Hyderabad Integrated MSW Limited

(A wholly owned subsidiary of REEL)

Integrated MSWM Project of GHMC being implemented under PPP mode

RAMKY GROUP
Towards sustainable growth

www.ramkyenviroengineers.com

Project Background

Hyderabad

- 6th largest metropolis in the country.
- Population ~7.5 million
- Area ~ 625 sq.kms

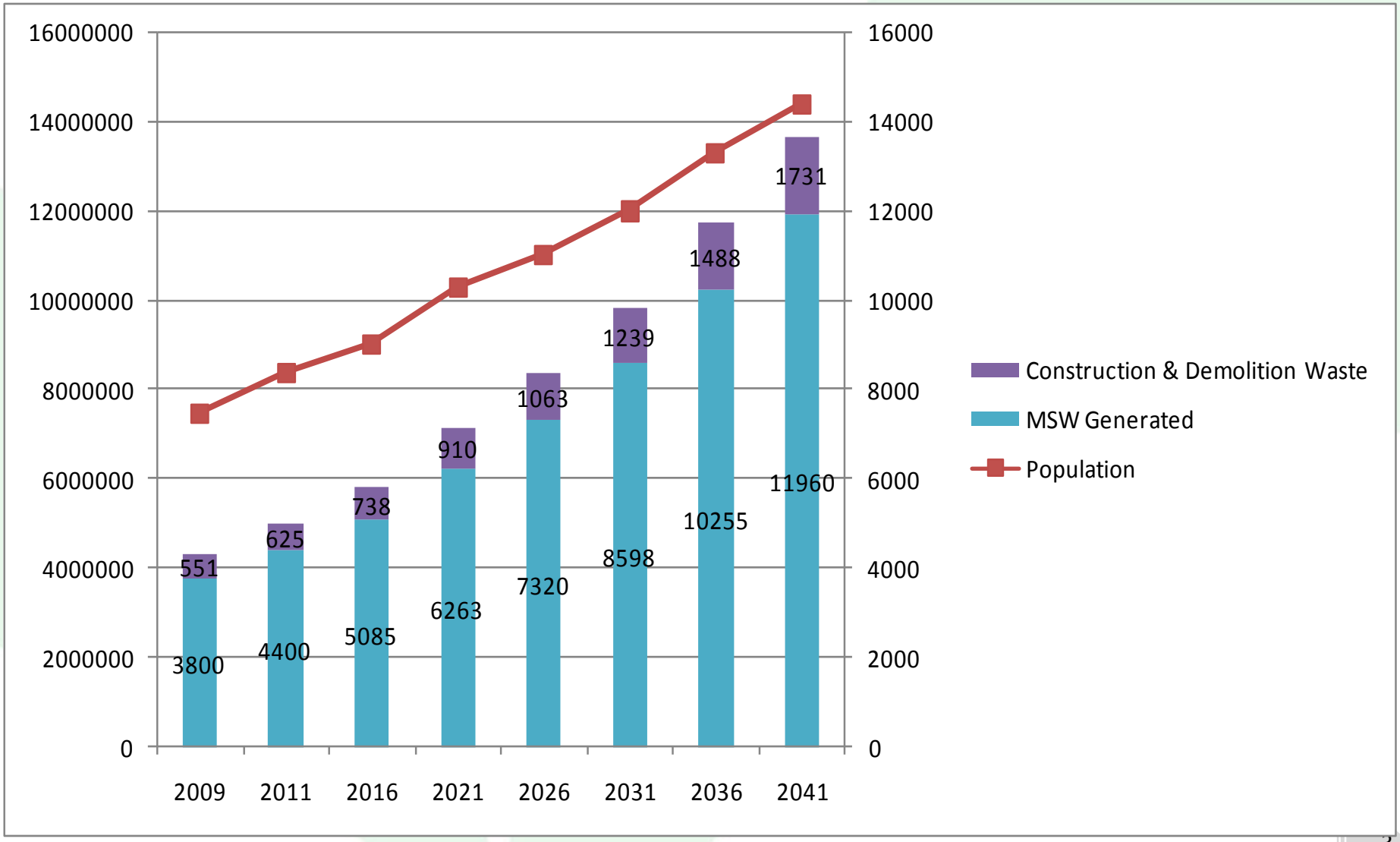
GHMC

- Formed in 2007
- 5 Zones, 18 Circles, 150 Wards,
- Present waste generation in GHMC is around 5000 TPD

