

EAST DELHI MUNICIPAL CORPORATION



एक कदम स्वच्छता की ओर

Co– Benefits of Sustainable Waste Management for Preventing Air Pollution

10 April 2018

Contents

- Introduction
- Waste Management in Delhi
- EDMC case study
- Conclusion



AREA & POPULATION OF DELHI

S.NO.	Organisation	Area (in Sq Km)	Population (in millions) 2011 census	Population Density (No.Per sq. km.)
1	NCT DELHI	1484.46	16.8	11317
2	MCD	1399.26 (94%)	16.13 (96%)	11527
3	EDMC	105.98 (7%)	4.0 (25%)	37743*
4	SDMC	656.91 (44%)	5.6 (35%)	8525
5	NDMC	636.37 (43%)	6.4 (40%)	10057

* Also lot of floating population

MCD-Trifurcation



एक कदम स्वच्छता की ओर



Solid Waste in Delhi



- Municipal Solid Waste – heterogeneous mixture of various constituents:
- Due to Rapid urbanization/uncontrolled growth rate of population Municipal Solid Waste Management (MSWM) has become acute
 - (i) The Per Capita Waste generated in a typical Indian Metro City increases by 1.3% per year (TERI)
 - (ii) and the urban population increase is around 3.5% per annum (World Bank Report)
- These two factors (i) and (ii) have led to a yearly 5% increase in Solid Waste burden
- The quantity of Solid Waste presently generated 10000 MT/day shall reach 17000–19000 MT/day by 2021–2024 in Delhi

