

**Electricity Generation from Municipal Solid Waste – CDM  
perspective**

**Presentation**

**by**

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**SELCO INTERNATIONAL LIMITED**

**HYDERABAD**

**Winner of**

**Best Technology Award**

in the year 2000 in the area of

**Alternative Inexhaustible Energy Sources**

awarded by

The Federation of Andhra Pradesh

Chamber of Commerce & Industry ( FAPCCI).

**SELCO INTERNATIONAL LIMITED**

**HYDERABAD**

**Winner of**

**Technology Achievement Award**

in the year 2004

Awarded by

The Confederation of Indian Industries

(CII ), New Delhi

## **HAZARDS OF DUMPING GARBAGE**

NITROUS OXIDE (N<sub>2</sub>O) is produced by the burning of Garbage in Dumping yards under uncontrolled conditions.

It has 179 times more Global warming potential than CO<sub>2</sub>

**Source: WHO**

## **HAZARDS OF DUMPING GARBAGE**

Methane is formed by the decomposition of Organic matter. Main Sources are Landfills.

It has 24 times more Global Warming Potential than that of CO<sub>2</sub>

**Source: WHO**

**Present MSW disposal system in most of the cities**

Open dumping of garbage in the barren lands

## **MSW Rules 2000**

- Mandatory for all Municipal bodies to dispose the MSW in a scientific manner.
- Mandatory for all the Municipalities to establish plants for the Scientific disposal of MSW.
- A buffer zone of no habitation development should be maintained around the plant site.

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

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



## **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.

## **Pelletisation & Incineration**

- 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.

## **Financial Support**

More Financial Institutions should come forward to fund the sector.

➤ Capital Subsidies should be given to encourage such green plants.

➤ Tipping Fee concept as practiced UNIVERSALLY should be implemented in Our Country also.

➤ Sale of CER's should help in sustainability

➤ Municipal Corporations should deliver the garbage free of cost to the plant site.

## Where CDM can help?

- Many green projects already registered
- CDM in big time news
- Niche projects like Solid waste management which are not commercially viable individually need encouragement
- CER sales can be a good source of revenue for such projects

## Where CDM can help?

- India envisaged to be one of the biggest players in CDM
- India to follow on the lines of developed nations
- 2012 deadline: Not worrisome
- Better guidelines to come up
- Encouragement through CDM makes people take up green projects

## Where CDM can help?

- 6 MW plant will produce around 35000 CER's per year without methane abatement
- The pathway for realizing the money appears to be clear now.
- In case of electricity generation from MSW when subsidies are not available the revenues from CER sales will definitely strengthen the sustainability of the projects.

**SELCO INTERNATIONAL LIMITED**

Hyderabad.

**CONVERSION OF MUNICIPAL SOLID WASTE  
TO 6.6 MW OF ELECTRICITY**

**(The First Project of its kind in India)**

## **SELCO'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. We offer one of the best possible scientific solution for the perennial garbage disposal problem.
- Currently we 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

