Solid Waste Management City Profile

São Paulo, Brazil

February, 2015

City Information

Population: 11,895,893 (IBGE, 2014)

Area (km²): 1,521 (IBGE, 2013)

Climate: warm temperate moist (average low temperature in winter months 11 degrees Celsius, average high temperature in summer months 28 degrees Celsius)

Main Economic Activities: Banking and finance, commerce; its leading industries produce textiles, mechanical and electrical appliances, furniture, foodstuffs, and chemical and pharmaceutical products. Computer industries and the manufacturing of electrical appliances are on the rise, as are automobile components.

City website: http://www.capital.sp.gov.br/portal/

Country Information

Population: 202,768,562 (IBGE, 2014)

Area (km²): 8,515,767 (IBGE, 2013)

Economy and GNI/Capita
Upper-middle-income; US$14,750 PPP (2013)

Main Economic Activities
Agriculture: mainly coffee, soybeans, wheat, rice, corn, sugarcane, cocoa, citrus, beef
Industry: mainly automobile, petrochemicals, machinery, electronics, cement and construction, aircraft, textiles, food and beverages, mining, consumer durables, tourism

Government Agencies responsible for guidance on waste legislation
Ministry of Environment*: http://www.mma.gov.br/cidades-sustentaveis/residuos-solidos*

Current or Planned Projects and Activities aimed at reducing SLCP Emissions

Currently the two sanitary landfills, Central de tratamento Leste – CTL and CTR Caieiras, both collect landfill gas (LFG). The CTL landfill flares LFG as well as selling the LFG to a nearby energy producer to produce electricity. The CTR Caieiras landfill currently only flares the LFG but is building a power generator and is planning to start generating electricity by the end of 2015.

The City currently landfills the organic fraction of municipal solid waste (MSW).However a civil society initiative started in 2014, Composta São Paulo, supported by the City, aiming at educating households about organic waste source. Separation and home composting. Two thousand home-composting boxes have been given out for free to households, together with training on home composting.

The city is considering scaling up the Composta Sao Paulo initiative to increase home composting. More ambitiously, the city is going to explore ways to reduce organic waste to be landfilled, such as MBT, composting and anaerobic digestion. These options will reduce the emission of methane from the landfills while generating valuable resources such as compost and biogas. This will lead to the beginning of source separation of organic waste.

MSW Sector Overview: City Level

Classification of MSW

Household waste, waste from street cleaning, markets and commercial activities that generate up to 50kg/day are considered, for the purposes of this assessment, as MSW. However, collection and disposal of waste produced by hospitals, waste disposed by citizens at the recycling stations and construction and demolition waste fall under the responsibilities of the municipal government. Large waste producers (waste production >50kg/day) of commercial activities must register with and report their waste disposal information to AMLURB, the City Waste Management Authority. Due to negligence of fulfilling this obligation by many of the large commercial waste generators, information from this sector is largely absent, and it is likely that a portion of commercial waste from large producers is dumped into the MSW stream.

MSW Generation

4.7 million tonnes/year; 402Kg/person/year

Collection Coverage and Type

Approximately 97.8% (IBGE, 2010) of waste generated is formally collected and disposed. The collection and disposal of MSW is the responsibility of AMLURB, the City Waste Management Authority, although the collection and disposal service is contracted out to four private companies. Currently, 75 out of the 96 districts have access to selective collection service: separate collection of two different source-separated waste streams takes place: wet waste (mostly organics fraction) and dry waste (containing

recyclables like plastics, paper, cardboard, glass and metal, and some residual waste). However due to the low participation of source separation by citizens, the amount of separately collected dry recyclables is still small.

Waste Composition

Material	Percent
Organic	47%
Paper	16%
Plastic	10%
Metal	2%
Glass	1%
Rubber	1%
Others	22%
Total	100%

Waste Management Practice

The wet fraction of the MSW is predominantly collected in the form of mixed MSW, transported to a transfer station (Santo Amaro or Ponte Pequena or Vergueiro) and then further transported to one of the two sanitary landfills for final disposal where landfill gas is collected partly for flaring and partly for producing electricity.

