Power Generation by Waste Material

Guide: Prof. J. J. Pharne,
Pranav S Shinde, Sahil S. Pharne, Atharva A. Patil, Sachin R Patil

Mechanical Engineering Department, Rajarambapu Institute of Technology, Rajaaramnagar,India

ABSTRACT

Traditional sources of fuels for generating power are declining day by day alternative sources for power generation is the need of major countries in today's era. The aim of this project is to demonstrate the model has the potential to convert solid waste into useful energy. The application of this Alternative green technology in converting waste heat 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 relevance .this technology is also helpful to economically improvement of country we hope this technology creating the green environmental world. The purpose of making this project is to generate electrical energy from waste materials like plastic, rubber, garbage, waste material, etc., and store that electrical energy in the battery through the circuit and use that electrical energy to operate the whole system.

Keywords: Energy scenario, Solid waste materials, Waste sources.

I. Introduction:

Basel I. Ismail et. al. [1] Electricity is one of the most essential elements of our daily life. It is used everywhere in our life. Electricity is a scarce resource and the demand for electricity is always increasing. Conventional energy generation plants use non-renewable sources of energy like gas and coal. With increased interest and existing limitations, a requirement arises for alternative sources of energy in the present world and a wide research effort is being performed to realize the ways to increase the efficiency of the existing methods. In Bangladesh load shedding is a very common problem. There nearly 64 % people are living in the rural areas of our country.

Changwei Liu et. al [2] Due to lack of electrical energy load shedding is occurring on a regular basis and it is the most in the rural areas. During the hot season the load shedding is the most in areas. In some remote rural areas in our country electricity is not still available. More than a quarter of the rural population still lacks access to electricity and relies on fuel wood and kerosene for energy.

The Purpose of Making 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.

The total amount of waste generated in the working year of the total quantity of Solid waste generated in the country is 160038.9 TPD of which 152749.5 TPD of waste is collected at a collection efficiency of 95.4%.

II. Literature Review:

Rohit Patil et. al [3] Waste to Energy generation is basically a form process for the generation of electricity directly or through heating first in both process we get electricity as an output to use for process. This process is basically completed in 3 steps and it last step we get the output all this steps involve firstly waste materials is been collected from door to door from every places which is been useful for long time after which is been useful for a long time After which in second step this waste material is being purified according to their calorific values and then in third step this waste is been burned out in a container where heat is been generated and in result we find to get electricity as an output. Compared with other form of technology this is most attractive method of generation of electricity because of low cost, low pollution and easy way.

III. SWM Trend (State wise):

Trend in solid waste generation: Per capita generation of solid waste in different States/UTs is illustrated in Figure 5. It is observed that maximum quantity of per capita solid waste is generated in Delhi followed by Lakshadweep & Mizoram in that order.[4]

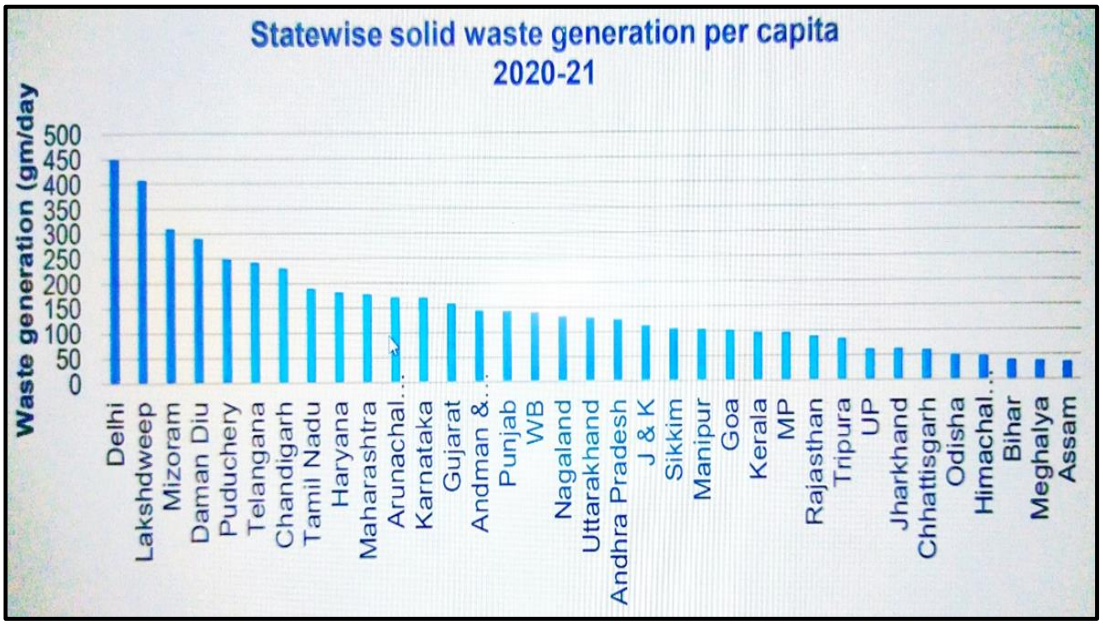

Fig no .1 State Wise per capita solid waste generation.

