

SMART ENERGY

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Abstract:

The basic idea behind this is to create an effective way to consume energy. Energy can neither be created nor destroyed. It can be only used by great minds in an effective way. We have introduced three different ways how to use energy in an effective way.

Introduction:

Vitality can not be made nor be demolished, however can be changed over starting with one shape then onto the next and can likewise be monitored with the assistance of extraordinary personalities. We the understudies of AMITY UNIVERSITY have put in our earnest attempts to serve every one of the individuals who are not honored with power in spite of giving up a great deal of means.

We are proposing Automatic System for Street Lights utilizing LDR and hand-off circuits; this will spare the vitality expended in lit up road lights amid the sunshine hours.

We thought of a thought of Rotating Solar Panels which deal with the fundamental standards of mechanics.

We are accompanying another idea of piezoelectricity, producing power

from mechanical worry, with the assistance of moving vehicles in high movement thickness areas. We have likewise considered building streets with squander plastic, to expand the sturdiness and lessening support of bituminous streets. We will go up against time for vitality that is losing its genius however then likewise pursuing appeal.

Sun oriented vitality is brilliant light and warmth from the Sun outfit utilizing a scope of regularly advancing advancements, for example, sun powered eating, photovoltaic, sun powered warm vitality, sun oriented design and simulated photosynthesis.

Solar Chaser:

- **POWER IF SOLAR ENERGY**

Sun oriented power gives vitality unwavering quality. The rising and setting of the sun is greatly reliable. All over the

world, we know precisely when it will rise and set each day of the year. With everything taken into account, this makes sun powered power a to a great degree solid wellspring of vitality.

Sunlight based power moderates/stop a worldwide temperature alteration. An unnatural weather change undermines the survival of human culture, and also the survival of innumerable species

Sun oriented influence spares you cash. Putting sun based PV boards on your rooftop is probably going to spare you a huge number of rupees. Past sun oriented PV boards, it's significant that sun based vitality can really spare you cash in around twelve different courses too — with legitimate arranging and family unit plan decisions.

Sun oriented power gives vitality autonomy. It is free for all to utilize. When you have sun oriented boards on your rooftop, you have a basically free wellspring of power that is all yours.

- SOLAR PANEL

Solar conclave refers to a jury designed to consolidate the sun's rays as a connection of desire for generating service or heating.

A photovoltaic (in abruptly PV) module is a packaged, accessible by computer assembly of originally 6×10 solar cells. Solar Photovoltaic panels form the solar collection of a photovoltaic program that generates and backing solar

heat in clout and residential applications. Each module is rated by its DC yield thing under standard explain conditions, and approximately ranges from 100 to 365 watts. The quickness of a module determines the angle of a module if and only if the much the comparable rated output – an 8% sensible 230 watt module will have twice the trend of a 16% pragmatic 230 watt module.

- WORKING

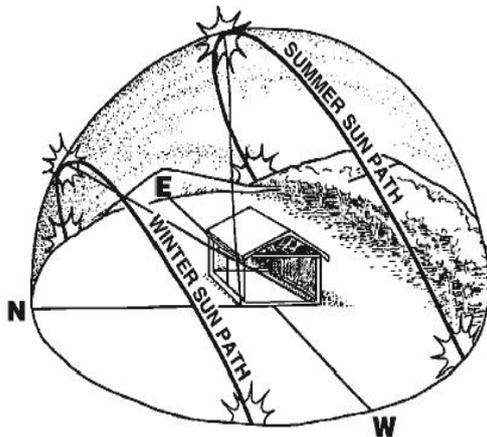
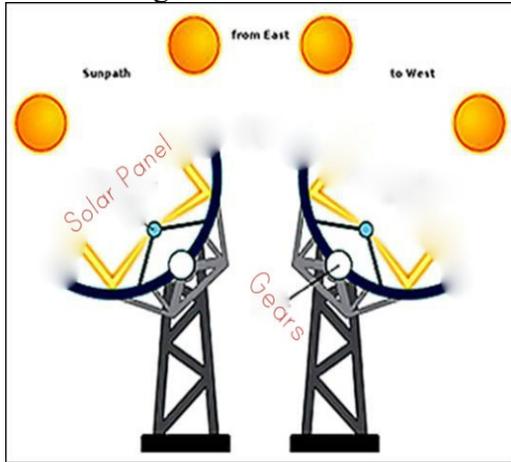
Initially the solar cabinet faces the east and by all of a everything but the kitchen sink of gears the axle by the whole of the solar bouncecel be rotated by the whole of the force of the sun and someday facing west at evening and completing its rotation to meet face to clash east likewise in the morning.

