AJES
ASIAN JOURNAL OF ENVIRONMENTAL SCIENCE ■ VOLUME 7 | ISSUE 2 | DECEMBER, 2012 | 245-250

A CASE STUDY

Green energy sources for sustainable development and environmental protection

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Article Chronicle :
***Received* :**
08.06.2012;
***Accepted* :**
02.09.2012

SUMMARY: The consumption of energy has been increasing rapidly and in fact almost exponentially since the Industrial Revolution. This increasing trend of energy consumption has been accelerated by improvements in the quality of life, which almost directly relates to the amount of energy consumption as a result of the industrialization of developing nations and the population increase in the world. To meet the growing demand of energy, there is at present the pressing need of alternative sources of energy in order to give the solution to the present-day problems with the fossil fuels. The target is then to explore such energy system or systems that have no negative environmental, economic and societal impacts, which we mostly refer to as "green energy". The sources of green energy include the energy from sun, wind, biomass, geothermal, hydropower system etc. which will provide an important attribute for sustainable development. This is because attaining sustainable development requires the use of energy resources and technologies that do not have adverse environmental, economic and societal impact. This article explains the practical relevance of deriving the energy from sources like ethanol, methanol, biodiesel, hydrogen energy, solar energy. Electric power can also be generated from solar energy; wind energy etc. This generated electric power can be used for running of the industries, hotels, restaurants, household activities etc. Water heaters, calculators etc. utilize solar energy for its function. So, within the near future, the sources of green energy need to slowly replace the usage of fossil fuels. Increasing the utilization of the sources of green energy to a maximum extent will benefit the mankind. In view of this, an attempt is made to study the applicability of these green energies in our day-to-day life for sustainable development and environmental protection. This article focuses in this direction.

HOW TO CITE THIS ARTICLE : Ghosal, M.K. and Das, R.K. (2012). Green energy sources for sustainable development and environmental protection. *Asian J. Environ. Sci.,* **7**(2): 245-250.

Key Words :
Green energy source, Environmental protection, Sustainable development

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Energy has become the prime commodity in modern civilization and the amount of energy consumption has become the indicator for the standard of living of a nation. It has long been recognized that the excessive use of energy has the adverse impact on the environment, economy, and society, from local air and water pollution to the threat of global warming (the mean temperature increase around the globe) and climate variability (the temperature fluctuations around the mean) and from the economic difficulties arising out of the rapid increase and swings in energy prices. The sustainable development of humanity and the economy with the security of energy has at present topped national agendas around the world. It is imperative to develop energy strategies, policies, and technologies to achieve this objective through an energy system(s) that have no observable (or net) negative impact on environment, economy, and society and such energy systems are being referred to as green energy (systems). At present, most of the energy requirement worldwide is met by the combustion of fossil fuels (*i.e.*, coal, petroleum oils, natural gas, etc. (IEA, 2007), which has become an essential and integral part of modern civilization, being increasingly relied upon since the industrial revolution. Only a very small proportion of the energy comes from nuclear and hydro-power and