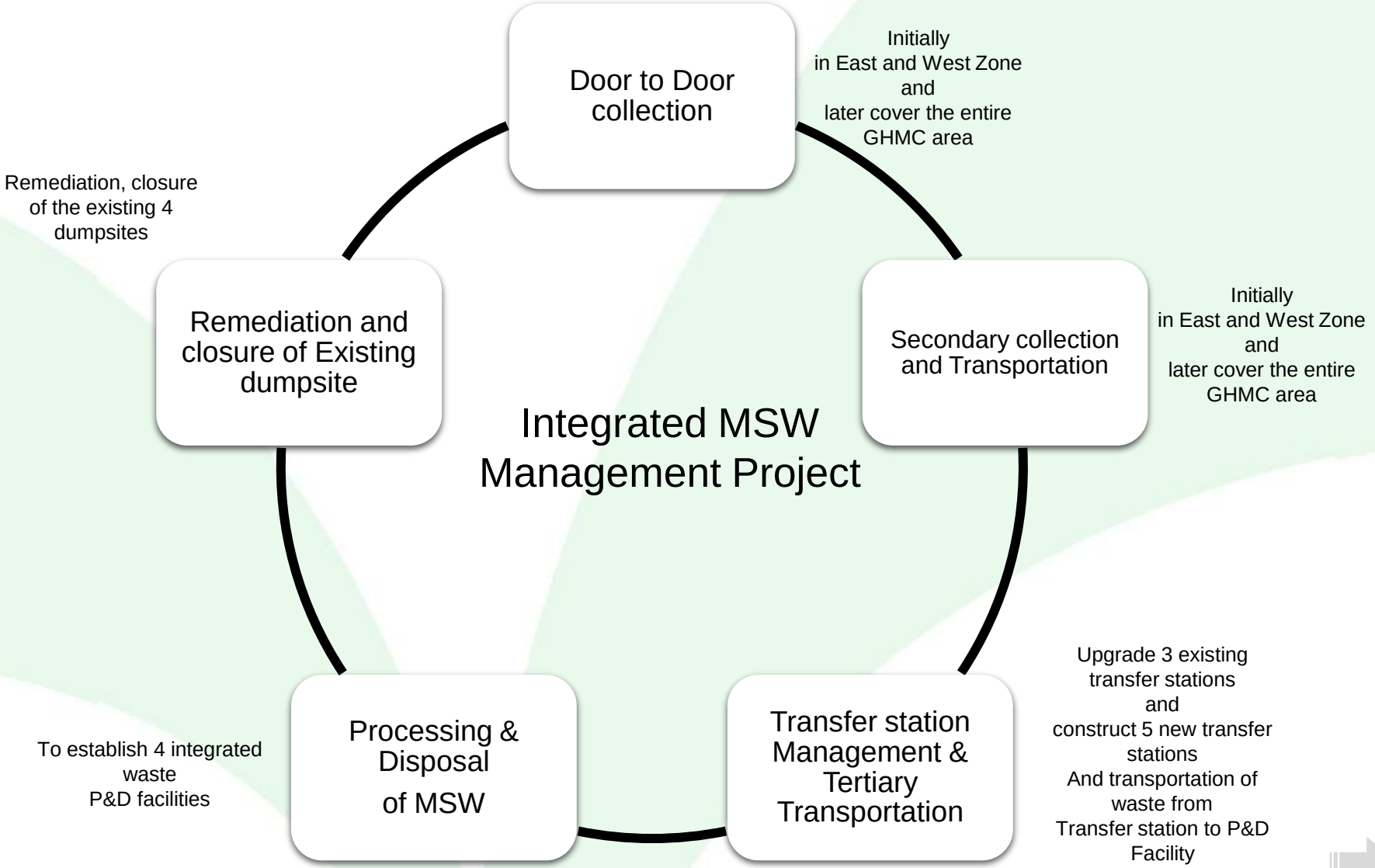
Project Details

- Concession signed in February'2009.
- Duration of CA is for 25 years
- Post-Closure maintenance for another 15 years
- Project cost Rs. 727.00 Crores.
- I.E appointed from 01.09.2010
- **Largest IMSW Management Project in the country**

Demographics and Waste Generation Trends for GHMC



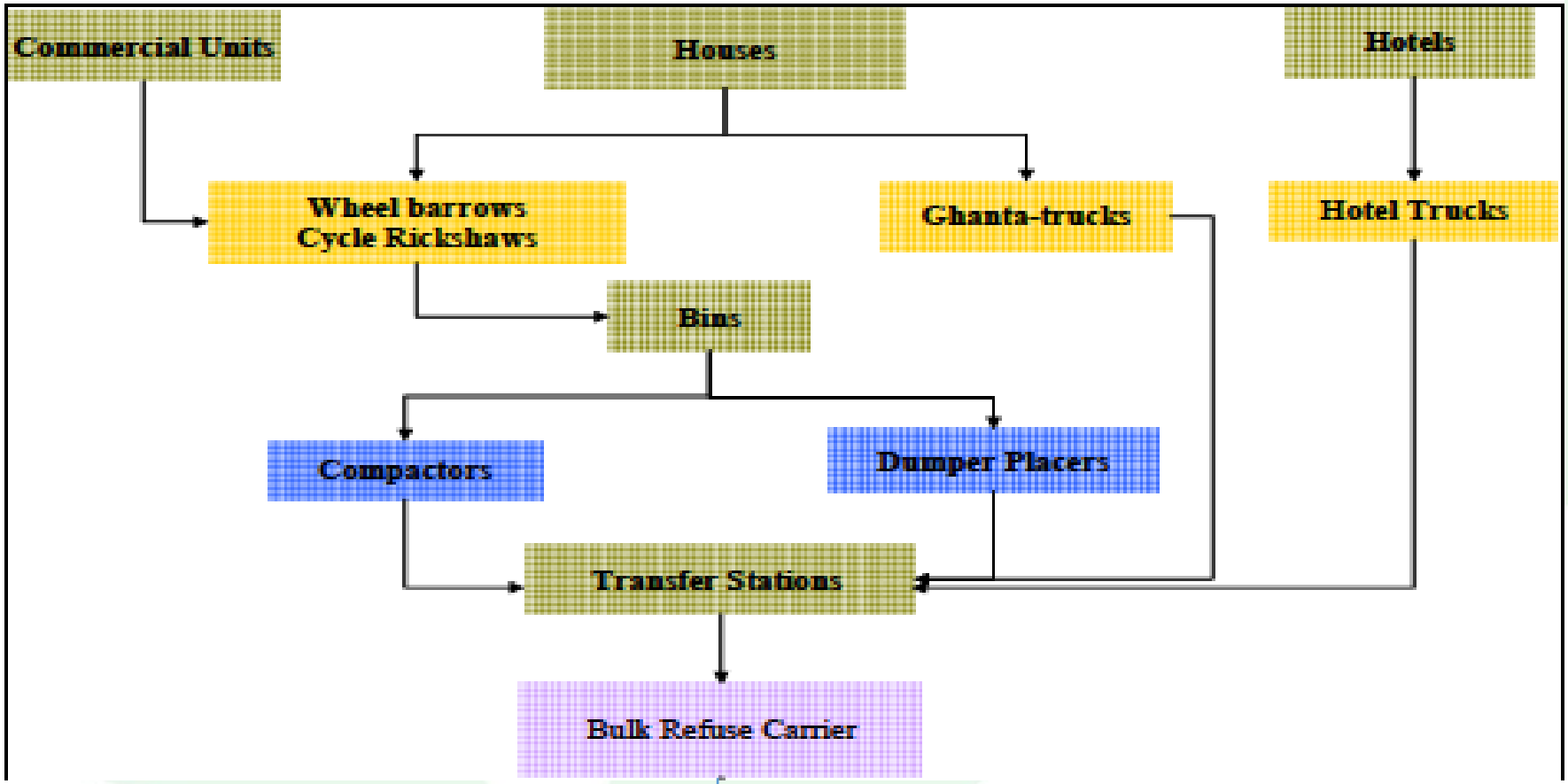
Project Scope



Collection and Transport of Waste

- Primary Collection
- Secondary Collection
- Tertiary Collection

Collection & Transportation



Processing & Disposal Site

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Processing and Disposal Facility

- Total area : 353 acres
- Encroachments – 86.60 acres
- Net area available for T&D facilities is around 266.30 acres
- Dumping activities commenced from 2001 for Alwal and Kapra municipalities
- From 2004, MSW disposal from all over Hyderabad.
- At the time of taking over the site, 80,00,000 cum waste existed
- Site access provided for initiating development works: 28th October 2010
- Master Plan approved by Independent Engineer on : 21st January 2011
- Provisional Readiness Certificate issued by IE for 2000 TPD: 7th February, 2012
- Commercial Operation Date of treatment and disposal facility: 18th February, 2012
- Current processing capacity 4000 TPD

