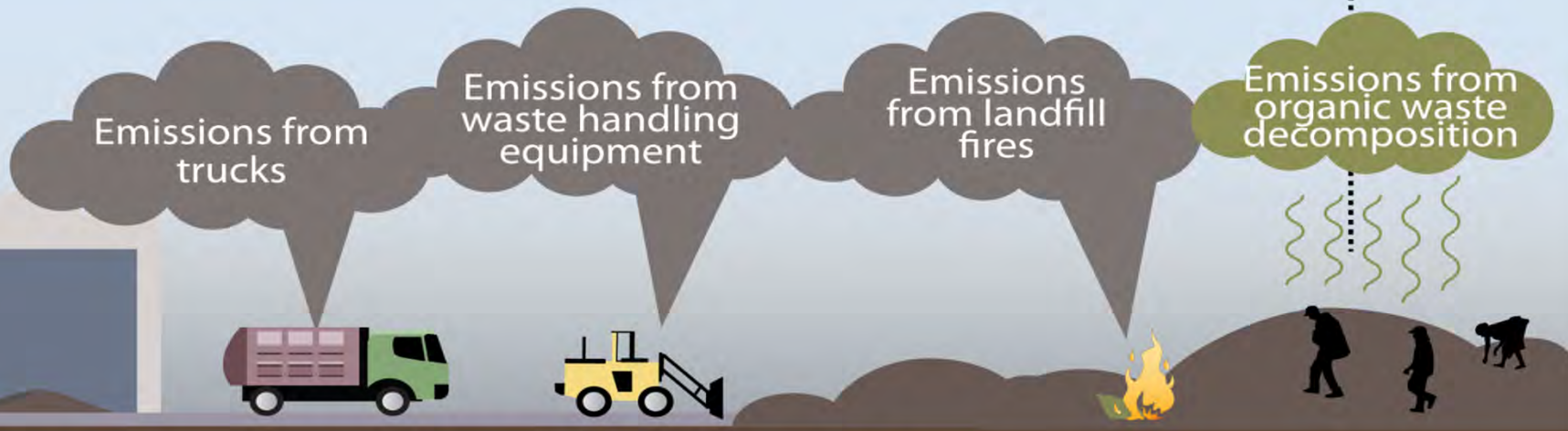
PRIMARY
COLLECTION



Methane Black Carbon

METHANE AND BLACK CARBON EMISSIONS FROM THE WASTE SECTOR

WASTE DISPOSAL →



TRANSFER STATION

TRANSPORT TO LANDFILL

LANDFILL OPERATIONS



WASTE INITIATIVE

Mitigating SLCPs from Municipal Solid Waste



WASTE

Objective:

- Reduce emissions of SLCPs across the municipal solid waste sector by providing a comprehensive package of resources, technical capacity building, and a global network of cities to facilitate the design and implementation of locally appropriate actions.



Why?

- Globally, landfills are the third largest sources of anthropogenic global methane emissions (approximately 11 %)
- Waste is growing; cities are growing
- Black Carbon from open burning of uncollected waste and transport of waste by outdated and polluting vehicles



WASTE INITIATIVE

Mitigating SLCPs from Municipal Solid Waste



WASTE

Goals:

- Enable cities to develop robust waste management systems to achieve real and immediate SLCP reductions and other development benefits.
- To move cities up the waste hierarchy through transformative actions
 - implemented sustainably,
 - compatible with the local context. and
 - replicable through national policy support or through city-to-city collaboration



MSW Initiative is working with its partners on the following focus areas



- **Reduce waste** generation
- Address **open burning**
- Improve **waste collection & handling equipment**
- Promote **organic diversion** programs: composting and anaerobic digestion
- Institute **recycling programs**
- Use landfills as final disposal options and enhance landfill operations - promote **landfill gas recovery**
- **Measure and track** SLCP emissions reduction



WASTE



WASTE INITIATIVE

Mitigating SLCPs from Municipal Solid Waste



WASTE

- Provide support to collect and assess MSW **data** through City Waste Assessment Tool
- Assist with the development of work plans to identify the appropriate **opportunities** for managing waste sustainably
- Develop of tools to enable informed policy decisions, and to measure SLCP emissions through an emissions quantification tool (SWEET tool)
- Provide **capacity building** support through workshops, webinars, and access to online resources
- Share best practices through a global city network, and **peer-to-peer learning opportunities**
- Assist in obtaining **technical and financial analysis** supporting SLCPs mitigation projects



WASTE INITIATIVE

Highlights on Progress and Achievements to Date



WASTE

- **MSW city data assessments (35)**
- **Work plans (18):** In progress: **Four** (Coimbatore, Nueva Delhi, Curitiba, Medan)
- **Tools:**
 - Solid Waste Emissions Estimation Tool (SWEET)
 - OrganEcs
 - Landfill Gas (LFG) Project Screening Tool
- Capacity building through **workshops and webinars**
- **5 Regional city networks:** South America, Central America, India, South East Asia, Francophone Africa
- City pairings through city-exchanges (**6**)
- **Implementation of activities** of different work plans
- **Knowledge Platform**

