INTEGRATED SOLID WASTE MANAGEMENT IN PUNE
About Janwani

Janwani is a Public Trust (Registered under Bombay Public Trust Act 1950) supported by MCCIA. Established in 2006 under the chairmanship of Late Mr. B.G. Deshmukh, former Cabinet Secretary, GOI.

Vision

- Make Pune Metropolitan Region (PMR) the best place to live and work
- Advocate and promote equitable and sustainable development in PMR
- Create a platform where different stakeholders can collaborate and develop implementable solutions
JANWANI GOVERNING COUNCIL

- Dr. Vijay Kelkar, (Ph.D, FNAE) Chairman, Janwani
- Mr. Ajit Nimbalker, (Retd IAS) Former Chief Secretary, Govt of Maharashtra
- Mr. Ramnath Jha, (Retd IAS) CEO and MD, Khed Economic Infrastructure Pvt Ltd
- Ms. Aruna Bagchee, (Retd IAS)
- Mr. Arun Firodia, Chairman, Kinetic Engineering Ltd
- Mr. S B (Ravi) Pandit, Chairman and Group CEO, KPIT Technologies Ltd
- Mr. Pratap Pawar, MD, Sakal Papers Ltd
- Ms. Rati Forbes, Director, Forbes Marshal
- Mr. Vishal Jain, CEO, Leverant

**Ex Officio Members**
- Mr. Satish D. Magar, President, MCCIA
- Mr. Anant Sardeshmukh, Director General, MCCIA
- Mr. S.K. Jain, Past President, MCCIA
SWM Plan – Six Focus Areas

1. Expansion of **doorstep collection and source segregation** to entire city and for different waste streams

2. Strengthen **transport systems** (feeder, community bin pick up)

3. Create visible improvement in **street cleanliness** levels

4. Ensure timely commissioning of **waste processing** and recovery capacity

5. Stakeholders Participation and Communication

6. Establish robust **complaint tracking** and resolution system
Initiatives under SWM

1. **PMC SWaCH model** - Integrating the informal sector in Municipal Solid Waste Management.

2. **Zero Garbage model** for Improving collection and segregation

3. **SWACHH Survekshan** - Parameters for service level benchmarking with color coded maps. Third party auditing in every 15 days and publication.

4. **Scientific Processing** –
   - Bio CNG – 300 TPD Plant
   - ORS – 500 TPD Plant
   - Decentralized OWC, Recycling, Composting projects.

5. **Scientific capping & Land filling** - work under progress.

6. **Systems for different streams of waste**
   - Constructing & Demolition waste Policy & its implementation.
   - Sanitary and Biomedical waste
   - E Waste
   - Garden Waste

7. **IEC and BCC activities** – Swachh Award, Plastic waste free Pune City, Thematic drives, Anti spitting, school and college student activities etc.

8. **NGO & Corporate involvement.**
Presentation Outline

1. Pune City Garbage Overview
2. Zero Garbage Concept
3. Zero Garbage Experience To Date
4. PMC – SWaCH Model
5. Decentralized and Centralized Waste Management by PMC
6. Q &A
Pune is the 8th largest city in India and the 2nd largest in the state of Maharashtra.
Pune City Overview

- Area: 250 km²
- Population: 40 L
- 4 Zones in City
- 15 Admin Wards
- 4-5 Electoral Wards (Prabhags) in each Admin Ward
- 76 Prabhags in total
Overview of Waste Management

- Pune generates 1600 -1700 tons of solid waste per day.
- 160 trucks collect waste door-to-door, collecting an average of 198 tons per day. About 2500 waste collectors for DTDC.
- 847 containers and 116 compactor buckets dispersed around Pune.
- Ward wise average- 350 to 750 gms per capita per day
- Construction and demolition waste generation –80-90 TPD
- Garden waste generation – 50-60 TPD
- Biomedical waste – 3 TPD
Pune Waste Profile

100% = 1650 TPD

- Household: 33%
- Hotels, restaurants and Vegetable Markets: 28%
- Commercial: 22%
- Streets: 9%
- Garden Waste: 8%

Household: 65 TPD
Commercial: 35 TPD
Garden Waste: 10 TPD
Wet %: 90 TPD
Dry %: 10 TPD
### Vehicle Names and Nos.

