Welcome to a Presentation on
Insights into RfP for Solid Waste Management

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Overview

• Objectives of MSWM - Legislation & Rules
• Objectives & Key Principles of RfP for SWM
• Understanding work flow - Key Focus Areas
• Characterization & Quantification of waste
• Processing & Treatment Options & WtE Plants
• Stakeholder Participation - Communication
• Livelihoods – Rag pickers
• Management of SWM Contracts – Competencies
• GO Ms 279
Compliance with existing Legislation & Regulations

• CPHEEO MSWM Manual
  – Part I Overview
  – Part II The Manual
  – Part III Compendium of Rules
• JNNURM MSWM Toolkit 2012
• Advisory on improving MSWM services
• Guidance Note: MSWM on Regional Basis
• MSWM PPP Toolkit Volume I
The MoUD has revised the MSW (M&H) Rules 2000 to cater to the changing scenario:
- To cater to enlarged scope of challenges due to rapid urbanization - urban agglomerations etc.
- Making source segregation mandatory
- Construction & Demolition Waste Handling Rules
- Hazardous Waste Handling Rules
- Biomedical Waste Handling Rules
- Responsibilities of bulk generators
- Responsibilities of Central/State/ULBs
Objectives of Legislation & Rules

• To ensure public health
• To ensure environmental sanitation
• To ensure end-to-end MSWM.
• Environmental sustainability
• Optimum use of natural resources
Policy initiatives by GoI

• For ensuring financial viability of Waste to Compost & WtE plants:
  – Market Development Assistance of Rs.1500/MT on sale of city compost to farmers
  – CERC notifies general tariff for Waste to Energy of Rs.7.90/kWh
  – Mandatory procurement of 100% of power generated from WtE plants
  – Allows usage of Recycled Concrete Aggregates derived from C&D waste
  – Published SWM Rules 2016 to make them more effective & serve the initiatives taken under SWM
Objectives of MSWM

• Preserving public health and preventing improper and unscientific handling of MSW, insanitary conditions and diseases through:
  • Environmentally & aesthetically sound management of MSW, in an integrated manner (closing the MSW loop)
  • Promoting resource recovery from wastes
Hierarchy of Integrated Solid waste Management Options

Waste Minimisation/ Source Reduction

Material Recycling

Waste Processing

( Energy & Material Recovery )

Waste Transformation

Landfilling

Insights into RfP for SWM
Objectives of RfP for SWM

- To fulfil the objectives of MSWM,
- To have a comprehensive scientific study of MSW system,
- Generate a Detailed Project Report for Integrated & Sustainable SWM
- Prioritized & phased Action Plan with Costs
- Bankable projects
- Should enable access to funding from GoI & exploring PPP options
RfP

• It is a Request for Proposals from eligible intending bidders for undertaking the assignment
• Its main contents are:
  – Invitation to bid
  – Instructions to bidders
  – Qualification criteria
  – Evaluation criteria
  – General Conditions of Contract
  – Special Conditions of Contract
  – Terms of Reference
  – Service Level Agreement
  – Contract Form
The ToR should address

- Background for the Study
- Objective/s of the Study – to be clearly defined
- Scope & Deliverables
- Detailed tasks to be performed
- Key personnel to be deployed
- Outputs & Deliverables with timelines
- Penalties, Liquidated Damages etc.
- Force Majeure
- Dispute resolution
- Payment conditions
- Responsibilities
Key Principles

• Preserve Public Health & Environmental sanitation
• Consider Waste as a Resource
• Polluter to Pay
• Reduce/Refuse - purchase, consumption, packaging etc.
• Reuse / Repair – plastic, packaging, bags etc.
• Recycle – plastic, glass, metal, cloth etc.
• Recover – compost, energy, material etc.
• Recreate – C&D waste conversion to building materials.
• 100% Door-to-Door Collection
• Source segregation, Eliminate multiple handling
Key Focus Areas

- Co-generation of value added products
- Minimization of Transportation
- Separate transport of Sand/Silt/C&D waste/Bio-medical & Hazardous waste
- Only rejects, inerts to go to landfill
- Leachate to be treated to standards
- Environmental & Financial sustainability
- Proper understanding of SW & SWM operations
- 100% Door-to-Door collection
- Appropriate processing methods
- Appropriate Treatment of waste &
- Generation of value added products
- Infusion of latest technologies & processes
Status of different countries