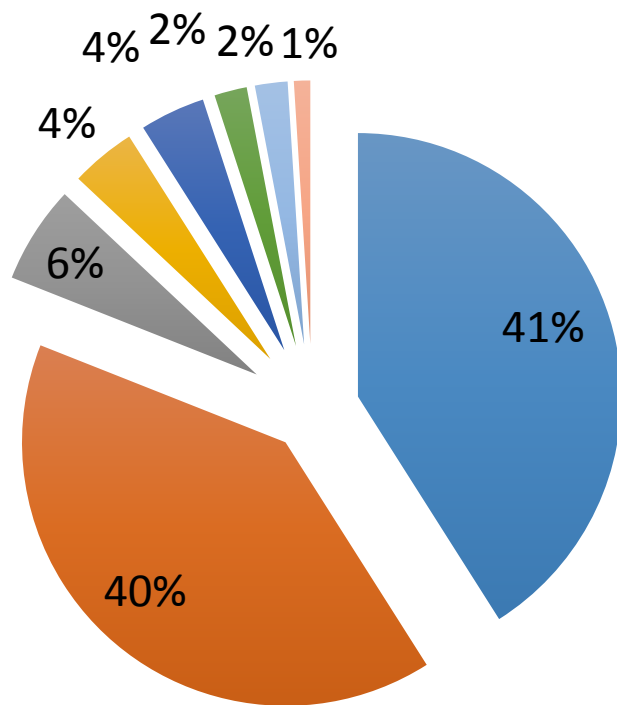


एक कदम स्वच्छता की ओर

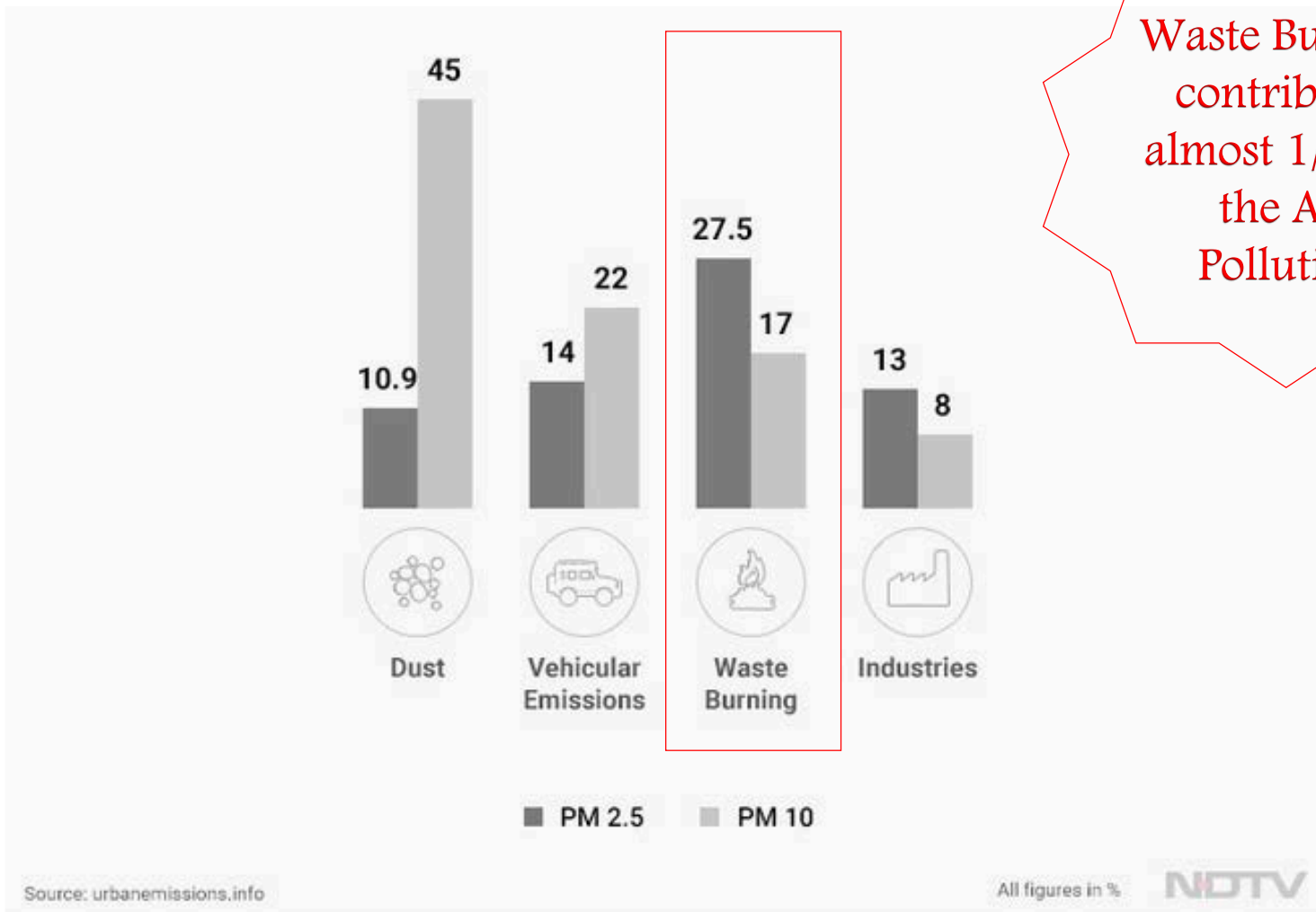
At least 40% in Delhi is Biodegradable!

Average (% by weight) composition of MSW in Indian metro cities.

Composition of Waste in Delhi



Waste Burning: A Severe Problem for Delhi



Waste Burning contributes almost 1/4th of the Air Pollution

Vehicular emission, dust and waste burning are the biggest contributors to Delhi's air pollution

