



MODERN SMART ELECTRICITY GENERATION USING WASTE MATERIALS

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Abstract-In recent years, an increasing concern of environmental issues of emissions, in particular global warming and the limitations of energy resources has resulted in extensive research into novel technologies of generating electrical Power. Thermoelectric power generators have emerged as a promising unconventional green technology due to their divergent Advantages Thermoelectric power generation offer a potential application in the direct conversion of waste-heat energy into electrical power where it is unnecessary to consider the cost of the thermal energy input. The application of this Alternative green technology in converting wasteheat energy unswervingly into electrical power can also improve the overall Efficiencies of energy conversion systems in this paper, background on the basic concepts of thermoelectric power Generation with waste material, their importance and relevant .this technology is also helpful to economically improvement of country we hope this technology creating the green environmental world.

Keywords-

Solar Panels, Heating Sensor, Electrostatic Precipitator, Voltage Stabilizer

INTRODUCTION

The Making of this Project is to generate electric energy from waste Materials such a plastic, rubber, waste and waste etc. and to convert that less electricity energy into more high power electricity energy by electric coil , this process is called boosting Process . Normally waste is any undesirable substances which have been obtained as a outcome of all those Humans and Animals activities. which includes rotten food stuffs, treated biomedical solid wastes etc. This is basically an advanced process where cost of generation of electricity is also been saved as we didn't need to use fossil It also includes all those waste materials which is been collected by Municipals Corporation also fuel, coal, or any other raw materials which costs high and it also produces less harmful gases as compare to other methods of generation. The large amount of waste can generate a large amount of heat energy by burning it in a controlled manor. In this Process we generate electricity by burning waste that is collected from the door to door, mostly house wastes. The main components used in this methods are heating panels, boosting coils, diodes, LEDs, capacitors, resistors, battery, PCB board etc. The demand of Electricity is increasing day by day, thus it is necessary to find out

the different types of source which can be used as the input in production of the electricity especially for developing countries like India. This method is one of the best methods to generate electricity. The greatest advantage of this project is that it does not require any other fuel except waste.

History

In 1885, the U.S. Army built the nation's first garbage incinerator on Governor's Island in New York City harbor. Also in 1885, Allegheny, Pennsylvania built the first municipal incinerator. As their populations increased, many cities turned to incinerators as a convenient way to dispose of wastes. These incineration facilities usually were located within city limits because transporting garbage to distant locations was impractical. By the end of the 1930s, an estimated 700 incinerators were in use across the nation. This number declined to about 265 by 1966, due to air emissions problems and other limitations of the technology. In addition, the popularity of landfills increased. In the 1970s, the Arab oil embargo and increasing energy prices encouraged the development of waste combustion. The U.S. Navy, for instance, built waste-to-energy plants at two Virginia naval stations, one of which is still in use. Federal laws and policies aided the development of the waste-to-energy industry. The heat generated by burning waste can be used directly for heating; to produce steam; or to produce electricity.

Economic impact

Municipal waste combustion facilities in Texas have had little economic impact on the state as a whole. Texas sole permitted waste-to-energy facility does not produce electricity. At this time, the Sharps Environmental Service Solid Waste Incineration Facility has the capability of producing steam for sale, but it is currently operating the facility only as an incinerator. A 50 MW waste-to-energy plant in Polk County, Florida, has an estimated \$6 million annual regional economic impact, according to its operator, Wheel aerator Ridge Energy. A similarly-sized plant in Texas would have comparable economic impact.

