AN EFFICIENT WAY OF POWER GENERATION WITH INTEGRATED USE OF SCRAPS AND RENEWABLES

Rohan Verma[1], Shantanu Das[2], Sameer Parmar[3], Saurabh Kumar[4]
Tanu Rizvi[5] , Devanand Bhosle[6]

[1,2,3,4] Student, Dept. of Electrical Engineering, SSTC, Bhilai, Chhattisgarh, India.

[5,6] Assistant Professor, Sr. Assistant Professor, Department of Electrical Engineering, SSTC, Bhilai

Abstract - The gigantic growth in the amount and multeity of waste materials produced in India and their potentially dangerous results in the environment and human health Which have led to create several disease in Human bodies, So we need to ingurgitate scholarly methods for safe arrangement of garbage.
This is an innovative idea of generating electricity Using solid waste which lead to decrease pollution by stoping to produce almost all dangerous gasses like CO2,CO, SO2,NO2 and Heavy metals such as mercury to a huge number. With a population of millions India produces large number of waste every day to Contemplate about this idea. So, we felt that it is valuable working on this project and it is high time to inject the idea of Waste to Energy in India.
Firstly, a map plan was carried out for research to collect the fact of total waste generation in India. During this research it was found that some locals were generating electricity using this process ago which encouraged the researchers to carry forward this Project.

Keywords: Heating panels, Led Bulbs, Zaar box, IN4007, Battery 4.5V, Resistors, Capacitors, Biodegradable Waste,Electricity India,Solid Waste Management,Agricultural waste,calorifuc value.

I. INTRODUCTION

The purpose of making this project is to generate electrical energy from bad materials like plastic, rubber, garbage and bad stuff etc. and store that electrical energy in the battery through the circuit and use that electrical energy to operate the whole project. And the LED bulbs shown to be turned on.
In this Project when burning starts then heat is generated and heating penal starts converting heat to electricity and that electricity we can see on display, we can see how much voltage generate by waste materials and when electricity is generated perfectly then Big LED bulb start glowing and our idea everyone can see in live working. Our Idea 100% work for generating electricity by wastematerials and when we burn anything then pollution start generating so we use pollution controlfilter for controlling carbon pollution so when carbon cross to filter then we store the carbon andcarbon use any area in real life. So this is our best live working idea.

1) Objectives

To discover new ways and choices of legitimate disposal of waste accumulation in mass and overseeing those for controlling the production effectively is the main reason for this research. This investigation will in the end help in sort of decision-making forms as to receive the accompanying techniques or not. This observation includes managing measure of waste production, attributes, administration mechanisms and conceivable cures.

The factors that can be used are :
- Estimation of energy produced utilizing Municipal Solid Wastes as an information.
- Estimation of the density of waste produced in various parts the all over the country.
- Estimation of the offshoot created that can be reused for different purposes and create techniques to check natural impacts if there is any.
- To convert waste into electrical energy.

2) Problem Statement

- All cities anywhere have garbage disposal as a major problem. It is produced in large quantities, and has nowhere to go, except mostly in landfills. This is attracting attention of city planners lately and measures are being considered towards making the garbage disposal fruitful and productive. One of the major areas of interest is the use of garbage for energy.
- Currently most of the power plants are using non-renewable fosil fuels as their prime ingredient which needs to be minimized

3) Proposed Solution

- Most solid waste goes to landfills/water bodies, causing serious pollution with methane and CO^2. Finding new landfill sites is no solution. Permanent and eco-friendly solution lies in gainful utilisation of this garbage into energy, by processing and treating the waste before final disposal. This can reduce the waste by up to 90%, and at the same time, recover fuel gas for cooking and lighting and electricity.
- The use of non renewable resourses will be reduced for power generation

II. LITERATURE SURVEY

Van Sark (2011) used very low temperature thermoelectric module for power generation. The TEG was attached to the backside of the PV module. The hot side temperature did not increase above 80ºC. The power output depends upon the irradiance value. Faraji et al. (2014) fabricated the "electricity generation apparatus inside thermoelectric (ZT~2.3)" abridged as ELEGANT-24 in an attempt to produce continuous electrical power throughout the year from the available low grade solar thermal energy (upto 90ºC).

