



# Importance of waste segregation in Circularity

**Presented by:**

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**MUNICIPAL COMMISSIONER**

**SURAT MUNICIPAL CORPORATION**



# Surat City- Overview



**SURAT**  
8<sup>th</sup> Largest City

4.46 million  
(2011 census)  
7 million  
(current estimate)



**462.149 sq.km**

Area  
under  
jurisdiction



**Fastest Growing  
City Globally**

Oxford Economics'  
Global Cities 2030  
Report

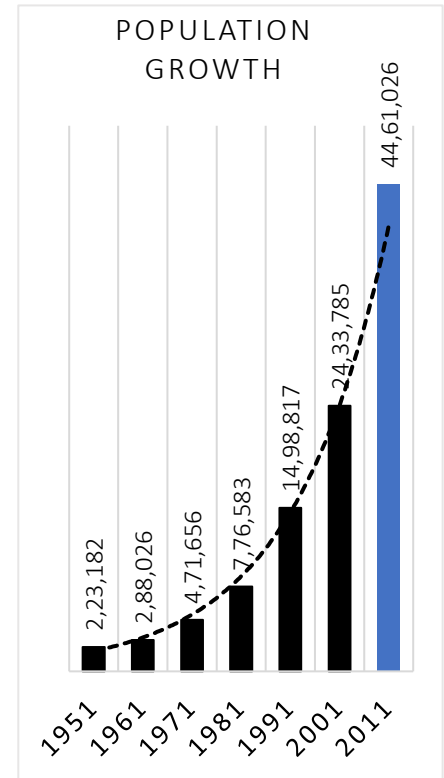


**Economic Capital  
of Gujarat**

Hub of Diamond &  
Textile Industries



- Historical Surat dates back to 300 BC
- Municipality Established in 1852
- Municipal Corporation Formed in 1966
- Hazira Industrial Estate near the City
- An Environment with Peace, Alliance & Unity
- Admin Zones : 9
- Election Wards : 30



60% to 80%  
Decadal Growth  
(since 4 decades)

# Surat is also known as...



Diamond City

9/10 **Diamonds** in the world are cut and polished in Surat

40% of nations total man-made fabric & 28% of nation's total man-made fiber production

Textile City



Bridge City

Over **117** bridges to ease commute

Declared as SOLAR CITY by Ministry of New & Renewable Energy

Solar City



Green City

Over **200** public parks & gardens along with Nature Park & upcoming Biodiversity Park



# Surat's Garbage Collection

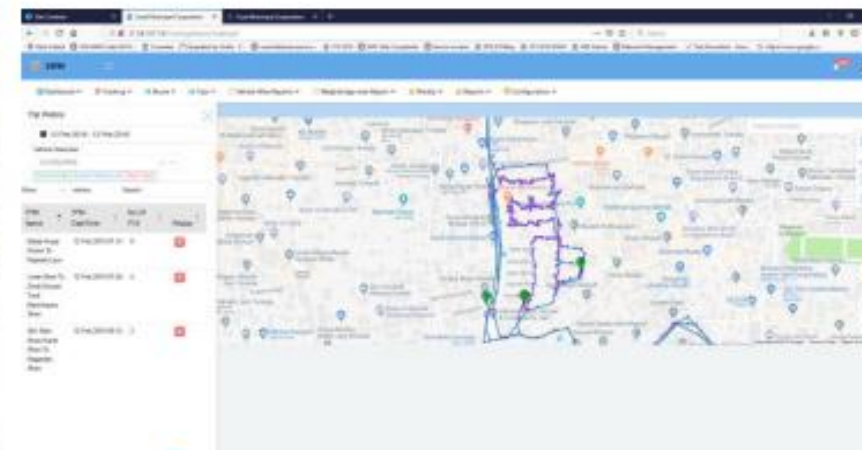
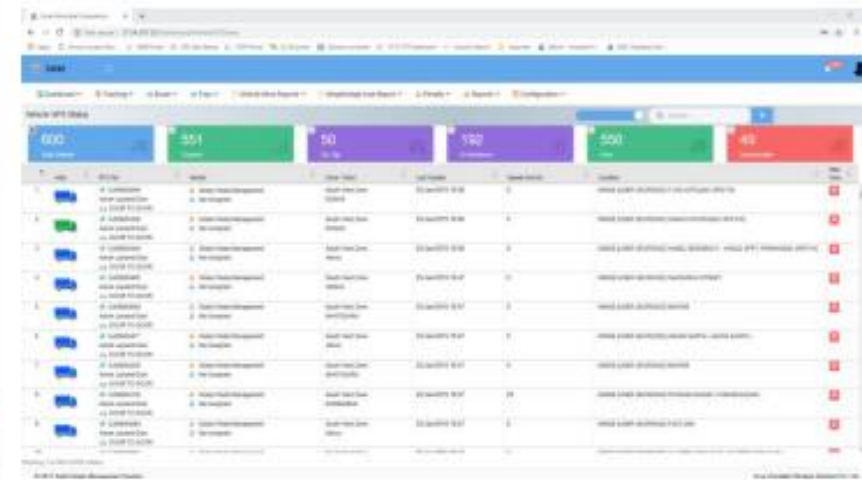
Smooth  
imple  
afe

