

## South Delhi Municipal Corporation, India

### City Information

**Population:** 6,500,000

**Area (km<sup>2</sup>):** 656.9

**Climate:** 25.2°C average temperature, 693mm annual rainfall

**Main Economic Activities:** Institutions, hotels, tourism, etc.

**City website:** [http://mcdonline.gov.in/tri/sdmc\\_mcdportal/](http://mcdonline.gov.in/tri/sdmc_mcdportal/)



### Country Information

**Population:** 1.35 billion

**Area (km<sup>2</sup>):** 3.287 million Km<sup>2</sup>

**Economy and GNI/Capita:** Lower-middle income economies (\$1,036 to \$4,045)

*Source:* [<http://data.worldbank.org/about/country-classifications>]

#### Main Economic Activities

- **Agriculture-** About 14% share in GDP of the country and more than 50% of the total population dependent on agriculture sector.
- **Service sector-** 60% of the GDP contribution comes from the services sector: banking, finance, business process outsourcing - and most importantly information technology services.

#### Government Agencies responsible for guidance on waste legislation

Ministry of Environment, Forest and Climate Change (MoEFCC).

<http://moef.gov.in/>

## MSW Sector Overview: City Level

South Delhi Municipal Corporation (SDMC) has developed an extensive system for collection, segregation, storage, transportation, processing and disposal of municipal solid waste through various scientific and modern technologies. SDMC comprises of four zones namely Central Zone, South Zone, West Zone, and Najafgarh Zone. SDMC has a total area of 656.91 sq. kms having population approximately 65.00 lacs, and 104 municipal wards within its territorial jurisdiction. SDMC collects, segregates, transports and disposes of all municipal solid waste, construction and demolition (C&D) waste and drain silt in all the colonies falling under its jurisdiction including 388 approved colonies, 252 unauthorized regularized colonies, 111 unauthorized colonies, 32 resettlement colonies, 152 urbanized villages colonies, 15 rural villages etc.

### Classification of MSW

Waste arising from residential areas, institutions, and commercial markets is comprised of organics, horticulture waste, paper, plastics, metals, inerts, etc. No recent waste characterization is available for waste generated by SDMC.



### MSW Generation

At present about 3,500 M.T of MSW is collected daily from about 761 nos. of storage/receptacles /collection centers. There are 107 fixed compactor transfer station (FCTS) and 142 mobile transfer station (MTS) existing at different places in all four zones of SDMC through concessionaires. Details are shown in the table below. Ten fixed compactor transfer station are in execution.

Item	Areas				Total
	South Zone	Central Zone	West Zone	Najafgarh Zone	
Concessionaire	M/s SSIL, SwayamSwachta Initiative Limited	M/s DDSIL, Dakshini Delhi Swachta Initiative Limited	M/s EESL, Eco- Green Envirotech Solutions Limited	M/S DWMN, Delhi Waste Management Najafgarh Limited	
Dhalao (transfer station)	259	193	45	70	567
Fixed Compactor Transfer Station(FCTS)	26	26	36	19	107
Auto Tipper	335	244	250	193	1022
Mobile Transfer Station (MTS)	31	47	38	26	142
Hook Loader	16	16	20	15	67
Refuse collector vehicle (RCV)	17	37	38	26	118
Cycle Rickshaw				336	336
Wheel Barrow				332	332

## Collection Coverage and Type

SDMC collects 100% of waste from generators. SDMC has identified 58 model wards

- In three model wards (59-S, AnderwGanj, 16-S Janakpuri, 65-S R.K.Puram) segregation of waste at source is extensively processed and achieved 80-100%.
- In the remaining 13 wards presently about 50% to 60% segregation of waste at source is achieved and 100% target be achieved by December 2020.
- In addition 42 more wards have been added to this list. IEC activities have been started by creating WhatsApp groups of the residents of the wards to disseminate all the information related to Swachhta Survekshan-2021 as per toolkit issued by MOHUA. It is expected that 100 % segregation will be achieved by March, 2021. Since, it is a behavioural change among citizens, despite earliest efforts progress is not achieved as per the timelines.
- In addition, ten colonies (i.e. NavjeevanVihar, Sarvodya Enclave, Anand Lok, Sadiq Nagar, Sarvpriyavihar, Maharani Bagh, Sundar Nagar, Defence Colony B-5 & 6 Vasant Kunj & R.K.Puram) are doing source segregation of waste by the citizens with the help of NGOs and targeting to become zero waste colonies by practicing various innovative measures such as home composting, Plastic Lao ThailaPao, BartanBhandar etc. SDMC intends to create awareness by IEC campaign for 40 such colonies.