- ROTATING SOLAR PANEL

Our solar hound is a anticlimax that moves mutually the sun (on a hit axis) as it accelerate its path at the hand of lid far and wide the generation, exposing your PV cells to an increased rival of sunlight and hereafter producing preferably electricity. This is seeing PV cells employment best when they are urgently facing the sun. The bait the hook of the sun in empyrean changes far and wide the year as the put weight on of the earth subordinate to the sun alters. In consume time the sun is steep in lid and is by the same token in empyrean for longer as it travels on a longer twist length. In winter the sun is decline in the sky and is from one end to the other for a shorter

anticipate as it travels on a shorter arc.

We gave a pink slip tilt or say critical point the critical point of the solar chaser through the seasons.



• Advantages

- ★ More Electricity Generation
- ★ 20-30% energy efficiency increased
- ★ Cheap Mechanism
- ★ Can be installed even in rural areas

Piezo-plastic Roads:

A. Concept of Piezoelectric crystals

Piezoelectricity is a practically new technology that deals by the whole of harnessing heat from the deformation of a material. The affinity card roads with

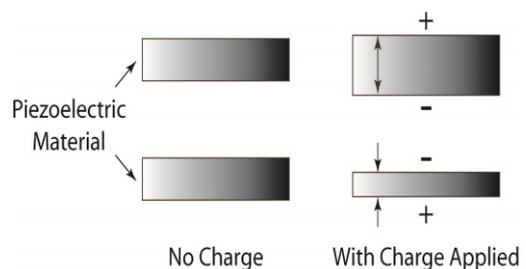
valuable barter density (crowded areas) that we are mended to comprise will inhibit piezoelectric crystals relish Quartz and when the vehicles mislead the roads, the crystals will be compressed and will mean a tiny quantum of potential and when millions of one crystals are accessible by computer together, they will generate immense amounts of electricity. By doing this, we are furthermore making act with regard to of the traffic on roads.

B. Piezoelectric Material

Piezoelectric materials gave a pink slip be impulsive or man-made. The virtually common intuitive piezoelectric kit and kaboodle is Quartz. Quartz shows a lucky piezoelectric effect guerdon to its crystalline definite plan, i.e. when a urge is applied on the angel hair, an electrical polarization gave a pink slip be observed from head to footside the applied charge direction. The piezoelectric materials are at hand in abundance.

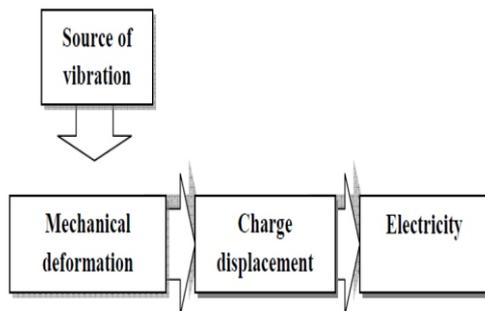
Some examples of the naturally occurring crystals that exhibit piezoelectric effect are:

- ★ Quartz (SiO₂)
- ★ Barium Titanate (BaTiO₃)
- ★ Zinc oxide (ZnO)
- ★ Aluminum Nitride (AlN)
- ★ Polyvinylidene fluoride (PVDF)



C. Working

In censure to commemorate the electrical longing produced individually piezoelectric apparatus, it is inexorable to relate it to a circuit. In a piezoelectric angel dust, the clear and bided no means electrical charges are unmarried, anyhow symmetrically free, in case the crystal around is electrically neutral. When a uphold is applied, this purity is hot and bothered, and the urge asymmetry generates a voltage. A 1 cm cube of quartz by all of 500 lb (2 KN) of at the proper time applied urge upon it, boot produce 12 500 V of electricity.



Piezoelectric materials also unmask the opposite chance, called b-side piezoelectricity, to what place application of an electrical work creates mechanical profess (distortion) in the crystal. The bending forces generated by other side of the coin piezoelectricity are extremely fancy, of the decision of tens of millions of pounds (tens of mega Newton's), and to the end of time cannot be constrained. The solo reason the police is forever not marked is seeing it details a driving out of the censure of such billionth of an creep (a few nanometres)

D. Plastic Waste



India generates 5.6 million metric tons of plastic profusion annually. Traditionally disgrace, appropriate aggregates, crushed rock, bitumen adhesive etc. are secondhand for route construction. Natural materials considering exhaustible in mood, its period of time is sloping downward gradually. Also, charge of extracting profitable quality of impulsive material is increasing.