PROCESSING OF MSW

MSW Generation

10800 TPD

Existing processing

Composting at Okhla

200 TPD

Waste to Energy at Gazipur

1300 TPD

Waste to Energy at Okhla

2000 TPD

Integrated Waste Facility at
Narela- Bawana

2000 TPD

Total

5500 TPD

C&D WASTE Generation

5000-6000 TPD

C &D facility at Burari

2000 TPD

C&D facility at Shastri park

500 TPD

C& D Facility at Rani Khera

150 TPD

Total

2650 TPD

PROCESSING OF WASTE IN DELHI



Delhi ULB	MSW Generated, TPD	Waste Processing available, TPD	Processing Plant	GAP in Waste Processing, TPD	Processing Capacity proposed to be added, TPD
North DMC	4000	2000	24 MWE Plant, Narela	2000	2000
South DMC	3600	1600	16 MWE Plant Okhla	2000	2000
East DMC	2600	1300	12 MWE Plant Ghazipur	1300	1200

PROCESSING AT NARELA-BAWANA WtE PLANT



Waste Intake (MT/day)	2,000 MTD – 2,400 MTD
Installed Capacity (MWe)	24 MWe
Current Status	Operational



REVIVAL OF OKHLA COMPOST PLANT



**200 TPD Capacity
Operational since 2007**

PROCESSING AT OKLHA WtE PLANT



Waste Intake (MT/day)	2,000 TPD
Installed Capacity (MWe)	16 MWe
Current Status	Functional
Proposed	3000 TPD



PROCESSING AT GHAZIPUR WtE PLANT



एक कदम स्वच्छता की ओर

Waste Intake (MT/day)	1,300 TPD
Installed Capacity (MWe)	12 MWe
Current Status	Functional
Proposed	2500 TPD



PROCESSING AT BURARI C&D PLANT – NORTH DMC



Waste Intake (MT/day)	2000 TPD
Installed Capacity (MT)	2000
Current Status	Functional

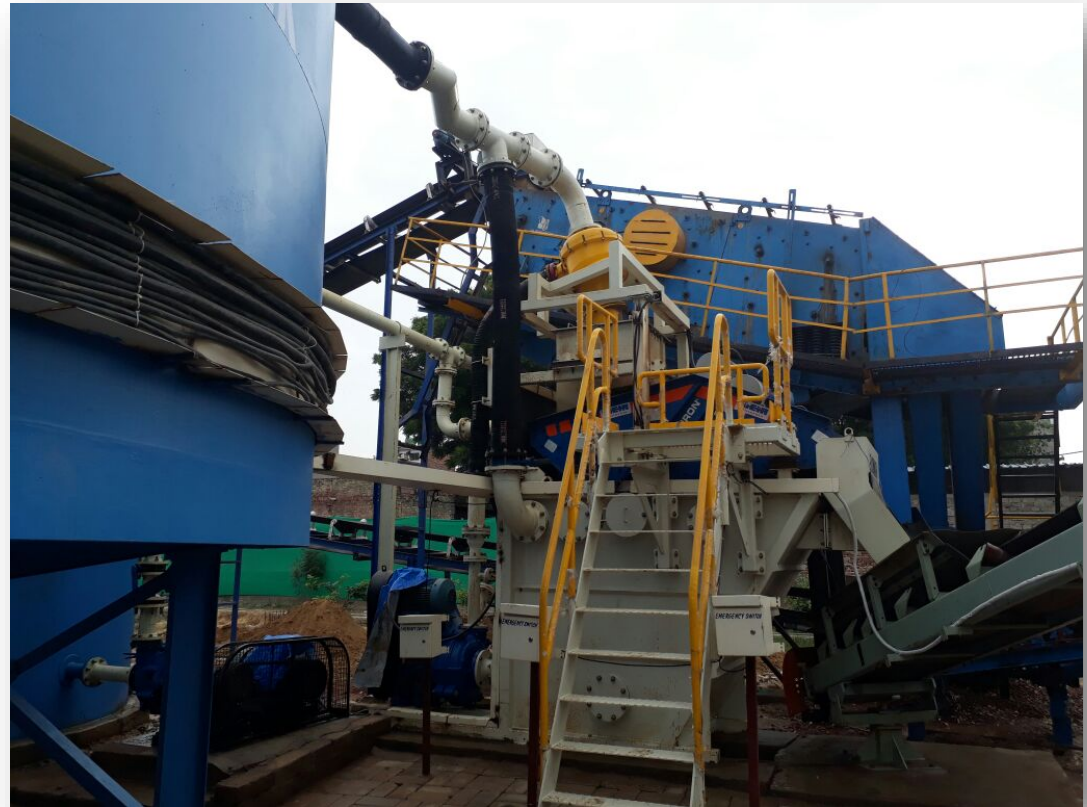


Crushing units at Burari C&D waste recycling plant
Picture credits: IL&FS Pvt Ltd

