

Wind Power The Clean Energy

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Abstract - Wind may be associated with some of weathers most chaotic storm, but its beginning could not be simpler. Defined as horizontal movement of air from one location to another. They are created from difference in air pressure .Its strength varies from light breeze to hurricane factor. Wind is renewable, clean and does not produce any deleterious byproducts like other forms of energy. Wind energy is a form of solar energy which when harvested by modern wind turbines can generate electricity to power homes, schools, business etc. It does not depend on process water, as coal or nuclear power. It is generated domestically. We need not depend on other countries to produce energy for local use. It brings clean high tech jobs to farm lands. These are several forces which impact the speed and direction of winds. The most important is the Earth's gravitational forces which create air pressure, the driving force of wind. Without gravity there would be no atmosphere or air pressure and thus no wind. Wind energy can be obtained from wind mills. The negative impact of wind mills are population of migratory/wild birds deteriorating, noise pollution due to rotor blades, wind cannot be stored, cost of production is high and the wind sites are located in remote areas far from electric power demand. The wind turbines must be constructed to withstand deeper water and higher waves. Green electricity goes to the grid along with electricity produced from renewable sources like solar energy. We must support the utility effort to produce electricity from renewable, more environment friendly methods.

Keywords - Wind Energy, Air pressure, Turbines, Green Electricity

Introduction:

The word green has become symbolic to environmental awareness. When you are thinking green , it means you are looking for ways in everyday life to help protect the environment. Thinking green is about not polluting too; Green Technology is one that has a green purpose. By green we do not mean the color, however, Mother Nature is quite green, and the long and short term impact on invention has on the environment. Green inventions are environmentally friendly that often involve energy efficiency, recycling, safety and health concerns, renewable resources and more. The word has a fixed amount of natural resources , some of which are already depleted or ruined.

From all the available evidences, it is clear that the climate has changed over time. The search for explanation of climatic change has become increasingly important in recent years. Human activities that resulted in a modification of both the atmosphere and the earth surface to such a degree that the changes are now an integral part of explaining climate variations .The basic reason for climatic changes on earth is essentially very simple. Change is related to the flow of energy into and out of the system and the ways in which the energy is exchanged within the earth- ocean- atmosphere system.

Fossil fuels are nonrenewable: they draw on finite resources that will eventually dwindle, becoming too expensive or environmentally damaging to retrieve. Alternative energy or renewable energy sources, such as wind and solar energy are constantly replenished and will never run out. Wind power is hardly new, the first sailing vessel was afloat at least 7000 years ago- it still has the reputation of being a novelty in many areas.

Solar radiation warms the air over the equator, causing it to rise. The rising air then proceeds south and north towards the poles. From approximately 20^o to 30^o north and south latitude, the air sings .Then the air flows along the surface of the earth, back towards the equator. This movement of air across the earth's surface produces difference in air pressure between one place to another.

Wind energy:

Wind may be associated with some weather's most chaotic storms, but its beginning could not be simpler. Defined as horizontal movements of air from one location to another. They are created from the difference in air pressure. Air pressure is created by the motion, size and number of gas molecules present in the air. This varies based on the temperature and density of air mass. Its strength can vary from light breeze to hurricane factor. Wind is renewable; it is clean and does not produce deleterious byproducts the other forms of energy do.

Within the atmosphere there are several forces that impact the speed and direction of winds. The most important is the earth's gravitational force which creates air pressure, the driving force of wind .Devoid of gravity; they would be no atmosphere or air pressure and thus, no wind. The Coriolis force and friction both significantly effect wind across the globe. The Coriolis force makes wind deflect from its straight path between high and low pressure areas. The strength of wind is measured with Beaufort wind scale, its speed with anemometer and its direction by wind vane.

Wind energy does not depend on process water or mining operations as coal and on nuclear power. It is generated domestically: there is no need of dependence on other countries to produce energy for local use. Wind energy can be obtained from wind mills. Throughout history, windmills have been in use as grinding mills and saw-mills. Today they are used to harness the winds kinetic energy. Wind moves the mill's blades, which rotates the shaft that in turn moves gears connected to generator. The generator

creates electricity. Wind turbines require extensive amount of land, which can make them more difficult to site in urban areas. Besides land availability, wind turbine sites must be located within high wind energy areas either on land or over the water. Theoretically upto 60 percent efficient wind mills typically produce about 35 percent efficiency under field conditions. Where conditions are favorable, wind power is already cheaper than any other new energy source. The standard modern wind turbines use only two or three propeller blades. More blades on windmill provide more torque in low speed winds so that the traditional Midwestern windmill with 20 or 30 blades was most appropriate for small-scale use in less reliable wind fields. Fewer blades operate better in high speed wind, providing more energy for less material cost at wind speeds of 25 to 40 Km/h. A two blade propeller can extract most of the available energy from a large vertical area and has less material to weaken and break in a storm. Three- bladed propellers often are preferred because they are easier to balance and spin more smoothly.

Disadvantages:

The negative impact of windmills is on wild birds, migratory bird's population. Individual birds may be killed or injured by flying into rotating windmill blades. These windmills generally occupy places with wind and weather too severe for residential or other development. Most wind farms are too far from residential areas to be heard or seen. But they do interrupt the view in remote isolated and destroy the sense of isolation and natural beauty.

Conclusion:

Research continues to improve this technology, making it more affordable. Companies must work more with local bird authorities to ensure that the migratory population is considered and that safer designed elements are included to help birds steer clear of the turbines. Careful placement outside of migration corridors and the addition of warning devices can reduce mortality greatly.

Offshore wind farm must be proposed relatively close to shore, which helps restrain costs. While wind speeds are much higher farther off the cost, the wind turbine foundations must be constructed to withstand deeper water and higher waves. Another factor is that the distance power must be relayed when farming offshore. The collected energy should probably be stored in electrolyzed water for transportation.

Organizations should look at safe wind farm designs that take marine life into account. They must compare the potential dangers associated with constructing and operating offshore wind farms, to other marine activities and other methods of generating electricity.

Green electricity goes to grid along with electricity produced from nonrenewable sources; customers choosing the green alternative are not necessarily receiving only green electricity. They are, however, supporting the utility's effort to produce electricity from renewable or more environmentally friendly methods.

TABLE:

Technology	Land Use (m ² per gigawatt hour for 30 years)	Jobs (terawatt hour per hour)
Coal	3,642	116
Photovoltaic	3,237	175
Solar thermal	3,561	248
Wind	1,335	542

From the above table it shows that Wind power brings clean, high-tech jobs to the farmlands and it actually takes up only one-third of land compared with other resources .Furthermore, the land under windmills is more easily used for grazing or farming. These wind energy could however make a substantial collective contribution towards providing us with the conveniences we crave in a sustainable, environmentally friendly manner. Wind is now the cheapest form of new energy in many places. It has the potential to supply one-third or more of our energy requirements.

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