Solid Waste Management Execution Plan for Sindh

Presentation to Urban Resource Center

25th March 2015
Sequence

- Guiding Principles
- Situation on Ground
- What is required in SWM?
- Karachi – Strategy
- Strategy in Interior Sindh Districts
Guiding Principles

• Waste is a resource

• Operational, environmental & economic sustainability of SWM Plan

• Emphasis on waste to energy options leading to earnings from Carbon Credits

• Integration & Involvement
Situation on Ground

- Municipal Agencies’ complete failure in Karachi and all Interior Sindh districts
- Karachi the dirtiest mega city in the world despite Rs.3.5 billion expenditure on SWM
- Recent Cleanliness Campaign
- Situation in Interior Districts is worse despite spending around Rs. 2.5 billion per year
- Health & Environment hazards / adverse impact on investments
- Sindh Solid Waste Management Board established under SSWMB Act 2013
What is required in SWM?

- Strategic Action Plan to turn the situation around in 7 to 9 months
- Taking Karachi Division, Hyderabad and Shaheed Benazirabad Districts in Phase I
- Phase II for 10 districts starting from FY 2015-16
- Phase III for all remaining districts starting from 2016-17
- Different strategies for Karachi and other districts of the Province due to economies of scale
Karachi -- Strategy

- No new study needed
- Stakeholders to be taken on board
- Multi-stakeholder consultation with civil society held on 19th Feb in Federation House, FPCCI - Jointly organized by SSWMB, KMC, DMCs, Commissioner Kar and FPCCI
- Karachi MSWM Plan finalized
- Rehabilitation of waste pickers & vulnerable communities
Karachi Waste Generation & Characterization

- Waste generation 11,000 tons per day
- Will grow significantly to 16,000 TPD (over 6 million TPY) by 2020

<table>
<thead>
<tr>
<th>Component</th>
<th>Low Income</th>
<th>Middle Income</th>
<th>High Income</th>
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<tbody>
<tr>
<td>Bulk density (kg/m³)</td>
<td>201</td>
<td>206</td>
<td>208</td>
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<tr>
<td>Per capita generation (kg/day)</td>
<td>0.315</td>
<td>0.370</td>
<td>0.382</td>
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<tr>
<td>Composition (Percent Wet Weight)</td>
<td></td>
<td></td>
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<tr>
<td>Paper</td>
<td>11.35</td>
<td>11.40</td>
<td>14.50</td>
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<tr>
<td>Glass</td>
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<tr>
<td>Metal</td>
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<td>Organic</td>
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<tr>
<td>Other Inorganic</td>
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<tr>
<td>Hazardous</td>
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<td>2.34</td>
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<tr>
<td>Total</td>
<td>100</td>
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Strategy – Karachi (cont...)

Front end (Direct contact with Public)

1. Door to door collection
2. Manual & mechanical sweeping
3. Transportation from community dustbins to GTS
4. Washing

The most difficult part in delivery but most satisfying for the public
- Karachi will be divided in 6 Zones
- All works to be outsourced
- Entire SWM staff to be detailed to private firms
- Payment to contractors on per ton delivered to GTS basis
- Strict monitoring system with penal actions/ On-line & SMS Complaint Management System
- Communities to be involved
Strategy -- Karachi

Back end

1. Garbage Transfer Station (GTS)
2. Material Recovery Facility / Recycling
3. Landfill sites (03 sites)
4. Waste to energy
   a) Pyrolysis (anaerobic digestion)/incinerator
   b) Plasma Gasification
   c) RDF
   d) Compost / Biogas
   e) Diesel from Plastics

- Comparatively easy, capital intensive, best avenue for foreign investment
- All components on BOOT model except GTS and Landfill Sites
- Health and Environmental gains and Clean Development Mechanism
- Cluster Formations on the basis of landfill sites (03)
- Time consuming
Waste requiring special treatment

- Medical Hazardous Waste
- Industrial Hazardous Solid Waste
- Sewerage Solid Waste
Medical Hazardous Waste

• Separation of Municipal SW and Medical Hazardous Waste
• Plan for Karachi is ready. Salient Features:
  ▪ Legal Framework
  ▪ Registration of all hospitals and clinics
  ▪ Door to door collection and AC vehicle for transportation
  ▪ The most modern Pyrolysis technologies generating energy and RDF
  ▪ Collection of Tipping Fees
  ▪ Awareness & training of Community and Medical professionals
  ▪ Outsourcing / Investment opportunities
  ▪ Rehabilitation Plan for Scavengers
  ▪ CDM Project with Carbon Credits income

• Checking spread of diseases and unsafe recycling
• Income for the City
Karachi Progress

- Office established
- EOI for In house Consultant Firm issued
- SWM Plan for Karachi ready
- PC I for 06 GTSs almost ready
- Land pieces for GTSs finalized
- RFP for Front End Collection outsourcing will be ready in one week
- New Landfill Site for Karachi identified. PC I being prepared
- Plan & RFP on Medical Hazardous Waste being prepared
- Consultant being hired for industrial Hazardous Waste Study
- Timelines
Nawab Shah Municipality, SBA SWM Project

- Initially for Municipal SW, Medical Hazardous Waste in 2\textsuperscript{nd} phase
- Waste generation is 150 ton per day
- Waste Characterization Study completed
- Entire revamping of SWM system on scientific lines
- Multi-stakeholder consultation to involve civil society
- Waste to energy options – Modular Pyrolysis Energy Plant
- Clean Development Mechanism project earning carbon credits
Nawab Shah SWM Project – Salient Features

**Front End**
- Door to door collection
- Sweeping – mechanical & manual
- Revamping of entire community dustbin system
- 02 GTSs
- Transporting waste to Landfill site
- Management Contract to be outsourced

**Back End**
- Material Recovery Facility / Recycling
- Sanitary engineered landfill site
- Compost Plant (Biogas to energy and green fertilizer)
- Refuse Derived Fuel (RDF) for selling to industries
- Modular Pyrolysis plant generating electricity
Nawab Shah SWM Project – Salient Features (cont…)

**Soft components:**

- Legal Framework
- Optimize deployment of existing labour & Shifting of entire staff to Management Contractor
- Community Awareness Plan
- Organization of entire community
  - *Creation of Zones on UC basis*
  - *Mohallah & Street Associations*
  - *Local leaders will be brought forth*
  - *Hiring of Social Motivators & registration of volunteers*
- Enhancing liaison between different department for service delivery like parks, engineering, sewerage
  - Effective monitoring system with penal actions/ On-line Complaint Management System plus SMS
Refuse Derived Fuel - RDF
Refuse Derived Fuel - RDF

Refuse

Primary crushing
- Improves shredder efficiency

Drying
- Increases the calorific value and storage capability

Classifying
- Removes foreign materials

RDF pellets

Pelletization
- Improves storing and handling capabilities by pelletizing

Secondary crushing
- Reduces volume

Refuse Derived Fuel (RDF)
Progress

• Waste Characterization Study completed

• PC-I will be prepared by 30th March

• Outsourcing of the Management Contract

• Front End system to be established by September 2015

• Back End will take more time

• Landfill site finalized
• The plan may seem ambitious but it is very much practicable

• Very strong political commitment

• Too many vested interest groups and mafias

• Strong civil society support needed

• Do we want our tax payer’s money going into the pockets of a few unscrupulous elements

• Let’s take one decision—whether we want our children to live in litter and garbage burning all around or we want a change?

• We need your support to succeed
THANKS

Sindh
Solid Waste Management Board