A small amount of dry fraction of the MSW is source-separated by some households. Those source-separated dry wastes are separately collected and sent to one of the sorting plants where recyclable materials such as paper, cardboard, metal, plastic, glass are sorted out, baled and then finally sold to different recyclers, while the residual unrecyclable materials are sent to one of the two landfills without further treatment.

Formal Waste Sector

The MSW management services are contracted out by AMLURB to four private companies through two types of contract:

a) Concession with Ecourbis and Loga operating household, construction and healthcare waste collection, transfer, sorting and landfilling, each responsible for half of the municipality (contracts lasting 20 years)
b) Consortium with Inova and Soma operating street sweeping and other public cleansing services, each responsible for half of the municipality (contracts lasting 5 years).

Both types of contract cover the entire territory of the municipality and deliver reliable services to urban and rural areas, as well as the favelas where there are special services to ensure an adequate collection of all waste generated there.

Ecourbis and Loga each has a large waste collection and transportation fleet and operates a state-of-the-art sorting plant and one or two transfer stations (Ecourbis operates two, Loga one). In addition, Ecourbis operates a sanitary landfill, the CTL Landfill, while Loga has a contractual agreement with a private sanitary landfill, the Caieras Landfill, to dispose of the waste it collects. Energy recovery takes place only at the CTL Landfill by producing electricity from the collected landfill gas, while both landfills flares partly or fully the landfill gas collected. The leachate is joined into the sewage pipe of the nearest residential area.

Recycling takes place by sorting out recyclable materials at the two official sorting plants and twenty-one informal cooperatives.

There are neither formal composting plants, AD plants nor incineration plants in the municipality.

Informal Waste Sector

There are approximately 20 thousand informal waste pickers, according to a non-official research, and 72 waste picker organizations in the municipality, out of which 21 cooperatives with about 1.200 waste pickers are working with the formal recycling system and are supported by the city government with equipment, trucks and service structure. These 21 cooperatives receive dry waste in two ways: from the collection trucks of the formal collection service providers, and by making their own informal collection itinerary. Two of the cooperatives also cooperate with Ecourbis and Loga under the concession contracts, whereby they work at the manual sorting section of the two formal sorting plants, receiving a monthly fixed salary and at the same time enjoy the full or partial revenue from selling the recyclable materials.

Financing of MSW

There is no specific solid waste fee charged to households. The cost of managing solid waste in the city is covered by the budget of the municipality allocated to solid waste management in the amount of about 2 billion Reals per year. In addition, the income from the registration tax charged to large commercial waste generators and commercial waste collection and transportation companies (about 7 million Reals per year) is also used to cover the cost of managing solid waste in the city. About 47% of this budget is spent for collection and transportation. The City spends about 170 Reals per person/year for solid waste management, less than 0.50Reals/day per person.

The management of waste from commercial activities that generate up to 50kg/day is the responsibility of AMLURB. Large commercial waste producers (producing more than 50kg/day) are responsible to manage their own waste, paying directly to private waste management service providers.

MSW Sector Overview: Country Level

General description and overview of common practice

More than 3,000 of the 5,570 Brazilian municipalities still dispose of their waste in dump sites or controlled landfills (ABRELPE, 2013). Of the waste collected, 18% goes to dumpsites, 24% to controlled landfills and 58% ends up in sanitary landfills. Approximately 10% of the national territory still does not have regular services to collect their waste, although the household collection service in urban areas has reached almost a universal level.

Organic matter generated in households accounts for more than 50 percent of the total waste collected and disposed of in sanitary landfills, of which only 3% is used in composting processes (CEMPRE, 2010).