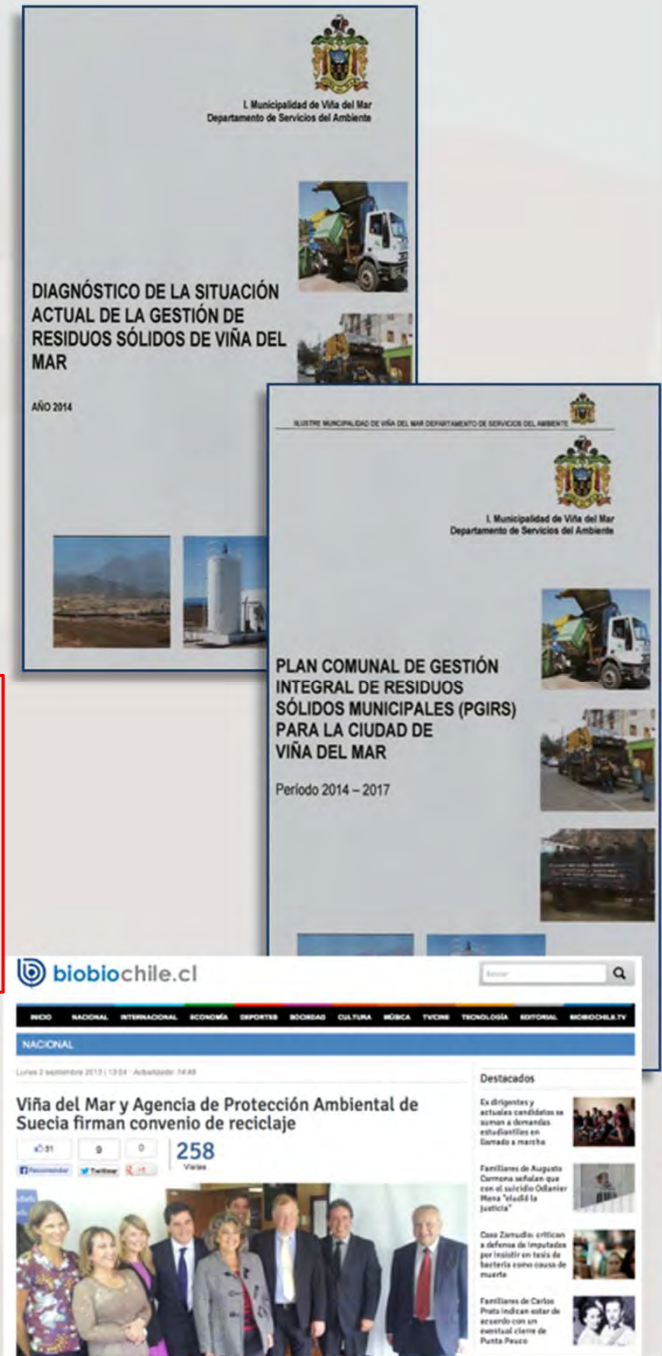


Example: Viña del Mar

The support of CCAC through CCAP has led the city to advance in the 3 stages of the Waste Initiative:

- Stage 1: Assessment
- Stage 2: Technical Work plan
- Stage 3: Elaboration of an implementation and financial plan for the organic waste treatment plant (in development)

In addition the city made an exchange with the city of Stockholm also thanks to the support of the Initiative



Example: Viña del Mar

- Elaboration of an implementation and financial plan for 1.3 MW biodigester (US \$6 million investment)
- PPP with the city and the investor / private operator, with the support of Canada and the Chilean government
- It would be the **first joint industrial-municipal project to process organic waste and serve as a model**
- 5-year process to involve the city, develop a waste management plan, identify priorities, evaluate feasible options, identify possible sources of financing, and involve the private sector



Example: Rio de Janeiro, Brazil

- Completing stages & deliverables:
 - MSW management assessment, action plan, technical work plan, SLCP emissions baseline
- Assessing large-scale sources of high-quality organic waste
- Conducting training on composting project operations
- Developing recommendations for improved operations at the Caju Composting Facility
- Coordinating city representative participation at Waste Fleet Conference
- **Conducting a training on landfill leachate management**



Caju Composting Facility



Leachate Management Training – Visit to Gramacho Landfill



Example: Naucalpan, Mexico

Support through the US EPA.

- A **pre-feasibility study** for a biogas project to treat organic waste in an anaerobic digester. It indicated that the project could have a rapid return on investment (2.2 years), while also reducing GHG emissions.
- A **road map** for implementing the biogas project, developed through a stakeholder engagement process that involved three workshops in the summer of 2016.
- A **waste characterization study** completed at the city's transfer station. The study indicated that approximately 69% of the waste generated handled at the transfer station could be recycled or otherwise diverted from the landfill. More than half of the waste analyzed as part of the study was organic and could be used as feedstock in composting or anaerobic digestion projects.

