e-ISSN : 2347 - 9671, p- ISSN : 2349 - 0187
EPRA International Journal of Economic and Business Review | Vol - 4, Issue- 1, January 2016
Inno Space (SJIF) Impact Factor : 4.618(Morocco) ISI Impact Factor : 1.259 (Dubai, UAE)

ECO –FRIENDLY TECHNOLOGY IN ENERGY PRODUCTION

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ABSTRACT

Eco- friendly technology means, which does not destroy the environment, can be used in number of ways, does not generate any pollution in the form of smoke or sewage. The material used in this technology is renewable and no waste is generated. Today the fossil fuel is the major source of energy and such fuels are the major sources of pollution.Morover, they are not renewable sources. Many sources as hydro power, wind power, solar poewer, tidal power, geothermal power and bio gas can be used as the sources of energy without generating environmental pollution. Solar enegery is one of the best energies which can be used by installing collector. It is helpful for air conditioning, power generation and industrial purposes. Hydrogen fuel cell is a device in which chemical reaction is converted into electricity. In such device anode (+ve) and cathode (-ve) in the circuit they are separated by electrolyte. In this cell hydrogen is supplied to the anode and oxygen to the cathode. When electron move from anode to cathode, there is the generation of electric current takes place that can be trapped to provide energy . Nanotechnology is the use and creation of devices that fall in the range of 1to 100 nanometers (nm).Some devices have already been made and used like catalytic converters in automobiles that remove air pollutants. Several devices that read from the hard disk are fitted in the computer. Our resources are fast depleting as a result of increasing industrialization, non equitable distribution and growing population. The pressure is being exerted on the environment resulting into environmental degradation; hence, we need sustainable use of resources.

KEYWORDS: *Eco- friendly, Nanotechnology, environmental degradation, energy, Electricity.*

INTRODUCTION

Technology grows with civilization, with the increase of industrialization as well as growth of population, damage to environment is also increased, and there fore it is necessary to develop such type of technology which does not damage the environment. Such a technology is called eco- friendly technology. Many renewable sources of energy like hydro power, wind power, bio-gas, solar power, tidal power, geo thermal power and natural gas etc. such sources of energy are very useful for the production of energy because they do not produce any environmental pollution. The material used in this technology is renewable and no waste is generated. Solar energy is one of the best energies which can be used by installing collector. It is helpful for air conditioning, power generation and industrial purposes. Solar energy is one of the best energies which can be used by installing collector. It is helpful for air conditioning, power generation and industrial purposes. Use of Compressed Natural Gas (CNG) is a very important alternative of the diesel. Nanotechnology is the use and creation of devices that

fall in the range of 1to 100 nanometers (nm).Some devices have already been made and used like catalytic converters in automobiles that remove air pollutants. Several devices that read from the hard disk are fitted in the computer. Our resources are fast depleting as a result of increasing industrialization, non equitable distribution and growing population. The pressure is being exerted on the environment resulting into environmental degradation; hence, we need sustainable use of resources.

TECHNOLOGIES

SOLAR ENERGY –Solar radiation ,which are received on the earth,having92% in the range315nm to 1400nm.45% of this radiation is present in visible regioni.e.400to 700nm.The earth absorbs radiation mainly in the visible region and emits radiation in the infra-red region(2μ to40μ,with maximum at10μ).The solar flux on the upper atmosphere of the earth which is obtained is observed approx 1400 watts m^{-2} min^{-1}.The heat equivalent of the solar radiation arriving on the earth is calculated to be about2.86x10^{14}Joules per year. Solar energy's the main source is the thermo nuclear fusion reactions which are occurring on the sun core. Solar energy is very useful for the living things on the earth, being non polluting and non –depletable, which is used in phoyosnthsis.Inthe way of photosynyhsis,it is the source of energy for all the eco systems in the nature. It is the renewable energy and by this way fits into the principle of sustainability.Approx 0.2 to 0.5% of solar energy reaching the earth is used in photosynthesis. Thus a small percentage of the solar energy reaching the earth could sustainably supply the energy requires of human societies with out altering the biosphere in any way. Economically feasible solar energy can be collected over large areas which can be converted into other forms that can be conveniently transported, stored and applied in existing equipment. Recently advanced technologies have reached to solve the problem of use of solar energy. Solar energy is an economically feasible and sustainable energy source.

Technologies for the use of solar energy:-

Space heating and Water –heating:-Solar energy is most useful for giving low temperature heat. The basic principle is that sunlight falls on any black surface is readily absorbed and converted to heat in the desired temperature range. A simple flat- plate collector is sufficient. There are several designs of flate-plate collectors but allof them basically consist of a black surface covered by a clear plastic or glass"window".The black surface absorbs sunlight and converts it to heat,and the window prevents the heat from escaping out. Air can be heated by passing it between the window and the black surface whereas water heating can bb done by passing through tubes embedded in the surface. Thus, minimum cost is involved in collecting and converting solar energy to heat. Cyprus is the world's largest solar energy user, 90% of the homes and several hotels and apartment buildings have solar water heaters.

Production of electricity by solar energy:-

Photovoltaic cells-A typical solar cell consists of two very thin layers of material. The lower layer has atoms with single electrons in the outer orbital. Which are easily lost..The upper layer has atoms lacking one electron from their outer orbital and hence can readily gain electrons. The kinetic energy of light striking this SANDWICH dislodges electrons from the lower layer, which are trapped into upper layer, thus generating an electric potential between the two layers. This potential gives the electric current through the rest of the circuit, which connects the upper side through a motor or other electrical device back to lower side. Thus without moving any part, solar cells convert light energy directly to electrical power, in which current life span is approx20 years because it is affected by weather.

