e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:07/Issue:04/April-2025 Impact Factor- 8.187 www.irjmets.com

ELECTRICITY GENERATION BY WASTE MATERIAL

Shila Bachute*1, Pratik Jadhav*2, Shrushti Nemane*3, Monica Jawalkar*4
*1,2,3,4JSPM'S Bhiwarabai Sawant Polytechnic Wagholi, India.

ABSTRACT

Electricity generation by burning waste materials, also known as thermal waste-to-energy, is a process that involves converting waste materials into electricity by burning them in a combustion chamber. This process is a sustainable solution for waste management as it reduces the volume of waste sent to landfills while producing renewable energy. The methodology for electricity generation by burning waste materials typically involves waste collection, handling, and preparation, incineration, energy recovery, and ash management. The generated electricity can be used to power local communities or industries or fed back into the national grid. The process of electricity generation by burning waste materials provides a reliable source of electricity while reducing greenhouse gas emissions by avoiding the release of methane gas from landfills.

Keywords: Heating Panel, Heating Sensor, Capacitor, Bulb, Diode, Resister, PCB, Battery, Wire.

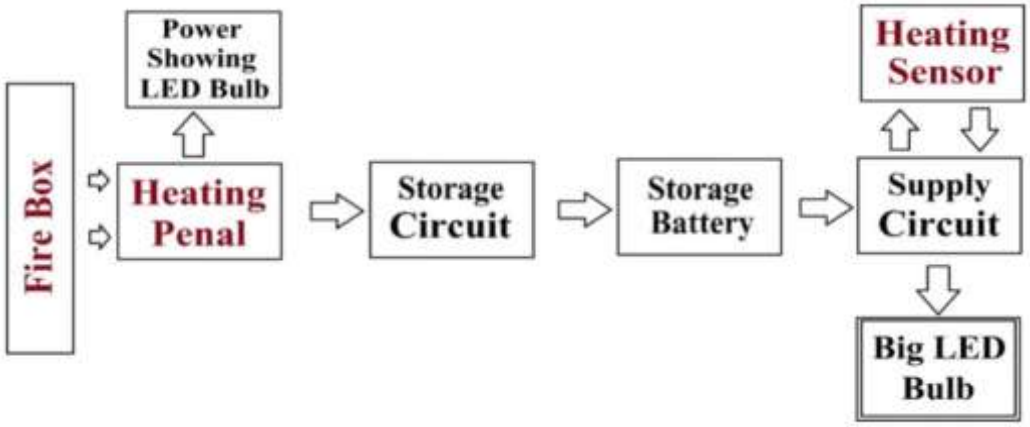
I. INTRODUCTION

The process of generating electricity from waste materials typically involves the use of thermal or biological processes. Thermal processes involve the incineration of waste, which is then used to generate steam to power turbines and produce electricity. One of the main advantages of electricity generation by burning waste materials is that it reduces the volume of waste sent to landfills, which in turn reduces the amount of space required for landfill sites. This can help to mitigate the negative impacts of landfill sites on the environment, such as groundwater contamination and greenhouse gas emissions. Another advantage of electricity generation by burning waste materials is that it produces a reliable source of electricity. This is particularly important in areas where there may be limited access to other sources of electricity, such as remote communities or developing countries.

Review of present scenario:

An important ecological concern relates to how to manage waste plastics. For the management of plastic waste, a variety of approaches have been used, along with sorting and processing waste plastic, dumping it in landfills, and recycling. Even so, the low quality of recycled products severely limits the scope of their use. Filling up land with waste makes it completely useless for other purposes while occupying productive land. Hazardous atmospheric pollutants like CO2 (a greenhouse gas) and persistent organic pollutants like dioxins, including polyaromatic hydrocarbons, are released as a result of the incineration and pyrolytic conversion processes used to dispose of waste plastics.

