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RENEWABLE ENERGY: A HOBSON'S CHOICE FOR SUSTAINABLE DEVELOPMENT

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Abstract

On account of indiscriminate uses, the conventional sources of energy or fossil fuels are on the verge of depletion. Even if it remains available with us we cannot afford to use them further as they are solely responsible for bringing out abrupt climate change, global warming and hazardous pollution. Such sudden changes in the environment have started to adversely affect human beings and all kinds of species. They are honest and sincere enough to treat the haves and have-nots alike. We have started to face its disastrous and dire consequences and it is the right time to look for alternative and renewable sources of energy before the crisis for us further deepens. It is true that we have taken a long stride in all walks of life but at the same time we cannot ignore the fact that we achieved them at the cost of compromising with sustainability. It is such a burning issue which demands attention of every individual and we need to exert a concerted effort to combat this ecological terror all set to ambush us. For sustainable development, the world has remained with no option other than seeking the shelter of renewable energy. As a responsible citizen of this world, every one of us needs to ensure a clean environment and hand over the same thing to our posterity. The present article shall discuss how renewable energy has become indispensable for sustainable development. In the course of debate and discussion, we shall focus on various sources of renewable energy and various advantages and disadvantages pertaining to its production and optimum utilization.

Keywords: Alternative and Renewable Energy, Fossil Fuels, Climate Change, Global Wwarming, Sustainable Development.

Jel Codes: Q0, Q3, Q4, Q5

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1. INTRODUCTION

Human lives now have totally been based on science and technology and thus we become synonymous with electricity and without its availability our survival remains at stake. Gone are the days when its presence was deemed as a sign of luxury and aristocracy, now it is everything to us – part and parcel of our day to day lives. We can't afford to spend a single day without it. Our dependence on its availability is to such a great extent that sometimes it seems we become slaves to our own inventions.

The uses of coal, oil and gas are called fossil fuels. They are known as non-renewable resources of energy because they cannot be reutilized and recycled. It requires a thousand years to form. Moreover, when fossil fuels are used to produce electricity and other kinds of various energies, they emit a huge amount of harmful greenhouse gases, such as carbon dioxide, methane and nitrous oxide. These harmful and toxic greenhouse gases are responsible for bringing out phenomenal change and deterioration in environment and ecology. Consequently we face the predicaments arising out of climate change and global warming. To get a sigh of relief from the tyranny of global warming we are bound to look for some alternative sources of energy which may be capable of keeping equilibrium between development and environment. Such urgent requirements justify the well said proverb, "Necessity is the mother of invention." Thus the need for some sorts of renewable energy is felt. The energy based on the bountiful blessings bestowed by nature and that too without her own chastity being compromised. Renewable energy is nothing but the energy that is achieved through the use of natural resources. In all this process the natural resources play the same role as catalysts play in the chemical reactions. It facilitates production of energy and in this production process, itself remains undiminished and non-depleted.

2. SOURCES OF RENEWABLE ENERGY

There are several sources of renewable energy. Here we shall discuss six major and popular sources for generating renewable energy. They are solar energy, wind energy, biomass energy, geothermal energy, hydropower energy and hydrogen. Now we shall debate them one by one:

2.1.Solar Energy: This is the most popular form of renewable energy. As the name implies, this energy is directly achieved from the sun. To generate this energy solar panels are brought into application. These panels remain coated with semiconductor material named silicon. Solar panels are also known as photovoltaic or PV panels and they are made to last for more than twenty five years. It works on the principle of photovoltaic effect which asserts that some specific materials generate a voltage or electricity when they are exposed to radiant energy or light. Solar energy has multiple uses but the commonest use is to generate electricity. It is one of the cheapest and easily available sources of renewable energy.

2.2.Wind Energy: It is another cheapest form of renewable energy. Wind is readily available in the environment in the free and clean form. Wind energy is created through wind turbines which rotate under the influence of wind, thus wind as energy is first converted into mechanical energy and this mechanical energy is finally converted into electrical energy.

2.3.Biomass Energy: It is another source of renewable energy as it uses various kinds of wastes to convert them into energy. Solid waste, landfill gas, alcohol fuels, wood and agricultural products are

some of the ingredients used as raw materials for producing biomass energy. Biomass is burnt in a boiler which produces steam of high-pressure. This high-pressure steam flows over turbine blades which in turn rotate and create mechanical energy. Again this mechanical energy is further converted into electrical energy.

2.4.Geothermal Energy: Heat continuously keeps on generating inside the core of the earth. This feature of nature is utilized to generate heat and electrical energy. The steam collected in this process is used to drive the turbine blades of geothermal power plants. Thus steam energy is converted into mechanical energy which is ultimately converted into electrical energy.

2.5.Hydropower Energy: It is one of the largest and oldest sources of renewable energy. The natural flow and force of a fast running and free falling stream is used to produce electrical energy. Reservoirs and dams of different capacities are built to control the momentum of the stream in the required amount and to cater the needs of generating the desired electrical energy. Again this force of stream is used to run the turbines which become potent enough to produce electrical energy.

