

## CCAC Municipal Solid Waste Initiative

### “Mitigating short lived climate pollutants from the municipal solid waste sector”

#### CCAC MSW City Action Plan

**Objective:** To initiate cooperation that promotes short-lived climate pollutant (SLCP) mitigation in waste management activities within CCAC partner cities.

**Purpose:** Understanding that CCAC partner cities have a broad range of experiences and differing levels of familiarity with waste activities focused on SLCP mitigation, this “City Action Plan” is designed to highlight key steps for development of these projects.

This exercise should help organize our thoughts on main priorities, stakeholders, processes, and resources needed for implementing waste sector SLCP projects. It will also help identify how the CCAC can help advance these projects in a targeted way. While considering these key issues, we can all think strategically about those actions that are within the purview of cities, those that require the involvement of external authorities (state, regional, national), as well as those challenges that may require engagement with other stakeholders.

#### Summary of City Assessment Results

Sao Paulo is a metropolitan city of about 12 million inhabitants. The collection and disposal of municipal solid waste (MSW) from households and small commercial activities is the responsibility of AMLURB, the city’s waste management authority. However, the service of managing the 4.7 million tonnes/year of MSW is contracted out by AMLURB to four private companies, two responsible for street sweeping and two responsible for the rest of MSW. For the purpose of this Action Plan, MSW includes household waste and waste from small commercial waste producers and street and market waste, while excluding healthcare, construction and demolition waste and waste from large commercial producers (generation >200l/day) such as shopping centres, hotels and restaurants. Such large commercial waste producers are obliged to contract services with private waste collection companies and report its waste disposal practices to AMLURB.

Sao Paulo collects 4.7 million tonnes/year of MSW and average per-capita generation is 402 kg. Organic waste corresponds to 47% of MSW, while dry recyclables (including paper, plastic, metal, glass) are approximately 30%. The remaining amount includes bulky waste, tyres and others.

Approximately 97.8% of waste generated is formally collected and disposed. The daily production is about 13,000 tonnes. Unsorted wet waste is partially transported to 3 transfer stations and from there further to the two sanitary landfills some 30 to 35 kilometers away from the city for final disposal, about 31% of the unsorted wet waste is transported directly to the landfills. Separately collected mixed dry-recyclables (about 140 tonnes/day or 1% of total MSW production) are sent to two state-of-the-art sorting plants and manual sorting in cooperation with cooperatives where about 60% is sorted into 4-5

waste streams (paper, metal, plastics and glass) and sold to recyclers. There are about 21 cooperatives operating with the assistance of AMLURB, collecting, manual sorting and selling dry recyclables.

The City currently landfills the organic fraction of MSW. Landfill gas is collected for flaring at both landfills and for producing electricity nearby the CTL Landfill. By 2016 both landfills will generate electricity from the landfill-gas. Both landfills are estimated to have another 10 years to go before they become full.

Bio-waste collection is currently absent. There are no composting or AD plants in place under the mandate of AMLURB. However a municipal program, Composta São Paulo, was carried out in 2014 aiming at recycling organic waste by equipping initially 2,000 households with home-composting boxes. The composting equipment is accompanied with training material and awareness-raising about the importance of organic waste management. The use of online social media has helped fostering a community of environmentally conscious citizens. One priority of Sao Paulo is the management of the organic fraction of MSW. The city is looking at applying composting both with decentralised and centralised facilities and potentially also anaerobic digestion and mechanical biological treatment.

**Proposed activities under the CCAC MSW Initiative**

**Project/programme/policy of interest to the city**

Each action described below is to be carried out with the assistance of the CCAC MSW Initiative.

The synergy of different actions proposed is briefly outlined in the following chart. Four actions are promoting separate collection (i.e. Action 2, 3, 4, 5) in order to enhance citizen’s and producer’s awareness towards the pivot role of separate collection of organic waste. Recycling of organic waste will be a topic of four actions (i.e Action 1, 2, 3, 5). Awareness and education is a cross-cutting element applying to all actions. Similarly, capacity building applies to all actions proposed even though it is described in Action 7. A general need of all actions is the availability of data and information. This will be improved when carrying out the actions, during which more data and information will become available, while assistance will be provided by giving guidance on how to better manage data and information.

