

Project Name – “NH-220v” – Concept of an electricity generating road.

Problem Statement- To make our roads more efficient and promote green energy.

Project Budget- INR 5,000

Description-

As I learnt more about electronics and robotics, I came across an item called piezo electric crystals. This fascinated me as it meant that any pressure anywhere could be converted into electricity.

The most pressure which I could think of which was produced daily was that of vehicles on road. So, the thought crossed my mind what if we could convert it into some form of usable energy.

With that I got a piece of scrap wood from a scrap dealer and bought a bunch of piezo electric crystal nodes. I conducted tests and saw that these crystals when pressed will give voltages up to 5 volts and when you let go it gives a voltage of minus 5 volts. This was a pretty simple problem of converting AC current to DC using a bridge rectifier. Once I wired all crystals in a series parallel set to give of around 12 volts. Upon stepping on the road, one could observe a voltage spike of up to 12 volts which light up an LED strip which I placed to give an example of a streetlight.

When you let go of your pressure it once again lit up the LED. This made me think that the power needs to be stored and deployed when needed. I didn't build on this more, but the design is straightforward. These crystals when connected their current is to be passed through a rectifier then a power stabilization circuit to give a stable 12v or whatever required output into a charging circuit for a battery. One power is stored into the battery then anything can be connected to it to use ahead.

For example, a strip of road which stores power throughout the day into batteries and then at night uses the same power to turn on proximity based street lights lighting up only the necessary parts on the road. One can also add a solar panel to further increase the power generation of this system.

Calculations can be done to estimate whether this will be economical and commercially viable.

Materials Consumed-

1. Wood Ply Board
2. Piezo Electric Crystal Modules
3. Solar Cell Tabbing wire
4. Multi meter
5. Diodes
6. 7812 Power Regulator IC