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Editor Note: Renewable Energy Sources

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Editorial

Sun is direct source of all renewable energy sources. It provides clean and environmentally friendly energy. It can be used to produce (a) thermal energy and (b) electrical energy. Further sun is also indirect source of other non-renewable energy sources. Solar energy is in the form of electromagnetic wave having wavelength range from 0.26 μm -2.60 μm. These wavelength range forms the short wavelength contains UV to infrared. The visible wave length between 0.26 μm - 2.60 μm contains photons responsible for photosynthesis of all plant on planet earth for biomass production as well as DC electricity by semiconductor. The photons produce biomass through light and dark reaction and hence bio-power by different cycle. Electromagnetic wave radiation falling on (i) ocean' surface produces ocean thermal energy conversion (OTEC), and (ii) on earth produces wind energy. Thermal energy available on the earth is responsible to defreeze frozen water on the earth for growth of bacteria through global greenhouse effect. Thus the living organism exists on the earth. One can say that there exists conservation of living organism of all species in the universe like conservation of energy and mass.

The motion of earth and moon around sun is responsible to create waves and tides in ocean in the form of kinetic energy which is converted in to mechanical energy and hence electrical power also a renewable source of energy sources.

It has been reported in literature that mass production crystalline solar cell based photovoltaic module (PV) can have maximum efficiency of about 20% under standard test condition. The remaining energy is lost to atmosphere. If the remaining thermal energy associated with PV module can be re-utilized by withdrawing thermal energy from PV module then one can have two advantages namely (i) increase in electrical efficiency of PV module and (ii) availability of additional thermal energy. Such system is known as photovoltaic thermal (PVT) system and economics of PVT system becomes more reliable.

Due to global industrialization particularly after Second World War (WR-II), there is significant increase in CO_2 concentration from 270 ppm to 450 ppm. It is due to using polluting fossil fuel (non-renewable energy sources) in from of solid, liquid and gases available inside the earth for power production. It has challenged the existence of human being and the living plants. If it is not controlled in time, then survival of human being including living organism will face dangerous situation in coming years. In order to balance the ecological system for clean air, water and food, one should prefer less polluting renewable energy sources to meet the energy demand of human being across developed, developing and under developing countries.

Energy consumption per capita is one of major components for definition of developed nation. So to increase energy consumption per capita, there is strong need to use local renewable energy sources locally to meet the energy demand locally. Also it proves to be economical with employment generation. This reduces the migration of citizen from one region to other region. It also helps to sustain climate change by mitigating CO_2 in atmosphere which is responsible for good health

It is important to mention that there is mitigation of 2 kg of CO_2 by using 1kWh energy from renewable energy sources. By knowing mitigation of CO_2 in kg, one can calculate CO_2 credit and then subsidy from respective Government can be earned. The both CO_2 credit and subsidy from Government can be used for economic analysis of the renewable energy sources.

I appeal to all my colleagues and students working in the area of renewable energy sources to publish their research paper, technical note, review, case studies and state of arts in Journal of Fundamentals of Renewable Energy and Applications.

Best of luck to all readers and researchers in area of Renewable Energy Sources

(G N Tiwari)