• Recycling ~60%
  – Norway, Austria, Germany, Belgium

• WtE 50%
  – Norway, Denmark, Sweden, Switzerland

• Landfilling ~ 100%
  – Turkey, Rumania, Bulgaria

• No landfill
  – Switzerland, Germany, Netherlands, Sweden, Belgium
Understanding work flow in SWM

- Source Segregation; Door-to-door collection;
- Primary, Secondary & Transportation
- Transfer station
- Workers Protection, insurance, rehabilitation etc.
  - Multiple handling of waste
  - PPE – Personal Protective Equipment for workers
  - Rehabilitation of rag pickers
  - Security for women workers during night sweeping
  - Space to nursing mothers for feeding children at work

- Processing, Treatment & Disposal
- Generation/co-generation of value added products – biogas, compost, energy, building material etc.
- Closing the SWM cycle
Characterization & Quantification of waste

- Domestic waste
- Commercial waste
- Construction & Demolition waste
- Hazardous waste
- Electronic waste
- Bio-medical waste
Collection of Waste

• Door to door collection
• Collect separately
  – Drain sand/silt etc.
  – C&D waste
  – Bio-medical waste
  – Hazardous waste like fuel cells etc.
  – Electronic waste
• This will enable easy recycling and fair value for the product
• Enables better treatment either in scientific landfill or WtE plants
Segregation of Waste

• Why segregation is important
  – The WtE plants are designed for handling mixed waste but only recyclable plastics and organic waste.
  – The operator wants waste without metals, glass, debris, C&D waste, sand, grit etc.
  – Hence, the segregate metals, glass, sand, grit, drain silt, C&D waste etc.
  – This will reduce load on the operator and the incineration will go smoothly.
Transportation of Waste

- Primary transportation
- Secondary transportation
- Tertiary transportation
- Compactors/Mini-compactors in bigger cities
- Minimize transportation
- Improved Operation & Maintenance
- GPS & geo-tagging of vehicles
- Outsourcing wherever appropriate duly verifying financials.
Transfer of Waste

• Transfer stations when the distance to landfill/treatment location is > 10 KM.
• To be properly located away from residences/proper green belt.
• Properly planned to ensure smooth transfer of waste and loading on to tertiary transport.
• Facilities for onsite compaction.
• Fire fighting and other equipment.
• Onsite separation of dry waste.
Processing of Waste

• Processing facilities may include:
  – Separation of plastics, metals, glass, leather etc.
  – Bundling
  – Arrangement with vendors/recyclers
  – Proper arrangements for cleanliness
  – Fire fighting arrangements

• Material Recovery Facility
Treatment of Waste - Objectives

- Environment friendly treatment and disposal
- Reduction of emissions into the air
- Reduction of bottom ash
- End-to-end treatment of waste
- Landfill management including leachate management to effluent discharge standards
- Financial sustainability
- Value added products
Options for Processing & Treatment

- Composting
- Bio-methanation
- Landfill / Sanitary landfill with gas recovery
- Waste to Energy
  - Incineration (Mass Burn Technology)
  - Incineration with Dioxin Breaker
  - Pyrolysis
  - Pyrolysis Hydrolysis at ultra high temperature
  - Gasification
  - Plasma gasification
  - Refuse Derived Fuel
Contextualization

• Considerations for selection of technology
  – Environment – emission norms & public health
  – Economy – cost control, financial sustainability
  – Energy - energy recovery & efficiency
  – Waste characteristics – type / quality / content
  – Size of the town and its characteristics
Mass Incineration Technology

• This is a kind of thermal treatment. It may be through
• Grate combustion – suitable for MSW
• Fluidized bed combustion – suitable for fine grained material like sewage sludge, wood chips
• Combustion in Rotary kiln – suited for hazardous waste
Design aspects of Mixed MSW WtE Plant

1. Heterogeneous fuel.
   - Non uniform in size & density.
   - Properties vary from region to region.
   - Properties vary from season to season

2. Variation in the heating value.
   - Wide variation of LHV from 1100 to 2200 kcal/kg

• Examples
  - Maishima (Osaka) (900 TPD, 25 MW), Tokyo Chuo (600 TPD, 15 MW), Japan; Laogang (Shanghai), (3000 TPD, 60 MW) China; Riverside (London), (2290 TPD
Conventional Biomass Power Plant