Selective waste collection takes place in 17% of the municipalities, covering approximately 13% of the population. From these 927 municipalities, 43% operate the selective collection, 37% hires the service from private companies and 51% operate the service together with waste pickers organized into cooperatives and associations (CEMPRE, 2014).

While in some northern and northeastern cities the waste generation per capita is less than 0.4kg per day, in some neighborhoods in Sao Paulo's districts, this value can be over four times higher.

Waste Generation (per capita/year)

380kg/inh/year (ABRELPE, 2013)

Collection Coverage

Approximately 10% of the national territory still does not have regular services to collect their waste, although the household collection service in urban areas has reached almost a universal level.

Number of Landfills/MSW Disposal rate (tonnes/year)

According to ABRELPE (2013), approximately 110,000 tons/day or 58% of what is collected are disposed in landfills; and 79,000 tons/day or 42% are disposed in controlled landfills or dumpsites.

Recycling Rate

Plastics 22%, Cardboard 75%, Paper 29%, Aluminum cans 98%, Steel cans 47%, Glass 45%, Tyre 85%, PET 57% (Cempre, 2013)

Waste management of Organic fraction (composting, anaerobic digestion)

About 5% of the organic fraction of urban waste in Brazil is composted. The country has about 211 municipalities with composting facilities, most of which concentrating in the state of Minas Gerais and Rio Grande do Sul, with 78 and 66 facilities respectively (Cempre, 2013).

Energy Recovery Rate

Energy recovery is still very low. Landfill gas is collected only at some of the state-of-the art sanitary landfills, while anaerobic digestion and thermal treatment plants are very few in the country.

Plans, Strategies, Policies [including financial instruments) and National Objectives

City Level

Aimed at improving Waste Management in General

The Municipal Solid Waste Master Plan (Sao Paulo PGIRS) was launched in 2014 and corresponds to the National Solid Waste Law (12035 from 2010), establishing specific objectives and targets to be achieved and the means to evolve from the current situation to the desired situation, including technical, institutional, legal, economic, financial, social, environmental and public health aspects.

Its fundamental guideline is to observe the following order of priority:

1. Non-generation,
2. Reduction,
3. Reuse,
4. Recycling,
5. Waste treatment

6. Final environmentally sound disposal of waste

In the Sao Paulo PGIRS, these guidelines translate into maximum valorization and source segregation of waste through the development of separate collection of organic and dry waste from households, grocery stores, markets and schools, construction and demolition waste, organic waste from the street fairs, as well as the induction of source separation practices of companies within legal requirements of having solid waste management plan.

The technological route adopted in Sao Paulo PGIRS implies:

- The end of the mixed municipal solid waste collection;
- the universal adoption of the source separation to all types of waste originated within the city;
- the maximum retention at source of the organic fraction from households;
- the gradual social inclusion of all agents;
- the investment in new destinations for dry waste, specially the improvement of the cooperatives and expansion of sorting plants;
- the investment in new destinations for organic waste (distribute composters and provide technical guidance for composting in situ, development of Organic Waste Recycling Units - fostering the establishment of composting and anaerobic digestion facilities);
- the reduction of the volume of waste landfilled, through the adoption of mechanical biological treatment plants (MBT) to receive the mixed waste, separate collection and composting in situ;
- and the investment in the expansion of recycling stations and reduction of the illegal disposal points, and new solutions and technologies to recover and add value to the construction and demolition waste and others.

Some goals were established specifically regarding the two main groups of waste:

Dry Waste - structural goals

- Separate collection to cover the 96 districts by the end of 2016
- Improve the capacity of the sorting plants installed in public buildings by 2016
- Install two more sorting plants by 2016
- Install three MBT plants in eco-parks by 2019

Organic Waste - structural goals

- Stimulate home composting in households through distribution of home-composting boxes together with training, aiming at reducing 33% of all organic waste generated in households (1.06 of 3.53 million households) by 2033
- Separate collection to cover the 96 districts by the end of 2023
- Compost all the organic waste generated by the 883 street markets by the end of 2016
- Install eight small composting plants with capacity of 50 tons/day each by 2016
- Install gradually four big composting plants to achieve full capacity - 2.400 tons/day by 2023
- Install three MBT plants in eco-parks, to produce biogas and fertilizers through AD process by 2019.