2.6.Hydrogen: The most abundant element available on our planet is hydrogen and its two-thirds are found in the form of water. It can be preferred because if we separate hydrogen from water, it can be used as a fuel free from carbon. This separation can be achieved through electrolysis - the process in which electricity is used to split water into hydrogen and oxygen.

3. RENEWABLE ENERGY: ADVANTAGES

The most significant advantage of renewable energy is that it is congenial for both living beings and the environment. Non-renewable energy, which is predominantly fossil fuels, poses a threat of unbearable pollution and environmental hazards like acid rain, climate change, global warming, etc. Main feature of renewable energy is that it is produced from natural sources. Therefore, it is a greener and cleaner form of energy. It generates a minimum quantity of secondary waste. Unlike non-renewable sources of energy there is hardly any carbon emission in its generation. Thus it poses hardly any harm to the environment. Moreover it reduces dependency on importing of high priced fuels.

It is found in unlimited quantities on the earth. It is relatively more reliable and easily available than other forms of energy. It is produced through the use of such natural resources like sun, wind, water etc. which replenish and restore at higher speed than they are consumed.

The building of new nuclear and coal power plants requires more investment of money and resources than that of renewable energy installations. Consequently electricity through renewable sources is relatively cheaper. Once electricity is available at cheaper rates it ultimately reduces production cost of several products and thus profit margins are significantly improved.

It can reduce dependency on the power grid or any third party. Using natural sources like the sun we can install our own solar panels within our own premises and thereby we can meet our own energy

demands and sell the extra unit of energy to the grid as well. We can achieve such a great feat with one time and little investment.

4. RENEWABLE ENERGY: DISADVANTAGES

Before we should look for disadvantages, here it would be very pertinent to cite a quotation from Laurell K. Hamilton's novel, "Incubus Dreams (2004)": "They say there is no light without dark, no good without evil, no male without female, no right without wrong. That nothing can exist if it's direct opposite does not also exist." It is true that several benefits and advantages are linked with alternative energy sources but at the same time we cannot ignore the disadvantages associated with renewable energy. Let us have a look at them:

For generation of renewable energy we need a choosy and peculiar location. For example, solar energy cannot be harnessed in the locations dominated by cold, rain and snow.

It is not feasible to ensure renewable energy round the clock. Its generation strictly depends on the existing weather conditions. For example in case of bad weather conditions, rainy seasons and in the absence of the sun, generation of solar energy will be affected.

The efficiency of renewable energy with respect to traditional or conventional sources is relatively low. The efficiency of renewable energy is almost fifty percent lower than that of non-renewable energy. Moreover we have more sources of renewable energy than that of conventional sources of energy. As a result, for every source we need to apply a peculiar device and technology for its production.

The requirement of huge space for production of renewable energy is another matter of great concern. It demands more spaces with respect to the space required for the installation of non-renewable sources of energy.

Though generation of renewable energy is based on the natural resources but their storing, transmitting and application requires such auxiliary devices which may defunct after some use and becomes a permanent waste whose disposal and recycling may emit pollution.

When we consider the quantum of renewable energy generated and the cost involved in it, it brings about big disappointment in terms of budget. The initial cost required for production of renewable energy is certainly high and matters of great concern for any form of firm and establishment.

5. RENEWABLE ENERGY: PRESENT & FUTURE

Fossil fuels are available with us in limited quantities. With the passing of everyday, we are running through a risk of its shortage and utter depletion. Because of high demands and poor availability, their prices keep on soaring every now and then. Moreover, by now, in this article itself we are well aware of

the various climatic and environmental threat uses of non-renewable sources of energy pose to us. These threats themselves are capable enough to raise a sign of caution against continuous and further uses of fossil fuels. So we are in the dire need of promoting renewable energy not only at the present but also for the future uses. The data revealed by the website of the United Nations can certainly provide some solace and a glimpse of optimism: “Cheap electricity from renewable sources could provide 65 percent of the world's total electricity supply by 2030. It could decarbonize 90 percent of the power sector by 2050, massively cutting carbon emissions and helping to mitigate climate change.” Thus we can safely promulgate that renewable energy has a future and the future is going to be of renewable energy.

CONCLUSION

Life without electricity is blank and bald. The population of the world is not only increasing, rather we can say it is exploding. The requirement of energy is proportionately galloping. We need to have a fine balance between nature and sustainable development. We need to think not only for ourselves but also for the well being of our offspring and succeeding generations. Seeing the ongoing global warming and climate change we cannot afford to continue with fossil fuels. The impending predicaments do not permit complacency of any kind or degree. We need to take a pledge of promoting and adopting renewable energy which has multi fold benefits. In this era of population explosion and unemployment crisis, it can open a fresh opportunity for employment also. Renewable energy has become indispensable not only for sustainable development but also for our sound health and survival.

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