

heating systems, and the operation of technological devices relying primarily on energy. Steven Fawkes, in his book, “Outsourcing Energy Management: Saving Energy and Carbon through Partnership”, describes the outsourcing of energy management as a way of addressing current energy challenges in different organizations. The author is an expert practitioner in the energy management field, having worked in and headed energy savings organizations and projects mostly in the United Kingdom, but also in other European countries, including projects at the United Nations Development Programme (UNDP) and World Bank. Reflecting the author’s background, the book is designed mostly for managers of organizations considering energy outsourcing, especially those dealing with energy-related constraints, as well as professionals and students working or studying in the energy field. The book can be best described as a guideline or handbook in terms of its descriptive-informative content.

The author takes the position that the best way of dealing with energy management constraints on the level of organizational management is through partnership with different energy service companies that take over the responsibilities for organizational energy management constraints. Such partnership with, or “outsourcing” to, professional energy service entities should ideally lead to significant energy savings and improved energy management for the client organization, generate more efficient energy usage, and have a positive impact on the current state of climate change. The book’s emphasis is above all on the energy outsourcing management process. The author begins the first part of the book with a presentation of *energy importance*, where after briefly explaining why the issue of energy supply and demand should be of concern to managers of different organizations, he proceeds with an analysis of the declining state of fossil fuels and the significance of climate change. In the second part of the book, focusing on the *energy management*

*process*, the author gives detailed guidance on how organizations should maintain effective energy management and savings programs by looking at total energy supply management and energy demand management. In the third and most important part of the book, Steven Fawkes presents a comprehensive review of the outsourcing cycle, i.e., its three main phases: the decision to outsource, the procurement process, and contract management, giving a detailed guideline of what processes need to be followed and what factors should be considered during each of these phases. In the last part, focusing on *energy service companies*, the author mainly discusses different models of energy services and actual service providers in the market, concentrating on two major energy service models: Energy Service Provider Company (ESPC) (supplying energy services or equipment with fixed-costs on a one-time basis), and Energy Service Company (ESCO) (supplying energy efficiency equipment, on an on-going operational basis).

Outsourcing energy management is a relatively new approach, at least with its sub credo of addressing global energy challenges. The author does a very good job connecting day-to-day practical energy constraints with the current global energy crisis in a very coherent, readable and well-organized practical guide. Different methodological tools such as illustrative matrices, boxes, tables and appendices, as well as a further reading list are used effectively to illustrate points to the book’s intended professional audience. The bibliography is not extensive, but is adequate given that it is supplemented by the aforementioned further reading list. However, along with its strengths, the book has some limitations. The author named both the book and its fourth part “Outsourcing Energy Management”. This creates confusion about the applicability of the three other parts in the course of the presentation. Another limitation is the book’s somewhat limited applicability outside of the European Union and to some degree even outside the United

Kingdom. The book’s page-to-page content, especially the two last parts concerning the outsourcing cycle and energy service companies that are the main emphasis of the book, draws almost exclusively on experience in the UK and to some extent the European Union, e.g., the history of the UK ESCO markets, the UK market size, and environmental and regulatory risks that were limited to the UK Climate Change Levy (CCL) risks and the EU Emissions Trading Scheme. This is a very important issue given that the author attempts to make a connection between day-to-day practical energy management challenges and the global energy crisis and climate change. Also most of the energy-intensive and energy inefficient companies that are profoundly contributing to climate change and are, therefore, in need of some practical guide for energy savings, are those located in non-European areas.

Generally, Steven Fawkes’ book can be considered a good contribution to the field of energy management, mostly in the European context. It is recommended reading for those concerned with and interested in energy matters. Hopefully, its practical instructions will be of good use to the intended audience, and will have a beneficial impact on client organizations and consultant energy service companies, as well as on the global state of climate change.

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### **Energy in Nature and Society**

By Vaclav Smil

*The MIT Press, Cambridge, MA and London, 2008, 480 pages.*

This latest work of Professor Vaclav Smil on energy nature and society is

an interesting, charming and detailed study of how energy flows and gets transformed. The book is neatly subtitled “General Energetics of Complex Systems”, where the term complex systems refers either to the entire universe, the planetary environment, or our economy and society, depending on the context. For a book published in 21st century it is as inter-disciplinary as a book can be. It is written in layman’s terms and is full to the brim with interesting facts. It can be used as reference by any professional whose work is marginally affected by energy-related phenomena.