<table>
<thead>
<tr>
<th>Vehicle Name</th>
<th>Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tipper Trucks</td>
<td>160</td>
</tr>
<tr>
<td>Compactors</td>
<td>12</td>
</tr>
<tr>
<td>Hotel Trucks</td>
<td>23</td>
</tr>
<tr>
<td>Tractors</td>
<td>10</td>
</tr>
<tr>
<td>Dumper Placers</td>
<td>89</td>
</tr>
<tr>
<td>Bulk Refuse Carrier (B.R.C.)</td>
<td>65</td>
</tr>
</tbody>
</table>

### Population and Waste Generation (TPD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Waste Generation (TPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>3,115,431</td>
<td>1374</td>
</tr>
<tr>
<td>2021</td>
<td>4,487,573</td>
<td>2677</td>
</tr>
<tr>
<td>2031</td>
<td>6,211,404</td>
<td>4125</td>
</tr>
<tr>
<td>2041</td>
<td>8,597,417</td>
<td>6071</td>
</tr>
</tbody>
</table>
Presentation Outline

1. Pune City Garbage Overview

2. Zero Garbage Concept

3. Zero Garbage Experience To Date

4. PMC – SWaCH Model

5. Decentralized Waste Management by PMC

6. Q &A
Background and Context

• Sustainable Solid Waste Management is essential to Pune’s Smart City aspirations

• However Pune has struggled with effective collection, transport, processing and disposal of waste over the past few years

• High quality segregation at source (homes, offices, shops, etc) along with “systemic” improvements in the end to end waste chain are required to address Pune’s waste management problems

• This project addresses these critical elements and is based on ground level pilots that have delivered demonstrable results
## Why Zero Garbage Ward?

<table>
<thead>
<tr>
<th>We Have</th>
<th>We Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Concerned Citizenry</td>
<td>• 100% Doorstep Collection</td>
</tr>
<tr>
<td>✓ Collection and Transport</td>
<td>• Greater Segregation at Source</td>
</tr>
<tr>
<td>Capacity</td>
<td>• Synchronization between Collection, Transport and</td>
</tr>
<tr>
<td></td>
<td>Processing</td>
</tr>
<tr>
<td>✓ Manpower</td>
<td>• More Wet Waste Processing Capacity</td>
</tr>
<tr>
<td></td>
<td>• Complaint Resolution System</td>
</tr>
</tbody>
</table>
Key Elements of Zero Garbage Model

1. Segregation at Source

2. Doorstep collection of Segregated Waste

3. Further sorting and segregation of dry waste and linkage with scrap dealers

4. Organic waste to biogas or other processing plant

5. Systems for handling specialized waste (C&D, E Waste, Garden Waste)
Project Stakeholders

PMC
Solid Waste Management System

SWaCH Cooperative
Door-to-door collection of garbage

Janwani
Facilitator

Households and Commercial units
Segregate the garbage into dry and wet garbage

Corporate / Sponsor
Financial aid
Zero Garbage Project Phase

- **Original Zero Garbage Wards (20)**
- **New Zero Garbage Wards (10)**
- **Subsequent Expansion (46)**
# Project Objectives

<table>
<thead>
<tr>
<th>Element</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Doorstep Collection Coverage</td>
<td>75%</td>
<td>90%</td>
<td>100%</td>
</tr>
<tr>
<td>2 Segregation Level</td>
<td>50%</td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td>3 Reduction in Community Containers</td>
<td>60%</td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td>4 Diversion of Waste from Landfill</td>
<td>50%</td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>5 Other Streams : Separate Collection System</td>
<td>75%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
## Importance of Four Components

| Ground Level Awareness Creation | • Mass Media alone do not drive behaviour change  
| | • Need to create champions of change in every ward |
| Reliable Systems from Collection to Disposal | • Current collection, transport and disposal system does not operate consistently  
| | • Need to overcome citizen skepticism about PMC’s capabilities on solid waste |
| Mechanisms for Specialized Waste | • Need holistic solution to ensure clean city objective is met  
| | • Need systems for things like Sanitary waste, garden and C&D waste |
| Recognition of Role Models | • Help convince citizens about doability of the model  
| | • Help build momentum and civic pride |
Zero Garbage Implementation Approach