## Door to Door Garbage Collection System

- **1<sup>st</sup> ULB to introduce in the year 2004**
- 100% D2D coverage
- Around 2200 MT waste is collected daily through more than 550 Door to Door Vehicles.
- Smart Solid Waste Management System to monitor entire activity from primary collection, secondary transportation and disposal.

## Night Scraping - Brushing

- **1<sup>st</sup> ULB to introduce in 1996**
- Major routes > 200
- Manpower engaged: around 1500
- 28 mechanical sweepers deployed for cleaning of major arterial roads.



# Overall Solid Waste Management Scenario

- SMC has initiated the concept of One Zone - One Agency under the provision of Swachh Bharat Mission
- For each zone, single agency is responsible for
  - ❑ Door to Door waste collection,
  - ❑ Waste Segregation,
  - ❑ Nuisance spot, Road Side Dustbin management
  - ❑ Material Recovery Facility,
  - ❑ Augmentation of Refuse transfer Station,
  - ❑ IEC Activity
- SMC has visualised to replace existing collection vehicle fleet by 25% by year 2025 with E Vehicles which will help in improvement of Air Quality in the City.
- Mechanised Material Recovery Facilities has been developed at the augmented **8 Nos. of Refuse Transfer Station** which has ensured reduction of Waste quantum (150 ton per day) reaching to Disposal Site as well as Earning of royalty to SMC in tune of Ave. Rs 400 per MT.



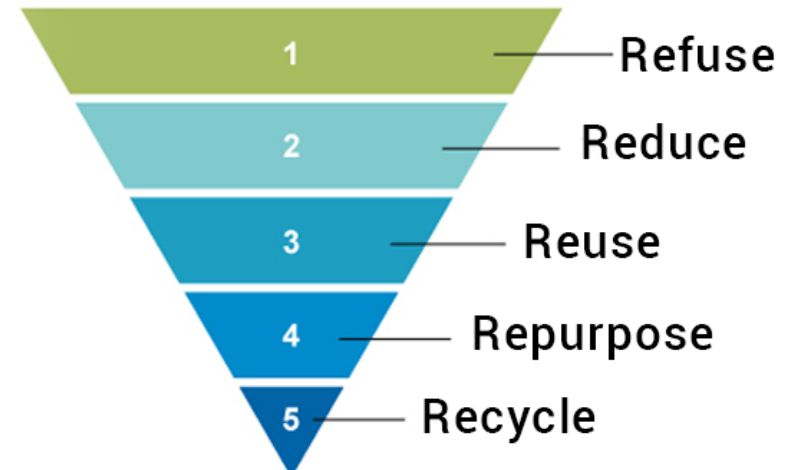
# Innovative practice on Liner to Circular Economy through 5R concept



Circular Economy ✓



## The 5 R's



# Benefits of Waste Segregation through 5R policy

- Conserves resources for our children's future.
- Prevents emissions of many greenhouses' gases and water pollutants and saves energy.
- Supplies valuable raw materials to industry.
- Creates jobs.
- Stimulates the development of greener cities
- Reduces the need for new landfills



