RESEARCH HUB – International Multidisciplinary Research Journal (RHIMRJ)
Research Paper
Available online at: www.rhimrj.com

Green Chemistry: The Importance and Impact of Pollution Free Renewable Energy

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Abstract: ***India has a vast supply of renewable energy resources and it has one of the largest programme in the world for deploying renewable energy products and systems. Nowadays energy crises are very high. for a vast country like India which stands sixth in the world in terms of energy consumptions, the depending on a single resources or technology to carry out all energy requirements. While tackling issue related to environmental impacts and fuel supplies is impractical. Wind power has emerged as the biggest source of renewable energy in the world. Renewable energy is available without any cost and it does not emit any greenhouse gases. Especially wind turbines have evolved rapidly over the past 20 years and the turbines have grown in size from 100KW in the early 1980s to over 2.5 MW today. The growth of renewable energy has been unprecedented over the past 25 years. Wind energy has been around for centuries. This paper will present each of these concerns in detail and provide all information about wind energy. In Gujarat there are lots of wind turbines in coastal area.***

Key Words: Alternative methods, Electricity, Fossils, Prominent role, Renewable energy.

I. INTRODUCTION

Wind energy is a source of renewable power which comes from air current following across the earth's surface wing turbines harvest this kinetic energy and convert it into usable power which can provide electricity for home, farm school or business applications on small (residential).medium (community).or large (utility) scales.

Wind energy is one of the fastest growing sources of new electricity, generation in the world today. These growth trends can be linked to the multi dimensional benefits associated with wind energy.

- **Green power:-** The electricity product from wind power is said to be "clean" because its generation produces no pollution or green houses gases. As both health and environmental concerns are on the rise, clean energy sources are a growing demand.
- **Sustainable: -** wind is a renewable energy sources, it is in exhaustible and requires no "fuel "besides the wind that blows across the earth .this infinite energy supply is a security that many users view as a stable investment in our energy economy as well as in our children's futures.
- **Affordable:-**Wind power is a cost-competitive source of electricity, largely due to technological advancements, as well as economies of scale as more these machines are manufactured and put online around the world.
- **Economic Development:-**As well as being affordable wind power is a locally produced sources of electricity that enables communities to keep energy dollars in their economy. Job creation (manufacturing, service, construction, and operation) and tax base increase are other economic development benefits for communities utilizing wind energy.

In recent years, wind energy has become one of the most economical renewable energy technologies today, electricity generating wind turbines employ proven and tested technology, and provides a secure and sustainable energy supply. At good, windy sites, wind energy can already successfully complete with conventional energy production. Many countries have considerable wind sources, which are still untapped.

Many developing countries and emerging economies have substantial unexploited wind energy potential. In many locations, generating electricity from wind energy offers a cost- effective alternative to thermal power stations. It has a lower impact on the environment and climate, reduces dependence on fossil fuels imports and increases security of energy supply.

For many years now, developing countries and emerging economics have been faced with the challenge of meeting additional energy needs for their social and economic development with absolute energy supply structures. Overcoming supply bottlenecks through the use of fossil fuels.

At the same time there is growing pressure on emerging newly industrialized countries in particular to make a contribution to combating climate change and limit their pollutant emissions.

It is only in recent years that appreciable development of the market potential in developing countries and emerging economies has taken place.

  ISSN: 2349-7637 (Online)

The share of global wind generating capacity accounted for by Africa, Asia and latin America reached about 20% at the end of 2008, with an installed capacity of 26 GW. This is attributable above all to breth taking growth in India and China: these two countries alone are responsible for 22 GW. This proves that economic use of wind energy in developing countries and emerging economies is possible and also indicates that there is immense potential that is still unexploited.

In 1920 and 1926 Albert Betz calculated the maximum wind turbines performance, now called the "betz limit", and the optimal geometry of rotor blades.

In 1950, Professor Ullrich Hutter applied modern aerodynamics and modern fiber optics technology to the construction of rotor blades on the wind turbines in his experimental system.

Poul la cour of Denmark developed a wind turbines that generated direct current in 1958 one of his pupils names Johanness Juul developed the "Danish concept", which allowed alternating current to be fed to the grid for the first time. This concept very quickly won ever. Today, almost half of all wind turbines operate according to the principle.