<i>Collection/diversion</i>	<b>4. Managing source separation of organic fraction from household waste</b>	<b>5. Diversion of the organic fraction from the commercial sector</b>	<b>2. Enhance organic waste management in schools and enhance awareness of teachers and children</b>	<b>3. Utilise public gardens and parks for green waste and organic waste from street markets for recycling and public education</b>	<b>7. Capacity building and knowledge transfer on organic waste management</b>
<i>Treatment option</i>	<b>1. Define the strategy for bio-waste diversion and</b>				

	help realise a pilot bio-waste treatment plant				
Awareness and education	6. Enhance citizens' awareness towards recycling and separate collection				

**1. Define the strategy for organic waste diversion and help realise a pilot organic waste treatment plant (Priority 1)**

**Project/Programme:** Considering the high percentage and amount of organic waste in MSW in Sao Paulo, there is a high need to establish treatment plants such as composting plant, AD plant and MBT plant to treat, stabilise and recycle organic waste into compost or biogas or both. The city of Sao Paulo is currently considering these options in order to reduce the waste amount going to landfills, but technical knowledge is needed in order to evaluate different options in order to realise some plants. A dedicated expert working group consisting of local experts will be established with the purpose of aligning knowledge and information on a common platform and coming up with an agreeable strategy for organic waste diversion, considering dialogue and involvement with the local population. A comparative study of currently available techniques and best-practises for composting and anaerobic digestion of organic waste and unsorted MSW in Sao Paulo will be conducted. The study shall also explore both centralized and de-centralised solutions in order to assist and inform decision makers on the opportunities and constraints of different solutions. At the same time a more detailed investigation of current wet-waste composition (i.e. mixed MSW) is necessary to assess possible pre-treatment options before landfilling.

**SLCP Impact:** reducing amounts of biodegradable waste (paper, cardboard and bio-waste) disposed of in landfills reduces the amount of methane generated from the anaerobic decomposition of these materials in landfills.

**Technical Assistance requested:** Provide technical input to the expert working group; support the comparative study, support the waste composition analysis; preliminary evaluation of current proposals of AMLURB for the realisation of facilities for organic waste treatment

**2. Enhance organic waste management in schools and enhance awareness of teachers and children (also Priority 1)**

**Project/Programme:** Some public schools of Sao Paulo are currently running initiatives to reduce the amount of food wastage and food waste. These practises can reduce from 40 to 70% the amount of organic waste that the schools generate that is disposed of as MSW on landfills. In the long term, such education will build up new generations who are going to support and request sustainable waste management in the city. Relevant initiatives will be analysed and a handbook on the management of organic waste in connection with other fractions (dry and reject) for schools in

Sao Paulo will be prepared and disseminated to all schools in Sao Paulo, which will provide more detailed guidance on the correct management and recycling of organic waste. The document will be prepared involving Sao Paulo's department for ground-schools and local NGOs involved in promoting home and community composting.

**SLCP Impact:** Reduce the amount of SLCPs by reducing the amount of methane emission from the landfills and reducing black carbons from transportation of waste.

**Technical Assistance requested:** Support for assessing the potential reduction of food waste due to such initiatives that will be practised in schools. Support in assembling waste managers and education experts to prepare the handbook for schools. Support in giving guidance on community-composting of food waste.

### **3. Utilise public gardens and parks for green waste and organic waste from street markets for recycling and public education (Priority 2)**

**Project/Programme:** São Paulo has more than ten large parks with lakes, running tracks, courts and bike tracks and up to 74 smaller green areas. The residues from pruning, trimming and other activities connected to the park-maintenance produce thousands of tonnes of green waste. On site composting in the parks will be introduced to prevent green waste being disposed of on the landfills and to produce compost which can be reused in park-maintenance. The sites will also act as education centres for citizens and schools. In addition, small composting sites planned by the City will start to compost street markets' organic waste utilizing green waste from parks.

**SLCP Impact:** reducing the amount of organic fraction (green waste and food waste) disposed of in landfills reduces the amounts of methane generated from the anaerobic decomposition of these materials in landfills.

**Technical Assistance requested:** Support in designing composting areas in the parks and preparing a handbook on compost use in maintenance of green areas. Support in designing collection routes and composting techniques for the planned small composting sites.

### **4. Managing source separation of organic fraction from household waste (Priority 3)**

**Project/Programme:** One priority of the City of Sao Paulo is the management of the organic fraction of the household waste. To explore and verify the participation of citizens in separate collection of organic waste and testing logistics for collection, transportation and recycling will be the starting point. Thereafter pilot projects of source separation of organic waste from households will be introduced, experimented and scaled up across the city. These activities shall enhance separate collection of dry recyclables as a consequence (mostly packaging waste). The separately collected household organic waste will need to be treated and recycled at facilities envisaged in Action 1.

**SLCP Impact:** reducing the amount of organic waste disposed of in landfills reduces the amounts of methane generated from the anaerobic decomposition of these materials in landfills.

**Technical Assistance requested:** Support in selection of trial zones and designing of collection service, support in provision of tools and provision of trainings for citizens, collection vehicles and operators.

## 5. Diversion of the organic fraction from the commercial sector (Priority 4)

**Project/Programme:** The programme needs to assess and analyse the amount of organic waste produced and collected from the commercial sector. It will start to collect organic waste from producers served by AMLURB such as schools, canteens and smaller commercial activities such as restaurants with up to 200 liter/day waste generation. Pursue a pilot project of recycling some amount of organic waste with a limited need of logistics for collection and transportation based on an assessment of existing treatment capacity in the state of Sao Paulo. Amounts collected can be composted at small-scale composting plants that are already operating in Sao Paulo state. These activities shall enhance separate collection of dry recyclables as well (mostly packaging waste), thus including paper and cardboard which have a similar methane emission potential as organic waste in landfills. The project will give high-visibility to the city's efforts to implement recycling.

