

Book Review: Non-Conventional Energy Resources

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The book entitled, "Non-Conventional Energy Resources" by S. Hasan Saeed and D.K. Sharma is specially intended to serve as a text book for the students of B.Tech., U.P. Technical University, Lucknow. A successful effort has been made to compile this book as per syllabus. The language is simple, the style is engrossing and the cost is affordable. The book is a modest attempt to explore the dynamics of non-conventional energy resources. It gives an exhaustive account of non-conventional energy resources and presents them in a systematic and organized manner.

Fossil fuels are the main conventional source of energy. Every country fulfills its energy requirements from these fuels. However, it is a well-known fact that the fossil fuels are depleting fast and will get exhausted very soon. It will increase dependence on oil rich nations. Moreover, burning of fossil fuels leads to environmental pollution. Global warming and acid rain are some of the destructive effects of pollution. The situation has compelled us to look for alternative energy sources, which should not only be sustainable but also eco-friendly. Over the years, non-conventional energy resources have assumed greater significance and have acquired a pre-eminent position in recent times. The renewable energy resources like solar, wind, tidal, ocean thermal, biomass, geothermal etc. come under the heading of non-conventional energy resources. Utilizing these energy resources can fulfill high-energy demands.

The present book deals with the basic concepts and technologies related to non-conventional energy sources. The book is divided into twelve chapters. The introductory part presents an overview of different forms of energy and their resources. The available conventional energy resources such as wood, coal and natural gas are discussed. In this chapter, various non-conventional energy resources are briefly introduced. Chapter two is devoted to geothermal energy. It is the energy, which lies embedded within the earth's crust. Therefore, in the beginning of chapter internal structure of earth is discussed. Good statistical data and schematic diagrams support the analysis of resources of geothermal energy. The environmental effects of this renewable energy resource are also being presented.

In chapter three, solar cells are discussed. Theoretical importance, characteristics and other aspects of solar cells are adequately explored. Presently, two technologies are being used for conversion of solar energy into electrical energy- solar thermal energy and solar photovoltaic. Chapters four and five are devoted to these two topics. Extensive use of schematic sketches and statistical data make the reading interesting. Without any doubt the sun is a very large and inexhaustible source of energy. However, the problem associated with the use of solar energy is that its availability varies with time because of which it requires storage or a combination with other energy sources. A detailed exploration of solar energy storage system is required. Measurement of solar radiation is an important aspect related to solar energy.

The instruments used for measurement of solar radiation must also be included in chapter four.

Chapter six is devoted to magneto hydrodynamics (MHD) systems. Material selection for MHD generator is also an important topic. Special treatment of this topic is required. Chapter seven is worth reading as it explores new technology of a fuel cell. In principle, a fuel cell operates like a battery. But unlike a battery, it does not run down or require recharging. It provides electrical energy as long as fuel is supplied. Their emissions are virtually zero. They find wide applications from space craft to automobiles and from power tools to cellular phones. Although the book is written keeping undergraduate students in mind, an introduction to fuel cell vehicles will make this topic little more enjoyable and exciting.

Chapter eight covers the thermo-electrical and thermionic conversions. Related concepts and principles are explained with sufficient mathematical equations. Chapter nine focuses on wind energy. An exhaustive exposition of the basic wind energy power generation is carried out well, which is sufficient for U.G. students. This energy source is similar to solar energy, in that it is not dependable. It is an intermittent source of energy. For continuity of energy supply, it should be used in conjunction with other methods of power generation. This chapter deals with combined power plants, which make this topic more interesting.

Chapter ten discusses energy derived from biomass. More attention is paid to biogas while other useful forms of energy derived from biomass are totally neglected. In chapter eleven and twelve, different energy forms from the oceans are described in the following order, ocean thermal energy conversion, wave energy and tidal energy. Use of schematic diagrams makes reading more interesting and self-explanatory.

There are some printing mistakes and unlabelled figures, which need to be corrected in the next edition. These proof reading mistakes should be rectified in next edition. Moreover, the prospects of these energy sources in Indian context should also have been adequately highlighted. The quality of the book is largely determined by the quality of references. The books and research papers from which various data and figures are taken must also be mentioned. In Appendix, photographs of some solar powered systems are given. Though the quality of the pictures is not very good, still they are informative.

The book on the whole is a good contribution to the existing literature in the field of energy studies, marked by lucidity and comprehensiveness supported by appropriate figures, tables and statistical data. It would prove useful to undergraduate students.

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