

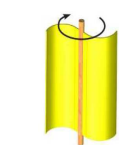
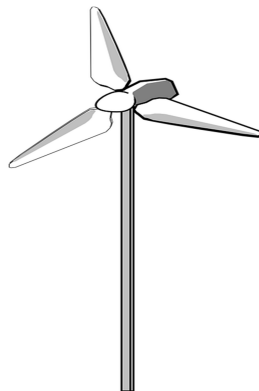
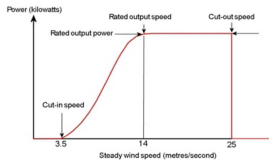
Master degree

INTRODUCTION: Since the oil crisis in the early 1970s, utilization of solar and wind power has become increasingly significant, attractive and cost-effective. In recent years, hybrid Photovoltaic/wind system becomes viable alternatives to meet environmental protection requirement and electricity demands. With the complementary characteristics between solar and wind energy resources for certain locations, hybrid Photovoltaic/wind system with storage banks presents an unbeatable option for the supply of small electrical loads at remote locations where no utility grid power supply. Since they can offer a high reliability of power supply, their applications and investigations gain more concerns nowadays. And an important challenge for Algeria to take up is the implementation of health care services in isolated coastal and mountainous regions of the north, high plains and desert regions of the south. Communities living there lack electricity for water sterilization, domestic use, medical services, education and irrigation. These remote areas are not supplied by power lines. For that we are going to make study for to see how can we provide or electrify this place by hybrid system PV/wind with batteries bank and going to use software HOMER energy which help us in simulation.

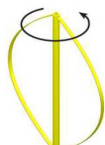
Principle of Wind turbine: The wind turbine is a device designed to convert the kinetic energy of the wind, they are generally used to produce electricity and that is one kind of renewable energies. Generally a wind turbine consists of a set of rotor blades rotating around a hub, a gearbox, and generator.

Different types of Wind Turbines: Wind turbines can be separated into two basic types determined by which way the turbine spins. Wind turbines that rotate around a horizontal axis (HA) are more common (like a wind mill), while vertical axis (VA) wind turbines are less frequently used (Savonius and Darrius).

Typical wind turbine power:



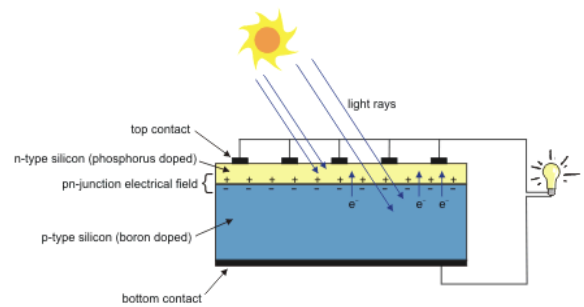
SAVONIUS(VA)



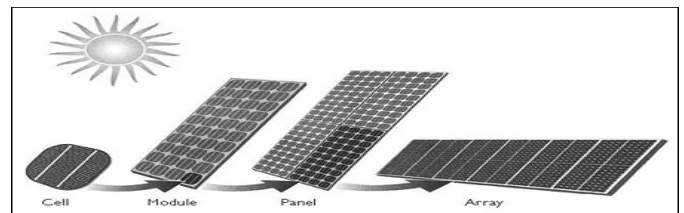
DARRIUS(VA)

Turbine Wind (HA)

Photovoltaic (PV) cell: Is the building block of the PV system and semiconductor material such as silicon and germanium are the building block of PV cell. Silicon is used for photovoltaic cell due to its advantages over germanium. When photons hit the surface of solar cell, the electrons and holes are generated by breaking the covalent bond inside the atom of semiconductor material and in response electric field are used to power a load. Generated by creating positive and negative terminals. When these terminals are connected by a conductor an electric current will start flowing. This electricity is used to power a load.

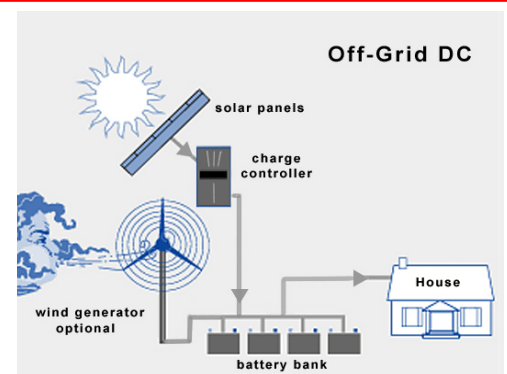


Photovoltaic array :



Stand-alone (autonomous) system:

The stand-alone or autonomous power system is an excellent solution for remote areas where utilities facilities, in particular transmission lines, are not economical to run or difficult to install due to their high cost and/or difficulties of terrain, etc. The stand-alone systems can be sub-classified into common DC bus or common AC bus. Variable nature of solar and wind resources can be partially overcome by integration of the two resources into an optimum combination and hence the system becomes more reliable. The strength of one source could overcome the weakness of the other during a certain period of time



CONCLUSION: System hybrid PV/wind with batteries bank is the best configuration for Algiers in terms of net present cost and carbon emissions, for our regions the hybrid electrical system incorporating wind technology is not influenced by the fuel price. These power systems are very well suited to supply the specific load demand of remote areas. The implementation of Renewable energies hybrid systems to supply Rural Health Clinics will contribute to reduce electricity production cost, and will improve the health care and the quality of life in isolated regions.