Engineering a Green World

TECHNOLOGIES FOR THE INTEGRATED SOLID WASTE TREATMENT

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The 2nd Sudokwon Landfill Site in Korea

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Scope of Service

The consultancy services are available at every stage of a project from conceptual planning to implementation and supervision

- Conceptual Design and Pre-investment Study
- Feasibility Study
- Basic and Detailed Design
- Construction Management and Quality Control

Waste Treatment

- Incineration Plant
- Sanitary Landfill
- Sustainable Landfill
- MBT, RDF, Biogas plant
- Organic Waste Treatment Plant
- Underground Pneumatic Waste Collection System

Water Treatment

- Food Wastewater Treatment Plant
- Industrial Wastewater Treatment Plant
- Livestock Wastewater Treatment Plant
- Sewage & Wastewater sludge Treatment Plant

Soil and Environment

- Recovery Technology For Polluted Soil
- Groundwater Pollution Survey / Design

New & Renewable Energy

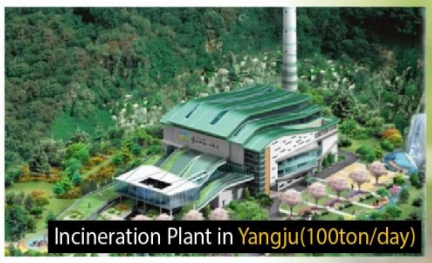
- Geothermal Energy System
- Solar Power plant
- Wind Power Plant
- Hydro Power Plant

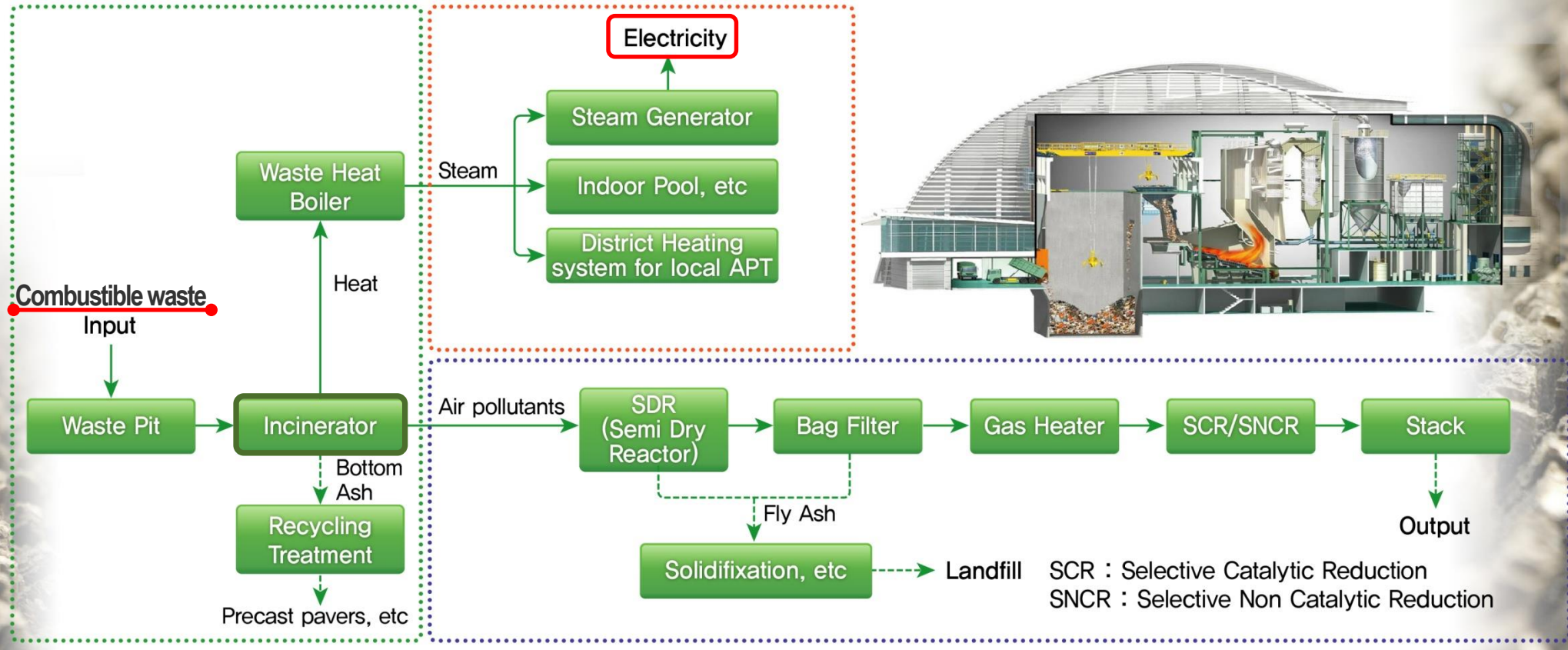
Scope of Service

Waste Treatment

Incineration Plant

- → Incineration and thermal conversion for combustible waste
- → Recovering and using energy in the form of heat by combustible process
- → Air–pollution control system


Incineration Plant in Yangju(100ton/day)



Process diagram of Incineration Plent (Example)

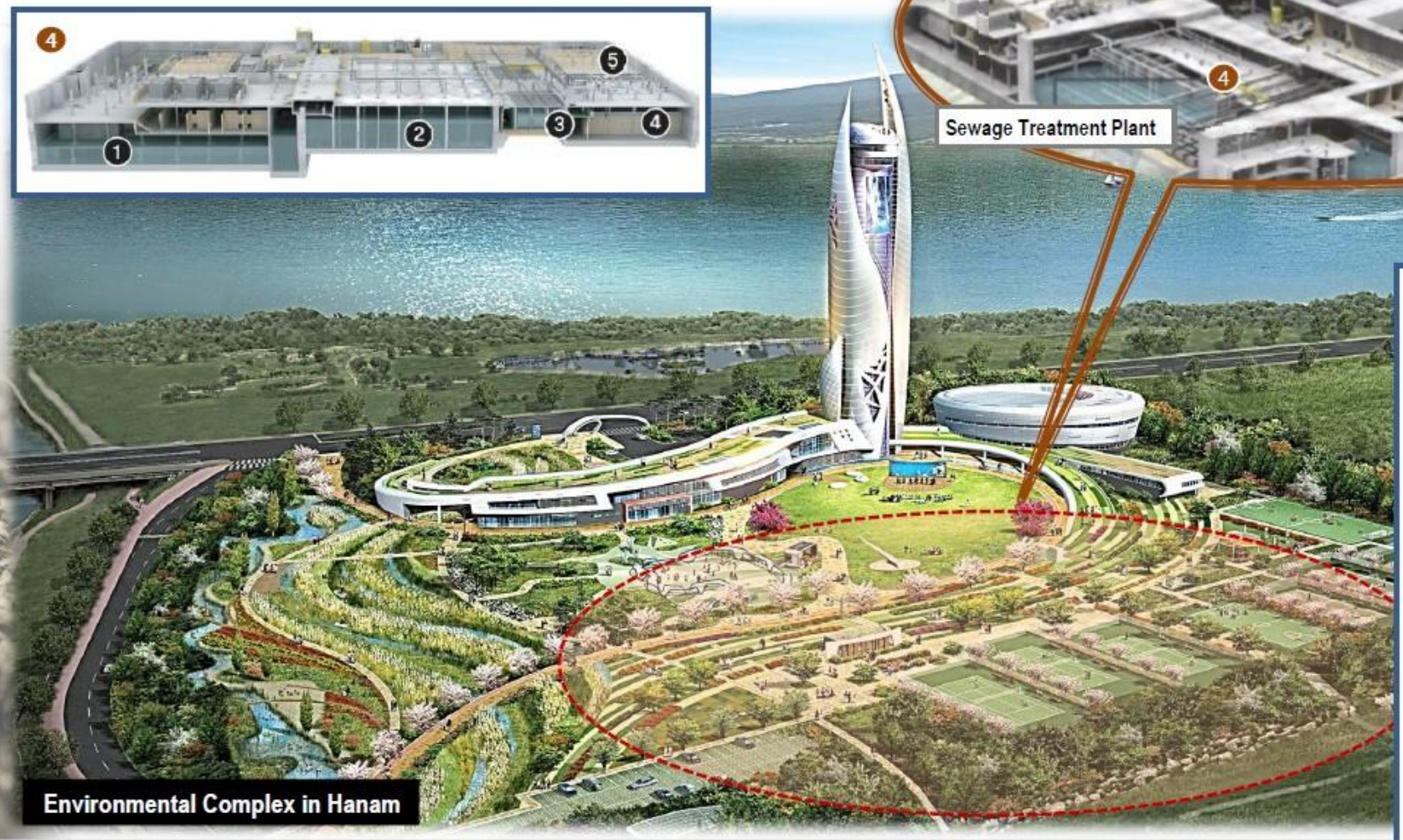
combustion process energy recovery process process for removing pollutants