1. Conduct Assessment of Existing Situation
2. Build Awareness
3. Encourage Segregation
4. Implement Doorstep Collection System
5. Integrate Collection/Transport/Dry Scrap Systems
6. Establish Decentralized Waste Processing Facilities
7. Implement Ongoing Monitoring and Supervision
Presentation Outline

1. Pune City Garbage Overview
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### Zero Garbage Pilot – Katraj Ward

- **11,500 Properties**
- **45,000 Residents**

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>BEFORE (2011)</th>
<th>AFTER (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Waste Containers</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Segregation at Source</td>
<td>&lt; 10%</td>
<td>~ 70%</td>
</tr>
<tr>
<td>Door to Door Collection Coverage</td>
<td>30%</td>
<td>~ 90%</td>
</tr>
<tr>
<td>No of Waste Pickers</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>Wet Waste Processing</td>
<td>None</td>
<td>5 Tons/Day Biogas</td>
</tr>
<tr>
<td>Waste Sent to Landfill</td>
<td>10 Tons/Day</td>
<td>2 Tons/Day</td>
</tr>
</tbody>
</table>
Expansion of Zero Garbage Model in 20 Prabhags

Increase in Door Step Collection/Coverage

- Overall Seg. in 20 Prabhags
- Door Step…
Result: Expansion 20 Prabhag

Community Bins Removal

- **No. Containers**
  - Before Project
  - At the End of Dec 2014

Society Level Composting

- **No. of Containers**
  - Before the Project
  - At the End of Dec 2014

- **End of Dec 2014**
  - 22354 properties
  - 21.41 TPD

- **Before the Project**
  - 41,224 Properties
  - 42.67 TPD
Awareness Building Tools

- Door to Door Campaigns
- Rallies
- Meetings with Society Chairpersons
- Compost Pits Demos in Large Housing Complexes
- Distribution of Pamphlets
- Awareness Films for Citizens & Volunteers
- Creation of Cleanliness Volunteers in Ward
- Talks and Films in local Schools
Execution Phase

Inauguration Rally

Door to door survey

Cleanliness Drive

Rally by Corporates
The Movement of Waste from Households in Pune

Source segregated waste -> SWaCH cooperative monthly user fee per house -> Compost Unit -> Materials Recovery Centre

- Recycling Units
- Scrap Market
- Recyclables
- Non Recyclables
  - Secondary collection to Uruli landfill
Mechanisms for Specialized Waste

- Ensure that specialized waste streams are not comingled with main household waste so as to maximize recovery
- Establish regular collection system for e waste using third party providers in Kothrud and Aundh areas
- Established linkage between collection agencies and certified disposal/processing units in Kothrud and Aundh areas

Output –
1. E waste drives in residential and commercial areas – 43
2. Total E waste collected – 2700 kgs
3. Properties covered for collection - 26000
4. Street plays – 10
5. Special events – 7
Plastic Waste Management in Kothrud and Baner-Balewadi

Objectives -
1. Promote and develop the market for recycled products, including reusable bags, to improve demands for alternative and eco-friendly products
2. Espouse take-back/collection mechanisms and recycling;
3. Support Local Communities in their recycling initiatives; and
4. Create awareness in the society and schools using 3 R’s Principle

Output –
1. Plastic Collection drives : 28, Properties covered : 20,000+
2. 2.5 ton plastic waste collected and recycled
3. 14 schools and 5300 students has been oriented
4. Trained 15 women for preparation newspaper bags( 10,000 distributed till date )
Corporate Participation

- CSR is now becoming an increasingly important priority for businesses. It is evident that companies are willing to get more involved in the community, leading to a sustainable and healthy environment.