Lertsatitthanakorn et al. (2014) proposed a solar parabolic concentrator coupled to a thermoelectric generator (ZT~1.6) for reliable electrical power generation. It was observed that under maximum heat flux, the generated output power (1.38W), heat dissipated by cooling air (95.1W), heat transfer efficiency (7%) and conversion efficiency (2.89%) increased with an increase in the air flow rate (0.42m3 /min). Beeri et al. (2015) experimentally demonstrated the conversion of concentrated sunlight into electrical power using a combination of a multijunction photovoltaic cell and thermoelectric generator.

Shaughnessy et al. (2012) integrated a thermoelectric generator with a cooking stove which generated 3.9W of power at a temperature gradient of 230ºC. These generator units are practically deployed in a village in Malawi. It provides the user with the ability to charge LED lights, mobile phones and radios. Liu et al. (2014) experimentally proved that the power could reach 1kW at a temperature difference of 120ºC when 600 thermoelectric modules were connected in series.

Rinalde et al. (2010) used two a medium and a high power output TEG and concluded that at a temperature difference of 100ºC, the medium power TEG generated 5.7W and high power TEG produced about 12.3W power. Rida et al. (2005) directly placed the TEG on the side wall of the wooden stove with an ambient heat sink on the cold side. Aluminium plates were placed above the hot side of the TEG. With a temperature difference of about 152ºC, an output of about 4.2W is obtained.

Champier et al. (2010) used a 2.2kW gas heater as heat source and water cooling method on the cold side. Depending upon the pressure applied, at a temperature gradient of 160ºC with 4 modules connected in series, an output power of 7W is obtained. Gou et al. (2010) used a low temperature waste heat source with forced convection air cooling on the cold side. 10 modules of Peltier device were connected in series and it was found that the output power was less than 6.6W which was not even sufficient to drive the axial fan used for cooling purposes. Champier et al. (2011) said that when hot side temperature range is between 320 - 400ºC with gas heaters employed as heat source and the cold side temperature was maintained at about 200ºC, an output of about 7.6W is obtained. Moser et al. (2006) employed a conventional pellet boiler as heat source and running water on cold side. About 288 modules were connected in series and an output of about 168W, with a hot side temperature of 235ºC and a cold side temperature of 50ºC was obtained. Chandy et al. (2015) designed an Automobile Exhaust thermoelectric heat exchanger system for waste heat recovery from an automobile engine using ANSYS. The cold side heat exchanger analysis was done at 269K and the hot side heat exchanger was analyzed at 600K, 750K, 900K, and 1200K. Results showed that the voltage, current, power developed and overall efficiency of the system increases with the increase in engine speed. Kinsella et al. (2014) developed a prototype electrical generator for delivering small amounts of electricity. Cartridge heaters with variable power supply were used as heat source with natural air cooling on cold side. With a temperature gradient of 100ºC and 200ºC, the output power per 16 module was found to be 2.18W and 5.3W. Hsu et al. (2011) concluded that for any type TEG employed, the output increases depending upon the clamping force in addition to maximum permissible temperature gradient. The clamping force should not exceed 18kgW; else the TEG module will get damaged.

Özdemir et al. (2015) modeled a solar heating thermoelectric generator with cooling wind chimney for efficient electrical power generation. The amount of power generated depends upon the temperature gradients applied across the modules. Liu et al. (2015) constructed an energy-harvesting prototype "Warrior" for automotive applications. The performance characteristics such as hot-side temperature (312ºC), cold-side temperature (69ºC), open circuit voltage (201.7V), current (1.7A) and power output (944W) and efficiency (1.85%) were analyzed 15 using revolving drum test at 2600rpm engine rate and an 3.9L engine displacement. Deok et al. (2015) developed a prototype of an actual diesel engine connected with two types of thermoelectric modules attached to the exhaust port of the engine and investigated the performance parameters using different shapes of heat sink under various thermal conditions. It was observed that a rectangular pillar heat sink produced the maximum possible power of 6.2W at a cold side temperature of 80ºC.

