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PIEZO ELECTRIC ROADS

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# Introduction

## PIEZO ELECTRIC ROADS

Traffic on the road all over the world is increasing day by day thus; congestion on road is becoming inevitable with the fancy of masses towards personal transportation system for their growing mobility. Energy demand and heavy traffic correlation motivate to dream about the road that would harvest energy from the vehicles driving over them which cause a significant number of vibrations. These vibrations can be used to generate sufficient electricity to power traffic lights, structural health monitoring (SHM) systems and to charge electric vehicles There are several methods to harvest electrical energy from civil infrastructures. Among them, piezoelectric, electromechanical, thermoelectric, and solar energy harvesting are reported. However, a significant portion of the studies is focused on the harvesting mechanism based on the vehicle mechanical energy, due to their high conversion efficiency, electrical power generation, and better adaptation to roadways. piezoelectric generators can produce electrical energies at higher power densities and voltage levels when compared with other methods.<sup>16</sup> Piezoelectric are among it. For this, piezoelectric material embedded beneath a road, the piezo-smart road, can provide the magic of converting pressure exerted by the moving vehicles into electric current.

## Keywords

Piezo effect

Piezo cells & panels

Vertical stress/load

Traction and Friction

Voltage booster

Multimeter

# Objectives

- The main goal of the project is to produce renewable energy to overcome the crisis of electricity.
- To produce electricity from vehicles using piezoelectric sensors.
- To produce energy by a source that has no negative effect on environment.

# Methodology

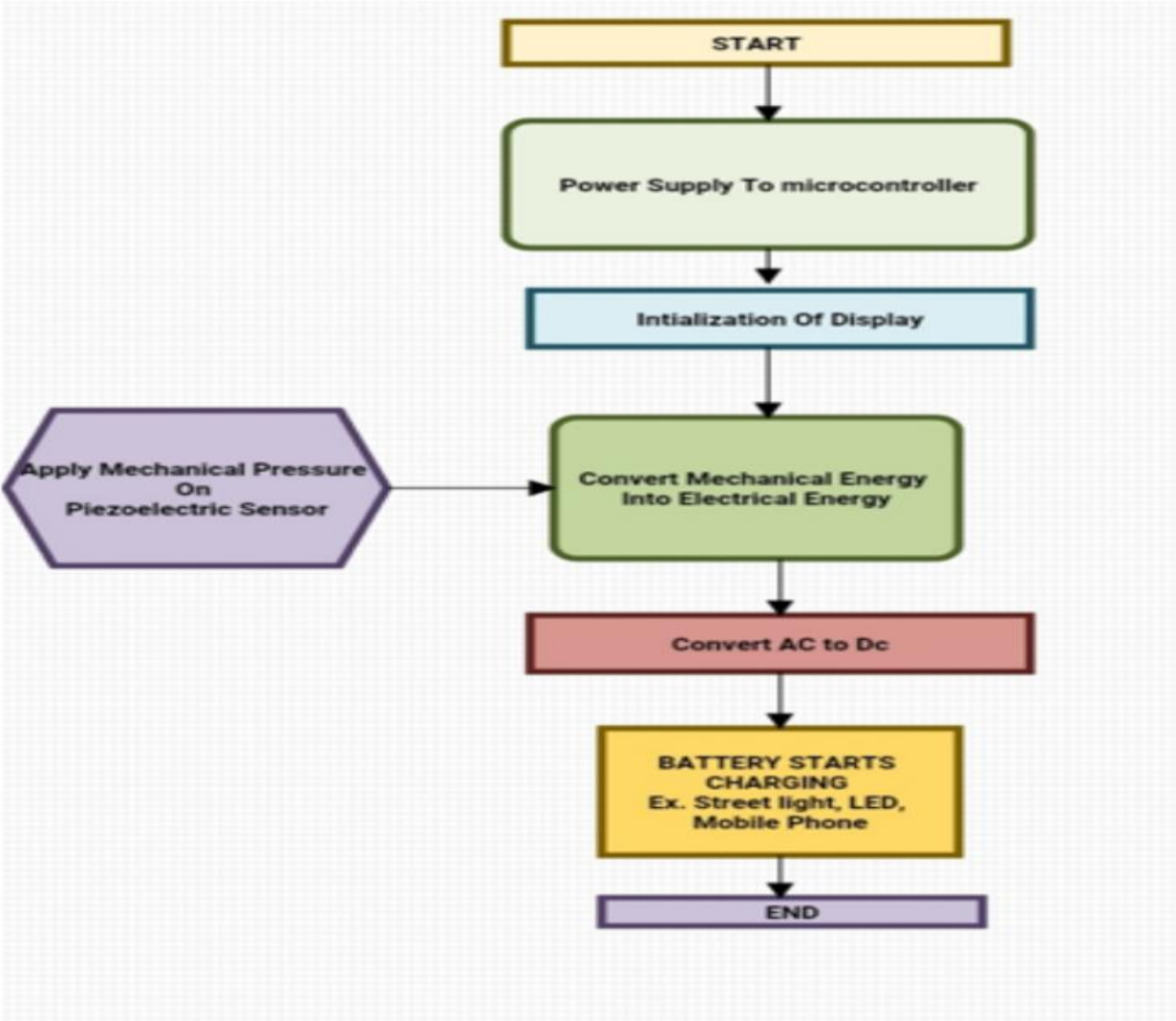


Fig 1:Process

## Results

In this project we have successfully made a piezo panel which is bearing the result as we expected ,where it is utilizing the vertical load excreted by the vehicle as well a moving body, where the piezo panel are consuming the heat stress and converting it into electrical energy. As we expected our piezo panel. came out with good output. So our model can be best way for alternative way for the generation of energy

## Conclusion

Renewable Energy Generation: Piezoelectric roads have the potential to generate electricity from the mechanical strain produced by vehicles passing over the road, providing a renewable source of energy that can be used to power various applications, such as streetlights, traffic signals, and electric vehicle charging stations. This can help reduce reliance on fossil fuels and contribute to sustainable energy generation. Environmental Benefits: Piezoelectric roads can have environmental benefits by reducing carbon emissions associated with traditional road infrastructure.

## Scope of future work

By generating electricity from the mechanical strain of moving vehicles, piezoelectric roads can contribute to mitigating the negative impact of transportation on the environment and help address climate change concerns. Innovation and Technology Advancement: Piezoelectric roads are a part of the ongoing innovation and technological advancement in the field of transportation and renewable energy. Research and development in piezoelectric materials, road design, and energy harvesting technologies are continuing to progress, which could lead to further improvements in the performance, efficiency, and cost-effectiveness of piezoelectric roads.