- Corporate involvement by employee volunteering and financial assistance is increasing.

- Cummins India, KPIT, Persistent Foundation, Bajaj Auto, Serum Institute and others have joined this initiative.

- Benefits - Section 135 and schedule VII of the Companies Act, 2013 as well as Section 55 and 186.
### Monitoring and Control

#### Detailed Control Plan and Training

#### Control Plan : Zero Garbage Model

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Project Activity</th>
<th>Time Line</th>
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<tr>
<td>1</td>
<td>Rallies/Door to door communication in Baner</td>
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<td>2</td>
<td>Rallies/Door to door communication in Narwadi</td>
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<tr>
<td>3</td>
<td>Control plan and FEMA</td>
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<tr>
<td>4</td>
<td>Fund approval</td>
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<td>5</td>
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<td>7</td>
<td>Education and training to school staff</td>
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<tr>
<td>8</td>
<td>Base line study for solid waste and identifying gaps in hospital &amp; institutional waste</td>
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<td>9</td>
<td>Training to Hospital staff, Hotel staff for identification</td>
<td></td>
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<tr>
<td>10</td>
<td>Decide action plan based on survey analysis</td>
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<tr>
<td>11</td>
<td>Review with NGO &amp; PFC for data collection</td>
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#### Weekly updating of Indicators

#### Key Indicators of Progress

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#### Control Plan in place to ensure sustenance

Control Plan in place to ensure sustenance.
Sustainability of the Zero Garbage Model

- Zero Garbage Ward changes how we view waste. Instead of something disposable, we see waste as a renewable resource.
- Present practice of collecting mixed waste and sending it to landfills is clearly not sustainable given the protests of nearby residents and the environmental degradation taking place.
- Model enhances the quality of work of the waste picker, while also meeting demands for neighborhood cleanliness and limiting garbage sent to landfills.
Recognition

Zero Garbage Ward has been acknowledged for its uniqueness
• Dubai International Award by UN Habitat: Best Practice – Zero Garbage –India, April 16, 2015
• Global Environment Challenge Award by Cummins India Ltd
• Vasundhara Award 2013 by Maharashtra Pollution Control Board for best practices
• HUDCO Awards for Best Practices to “Improve the living Environment 2012-13”
• ICON SWM 2012- Award of Excellence in SWM.
• Skoch - Digital Inclusion Award:- The Benchmark of Best Practices 2013
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1. Pune City Garbage Overview

2. Zero Garbage Concept

3. Zero Garbage Experience To Date

4. PMC – SWaCH Model

5. Decentralized Waste Management by PMC

6. Q &A
Wholly worker-owned SWaCH cooperative - born in 2007 to provide front end waste management services to the city of Pune and recover user fees, entered into a formal memorandum of understanding with PMC for door to door collection of waste in 2008.
SWaCH: How it works

• A Pair services door-to-door waste collection for 300-400 households.

• **Segregated waste** expected but not always received from generators.

• Waste pickers further segregate waste and sell recyclables.

• Non-recyclable waste delivered to feeder points.

• Also provide compost services.
KEY Features

• Decentralized: Removes pressure from PMC, which lacks manpower and resources for door-to-door coverage.

• Cost-effective: Saves money – reduces transport costs.

• Energy efficient and environmentally sound: Non motorised, reduced waste sent to landfills.

• High-resource recovery: Recycling of dry and wet waste

• Labour friendly: Enhanced earnings, work conditions

• Sustainable: Cost and environmental benefits and availability of workforce make decentralized system administratively feasible.
Cost for PMC

- Pune city’s efforts to partner with waste pickers organizations to provide better service – 2300 wastepickers cover about 0.4 Million Households
- PMC pays for management and equipment cost
- Health insurance provided by PMC Sorting Sheds
- Citizen Outreach, awareness and Training
- Subsidy for Slum Areas expenditure to PMC Rs 10 per hh per mth
Benefits to waste pickers

- Recognition – by govt. and citizens
- Dignity of labour
- Guarantee of Work
- User Fee (Rs. 50 per hh)
- Revenue from sale of recyclables
- Occupational Health and Safety – Tools
- Sorting Sheds
- Social Protection: Medical Insurance, Life Insurance + Educational Incentives
Benefits to Municipality

