<<非传统能源>>

图书基本信息

书名：<<非传统能源>>

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作者：卡恩

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前言

Energy has become an important and one of the basic infrastructures for economicdevelopment of a country. Energy security is, therefore, imperative for sustained growthof economy. The oil crisis of 1973 and concern for environment due to excessive use offossil fuels have led to remarkable global efforts in harnessing alternative energy resources.The renewable energy resources such as the sun, wind, biomass and geothermal heatare environment friendly and perennial in nature. These resources are also referred asnon-conventional energy resources as, at present, their large-scale use is not common.Harnessing of energy through these resources using efficient technologies is expected toplay an important role in serving as clean energy sources for mankind. Thus, processesto harness these are steadily gaining technical and economic importance worldwide. Mostgovernments have substantial plans directed towards encouraging these technologies inorder to develop them commercially. As we had hoped and wished initially, the developmentof these technologies have not been dramatic. They have yet to achieve the cost-benefitratio possible with conventional fuels and are not likely to replace fossil fuels in the nearfuture. Nevertheless, they have come to play a very important supportive role in additionto conventional sources. Therefore, it is necessary for energy planners / users to knowthe virtues as well as limitations of these technologies. The present book is an effort t,,explore these technologies in a balanced perspective.Being a relatively recent field, the subject matter is scattered in specialized researchjournals and a few books of advanced levels are devoted exclusively to a particulartechnology. There is, however, scarcity of publications that introduce all these technologiesin a single volume to a beginner. Therefore, a natural consequence of the current volumewill be a much-needed and relatively inexpensive textbook at an undergraduate level, Whileteaching a course on non-conventional energy to undergraduate engineering students, theauthor himself felt this need, which encouraged him to write the present book.Human-resource development in the area of energy, in general, and in new andrenewable sources of energy, in particular, has been neglected all over the world, and moreso in developing countries. Therefore, the book is primarily intended to serve as textbookfor undergraduate-level courses for engineering and science students. It stresses scientificunderstanding, analysis and applications of non-conventional energy technologies. Manypracticing engineers and scientists may not have a formal exposure to this area and may beinterested to have a general training of these technologies. Therefore, the book is orientedto cover both basic study and its widespread applications. It describes the fundamentalphysical processes governing various non-conventional energy technologies and theirapplications. The book may also serve to create awareness among energy planners, policymakers and users at large about these technologies in general. Because of the spread ofdisciplines involved, it is not possible to discuss each of them exhaustively in a singlebook. Therefore, only relevant background up to a depth essential to understand the basicprin_ciples has been included.

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内容概要

《非传统能源》（Non-Conventional Energy Resources）一书的内容非常丰富，也比较有特色。
从内容上讲，该书不仅包含了太阳能、风能、生物质能、地热能、海洋能、水能等可再生能源，而且对各种新型的能源利用技术，包括燃料电池、氢能、磁流体发电、热电堆发电等进行了介绍，同时还对财务和经济评价方法进行了较详细的说明。
这与国内一些院校为本科生开设的课程“可再生能源及其利用技术”或类似的课程时，也将财务和经济评价的内容包括在内的情况不谋而合。
这说明对于这些非传统能源，经济评价已经是相当重要的一个方面。
而对于每种主要的能源形式，该书都从基本理论、主要利用技术、环境特性、发展应用现状等方面进行了详细的介绍。
如果作为教材或教学参考书，建议教师能够再在技术经济性方面做些补充，教学内容会更加全面。
《非传统能源（第2版）》对太阳能的介绍最为详尽，共用了三个章节，分别介绍了太阳能的基础知识，太阳热系统，以及太阳能光伏系统。
其他能源形式基本是每种一章。
同时，《非传统能源（第2版）》对储能也给予了关注，除了有单独的一章介绍储能外，对风能等具体能源形式的储存问题也进行了介绍。
《非传统能源（第2版）》的主要特色还有以下几个方面：首先是有大量的例题，这在目前很多相关内容的书籍中是比较少见的；大量的例题非常有利于对内容的理解。
其次是有很多特色习题，《非传统能源（第2版）》的习题分为三部分，一是用来复习课本内容的问题（Review Questions）；二是一些分析或计算题（Problems），可以对课本中的知识进行应用；三是客观题（Objective Questions），主要是对一些基本的知识点进行考查。
《非传统能源（第2版）》所介绍的例子、应用情况均是以印度的情况为主，阅读和使用时，建议尽量参考我国的实际情况进行修改和补充。

作者简介

作者：（印度）卡恩（B H Khan）

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书籍目录

章节摘录

插图：The highest inlet steam temperature for a steam turbine is limited by theproperties of the materials to about 540~C. However, the flame temperaturesof burning fossil fuel in a boiler may be more than 1650~C. Consequently, in acombined cycle system, steam turbine is preceded by a topping cycle heat engine,which can utilize heat at higher temperatures. The working fluid leaves the toppingcycle at a sufficiently high temperature to generate steam for the steam turbine. Because the technology is well developed for the gas turbine, it is most commonlyused as a topping cycle engine. The turbine exhaust gases at a temperature of 600C or more pass through a waste heat （heat recovery steam generator） boilerwhere steam is produced from water under pressure. In addition to using fuelmore efficiently, a combined gas and steam turbine generating system requireslesser condenser cooling water for a given electrical output than a steam turbinegenerator alone.

编辑推荐

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