



**Municipal Solid Waste Conversion to Briquette
(~40 T/D MSW)
Gasification & 1 MW Power
A Pilot Plant**

This is a 1 MW Power Pilot Plant Proposal, which is presented to address the disposal of Municipal Solid Waste (MSW) and converting that into Electricity.

MSW is posing a hazard to the environment and to the people if it is burned in open pits or piled in dumpsites. Furthermore as reported in the media; absence of a proper garbage disposal system has caused a number of health and social problems.

CHAMCO will build facilities that convert MSW into refuse derived fuel Briquette (RDF) and Power Plants using RDF as fuel in Gasification units and generate Electricity.

In this pilot plant proposal, MSW first will be sorted. The constructional waste, ferrous & nonferrous wastes, glass pieces & other noncombustible ingredients will be separated. Sorting machine with atomized conveyor & magnetic separators will be installed before subjecting the biomass to RDF Briquetting machines.

The gasification unite coupled with 1 MW generator requires approximately 20 T/D briquette, which is derived from approximately 35 or 45 Tons of low calorie MSW. If MSW is dry and rich, then the excess briquettes, with caloric value of 3,000 Calories per Kg. could be sold in the market or increasing the power plants capacity in the future.

We do recommend adding 10% coal, nut shell, rice husk, wood waste, if available, to the MSW Briquettes if there was a shortage of MSW, since it also enhance the caloric value of briquette and could be used for better operation of the gasification.

Project Cost:

The total cost of the Sorting and Briquette making facilities, Gasification and Power Plants including; survey, feasibility study and planning, engineering, procurement, contracting, test, commission and training for plants larger than 10 MW is approximately \$4,000,000 (four million USD) per Mega Watt.

But the cost of this 1 MW plant project will be:

\$4,500,000 (four and half million US Dollars).

Project Income:

A – “Power Purchase Agreement” (PPA) for electricity, which the national grid pays to the owner of the plant. For calculation purposes we will use 10 cents per kilowatt hour (KWH).

Assume that the PPA for 1 MW of electrical power generation at a fixed price is \$0.10 per KWH.

Sale of electricity =

1 MW(net power generation) x 1000 x 24 (hours) x 365 (days) x \$0.10 x 0.85(Efficiency Factor) = \$744,600 gross income from power generation annually.

B - Tipping Fee: Municipalities pay the plant operators/owners a tipping fee for each Ton that they receive and handle per day. Assuming the average tipping fee is around \$30 / T: Tipping Fee = 50 (T/D) x \$30 (per Ton) x 365 Days = \$547,500 Annually.

Project Costs:

Plant Turnkey Cost includes Engineering, Procurement Contracting, Insurance, Marketing and Commission etc. (Turnkey).

Cost of the Project: \$4,500,000

C - **Operation & Labor Cost.** For this project of 1 MW power plants and RDF plant, a work force of about 2 technical and 5 non-technical workers are estimated.

Assuming \$80,000 per technical and \$40,000 per non-technical works, the approximate labor costs will be: 2 x \$80,000 + 5 x \$40,000 = \$520,000

Summary:

- Assume 7 years Return On Investment (ROI)
- Cost of facilities \$4,500,000
- Income from PPA \$744,600
- Income from tipping fee \$547,500
- Labor costs \$360,000
- Maintenance costs \$40,000
- ROI = 4,500,000 / (744,500 + 547,500 - 360,000 - 40,000) ~ 5 years