Processing & Disposal Facility

- As per the Consent to Establish issued by APPCB, following facilities with respective capacities are provided:

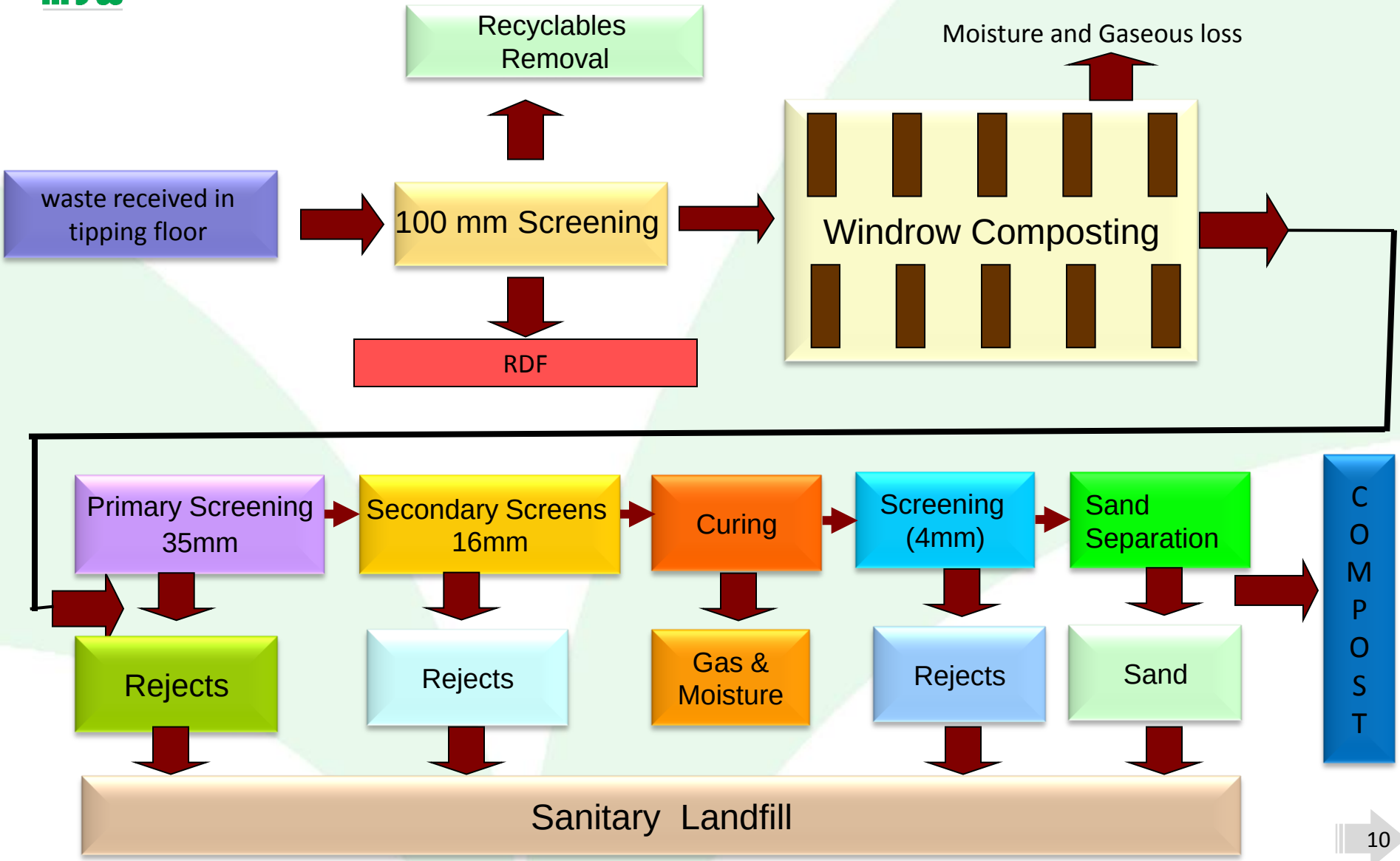
Description	Capacity
Refuse Derived Plant	2400TPD
Compost Plant	2040TPD
Bio-methanation Plant	500TPD
Recycling (Plastic, paper, Metal, Rubber)	600TPD
Landfill	735TPD
Waste to Energy	20MW subject to GO ammendment

Processing and Disposal Facilities

Key infrastructure

- Boundary Wall – 4.2 Kms (balance pending due to encroachments)
- Weighbridge Plaza
- (5) Weighbridges
- Internal CC roads – 7.88 km
- Storm water drain – 15.76 km
- Leachate drain – 2 kms
- Three leachate collection tanks and four ponds
- Waste Receiving Platform – 5000 Sqm
- Pre-Sorting – 4000 Sq.m.
- Windrow – 28,125 Sq.m.
- Monsoon & packaging – 25,875 Sq.m.
- Coconut shredding Unit
- Recyclables Processing Unit
- RDF Storage facility
- Leachate Storage and Treatment Facilities
- RDF Manufacturing Unit (under construction)
- Waste to Energy (awaiting CFE from APPCB)
- Scientific Landfill

Compost Operations



Processing and Disposal Facilities

Contd.

Supporting infrastructure:

- Administrative Building – Laboratory, Conference & Training Facility (under construction)
- Health Centre
- Cafeteria
- Workers Change Rooms and Toilets
- Material Stores
- Maintenance Facilities for Vehicles and other mechanical equipments
- Vehicle Wash Facility
- Transformer Yards – Connected load of ~1Mw
- DG and Electrical Panel Room

MSW Reception and Weighment

Weighment

- 5 Weighbridges commissioned
- Weighbridges operate in 3 shifts
- Capacity of each weighbridge capacity is 50 MT
- Registering and weighing process is carried with the help of fully automated software to synchronize the data logged in different weighbridges

Pre-sorting and Segregation

- MSW is segregated through trommels (100mm screens) in to organics and in-organics
- 100mm acceptance material is composted using windrows composting method
- 100mm rejects material is further processed to generate Refuse Derived Fuel (Stored on HDPE lined storage area)
- Recyclables are picked by rag pickers who are integrated in the system

Sorted recyclables

Acceptance Material Conveyor

Windrows Composting

- Impermeable platform of 28,125 sq.m. Established
- Windrow heaps formed for aerobic composting
- Windrows formation and turning in the process
- Decomposed material transferred to monsoon section with 9000sq.m of shed having 35mm and 16mm screens for further refinement (7-10 days of natural drying)
- Curing and Finishing section with 7875 sq.m. Of sheds with 4mm screens for 10-15 days cured material

Blending and Packing Section

- Blending and Packing shed built in the area of 9000 sq. mts.