II. BLOCK DIAGRAM



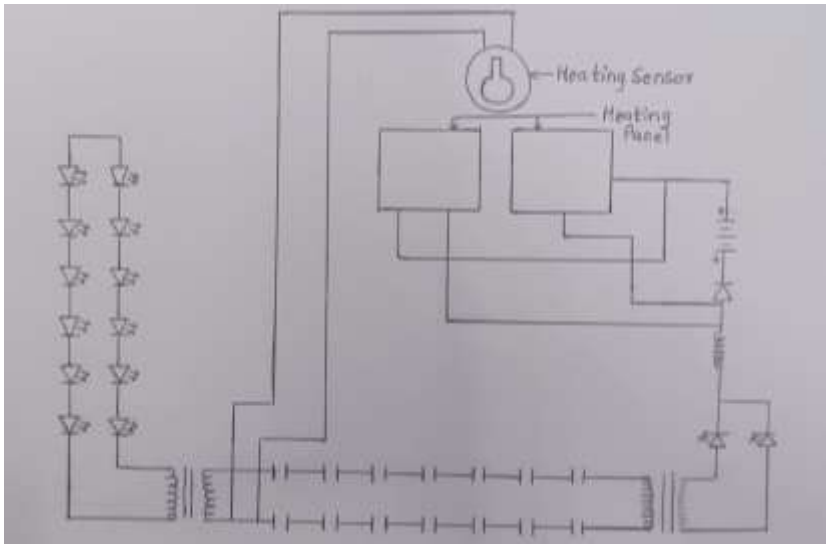
III. WORKING PRINCIPLE

To put it simply, the way a heating panel operates is by allowing photons, or particles of light or heat, to knock electrons free from atoms, creating an electrical current. Photovoltaic cells, a multitude of smaller units, make up heating panels. P-type and n-type semiconductors are placed next to one another to create a p-n junction diode. With one fewer electron, the p-type draws the extra electrons from the n-type to stabilise itself. As a

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:07/Issue:04/April-2025 Impact Factor- 8.187 www.irjmets.com

result, the electric is displaced and a flow of electrons, also known as electricity, is produced. An electron springs up and is drawn to the n-type semiconductors when heat is applied to the semiconductor. This results in more negatives in n-type semiconductors and more positives in p-type semiconductors, increasing the flow of electricity. This is called the photovoltaic effect.

IV. CIRCUIT DIAGRAM

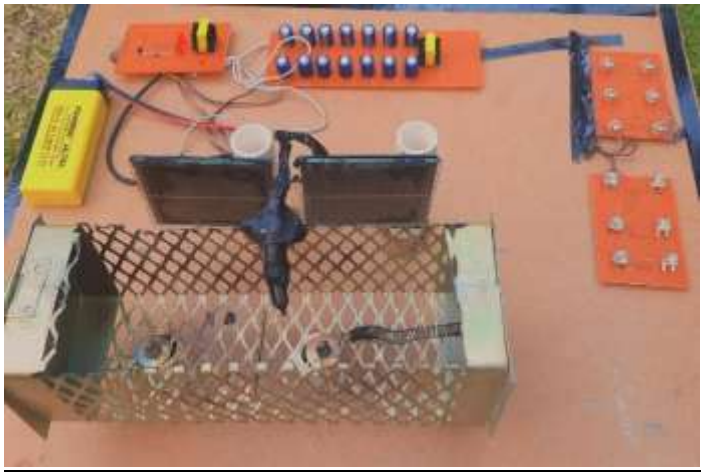


V. ADVANTAGES

1. Reduces the amount of waste.
2. Energy and heat production.
3. Burning devices filters to Capture Pollutants.
4. Reduces waste transportation costs.
5. Enhances door and noise control.
6. Prevents methane gas production.
7. Removes harmful chemicals and bacteria.

VI. FUTURE SCOPE WORKS

We can impose a penalty on high-quality heating when producing a lot of electricity. With an easily heated penal connecting system, we can create large burning level burning boxes. We can create the best storage system to turn waste materials into electricity. Pollution reduction: recycling reduces the need for energy, the consumption of virgin raw materials, and the pollution of the air and water. Energy used to process recycled materials partially offsets the energy used to process virgin raw materials. We're assuming that the chimney is where the flue gases enter the water. The alternative goal is to connect a turbine after the water filterization process so that we can generate electricity from the water that has been cleaned by the filter.



e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:07/Issue:04/April-2025 Impact Factor- 8.187 www.irjmets.com

Actual Hardware Circuit

VII. CONCLUSION

This paper highlights future sustainability. A steady supply of affordable, clean, and renewable energy sources with little harm to society or the environment is a major concern. In this project, we demonstrate how to successfully generate electricity from waste materials. After finishing our project, we checked to see if everything was operating as intended. Everything went smoothly, and the project successfully demonstrated how to successfully generate electricity from waste materials. The main objectives of waste to energy are the reduction of greenhouse gas emissions and the creation of fossil fuel alternatives. Additionally, the creation of small, inexpensive, yet highly effective technology is necessary, along with the best method for getting rid of or using filter ashes and other leftovers from air pollution control devices.

VIII. REFERENCE

[1] Online Available in: Waste to Energy Plants https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1811073
[2] Editorial Board/Aims & Scope". Waste Management. 2014, 34(3): IFC.
[3] Online Available in: https://en.wikipedia.org/wiki/Waste_management
[4] Online Available in: https://bestcurrentaffairs.com/waste-energy-plantsoperational-india
[5] Non-conventional energy sources – R.B.Vari
[6] Online Available in: https://www.google.com/search?q=resistors&tbm=isch& ved=2ahUKEwjMnv-p_sP8AhWWi9gFHZDQDZgQ2
[7] Online Available in:
[8] https://www.google.com/search?q=tubelight+staryer&tbm=isch&ved=2ahUKEwiY0o_ugMT8AhX573MBHQ93 DRwQ2-
[9] Online Available in: https://www.google.com/search?q=capacitor&tbm=isch& ved=2ahUKEwj48e72gMT8AhXak9gFHdolCncQ2