

**TEKNOFEST**  
**AEROSPACE AND TECHNOLOGY FESTIVAL**

**TECHNOLOGY FOR HUMANITY COMPETITION**

**PROJECT DETAIL REPORT**

**TEAM NAME**

**TEAM BAZINGAA**

**PROJECT NAME**

**ROAD POWER GENERATOR**

**APPLICATION ID**

**64164**

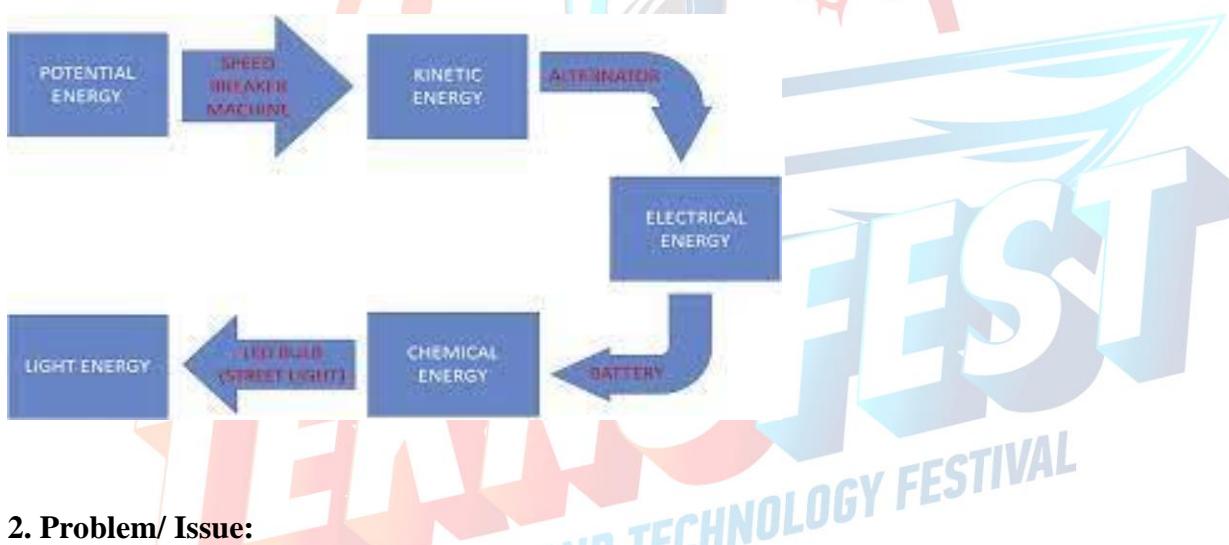
## Project Detail Report

### 1. Project Summary:

Everything that occurs in the environment is a representation of energy flow in one of its forms, and we encounter it in our everyday lives as friction. In the contemporary world, when science and technology are the foundation of every society, we are yet unable to utilize the energy created by friction. Therefore, our project is mainly based on converting frictional energy into electrical energy. The number of vehicles on road is growing rapidly and if we convert some of the kinetic energy of the vehicles into the electrical energy then we can produce a considerable amount of electricity.

In this project, we show a functioning system with speed breakers fitted. When they come into touch with moving vehicles, they cause the gear mechanism to rotate, generating power and converting frictional energy into electrical energy, resulting in source of light. We will also setup a streetlight system with sensors that can detect darkness in the area and turn on the lights automatically.

This approach may help us conserve natural resources. This will be of enormous use in the future days, as it would save a lot of electricity from power plants that would otherwise be spent on lighting streetlights or other purposes.



### 2. Problem/ Issue:

In the present scenario power is the major need for human life but the rapid increase in population and conventional energy sources are lessening. Secondly, the standard of living of human beings has increased. Pakistan is a country in which electricity is becoming expensive as time passes and also majorly suffers with the lack of sufficient power generation. These all factors have lead to energy crisis.

Another problem is pollution. It makes all living organisms suffer. Power stations and automobiles are the major pollution producing places.

The availability of fossil fuels will be the major source of power generation, but this solution will be insufficient because they may run out in the coming decades. As a result, we must investigate some alternative, power generating sources that are not depleted in a few years.

### 3. Solution

There is a lot of energy that is consumed when vehicles pass over a speed breaker that may be conserved. To resolve this concern, we must develop energy-conversation strategies and our project can help solve these problems to a great extent by speed breaker energy conversion which is the most recent technique utilised to create electricity. When a vehicle passes over a speed breaker, it causes the gear mechanism to rotate and create electricity. As a result, moving vehicles' frictional energy may be turned into electrical energy.