• Homogeneous fuel.
  – Uniform in size & density.
  – Properties will not vary from region to region.
  – Properties will not vary from season to season

• Variation in the heating value.
  – Fixed heating value of 3115 kcal/kg
Decentralized Waste Treatment Options

- Decentralized processing units
- Decentralized composting
- Decentralized bio-methanation plants
- Decentralized WtE plants
Co-treatment with (sewage) Sludge

• Co-treatment options
  – Compost with municipal sewage sludge
  – Bio-degradable waste with municipal sewage sludge for bio-methanation
Leachate Collection & Treatment

• Leachate may be collected through HDPE pipe network

• Leachate treatment may be done
  – Separately through a leachate treatment plant, or
  – Combined with municipal sewage through combined STP with pre-treatment for leachate
WtE Plants – Key requisites

• Land Availability
• Classification & Characterization of Waste
• PPPs
• Enabling Policy & Regulatory environment
• Concession Agreement with SLA
• Capacity of ULB officials to manage the Contract
• Optimum Calorific value for the Waste
• Permissions from line depts.
  – Consent For Establishment, Consent To Operate, Industries, APTRANSCO, CRZ, Fire, (Forest), AAI etc.
• Laboratory facility
• Effective Dispute Resolution Mechanism
• Independent Engineer
Management of SWM Contract – Building Competencies

• Needs a positive mindset
• A win-win attitude
• Ability to manage a Concession Agreement
• Ability to ensure compliance to environmental regulations
• Ability to address disputes with operator
• Ability to engage & communicate with the citizens
• Ability to understand and address technical issues
Livelihoods – Integrating the rag pickers

- >15 lakh rag pickers in India recycle >20% of solid waste. They collect, sort, segregate and then trade it.
- They work 10-12 hrs/day & their income is ~Rs.3500/month.
- Children constitute ~20% of rag pickers
- Afflicted with gastrointestinal, infectious, skin, pulmonary & eye diseases, scars & wounds, back pain.
- Rehabilitation of rag pickers assumes significance in the light of WtE plants & RDF plants in ULBs
- Improve their working condition
Stakeholder Involvement & Communication Strategy

- Stakeholder participation through
  - Awareness campaigns
  - Consultation
  - Involvement
  - Participation
  - Workshops & get-togethers
  - Urban Living- labs

- Communication strategy
The State has a vision of transforming cities and towns in AP into neat, clean and litterfree areas for good liveability, health, envt, tourism etc.

Accordingly GO MS No.279 MA dt.31.12.2015 was issued with Operational Guidelines for Micro Planning, Work Rationalization & Outsourcing of Work.

Three model RFPs:
1) for commercial & Bulk Waste,
2) Mechanical Sweeping and Residential Micro Pockets Management, and
3) Road Sweeping & Drain Cleaning.

**Objectives of the guidelines**

To guide the ULBs for effective implementation of MSW (M&H) Rules 2000, NGT recent directives etc. in a systematic and uniform manner in Source Segregation, Collection, and Transportation of Solid Waste.

To improve sanitary conditions in all ULBs and win public satisfaction.

To rationalize norms for manpower, vehicles, tools and implements etc.

To shift from manpower outsourcing to Work Outsourcing System.
Do you want to make a difference to your Citizens?
Purpose of life?

• All of us share 99.9% of same genes, mostly transmitted from African ancestors 80000 years ago.
• The genomes of humans & chimpanzees are 99% identical
• MY family? Are WE connected?
• Love our fellow beings? Why?
• How do we get happiness in life?
• We are what we are at present. How?
• How do we get our salary?
• What is the Purpose of our life?
Essentials for Fulfillment

• What will give happiness and fulfillment?
• Duty saturated with Love towards fellow beings - transforms into service
• A Goal – TEAM work-Together Everyone Achieves More
• Trust – Ownership - Learning – Sharing - Networking
• Sustained Capacity Building
• Perseverance & Continuous Monitoring
• Appreciation for Good Performers
UNLEASH YOUR ENERGIES

SAVE WATER

SAVE ENERGY
APPO DEEPO BHAVA!
(Be a Light unto thyself – The Buddha)

Thank You for a patient listening