**Door to door collection (%):** Door to door collection of segregated solid waste has been started in all four zones by the zonal level through concessionaires and/or resident welfare associations (RWA's). All concessionaires are using covered vehicles for transportation of waste from Central zone, South zone, West zone and Najafgarh zone to the processing facilities at Waste to Energy Plant Okhla, Compost Plant Okhla or disposal site at sanitary landfill (SLF) Okhla. All the vehicles are equipped with global positioning systems (GPS) and their movements are tracked on daily basis. Delhi Integrated Multi-Modal Transit System Ltd. (DIMTS) has been engaged as information technology (IT) consultant for daily monitoring of the vehicles. Closed circuit televisions (CCTV) have been installed at the weighbridges and various other locations at SLF site.

**Treatment (%):** About 51% of the collected waste is treated in different arrangements. The present arrangements for disposal of 3500 MT of MSW, 500 MT of C&D Waste, 200 MT of drain silt and 300 MT of residue/ash are as given below.

- Incineration: 1,650 TPD MSW
- Centralized composting: 150 TPD
- Biomethanation: 5 TPD x 3 = 15 TPD
- Decentralized composting: (1TPD x 3 Drum Composter) + 7 TPD(micro composting units) = 10 TPD
- In addition about 2.85 TPD of plastic waste is collected and sold to recyclers and 133.45 TPD of non-recyclable plastics plus 3.7 TPD of thermoset plastics are sent to waste to energy plant for energy recovery.

**Disposal (%):** About 49 % of the collected waste is deposited at the sanitary landfill site at Okhla. Out of 46.2 acres of land available at Okhla landfill, approx. 40 acres of land have already been closed in 2018. On the recommendations of IIT Delhi (former consultant of SDMC) about 80% area of 40 acres land was

stabilized for stability of side slopes. Now, as per orders of Hon'ble National Green Tribunal (NGT) this site is being [bio-mined/remediation through trommels](#). This process includes first stabilizing the waste materials through effective microorganism solutions and thereafter the materials are screened through trommels. The dry combustible waste extracted is sent for waste to energy plant and inerts for embankment filling.

### **Waste Composition**

Waste comprises of wet and dry waste. Wet waste includes organics like food waste and green waste is a major portion of waste. Other components like paper, plastics and metals along with inerts are also part of MSW. City has no recent waste characteristics available from source of generation.

### **Waste Management Practice**

Waste gets collected through concessionaires under public-private partnership (PPP) models and transported to processing or disposal facilities.

There is a centralized composting plant (200TPD capacity) that treats around 150 TPD of organic waste, incineration plant receiving 1,950 TPD waste of which around 1650 TPD is from SDMC area, and 3 number of decentralized bio-methanation plants of 5TPD capacity (cumulatively 15TPD) and decentralized composting units of cumulative 10 TPD capacity.

City does have a huge support from informal sector both for waste collection and recycling. However, city does not record amount of waste getting recycled through informal sector workers.

To prevent littering on roads green and blue dustbins have been provided at various locations especially near bus stands, markets, along roads and other places having movement of people. About 16288 nos. of green and blue dustbins of different capacity have been provided in the past three years and installed at various locations for segregation of waste. 1750 tricycle rickshaw have also been procured in past 3 years (with dual bins for segregated collection). The waste is collected from these bins by Auto Tippers / Department Vehicles.

### **Formal Waste Sector**

City has PPP models whereby concessionaires are appointed for collection of waste in different zones. Incineration plant and composting plant are also under PPP agreement and now recently 04 bio-methanation plants have come up under PPP arrangement.

City is also tying up for 50 TPD pyrolysis plant to manage plastic waste under tri party agreements with National Thermal Power Corporation Limited (NTPC) and Indian Oil Corporation Limited (IOCL).

### **Informal Waste Sector**

Informal waste sector collects waste from societies providing door to door service and sometimes even charge for this service. The collected waste is bought to the Dhalao. During this transit from residents to Dhalao, informal workers extract paper, plastic, metal and glass for recycling.

In areas where waste gets collected formally through door to door systems, concessionaires are appointed under PPP models and waste collected is linked to processing/disposal facilities. Informal

waste collectors are also attached in formal chain under this system. This systems is mostly deployed in Model wards.

SDMC has established a system to recognize organizations of waste pickers for integration of the various waste pickers to facilitate their participation in solid waste management including segregation and door to door collection of waste through concessionaires. All the 4 concessionaires have integrated approximately 1348 waste pickers and issued I-Card to them.

