University Of Diyala-College Of Engineering

Chemical Engineering Department

RENEWABLE ENERGY

(Design And Implementation Horizontal Wind Turbine)

Preparation

Assist. Lecturer

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Renewable Energy

INTRODUCTION

- Renewable Energy "any sustainable energy source that comes from natural environment."
- Ready to be harnessed,
- It is a clean alternative to fossil fuels
- "energy that is derived from natural process that are replenished constantly" defined by the renewable energy working party of the international energy agency

TYPE OF RENEWABLE ENERGY

- Tidal Energy
- Wind Energy
- Solar Energy
- Wave Energy

WIND ENERGY

WIND ENERGY

- Wind power is good renewable, clean and free source of energy for power production
- Reduce dependence on fossil fuels including imported oils
- Reduce emission of greenhouse gas and other pollutant

WIND TURBINES

Small Turbines

- Local electrical grids may not be able to handle the large electrical output from a large turbine, so smaller turbines may be more suitable.
- High costs for foundations for large turbines may not be economical in some areas.

WIND TURBINES

Large Turbines

- Able to deliver electricity at lower cost than smaller turbines, because foundation costs, planning costs, etc. are independent of size.

- Well-suited for offshore wind plants.
- In areas where it is difficult to find sites, one large turbine on a tall tower uses the wind extremely efficiently.

TYPE OF WIND TURBINES

- Horizontal axis
- Vertical axis

Advantage of Wind Energy

- Wind energy is cost competitive with other fuel sources
- Wind energy creates jobs
- Wind turbines do not consume water
- Wind energy is clean
- Wind energy systems have low operating costs

DISADVANTAGE OF WIND ENERGY

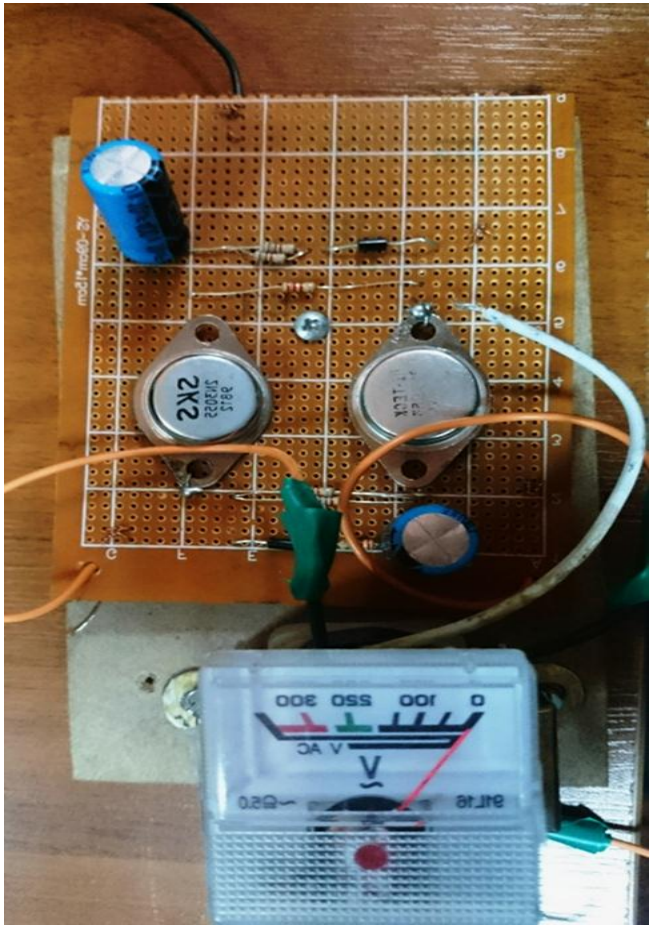
- Poor Electricity Production
- It is Dependent on the Availability of Wind
- The Speed of the Blowing Wind Has to Be Right
- The Energy that is Produced Can’t Be Stored in Large Scale
- The Turbines are Noisy
- The Amount of Wind that Blows Is Unpredictable

