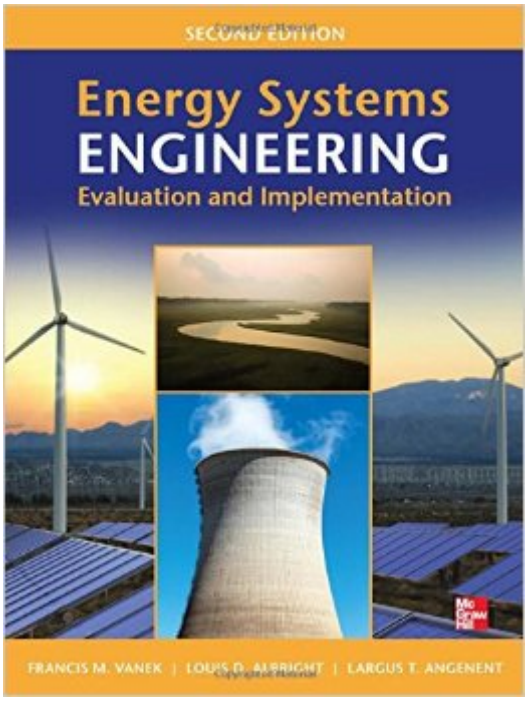
Energy Systems Engineering: Evaluation And Implementation, Second Edition



Synopsis

The defining guide to energy systems engineering--updated for the latest technologies "Broad in scope, with focused instructional detail, this text offers a uniquely excellent, student-accessible educational resource for integrating thermodynamic, alternative, and renewable energy conversion processes." -- Professor Randy L. Vander Wal, Department of Materials Science and Engineering, Penn State University "A carefully written book, providing good breadth as well as depth on major conventional and sustainable energy systems." -- Professor David Dillard, Department of Engineering Science & Mechanics, Virginia Tech Fully revised throughout, Energy Systems Engineering, Second Edition discusses fossil, nuclear, and renewable energy sources, emphasizing a technology-neutral, portfolio approach to energy systems options. The book covers major energy technologies, describing how they work, how they are quantitatively evaluated, their cost, and their benefit or impact on the natural environment. Evaluating project scope, cost, energy consumption, and technical efficiency is clearly addressed. Example problems help you to quantify the performance of each technology and better assess its potential. Hundreds of illustrations and end-of-chapter exercises aid in your understanding of the concepts presented in this practical guide. Coverage includes: Systems and economic tools for energy systems Climate change and climate modeling Fossil fuel resources Stationary combustion systems Carbon sequestration Nuclear energy systems Solar resource evaluation Solar photovoltaic technologies Active and passive solar thermal systems Wind energy systems New chapter on energy from biological sources Transportation energy technologies Systems perspective on transportation engineering

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Customer Reviews

This textbook is aimed squarely at the engineering student or professional engineer.It reflects the current state of analysis of energy systems; focusing on existing technologies, it is not a preparation for inventors. It could be considered a beginning of a study on macro-scale modeling of a global energy system, and it will prepare professionals to make the best of state-of-the-art technologies.The contents include diverse topical units that engineers are expected to understand, like economic tools for energy systems, climate science, and calculus of turbine blade design.Life cycle analysis of various systems is clearly important to the authors. I might say the authors are relatively sanguine about the economic viability of growing technologies; to instructors bent on leaving conclusions to the individual, some sections might seem to some like indoctrination into the collective, current feeling of future-thinking engineers, be they thoroughly grounded in reality.The writing includes practical wisdom from experience with systems, for example in the discussion on page 341 on solar hot water systems. Experimental examples include not only results but useful notes on methodology.The language is clear but impersonal; I haven’t found any errors in grammar or content. I prefer to teach with more engaging dialog--I would intersperse exercises with the reading to help break the third-person monotony. Like most engineering courses, the book requires facility with multi-variable analysis, multi-step problems, different systems of units, and physical thinking. Many passages and exercises require understandings explained in previous chapters.

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