Wind energy conversion system

A wind energy conversion system (WECS), or wind energy harvester[2] is a machine that, powered by the energy of the wind, generates mechanical energy that can be used to directly power machinery (mill, pump, ...) or to power an electrical generator for making electricity.[3] The term can thus refer to windmills, windpumps as well as wind turbines.

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Operation

The conversion of the energy of the wind into more useful forms can be done using a rotor fitted with blades or sails. Note that a suitable location needs to be chosen for the WECS, preferably an open area[4] Also, some general locations lend themselves far better than others for WECS. See Wind power

Windmills

Main article: Windmill

A windmill is a mill powered by the wind. It allows to reduces a solid or coarse substance into pulp or minute grains by crushing, grinding, or pressing.

Windpumps

Main article: Windpumps

A windpump is a type of windmill used for pumping water from a well or draining land.
Windturbines

Main article: Wind turbine

The most modern generations of windmills are more properly called wind turbines, or wind generators, and are primarily used to generate electricity and electrical energy. Modern windmills are designed to convert the energy of the wind into electricity. The largest wind turbines can generate up to 6MW of power (for comparison a modern fossil fuel power plant generates between 500 and 1,300MW).

With increasing environmental concern, and approaching limits to fossil fuel consumption, wind power has regained interest as a renewable energy source. It is increasingly becoming more useful and sufficient in providing energy for many areas of the world, especially in temperate climates.

Wind Turbine systems have a competitively high Energy Return on Investment (EROI) estimated to be around 36.5:1. (National Renewable Energy Laboratory)

To generate enough power for a family, the tower and the blades need to be sufficiently large. See Domestic energy consumption

Kite Systems

Kite systems convert the wind’s kinetic energy to other forms of energy: mechanical energy, motion of mass, noise, electricity, potential energy, tension, heat, light. Kite systems convert the energy of the wind; such energy may be employed to do general works genera and practical works. Energy Kite Systems. A kite system consists of wings coupled with tensioned tethers interacting with a media, say air or water; the wing(s) of a kite system may be seen as anchors relative to each other.

See also

- energy harvesting
- windmill sail
- Comparison of bladed rotors for WECS
- Solar energy conversion system
- High-efficiency HAWT’s

References
1. Wind energy conversion system
2. Wind energy harvesting
3. WECS as device generating mechanical energy
4. Wind turbines in urbanised areas only 5% efficient

External links

- Wikipedia:Wind energy conversion system