ISSN: 2277-9655
Impact Factor: 4.116
CODEN: IJESS7

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

RESEARCH WORK ON CONVERSATION ENVIRONMENTAL WASTE TO ENERGY

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DOI: 10.5281/zenodo.160852

ABSTRACT

Waste the term which is usually creates a feeling of untidiness and unused matter in environment/ society. We know that now a day's consumption of Electric energy is majorly employed in every industry, companies, domestics, etc. and it very essential for all. We know that present resources and fossil fuels are getting extinct. So, there is a necessity to find the alternative ways for production of electricity. This paper deals with great applications and management of the waste in an eco-friendly manner. The process of producing electric energy from the waste and utilization of its by-products are going to be discussed.

KEYWORDS: ENVIRONMENTAL WASTE TO ENERGY

INTRODUCTION

Millions of tons of solid municipal waste are created in many countries across the world every day. This waste is then dumped onto landfills and left to decompose. This waste causes a lot of environmental as well as health problems. The problem deepens further when the landfills are overfilled and there is no more space for any kind of waste. By producing electricity from solid municipal waste this problem can be solved, and it provides an alternative way to produce electricity.

Electricity production from municipal solid waste can be very efficient, depending on the method that is used. The level of carbon or greenhouse gas emissions and environmental friendliness will also depend on the processing method used to generate the electricity. Generating electricity from municipal solid waste, which you discard every day, can be a terrific way to get the energy the world needs, without putting any more strain or pollution on it. One ton of municipal solid waste can provide five to six hundred hours of light or other electrical needs to your home.

Electricity can be produced by burning "municipal solid waste" (MSW) as a fuel. MSW power plants, also called waste to energy (WTE) plants, are designed to dispose of MSW and to produce electricity as a byproduct.

The term MSW describes the stream of solid waste ("trash" or "garbage") generated by households and apartments, commercial establishments, industries and institutions. MSW consists of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint and batteries. It does not include medical, commercial and industrial hazardous or radioactive wastes, which must be treated separately.

OBJECTIVES

- Reduction of MSW,
- Increase of value added refuse,
- Reduction of environmental and social problems at the disposal site,
- Utilization of MSW to generate energy,
- Improvement of MSW management services,
- To avoid land filling of the fly ash,
- To make use of the grit and mud from the waste.

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TYPICAL COMPOSITION & PROPERTIES OF INDIAN MSW

Organic Fraction/Bio-mass: 35.00 %
Woody Bio-mass: 15.00 %
Paper: 05.00 %
Rags/Textiles: 05.00 %
Plastic: 00.05 %
Rubber etc.: 04.85 %
Glass: 00.05 %
Metals: 00.05 %
Stones: 20.00
Sand/Earth & other particulates: 15.00 %
Moisture Content (%): 50.00
Bulk Density (MT/m^3): 0.4-0.6
Calorific Value (kcal/kg): 800

PROCESS FOR PRODUCTION OF ELECTRICITY FROM WASTE (MSW)

- Collecting of garbage from city premises
- Storing under sheds for sun drying
- 3-stages of inspection
- Chipping
- Fluff making
- Burning of pallets in the boiler
- Steam generation
- Power generation
- Collecting of bottom ash
- Collecting of fly ash
- Collecting of gases from chimney

COLLECTING OF GARBAGE FROM CITY:

Garbage is collected from the nearby city by the help of trucks and other means, like bullock carts etc. As the waste is abundantly present in India at free of cost thus money is just spent for transportation

STORING UNDER SHEDS:

The material solid waste (MSW) or garbage collected is just stored under a shed as raw material .it helps in sinking the moisture content

SCREENING:

The waste which is collected is fed under screening and exposed to sunlight to decrease the moisture content up to 30% at least.

THREE STAGES OF INSPECTION:

MANUAL INSPECTION:

Municipal Solid Waste is dumped on the tipping floor where manual inspection is carried out to remove large debris, tree cuttings, and tyres etc, which are harmful to the downstream process equipment in the plant.

MAGNETIC SEPARATION

For removing any long iron material present in the MSW

FINAL INSPECTION:

Waste is layered on belt conveyer at a layer of up to 5cm and stones, plastic, glass and metals are removed and if any unwanted particles present are removed

SEGREGATION TAKES PLACE IN THREE STAGES

SIEVING:

In sieving, Grit and sand up to 5mm are removed; this sand is used as the manure.

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PNEUMATIC CLASSIFIER:
It is used to remove small stones and glass and non-combustible fractions

CHIPPING:
Thus the waste obtained from the above process is made into 20 to 25mm size by passing it under mobile chippers or drum chippers

FLUFF MAKING
MAKING OF THE FLUFF:
Course fluff is made by adding rice husk at a ratio of 3:1 and mixed in the mixer for burning in the boiler

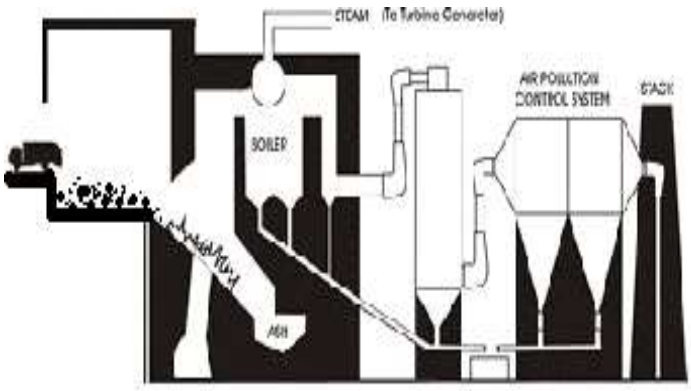
DENSIFICATION:
5 to 10% of binders, additives are added for obtaining good quality fuel

SIZE REDUCTION UNIT:
Fluff is heated by the hot gases from the chimney up to moisture content 15% and made to short pieces up to 1 to 2cm.These small pieces are called pellets. These pellets are cooled and stored under storage room for dispatch

SUPPLY OF PELLETS TO BOILERS:
These pellets produced are combusted in the boiler and generated heat is used for producing steam

POWER GENERATION:
The steam generated is used to run the turbine. Power stations for combined generation of electric energy and heat are provided with steam turbines. High-pressure steam is fed to steam turbine generator, which is compiler to alternator through heavy-duty gearbox. The mechanical energy is converted to electrical energy in the alternator and the generated voltage is stepped up to 33 KV for sale to grid. Part of the generated electricity is stepped down to 440 volts for running auxiliary equipment like feed pumps, fans and process machinery. Cooling water is passed to condenser where the steam is condensed to water for re-circulation to boiler as feed water.

The principal purpose of electric power stations is to produce electric energy and supply it to industrial and agricultural enterprises, public utilities, and transport.



ADVANTAGES

- Eco-friendly
- Low cost for power generation
- Profits are obtained from bi products also
- Cost of raw material is low
- Helpful for decreasing the production of plastic by recycling it