### **Financing of MSW**

Municipal solid waste management is a significant cost in the municipal budget. The financing for infrastructure comes through Grants from national government schemes, ULBs resources and under PPP agreement via private partners as well.

### **Waste Management Challenges**

Waste characterisation at various levels of management is unknown. Ingression and recycling rates of informal recycling is not known. City wants to establish Material recovery facilities but challenges persist in doing so.

### **Technical Assistance**

There is no landfill space on existing Okhla landfill and new landfill site is to be developed to handle rejects from processing.

Plastic waste management and recycling needs to be strengthened. Currently, waste collection does have GPS systems, but their optimization to reduce fuel consumption is required.

City also needs to educate citizens and stakeholders for better participation and strategies to reduce waste burdens for municipalities.

## MSW Sector Overview: Country Level

### General description and overview of common practice

Country generates 68 Million tonnes of MSW every year.

### Waste Generation (per capita/year) and Composition

- This varies from 0.17kg/c/day – 0.6kg/c/day,
- Average being 0.45kg/cap/day

### Collection Coverage

86% of the waste gets collected and of this collected waste only 27% gets treated.

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

### Recycling Rate

About 27% for paper and 60% for plastics

### Waste management of Organic fraction (composting, anaerobic digestion)

Yes, anaerobic digestion (AD) and composting is practiced in cities, furthermore legislation does not allow the disposal of organic waste at disposal sites. India has micro composters (in house composters) to 300 TPD bio-methanation plants.

### Energy Recovery Rate

Landfill gas is recovered at few sites that is used to generate energy. However, earlier researches identified that there were 13 potential landfill sites for energy recovery but the landfill gas expected would be of low calorific value. With the inclusion of Rules of 2016 not allowing organic waste to be landfilled, any new landfill gas capture projects are not seen to be coming up.

At a few sites organic waste is digested and the biogas is generated, which are either used as fuel at the source, converted to BioCNG or used to produce electricity.

Cities also practice composting in their areas to handle organic waste and produce compost, which is sold to nearby farmers.

### City Level

#### Aimed at improving waste management in general

SDMC has the following plans

- (i) Four composting plants are/being developed /constructed to process 1 MT of solid waste per day at Punjabi Bagh, Dwarka Sector-14, Chirag Delhi, and LSR College East of Kailash-II. Three plants at Punjabi Bagh, Chirag Delhi and LSR East of Kailash-II are in operation. The remaining one plant at Dwarka Sec-14 would also be operational by 28<sup>th</sup> Feb 2021. At present with micro composting units installed at multiple locations the capacity is 10 TPD, which is expected to further increase to 20TPD by end of 2020.
- (ii) Four Biomethanation plants with processing of capacity 5 MT of solid waste each per day are / being developed /constructed situated at SaritaVihar, Punjabi Bagh, Vasant Kunj and Sector-14 Dwarka. Three plants at Punjabi Bagh, SaritaVihar and Sector-14 Dwarka are in operation while the balance at Vasant Kunj would also be operational by 30th October, 2020.
- (iii) A project to promote de-centralized disposal of cattle dung in dairy colonies in compliance of SWM Rules 2016. It will help in preventing cow dung in storm water drains. This is under construction. The Concessionaire is stabilizing the excavated pits and taking up safety measures during rainy season. It is expected that work will completed by December, 2021
- (iv) Construction of Fixed Compactor Transfer Station (FCTS): South Zone: 7 Nos. two works awarded three under award 1 under A/S E/S and one site yet to be identified. Najafgarh Zone: 3 Nos. proposals under process of award.
- (v) Establishment of Material Recovery Facility: Tender has been called for establishing 200TPD MRF
- (vi) Delhi Development Authority (DDA) had handed over a piece of land approx. 47.347 acres at Tehkhand near SLF Okhla to SDMC for solid waste management facilities on November, 2017. SDMC has already awarded the work of setting up of a Waste to Energy plant for processing of 2000 MTD of solid waste on 15 acres land to the concessionaires. The work of development of site for setting up of plant has already been started at site. As per the commitment given by concessioner the plant is likely to be made operational by December-2021. SDMC has also initiated the work of an engineered sanitary landfill site on 22-acre land plus 10 acres for a green belt (buffer zone). The process for development of engineered sanitary landfill facility has been initiated.
- (vii) City also plans to establish 50 TPD pyrolysis plant to manage plastic waste under tri party agreements with NTPC and IOCL.
- (viii) City has made 500 TPD C&D waste processing plant at Bakkarwala (operational since July 2020), which is expandable to 1000 TPD. SDMC is also establishing another 500TPD at Maidangadi and will be made operational by end of 2021.
- (ix) All the three DM C's and New Delhi Municipal Council had jointly finalized draft plastic management bye-laws and sent to Urban Development Department GNCT Delhi for notification in April-2019. After lots of deliberations with various stockholders modified bye-laws are required to be notified.