PROCESSING AT RANI KHERA C&D PLANT – DMRC



Waste Intake (MT/day)	150 TPD
Installed Capacity (MT)	150 TPD
Current Status	Functional



PROCESSING AT SHASTRI PARK C&D PLANT

- EDMC



Waste Intake (MT/day)	500 TPD
Installed Capacity (MT)	500 TPD
Current Status	Functional
Proposed	1000 TPD



EXISTING LANDFILLS

Location	Area (in acre)	Year of operation	Total qty.
Ghazipur	70	1984	Over 13 million
Okhla	32	1996	Over 06 million
Bhalswa	40	1994	Over 10 million



FIRE AT LANDFILLS



- On account of decomposition of the bio-degradable waste, large amount of methane gas is released from the landfill sites.
- The methane gas coming out of the landfills is highly inflammable which catches fire.
- In spite of extinguishing the fire at SLF site it erupts again and again due to its deep roots in garbage and presence of methane gas which automatically ignites after achieving the temperature of its combustion and contact with air.

LFG EXTRACTION at GHAZIPUR LANDFILL



एक कदम स्वच्छता की ओर



Capturing and Flaring of LFG at Ghazipur Landfill



Capturing of LFG

BEFORE



AFTER



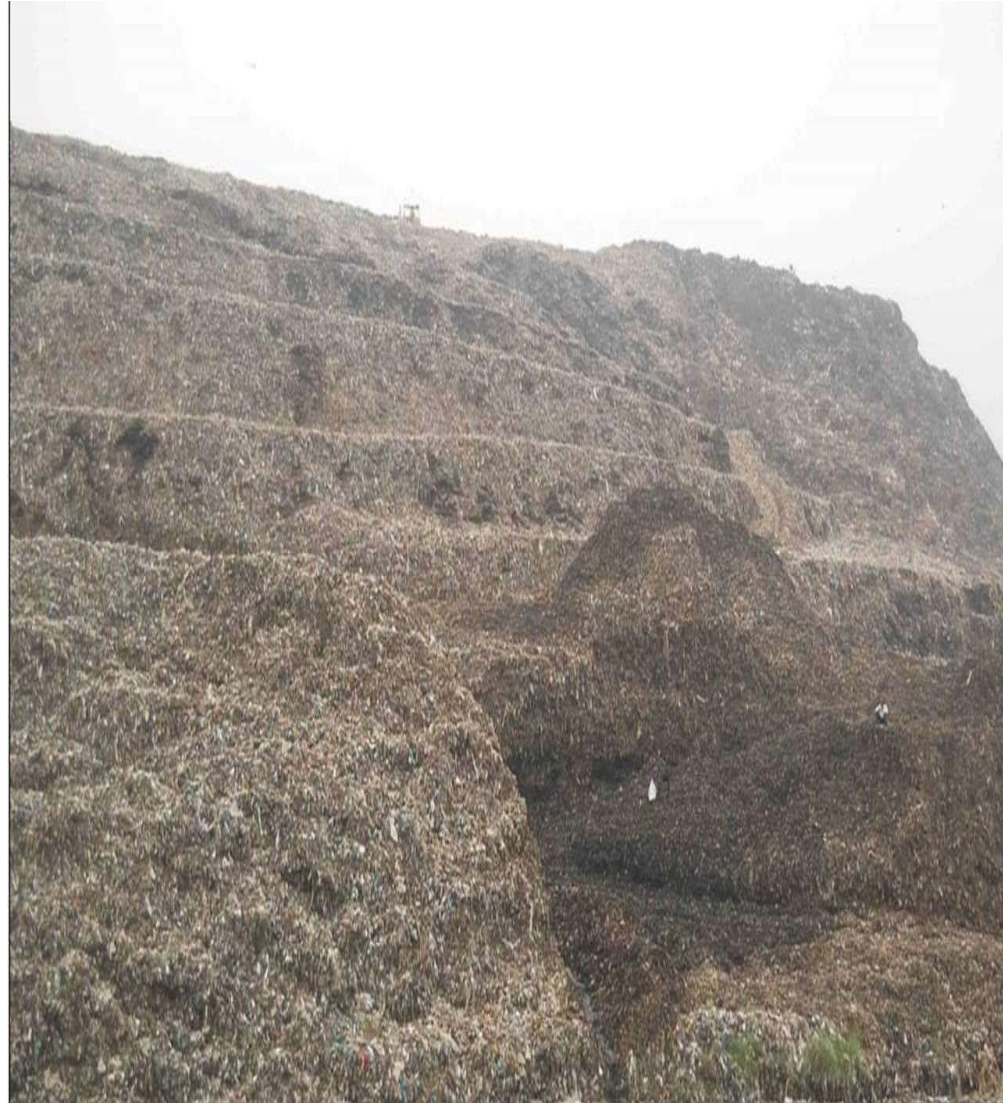
RECLAMATION OF DUMP SITES



GHAZIPUR DUMPSITE UTILIZATION - EDMC



Dump utilization	To use in sub-base of Delhi-Meerut Expressway
Type of Project	Dump Utilization / remediation
Total Waste in dump	13 Million MT
