Charles A.S. Hall, Kent Klitgaard

Energy and the Wealth of Nations
An Introduction to Biophysical Economics

- Provides a new and fully integrated approach to economics
- Updated and revised new edition includes the best ideas from conventional economics as well as a comprehensive integration of the biophysical and economic limits to growth
- Includes comprehensive updates for all earlier chapters together with new coverage of the economic implications of hydraulic fracturing (fracking), social inequality and access to energy, and climate science and planetary boundaries
- Uses predictive tools and measures, such as EROI, to show how the economy is embedded in a biophysical world subject to scientific rules and constraints

In this thoroughly updated edition of a groundbreaking text, concepts such as energy return on investment (EROI) provide powerful insights into the real balance sheets that drive our national and global economies. The authors explore the relation between the energy and the wealth explosion of the 20th century, as well as the interaction between internal limits to growth found in the investment process itself, and the external biophysical limits imposed by finite high quality energy resources. The authors focus attention on the failure of markets and economic models to recognize or efficiently allocate diminishing resources, the economic consequences of peak oil, the high cost and relatively low EROI of finding and exploiting new oil fields, including the much ballyhooed shale plays and oil sands, and whether alternative energy technologies such as wind and solar power can meet the minimum EROI requirements needed to run society as we know it.

Biophysical economics offers a comprehensive integration of social and natural sciences, including an understanding of the economic process that is consistent with the laws of thermodynamics, the conservation of materials, and the essentials of energy analysis. The text helps to address the major questions of our day such as: How do we adapt to declines in resource quality? What will life be like in a climate-compromised world? Are we generating unpayable quantities of debt and how will that affect the rest of the economy? And, perhaps most important, should growth be the main economic and political objective/tool to resolve the social issues associated with concentration of wealth, questions of fairness in our political/economic system, and secular stagnation. As we enter the second half of the age of oil, when energy availability and the environmental impacts of energy production and consumption are likely to constrain economic growth, restoring physical drivers and constraints to their rightful place in economic analysis will be key to our ability to predict the dynamic behavior of complex economic systems. This book is an essential read for all scientists, economists, financial analysts and indeed anyone who has recognized the urgent need for a more scientific, empirical, and logically unified approach to economics in an energy-constrained world. It also serves as an ideal teaching text for the growing number of courses, such as the authors’ own, on the role of energy in society.

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