

WIND TURBINE

TEACHER/TUTOR NOTES



The project takes 3 - 4 weeks to complete. The following are suggested topics for introduction and discussion.

Power Generation and Transmission

- AC & DC electricity
- Motors and generators
- Volts, amps, power
- The Grid

Turbines

- Fluids – steam, water, gas
- Rotary machines, blades
- Windmills
- Steam Turbines
- Gas Turbines

Environment

- Fossil fuels – how they are used see Wikipedia – Thermal Power Stations
- Power station parts - see www.americanhistory.si.edu/powering/generate/gnmain.htm
- Pros & cons – pollution
- Alternative power generation – nuclear, wind, tide, biomass fuel, fuel cells – scale factors
- Relative costs
- Wind generators, farms

Extended activities

1. Measure voltage generated This is proportional to speed at no load.
 - Different wind directions
 - Different numbers of blades
 - Different pitch angles
 - Different lengths of blades
2. Plan a method of keeping the turbine facing the wind
3. Plan a system for stopping the turbine if the wind is too strong.
4. Work out how to keep the turbine running at a constant speed if it is connected to an A.C. grid.