Potential	Upto 75% utilization as per CRRRI Study
Current Status	MoU signed with NHAI
Present status	NHAI invited the Bids



Objectives of Solid Waste Management



- 100% MSW Collection Efficiency
- Segregation of Garbage
- Hygienic & Efficient Transportation to Processing / Landfill Site
- Vehicle Tracking System of Transport Vehicles
- New Technologies for Collection, Processing & Treatment of MSW
- Decentralized processing of biodegradable waste
- Reclamation and Value Extraction from Existing Dumping Yards
- Citizen Friendly Complaint Redressal & Monitoring System
- Public Awareness & Training of Staff

New Initiatives

- Introduction of new machinery
- Segregation at source
- Decentralized waste processing
- Introduction of user fee and spot fines
- Remediation of existing land fills
- Paunch waste treatment facility
- Dairy waste treatment facility

SPRINKLING OF WATER ON ROADS



- Dust from roads and construction activities play major role to pollute the air.
 - Mechanical sweeping introduced
 - sprinkling of water on various roads by all agencies of all the Municipalities (SDMC, EDMC & NDMC) started
 - Sprinkling through water tankers, water tanks on vehicles like tractors or rickshaws
 - Sprinkling of water on roads reduces PM 10 and PM 2.5 to the major extent
 - Road cuts paved or greened – preference is given for greening