IV. Working Principle:

Simply put, a Heating panel works by allowing photons, or particles of light or heat, to knock electrons free from atoms, generating a flow of electricity. Heating panels actually comprise many, smaller units called photovoltaic cells. (Photovoltaic simply means they convert heating or light into electricity.)

A p-n junction is formed by placing p-type and n-type semiconductors next to one another. The p-type, with one less electron, attracts the surplus electron from the n-type Circuit to stabilize itself. Thus, the electricity is displaced and generates a flow of electrons, otherwise known as electricity.

When heat hits the semiconductor, an electron springs up and is attracted toward the n-type semiconductor. This causes more negatives in the n-type semiconductors and more positives in the p-type, thus generating a higher flow of electricity. This is the photovoltaic effect.

V. BLOCK DIAGRAM:

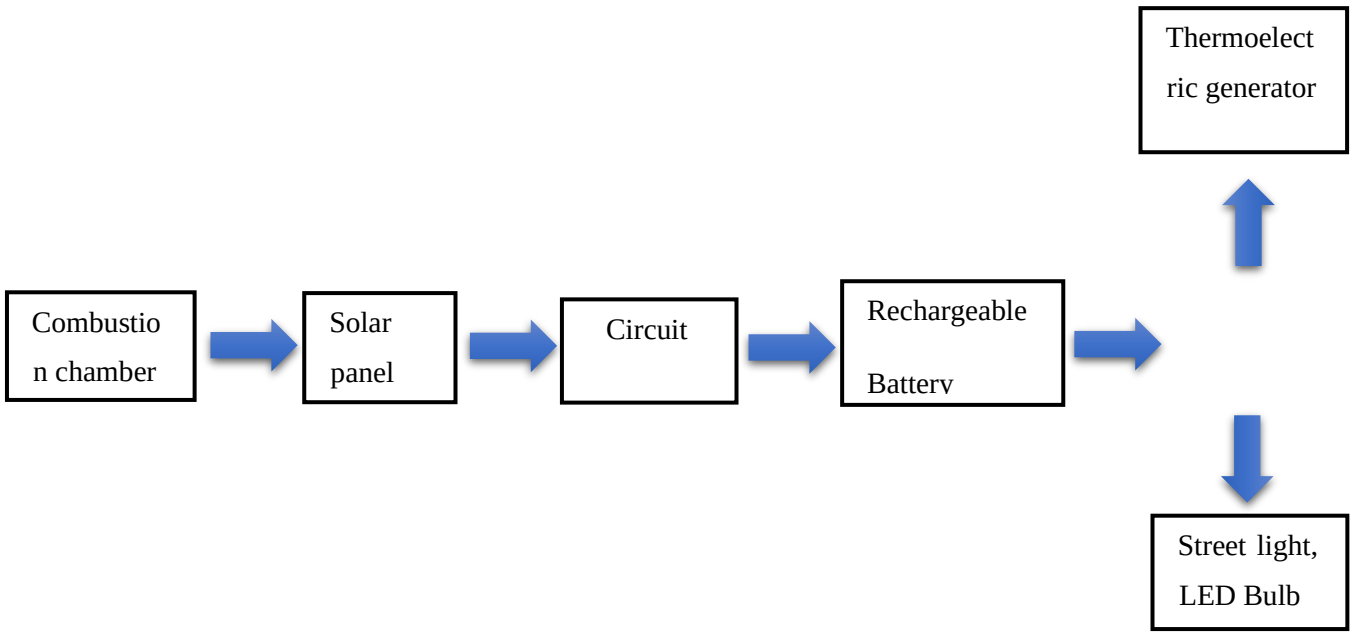

Fig no. 2 Block diagram of circuit.