In the 1985 the Danes developed small turbines with a nominal output 20 kw to 100 kw .Thanks to state subsidies, these turbines were get up on farms and on the coast to provide distributed power , with the excess power not consumed locally being fed to the power grid .

In other countries, research focused on large systems, two examples being NASA's research in the US or the German Growian project. Unfortunately, these plants turned out to be too ambitious. After only a few hundred operating hours, tests at the research facilities were discontinued.

II. METHODS AND MATERIALS

A wind turbine is a machine that converts the wind's kinetic energy into rotary mechanical energy, which is then use to do work In more advance models, the rotational energy is converted into electricity, the most versatile form of energy, by using a generator.

A wind turbine consists of three basic parts: the tower, the nacelle, and the rotor blades. The tower is either a steel lattice tower similar to electrical towers or a steel tubular tower with an inside ladder to the nacelle.

Preparing the site:

Whenever a wind farm is to be built, the roads are cute to make way for transporting parts. At each wind turbine location, the land is graded and the pad area is leveled. A concrete foundation is then laid in to the ground, following by the installation of the underground cables.

Erecting the tower:

The tower's steel parts are manufactured off site in a factory; they are usually assembled on site. The parts are bolted together before erection. And the tower is kept horizontal until placement. A crane lifts the tower into position. All bolts are lightened, and stability is tested upon completion.

Nacelle:

The fiberglass nacelle, like the tower, is manufactured off site in a factory. Unlike the tower, however, it is also put together in the factory. Its inner workings main drive shaft, gearbox, and blade pitch and, yaw controls are assembled and then mounted on to a base frame. The nacelle is then bolted around the equipment At the site, the nacelle is lifted onto the completed tower and bolted into place.

Rotary blades:

Aluminium blades are created by bolting sheets of aluminium together, while wooden blades are carved to form an aerodynamic propeller similar in cross-section to an airplane wing.

The greatest number of blades, hower, are formed from fiberglass. The manufacture of fiberglass is a pain staking operation .First, a mold that is in two halves like a clam shell, yet shaped like a blades, is prepared. Next a fiberglass-resin composite mixture is applied to the inner surfaces of the mold, which is then closed. The fiber glass mixture must them dry for several hours, while it does, an air –filled bladder within the mold helps the blade keep its shape .After the fiberglass is dry, the mold is then opened and the bladder is removed. Final preparation of the blade involves cleaning, sanding, sealing the two halves and painting.

ISSN: 2349-7637 (Online)

The blades are usually bolted onto the nacelle after it has been placed onto the tower. Because assembly is easier to accomplish on the ground, occasionally a three –pronged blade has two blades bolted onto the nacelle before it is lifted and the third blade is bolted on after the nacelle is in place.

III. RESULT AND DISCUSSION

Table-1
Relation between density and power out

Sr. No.	Medium	Density (kg//m3)	Theoretical power	Experimental power generated(kw)
1	Hydrogen	0.0832	8.212	7.49
2	Steam	0.0798	73.801	65.81
3	Nitrogen	1.159	108.496	97.32
4	Air	1.204	112.968	101.34
5	oxygen	1.326	132.450	123.45

Table-2
Relation between wind speed and power out

Sr. No.	Wind speed(m/s)	Theoretical power generated(kw)	Experimental power generated(kw)
1	8	54.532	51.25
2	12	181.433	177.8
3	16	442.356	432
4	20	856.768	821
5	24	1455.503	1422

Table:-1, shows that the when density increases that time power out increases and it is not depend on the medium.

While in case of Table:-2, shows that the when wind speed increases that time power out increases.

Due to above result, most of the wind farm stations are found in the coastal areas here wind speed is more than other are so power output is more.

IV. CONCLUSION

Obviously, the entire world needs energy and the energy demand is constantly growing. on renewable energy looks to be slowly but surely losing its dominance, and some innovative ideas in technology have really helped boosting some renewable energy sources it is last five years or so most notably solar and wind energy by using wind energy instead of conventional one based fossil fuels, you will be able to not only decrease your electricity bills but you will also help our planet recover from pollution and climate change problem.

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ISSN: 2349-7637 (Online)