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Generation of Electricity from Waste Material

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Abstract: ***Electricity generation by burning by waste material, also known as thermal waste-to-energy, is a process that involves converting waste material 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 material 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 landfill.***
Keywords: waste material, electricity, ash plant.

I. INTRODUCTION

Electricity generation from waste material is a rapidly growing field that involves the conversion of various type of waste into usable energy. This process is often referred to as waste-to- energy, and it offers a number benefits including reducing waste in landfill, reducing greenhouse gas emissions, and providing a source of renewable energy.

The process of generating electricity from waste material 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 material is that it reduces the volume of waste sent to landfill, such as groundwater contamination and greenhouse gas emissions.

Another advantage of electricity generation by burning waste material is that it produces a reliable source of electricity. This is particularly important in areas where there may be limited access to other source of electricity, such as remote communities or developing countries.

The technology used to generate electricity from waste materials is constantly evolving, and new innovations are being developed to make the process more efficient cost- effective.

A. Block Diagram

In this block diagram you can see when we burn waste material and fire box then heat generating and heating panel start to heat convert electricity and after that electricity, we can see by LED Bulb glowing and that electricity go to circuit and after that in battery and start storing power and when electricity store in battery then heating sensor turn on the output power supply and LED Bulb start glowing and smoke go to water tank and filter system start controlling pollution.

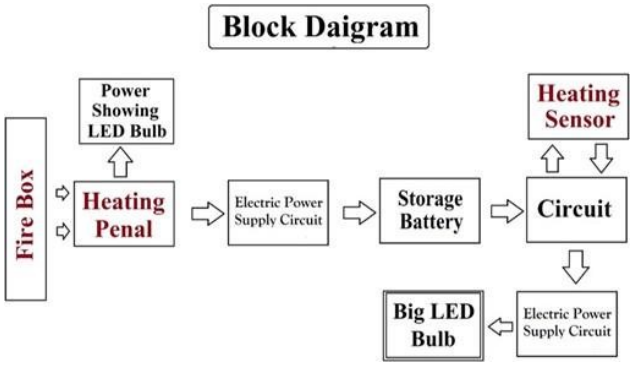


Fig. 1. Block diagram

II. WORKING

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

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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.

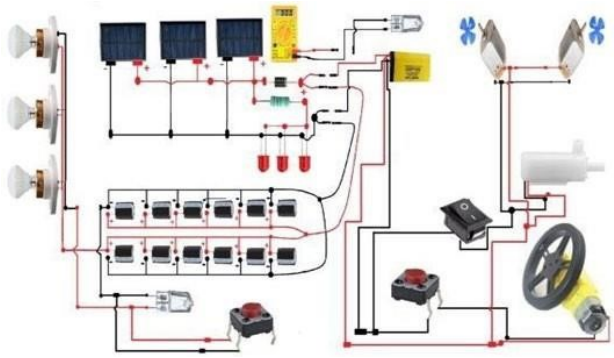


Fig. 2. Connection diagram

The batteries relate 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.



Fig. 3. Prototype

A. Advantages Reduced landfill Waste

- Reduced greenhouse gas emissions
- Renewable energy
- Cost saving
- Waste management
- Environmental impact
- Clean energy

B. Applications

- Waste to energy power plant
- Biogas production from organic waste
- Plastic to fuel technology
- Hydrothermal carbonization
- Thermoelectric generation from waste material
- Microbial fuel cells

III. CONCLUSION

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 panel. 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.