VI. Project photo:

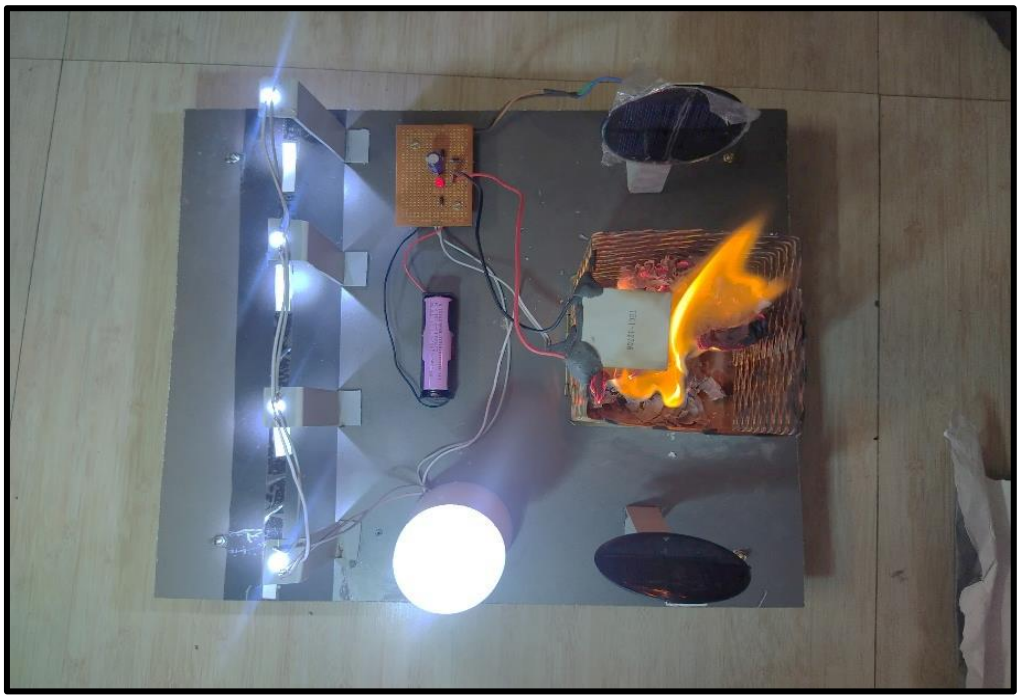

Fig no. 3 Model of power generation by waste material.

Heating panel:

Fig no. 4 Solar Panel.

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Battery:

Fig no. 5 Li-ion 2500 mAh Recharable battery.

An electric battery is a device consisting of one or more electrochemical cells with external connections provided to power electrical devices. Such as flashlights, smartphones, and electric cars. When a battery is supplying electric power, its positive terminal is the cathode and its negative terminal is the anode.

The terminal marked negative is the source of electrons that when connected to an external circuit will flow and deliver energy to an external device. When a battery is connected to an external circuit, electrolytes are able to move as ions within, allowing the chemical reactions to be completed at the separate terminals and so deliver energy to the external circuit.

Heating sensor:

Fig no. 6 Heating sensor

The main property of a heat sensor is to sense the heat, which is present around the sensor. A heat detector is a fire alarm device designed to respond when the converted thermal energy of a fire increases the temperature of a heat sensitive element. The thermal mass and conductivity of the element regulate the rate flow of heat into the element.

Capacitor:

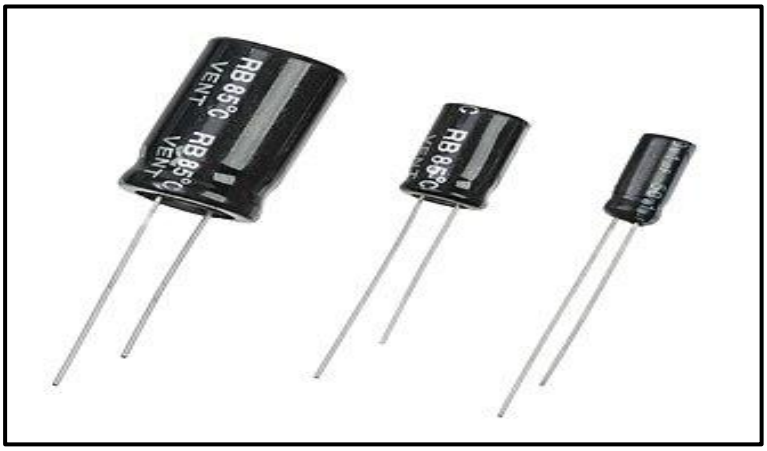

Fig no. 7 Capacitor

A capacitor can store electric energy when disconnected from its charging circuit, so it can be used like a temporary battery. Capacitors are commonly used in electronic devices to maintain power supply while batteries are being changed. Capacitors have many important applications. They are used, for example, in digital circuits so that information stored in large computer memories is not lost during a momentary electric power failure; the electric energy stored in such capacitors maintains the information during the temporary loss of power. Capacitors play an even more important role as filters to divert spurious electric signals and thereby prevent damage to sensitive components and circuits caused by electric surges.

SPECIFICATION OF COMPONENTS

Sr. no	Components	Specification
1.	Solar Plate	Type of Solar Panel -: Poly Crystalline Output Current -: 80mAh Maximum Power Voltage-: 6V Shape-: Round
2.	Recharable Battery	Battery type-: Lithium-ion Voltage-: 3.7V Capacity-: 2500mAh Size-: Cylinder
3.	Thermoelectric generator	Max. 320 Celsius Degree/ 608F / 593.15K / 1067.67Ra

4.	Temperature sensor	Power supply-: 3-5.5 V Accuracy-: ±0.5℃ Resolution-: 9-12 bit Measuring range-: -55 -125℃
5.	Capacitor	Type-: electrolytic radial Capacitance-: 470 µf Voltage-: 35 VDC Size-: Circular

VII. CONCLUSION:

The project has been made to deal with the problem of modern power system. Power generation has been important and crucial subject for any country. We can deal the problem of waste generated by humans by converting the waste into the power. This power can be used in many applications. Also this technology can be used to create green environment across the country.

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