**Aimed at addressing climate change and reducing SLCPs through waste related activities**

Not presently, SDMC is working on streamlining waste management activities and target waste at source. SDMC would however like to work in this direction.

***Country Level***

**Aimed at improving waste management in general**

Swachh Bharat mission aims to provide 100% population coverage for waste management by 2026. The aim was to achieve 80% coverage by 2019 and thereafter 2% every year. There is also a Swachhta Sarvekshan every quarter which helps ULBs scale up their management practices and document them for obtaining higher ranks.

**Aimed at addressing climate change and reducing SLCPs through waste related activities**

Country does have declared NDCs which covered waste sector as well.



## Legislation

### **City Level**

#### **Legislation governing MSW management**

SWM Bye-Laws and Solid Waste Management Rules 2016.

#### **Guidance for MSW management (after legislation, before inspection activities)**

Guidance documents on MRF, landfill siting criteria's are given by Swachh Bharat mission guidance (under MoHUA) and CPHEEO technical wing (MoHUA) and central pollution control board (CPCB) under MoEFCC.

#### **Inspection activities/supervision and enforcement of legislation**

Municipal Staff and Delhi Pollution Control Committee (DPCC).

### **National Level**

#### **Legislation governing MSW management**

Solid waste Management Rules 2016

#### **Guidance for MSW management (after legislation, before inspection activities)**

Guidance documents on MRF, landfill siting criteria's are given by Swachh Bharat mission guidance (under MoHUA) and CPHEEO technical wing (MoHUA) and central pollution control board (CPCB) under MoEFCC.

#### **Inspection activities/supervision and enforcement of legislation**

Central Pollution Control Boards

## Current Projects or Activities Aimed at Reducing SLCP Emissions

At present SDMC is operating three 5TPD Bio-methanation plants and three 1 TPD in drum composting plants at decentralized model. The basic idea is to come up with solutions that can prevent transportation of waste. The electricity produced through biogas at these biomethanation plants is sold to BSES (Electricity Supply Company) as renewable energy. Compost prepared is used for own green belt within city.

SDMC also has a waste to energy plant which receives about 1950 TPD of waste that is non-recyclable. The plant has ballistic separator to separate Inerts, organics and combustibles. The electricity produced is sold to BSES.

Further SDMC also has a 200TPD organic windrow composting facility that manages segregated waste received from residents. All these facilities help reduce SLCPs from city's waste management sector. City is coming up with a 50 TPD pyrolysis treatment unit and a 200 TPD MRF facility to reduce burdens on landfill and divert waste to recycling routes.

## Key Stakeholders

- Delhi Development Authority
- National Thermal Power Corporation Limited
- Indian Oil corporation limited (IOCL)
- IL&FS (<https://www.ilfsindia.com/>)
- Jindal EcoPolis (<http://www.jindalecopolis.com/>)
- Organic Recycling Systems Pvt Ltd.
- Alfatherm Ltd
- M/s SSIL, SwayamSwachta Initiative Limited
- M/s DDSIL, Dakshini Delhi Swachta Initiative Limited
- M/s EESL, Eco-Green Envirotech Solutions Limited
- M/S DWMN, Delhi Waste Management Najafgarh Limited, Etc.
- Delhi Integrated Multi-Modal Transit System Ltd. (DIMTS) (<https://www.dimts.in/default.aspx>)

## Additional Useful Information

SDMC initiative for reducing single use plastics.

- Plastic Lao Thaila Pao Campaign
- Kachhra lao khad lejaio
- Plastic waste processing facilities.
- Installing of bottle crusher machines in market areas.
- BartanBhandar -to stop use of thermocol/plastic cutlery.
- Punitive action for trading single use plastic less than 50 Micron
- SDMC has stopped use of pet water bottles in all its office and promoting use of environmental friendly products.
- Proposal for Installation of Automated Dry Waste Processing Plant of Capacity 200 TPD at Okhla
- Development of Integrated Waste to Energy Facility of Capacity 50 TPD at Okhla- using plasma technology.

## Contacts

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