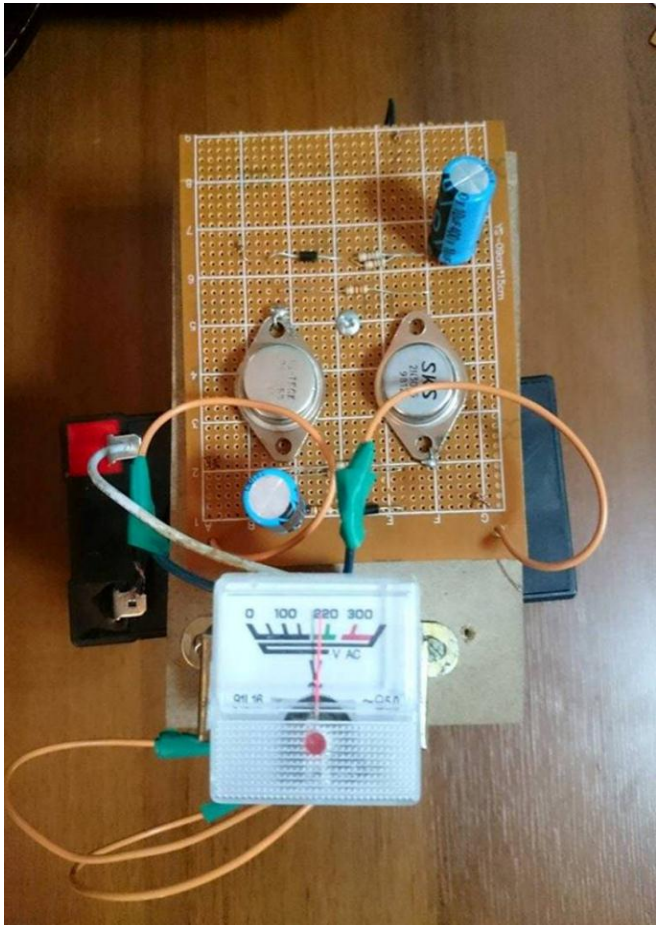
DC HORIZONTAL WIND TURBINE

- In this project, the aim is to get power by exploiting wind power and that using a system composed of horizontal wind high-efficiency turbines (horizontal turbine efficient) and drive continuous current (DC Motor)) for the purpose of generating a voltage value V 12 plates storage (Battery) for the purpose of teams storage output voltage of the constant engine and also we used the power adapter Inverter)) for the purpose of converting DC power to AC and also we used electric lifter for voltage transformer (transformer) to raise the voltage generated by teams from the power adapter from 12 volts to 220 volts and a frequency of 50 Hz.

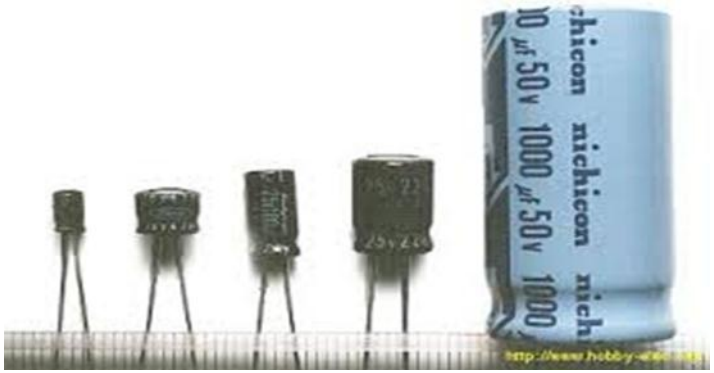
ELECTRICAL PART

Inverter CCT Convert the DC voltage to AC voltage





center tap transformer



capacitance

Resister

Dry cell battery

Dc Motor

- Advantages

*Low Initial Cost
*Long Life
*High Efficiency
*Automated Control
*No Fossil Fuels
*Occupational Safety

Mechanical Parts

show the fan

Blades

Blades turbo shape much like the shape of the aircraft wings was used by the sleek surface design means that the surface of the blade spins a little bit in a destination and be relatively flat in the rest of the surface is a very complex phenomenon and may require in fact a PhD in mathematics or physics to understand it fully and design optimization of them.

Blades

The Turbine Blade Base

An important part which the turbine blades to prove it and to link these blades birth of electricity generation and we have this rule manufacture of light thanks to the iron plus (+) and length (25.) cm

The turbine blade base

Generating Base

this part of the turbine and the job is to load generating DC power and installed it with the rudder (flipper background) of the turbine so that our industry this rule of iron in the form of three-star and a length of half a meter of each hand to increase balance and build for the column installer them was the use of the main column measure (3inch) Used in the construction of water transmission lines and, of course, all be of iron.

Rudder (Rear Flipper)

An important part in the turbine industry and in our project, we manufacture this rudder to guide the turbine coming downwind from the point of emitted and in designer this have canceled spin control, which is a that control the turbine-mail device monitors the direction of emission of the wind through the sensors Air which in turn determine the direction of the wind and then there are the control panels you rotate the turbine downwind

Rudder (rear flipper)

Thank You