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DESIGN AND DEVELOPMENT OF GENERATE ELECTRICITY AND PETROLEUM THROUGH WASTE GARBAGE

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ABSTRACT

The main aim of this paper is to generate electricity and petroleum product from waste garbage. The conversion from waste to energy is the first process of generating energy in the form of electricity by heat from the primary treatment. The second process is that the conversion energy from degradable waste into a fuel source (Methane). It can use in ignition vehicle, diesel generator and combustion chamber. The non-degradable waste is burnt in combustion chamber, produce heat and generate steam with high pressure. The steam passes through the steam pipe and devolves in the turbine with high pressure which is connected with generator and produces the electricity. It requires sewer filter for store waste from sewer and one dump yard for storing waste product. The re-generator provides hot air in dump yard which is covered by silver coated layer. This process is used for removing humidity from garbage. It needs a proper arrangement of waste management system which decomposes the garbage and provides pollution free environment. The tons of waste garbage consist of many hazardous heavy metals acid toxic chemical and non degradable plastics. Most of the waste products are burnt, then dumped and some are exported for recycle process. The smoke and dust particles consist of carcinogens and other hazardous chemical which causes severe inflammation and lesion including many respiratory and skin deceases like skin cancer.

Keywords: Regenerator, turbine, waste filter, dump yard.

I. INTRODUCTION

The human life has affected by deceases due to improper waste management. So it needs to proper arrangement of waste management system. First it decomposes the garbage and provides pollution free area. Every year tons of waste garbage consists of many hazardous heavy metals acid toxic chemical and non degradable plastics are producing [1][2]. Many are dumped and burnt or exported recycle. Dismantling process takes much labour in countries; Dismantling is not only involved in unscrewing but also shredding tearing and burning. The smoke and dust particle consist of carcinogens and other hazardous chemical which causes severe inflammation and lesion including many respiratory and skin deceases like skin cancer. The initial thing which is use for generate electricity is known as fuel. In this waste management system it use waste garbage as a fuel for generate electricity and methane gas. Agriculture waste use for fuel and generate methane [3]. It is benefits for ruler society and farmer. Company can take waste from farmer and provide them electricity at low cost at place of waste cost.

II. WASTE MANAGEMENT OBJECTIVE

The main objective of this paper is to generate electricity and produce methane gas by degradable and non degradable waste [4][5]. Methane gas is converted into petroleum; its price is cheaper than that of the petroleum which is available in market. It requires 92 Kg dry waste (or) 87 Kg wet waste for generating 1kw electricity.
➢ Reduce Land pollution
➢ Generate petroleum at minimum cost
➢ Generate electricity with garbage waste
➢ Operate diesel generator through methane gas

III.   METHODOLOGY OF WASTE MANAGEMENT

Design on layout of basic thermal power plant in which waste is use as fuel. Waste filter by sewage filter and collected by different municipalities of cities. For degradable agriculture waste can use. Waste is filter into two parts (i) Degradable waste (ii) Non-Degradable waste. Degradable waste compose and generate methane gas which is convert into petroleum but non-degradable waste burn in combustion chamber and produce heat and generate steam with high pressure. Steam pipe leave steam on turbine which is connected with generator through shaft, when turbine will move then electricity produce. These are following steps as

➢ It requires sewer filter for store waste from sewer and one dump yard for store waste for several zones of cities.
➢ Divide the garbage into two group (i) Degradable (ii) Non- Degradable
➢ Re-Generator provides hot air in dump yard which is covered by silver coated plat, this process use for removing humidity from garbage.
➢ Chemical process chamber used for degradable waste chemical reaction which is demoblized methane gas from waste garbage. Methane gas store in gas container.
➢ Through methane it can get petrol, diesel, kerosene those use for combustion and diesel generator.
➢ Non degradable waste directly burn into combustion chamber
➢ If it is use for combustion, it need to connect turbine through steam valve & turbine other portion connected with Ac generator which produce electricity. Otherwise using petroleum we can easily get electricity.

