YOUNG ENVIRONMENTAL SCIENTIST

Innovating for a better future

New Thinking
New Possibilities

GENERATING ELECTRICITY WITH WINDMILL ON MOVING TRAIN / CAR / BIKE

SBOA SCHOOL & JUNIOR COLLEGE
CHENNAI

Mentor : Mrs. Selvarani

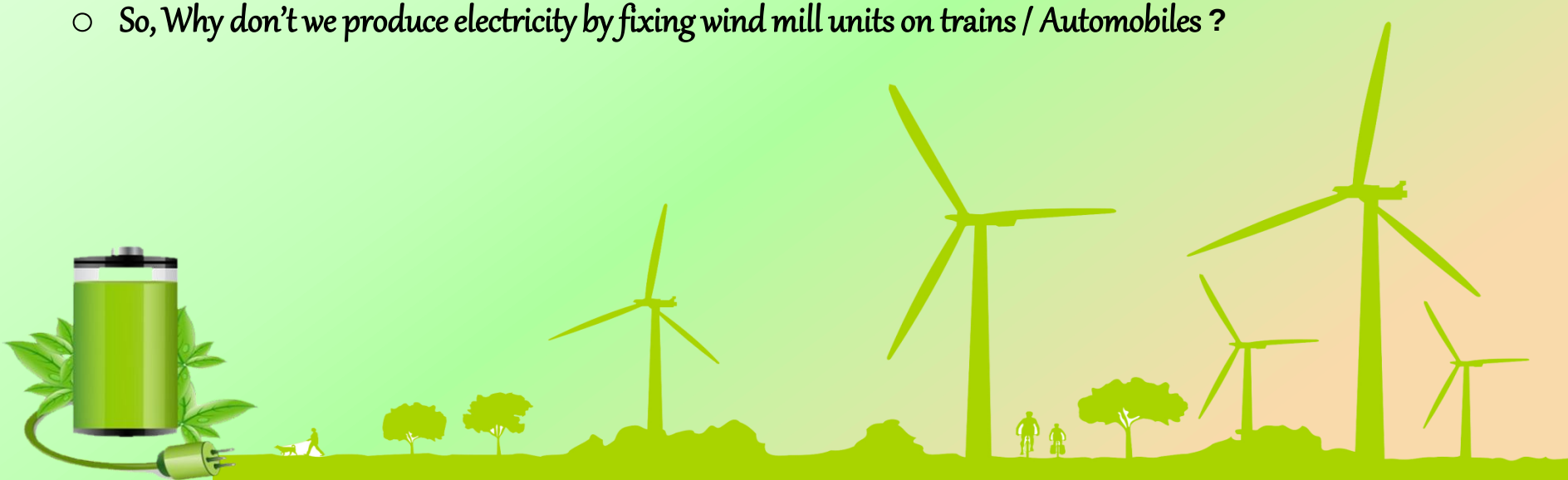
Members : T. Meera
R. Abirami Sri
Std : VI

SYNOPSIS

- Introduction
- Working principle
- Background study & Proto sample
- Tryout Details (After Mentoring Session)
- Advantages & Challenges

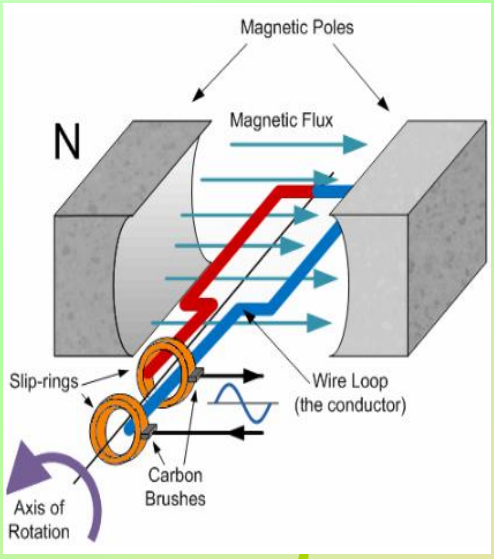
INTRODUCTION

- Wind energy is a “Renewable Energy”.
- India has the largest railway network / Road transport.
- Windmill requires 15 Km/hr speed of wind to rotate its propeller blades.
- Trains / Automobiles are running more than 60 Km/hr / 40 Km/hr speed.
- **So, Why don’t we produce electricity by fixing wind mill units on trains / Automobiles ?**



WORKING PRINCIPLE

- Wind turbines convert the kinetic energy of the wind into Mechanical energy and then into Electrical energy.
- While the train / Automobile is moving, the wind mill blades and in turn rotor shaft will automatically start rotating.
- The rotor shaft is cutting the **"Electro Magnetic Field"** which is produced between the two magnets and producing the electricity.
- This generated electricity can be transferred through wires to function electrical equipment's such as lights, Fans and air conditioners in the train / Automobiles.



BACKGROUND STUDY & PROTO SAMPLE

Went to ICF & Met
Mr. Malaiarasan (Sr. Engr)
to check the feasibility

Went to Vestas - Udumalpet & met Mr. Ashok, Dy. Mgr. to check the feasibility

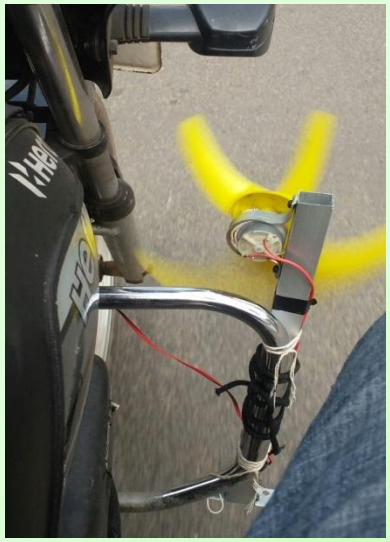
Did the model project for feedback survey @ school

TRYOUT DETAILS

Study Materials :

#	Parts	Purpose
1	Generator, Blade & Channel (Spec : 18V X 1 Amps) – Weight < 1 Kg	To Generate the current
2	Electrical wires	To conduct the current
3	LED bulbs (Spec : 3 Watts (0.25 A, 12 V))	To check the output
4	Multi meter	To check the current output
5	Bike	To fix & Do the tryout

TRYOUT DETAILS

Fixing the windmill in Bike	Taking tryout
 	
Taking the tryout data with Multi meter	**Taking the tryout with LED bulbs**
	

TRYOUT DETAILS

Data Analysis :

#	Generator Specification	Bike Speed	Actual Current Output	Can be used to glow
1	Generator, Blade & Channel (Spec : 18V X 1 Amps)	30~35 Kms/Hr	16~17V X 1 Amps	12V X 0.25 Amps (4 LED Bulbs of 3 Watts)

Observations :

- In one bike, We can fix maximum 4 wind mills.
- Output current can be used for side indicator, Speedometer lights & For mobile recharging also.

FEASIBILITY DETAILS

Fixing the windmills on the train

Fixing the windmills on Bottom of the train

Fixing the windmills on In between the train coaches

Fixing the windmills on Automobiles

ADVANTAGES & CHALLENGES

Advantages :

- It is Green energy
- Wind power requires “No Power”
- We can save the electricity consumption of the train / Automobiles.

Challenges :

- Wind mill blade design to be optimized to match with moving vehicles.
- Dynamic imbalance to be considered for the moving vehicles.
- Power can be generated only when train / Automobiles is moving

→ Electrical backup facilities can be used to restore the current