EDMC Scenario

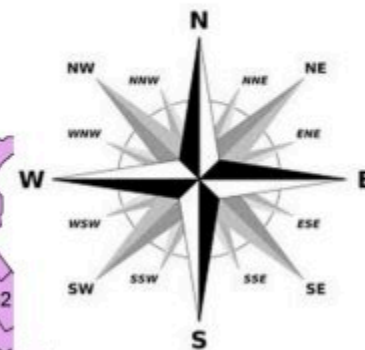
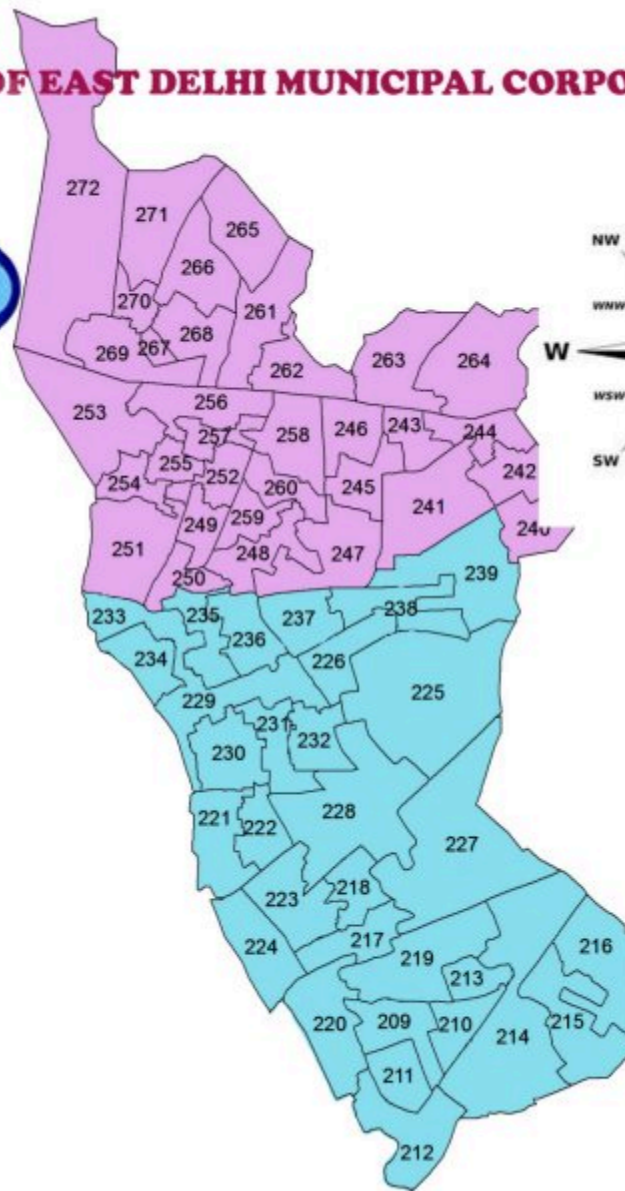
- Study carried out by EDMC & CCAC to reduce short lived carbon pollutants (SLCP)
- This work plan for East Delhi is developed with the objective of improving waste management practices to reduce SLCP emissions.
- Waste generation: 2,600 TPD
- Biodegradable waste: 50%
- Primary vehicles
- Secondary vehicles
- Machinery at Landfill
- Processing of waste



एक कदम स्वच्छता की ओर

MAP OF EAST DELHI MUNICIPAL CORPOR

DELHI



Zones -2
Wards 64 (SHS-30,SHN-34)

Waste processing in EDMC

Construction & Demolition Debris

Collection & Transportation



C&D Processing Facility, Shasti Park



C&D Products

Municipal Solid Waste

Collection & Transportation

Segregation of Waste



Recyclables

Combustible

Recyclables



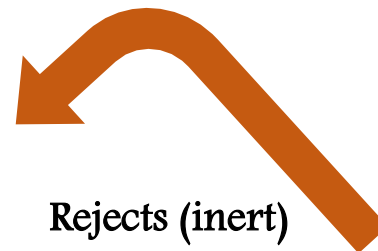
RDF & WtE, Ghazipur



Landfill



Rejects (inert)



SLCP baseline

- Activities: waste collection and transportation, waste burning, waste handling equipment, landfills and dumpsites, organic waste management facilities and waste combustion and recycling
- Pollutants: Targeted pollutants are black carbon, methane, oxides of sulphur, oxides of nitrogen, particulate matter, organic carbon and carbon dioxide.