Scope of Service

Waste Treatment

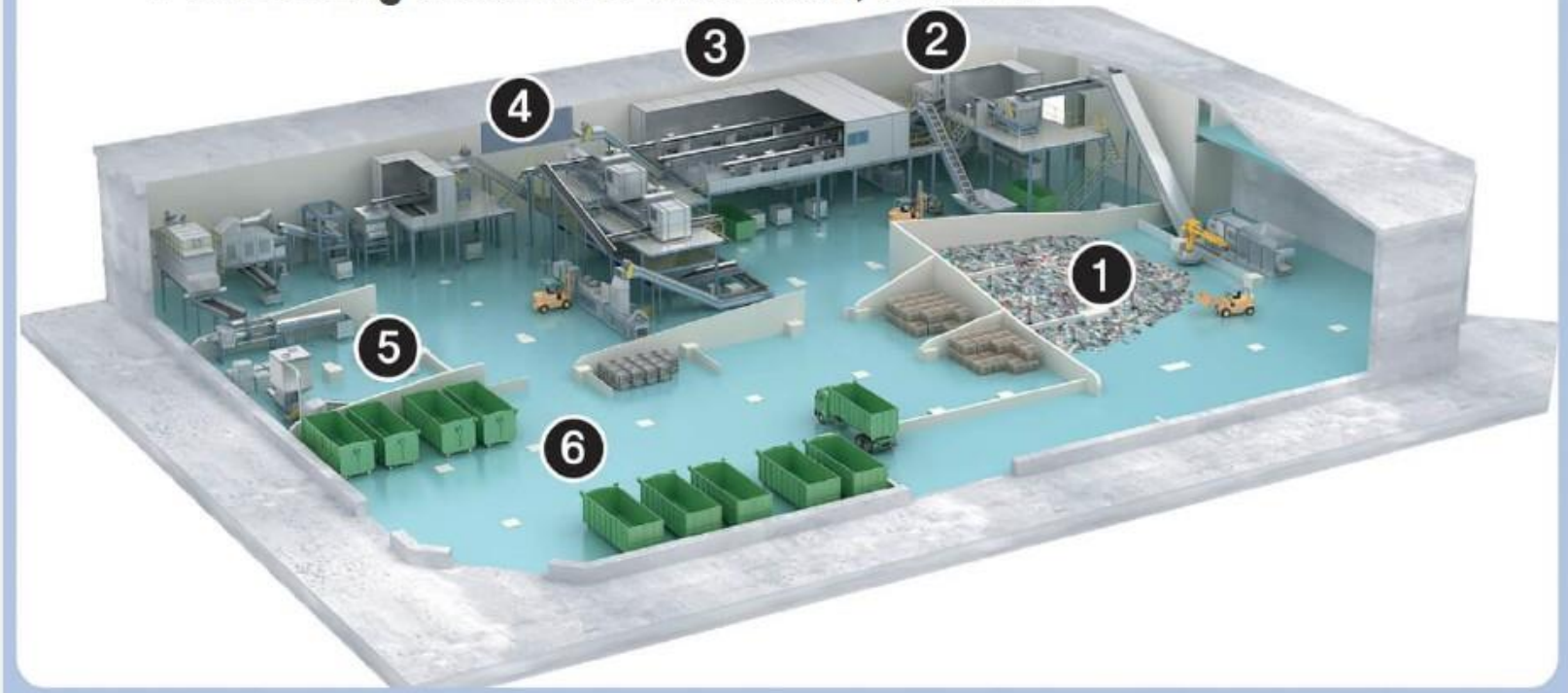
Environmental Complex

- → Recycled Waste Sorting Plant : 50 tons/day
- → Incineration Plant : 48 tons/day
- → Food Waste Treatment Plant : 80 tons/day
- → Sewage Treatment Plant : 32,000 ㎥/day