Customers for Compost

TATA

TATA CHEMICALS LIMITED

Coromandel

KRIBHCO

FACT

NAGARJUNA GROUP

SPIC

Nourishing growth

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RDF Storage

- RDF material is being stored in the HDPE lined storage units build in an area of ~3 acres

Refuse Derived Fuel

RDF Parameters	Specifications
Calorific Value	2800 – 3300 Kcal/Kg
Moisture Content	<20%
Ash Content	<25%
Bulk Density (RDF Fluff)	350-450 Kg/cu.m
Bulk Density (RDF Bale)	600 to 700Kg/cu.m

100 MM PRESORTED / + 35 MM REJECTS

↓

Solar Drying Platform (3 days)

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Manual Picking Station

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Magnetic Separator

↓

Primary Shredder (50 TPH, 80- 90 mm)

↓

Trommel (20TPH, 35mm)

↓

Bailing/Loading to Truck

Customers for RDF

Scientific landfill

- 1st phase constructed in an area of 5.5 Acres -
- Landfill capacity developed in modular approach.
- Extension works of the landfill for the 2nd phase is under progress in another four acres

Landfill ready to receive

Monsoon cover

Leachate collection and Storage system

Leachate storage tanks are constructed corners of the compost plant to store the leachate generated in the compost plant. The drainage system is established with RCC drains to pass the leachate from the plant to storage tanks.

Leachate tanks @ Compost plant

The leachate from the landfill is collected in the leachate collection sump of landfill and transferred to leachate treatment pond

Established approx. 2kms of leachate collection network

Landfill – leachate collection sump

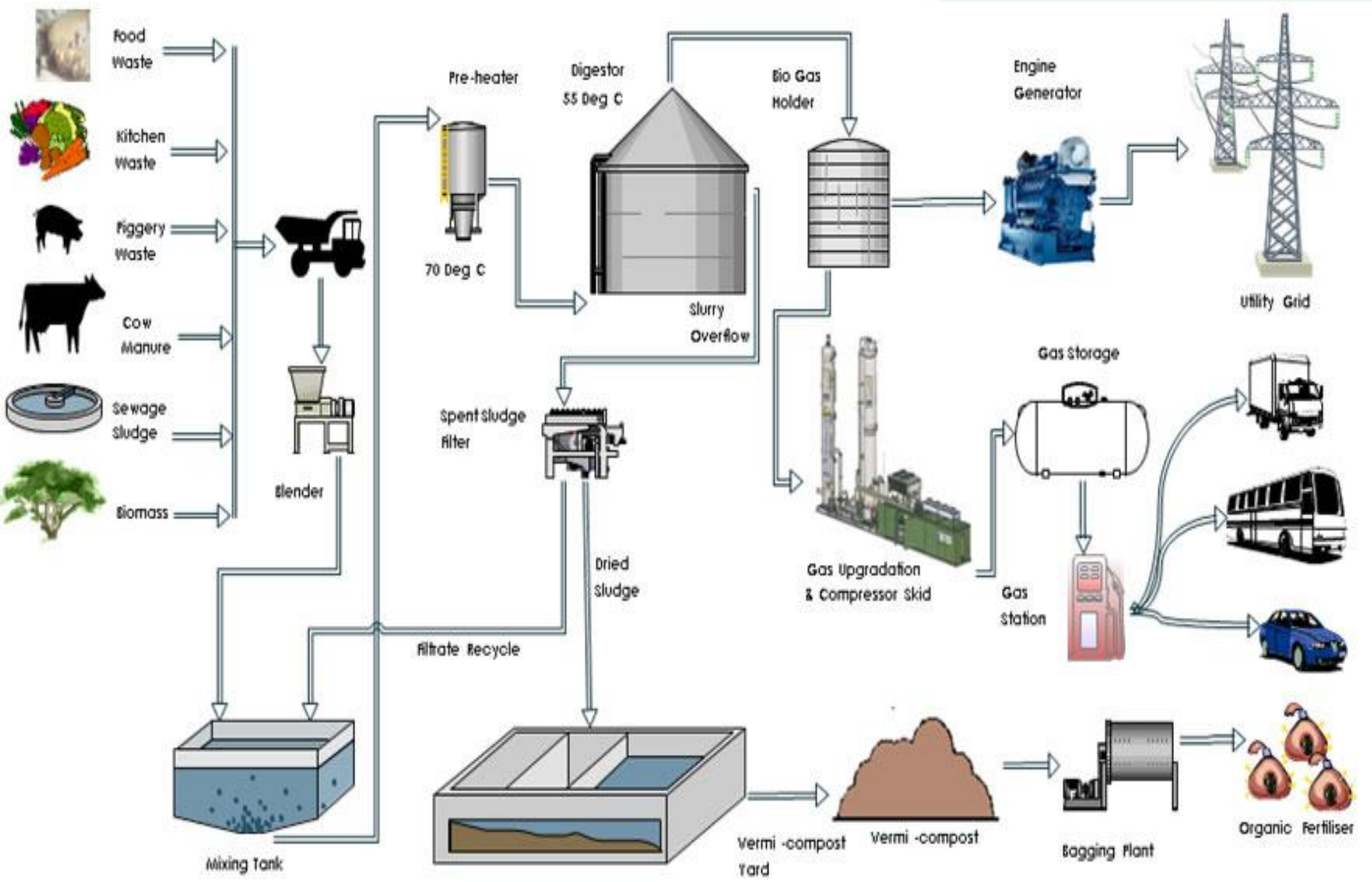
Leachate Aeration facility

- Aerated Ponds
- Leachate aeration facility is established with aeration equipment and the ponds are built with a capacity of 10000 cum
- 1 – 2657 Sqm – 5581 Cum
- 2 – 2350 Sqm – 4301 Cum
- 3 - 2805 Sqm – 6171 Cum
- 4 – 4291 Sqm – 11586 Cum

Leachate Treatment Technology (Reverse Osmosis Process)

Capacity: 150m^3/day

Bio-methanation Plant



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Bio-methanation

- Pre-treatment
- Anaerobic Digestion
- Biogas Generation
- Power generation
- Dewatering of digested residue
- Refining and Post Composting
- Thermophillic Process to enhance the biogas generation
- Less water consumption compared to mesophillic process