- Economically viable: Lower waste handling costs, Reduced Space requirement for landfilling, Lower Processing Costs (Annual Savings: INR 5 Cr waste handling, INR 1 Cr Tipping Fees, INR 33.5 Cr Labour costs)
- Environmentally sustainable: Cleaner City, Higher Segregation and Recycling, Resource Recovery, Mitigation of Climate Change
- Socially relevant: Poverty Alleviation, Social Security, International Labour Norms, Greater Awareness and accountability
- Diversion of waste going to landfill – 25% dry recyclables and 25% wet waste by in situ composting

© SWaCH Coop
New Portable Sheds for SWaCH

- There are 45 sorting sheds including 6 Portable & Other
- Sonia Gram Udyog Prakalp
  1) Aundh 2) Katraj 3) Yerawada
- 200 – 250 Waste Picker Directly Attached Processor
- 4 TPD of waste is Processed
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Decentralized Wet waste disposal

**Society level disposal**  
(For those having space for in situ disposal)  
- Encouragement  
- Penalties  
- Awareness about technology options  
- Time bound coverage plan

**Community Plants**  
(For those having no space for in situ disposal)  
- Catchment area  
- Quantity  
- Composition  
- Size  
- Location  
- Selection of Technology
Wet Waste Disposal Methods

- Composting Process
  - Bacterial Culture
  - Vermiculture
  - Composting Machines
- Anaerobic Biogas Digester
  - Biogas Systems
- Refuse Derived Fuels – Garden Waste
  - Briquetting
Composting

- Vermiculture
  - Society level disposal technique
- Critical factors
  - Moisture
  - Temperature
  - Expert maintenance needed
Vermiculture bins
Composting Pits

- Bacterial Culture
- Traditional disposal method
- Critical factor
  - Temperature
  - Moisture
  - Carbon to Nitrogen ratio
  - Expert maintenance needed
Composting machines

• Bio-mechanical composting
• Automated and quick method
• Critical factors:
  • Electricity consumption
  • Maintenance of machinery
  • Raw material- carbon source
Anaerobic biogas digestors

- Anaerobic: absence of Air
- **Society or Ward level and Food Waste is most suitable**
- Biogas is a mixture of gases that is composed chiefly of:
  - Methane (CH4): 40-70 vol. %
  - Carbon dioxide (CO2): 30-60 vol. %
  - Other gases: 1-5 vol. % including H₂, H₂S, etc.

Critical factors:
- Land and high capital cost
- Need of water
- High amount of byproduct slurry
- High quality segregation
Anaerobic biogas digesters

Decentralized biogas

Portable Biogas Systems
# Techno-commercial Viability Of Decentralized Biogas Plants

<table>
<thead>
<tr>
<th>Project Economics  - If Biogas is utilized for Electricity Generation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plant Cost</strong></td>
<td>Rs. 100.00 Lakhs</td>
</tr>
<tr>
<td><strong>Biogas Generated</strong></td>
<td>300 Cum./day</td>
</tr>
<tr>
<td><strong>Electricity Generated</strong></td>
<td>400 kWh/day</td>
</tr>
<tr>
<td><strong>Auxiliary Consumption</strong></td>
<td>@ 50 kWh/day</td>
</tr>
<tr>
<td><strong>Annual Savings due to Biogas (Considering 330 operating days)</strong></td>
<td>Rs. 7.50 Lakhs (350 kWh/day X Rs.6.50 /kWh X 330 days)</td>
</tr>
<tr>
<td><strong>Annual Savings due to Manure</strong></td>
<td>Rs. 1.80 Lakhs (150 TPA X Rs.1200 / MT)</td>
</tr>
<tr>
<td><strong>Savings to ULB in Transportation of Wastes to Landfill Site</strong></td>
<td>Rs. 11.50 Lakhs (5 TPD X Rs. 700/- / Tone X 330 Days)</td>
</tr>
<tr>
<td><strong>Savings (Electricity + Manure + Tr.)</strong></td>
<td>Rs. 20.80 Lakhs</td>
</tr>
<tr>
<td><strong>O &amp; M Cost</strong></td>
<td>Rs. 9.50 Lakhs / Year</td>
</tr>
<tr>
<td><strong>Net Savings</strong></td>
<td>Rs. 11.30 Lakhs</td>
</tr>
<tr>
<td><strong>Simple pay-back period</strong></td>
<td>8 Years</td>
</tr>
</tbody>
</table>