Recycled Waste Sorting Plant

- Facility capacity : 50 tons/day
- Processing method : Automatic, manual

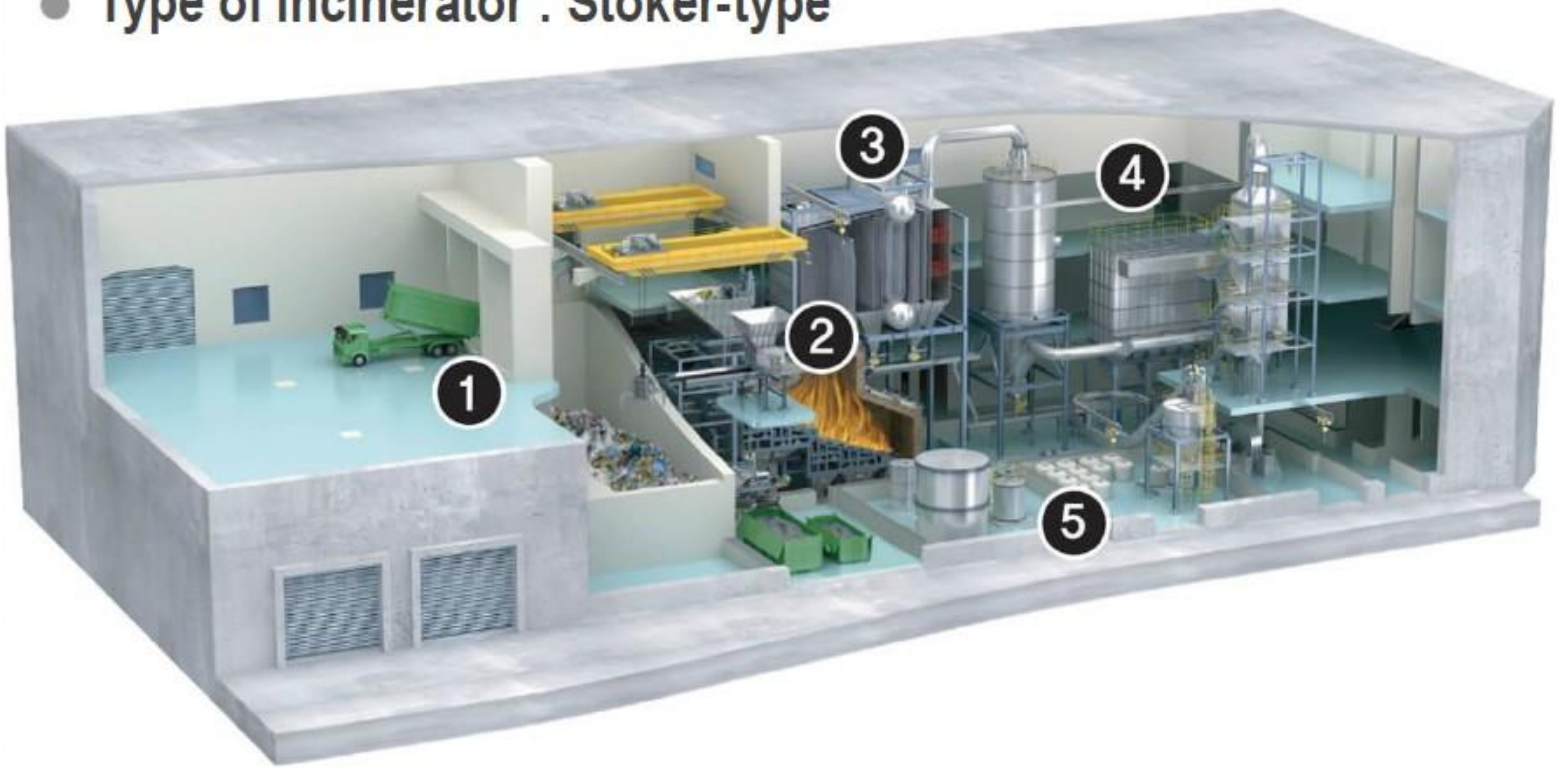


1 Waste intake and supply → 2 Pretreatment → 3 Hand sorting → 4 Plastic sorting → 6 Selling

2 Pretreatment → 5 RPF molding → 6 Selling

Incineration Plant

- Facility capacity : 48 tons/day
- Type of incinerator : Stoker-type

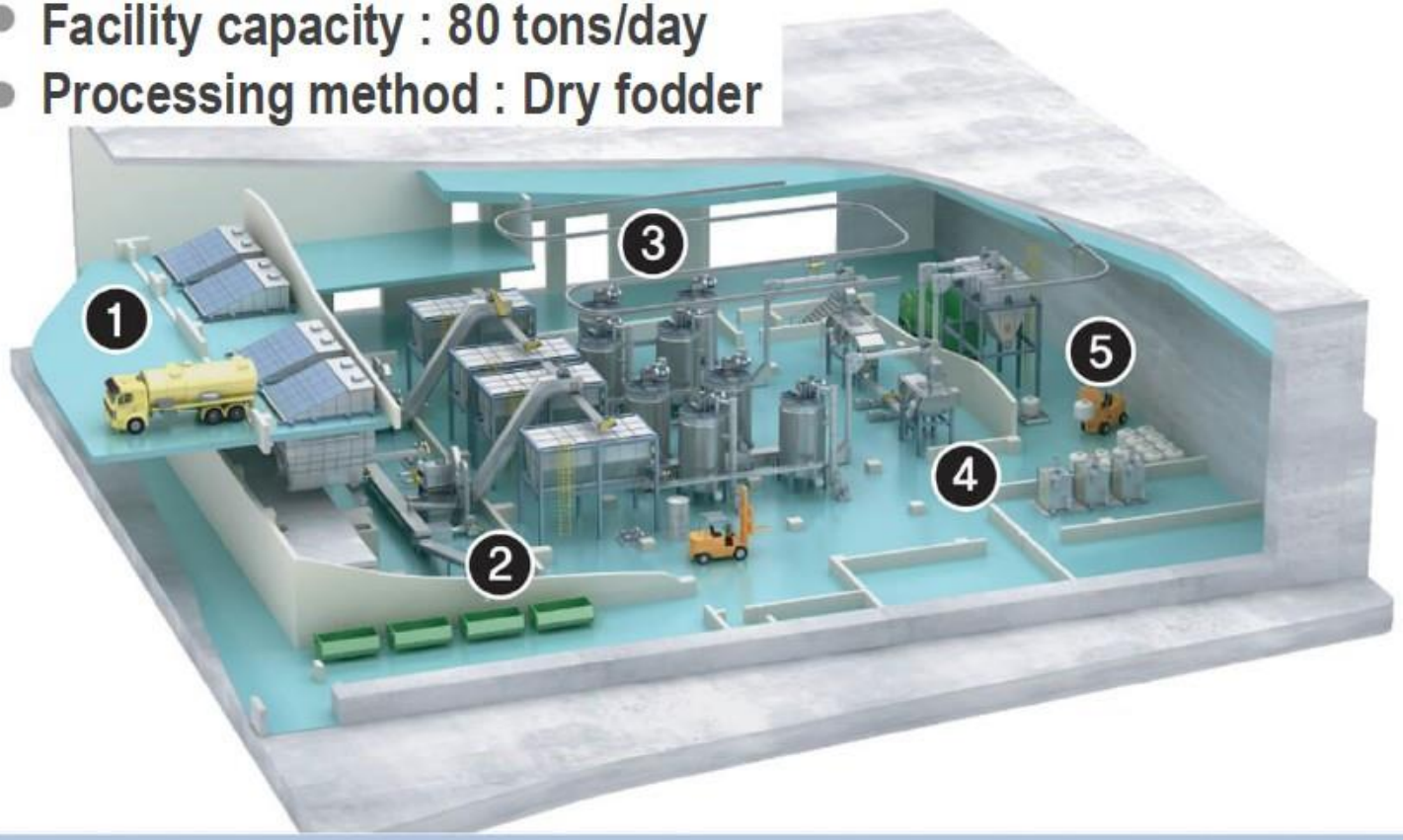


1 Waste intake and supply → 2 Incineration → 3 Flue gas cooling → 4 Flue gas treatment

2 Incineration → 5 Ash treatment

Food Waste Treatment Plant

- Facility capacity : 80 tons/day
- Processing method : Dry fodder



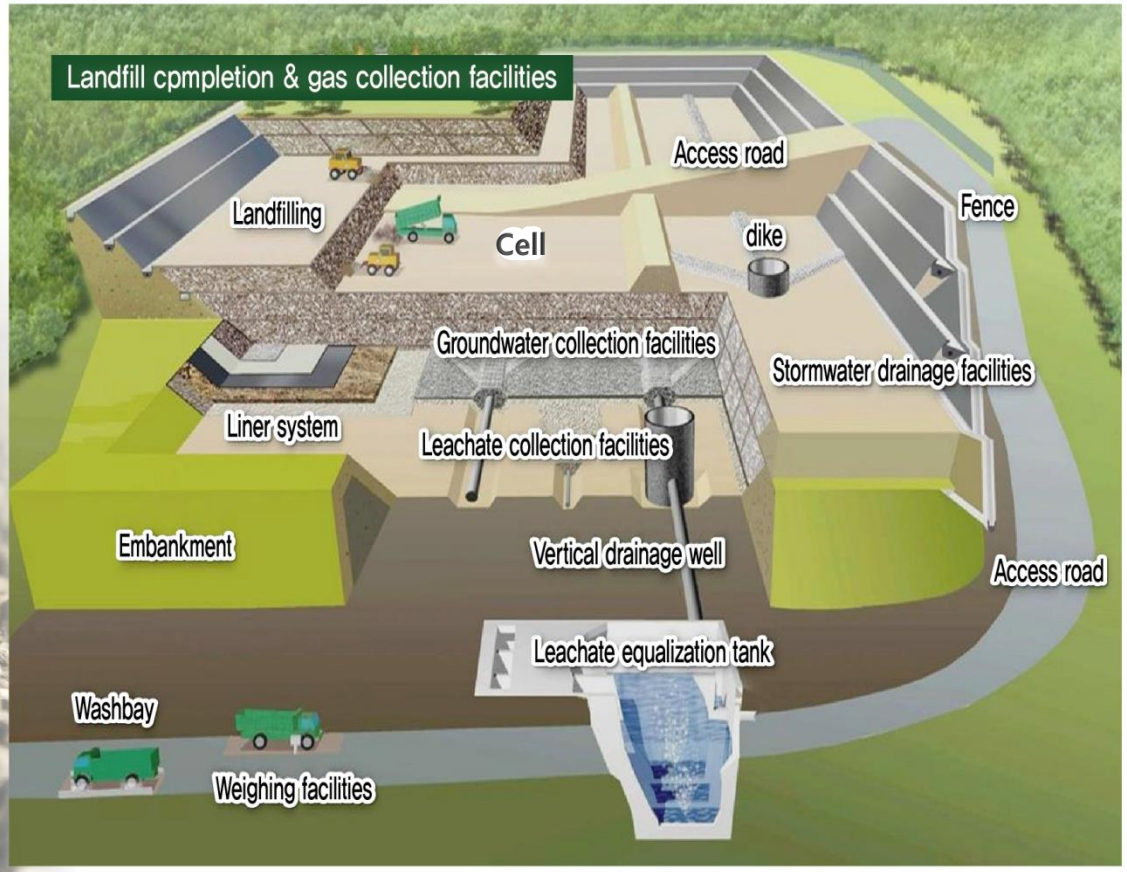
1 Waste intake ➡ 2 Pretreatment ➡ 3 Drying and cooling ➡ 4 Sorting ➡