SLCP baseline

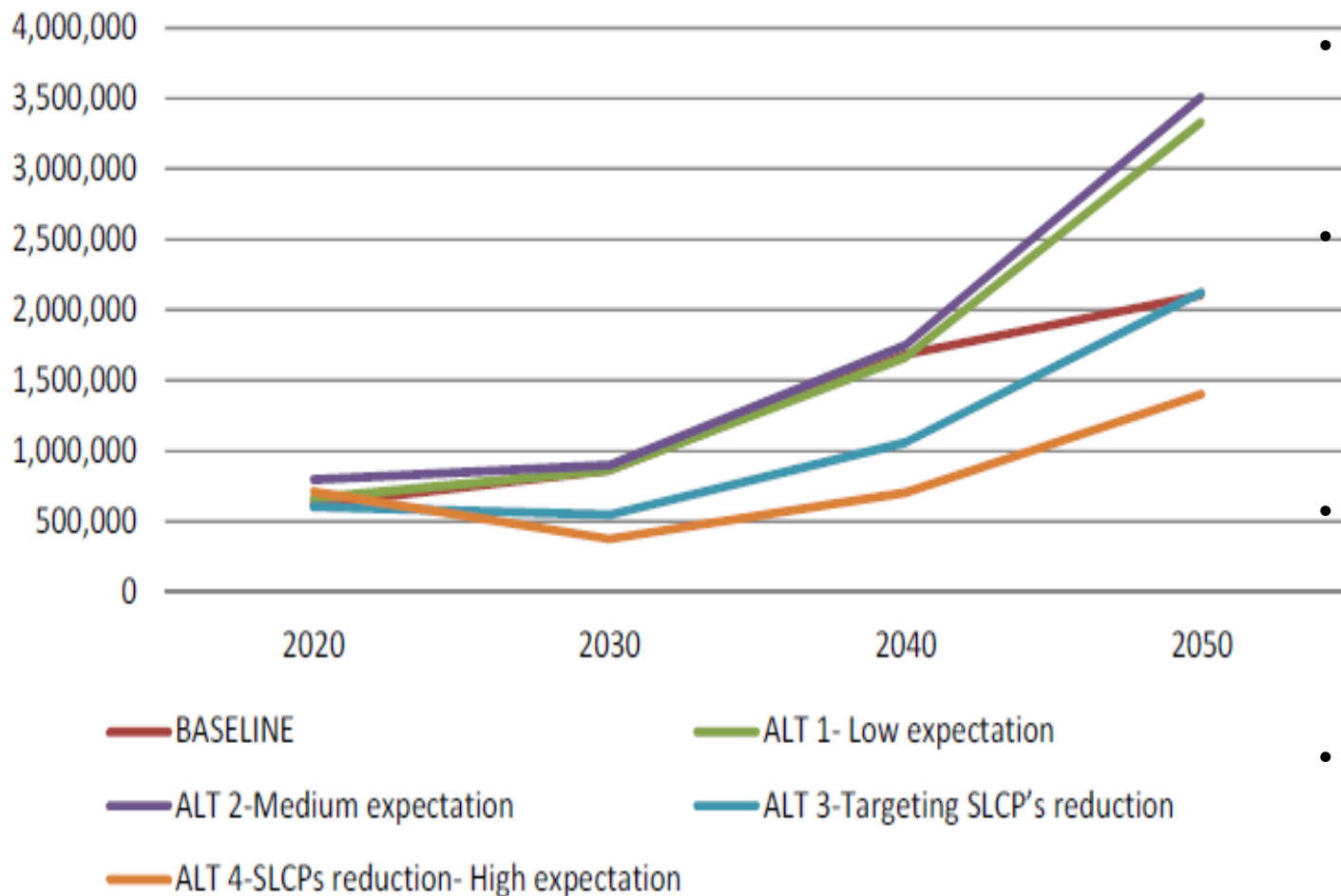
Year	Emission (metric tonne CO2 eq)
2021	651,393
2025	658,989
2031	919,529
2041	18,04,425
2050	21,04,996