In 2017, Naucalpan entered an agreement with BANOBRAS to receive funding for 50% of the projected costs for the proposed biogas project. Project needs to be implemented through a PPP.



Example: Sao Paulo, Brazil

Stage 1: Assessment & Action Plan

Stage 2: Technical Work Plan

Stage 3: Financial Work Plan

Overarching project of an Eco-Park Waste facility that integrates different technologies for the treatment/recovery of two waste streams: mixed waste from households and biowaste separated at source from large generators. The foreseen capacity is 1,250 tons/day.

1. Technical feasibility study
2. Regulatory environment study
3. Financial feasibility study



KNOWLEDGE PLATFORM



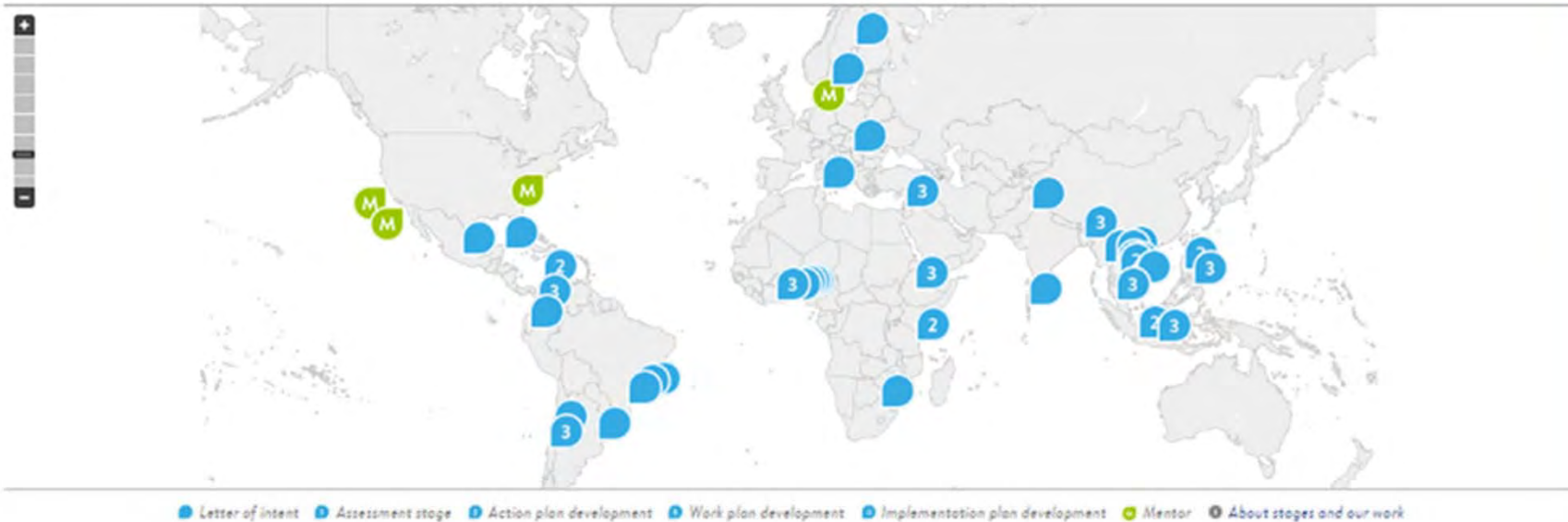
MUNICIPAL SOLID WASTE
KNOWLEDGE PLATFORM

Enter your keywords



🏠 CITIES DOCUMENTS TOOLS DATABASES EVENTS WEBINARS FORUM

Knowledge platform
to support cities and governments in
short-lived climate pollutant reduction.



Address methane, black carbon, and other air pollutants emissions from the waste management sector!

Knowledge Platform Link: <http://www.waste.ccacoalition.org/>



Thank you!

For further questions or information contact:

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LEARN MORE:



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Process of joining the initiative – onboarding new cities



Introduction to the
MSW Initiative



Joining the Initiative



On-boarding
Package



Introduction to the MSW Initiative

1. Interested City reaches out to a member of the Initiative and has an initial meeting to understand the initiative.
2. From the meeting, the interviewer recommends to the Lead Partners of the Initiative, whether or not to invite the city to join the initiative
3. If MSWI Lead Partners approve the city, the Coordinator sends the city an ***Expression of Interest*** letter



Joining the MSW Initiative

- I. Cities sign an *Expression of Interest* letter -
 - Identify points of contact
 - Identify their goals/desired outcomes through cooperation
 - What they can contribute, and
 - A commitment to support other cities by sharing their experiences (webinars, workshop presentation, case study) or mentoring other cities (city-to-city partnership)

- II. Welcome letter with on-boarding package

