

PROJECT NOTE

Integrated Waste Pre-Processing & RDF Manufacturing Plant

1. Project Title

Establishment of an Integrated Waste Pre-Processing and Refuse Derived Fuel (RDF) Manufacturing Plant

2. Project Background

Waste generation is continuously increasing due to rapid urbanisation, industrialisation, commercial activities and expansion of residential areas. A significant portion of municipal and commercial waste contains combustible and recoverable materials such as plastics, paper, cardboard, textiles, packaging material and other high-calorific-value fractions.

At present, a substantial quantity of such waste is either disposed of at landfill sites or remains underutilised. This creates environmental challenges including landfill dependency, odour, greenhouse-gas emissions, fire risk and loss of recoverable resources.

The proposed project aims to establish a **modern Waste Pre-Processing and RDF Manufacturing Plant** for scientific segregation, mechanical processing and recovery of combustible waste and conversion of suitable waste fractions into **Refuse Derived Fuel (RDF)**.

The project will promote the principles of **Waste-to-Resource, Circular Economy and Scientific Waste Management**.

3. Proposed Business Activity

The proposed facility will undertake:

1. Collection/receipt of suitable waste streams.
2. Primary segregation of incoming waste.
3. Removal of inert and non-processable materials.
4. Mechanical size reduction/shredding.
5. Separation of recyclable and combustible fractions.
6. Drying/conditioning wherever required.
7. Processing of high-calorific-value combustible material.
8. RDF preparation and quality control.
9. Storage of finished RDF in a controlled manner.
10. Dispatch of RDF to authorised/end-use industries.

The plant may also recover recyclable materials such as plastics, paper, cardboard and metals, wherever economically and technically feasible.

4. Main Objective of the Project

The primary objectives are:

- To establish a scientific waste processing facility.
 - To reduce the quantity of waste going to landfill.
 - To recover useful materials from waste.
 - To manufacture RDF from combustible waste.
 - To supply alternative fuel to suitable industrial users.
 - To support circular-economy principles.
 - To create local employment.
 - To develop sustainable waste-management infrastructure.
 - To reduce environmental impact associated with unmanaged waste disposal.
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5. Concept of the Plant

The proposed plant will function as an **integrated pre-processing and RDF production facility**.

Proposed process flow:

Waste Receipt



Weighing & Inspection



Primary Segregation



Removal of Inert Material



Mechanical Processing / Shredding



Screening & Separation



Recovery of Recyclables



Combustible Fraction



Conditioning / Drying, if required



RDF Preparation



Quality Testing



RDF Storage



Dispatch to End Users

The exact machinery and process configuration will be finalised according to the waste composition, plant capacity, end-user specifications and applicable environmental requirements.

6. RDF – Refuse Derived Fuel

RDF is a fuel produced by processing suitable combustible fractions of waste.

Typical feedstock may include:

- Waste plastics
- Packaging waste
- Paper and cardboard
- Textile waste
- Multi-layer packaging
- Combustible commercial waste
- Selected industrial non-hazardous waste
- Other suitable high-calorific-value waste

The objective is to remove unsuitable/inert fractions and produce a more consistent combustible material suitable for authorised industrial applications.

Potential end-use sectors may include:

- Cement plants
- Industrial boilers
- Waste-to-energy facilities
- Other authorised thermal applications

The final RDF specification will be maintained according to the requirements of the intended end user and applicable regulations.

7. Proposed Infrastructure

The project is expected to include:

A. Waste Receiving Area

- Vehicle unloading area
- Weighing facility
- Inspection area
- Waste reception platform

B. Pre-Processing Area

- Conveyor systems
- Sorting arrangements
- Shredders
- Screens
- Magnetic separation, where required
- Material handling equipment

C. RDF Processing Area

- Secondary shredding/processing
- Size control
- Conditioning/drying arrangements, if required
- RDF quality-control system

D. Storage Facilities

- Raw material storage
- Recovered recyclable storage
- RDF storage
- Reject/inert material storage

E. Environmental Infrastructure

- Dust-control arrangements
- Fire protection
- Storm-water management
- Leachate/runoff management, wherever applicable
- Ventilation
- Noise-control measures
- Greenbelt/plantation, as applicable

8. Technology & Machinery

Depending on final capacity and waste characteristics, the proposed plant may include:

- Waste receiving system
- Conveyor belts
- Trommel/screening equipment
- Primary shredder

- Secondary shredder
- Magnetic separator
- Air/density separator, if required
- Baler/compactor, where required
- RDF processing equipment
- Material handling equipment
- Weighing system
- Dust suppression system
- Fire detection and firefighting system
- Electrical/control panels
- Quality-testing arrangements

The machinery configuration will be selected to achieve optimum recovery, consistent RDF quality and safe operation.

9. Raw Material / Waste Input

The plant will process **suitable non-hazardous combustible and mixed waste streams** sourced through legally authorised channels and subject to applicable permissions.

The actual waste mix will depend upon:

- Source of waste
- Moisture content
- Calorific value
- Inert content
- Plastic/combustible fraction
- Market requirements
- Applicable regulatory conditions

Hazardous waste, biomedical waste or other regulated waste streams will not be accepted unless the facility has the specific statutory authorisation and infrastructure required for such waste.

10. Capacity

The proposed project capacity can be designed according to available waste and investment.