Alternate Scenarios

Alternate Scenario	Composting (TPD)	AD (TPD)	Waste Combustion (TPD)	Additional Activities
Alt 1: Low expectation	200	0	1300	A new landfill site to be operationalized from 2019 till 2050, having flaring and LFG utilization facility, but with no high BTU energy source
Alt 2: Medium expectation	300	100	1900	Partial secondary collection fleet to be diverted to CNG fuel. A new landfill site shall be operationalized after closure of Ghazipur in 2018 till 2055, having flaring and LFG utilization facility, but with project utilising high-BTU LFG as an energy source.
Alt 3: SLCP's reduction	400	250	1300	A new landfill site shall be operationalized after closure of Ghazipur in 2018, which shall be operational till 2055, have flaring and LFG utilisation facility, but with project utilizing high-BTU LFG as an energy source. Complete fleet shall be converted to CNG fuel.
Alt 4: SLCP's reduction-High expectation	400	800	1300	Complete fleet shall be converted to CNG fuel. A new landfill site shall be operationalized from 2018 – 2055 have flaring and LFG utilization facility, but with project utilising high-BTU LFG as an energy source.

Modeling Output

Scenerio Comparison



- In the case of alternate scenario 1, the total emissions are expected to continuously increase when compared to baseline scenario due to waste combustion methods.
- In the alternate scenario 2 of medium expectation, the total emissions are expected to increase as compared to baseline scenario due to waste diversion to anaerobic digestion and the expected increase in capacity of waste to energy plants as per scenario.
- In the alternate scenario 3 of targeting SLCP reduction, the total emissions are expected to decline when compared to baseline scenario. This is due to diversion of more waste to composting and anaerobic digestion.
- In alternate scenario 4, due to high organics treatment in composting and anaerobic digestion, the SLCPs are expected to reduce substantially.

Modeling Output

Year	BASELINE	ALT 1- Low expectation	ALT 2- Medium expectation	ALT 3-Targeting SLCP's reduction	ALT 4- SLCPs reduction- High expectation
		<i>Emission Change from Baseline</i>			
2020	618,623	58,502	191,169	-4,888	103,318
2030	863,854	25,243	57,850	-291,575	-464,407
2040	1,683,666	29,414	114,908	-574,195	-930,267
2050	2,104,996	1,328,568	1,504,719	117,456	-604,205

Source: SWEET run

- Alternate scenario 1: Total **emissions are expected to continuously increase** when compared to baseline scenario due to waste combustion methods.
- Alternate scenario 2 : total **emissions are expected to increase** as compared to baseline scenario due to waste diversion to anaerobic digestion and the expected increase in capacity of waste to energy plants as per scenario.
- Alternate scenario 3: Total **emissions are expected to decline** when compared to baseline scenario. This is due to diversion of more waste to composting and anaerobic digestion.
- In alternate scenario 4: due to high organics treatment in composting and anaerobic digestion, **the SLCPs are expected to reduce substantially**.

3R Policies at local body level: EDMC



- **Reduce**

- EDMC is focused on creating awareness about waste management in its area. A brand ambassador has been appointed to ensure that message reaches the masses.

- **Reuse**

- EDMC is making efforts to integrate informal sector in its system.

- **Recycle**

- Waste generated in EDMC area is about 2600TPD.

- To manage such waste, a waste to energy facility of 1300 TPD, 12 MW has been installed. The capacity of this facility is being enhanced to manage 2500 TPD of waste. Land for the same has been allocated.

- C&D waste management facility of 500 TPD has been setup. It is proposed to be expanded to 1000 TPD to cater to increasing C&D waste. Land for the same has been allocated.

- EDMC also proposes to undertake decentralized waste management activities in near future.



एक कदम स्वच्छता की ओर

THANK YOU

For any query, contact

Pradeep Khandelwal CE, EDMC

Ph 9717788004, Email ID pradeepkhandelwal100@gmail.com