

Renewable Energy and Sustainability

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The term sustainability was first advanced in 1980 by the International Union for Conservation of Nature and Natural Resources (IUCN). In 1987 the 'Brundtland Report' (the report of the United Nations Commission on Environment and Development) established the concept of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 8). Examining the major environmental problems facing the world, the Brundtland Report established the framework under which the twin requirements of environmental protection and economic development could be integrated. Sustainable development rapidly became the key principle underpinning official environmental policy at both national and international levels.

Environmental protection has become a major issue in the past two decades and is very much connected with the increase of the standard of living, especially in the developed world. The increase of the production of consumer goods has led to the big increase in the use of energy. As the world economy expands in order to meet the aspirations of the developing countries the demand of energy increases even more.

Most of the environmental problems that concern us today, such as atmospheric pollution, acid rain, etc., are directly or indirectly related to the transformation of energy. Most of the energy used, either in the production of electricity or in transportation sector, comes from hydrocarbons, a non renewable physical resource. The combustion of these energy sources contribute to the release of carbon dioxide and other harmful gases to the atmosphere, which lead to the so called greenhouse effect. The greenhouse effect represents a great threat to the climate in the planet earth and is responsible for the disastrous effects the climatic change will bring to humanity.

One way to reduce the environmental impacts of all these harmful gases, besides the implementation of energy savings procedures, is the use of renewable energy sources (RES). RES include solar energy, wind energy, geothermal energy, biomass, hydropower, and ocean energy. The use of RES for the production of electricity is being widely applied today, but it has a drawback when it comes to the economic cost as compared to conventional energy sources. However, due to the growing demand, the advancement of renewable energy technology can lead to prices lower than that of the conventional energy sources. By the middle of the 21st century RES could account for more than 60% of the world's electricity market and more than 40% of the market of direct use fuels.

The objective of this special issue on "Renewable Energy and Sustainability" is to bring forward papers related to all aspects of RES use, from technological to economic and social.