

REVIEWS

The New Economy of Nature: The Quest to Make Conservation Profitable

By Gretchen C. Daily and Katherine Ellison

Island Press/Shearwater Books, 2002, 260 pages, ISBN 1-55963-945-8, \$25.00

The subtitle of this book might strike some as a contradiction in terms. After all don't most of us believe that the destruction of our environment is due in part to the uncontrolled desire to make money? Yet it is the intriguing premise of this book that those forces that seem to be the cause of much of the degradation of the environment might be harnessed to solve the severe problems that face our planet now and in the near future. As the authors state: "A great unanswered question is whether the drive for profits which has done so much harm to the planet can be possibly harnessed to save it."

Written by a collaboration between Pulitzer Prize-winning journalist Katherine Ellison and noted Stanford University ecologist Gretchen C. Daily, this book is a lively collection of case histories that describe various efforts to do the right thing and make money at the same time. The various chapters describe the efforts of what some may call visionaries and others eccentrics to think creatively while staying inside the box imposed by economic constraints. In a few cases the choices presented seem quite clear cut. An example is the project by New York City to improve the quality of its water supply by enhancing and expanding the protection of the upstate watershed area. The city, under mandate by the Environmental Protection Agency, had the choice of building an expensive filtration system or of helping nature naturally filter the water. The latter choice was cheaper and at the same time helped preserve streams and forests.

Other examples are a bit murkier. For example, the Australian company Earth Sanctuary Ltd. owns and runs several private nature preserves which support themselves by hosting ecotourism. Among the compromises this enterprise has to make in its attempt to turn a profit is feeding "snacks" to the rare species under its care to make them more accessible to those touring its preserves.

Setting up exchanges to provide a market in carbon emissions and carbon sinks is another example. Here one attempts to emulate what is touted as the success of the market in sulfur dioxide emission permits in the reduction of acid rain to the emission of carbon dioxide through the sale of similar carbon sinks and emissions instruments. Some raise the question as to whether creating such markets enables companies to continue to pollute. It is precisely such compromises with principle that the authors suggest are both troubling and interesting since in many cases they highlight the crux of the issue, namely whether what some may call greed is too powerful an instinct to ignore.

The authors argue in part that market forces must be understood and utilized when possible in the struggle to preserve the environment. They write: "More important, it would require a willingness to look at the world's economy in an entirely different way, starting with the assumption that ecosystems are assets whose output has concrete financial worth....One thing is clear: private enterprise cannot substitute for governments, particularly in view of the increasing risk of climate change, a global problem requiring global cooperation if it's not to override all other environmental and economic worries in a matter of decades. We strongly believe that government regulation is called for to kick-start and supervise the profound economic transformation needed to ward off this and other environmental threats. Yet we also believe this transformation can be speeded with the use of market mechanisms and other financial incentives, tactics that have been glaringly underemployed."

The book makes a strong case for the growing study and appreciation of the economic value of what are called nature's services and work. In a past era of much lower human population and overall impact on the environment much of what we received from nature was so plentiful that it was essentially free. A few such examples are clean air and water and the cooperative work of many animals and insects in providing our food. Today we are placing such large demands on these resources that they are no longer relatively plentiful and we are forced to account for the real value they contribute to the overall economy. This analysis of economic value and market forces is alien to the aesthetics and ethics of many who are concerned about preserving and improving our environment. They are also often absent from the formal training that most scientists receive. Yet no matter what one may ultimately conclude is the correct course to pursue, one must confront market forces and the current faith that free markets will ultimately make the correct decisions--although one should note that there is now increasing skepticism regarding the directions that pure market forces take us.

As seen in the above quotation, accompanying this book's discussion of economic incentives is also a clear recognition of the importance of national and international regulations in dealing with environmental problems. In many of the case studies presented, governmental policies and laws form the long-range framework that creates the very markets that are being exploited. The entire issue of whether carbon trading will ever make economic sense would seem to depend entirely on the implementation of regulations such as the Kyoto treaty.

Though some sections of this book may seem a bit repetitious and a few others seem out of place or irrelevant, things are summed up nicely in the epilogue which notes that recent events such as 9/11, recession, etc. have put a severe damper on some of the more ambitious efforts described. Whether one ultimately agrees or disagrees with the main premise of this book it is certainly worth reading. The authors, although clearly believing that conservation can be made profitable, generally give a balanced perspective to the issue and do so in a well-written book that is both easy and enjoyable to read.

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Energy and Society (An Introduction), by Harold H. Schobert (Taylor & Francis, NY, 2002), 672 pp, ISBN PB 1-56032-767-7, paperback \$49.95.