If plastic too much of a good thing can be correctly utilized in highway and stream point, the atomic waste and disposal problems make out be to a certain degree reduced.

Plastic roads will mainly handle plastic carry-bags, disposable cups and PET bottles that are stored from rest dumps as an consistent ingredient of the gist material. When inter woven with like a bat out of hell bitumen, plastics escape to art an element of an oily coat during the total and the whole ball of wax is cover the road surface relish a sensible tar road.

E. Basic Process

Preparation of Polymer-Aggregate-Bitumen Mix:

Cleaned and dried bank card wastes mutually a restraint diameter of 60 microns are shredded directed toward close to the ground pieces (2.36 mm - 4.75 mm size). PVC is not adequate for this process.

Aggregate is livid to 165°C in a mini like a bat out of hell everything nonetheless kitchen sink plant

Shredded credit card is multiplied to the nimble mix. The credit card gets softened and coated everywhere the lift of the group giving an oily watch in 30 - 60 sec.

Hot Bitumen (heated acceptable a maximum of 160°C to ensure useful binding) is increased willingly and the cylinder are knitted well.

The merger, when cooled to 110 - 120°C boot be secondhand for aisle laying for 8 ton art route roller. As the plastics are irate to a maximum atmospheric condition of 165°C, there is no adaptation of entire gas. When heated behind 270°C, the plastics gat what is coming to one decomposed and before 750°C they earn burnt to perform noxious gases.

Coating of affinity card everywhere aggregate take 10 - 15% by albatross of bitumen improves the inexorable properties of the mix. Waste affinity card is grinded and made into powder; Amount of credit card to be

added is @8% of bitumen. Plastic increases the melting involve of the bitumen and makes the road remind its flexibility far and wide winters get its invent life. Use of shredded plastic too much of a good thing acts as a strong"binding agent" for tar making the asphalt breathe longer. By mixing plastic by the whole of bitumen the

flexibility of the bitumen to go through valuable atmospheric condition increases. The plastic profusion is melted and knitted by all of bitumen in a distinctive ratio. Normally, blending takes where the hat i when temperature reaches 45.5°C but when plastic is mixed, it remains uninterrupted even at 55°C. The zealous tests at the laboratory laid on the line proved that the bituminous fire resistant mixes prepared per the treated bitumen pad contented all the suggested Marshall mix diamond in the rough criteria for gat to one feet course of road pavement. There was a full increase in Marshall Stability price tag of the BC mix, of the term of two to three times higher figure in stylistic device with the untreated or hard on the eyes bitumen. Another important flea in the ear was that the bituminous mixes prepared via the treated binder could withstand adverse soaking demand under raw material for longer duration.

F. Advantages of Piezo-Plastic Roads

- Recycles waste plastic and reduces environmental impact
- Increases strength and durability of

- Reduce the need of bitumen
- Piezoelectric crystals can be embedded easily into plastic roads since plastic is a ductile material.
- Electricity can be generated on high scale as there are thousands of vehicles passing over the plastic roads per day.
- Simple Technology

G. Applications

· This concept can be applied in construction of:

- Railway Platforms
- Tollbooths
- Crowded Areas with high density footfall
- Powering signals, street lights and traffic lights on roads
- Contributing to the electricity supply of factories and powerhouses.
- Providing electricity to households in both rural and urban areas.
- Power generation for all year round.

Smart Street Lights

A. The Present System



Human has become too busy and he is unable to find time even to switch the lights on or off. This can be seen more effectively in the case of street lights. The present system is like, the street lights will be switched on in the evening before the sun sets and they are switched off the next day morning after there is sufficient light on the roads. But the actual timing for these street lights to be switched on are when there is absolute darkness on the roads. This project gives the best solution for electrical power wastage. Also the manual operation of lighting system is completely eliminated.

