World Scientific Series in Current Energy Issues

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Fossil Fuels Volume 1

FOSSIL FUELS
Current Status and Future Directions

The Fossil Fuels volume focuses on the main fossil resources, viz. coal, oil and natural gas. Coal is still an extremely important resource especially for electricity production around the world and the book discussed methods for making coal a cleaner resource, including carbon sequestration. There has been a rapid change in the mix of fossil fuels mainly because of hydraulic fracturing which enables oil and gas to be extracted from previously inaccessible formations. The book describes this changing situation including the precautions required to make the production of these fuels safe and environmentally benign. Alternative fossil fuels such as methane hydrates are also discussed.

Readership: Scientists, engineers, policy makers, graduate students and researchers on the field of energy studies.

400pp Jul 2016
978-981-4699-97-6 US$144 / £104

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Solar Energy Volume 2

SOLAR ENERGY

This Solar Energy volume covers a variety of approaches to the use of solar energy. These include large scale photovoltaic production of electricity as well as more local applications in the home and businesses. Similarly, there is an extensive discussion of large scale solar thermal electricity production and smaller scale uses such as solar water heating, home heating and cooling plus crop drying. There is also discussion of more forward-looking technologies including the production of fuels using artificial photosynthesis and the production of biomass.

Readership: Researchers, academics, professionals and graduate students in energy studies/research and environmental/energy economics.

450pp Jun 2016
978-981-4689-49-6 US$162 / £117

Energy from the Nucleus Volume 3

ENERGY FROM THE NUCLEUS
The Science and Engineering of Fission and Fusion

Energy from the Nucleus focuses on the two main approaches to producing energy from the nucleus: fission and fusion. The chapters on nuclear fission cover the status of current and future generations of reactors as well as new safety requirements and the environmental impact of electricity production from nuclear fission. The chapters on nuclear fusion discuss both inertial confinement fusion and magnetic confinement fusion, including the new international fusion test facility, ITER. The expertise of the authors, who are active participants in the respective technologies, ensures that the information provided is both reliable and current. Their views will no doubt enlighten our understanding of the future of energy from the nucleus.

Readership: Students and Professionals interested in/dealing with Nuclear Engineering; Scientists, Engineers and Policy makers interfacing with Nuclear Engineering and Power.

300pp Aug 2016
978-981-4689-19-9 US$132 / £95
Concerns about energy resources and the environmental impact of energy use will continue to be important globally. World Scientific's unique series of books on Current Energy Issues is intended, in part, as an expansion and update of the material contained in the World Scientific Handbook of Energy. Each volume will focus on related energy resources or issues and will contain a broader range of topics with more explanatory text.

**FOSSIL FUELS**
Current Status and Future Directions

Contents:
- Coal Resources, Production, and Use Worldwide (Thomas Sarkus & William Ellis)
- Coal Gasification and Advances in Clean Coal (Thomas Sarkus & Adrián Radziwon)
- Geologic Carbon Storage (Thomas Sarkus, Michael Tennyson & Derek Vikara)
- Environmental Impacts of Coal Production (Thomas Sarkus & William Ellis)
- Petroleum Liquids (William L. Fisher & Christopher G. St. C. Kendall)
- Unconventional Petroleum Liquids: Tar Sands & Oil Shale (Vello A. Kuuskraa)
- Oil Spills: Causes, Consequences, Prevention and Countermeasures (Jacqui Michel & Mervin Fingas)
- Natural Gas (John B. Curtis)
- Hydraulic Fracturing (Randy F. LaFollette & Robert Samuel Hurt)
- Methane Hydrates (Yoshinori Masuda, Tatsuo Uchida, Saadok Nagakubo & Mikio Satoh)

**SOLAR ENERGY**

Contents:
- Introduction to Solar Energy (Richard Corkish, W. Lipinski & Robert Patterson)
- Fundamentals of Photovoltaic Cells and Systems (Ignacio Rey-Stolle)
- Large Scale Solar Thermal Plants (M Becker, R Pitz-Paal & W Stein)
- Large Scale Photovoltaic Plants (G. Almonacid Puche, P G Vidal & E Muñoz-Cerdán)
- Biomass (Anthony Turhollow)
- Artificial Photosynthesis (Nathan Skillen & Peter KJ Robertson)
- Small Scale PV Applications in Home and Business (Estepania Caamaño-Martín, Miguel Angel Egidio-Aguilera & Jorge Solfranco)
- Small Scale Solar Thermal Applications (Brian Norton, Hans Martin Henning & Daniel Magnier)
- Solar Thermo-Chemical Processes (Roman Bader & Wojciech Lipinski)

**ENERGY FROM THE NUCLEUS**
The Science and Engineering of Fission and Fusion

Key Feature:
- This is a comprehensive look at all the possible approaches to obtaining energy from the nucleus including the promise and the difficulties

Contents:
- Fundamentals of Nuclear Fission (Bertrand Barré)
- Current and Future Fission Power Plants (Bertrand Barré)
- Nuclear Safety and Waste Management (Bertrand Barré)
- Indirect-Drive Inertial Confinement Fusion (Erik Strom & John D Lindl)
- Direct Drive Laser Fusion (John Sethian)
- Magnetic Fusion Energy (M. C. Zarnstorff & R. J. Goldston)
- Creating A Star — The Global ITER Partnership (US ITER Project Office; edited and compiled by Mark Uhran)