Constitute	Content
Methane	55-70% by volume
Carbon dioxide	30-45% by volume
Hydrogen sulphide	200-4000 ppm
Energy content of AD gas product	20-25MJ/standard m^3
Energy content of CH4 per ton MSW	167-373MJ/Ton MSW

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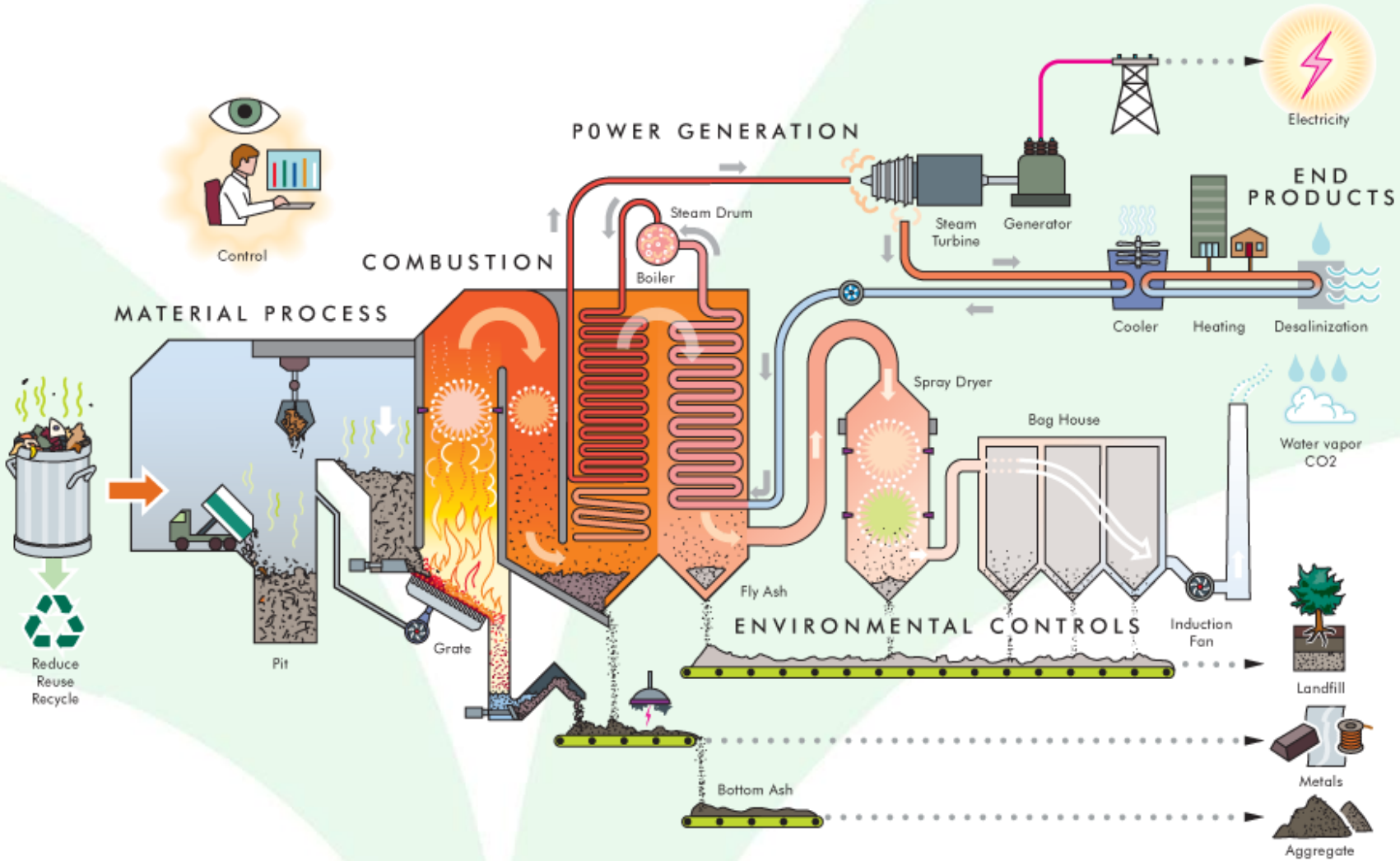
Waste to Energy Process Flow



Waste to Energy

- Propose to build waste-to-energy plant using the Pusher Grate technology
- Sophisticated air pollution control (APC) system for treatment of flue gases
- Continuous online monitoring of air emission will be included
- Reduce volume of waste up to 90% which leave only 10% of inert / ashes need to be land filled
- The combustion process will destroy all odour-emitting substances in the waste
- Conversion of bottom ashes into bricks or construction materials
- Recovery of metals through magnetic separation from bottom ashes
- Control room with PLC controlled system

Waste to Energy

Waste to Energy is essentially an application of sound, proven combustion engineering principles to reduce & sanitize the residual solid waste – after recycling and bio-composting the biodegradable component of the waste – after pre sorting- to recover the energy

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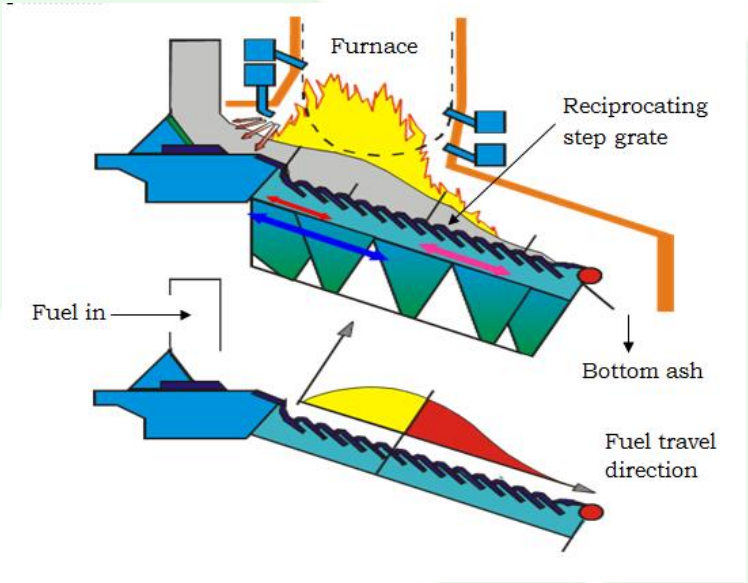
Proven Grate Technology

- Reverse acting Reciprocating grate with inclination to allow sliding of waste on its own is selected.
- Ram Feeders to push the waste positively on to the combustion zone.
- Grabs to mix the waste to homogenize and feeding rather than Overhead silo mode of storage to avoid bridging.