IV.   IMPACT OF NATIONAL AND INTERNATIONAL OF WASTE MANAGEMENT SYSTEM

The national impact consists of

➢ Key waste management legislation in India
➢ Role of the informal sector in waste materials reuse and recycling
➢ Waste collection and transport
➢ Waste disposal
➢ Environmental and health impacts of waste dumping
➢ Barriers to improved waste management in India
➢ Changes required to improve waste management in India
➢ Waste-to-energy in India
➢ Engineered landfills in India
➢ Increase benefits for farmers

The international impact as
1. Tested fertilizers contain harmful toxic metals
2. Toxic fertilizers threaten human health
3. Toxic fertilizers pressure agricultural soils, food safety and waterways
4. Agricultural soil quality
5. Plant uptake
6. Water quality
7. Evolutionary
8. PH Change and oxygen depletion
9. Pro line as an internal toxic affect manger

V.   FLOW CHART OF WASTE MANAGEMENT SYSTEM
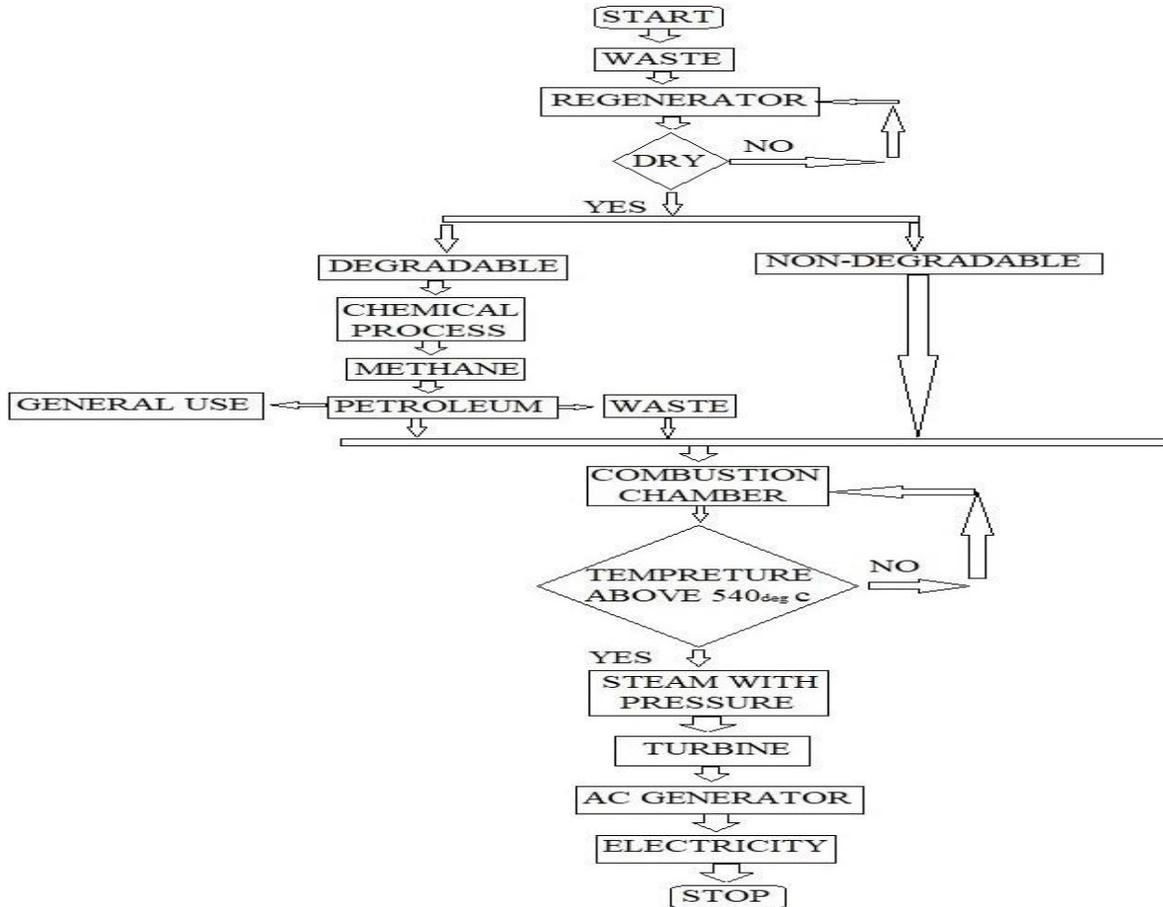
VI.   COMPLETE BLOCK DIAGRAM OF WASTE MANAGEMENT SYSTEM

