



Welcome to a
Presentation on

Insights into RfP for Solid Waste Management

Presentation by

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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

SWM Rules 2016

- 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

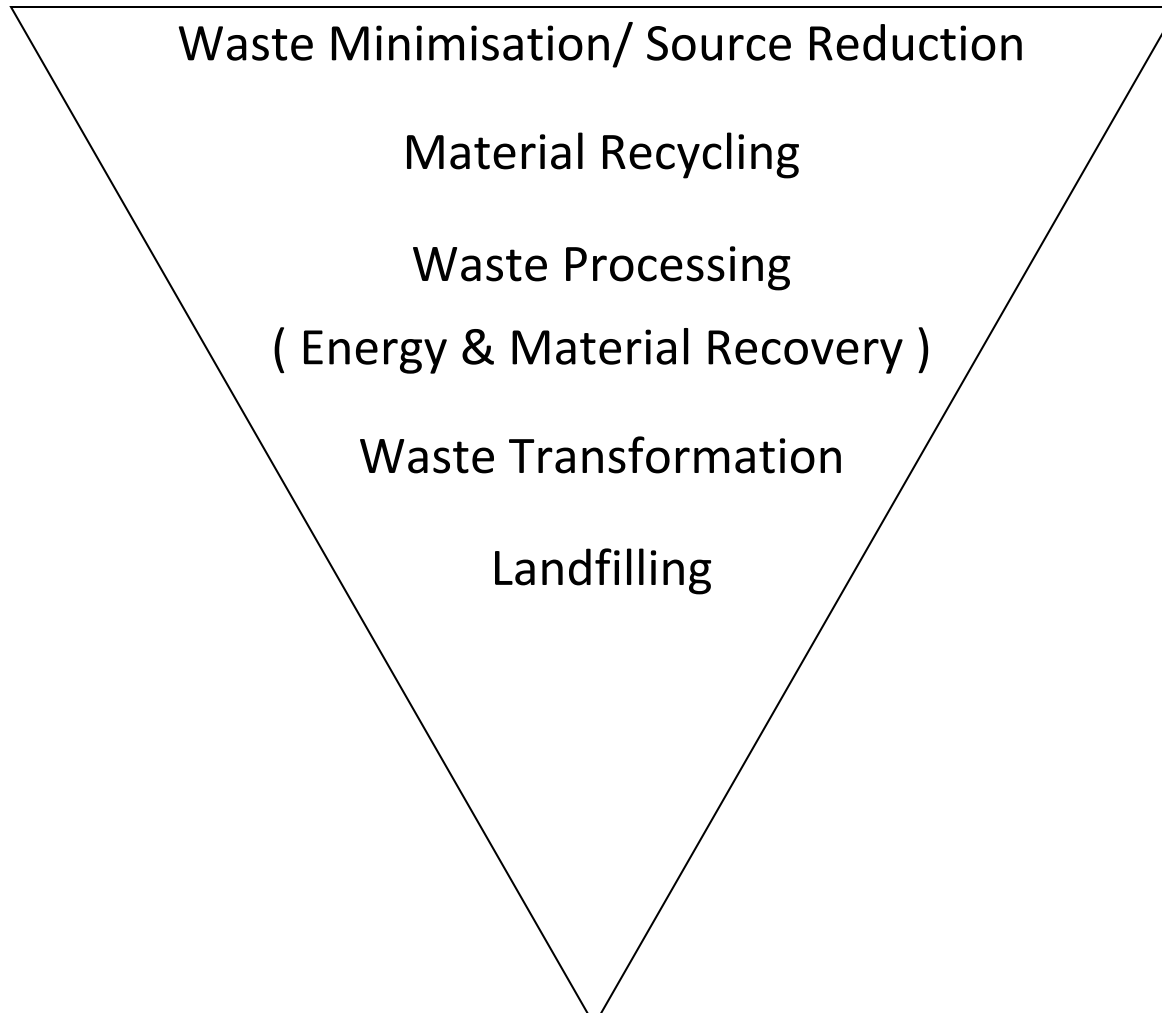
Policy initiatives by GoI

- 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



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 Govt & 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



Reuters/Anindito Mukherjee

Stakeholder Involvement & Communication Strategy

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

GO Ms 279

- 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-**T**ogether **E**veryone **A**chieves **M**ore
- 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