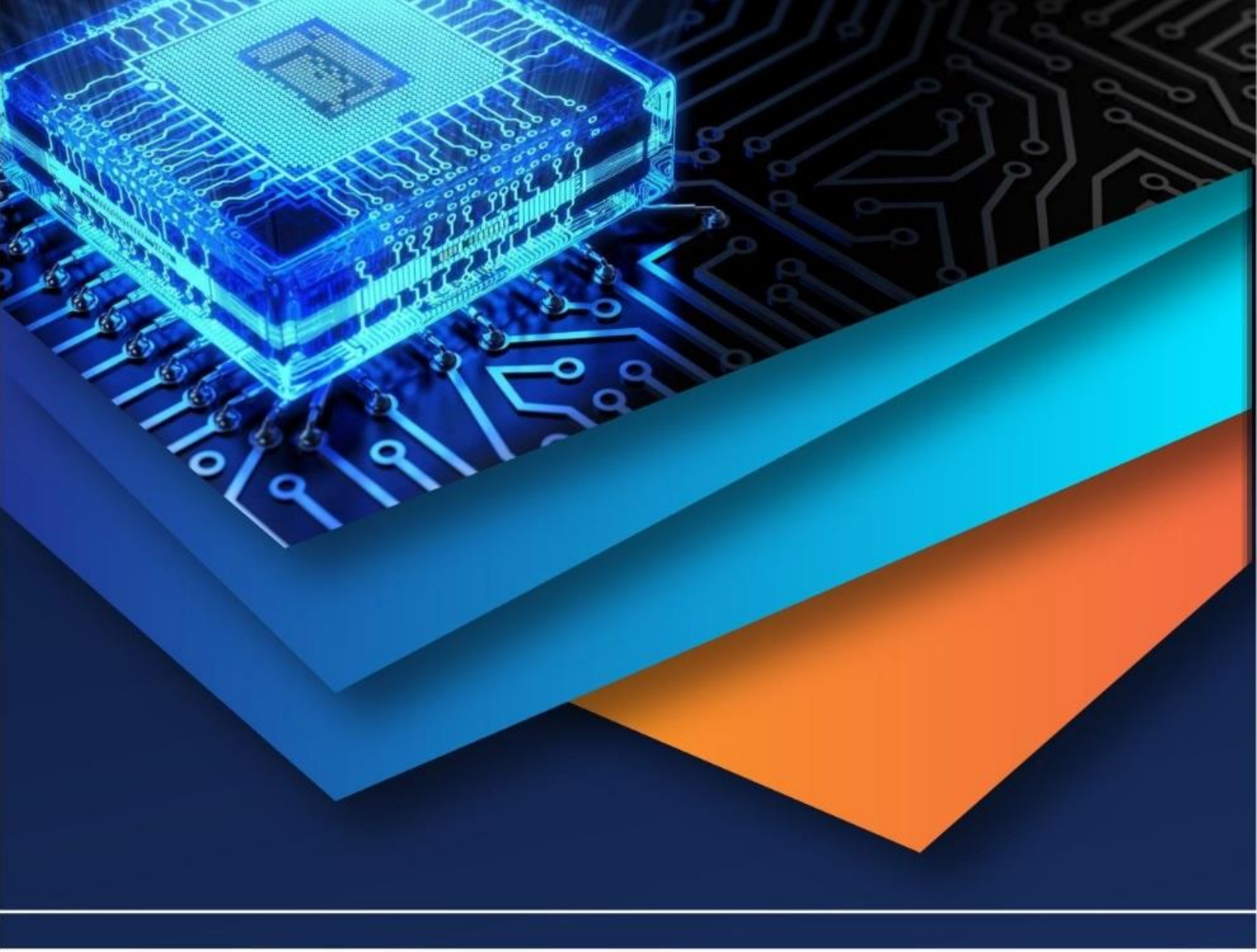
For technical service provider Plant Objectives & Maintenance activities are very important as its service mostly depends on the availability of its equipment. From this we see how electricity generated successfully. From this we can see how to store the energy in batteries.

Scope for Future Work

- We can make high quality heating panel for generate high electricity.
- We can make large level burning box with easily heating panel connecting system.
- We can make best storage system by generate electricity by waste material.
- Reduction of pollution: Recycling helps to reduce energy usage, consumption of virgin raw materials, air, and water pollution.

REFERENCES

[1] S. Kumar & R. Tiwari, “Electricity Generation from Municipal Solid Waste: A Case Study in India,” Journal of Environmental Engineering and Management, 2019.
[2] N. Singh et al., “Thermal and Electrical Efficiency Analysis of Waste Combustion Plants,” Energy Conversion and Management Journal, 2021.
[3] Ministry of Environment, Forest and Climate Change (MoEFCC), India. Annual Report on Solid Waste Management and Energy Recovery Projects, 2021.
[4] National Thermal Power Corporation (NTPC). Feasibility Study Report on Biomass and Waste Co- firing in Thermal Power Plants.
[5] The Energy and Resources Institute (TERI). Turning Waste into Power: India’s Waste-toEnergy Revolution, 2022



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