5 Fodder storage and selling

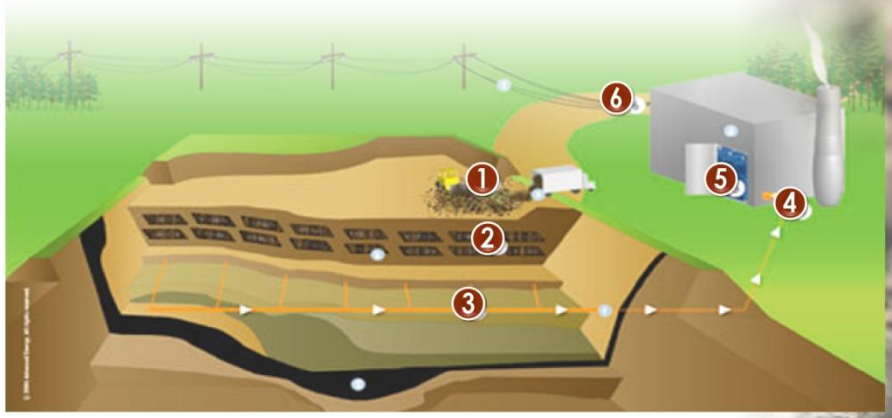
Scope of Service

Waste Treatment

Sanitary Landfill

- ➜ Final disposal and dumping of separated waste(exclude recyclables)
- ➜ Safe sanitary landfill method (Leachate treatment and LFG treatment)





How power is generated by using landfilled waste

1. Collecting waste, delivery to the landfill and compounded
2. Decomposition of the waste causes the release of gas
3. Pipes underneath the landfill transport the gas(mostly methane)
4. Gas is pumped to an engine
5. The engine powers a generator
6. The generator produce electricity, and used for local power supply

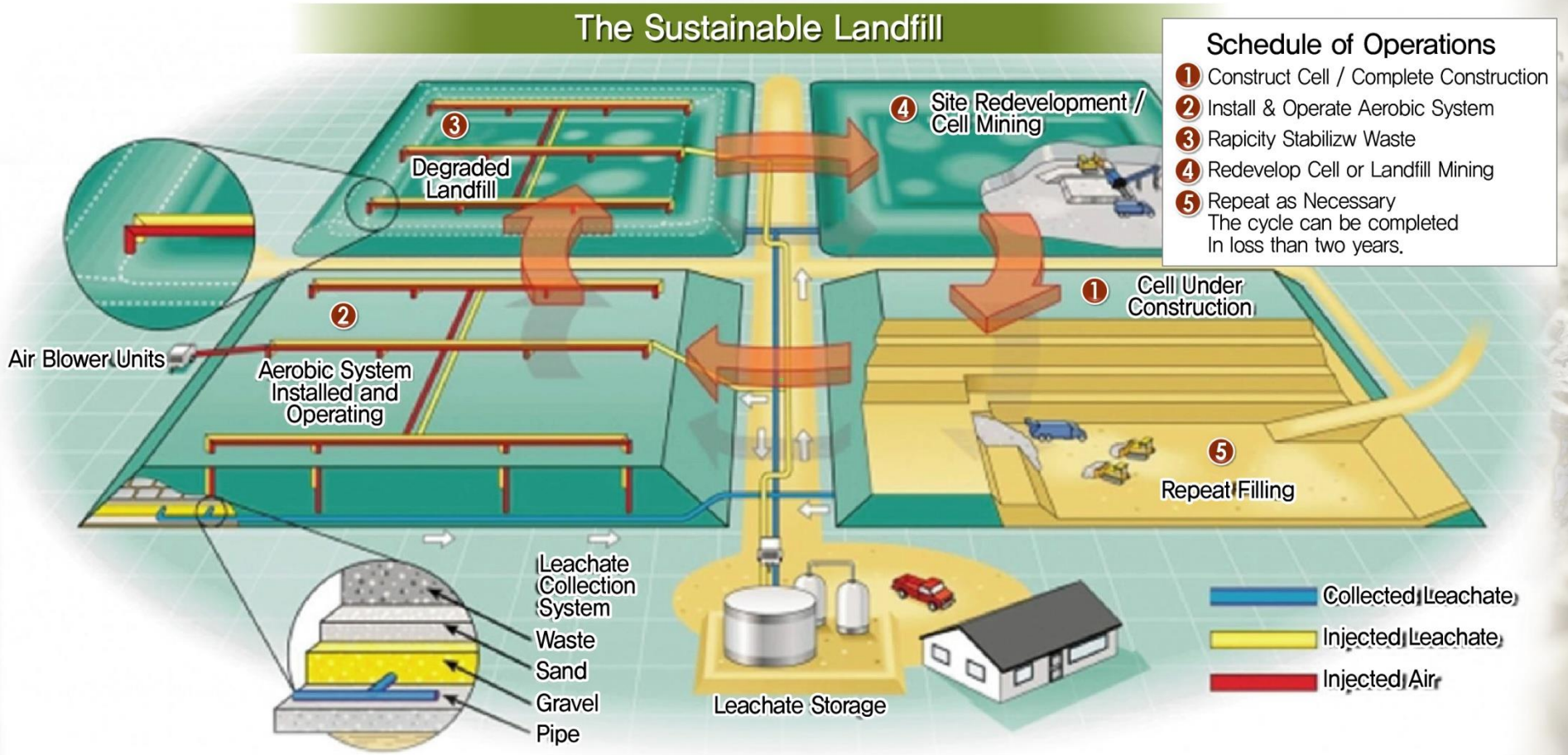
Definition Sketch of Sanitary Landfill (Example)