# Zero Waste Society

- There are 88 RWAs in the city self-operating their wet waste by the Organic Waste Converter (OWC).
- Surat Municipal Corporation is providing financial assistance up to 100% to RWA for purchase of OWC under swachh bharat mission and 5% rebate in user charges for operation of same.
- These RWAs processed their wet waste onsite and dry waste is also sent for recycle.
- All PMAY/Mukhyamantri Awas Yojna are practicing segregation, SMC has also provided OWC machines for onsite processing of wet waste.
- 17 PMAY/Mukhyamantri Awas Yojna has already started onsite processing of wet waste and compost is being used as manure for the gardening within the premises.
- **Approximately 30 M.T. of waste generated from Bulk Waste Generators are self treated, which results in daily saving of Rs. 90000 likely to be incurred for transporting, treating and processing of these waste.**





# BIOMETHANATION PLANT - APMC

- To treat the organic waste generated from APMC market in decentralized model. Biogas plant of 50MT/day capacity has been established in APMC market premises since June 2017.
- The present project is based on 75 MT/day Bio methanation Plant for generation of 1200 Kg/day Bio CNG from APMC market waste.
- The purpose of the project is the use of low cost waste streams such as vegetables waste/food waste/cow dung as feedstock to generate high value industrial gases and organic fertilizers.



Description	Quantity
Capacity of the Biogas plant	5200 M3/Day
Raw material-Food waste requirement/day	75 M.T./day
Production of CNG/day	2200 Kg/day
Production of CO2/ day	3000 Kg/day
Net sales realization/ day@88% PLF	@88% PLF Rs 3.02Lakhs/ day
Production Solid Fertilizer/day	2600 Kg/day
Production of Liquid Fertilizer/day	30.50 Kg/day
Project Cost	Rs. 7.95 Crore



# Vermi Compost Plant



- SMC currently has 2 Vermicomposting plants located in the Central and North Zones with a cumulative capacity of 5 TPD.
- Vermicomposting is providing a dual benefit of waste processing along with production of a nutrient rich which is being used by SMC for gardening and is produced in less time.
- Vermicomposting also reduces the weight of the material as the worms consume a lot of waste that is put in for composting.
- Vermicomposting ,unlike the artificial fertilizers, improves the natural qualities of the soil instead of degrading it.



# C & D Waste Management – 300 TPD Capacity

## Recycled Products

SMC make compulsory for utilization of 20% recycle products in all the tenders as per the guideline of SBM at 15% below the market value of Product.

Approx 80 MT of products is manufactured from the recycling of C & D waste which results in approx. 240000 Rs/day of revenue generation



**Kerb Stone, Road Edge Stone, Paving Stone, Granite**



**Paving Blocks Mortar less For Concrete And Interlock Pathways**



**Aggregate +- 20 to 40 MM**



**Solid Blocks & Hollow Blocks**



**Manhole and Tree Pit**



**Plaster sand**

**Concrete Sand**

# Plastic Waste Management - 75 TPD Capacity

- Tie up with SUMUL Dairy under EPR for collection of plastic bags used for milk packaging. Daily 1.5 lac milk bags are collected and processed.
- **Road making:** SMC has started utilizing plastic waste for road making, approximately 21.96 km of road has been constructed using plastic waste material in last year.
- Daily 20 MT Pellets have been produced from waste plastic, which is being used as raw material for various plastic products such as chair, bench, tiles etc.
- **Fabric from Plastic:** Private Operator is manufacturing Textile Material from Plastic PET bottles, which is used in textile industry for weaving process.
- Approx 30 MT of products is manufactured from the recycling of Plastic waste which results in approx. 75000 Rs/day of revenue generation