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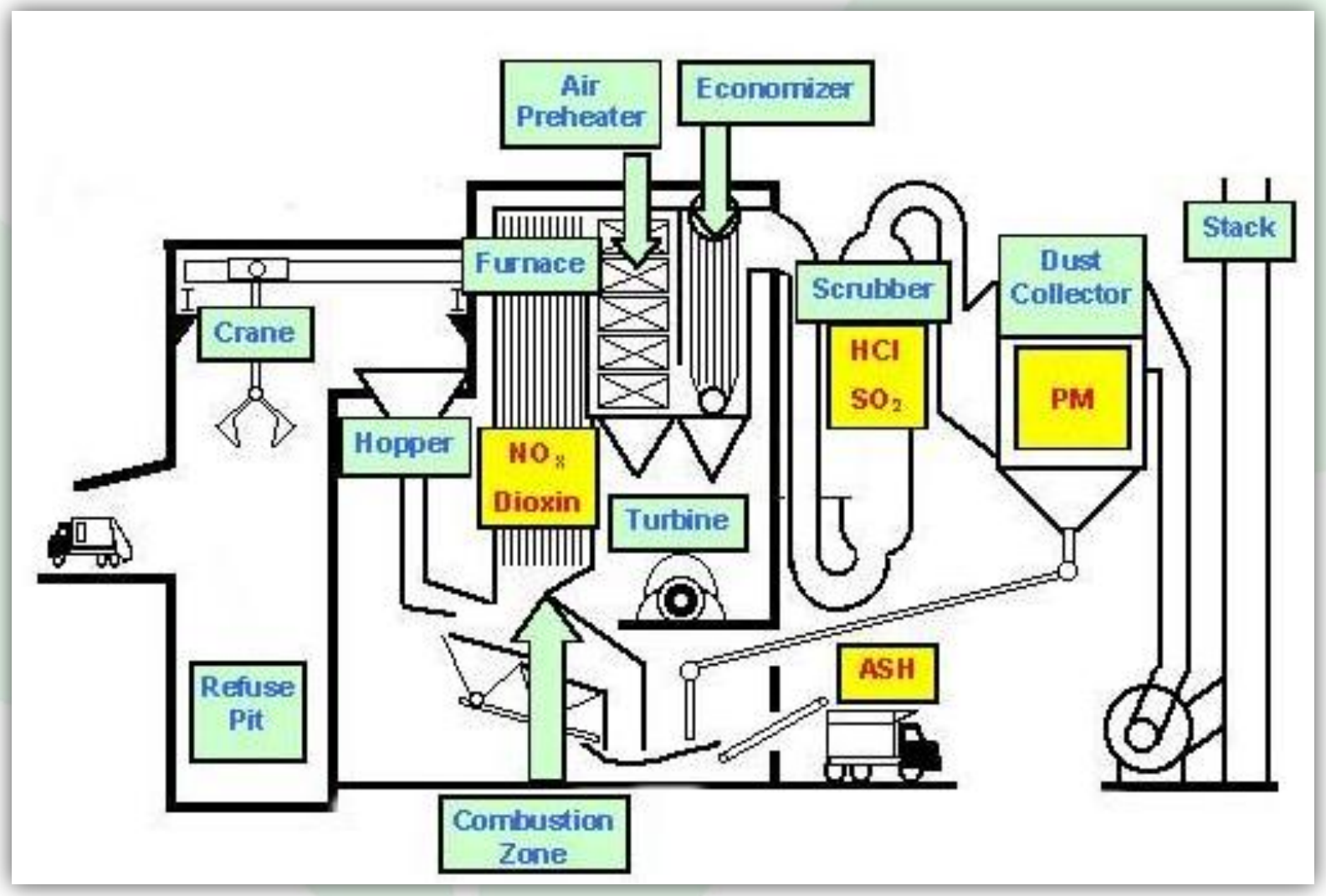
Flue Gas Distribution System



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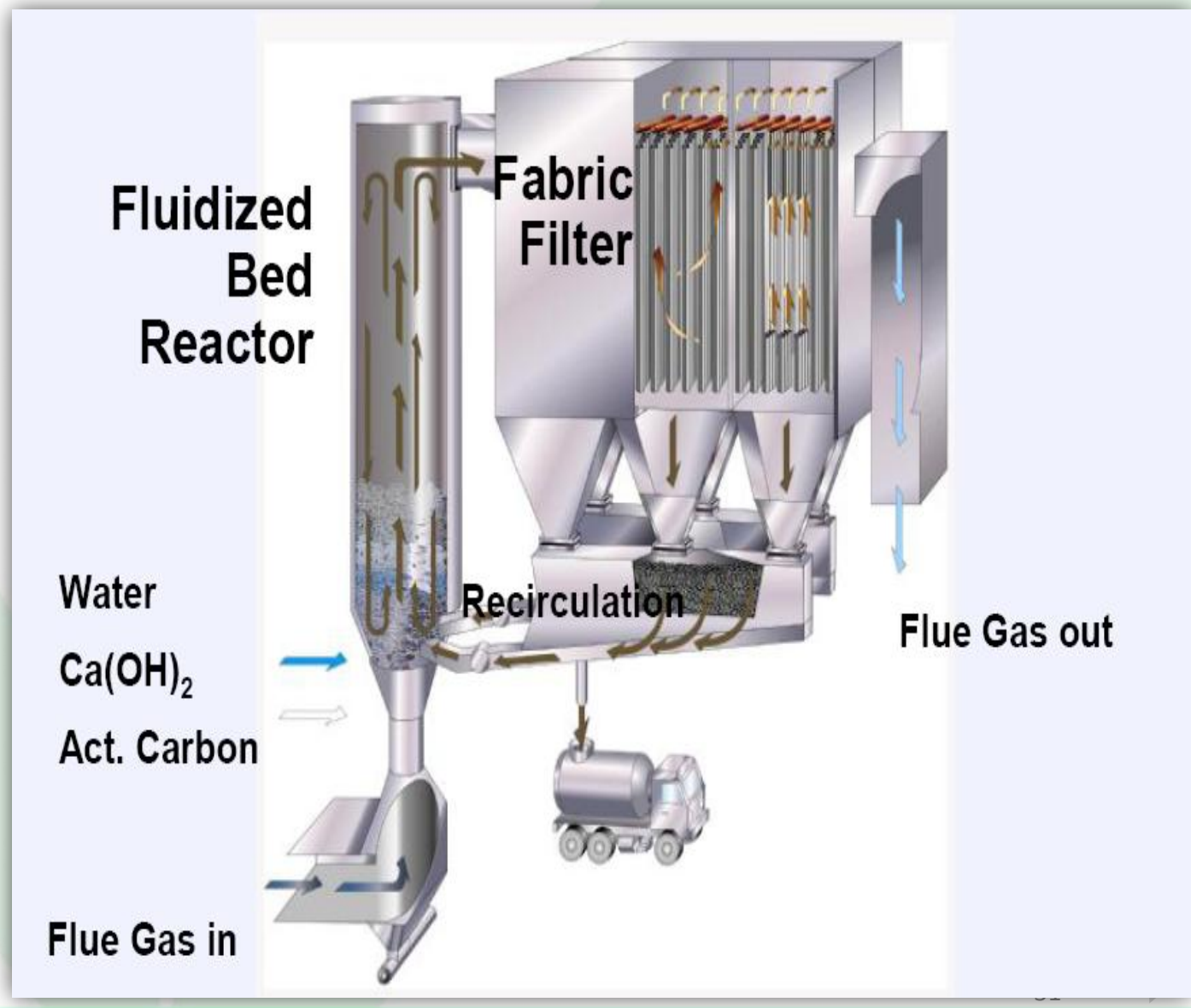
Flue Gas Treatment Scheme