Practitioners of sustainable development in particular, regardless of their specialization, may find this book very useful. The reason is the following: sustainable development, in essence an eclectic and cross-cutting concept, involving stakeholders with very diverse backgrounds; therefore, finding common grounds often presents a challenge. Having a concept that can be used as a least common denominator and a measuring rod across sustainable development themes is thus very convenient. The notion of energy is one of the few abstractions — along perhaps with space, time, entropy, and money — that can play such a role. Although this book touches practically every sustainable development topic, it is particularly relevant to agriculture, atmosphere, biodiversity, climate change, consumption and production patterns, demographics, forests, human settlements, land, sustainable tourism, transport, and waste management.

To measure and analyze how energy flows through nature, economy, or society, in the past and present, Vaclav Smil utilizes variables such as energy density (measured in joules per cubic or square meter), specific energy (J/kg), energy intensity (J per unit of currency), and, as probably the most powerful analytical tool, power density (expressed in watts per surface area). The power density could also be called energy flux (units of energy per unit of surface area and time). Energy flux is used to measure and compare energy

flows and densities in diverse topics such as agriculture, oil and gas fields, energy consumption of urban areas, potential of the renewable energy sources such as wind and photovoltaic, etc. Use of unifying metrics as a framework into which natural and economic phenomena could be placed is arguably the most important contribution of this book.

There is a certain chronological order and logic, in evolutionary and human development senses, that the book follows. It starts with a detailed account of how energy is produced within stars, radiated and intercepted by planets such as ours. On the planetary level, solar energy flows are used to drive the water cycle and the motion of the atmosphere which are ultimately sources of our ‘renewable’ energy. The narrative then follows the fate of the intercepted radiation in the biosphere, discussing photosynthesis and other processes that convert a tiny portion of the solar energy, via competing metabolic routes, into various chemical forms (carbohydrate polymers, proteins, lipids).

A particularly interesting part of the book deals with metabolism of heterotrophs — including *Homo Sapiens* — and its consequences on human evolution and subsequent social development. Many of the examples offered by Prof. Smil are helpful in putting human development into a long-term inter-generational perspective, crucial for sustainable development in general.

Chapters 6 to 10 deal with what could be called energy and civilization, discussing transition from nomadic agriculture to intensive crop agriculture of the pre-industrial era to our industrial, fossil-fuelled civilization. Chapter 9 details the unprecedented material affluence brought about by the use of fossil fuels, which increased global consumption of energy by several orders of magnitude. Chapter 11 discusses environmental consequences of the fossil-fuelled civilization, drawing parallels while taking note of differences between the functioning of modern civilization and heterotrophic life.

Looking at various phenomena from an energy perspective, and using power density and other variables previously mentioned, Prof. Smil points out the important differences between walking and trotting, eating cellulose and fat-rich foods, anaerobic and aerobic metabolic paths, foraging and stationary agriculture, and so on. Such differences in energy content and requirements have tremendous evolutionary, economic and cultural consequences.

The closing chapter of the book “Grand Patterns: Energetic and Other Essentials” is a very useful and condensed finale of the book. It is helpful in the sense that it once again puts diverse natural and economic phenomena next to each other for the reader to better appreciate the differences and compare the relative magnitudes of various energy flows and paths. Taking a look at our civilization using a broader time scale is very helpful for it can put us in a constructive mode of thinking, it can help us forgive ourselves for our past mistakes and concentrate on what realistically can be done, taking into account natural constraints and our own imperfections. After all, as Prof. Smil puts it, we humans have spent most of our existence as opportunistic scavengers.

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**Bridges Over Water, Understanding Transboundary Water Conflict, Negotiation and Cooperation**

Ariel Dinar, Shlomi Dinar, Stephen McCaffrey & Daene McKinney  
*World Scientific Publishing Company,*  
*Oct. 2007, 468 pages*

This textbook introduces a comprehensive, innovative and interdisciplinary analysis of transboundary water conflict, negotiation and cooperation.