

Team Name: ____Curie-Ous_____

	Name	Branch and Semester	Contact Number	Email- ID
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Member 2				

Note:

1. One can participate either as a part of a team or an individual basis. Switching teams is not allowed.
2. The uploaded ideas will be screened to go to the second round.
3. Judging: competition entries shall be judged, or winners selected based on the following criteria
 - Is the problem worth solving
 - How innovative or novel is the idea
 - Scientific accuracy
 - Social impact
 - Scalability
4. Decisions of IIC JSSSTU in respect of all matters to do with the competition will be final and no correspondence will be entertained.
5. In second round, the selected teams will have to present their idea in front of the jury panel.
6. Idea should be submitted in **.pdf** format.

Abstract: (not more than 150 words)

With each passing year, the problem of the world's increasing energy needs, but decreasing energy supply is a worry for the society. Sun, wind, water — all are great, renewable sources of energy. People? Well, they're constantly on the move, but much of that kinetic energy goes to waste. Our idea is to develop a modular floor tile that converts the kinetic energy from a person's footstep into storable electricity.

A thin membrane is placed on a massive base to transfer the applied force to the piezoelectric element. Upon application of pressure, on this thin membrane, the piezoelectric material, gets loaded and starts generating electrical voltages. The produced voltage is proportional to the amount of pressure applied. This voltage produces energy that can be used for lighting purposes.

Introduction (not more than 200 words)

Walking is one of the most common activities in everyday life. While walking, a person loses energy in the form of impact, vibration etc. This energy can be tapped and converted into useful electrical energy.

In order to harness footstep energy, Piezoelectric sensors can be used. A piezoelectric sensor is a device that uses the piezoelectric effect to measure changes in acceleration, pressure, temperature, strain, or force by converting them into electrical charge. A piezoelectric disk generates a voltage when deformed.

The principle involved is piezoelectric effect that is the ability of certain materials to generate electricity in response to applied mechanical stress.

Motivation (not more than 100 words)

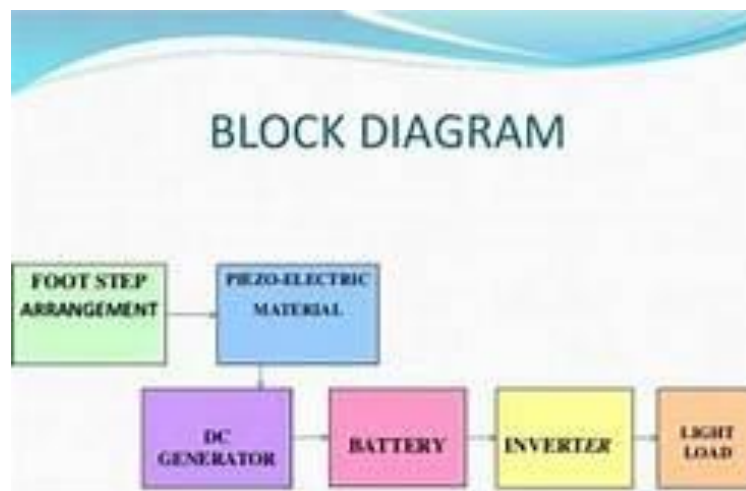
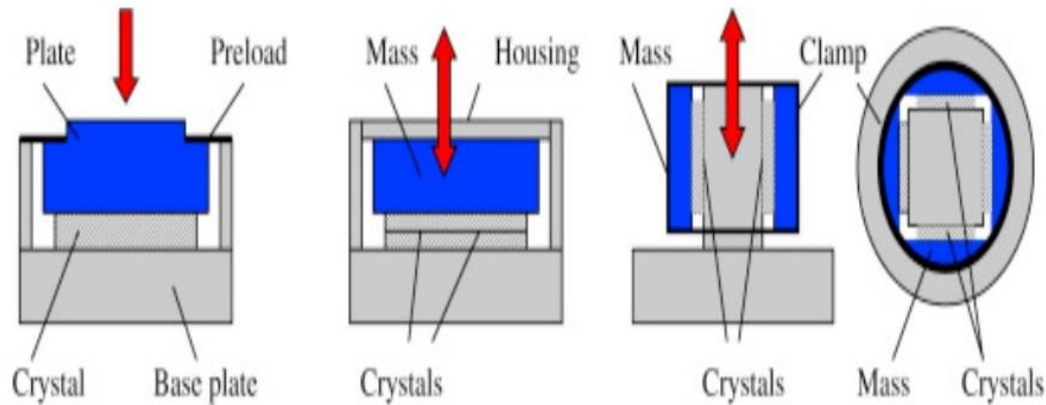
The history of energy harvesting dates back to the windmill and the waterwheel. People have searched for ways to store the energy from heat and vibrations for many decades. One driving force behind the search for new energy harvesting devices is the desire to power sensor networks and mobile devices without batteries. Energy harvesting is also motivated by a desire to address the issue of climate change and global warming.

Methodology (block diagram, related figures etc)

Piezoelectric transducers are comprised of materials such as crystals and certain ceramics that have a special property which allows them to convert physical energy into AC electricity.

Piezo elements can be embedded in floor tiles such that every time we take a step, we are using our weight to push on the piezoelectric elements which in turn convert that energy into electricity. A

bridge rectifier with diodes or an inverter can be used to convert the AC power generated into DC power which can be used.



Social Impact

Renewable and sustainable energy sources will be imperative as the world population continues to grow and create more waste. The conversion of kinetic energy from footsteps to electrical energy is considered as one of the renewable energy techniques. Solar power, wind energy and hydropower, all three of these methods extract energy from nature. However, unlike raw materials, nothing has to be removed from the earth. These technologies are harnessing energy by converting energy that already exists into electric energy. These methods though are not without their own set of flaws.

One of the largest issues with solar power, wind energy and hydropower is that to a certain extent they are unpredictable. For example, at a certain point hurricane are predictable. However, hurricanes can only be predicted once they have come to be. There is no way to predict every hurricane that will occur in the future. This idea looks into renewable types of energy that can more easily be predicted. For this idea we explored the ways in which energy can be harnessed from the kinetic movements of humans and converted into electric energy. We believe this will have a positive social impact as people as piezoelectric energy is not only renewable but also can be controlled to a large extent.

Market Survey

Now-a-days there is a lot of focus on renewable energy resources due to global warming and projects of footstep power production have huge scope. Non-conventional energy resources which are commonly used are solar energy and wind turbine energy. When compared to these, footstep electrical energy is cost effective, reliable and fruitful.

Electricity producing fabrics and shoes are available which are based on the same principle.

A similar solution to the problem of energy crisis can be electricity generating floor tile using a solenoid instead of a piezoelectric material.