This strategy will not only help to handle the energy crisis brought on by population increase, but it will also help to save our natural resources. Also the operating cost would be less so Generation of electricity will at low cost. As a consequence, we will have a pollution-free environment. since the mechanism employed is dependable and the total waste energy will be converted in some useful work.

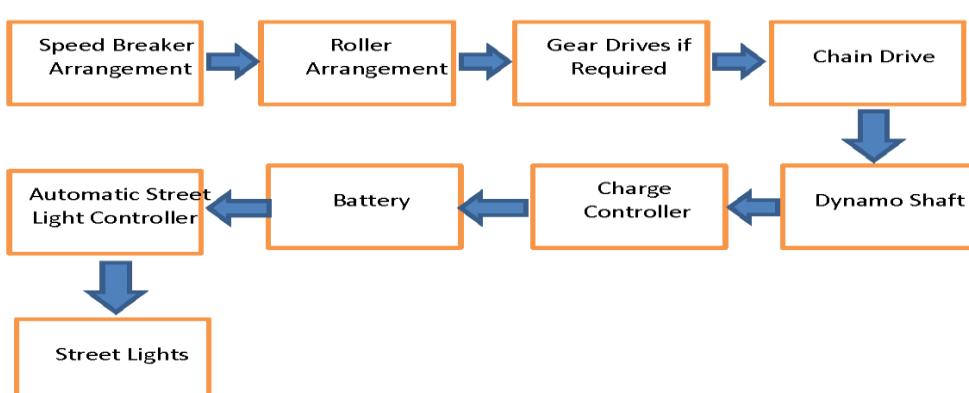
#### Contribution of our project in the field of Education

Problem	Solution	Contribution in Education
The lack of power at school is unfortunate because of the numerous services it can give in the classroom, and studies show that schools without electricity perform worse than electrified schools.	This lack of power can be overcome by speed breaker energy conversion technology. It will be less expensive to build and will be able to supply adequate power.	it will reduce illiteracy and improve the quality of education, eg: Lighting can enable classes to be taught early in the morning or late at night and introduce ICTs into the classrooms.

### 4. Method

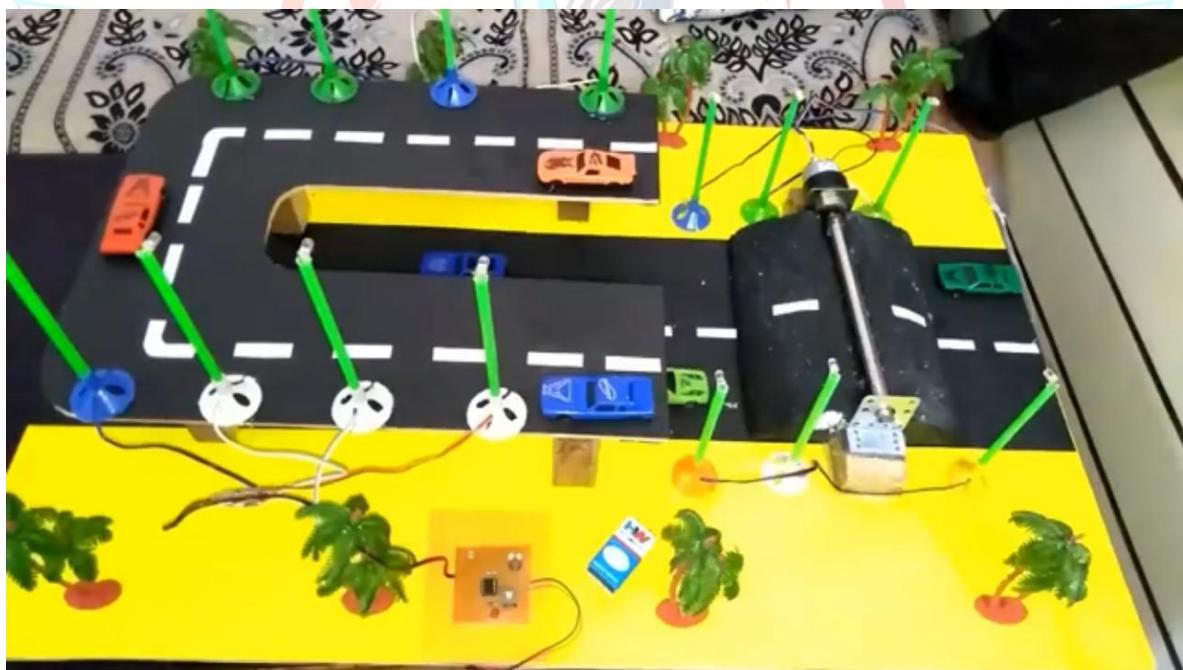
#### PRINCIPLE

Road power generation (RPG) is a system design to capture waste and kinetic energy from all vehicles. This device converts the kinetic energy of the vehicles into electric energy. This is done by moving plate installed on the road, this plate captured very small movement from the road surfaces and it transferred to a keyway flywheel system. From hundreds of wheel lies a single flywheel having used to driving machinery. The RPG included the method of driving one flywheel to another, once it reached predetermined velocity. The RPG flywheel system has been developed to achieve large amount of moment of inertia in relatively small space. The captured energy is converted into electricity which is fed into power grid. With the following block diagram we can easily understand the overall working of the automatic street light.