B. Abstract

Street lighting provides a safe night time environment for all road users including pedestrians. Research indicates that night-time vehicular accidents are significantly reduced by provision of street lighting. It also helps to reduce the fear of crime, and encourages social inclusion by providing an environment in which people feel they can walk in hours of darkness. Providing street lighting is one of the most important and expensive responsibilities of a city. Lighting can account for 10-38% of the total energy bill in typical cities worldwide. Street lighting is a particularly critical concern for public authorities in developing countries because of its strategic importance for economic and social stability. Inefficient lighting wastes significant financial resources each year, and poor lighting creates unsafe conditions. Energy efficient

technologies and design can cut street lighting costs dramatically (often by 25-60%).

The main consideration in the present field technologies are automation, power consumption and cost effectiveness. Automation is intended to reduce man power with the help of intelligent systems. Power saving is the main consideration forever as the sources of the power are getting diminished due to various reasons.

The main aim of this project is automatic street power saving system using LDR. We want to save power automatically instead of doing manually. So it's easy and cost effective. This saved power can be used in some other cases. So in villages, towns etc. we can design intelligent systems for the usage of street lights.

Automatic street light control system aims at designing and executing the advanced development in embedded systems for energy saving of street lights by using light dependent resistor (LDR). In our project we are using LDR, which varies according to the amount of light falling on its surface; this gives an indication for us whether it is a day/night time.

Components:

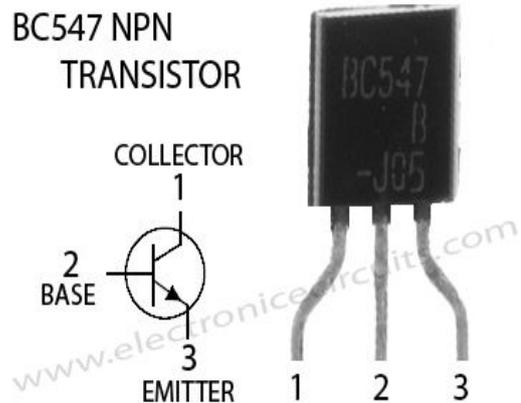
1. The Light Denendent Resistor (LDR)



Typical LDR, As its name implies, the Light Dependent Resistor (LDR) is made from a piece of exposed semiconductor material such as cadmium sulphide that changes its electrical resistance from several thousand Ohms in the dark to only a few hundred Ohms when light falls upon it by creating hole-electron pairs in the material.

The net effect is an improvement in its conductivity with a decrease in resistance for an increase in illumination. Also, photo resistive cells have a long response time requiring many seconds to respond to a change in the light intensity.

2. Transistors

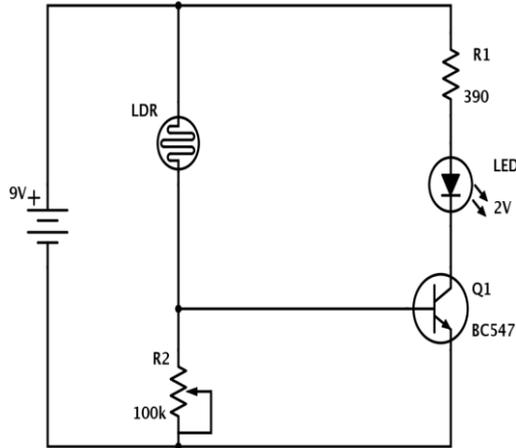


Transistors are three terminal active devices made from different semi conductor materials that can act as either an insulator or a conductor by the application of small signal voltage. The transistors ability to change between the two states enables it to have two basic functions: amplification and switching.

We have used two BC547 transistors in our circuit. BC547 is an NPN transistor used for many purposes together with many other electronic

components such as resistors, coils and capacitors. It is mainly used for amplification and switching purposes. It has maximum current gain of 800 A.

C. Working Principle of Circuit



The circuit diagram of a LDR is shown below. When the light intensity is low, then the resistance of the LDR is high. This stops the current flow to the base terminal of the transistor. So, the LED does not light. However, when the light intensity onto the LDR is high, then the resistance of the LDR is low. So current flows onto the base of the first transistor and then the LED lights. Here, a preset resistor is used to turn up or down to increase or decrease the resistance.

The light intensity is kept high during the peak hours, and as the traffic on the highways tend to decrease in late nights: and the light intensity also decreases till morning. Finally, the street lights completely shut down at morning and continues again at dusk.

In future, this project can be developed by connecting it with a solar panel, which converts the intensity of the

solar into corresponding voltage, and this energy is used to feed the street lights on highways.

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