Aimed at addressing Climate change and reducing SLCPs through waste related activities

The Sao Paulo PGIRS recognizes the contribution of the solid waste management to climate change, and addresses this issue in the topic "Actions to Mitigate GHG Emissions", establishing the main types of GHGs that are to be mitigated: carbon dioxide, methane and nitrous oxide.

The Master Plan supports the Climate Change Policy for the City of Sao Paulo Law 14933/2009. The Municipal Secretariat of the Green and the Environment - SVMA developed every five years inventory emissions reports which showed that the waste sector is the second largest GHG emitting source of the City of São Paulo.

Table - Total GHG emissions from 2003 to 2011

Sector	2003	2004	2005	2006	2007	2008	2009	2010	2011
	($GgCO_2e$)								
Energy	12,911	13,065	12,689	12,544	13,114	13,860	12,384	13,642	13,990
Waste	2,199	2,260	2,335	2,474	2,658	2,307	2,363	2,445	2,440
Total	**15,110**	**15,325**	**15,025**	**15,018**	**15,772**	**16,167**	**14,748**	**16,087**	**16,430**

Source: "Inventory of Anthropogenic Emissions and Removals of Greenhouse Gases of the Municipality of São Paulo from 2003 to 2009, updated to 2010 and 2011 in Energy and Waste Sectors".

The technological route showed in the previous section was designed to address actions to mitigate the GHG emissions from the waste sector, giving emphasis to those related to recycling and treatment of the organic waste through composting and anaerobic digestion.

Climate Change Policy for the City of Sao Paulo Law 14933/2009
(http://www3.prefeitura.sp.gov.br/cadlem/secretarias/negocios_juridicos/cadlem/integra.asp?alt=06062009L%20149330000)

Country Level

Aimed at improving Waste Management in General

The National Waste Law (12305/2010) brings principles, objectives and instruments and sets forth guidelines for integrated solid waste management, generators' responsibilities and applicable economic instruments.

Some of its content that is important to highlight:

- An integrated municipal solid waste management must follow some steps: waste generation reduction, re-utilization, destination to treatment (recycling, composting, energy recovery) and final disposal;
- The sanitary landfills are considered the only environmentally-adequate final disposal for municipal solid waste;
- All the dumpsites must be closed by August 2014;
- All states and municipalities must have an Integrated Solid Waste Plan, in order to be in compliance with the law and to have access to funds provided by the national government to solid waste management actions at the city level.

- Separate collection has to be part of the municipal solid waste management system, and must prioritize the integration of waste pickers' cooperatives in the formal system.

Law 12305/2010 - National Waste Law
http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm

Decree # 7404
http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/Decreto/D7404.htm

Aimed at addressing Climate change and reducing SLCPs through waste related activities

In late-2009, the Brazilian Government assumed a voluntary, nationwide commitment to set mitigation measures in order to reduce the country's GHG emission by 36.1 – 38.9% against their business-as-usual by 2020.

This commitment was established under Law # 12,187 of December 29, 2009, which launched the National Policy on Climate Change (PNMC). The PNMC was regulated by Decree # 7,390 of December 9, 2010.

There is no specific legislation in Brazil that specifically refers to a GHG emission reduction plan for solid waste and landfills. However, the potential inclusion of such legislation in this sector has been discussed, and new segments might be adopted for the years to come, such as hydro resources and solid waste, among others. Another important aspect to consider is the possibility of the creation of a Brazilian carbon market, which could allow credit trading among the regulated sectors and set reduction targets. This trading scheme is being studied by Brazilian authorities, and could reflect realities that are consolidated in other countries.