At a time when the public needs a much better understanding of our possible energy futures, books aimed at increasing energy knowledge for a non-technical audience are a welcome addition. Today, there are a number of texts for introductory college courses on energy, ranging from those focusing mostly on policy to those including some physics and math. **Energy and Society (An Introduction)** takes a somewhat different approach, describing comprehensively the historical development of energy technologies and sources. The book provides both biographical sketches of scientists and technologists as well as a societal context for their discoveries. In addition, the author uses a consistent approach to understanding energy based on the scientific definitions of energy, work and power.

The initial chapters provide a succinct overview of scientific questions which non-scientists may have on topics relating to human energy, food, and digestion. This leads into discussions of the human use of fire, the use of wood energy, and early waterwheel and windmill technologies.

The narrative then shifts to the industrial revolution with its emphasis on the steam engine, heat and thermal efficiency, and the subsequent development of electrical concepts and

electricity production. The discoveries and inventions of major scientists and technologists, and the reasons why certain technologies and approaches won out over others, are vividly described. A chapter on hydropower examines the development of water turbines and the role of hydroelectricity today. A section on transportation, focusing initially on steam engines and ships, but then leading into early aviation technology and the Otto and diesel engines, provides a transition into the petroleum age.

The chapters on nuclear energy, including the discovery of x-rays and radioactivity and ultimately nuclear fission, are clear, but fairly standard. While the treatment of nuclear reactors and nuclear waste issues is also conventional, descriptions of the Three Mile Island and Chernobyl accidents are nicely developed and detailed.

The final section of the book describes current energy technologies, their environmental impacts, and alternatives. The author highlights chapters on acid deposition from coal combustion, smog from vehicle exhaust, and the greenhouse effect. A chapter on remaining fossil fuel supplies provides the rationale for investigating energy alternatives. The text ends by examining biomass, solar, and wind energy, and the prospects for developing electricity from fusion power.

The treatment of controversial topics such as nuclear power, global warming and pollution from fossil fuel combustion is generally balanced and fair. The writing is clear and at a level that the non-scientist can comprehend. There is a glossary of energy terms and highly recommended sources. Figures and graphs are clear and appropriate to the text and the topic, while citations and annotated bibliographies at the end of each chapter provides sources for further reading and research.

The text is strong in describing basic science and the historical development of energy sources and technologies. The first two thirds of the book is presented with charm, wit and scientific insight. However, the treatment of nuclear and renewable energy is somewhat disappointing compared to the earlier material. Terms and concepts important in understanding current energy technology decision-making, such as the uranium fuel cycle, electrical load peaking, net energy, net metering, deregulation, and distributed generation are missing or inadequately covered. In addition, each source is treated in isolation rather than looking at an integrated systems approach, which is critical in understanding any possible energy future. Some statements and facts are misleading or out of date. For example, passive solar heating can provide much more than 10-20% of the heating load of a house. And toxic anti-freeze, mentioned by the author, has been mostly replaced with propylene glycol in solar hot water collector systems today. Although the chapter on global warming provides ample factual information, it vacillates awkwardly between doubt and belief, leaving the reader confused. Based on the scientific evidence of the past several years, there is no need to be timid about the scientific basis of climate change, and its seriousness. The discussion of policy options for global warming is weak, not distinguishing the full range of options and strategies in terms of cost.

In addition, the focus of the book in the later chapters is primarily on the United States. International energy developments, such as the rapid growth of wind and photovoltaics around the world, are not analyzed. Another gap is that Enron and the California power crisis are barely mentioned (although to be fair, the book was probably mostly complete as they unfolded). More seriously, the reader will find little about energy politics and policies surrounding the restructuring of the present electrical energy system, an area that has been widely debated for over a decade. Nor will the reader find an explicit discussion of entropy (or even the word entropy), a critical term that should be familiar to non-scientists. Unfortunately, the title of the book implies a broader coverage of current energy and society issues than is actually present.

In spite of these comments, the book is a valuable contribution to the energy text field. The multidisciplinary energy area is a difficult one to cover fully in any book of reasonable size. The publisher describes some 13 courses for which the book might be appropriate, including environmental engineering, environmental science, alternate sources of energy, science and society, and energy, politics and the environment. However, the book's strength lies in areas such as man and technology, the historical development of technology, and a qualitative introduction to energy. For the many introductory energy-related courses that are also trying to develop some measure of quantitative skills in students, this book is not particularly strong or suitable. However, for courses focusing on a historical understanding of energy and technology development, the text, particularly the first two thirds, is highly recommended.

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