- Lime Treatment
- Activated Carbon Injection
- Bag Filter
- Ammonia Injection



Compliant Specifications of Emissions for WtoE Projects

Description	Value
Particulate Matter (SPM)	< 50 mg/N CuM
So_2	< 260 mg/N CuM
Hcl	< 50 mg/N CuM
Dioxins & Furans	0.1 TEQ ng/N CuM
No_x	< 450 mg/N Cu M
Stack Height	60 mtrs

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Waste Plastic Mechanical Recycling – Process DetailS

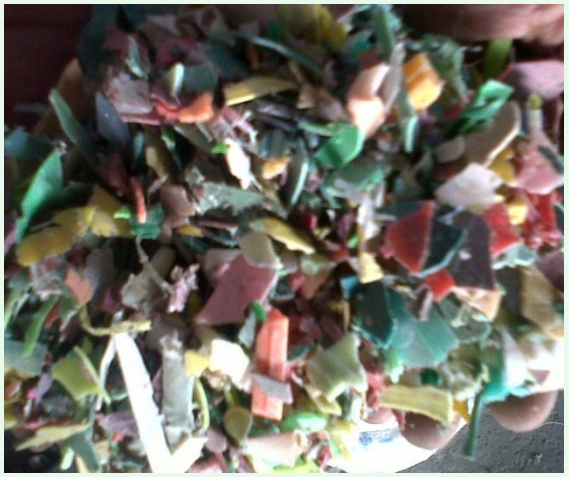
- Waste Plastic Collection
- Grading
- Grinding
- Washing / Drying
- Extrusion
- Strand palletizer
- Granules Collection
- Packing (25 kgs in PP bags)
- Granules Store

Equipments

Grinder

Extruder

Raw Material



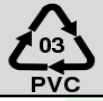
Grinded Plastic Articles

Final Product

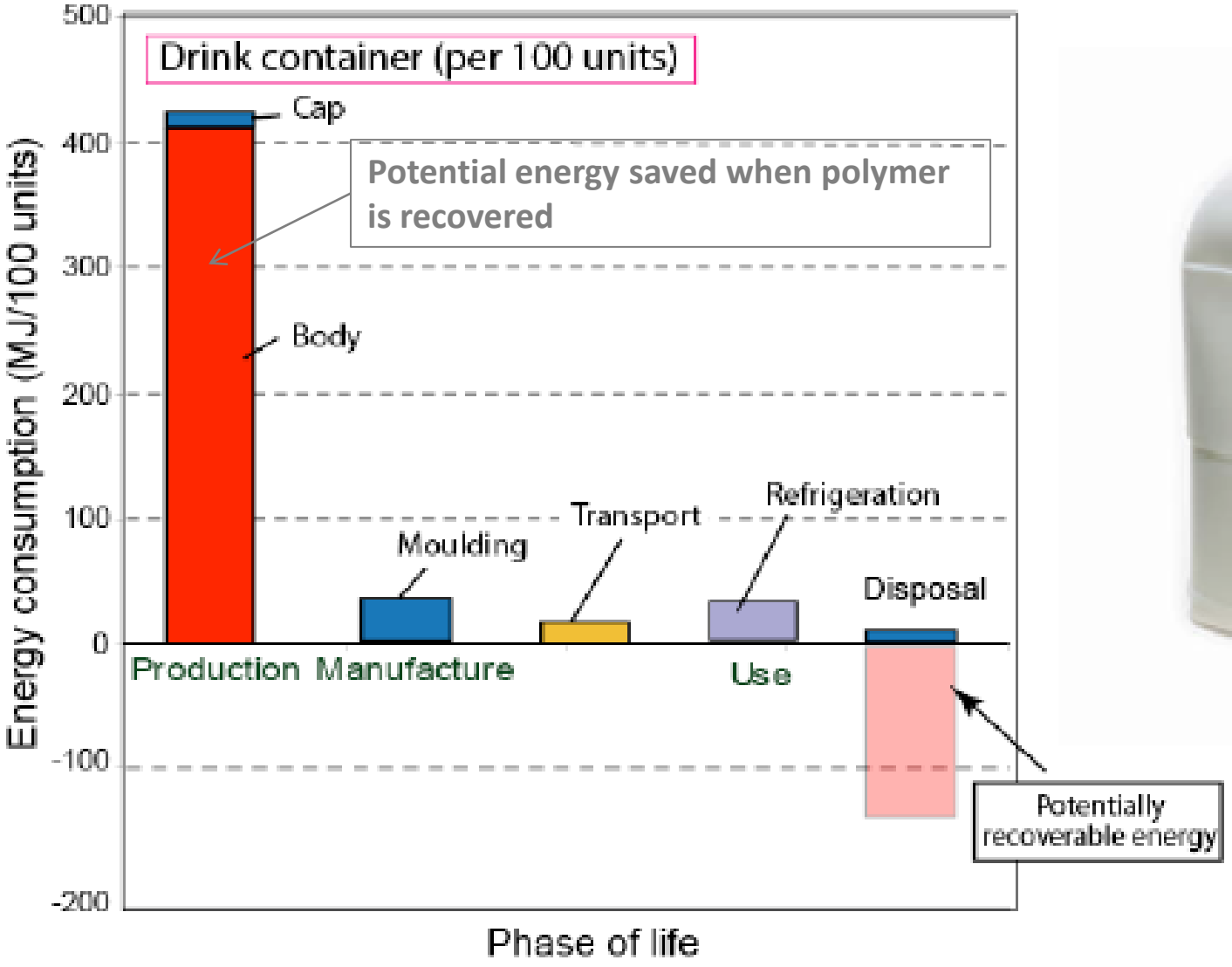
Plastic Granules

Mechanical Recycling, the most common recycling in India

- Mechanical Recycling is practical option, provided it is done in environmentally safe manner.
- As much as 60% of both industrial and urban plastic waste is recycled
- The pure grade production plastic scrap (waste) directly comes from Industry. The other post consumer plastic waste, part of MSW, is the problem area – typically picked by rag pickers at the bottom of the chain.
- The plastics waste in India is supposed to be segregated as per the Resin Codes (1-7) mentioned in the BIS guidelines (IS: 14534:1998).