Hydroelectric Energy-It is most common; nonpolluting commercial source of energy. Electricity is generated by turbines that run with the help of falling water. In U.S. About 300 large dams generate 9.5 of its total electrical power production.

OTEC- it is known as ocean thermal energy conversion. It is found that in the tropical oceans there is temperature difference of the surface water (28°C-30) and deep water (5 at the depth of 800-1000m).The difference can be used to generate electricity. At present 1mw plant is operating in the area of Lakshadweep islands.

Wave Energy-Although it is looking very small source for the generation of electricity but it is non exhaustible resource. In which a platform with sloping ramp collection basins and low head turbines is required to convert wave power into electricity. A commercial wave powered plant is working near Bergen, Norway.

Tidal-Power-Scientists have drawn the conclusion that the tidal energy is eternal and pollution –free. Tides moving into narrow areas like estuaries are suitable for power generation. Dual flow turbines can produce electricity both during rising and receding tide. The incoming tide flowing through the turbines generates power as soon as the tide shift; the blades may be reversed so that that out flowing water continues to generate power. Commercial tidal power plants are already operating at the mouth of the river a Rance in Brittany (France) and Bay of Fundy (Canada). In India, there is an also important

place for tidal plants which are Gulf of Kutch, Gulf of Cambay and Sunderbans.A Tidal power plant is operating in Gulf of Kutch

Wind power-wind power is a non-polluting, renewable and hence sustainable source of energy. Wind turbines, which are machines having the blade diameter of about 17 m which can generate about100 kilowatts, their blades are working on the old concept of airplane type propeller blades turning a generator geared to the shaft. "Wind farms" having rows of several thousand of such machines, which are producing power in many countries in the world. California is the largest producer of wind generated power where more than 17,000 wind turbines are operating they are generating moerthan 1500 megawatts electricity..European countries like Britain, Netherlands, Germany, Italy and Denmark are cmbindly generating wind power more than3.000 megawatts. Now approx 95 countries right from tropics to the Arctic have installed power-generating wind turbine. Asia's largest wind mill complex is located at Lamba (Gujarat), generating 28 megawatts .Total energy available in costal areas from wind mills is 350mw.

Geothermal Energy –It is obtained from either hot rocks or from water trapped in hot rocks present in the earth. The trapped water is changed into steam which comes out at certain places as hot springs. India has 340 locations with hydrothermal energy. Already a 05 k w geothermal power plant is operating at Manikaran, H.P.The oldest geothermal electrical plant is operating at Larderrelo in Italy.

Nuclear Energy-Nuclear energy is produced by nuclear fission aswellas nuclear fusion reaction in which heat is generated .Heat energy is converted into electricity. Such reactions take place in nuclear reactor. One kilogram uranium liberates an energy equivalent to 35000kg of coal. In France73% of the commercial energy is provided by nuclear reactor but in INDIA ONLY 1%.

Hydrogen Fuel Cell-It is a device in which chemical energy is converted into electricity it consists of positive end of circuit i.e. Anode and negative end i.e.Cathod.Both are separated by electrolyte(HCl).Hydrogen is supplied to the anode and oxygen to the cathode. When electron move from anode to cathode they generate current that can be trapped to provide energy.

Gas to liquid fuel Technology-Technology to convert gas into liquid has already been developed and holds a promising future because natural gas can be converted into liquid fuels. Use of **compressed Natural Gas (CNG)** is very important alternative of the diesel. In Delhi the government has made it compulsory to use CNG for auto rickshaws and buses. Liquid bio – fuels like bio disealsandbio –ethanol is the perfect substitutes to conventional petrol and diesel. Technology to develop such fuels has already been developed and effective steps are needed to promote the production of such fuels. Use of alcohol as fuel is being vehemently in some grain-growing regions of developed countries such as U.S. Alcohol is produced by fermentation of grains, starches, sugar or similar food products.

Biogas (Gobar gas)-Biogas is produced as a by-product of anaerobic break down and fermentation of biomass**.** Biogas is mainly having 50-70% methane and30-40% carbon dioxide with traces of hydrogen and hydrogen supplied In china, millions of small farmers maintain a simple digester in the form of seald pit into which they put agricultural waste. Anaerobic digestion of sewage sludge and animal manure is a biomass utilizing method which creates a valuable synergism between recycling and energy production. The biogas is better alternative for domestic fuel.

Nanotechnology is the use and creation of devices that fall in the range of 1to 100 nanometers (nm).Some devices have already been made and used like catalytic converters in automobiles that remove air pollutants. Several devices that read from the hard disk are fitted in the computer.

CONCLUSION

A big step towards controlling pollution is the use of alternatives of those things that cause pollution. These alternatives replace the thing that is causing pollution .Renewable sources of energy are the alternatives of fossil fuels. Use of compressed Natural Gas (CNG) is a very important alternative of the diesel. If our energy use is continues to grow with the growth of the population as in the past, it will be difficult to keep pace with the growing power demands even with massive installation of solar and other alternative energy sources. Our resources are fast depleting as a result of increasing industrialization, non equitable distribution and growing population. The pressure is being exerted on the environment resulting into environmental degradation; hence, we need sustainable use of resources.

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