Waste is collected and drop in dump yard after collecting, the humidity will be removed by using re-generator air. This waste filter can be divided into two parts one degradable and another is non degradable. Degradable waste composes in chemical process chamber after chemical process degradable waste convert into petroleum. Combustion chamber uses for burn the waste for generate heat. Turbine connected with generator for generate electricity. It is shown in the figure 1.
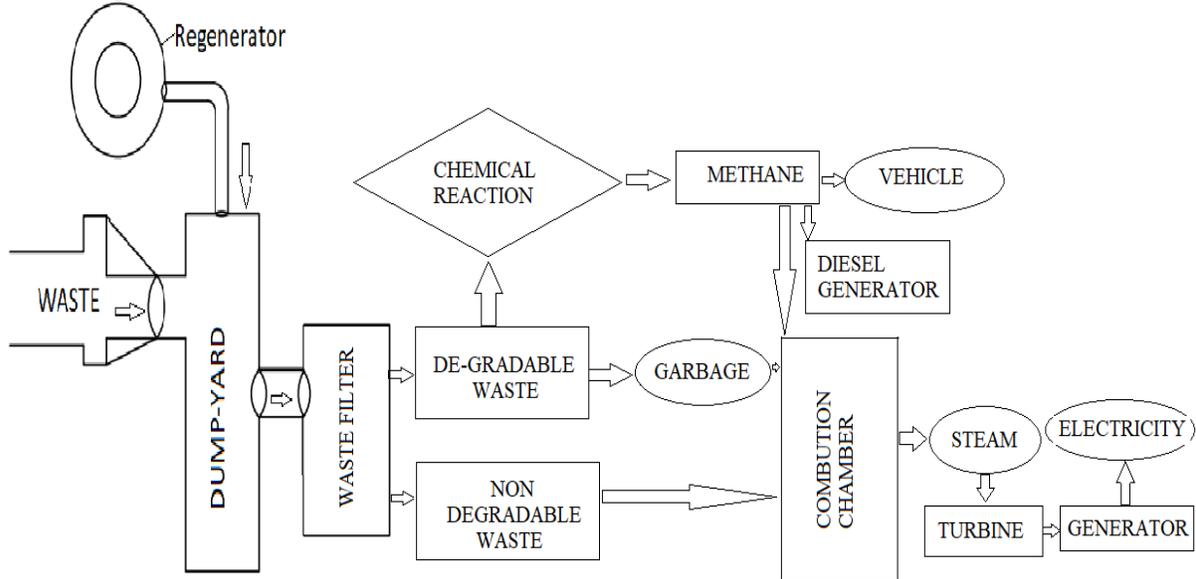
Figure 1 complete block diagram of waste management system

VII.   MATHEMATICAL EXPRESSION FOR DRY AND WET WASTE SYSTEM

The dry waste calculation can be done by the following equation
Total solid waste (W) = W in Kg,   (1)
Net calorific value (NCV) = 900kcal/kg,   (2)
Energy recovery potential (kWh)= $NCV \times W \times 1.16 \times 10^{-3}$ (3)

Power generation potential (KW) = $\dfrac{NCV \times W \times 1.16 \times 10^{-3}}{24} = 0.048 \times NCV \times W \times 10^{-3}$ (4)

Net Power generation in KW = $0.012 \times NCV \times W \times 10^{-3}$ (5)
The solid waste is

$$W = \dfrac{1}{0.012 \times 900 \times 10^{-3}} = 92.59 kg$$ (6)

For generate 1 KW power require 92.59 KG Dry waste. Similarly the wet waste calculation can be done by using this formula
Total waste quantity organic / volatile solids = W in Kg   (7)
Let organic biodegradable fraction (33%) = (0.33W) in Kg   (8)
Typical digestion efficiency (60%) = (0.198W) Kg   (9)
Typical biogas efficiency (B) = $0.158W$ m³   (10)
Net Calorific value (NCV) of wet waste = 5000 K cal/ m 3   (11)

Power generation potential in Kw = $\dfrac{NCV \times B \times 1.16 \times 10^{-3}}{24} = 0.048 \times NCV \times B \times 10^{-3}$ (12)

Total wet waste W= $\dfrac{1}{0.0144 \times 5000 \times 0.158 \times 10^{-3}} = 87.68 kg$ (13)

VIII.   CONCLUSION

The solution of waste garbage system is to bring into focus the existing system towards new India 2022. Hence proper research and development should be encouraged in this area. The new idea of this technology design of waste garbage system have land pollution reduces, generate petroleum by minimum cost. The most important step would be addressed the awareness among every individual about pollution free environment and keep healthy life.

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