Principles of Sustainable Energy Systems, Second Edition (Mechanical and Aerospace Engineering Series)

Frank Kreith, Susan Krumdieck

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Completely revised and updated, **Principles of Sustainable Energy Systems, Second Edition** presents broad-based coverage of sustainable energy sources and systems. The book is designed as a text for undergraduate seniors and first-year graduate students. It focuses on renewable energy technologies, but also treats current trends such as the expanding use of natural gas from fracking and development of nuclear power. It covers the economics of sustainable energy, both from a traditional monetary as well as from an energy return on energy invested (EROI) perspective.

The book provides complete and up-to-date coverage of all renewable technologies, including solar and wind power, biological processes such as anaerobic digestion and geothermal energy. The new edition also examines social issues such as food, water, population, global warming, and public policies of engineering concern. It discusses energy transition?the process by which renewable energy forms can effectively be introduced into existing energy systems to replace fossil fuels.

See What’s New in the Second Edition:

- Extended treatment of the energy and social issues related to sustainable energy
- Analytic models of all energy systems in the current and future economy
- Thoroughly updated chapters on biomass, wind, transportation, and all types of solar power
- Treatment of energy return on energy invested (EROI) as a tool for understanding the sustainability of different types of resource conversion and efficiency projects
- Introduction of the System Advisor Model (SAM) software program, available from National Renewable Energy Lab (NREL), with examples and homework problems
- Coverage of current issues in transition engineering providing analytic tools that can reduce the risk of unsustainable fossil resource use
- Updates to all chapters on renewable energy technology engineering, in particular the chapters dealing with transportation, passive design, energy storage, ocean energy, and bioconversion

Written by Frank Kreith and Susan Krumdieck, this updated version of a successful textbook takes a balanced approach that looks not only at sustainable energy sources, but also provides examples of energy storage, industrial process heat, and modern transportation. The authors take an analytical systems approach to energy engineering, rather than the more general and descriptive approach usually found in textbooks on this topic.

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