CASE STUDY REPORT ON WASTE TO ENERGY

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Abstract

Urbanization is an outcome of the changes in the pattern of livelihood and the consequent change in the nature of habitation. From its earliest days urban economy in most parts of the world has been dominated by trade and commerce, supported by artisanal and other specialized activities. As industrialization gained pace, economic activity increasingly shifted away from farming to factories and to the service industries causing rapid increase in urbanization. Slower pace of urbanization over past six decades is case of India is the result of slow pace of economic growth and slower growth of employment opportunities in non agriculture sector .However, it is estimated that by 2025 37% of the population of India i.e., 450 million will live in urban areas.Urban occupations generally fetch higher incomes -whether in factories or in the service sector or in petty businesses. Higher incomes enable higher levels of consumption. The impact on waste generation in the urban areas is a compounded effect of the proportionate increase in urban population, improved levels of income and change in the pattern of consumption.

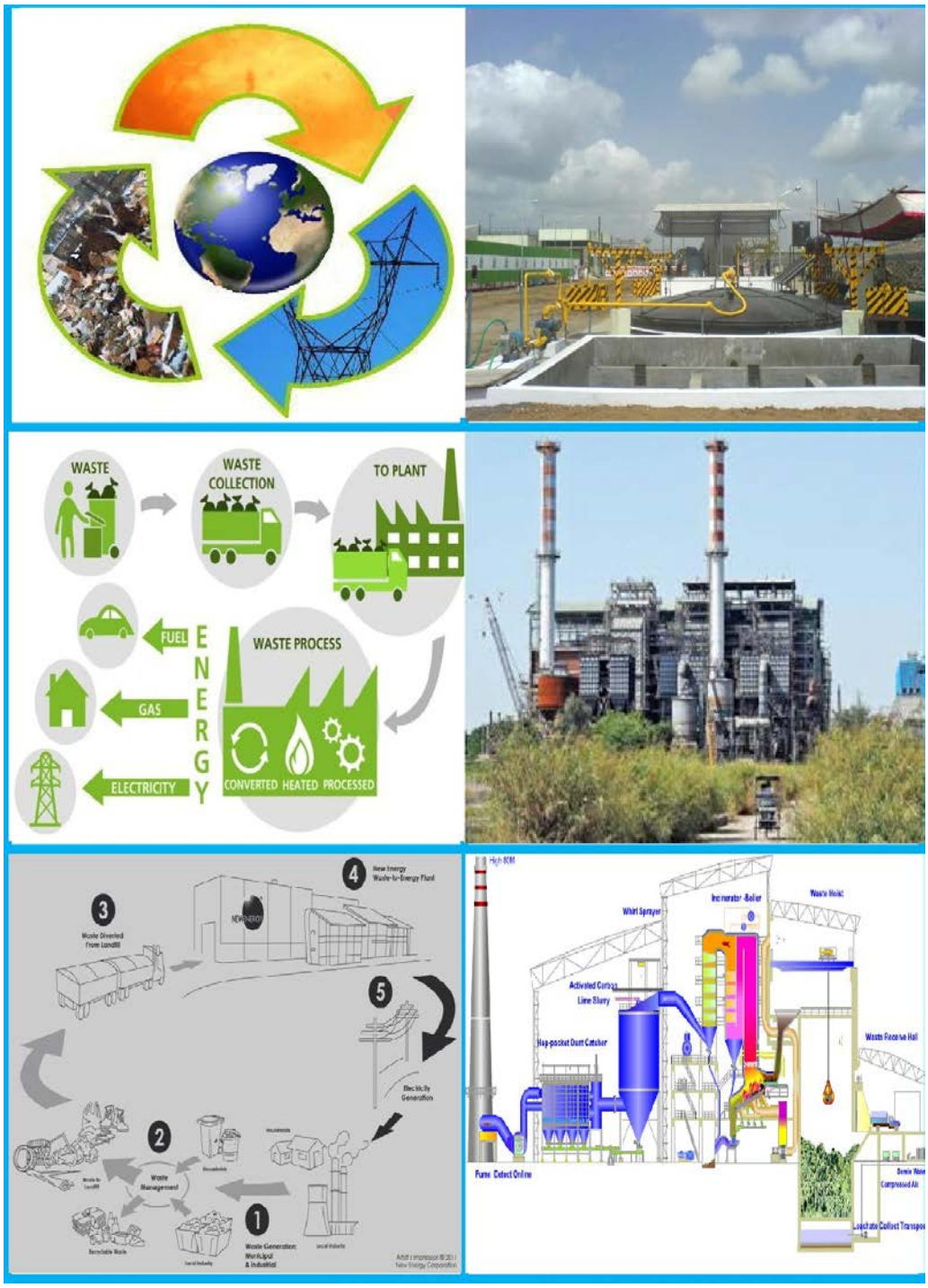
Introduction

The institutional response to the issues of urban waste management has only mirrored citizens' apathy. Outdated and unhygienic systems of waste collection, transportation and disposal continue in most of the cities and towns even though it has been more than a decade since Municipal Solid Waste (Management and Handling) Rules 2000 was notified. It is therefore, imperative to think afresh on the problem of dealing with urban waste.

Urban solid and liquid waste has two principal components. One is the municipal solid waste (MSW) which includes commercial and residential waste generated in municipal or notified areas in either solid or semi-solid form excluding industrial hazardous waste, e-waste and including treated bio-medical waste as defined in the MSW Rules, 2000. The other is the liquid waste, that is, sewerage. This Task Force is focused on MSW and hence the discussion that follows is exclusively on MSW.