**SLCP Impact:** reducing the amount of organic waste disposed of in landfills reduces the amount of methane generated from the anaerobic decomposition of these materials in landfills.

**Technical Assistance requested:** Support for assessment and analysis of organic waste from the commercial sector; design of collection service, including tools for collection, collection vehicles and operators. Support for managing the recycling process at treatment plants.

## 6. Enhance citizens' awareness towards recycling and separate collection

**Project/Programme:** Sustainable waste management needs the everyday engagement of waste producers in order to reach its goals. A communication strategy needs to be conceived for a multi-target audience (citizens, commercial waste producers, schools, etc.) focusing on fundamental aspects of sustainable MSW management: hygiene, environmental cost, prevention, reuse and recycling. This is aimed to create acceptance for future implementation of various practices such as separate collection and the recovery of waste management cost. An annually recurring public campaign is to be created to stimulate public engagement and media support in improving MSW management.

**SLCP Impact:** In the mid to long term, reducing the amount of methane emission from the landfills and reducing black carbons from transportation of waste by waste prevention and recycling.

**Technical Assistance requested:** Support in providing communication expertise with knowledge about MSW management; assist to set up of a communication team and campaign between AMLURB, City of Sao Paulo and local NGOs involved in promoting recycling.

## 7. Capacity building and knowledge transfer on organic waste management

**Project/Programme:** Conduct a set of trainings focusing on management strategies for organic waste; these seminars are intended for stakeholders and actors of organic waste management in Sao Paulo. The focus will be defined by consulting with stakeholders involved in actions from Action 1 to Action 5. In connection with the activities foreseen in Action 1, a training specifically on plant operation and management for a selected group of Brazilian operators will be organised with the methodology of "learning by doing" at a plant in a country with experienced management of organic waste collection and recycling.

**SLCP Impact:** this is a prerequisite for good management of organic waste treatment plants that reduce the amount of bio-waste going to landfills thus reducing SLCP emissions

**Technical Assistance requested:** Support the realisation of the trainings with a group of international experts in cooperation with Brazilian experts for the local context. Support in organising and coaching in the training for plant operation and management.

### **Knowledge sharing, Networking, and City-to-City Exchanges**

#### ***Interested in learning about:***

Other cities' MSW approach with a specific focus on food waste collection and recycling

Communication schemes

AD plants for treating large amounts of organic waste

Simplified composting plants using organic waste collected from big producers

Simplified composting sites for green waste recycling from public parks and green areas

Effective cases of decentralised, community composting initiative for local recycling of organics

Use of compost, its quality and market

Data management and evaluation of MSW management performances

#### ***Interested in sharing information on:***

Community composting initiative for local recycling of organics, such as Composta Sao Paulo

Public participation in the development of the Master Plan 2014

São Paulo City Recycling Fund

School projects on composting

Street markets and parks projects on composting

### **Roles and Responsibilities**

The City of Sao Paulo and CCAC, with ISWA as the leading implementation partner, will cooperate and interact by:

- Periodic, scheduled email communication and conference calls with team partners
- direct meetings (i.e. face-to-face), according to the available budget

Documents will be shared on a common cloud platform (e.g. Google Drive, Dropbox, etc).

Stakeholders and project partners need to be constantly involved so regular dialog and sharing of draft documentation and feedback is a key-element for a shared interest in the success of the project actions

### **Next Steps**

The City of Sao Paulo is fully supporting the CCAC Waste Initiative, both technically and politically through AMLURB, the municipal company responsible for MSW management and the Mayor's Office.

Once there is a common understanding on the tasks and goals of the Action plan a detailed work plan will be drafted and agreed upon the next technical meeting of ISWA and its representatives in Sao Paulo.

### **Overall experience**

Amlurb's feedback: The partnership between the Sao Paulo City Hall and CCAC has been very fruitful, especially in aspects concerning the technological route adopted by the Master Plan 2014 and implementation strategies for the separate collection, according to other cities experience in the world. The proposed Action Plan is integrated with the City's planning.

The Master Plan 2014 is being gradually implemented, and some actions have been initiated following the initiatives of the City Hall. In this sense, it is expected to implement, as soon as possible, the Action Plan and Work Plan in order to guarantee the project's success.

ISWA's feedback: The current participation at the CCAC initiative with the Municipality of Sao Paulo shows to be effective in enhancing the participation and cooperation between experts from ISWA and Brazil. ISWA's work is supported by a strong political will of the City of Sao Paulo.

Data and strategies about MSW management in Sao Paulo have been carefully evaluated and assessed in order to have a common understanding for proposing activities and practical initiative to fulfill the main targets of the CCAC initiative.