# PET bottle to Yarn - Recovery of PET Bottles and conversation in Polyester Yarn

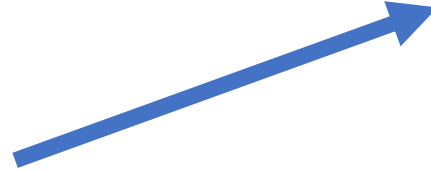


Bottle Feeding System

Trommel

Bottle Pre-Washing

Manual Sorting



Automatic Sorting Color bottle remover

Bottle Crusher



Charging to spinning Unit

Spinning Unit

Can Creel

Cutting-Packing



Flake Washing unit

Label, Cap removal

Flakes drying Unit

Flakes Packing Unit

# Centralized Waste Processing Plant

- The amount of segregated solid waste collected from the entire city was scientifically treated and disposed as per the norms laid in Solid Waste Management Rules-2016.
- Around 2500 TPD capacity of Centralized Municipal Solid Waste Processing Plant has been commissioned at the Khajod Final Disposal site
- Wet waste is been converted to compost using traditional wind rose method
- Dry Waste is been converted in to Refuse Derived Fuel (RDF).
- Approx 100 MT of compost is manufactured from the plant which results in approx. 300000 Rs/day of revenue generation



# Transformation of Dumping Site into Ecological Park

- Waste Quantum- 24,15,490 MT
- Area of Park- 3,44,300.00 Sq. mt
- **Area Reclaimed - 2,67,000.00 Sq. mt**
- **20% of air pollution reduction was achieved in the nearby vicinity due to this project**
- Increased the green cover area of the Surat city by 0.2%
- Ecological park - recreational areas, Development of Cycle Track for public use
- Trapping of Green house gases



PAST



PRESENT



FUTURE

# CIRCULAR ECONOMY CYCLE

Sr. No.	Waste Type	Product Generation per day	Unit Rate for sell or expenses saved	Total income/day or expenses save/day
1	Bio methanation plant at APMC for	400 m3	45 Rs/m3	18000 Rs.
2	C&D Waste	80 MT	3000 Rs/MT	240000 Rs
3	Plastic Waste	30 MT	2500 Rs/MT	75000 Rs
4	Material Recovery Facility	90 MT	400 Rs/MT	36000 Rs
5	<b>Centralized Waste Processing Plant (Compost Generate)</b>	100 MT	3000 Rs/MT	300000 Rs
<b>TOTAL INCOME PER DAY</b>				<b>6,69,000 Rs</b>
Sr. No	Description	Waste Quantum	Waste transport and treatment charges	Total Amount saved per day
1	Waste Reduction through 5R policies and IEC Activity @30%	300 MT	3000 Rs/MT	9,00,000 Rs
<b>On an average approx. 55 Crore per annum is saved through circular economy concept</b>				





Surat  
Municipal  
Corporation

महानगरिणाम्य महानगरसुख्यम्

# Sewage Management Initiatives

Surat Municipal Corporation



# Recycle, Reuse of Sewage Water through Tertiary Treatment



- **1st ULB** in to have Tertiary Treatment Plant (TTP) for recycle & reuse of Sewage Water
- **TTP Capacity : 115 MLD** (40+35+40) plus 10% additional capacity on demand
  - 40 MLD capacity TTP at Bamroli to cater **Pandesara** Industrial Estate (2014)
  - 35 MLD capacity TTP at Bamroli (Phase -II) to cater need of **Sachin** Industrial Estate
  - 40 MLD capacity at Dindoli to cater additional need of **Pandesara** Industrial Estate
- **8 lakh population can be served potable water (115 MLD water spared)** by supply of Industrial Grade Water Industrial Estate thereby saving river water use.
- **Rs 140+ Cr. revenue generation on yearly basis**
- **Captive 1 MLD capacity TTP** at Kavi Kalapi Garden and Kansa Nagar Lake Garden
- **Captive TTP for large housing projects** (6 sites) to treat domestic sewage for reuse in toilet and gardening

# Tertiary Sewage Treatment Plant

40 MLD capacity Bamroli Tertiary Treatment Plant



# Citywide Beautification



- Various fly-over bridges all over the city have been beautified via paintings.
- Vertical Wall gardens are created on the pillars of the bridges.
- VIP Road, Vesu has been beautified using multiple statues and murals made from waste and turn into Iconic Road of City with Modern Urban Space, Artifacts and landscapes.
- Many statues made from waste are placed all over the city.
- On the way of Dumas beach, the favorite weekend destination of Suratis' have been transformed into 1.5 km long Dumas Vibrant Pathway





बहुजनहिताय बहुजनसुखाय

Thank  
You