The management of MSW is an organizational, technological and economic challenge. The primary objective of urban waste management must be outcomes that are acceptable from the perspective of public health and the environment. In the hierarchy of objectives, public health has to necessarily have the first priority. The choice of technology has also to pass the filter of public health responsibility. Needless to say, the solution has to pass the test of financial viability and fit into the institutional system that exists. Policy changes that can be helpful in closing out gaps and act as enablers for the solutions to operate need to be identified and flagged as part of the policy reform that may be required. The accumulation of garbage in various stages of decomposition, along with other representations of the squalor of unsanitary conditions in India and other parts of the developing world, has unfortunately become the identifiers of our progress- badges of shame so to say. That is, however, an unconstructive dialogue. Cleaning up of our cities and towns is not an aesthetic pursuit but a necessary one for responsible public health management. Squalor has been in evidence elsewhere in the past and has been successfully

dealt with and there are no signs of it today to be seen. The technology and human endeavor that makes modern life possible also permits us to maintain cleanliness in our urban habitations and recover resource and Energy from waste. The Task Force views its mandate in respect to MSW in this particular light.



Objective

This study intends to do a case study on the Technology Choices available for the Scientific Disposal of Garbage (MSW) at Processing Project of SELCO located at Shadnagar 55 kms from Hyderabad.

Technology Choices available for the Scientific Disposal of Garbage (MSW)

- Pelletisation Combustion / Incineration
- Land filling
- Pyrolysis
- Bio-methanation
- Composting

Organization

1.3.1 Advantages of Pelletisation & Incineration

- The only proven and time tested technology for Heterogeneous Indian Garbage.
- Widely implemented in EUROPE for the Disposal of MSW.
- Suitable for the Indian cities generating more than 50Tpd MSW
- The Combustibles are separated for the production of RDF, the fine sand that comes out is a good soil en richer. The left out inert materials like big stones can be used for filling into the low lying areas.
- RDF is a good coal substitute.
- Emissions of RDF burning are superior to that of coal burning with less NOX and SO2.
- RDF as a Coal substitute has a good track record
- Instant MSW volume reduction is possible only through incineration
- Energy recovery from Garbage can be through RDF/electricity
- RDF incineration is economical than Garbage incineration.
- No Dioxines or Furons emissions.