Poly Ethelene Terapthalate		LDPE		Others	
High DensityPoly Ethylene		Poly Propylene			
PVC		Poly styrene			

Energy break down of a PE bottle



Data from ImpEE project at university of cmbridge

Recyclables

Plastics recycling

Environment Management Plan

- Mitigation of environment impact of existing operations of Processing & Disposal
- Ground water monitoring (15 inside facility and 7 in buffer zone)
- Surface water monitoring (5 Locations outside)
- Ambient Air Quality Monitoring (5 inside facility and 3 in buffer zone)
- Leachate management
- Greenbelt development
- Prevention of raw waste pile up for mitigation of odour, scavenging and putrefaction of waste
- Noise monitoring (5 Locations)
- Compliance of environment monitoring parameters with EC, CA & APPCB consent
- Environment Monitoring Data

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Situation at Jawaharnagar as on 28th October, 2010

Dump at Compost Plant Area

Contaminated Water Bodies

Burning of Waste

Uncontrolled flow of leachate

Dump Capping

- Dump capping works viz., profiling and soil cover are in progress

Outside view

Inside

Imliban Transfer Station

(In operation since January'2013 by GHMC)

Before

After

Kukatpally Transfer Station

(In operation since August'2013 by GHMC)

Before

After

Administrative Building

- Administrative building with Laboratory, Conferencing, Training & Display Halls is under construction in the area of 2400 sq. mts

Transformer Yard

- Transformer yard is established with 800 KVA power supply at Material Stores. Second transformer yard with 200 KVA power supply is established at Landfill.

Power & Backup

Direct Power

- 800KVA HT
- 200KVA

Backup Power

- 320KVA
- 35 KVA, 15KVA,
- 10 KVA, 7KVA
- 2. Nos: 6KVA ups systems

Entrance Gate and Security

BEFORE

AFTER

Entrance Green Belt

BEFORE

AFTER

Road - Entrance to Weighbridge

BEFORE

AFTER

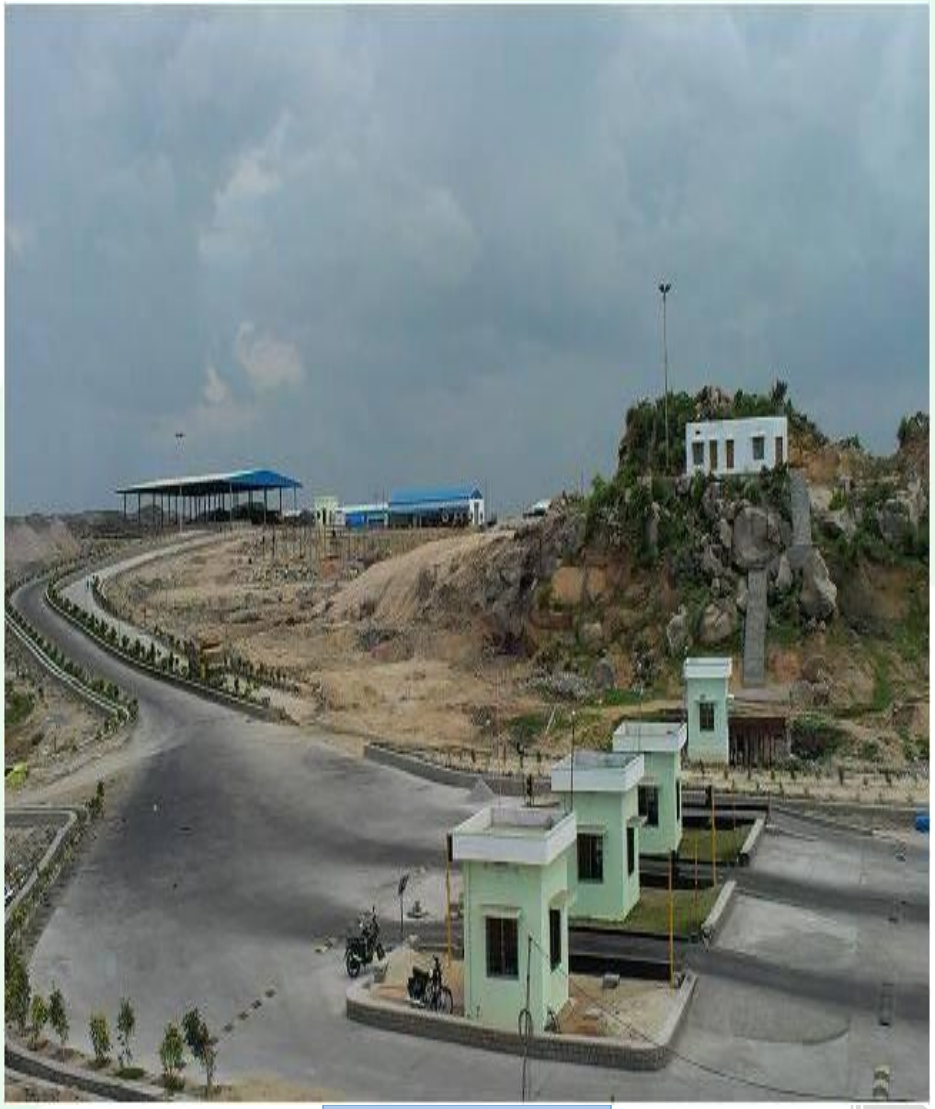
Weighbridge Plaza

BEFORE

AFTER

Road - Weighbridge to Compost

BEFORE



AFTER

Dump Capping near weighbridge

BEFORE

AFTER

Compost plant – Pre - sorting

BEFORE

AFTER

Compost Plant (Monsoon and Curing Section)

BEFORE

AFTER

THANK YOU

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