Scope of Service

Waste Treatment

Sustainable Landfill

- ➜ Reclaiming soil from excavated areas in on-site
- ➜ Recycling separated materials
- ➜ Removing a source of leachate and polluted landfill gas
- ➜ Ready the cell(s) for reuse, restoration (if it needs), and landfilling once again



Definition Sketch of Sustainable Landfill (Example)

Scope of Service

Waste Treatment

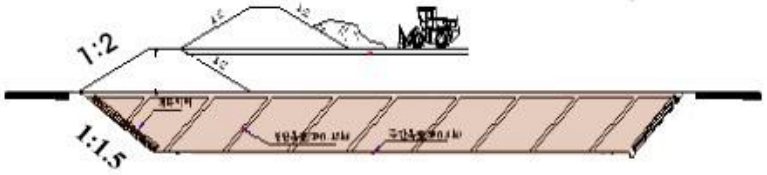
Dompe Sanitary Landfill for the Integrated MSW Management

- Site location : Dompe PS, in Gampaha District, Western Province, Sri Lanka
- Landfill : Area 2ha, Capacity 163,000㎥
- Waste intake : 90 tons/day

Scope of Service

Dompe PS

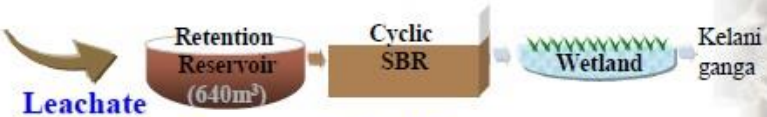
- Pop.: 132,149 (2008) → 166,495 (2031)
- Septage: 10 m^3/d
- MSW: 0.4 kg/d.capita
- Waste: 5 ~ 90 tons/d



LFG (3.21 m^3/min)

Collected to flare

LFG Treatment



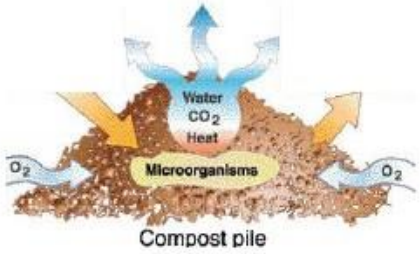
Leachate (40 m^3/d with septage 10 m^3/d)

Sanitary Landfill

- Proposed site: 5ha of 31ha
- Landfill area: 2ha
- Height: 15mH (5 mH×3 layers)
- Capacity: 163,000 m^3
- Period: about 6 years at 90 tons/d
- Liner with bento mix: 1.5mm with 30cm

