Wind Energy Lab

Wind Energy lab provides an end to end learning experience of Wind Energy based electrical power generation. The lab consists of two products Wind Energy training system which gives user, insight about the individual components and power generation using wind energy, the other product Wind Turbine emulator is mainly research based equipment which enables user to do research in the field of Wind Energy power generation by tweaking the controls and power electronics of the system.

Wind Energy Training System (WETS)

WETS is a scaled down version of actual wind turbine power plant. This system facilitates the students with working and configurable model of wind turbine. This system gives the insight about individual components and consequences of changing the operating points of any wind turbine defined in terms of wind speed and pitch angle. Students can learn concepts like I-V characteristic, cut-off, cut-in speed, TSR, Coefficient of performance etc.
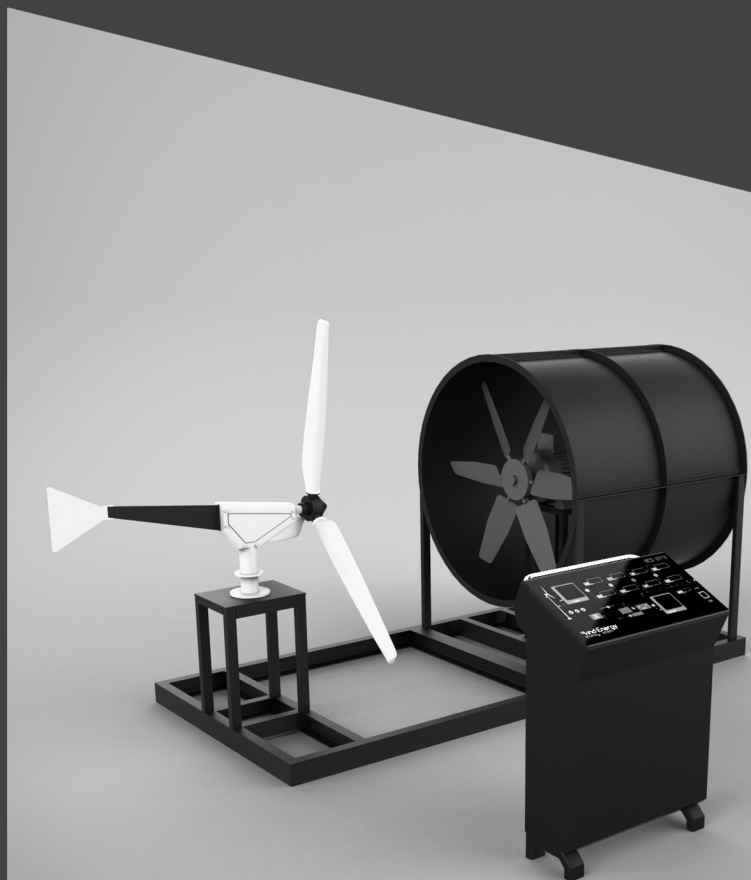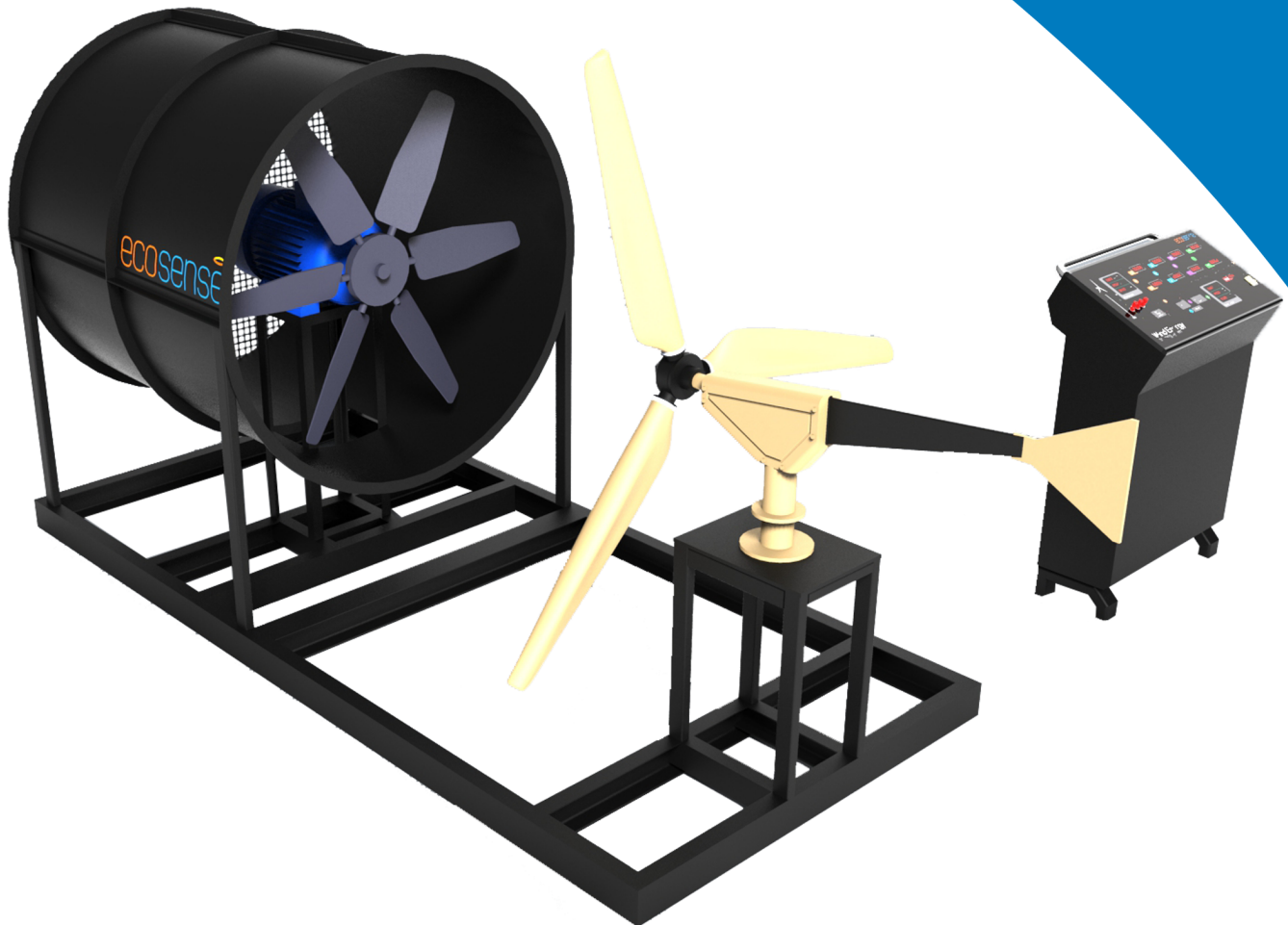
Design

Compact Design

Usability

Can be used indoors as well as outdoors.

Specifications

300 Watt. Wind energy training system with artificial wind generator, charge controller , inverter, battery and AC/Dc Loads

- Artificial Wind generator
- Actual fixed pitch wind turbine in controlled environment
- Provision to vary wind speed.
- Evaluation of the efficiency of charge controller.
- Cut-in speed of wind turbine can be calculated experimentally.
- Evaluation of the Tip Speed ratio (TSR) at different wind speeds.
- Evaluation of the coefficient of performance of wind turbine.
- User can draw the turbine Power versus wind speed curve.
- User can draw the curve between TSR and coefficient of power.
- User can draw the power curve of turbine with respect to the rotational speed of rotor at fix wind speeds.
- User can study the power analysis at turbine output.
- User can study the power analysis at different branches of wind turbine energy system with AC load only.
- User can study the power analysis at different branches of wind turbine energy system with DC load only.