ELCO's MISSION - ENERGY FROM WASTE

- The aim of SELCO is to reduce pollution, preserve the fossil fuel, reduce the green house gases and protect the ozone layer. They offer one of the best possible scientific solution for the perennial garbage disposal problem.
- Currently they are running one power plant and are setting up another power plant at Shadnagar.
- Setting up WTE plants in Russia, South East Asia, Middle east and Latin America.

PROJECT SUPPORTED BY

- Municipal Corporation of Hyderabad
- Technology Development Board
- Technology Information Forecasting & Assessment Council
- IREDA
- MNES
- NEDCAP
- AP Pollution Control Board

PROCESS

Fig1.MSW Plant

FLOW CHART OF PELLITISATION

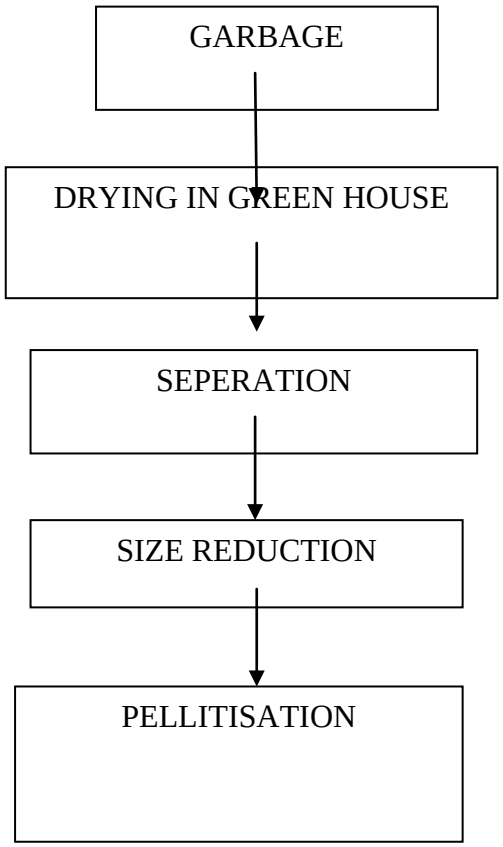


Fig2.Reduced Fuel Pellets

RDF (Refuse Derived Fuel) Characteristics

- Calorific Value: 2500 – 3000 Kcal/Kg
- High Volatile Matter (60%)
- Emission characteristics of RDF are superior compared to coal with less NOX, SOX, CO & CO 2
- Bio fertilizer and the Fly ash are the useful by products

Proximate Analysis	in %
Moisture :	7.2
Volatile Matter :	64.6
Ash Content :	21.9
Fixed Carbon :	6.3
Ultimate Analysis in % Carbon :	36.70
Hydrogen :	5.30
Nitrogen :	1.21
Sulphur :	0.32

Fig3.Power Plant

Power plant

Capacity : 6.6 MW
Exportable : 5.9 MW
Substation : Shadnagar 33/11 kv, 55 Kms from Hyderabad
Location : Elikatta(V), Mahabubnagar Dist,AP
Technology : Indigenous and in house
Funding : TDB - Term loan TIFAC - Technology Development Assistance Power purchase Agreement with APTRANSCO

THE ADVANTAGE

The fuel viz., Refuse derived fuel (processed MSW) in adequate quantity is being produced in our own factory in the downstream.
Proven experience in producing the RDF for the last more six years

Fig4.Cooling Chamber

Production

- More than 74 million units of Power generated since November 2003
- More than 5 Lakh tonnes of MSW have been processed in our MSW processing unit.
- Teething problems encountered with RDF combustion for Power generation solved

Conclusion

- Studied SELCO plant which is in operation Over 6 years in MSW processing is yielding results.
- MSW processing technology offered to several private companies in India and several companies abroad
- Awareness about the need for the scientific disposal of MSW brought in the country.

REFERENCES

- **http://theconstructor.org/geotechnical / reference**
- **termite101.org/termite-treatment**