Leachate Treatment

- COD 5,000 → < 250 mg/L
- BOD 2,300 → < 30 mg/L
- TKN 600 → < 150 mg/L

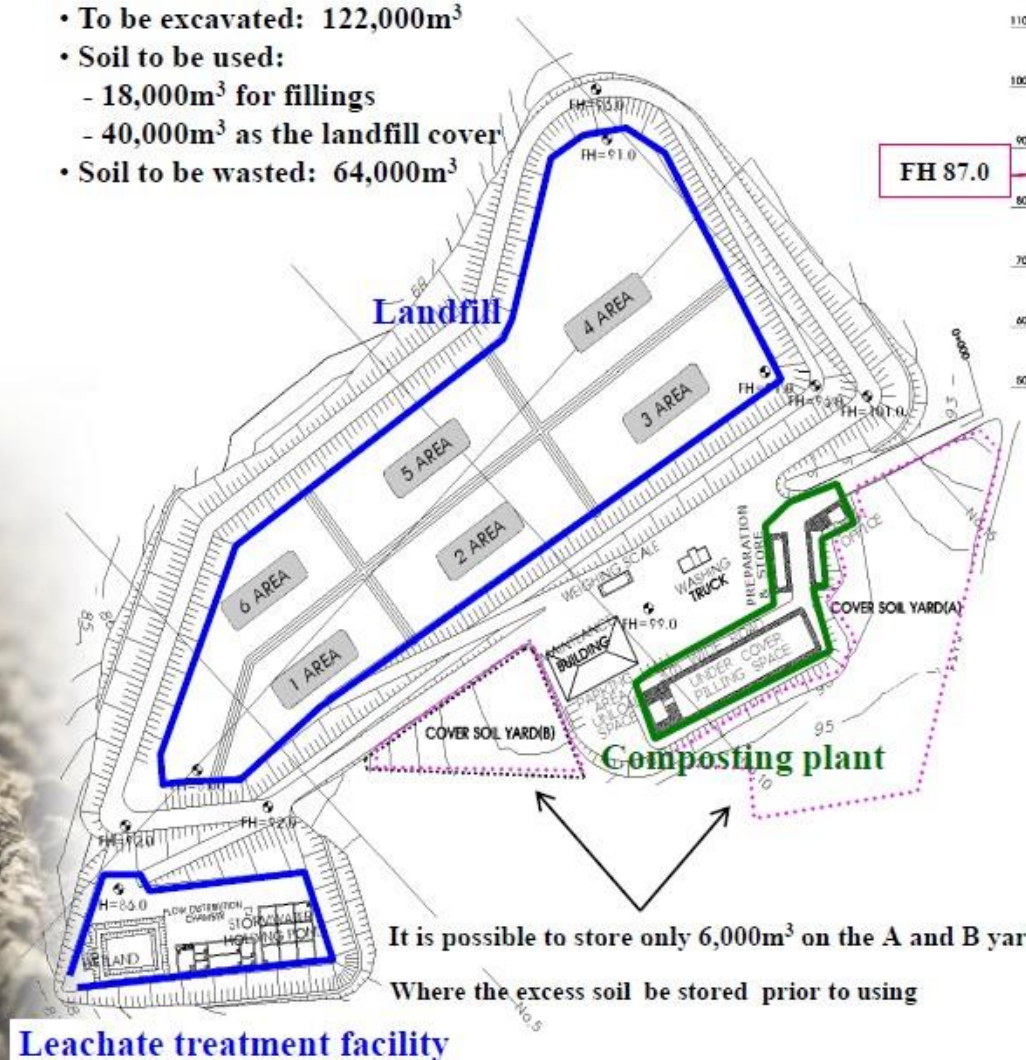


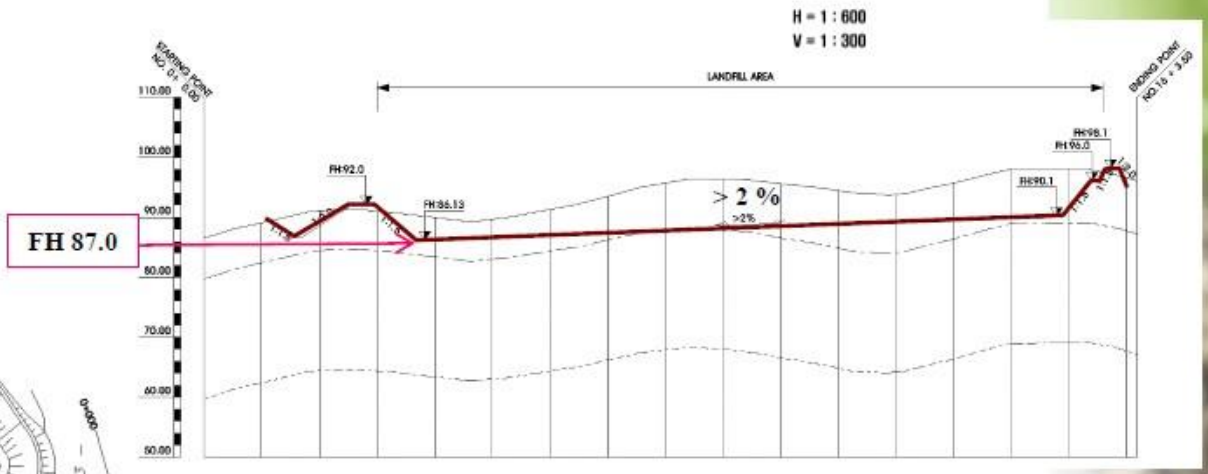
Composting Plant

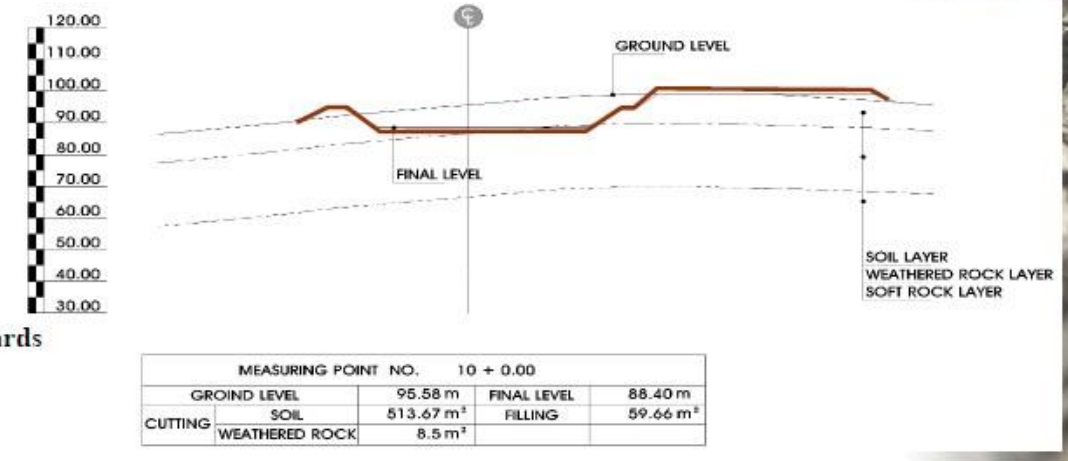
Scope of Service

Earth Work for Lanfill

- To be excavated: 122,000m³
- Soil to be used:
  - 18,000m³ for fillings
  - 40,000m³ as the landfill cover
- Soil to be wasted: 64,000m³







It is possible to store only 6,000m³ on the A and B yards

Where the excess soil be stored prior to using

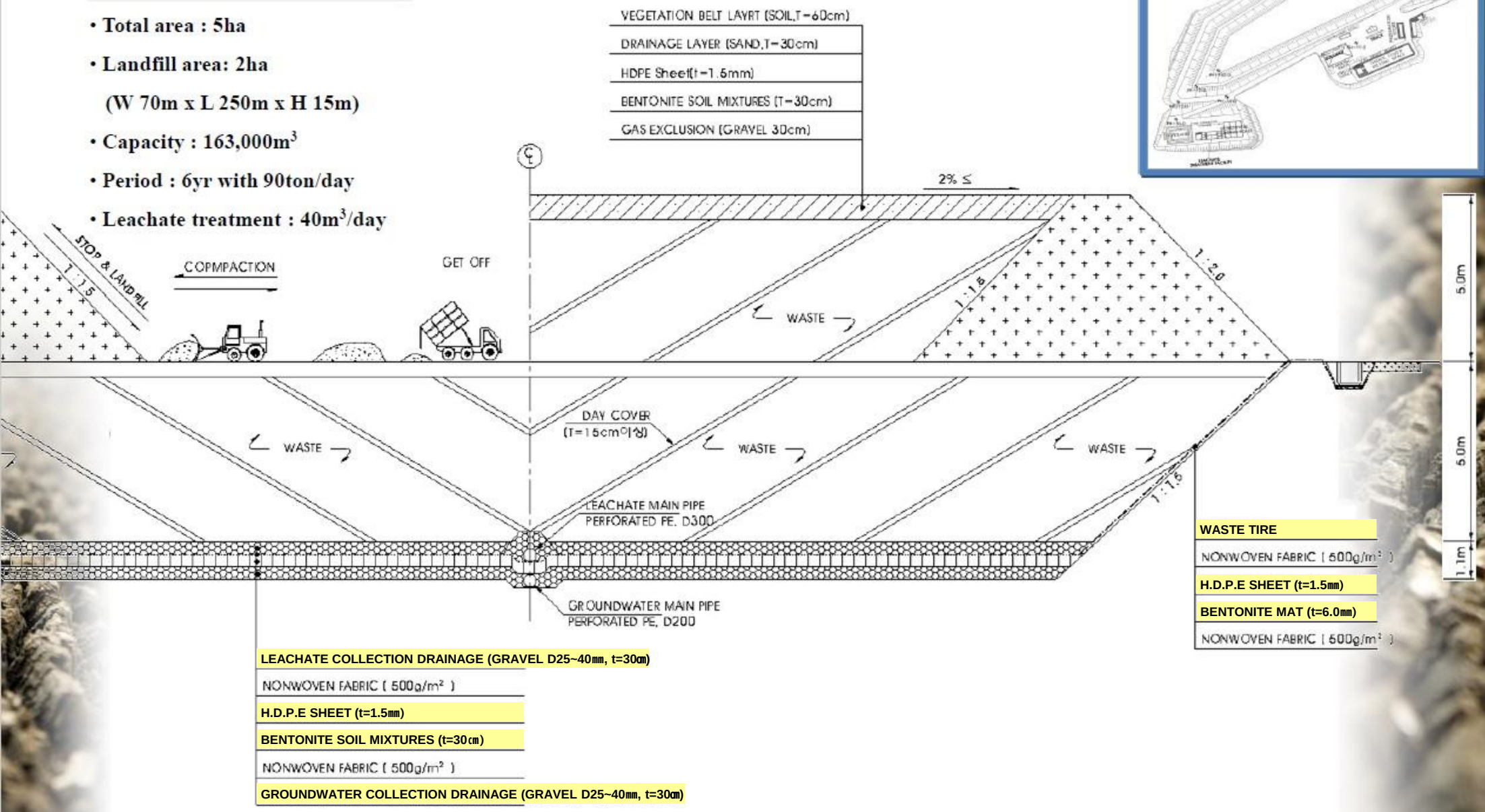
Leachate treatment facility

MEASURING POINT NO. 10 + 0.00				
GROIND LEVEL		95.58 m	FINAL LEVEL	88.40 m
CUTTING	SOIL	513.67 m³	FILLING	59.66 m³
	WEATHERED ROCK	8.5 m³		

