



# MINI PIEZOELECTRIC HARVESTING SYSTEM

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## **ABSTRACT**

Our project is about to develop the Mini Piezoelectric Energy Harvesting Prototype. This piezoelectric technology prototype is to be used to generate voltage for traffic light or street lights alongside main roads or streets of big cities. The piezoelectric sensor is the main component of this prototype. Its working principle is when stress is placed on the piezoelectric sensor, energy will be harvested and stored, then, it will be capable of powering the street lights or traffic lights. We are actually making a small scale prototype for learning purposes. Hopefully, in the future, this piezoelectric technology could be developed and implemented when it could be placed under the roads, as transports such as vehicles moving on that road, they'll give stress to the piezoelectric. Then, energy as voltage will be generated to recharge a backup battery for the use of the traffic lights or street lights. This project is purely relevant when it is to be used on roads that have a high rate of vehicles moving on the road. The power will always be continuously generated, as long as there are vehicles moving through or on the road. This project is contributing to the rise of clean and Green Energy Technology. We think that it is very beneficial and yet possible to apply this technology in this country as we are moving towards Green Technology.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the study

Nowadays, most country are depending on fossil fuels in order to operate a power plant that resulting unwanted and hazardous environmental gasses and creating greenhouse effect to the earth. This is the only one reason that renewable energy is very important in revitalize the environment, this project will be able to become a new alternative green energy for a clean and environmental friendly method in generating electricity and able to harness and harvest the waste kinetic energy that was produced by vehicles on the traffic road.

Furthermore, Electricity Generator using Piezoelectric Effect from passing traffic project is a green energy project which generates electricity without hazardous unwanted environmental gas. In term of safety for road users, some of the road's street lights are not working due to loss of power which can be dangerous to road users at night. This project is also will be able to reduce the cost for the electricity utility company of the roads like PLUS MALAYSIA BERHAD and JKR because this technology is able to produce electricity on their own so there will be less cost of electricity to be paid to electricity supplying company as Tenaga Nasional Berhad for road utility basis.

Therefore, we want to develop a piezoelectric energy harvesting circuit and to ensure the batteries can be charged successfully because in our opinion, this idea is practical and usable to improve the future in electricity generation technology.

To be simplified, Piezoelectric circuit converts vibration and stress to power when vehicles tyres apply pressure to the plate and convert from pressure into voltage. The rectifier circuit will change from AC to DC. Step-up converter converts DC-to-DC power with a resulting output voltage is greater than its input voltage. Then, the input will be charged in the battery. The battery is used as a backup power supply if there is no vehicle