ECONOMICAL IMPACT:

Burning solid waste produces nitrogen oxides and sulfur dioxide as well as trace amounts of toxic pollutants such as mercury compounds and dioxins. The nature of the waste burned affects the composition of its emissions. If batteries or other materials containing heavy metals are burned, particularly toxic materials can be released into the air. Some of these materials, such as dioxins, furans and metals, do not degrade quickly when released, and may be deposited on plants and in water. Animals and fish may absorb them, and humans may be exposed if they eat the contaminated animals or fish. Particulate matter, hydrogen chloride, carbon monoxide and nitrogen oxides also can

be released into the air and absorbed into the environment. Waste-to-energy power plants use water in boilers and in cooling. When this water is discharged, its higher temperature and pollutants it contains can harm aquatic life and reduce water quality. Scrubbers – devices that use a liquid spray to neutralize acid gases – and filters to remove particles are used to treat the emissions created when solid waste is burned. Ashes representing about 25 percent of the weight of the original combustible material are generated when waste is burned. Metals must be removed from this ash, and the ash must be tested to ensure that it meets environmental standards before it is recycled for use in roadway construction or placed in a landfill. Ash may be used as daily cover at landfills, but its disposal still represents a considerable operational cost for

most waste-burning facilities Federal and state pollution laws regulate waste-to-energy power plants. As mentioned previously, EPA ordered waste-to-energy facilities to reduce their emissions of dioxin, mercury, lead, cadmium, hydrochloric acid and particulates significantly. These facilities are also regulated under Texas' environmental pollution laws in the Health and Safety Code, which establishes air quality and environmental standards to protect public health and the environment. *The primary advantage of wasteto-energy plants is that they consume wastes from highly populated urban areas, relieving the burden on landfills*

PRODUCTION

Waste-to-energy facilities tend to be constructed near the landfills of large urban centers. A few conveniences are modular units, smaller plants built off-site and transported to wherever they are needed. Waste-to-energy plants generate electricity by burning municipal wastes in large furnaces to produce steam, which in turn drives a steam turbine to generate electricity. On average, one ton of waste produces 525 kilowatt-hours (kWh) of electricity. This is equivalent to the energy produced by a quarter-ton of coal or one barrel of oil. One type of waste-to-energy plant is called a mass burn facility. These facilities use solid waste directly off garbage trucks, without shredding or processing the materials. The solid waste is then fired in large furnaces to produce steam, which turns a steam turbine to generate electricity. Less than a fifth of the U.S. municipal solid waste incinerators recover glass, metals and other recyclable materials and then shred the combustible materials before firing. This type of plant is called a refuse-derived fuel (RDF) plant. Sometimes, refuse-derived fuel is prepared at one facility and then transported to another for burning. The shredded waste also may be added as a fuel to boilers that burn fossil fuels. Mass burn and RDF plants are the most common facilities in use today. A new technology called thermal gasification, however, changes waste into synthesis gas, a mixture of hydrogen and carbon monoxide. Contaminants are removed from this gas, which can then be burned as fuel. A typical waste-to-energy plant generates about 500 to 600 kWh per ton of waste.

STORAGE AND AVAILABILITY:

The energy or hot gas produced by waste-to-energy plants is not stored. It is used to produce energy, either to sell to an electric company or business or to produce steam for other purposes. The nation's 87 waste-to-energy facilities are mostly located in the Northeast, but 25 states have at least one. Their generating capacity is a total of 2,720 megawatts of power, enough electricity to power all the homes in Maine, New Hampshire, Vermont, Rhode Island and most of Massachusetts. They can process 28.7 million tons of waste each year. Most sites burn all types of solid waste, but some burn material separated from the main waste stream, such as tires, wood or paper. According to a Columbia University survey published in *Bio Cycle* magazine, the U.S. generated about 388 million tons of municipal solid waste in 2004. Of this amount, about 28.5 percent was recycled and composted; about 7.4 percent was burned in waste-to-energy plants; and the majority, 64.1 percent, was put in landfills. The U.S. Environmental Protection Agency (EPA), using a different methodology, estimates that the U.S. generated 251.3 million tons of garbage in 2006. Of this amount, 81.8 million tons (32.5 percent) were recycled and composted; and 31.4 million tons (12.5 percent) were burned for energy production. The remaining 138.2 million tons (55 percent) were placed in landfills