## Selco – Pioneers in Waste to Energy sector

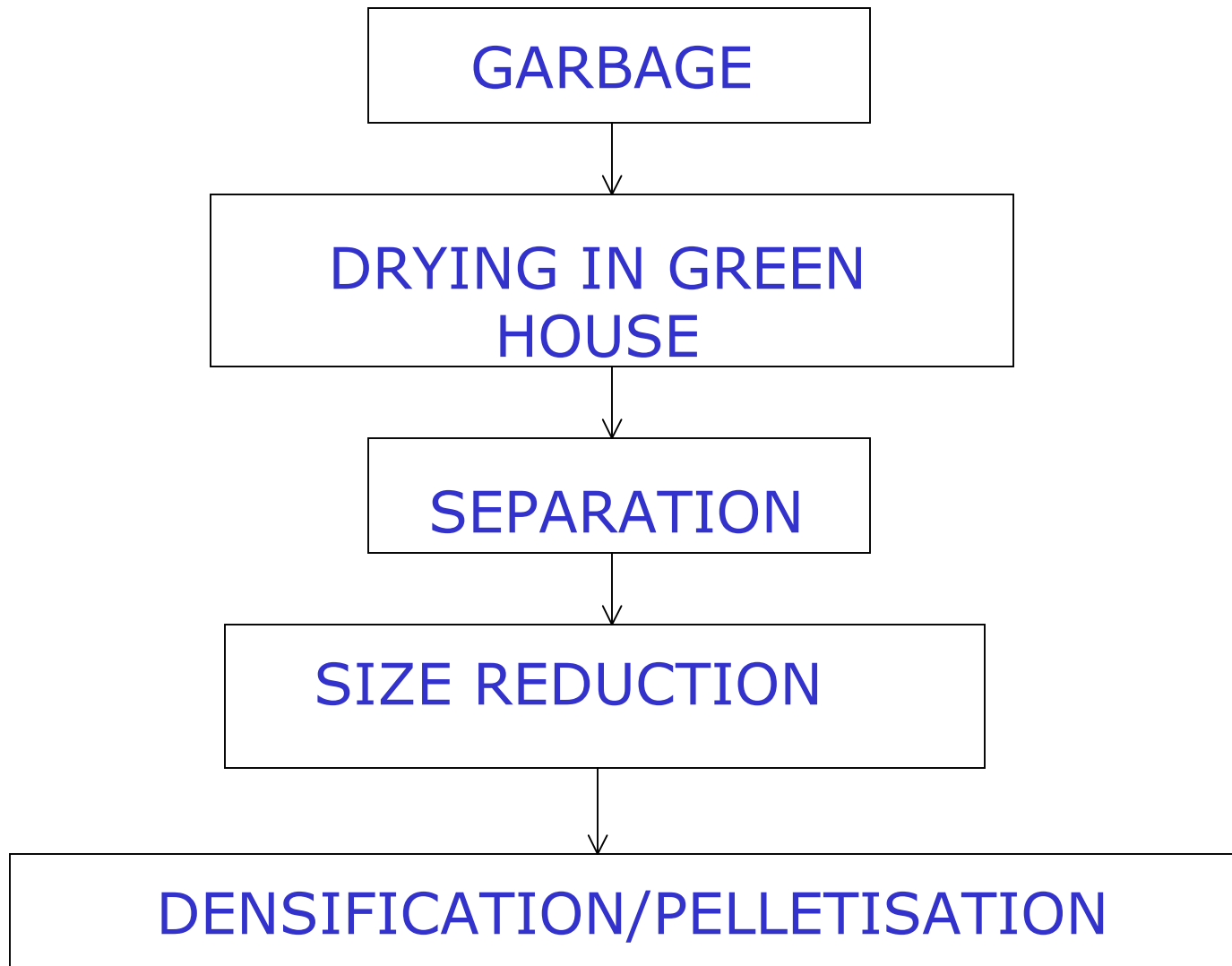
- Selco International Limited is a Hyderabad based company with core business focus on energy generation from MSW.
- Selco has set up the first commercial garbage processing plant in India at Gandhamguda Village on the outskirts of Hyderabad way back in 1999.
- Selco has started operations of the power plant based on MSW – Combustion technology at Elikatta Village in November 2003 – The First project of its kind in the country.

# MSW PROCESSING PLANT





# PELLETISATION - PROCESS FLOW CHART



## REFUSE DERIVED 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<sub>2</sub>
- Bio fertilizer and the Fly ash are the useful by products

## RDF (Refuse Derived Fuel) Characteristics

### 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



# 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 than SIX years.

# Air Cooled Condenser



# 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.

## Technology Transfers Done

1. M/s Shreeram Energy Systems Ltd,  
Vijayawada
2. M/s Grasim Industries for their cement  
units at Jaipur, Indore, Ajmer & Trichy
3. M/s Hemasri Power Projects, Suryapet,  
Nalgonda Dist, A.P.
4. M/s Sri Venkateswara Hydro Power  
Projects, Hyderabad
5. M/s Chamco Inc. USA

## Distinguished visitors

- Hon'ble Minister for Urban Development Mr. Gulam Nabi Azad & Hon'ble Chief Minister of A.P. Dr. Y.S. Rajasekhara Reddy
- Standing committee of Parliamentarians on Energy.
- Dr. Rangarajan, Chairman, 12<sup>th</sup> Planning Commission and his team.

## Patents Generated

1. Process for converting Heterogeneous garbage to Electricity.
2. Process for converting Municipal Solid Waste to RDF Coke.



## Conclusion

- Our 6 years of operational experience 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.
- CDM will help in encouraging green projects like the SELCO project.