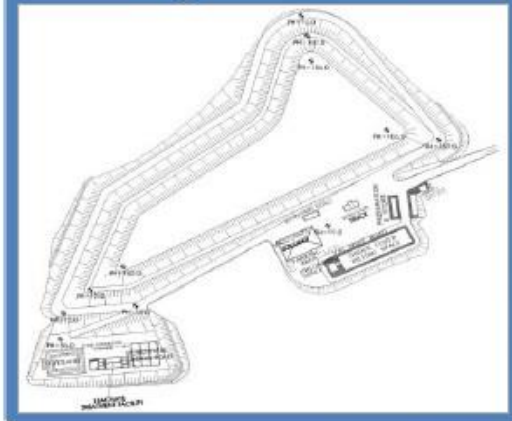
Scope of Service

Profile of Landfill

- Total area : 5ha
- Landfill area: 2ha
  (W 70m x L 250m x H 15m)
- Capacity : 163,000m^3
- Period : 6yr with 90ton/day
- Leachate treatment : 40m^3/day



Completed Landfill

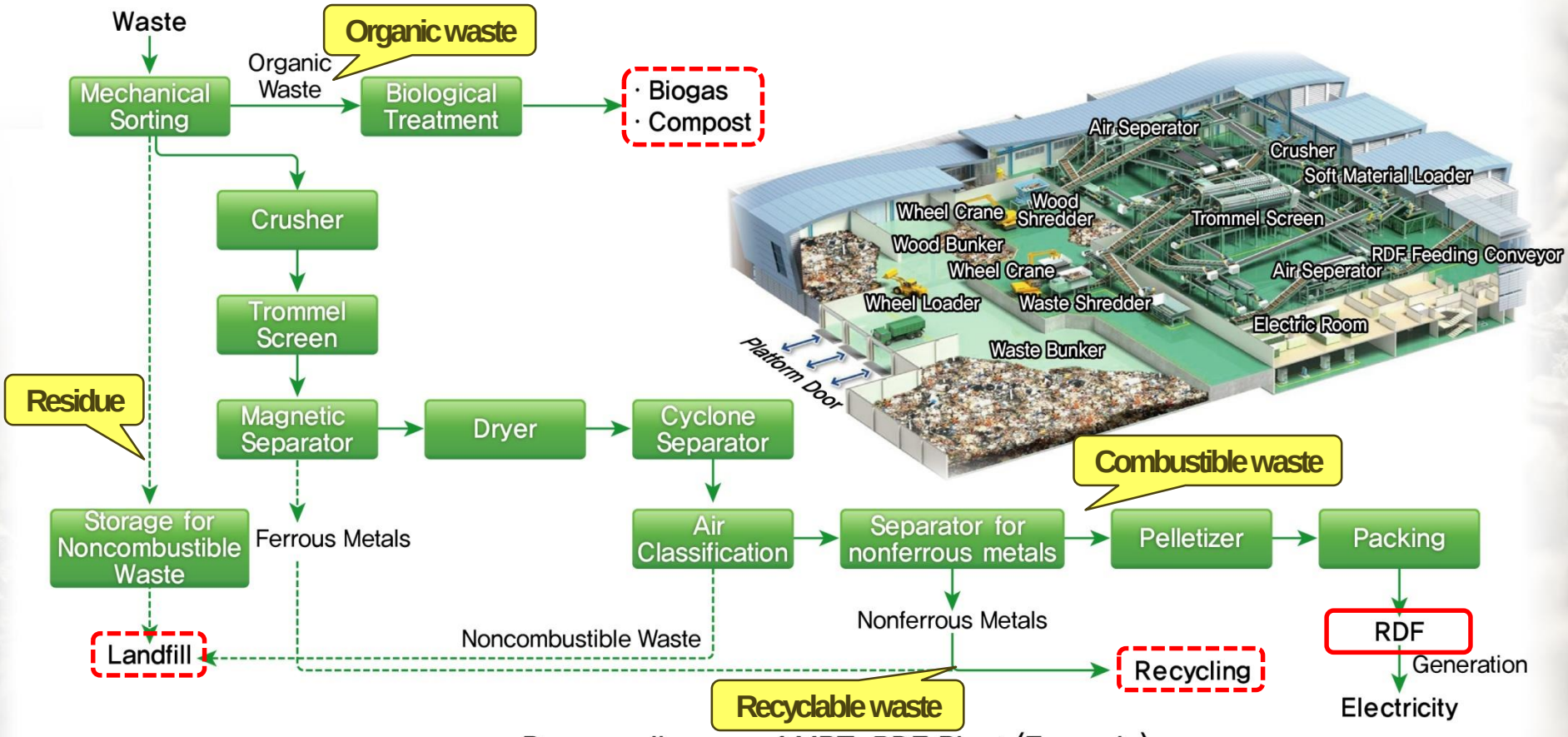


Scope of Service

Waste Treatment

MBT(Mechanical Biological Treatment)-RDF(Refuse Derived Fuel) Plant

- ➜ Separating and sorting commingled waste(combustible, recycle and organic waste, etc.)
- ➜ Producing RDF (over 3,500kcal/kg calorie value with combustible waste)
- ➜ Producing Compost or Biogas from separated organic waste



Process diagram of MBT-RDF Plant (Example)

Scope of Service

Waste Treatment

Narangiin Enger Recycling Facility for Municipal Solid Waste

- Site location : Narangiin Enger Landfill in Ulaanbaatar City, Mongolia
- Plant area : 1,380㎡
- Recycling facilities : Feeding & sorting 160 tons/day, RDF molding 2 tons/hour

Scope of Service

ULAANBAATAR City

- Pop. : 1,000,000 (2009)
- Waste : 1,000 tons/day

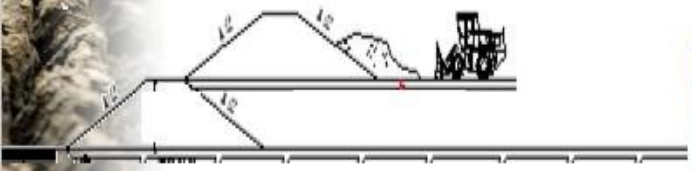
Location map

Recycling 110 tons/day (11%)

Illegal Dumping 30 tons/day (3%)

160 tons/day (16%)

700 tons/day (70%)



Narangiin Enger Landfill

Recycling Facility

- Recycling facility : 160 tons/day
- RDF facility : 2 tons/hour

Excavator
- Waste input
- Coarse waste Sorting

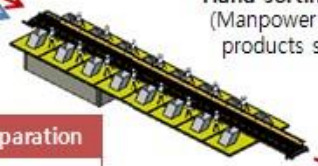
Re-use screening facility	
Glass (bottles)	Re-use
Paper (cardboards)	Re-use

Vibrating hopper (Weight feeders)

Input conveyor (Hand sorting)

Trommel screen (Size selection)

Blow-sorting device

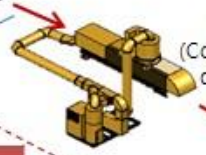


Hand sorting conveyor (Manpower re-useable products screening

Mass balance			
	Re-use products	54.2 t/d	Re-use
	RDF Production	23.7 t/d	Recycling
	Landfill	82.1 t/d	Landfill

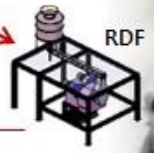
Re-use product screening	
Papers	Re-use
Vinyl, plastic	Re-use
Metals	Re-use
Glass (bottles)	Re-use
Bones	Re-use
Rubbers	Re-use
Textiles	Re-use
Wood & others	Re-use

Light-weight wastes separation
Paper, plastic, vinyl, etc.