**Total Decentralized biogas plants = 22 nos and 110 TPD capacity**
### Techno-commercial Viability Of Decentralized Biogas Plants

#### INDIRECT SAVINGS

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Savings in Conventional Fuel - Coal to Electricity</td>
<td>100 Tones / Year</td>
</tr>
<tr>
<td>Stopping Release of Methane to the Atmosphere</td>
<td>54,000 Cum./Year</td>
</tr>
<tr>
<td>Generation of Employment</td>
<td>5 Persons</td>
</tr>
<tr>
<td>Volume saved at Landfill / Open Dumping Site</td>
<td>3000 Cum.</td>
</tr>
<tr>
<td>Stopping Ground Water Pollution at Open Dumping / Landfill site</td>
<td></td>
</tr>
</tbody>
</table>

Source of Info: Enprotech Solution
## Decentralised Wet Waste Processing Units

<table>
<thead>
<tr>
<th>Zone No</th>
<th>Vermicomposting Pits</th>
<th>Bio-Sanitisers</th>
<th>Bio-Methanisation</th>
<th>Organic Waste Converter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nos</td>
<td>Kgs</td>
<td>Nos</td>
<td>Kgs</td>
<td>Nos</td>
</tr>
<tr>
<td>Zone-1</td>
<td>775</td>
<td>12754</td>
<td>223</td>
<td>2522</td>
<td>14</td>
</tr>
<tr>
<td>Zone-2</td>
<td>12</td>
<td>330</td>
<td>100</td>
<td>2878</td>
<td>1</td>
</tr>
<tr>
<td>Zone-3</td>
<td>63</td>
<td>934.5</td>
<td>396</td>
<td>3273</td>
<td>4</td>
</tr>
<tr>
<td>Zone-4</td>
<td>139</td>
<td>1878</td>
<td>86</td>
<td>726</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>989</td>
<td>15896.5</td>
<td>803</td>
<td>9334</td>
<td>25</td>
</tr>
</tbody>
</table>
Conversion of waste to energy is a process of waste disposal to result in the production of usable form of energy. Thus refuse derived fuel (RDF) or solid recovered fuel/ specified recovered fuel (SRF) is a fuel produced by shredding and dehydrating solid waste (MSW) with a waste converter technology.

- Pelletization

- Briquetting
Utilization of Pellets/ Briquette
Waste Management Infrastructure

- Decentralized and Centralized Plants
- 7 transfer stations
Intermediate Transfer Station
<table>
<thead>
<tr>
<th>Waste Processing Infrastructure</th>
<th>Current</th>
<th>Proposed Dec 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per day waste Generation</td>
<td>1650 TPD</td>
<td>1700 TPD</td>
</tr>
<tr>
<td>Biogas</td>
<td>21*5TPD = 105 TPD</td>
<td>105 TPD</td>
</tr>
<tr>
<td>Disha Waste Management</td>
<td>100 TPD</td>
<td>80 TPD</td>
</tr>
<tr>
<td>Ajinkya Biofert</td>
<td>200 TPD</td>
<td>100 TPD</td>
</tr>
<tr>
<td>Decentralised Mechanical composting</td>
<td>OWC + Foodie</td>
<td>105TPD</td>
</tr>
<tr>
<td>Rochem Separation systems</td>
<td>700 TPD</td>
<td>250 TPD</td>
</tr>
<tr>
<td>Biogas ( additional)</td>
<td>5 * 5 TPD</td>
<td>25 TPD</td>
</tr>
<tr>
<td>Garbage segregation and manure</td>
<td>50 TPD</td>
<td>50 TPD</td>
</tr>
<tr>
<td>Nobel Bio-Methanation</td>
<td>300 TPD</td>
<td>100 TPD</td>
</tr>
<tr>
<td>Inorganic Recycling (Decentralized thru-scrap dealers)</td>
<td>50 TPD</td>
<td>50 TPD</td>
</tr>
<tr>
<td>Sell of scrap thru wastepickers</td>
<td>200 TPD</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>1115TPD</td>
<td>1889 TPD</td>
</tr>
</tbody>
</table>
THANK YOU!
ANNEXURE
Grassroots Activation