National Policy on Climate Change (12.187/2009)
http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2009/lei/l12187.htm

Decree # 7390
http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Decreto/D7390.htm

2nd Brazilian GHG Annual Emissions Estimation report
http://www.mct.gov.br/upd_blob/0226/226591.pdf

Legislation

City/State or Regional Level

Legislation governing MSW management

São Paulo city

Decree 54.991/2014 - Municipal Solid Waste Master Plan
http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/servicos/arquivos/PGIRS-2014.pdf

Municipal Solid Waste Management Law 13.478/2002
http://ww2.prefeitura.sp.gov.br//arquivos/secretarias/financas/legislacao/Lei-13478-2002.pdf

Resolution # 028/AMLURB/2014 – DOC 01/05/14
http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/servicos/resolucao.pdf

Resolution # 055/AMLURB/2015
http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/servicos/amlurb/Resolucao-n55-AMLURB-15.pdf

São Paulo State

State Solid Waste Law 12.300/2006
http://www.ambiente.sp.gov.br/cpla/files/2012/09/2006_Lei_12300.pdf

State Solid Waste Management Plan 2014
http://s.ambiente.sp.gov.br/cpla/plano-residuos-solidos-sp-2014.pdf

National Level

Legislation governing MSW management

Law 6.938/1981 - National Environmental Policy
http://www.planalto.gov.br/ccivil_03/leis/l6938.htm

Law 9.605/1998 - National Environmental Crimes Law.
http://www.planalto.gov.br/ccivil_03/leis/l9605.htm

Law 12305/2010 - National Waste Law
http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm

Decree # 7404
http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/Decreto/D7404.htm

Involvement to date in CCAC MSW Initiative

The city of Sao Paulo joined the CCAC MSW Initiative in the first half of 2014, appointing Mr Simão Pedro Chivetti as the principle coordinator of the City with the CCAC. The City agreed to collaborate with the CCAC MSW Initiative through information sharing and data collection, participation in regular consultations, and implement action.

Towards the end of 2014 the International Solid Waste Association (ISWA) was commissioned by the CCAC MSW Initiative to assist the City of Sao Paulo in carrying out the City Assessment and Action Plan project. The City Assessment aims at collecting data to establish the baseline scenario of the MSW management system in the City, based on which the Action Plan will identify priority actions to take in order to improve the MSW management particularly with the aim of reducing SLCPs emissions.

Key Stakeholders

- AMLURB (http://www.prefeitura.sp.gov.br/cidade/secretarias/servicos/amlurb/) and (http://sprecicla.com.br/)
- ECOURBIS (http://www.ecourbis.com.br/site/)
- LOGA (http://www.loga.com.br/)
- ABRELPE (http://www.abrelpe.org.br/_eng/index.cfm)
- ISWA (www.iswa.org)
- Waste picker cooperatives

References and Key Resources

AMLURB (the Waste Management Authority of the City of Sao Paulo)

ABRELPE (Brazilian Association of Public Cleaning and Special Waste Companies)

IBGE (Brazilian Institute of Geography and Statistics)

Recycling and Waste Management in Brazil, K. Beecheno, 2013

Inventory of Anthropogenic Emissions and Removals of Greenhouse Gases of the Municipality of São Paulo from 2003 to 2009, updated to 2010 and 2011 in Energy and Waste Sectors

Solid Waste Management in São Paulo: The challenges of sustainability, 2011

Contacts

MSW Initiative City Lead:
ISWA: Ms. Jiao Tang (jtang@iswa.org)

MSW Initiative City Representative:

- The Office of the City Secretary of São Paulo: Mr Simão Pedro Chivetti, Secretary of Services of the City of São Paulo (simaopedro@prefeitura.sp.gov.br)

- AMLURB, the Department of Solid Waste Management of the City of São Paulo: Mrs. Julia Moreno Lara, Deputy Head – AMLURB (jlara@prefeitura.sp.gov.br)