Blow sorting & dust, odor collecting facility (Combustion are separated by using wind power and dust & odor is recovered with the air circulation.

Waste Shredder



RDF Molding

Soil & organic wastes	
Food, vegetables	Landfill
Wood	Portion landfill
Soil	Landfill
Glass	Landfill
leather clothing	Landfill

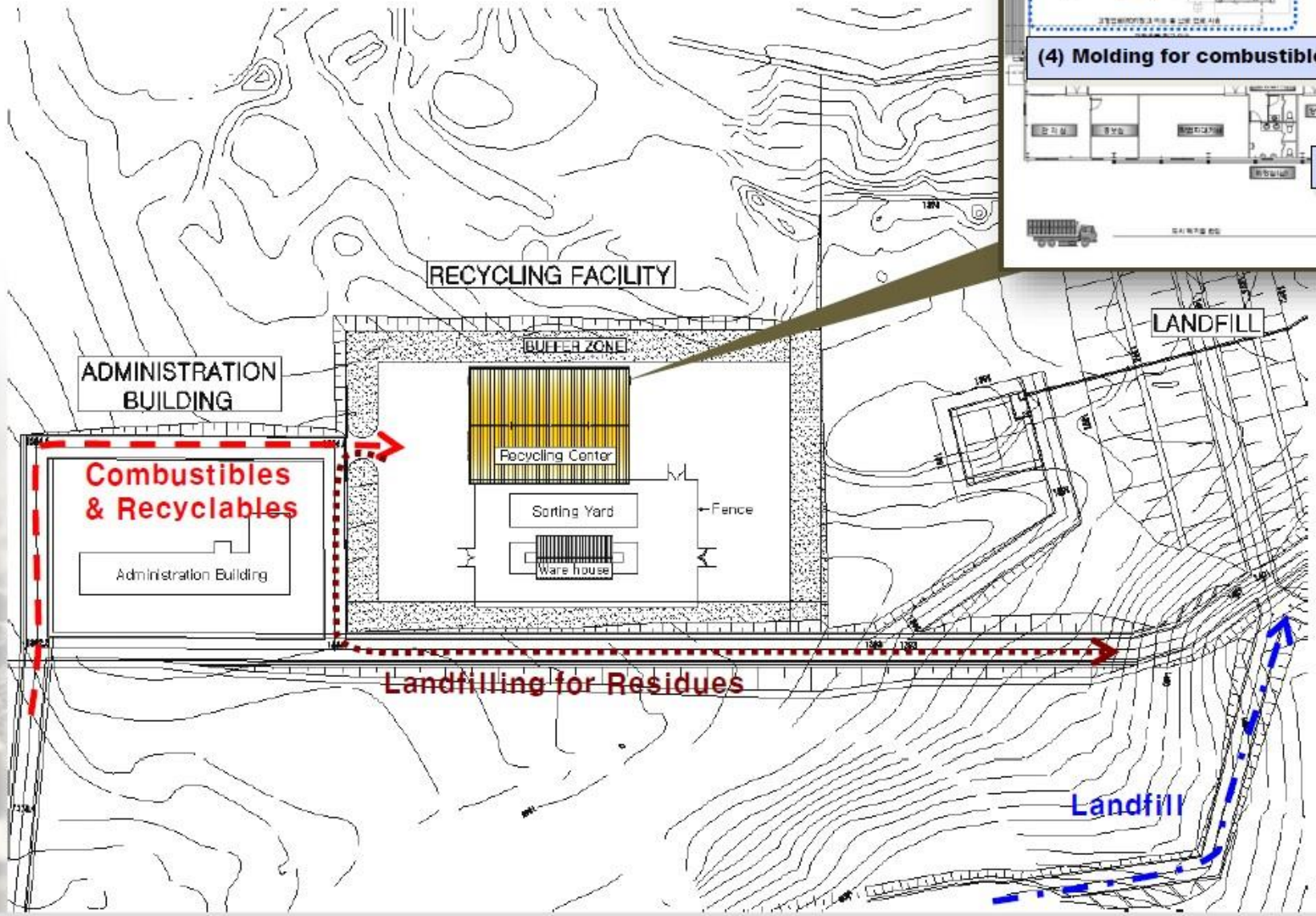
Hand sorting (combustion)
Rubber, wood, etc

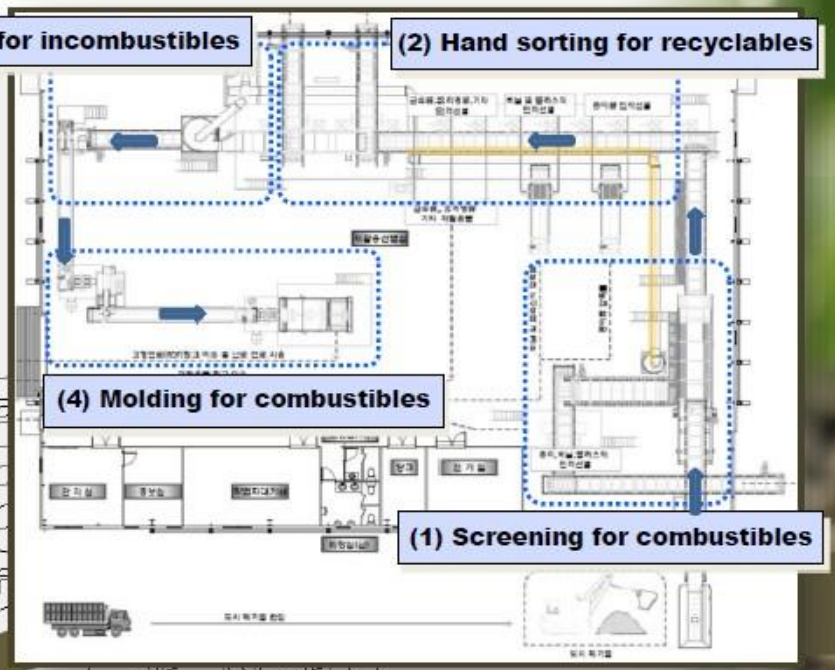
RDF production	
RDF/RPF	Recycling

Re-use → Non-combustion → Combustion →

Scope of Service

Layout Plan





Thanks