- **Objective**
  - Ensure key messages and “so what’s” delivered to, and understood by every household and establishment

- **Actions**
  - Customize communication strategy for different groups
  - Create multilingual and easy to grasp pamphlets and posters
  - Build team of ‘Swatchata Mitras’ and ward level citizen groups
  - Conduct Door to Door campaign through volunteers
  - Conduct street plays and community events within each ward
  - Publish articles and case studies by prominent citizens
  - Interactive sessions and outreach at education institutes and large companies
  - Hold regular city, zone, ward level events and competitions
Systems and Processes

- **Objective**
  - To match the ability of the system to collect, transport and process the segregated garbage with awareness created

- **Actions**
  - Conduct baseline surveys
  - Define Standard Operating Procedures for each key stage
  - Establish Grievance Redressal Mechanism
  - Train PMC staff and waste collectors
  - Establish synchronization between primary and secondary waste collection systems
  - Create dedicated and sustainable system setup for e-waste, garden waste
  - Implement lean management practices and ISO standards
  - Create interactive digital interface (Website and App)
Ground Level Awareness Creation

Objective
- Bring awareness to the doorstep of every household across the city

Approach and Actions
- Door to Door campaign through trained volunteers
- Interactive **digital interface** (Website and App)
- Simple and visual multilingual pamphlets
- Vibrant team of ‘**Swatchata Mitra**’ (ward level citizen volunteers) focused on cleanliness
- Street Plays and Community events in slums
- Weekly articles by prominent citizens
- **Interactive sessions and trainings** at educational institutes and companies
- Inter-ward Competitions and promotional activities.
- City wide events (e.g. marathon, poster art, etc)
Systems for Collection, Transportation and Processing of Solid Waste

Objective

- Ensure city’s SWM system has the ability to reliably collect, transport and process segregated waste

Approach and Actions

- Establish implementation with lean management practices and ISO standard process
- Install Grievance Redressal Mechanism
- Capacity building within PMC by training PMC staff
- Synchronization between primary and secondary waste collection systems
- Implement monitoring systems and KPIs to measure system performance and take corrective actions as needed
Mechanisms for Specialized Waste

Objective
• Ensure that specialized waste streams are not comingled with main household waste so as to maximize recovery

Approach and Actions
• Establish regular collection system (e waste and garden waste) using third party providers
• Ensure linkage between collection agencies and certified disposal/processing units
• Create “On Call” system for bulk garden and C&D waste
Recognition of Success Stories

Objective
• Publicize success stories and role models to build momentum and overcome resistance

Approach and Actions
• Launch activities and celebrity talk shows
• Clean Street and Clean Ward awards
• Clean Society and Clean Slum competitions
• Clean City competitions in schools and colleges
Pune Clean City Goals

1. Achieve 100% Segregation
   - Initially wet and dry
   - Subsequently finer segregation (e.g. E-waste, Biomedical waste)

2. Establish Collection and Transport System that Covers Entire City and all Streams of Waste
   - 100% doorstep collection for households and commercial establishments
   - Maintain segregation during transport
   - Increase capacity for garden waste collection and disposal
   - Appropriate system for handling street sweepings
   - Dedicated collection system for specialized waste (Biomedical, E-waste, C&D)
   - Availability of litter bins on all streets along with collection system

3. Maximize Reuse and Recovery
   - Increase capacity for wet waste processing
   - Establish facilities for specialized waste
   - Earmark space for dry waste segregation