Liu et al. (2014) carried out experiments on different semiconductor materials and concluded that a Bi2Te3 semiconductor with less insulator plate thickness was not only economically feasible but also had the highest power cost ratio. A prototype employing 96

thermoelectric modules to generate 500W electrical power at a temperature gradient of 80ºC was proposed. It was found that the overall expenses of a TEG system was lower than those of PV and wind power systems. Nuwayhid et al. (2005) developed and tested a low cost, high performance thermoelectric module fitted to the upper right hand corner side of a common domestic wooden stove. A maximum of 4.2W was obtained from a single TEG module at a temperature difference of 88ºC.

III. CIRCUIT DIAGRAM

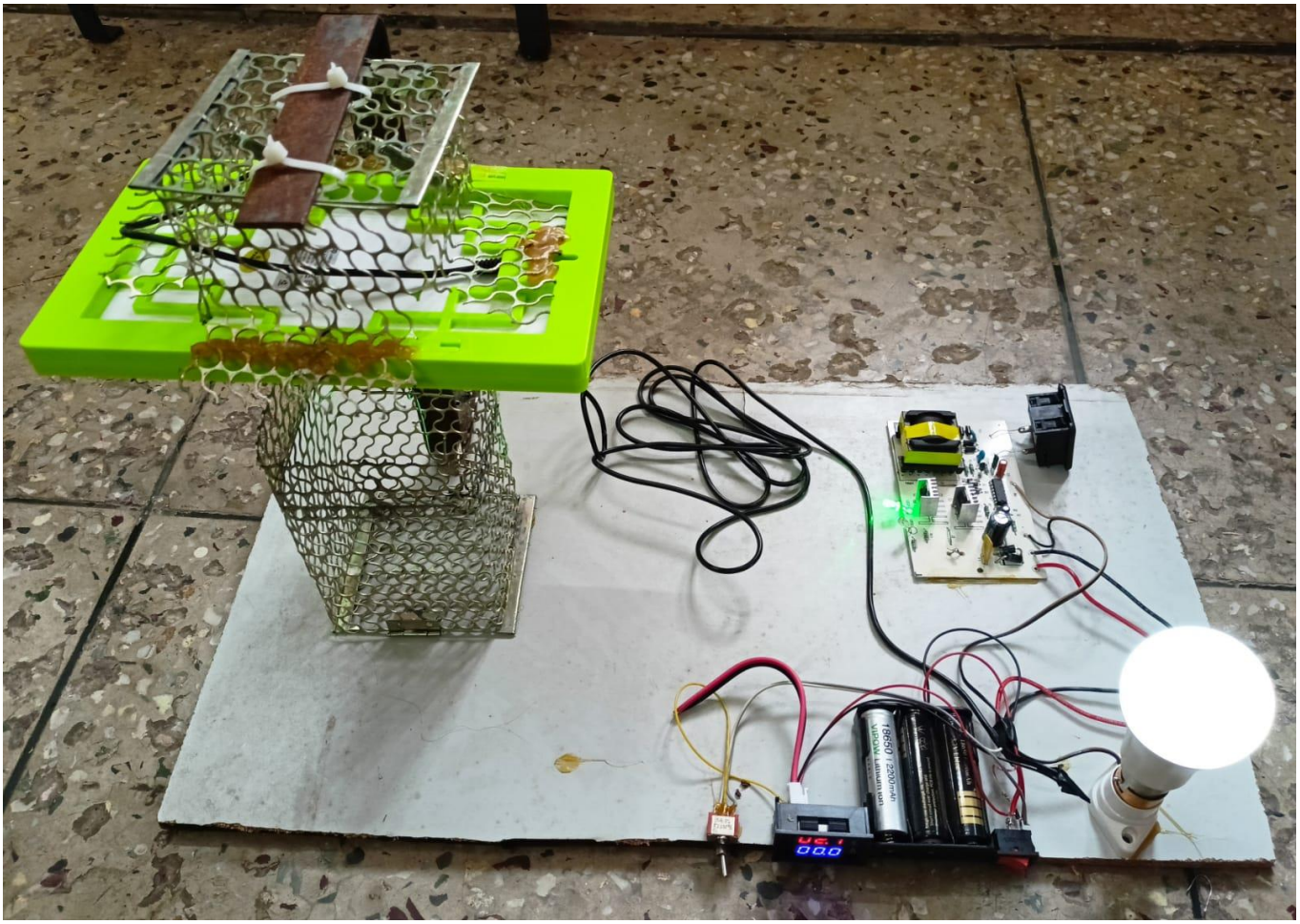

Figure 1: Circuit diagram

IV. WORKING PRINCIPLE

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 is related to the heat sensor and LED bulbs. Whenever the heat sensor will start conducting the batteries allow energy to flow will start conducting and LED bulbs will glow.

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 to stabilize itself. Thus the electricity is displaced and generates a flow of electrons, otherwise known as electricity.

V. MODE OF OPERATIONS

We now understand how the model works.

- Firstly , when we switch on the circuit the toggle switch was on the battery side amd it showed the battery voltage as shown in Fig 2

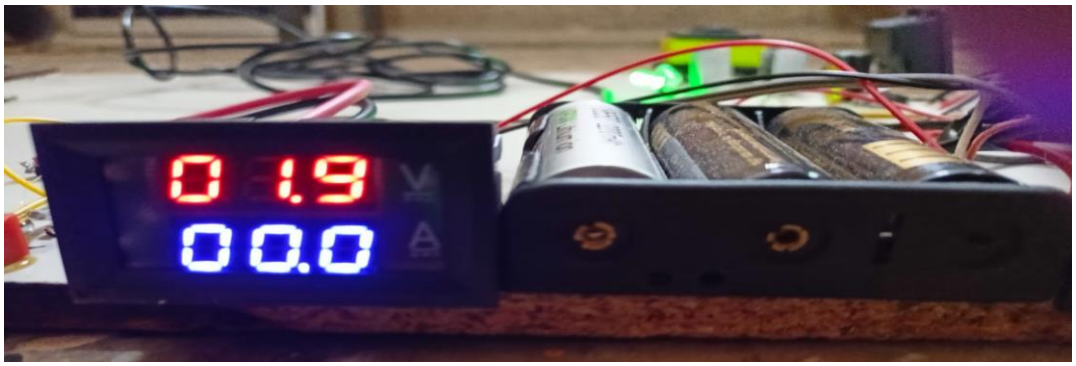

Figure 2 : Display Reading 1

- On switching the toggle switch , now the display shows the voltages generated by the solar panel on burning wastes in the zaar box.

Figure 3 : Display Reading 2

- On burning dry leaves voltage generated is as shown in Fig 4

Figure 4 : Display Reading 3

- On burning waste papers voltage generated is as shown in Fig 5

Figure 5 : Display Reading 4

VI. CONCLUSIONS

Incineration technology is complete combustion of waste (Municipal Solid Waste or Refuse derived fuel) with the recovery of heat to produce energy that in turn produces power through heating panels. Now from this we can conclude that electricity plays an important role in our life we are made aware of how the generate electricity waste is done. For technical service provider plant Objectives & Maintenance activities are very important as its service mostly depends on the availability of its equipment. From this we see that how electricity generated successfully. From this we can see how to store the energy in batteries.

How to Generate Electricity by Waste materials.
1. Recover energy from solid waste.
2. Recycle plastic.
3. Space for new landfills.
4. Alternative in resolving the waste disposal various colonies/villages

In This Project we show How to Generate Electricity by waste materials is successfully and we show in the project how to control pollution through 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.

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