For example:

Proposed Processing Capacity: ____ TPD

Proposed RDF Production Capacity: ____ TPD

The final capacity can be established after a detailed feasibility study covering waste availability, composition, land, machinery, power requirement, manpower, transportation and offtake arrangements.

11. Market Potential

There is increasing demand for alternative fuels and scientifically processed waste due to:

- Increasing industrial fuel costs
- Need for alternative fuels
- Increasing landfill pressure
- Circular-economy initiatives
- Industrial decarbonisation
- Waste-resource recovery
- Growing requirement for scientific waste management

The project therefore has potential to generate revenue from:

Primary Revenue

Sale of RDF

Secondary Revenue

- Sale of recovered recyclable plastics
- Sale of paper/cardboard
- Sale of recovered metals
- Processing/service charges, wherever applicable
- Waste-management contracts

This diversified revenue model can improve the financial sustainability of the project.

12. Environmental Benefits

The proposed project can provide significant environmental benefits by:

- Diverting combustible waste from landfill.
- Reducing uncontrolled waste disposal.
- Recovering valuable resources.
- Converting waste into useful fuel.
- Reducing dependence on conventional fossil fuels in suitable applications.
- Supporting circular economy.
- Reducing landfill burden.
- Improving scientific waste management practices.

The project will operate subject to applicable environmental permissions and standards.

13. Employment Generation

The project will create direct and indirect employment opportunities.

Direct Employment

- Plant manager
- Supervisors
- Machine operators
- Sorting workers
- Maintenance staff
- Quality-control personnel
- Drivers/material-handling staff
- Administrative personnel
- Safety personnel

Indirect Employment

- Waste collection/transport
 - Maintenance contractors
 - Equipment suppliers
 - Recyclable-material traders
 - Logistics providers
 - Ancillary service providers
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14. Business Model

The proposed business model can operate on a **Waste-to-Resource** approach.

Waste Input → Segregation → Processing → Resource Recovery → RDF Production → Sale to Industrial Users

The project will seek long-term arrangements with suitable RDF off-takers to ensure stable demand and improve revenue visibility.

Potential customers will be identified based on:

- RDF quality requirements
- Calorific value
- Moisture
- Chlorine and other parameters
- Quantity requirements

- Transportation distance
 - Applicable regulatory permissions
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15. Funding Requirement

Funding will be required primarily for establishment of:

- Land/site development
- Civil infrastructure
- Waste-processing machinery
- RDF processing machinery
- Electrical infrastructure
- Material-handling equipment
- Pollution-control/environmental infrastructure
- Fire & safety infrastructure
- Storage facilities
- Laboratory/quality-control facilities
- Vehicles/equipment, where required
- Working capital
- Initial operating expenses

Proposed Funding Structure

Total Project Cost: ₹ 5 Crore

Promoter Contribution: ₹ 2Crore

Term Loan / Project Finance: ₹ 0 Crore

Grant/Subsidy/Startup Funding: ₹ 2 Crore

Working Capital Requirement: ₹ 1 Crore

16. Why Funding is Required

The proposed project is capital intensive because it requires specialised mechanical processing equipment, civil infrastructure, environmental-control systems, electrical installation and adequate working capital.

External funding will enable the project to:

- Establish the plant at an appropriate scale.
- Install modern processing machinery.
- Increase waste-processing capacity.
- Produce consistent-quality RDF.
- Develop long-term industrial off-take.
- Create employment.
- Reduce landfill dependency.

- Establish a commercially sustainable waste-to-resource operation.
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17. Expected Outcomes

After commissioning, the project is expected to:

1. Process substantial quantities of waste every day.
 2. Recover recyclable materials.
 3. Produce marketable RDF.
 4. Reduce landfill disposal.
 5. Generate employment.
 6. Establish a sustainable waste-management business.
 7. Develop industrial customers for RDF.
 8. Generate recurring revenue.
 9. Support environmental sustainability and circular economy.
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18. Project Strength

The project combines **waste management + material recovery + alternative fuel production** rather than depending solely on waste disposal revenue.

The integrated model provides multiple potential revenue streams and allows maximum possible value to be extracted from suitable waste.

Core Business Model:

“Waste → Processing → Resource Recovery → RDF → Industrial Fuel”

19. Long-Term Vision

The long-term objective is to develop the facility into a **regional integrated waste-processing and RDF manufacturing centre**, with the ability to process increasing quantities of suitable waste and supply consistent-quality alternative fuel to authorised industrial users.

The project can subsequently be expanded through:

- Additional processing lines
- Higher RDF production capacity
- Advanced segregation technology
- Additional material-recovery systems
- Automated sorting

- Additional RDF off-take agreements
- Expansion into nearby districts/industrial clusters

20. Conclusion

The proposed **Integrated Waste Pre-Processing and RDF Manufacturing Plant** is an environmentally sustainable and commercially oriented infrastructure project.

The project addresses two important requirements simultaneously:

- (1) **Scientific processing and diversion of waste from landfill**
- (2) **Conversion of suitable combustible waste into useful RDF**

With appropriate technology, statutory approvals, reliable waste supply and long-term RDF off-take arrangements, the project has the potential to become a sustainable **Waste-to-Resource and Circular Economy business**.

Funding support is therefore sought for establishment of the plant, procurement of processing machinery, development of infrastructure and initial working capital.

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