RENEWABLE RESOURCE:

Should waste-to-energy be regarded as a renewable source of energy? Fifteen states have categorized waste-to-energy as a renewable resource in their renewable portfolio standards and some federal laws have categorized it as a renewable resource. On the other hand, some federal and state tax advantages given to other renewable resources are not available to waste-to-energy facilities. In Texas, some consumer groups have opposed including waste-to-energy in Texas's renewable energy goals

4. WORKING:

When we start burning the waste material in the burning box the heating panels will start collecting the heat energy generated in the burning box by waste material.

The heat energy collected by heating panel will be converted into the electrical energy. The generated electrical energy will be seen in circuit box with led glowing. The generated electrical energy will transfer to the batteries through the power boosters. The batteries will not dissipate the energy back because a diode is connected to it. The batteries relate to the heat sensor and LED bulbs. Whenever the heat sensor will start conducting the batteries allow energy.

4.1 BLOCK DIAGRAM:

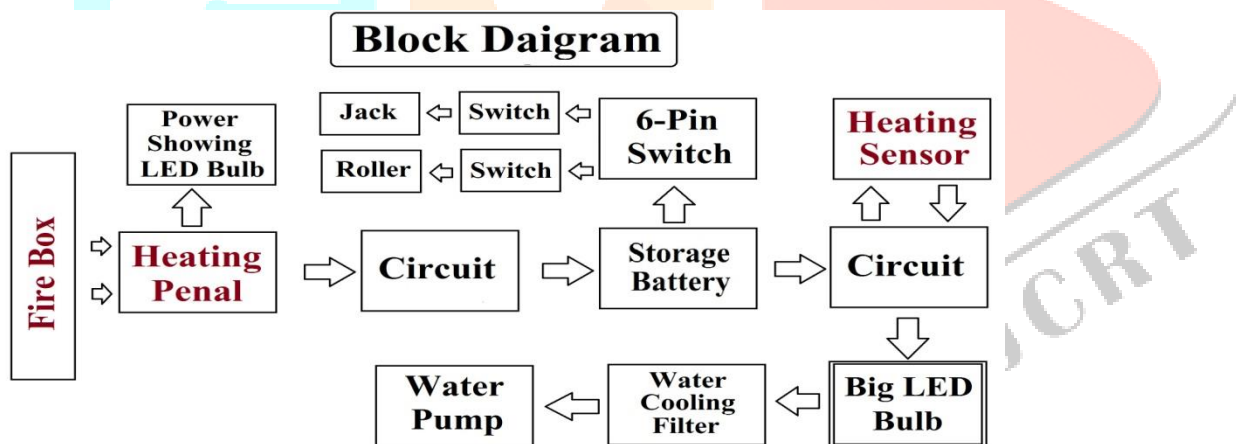


Fig 1 BLOCK DIAGRAM OF ELECTRICITY GENERATION USING WASTE MANAGEMENT

APPLICATION AND SCOPE:

- The aim of this project is to find a good solution to optimize pollution.
- The main challenges and barriers for reducing plastic waste in mixed waste and residual waste streams hereby stimulating prevention and recycling of plastic waste.
- Promoting recycling of plastic polymers as a substitute for virgin plastic.
- The main application of these system is to generate electricity. This is the only major application of this project. After the generation of electricity, we can use it for other application such as agriculture, industrial, residential use, etc.

CONCLUSION

In This Project we show How to Generate Electricity by waste materials is successfully and we show in project how to control pollution by Pollution control filter , When we making complete our project then we check it's full working ,that time he's working is very good without any problem So our Project is best for working and Showing , How to Generate Electricity by Waste materials .From this project we generate electrical energy from waste material with minimum pollution is about 50%.Because of this project 1250 hectares of land is save from storage of wastage. As compare to thermal power plant it generate less pollution is about 0-5%.

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