## MATERIAL USED

- |                              |                   |
|------------------------------|-------------------|
| 1. PLYWOOD                   | 2BY3 FOOT         |
| 2. GEAR MOTOR                | 1000 RPM          |
| 3. MOTOR CLIP                | 2                 |
| 4. PIPE                      | 15 CM (1/2 INCH ) |
| 5. STREET LIGHT CIRCUIT      | 2                 |
| 6. COLOR PAPER               | 1                 |
| 7. FEVICOL                   | 1                 |
| 8. THERMACOL                 | 1                 |
| 9. PLASTIC TREE AND CARS     | 1 (System)        |
| 10. SR Robotics Street Light | 4 LED Lights      |



## ANALYSIS

The calculation of the road power generation system will be made after the preparation of the prototype. The calculation part will contain the dimensional and specific details of parts of the system. The analysis will contain the practical data according to which the discussion of result will be made about its applicability in real life. The final decision will be made according to the efficiency and performance by supervisors for this project.

## **5. Innovative Aspect**

In today's world, the innovative feature of our revolutionay project is of great importance. Our project's latest technology offers us low-cost and low-maintenance options, allowing us to save a significant amount of energy that would otherwise be wasted on illuminating street lighting or other non-value-added activities. The lighting of streets can also improve the safety of drivers, riders, and pedestrians. It's also utilised to improve security in cities.

Because Pakistan is reliant on fossil fuels (coal, furnace oil, and natural gas) for electricity generation, which is a major source of pollution so our project wont require any consumption of fossil fuels with a pollution free power generation and can help save alternative energy resources. It will also have minimal installation and maintenance costs because it will generate power that can be stored and utilised for other purposes (we've included a storage battery, so it can function at night). .it will also not require manual work.

## **6. Applicability**

No one is pleased with the present electrical situation. Every tiny task necessitates the use of power. Despite the lower electrical output, this is a straightforward idea for producing power from kinetic energy of moving vehicles. I am certain that an incredible quantity of power can be created if this concept is further improved and produced at a high potential. It can also be designed for heavy vehicles, thus increasing input torque and ultimately output of generator by using the multiple transmission system. This speed braking technique may be utilised on any highways and roads.

This will prove to be a huge blessing to the globe in the future days, since it would save a significant amount of electricity from power plants that would otherwise be consumed on street lights.

## **7. Estimated cost and Project Scheduling**

### **MATERIAL USED**

1. PLYWOOD 2BY3 FOOT	5000PKR
2. 1000 RPM GEAR MOTOR	2250PKR
3. 2 MOTOR CLIP	250PKR
4. 15 CM PIPE (1/2 INCH )	100PKR
5. 2 STREET LIGHT CIRCUIT	500PKR
6. COLOR PAPER	50PKR
7. FEVICOL	70PKR
8. THERMACOL	50PKR
9. PLASTIC TREE AND CARS	300PKR
10. SR Robotics Street Light with 4 LED Lights	1200PKR
Total Cost	9720PKR

## **8. Target Group of the Project Idea (Users):**

The issue of balancing the country's supply and demand for energy had remained largely unsolved for years. In Pakistan, many individuals who reside in rural regions do not have access to electricity since these areas are not powered by electricity and approximately 38% of individuals have low-quality energy. As our project is associated with power generation so the produced electricity due to speed breakers can be supplied to all those areas or rural areas where electricity has been a problem and can solve their minor needs. This would also prove a great boon to educational institutes and every sector that demands electricity for basic problems.

This project will also help with the energy problem created by dependency on imported furnace oil and natural gas (both of which are harmful to the environment), thus polluted areas will be a focus too.

## **9. Risks**

The greatest risk to our project is changes to or removal of FiTs during construction and before commissioning. We require government assurance or the ability to guarantee against damages associated with performing such a project if they are applying in major levels.

There is money available from the government in the form of FiTs, and interior villages should receive it entirely rather than a developer who may not share profits with us. We might as well receive something back if we're subsidising FiTs with our bills at the time of performing the principle of project in the higher levels.

## **10. Resources**

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