



RENEWABLE ENERGY

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ABSTRACT

Recent studies shows that renewable energy such as wind and solar is an appropriate first consideration in sustainable development because apart from constructing the planet, there is no depletion of mineral resources and no direct air or wind pollution. Renewable source other than hydro notably wind and solar are diffuse, intermittent, and unreliable by nature of their occurrence. Wind is the fastest growing source of electricity in many countries and there is a lot of scope for further expansion. The rapid expansion of wind farms and solar power capacity is helped considerably by generous government – mandated grants, subsidies and other arrangements ultimately paid for by consumers .The hydrogen present in atmosphere is expected to come into great demand as a transport fuel which does not contribute to global warming. It can be used in fuel cells to produce electricity. These sources of renewable energy has unique benefits and costs.

Key words: Energy, consumer, wind, solar, fuel, global warming.

Introduction:

Renewable energy is generally defined as energy that comes from resources which are naturally replenished on a human time scale such as sun light, wind, rain, tides waves and geo thermal heat. Wind, solar and biomass are three emerging renewable sources of energy. Air flows can be used to run wind turbines. Globally the long term technical potential of wind energy is believed to be five times global energy production, or 40 times current electricity demand. The wind power is required to run wind turbines are installed at offshore which contribute 90% greater than that of land . So offshore resources contribute substantially more energy than land sanctioned turbines. Solar energy radiant energy and heat from the sun, is harnessed using a range of ever evolving technologies such as solar heating photo voltaic cells, concentrated solar power, solar architecture and artificial photo synthesis{1 2}. Solar technologies are broadly characterized as passive solar or active solar depending on the way they capture and convert and distribute solar energy.

Passive solar techniques include orienting a building to the sun, selecting materials with favourable thermal mass or light dispersing properties and designing spaces that naturally circulate air. Active solar technologies encompass solar thermal energy, using solar collectors for



heating and solar power, converting sun light into electricity either directly using photo voltaic cells [PV], or indirectly using concentrated solar power [CSP]. A photo voltaic system converts light in to direct current [D.C] by taking the advantage of photo electric effect{3}. Solar PV has turned in to a multi billion fast growing industry, continues to improve its cost effectiveness, and most potential of any renewable technology{4 5}.PV systems range from small, residential and commercial roof or building integrated installations, to large utility-scale solar plants. The predominant PV technology is crystalline silicon, while thin film solar cell technology accounts for about 10 percent of global photovoltaic deployment. At the end of 2013 world wide PV capacity reached 139000 MW. PV grew fastest in China followed by japan and U.S.A. Germany remains the worlds largest over all producer of PV power.

Materials and methods:

Concentrated solar power systems use lenses or mirrors and tracking systems to focus a large area of sun light into a smaller beam. Commercial concentrated solar power plants were first developed in 1980s. In 2011 the International Energy Agency said that the development of affordable, inexhaustible and clean solar energy technologies will have huge long term benefits. It will increase countries energy security through reliance or any indigeneous, inexhaustible and mostly import independent resource, enhance sustainability reduce pollution, lower the development should be considered learning investments, they must be wisely spent and need to be widely shared{3}. Geo thermally energy is from thermal energy generated and stored in the earth. Thermal energy is the energy that determines the temperature of matter. Earth geo thermal energy originates from the original formation of the planet and from radioactive decay of temperature of matter. The thermal gradient which is the difference between the core of the planet and its surface, drives a continue conduction of thermal energy in the form of heat from the core of the surface. The heat that is used for geothermal energy can be from deep with in the earth, all the way down to earths core 6400 kilo meters down. At the core the temperature may reach over 500 degree centigrade. At the core heat conducts to surrounding rock.

Extremely high temperature and pressure causes some rock to melt, which is commonly known as MAGMA. Magma convects upward since it is lighter than the solid rock. This magma then heats the rock and water in crust, some times up to 371 degree centigrade{6}.From hot springs, geo thermal energy has been used for bathing since Paleolithic times and for



space heating since ancient Roman times, but it is now better known for electricity generation.

Reults and Discussions:

We can see solar power plants 150MW Andasol power station in Andalusia, Spain and Mojave desert, California U.S.A. Photo voltaic and solar thermal plants may meet most of the worlds demand for electricity by 2060. Renewable energy is also the most economic solution for new grid connected capacity in areas with good resources. As the cost of the renewable power falls the scope of economically viable applications increases. As of 2012 the ALTA WIND ENERGY Center California 1022MW is the worlds largest wind farm. The United Kingdom is the worlds largest leading generator offshore wind farm 500MW followed by Denmark. The London array 630MW is the largest offshore windfarm in the world. Nearly 83 countries around the world are using wind power on commercial basis{7}. The oldest solar thermal plant is the 354MW SEGS thermal power plant in California. U.S.A.

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