Energy and the Wealth of Nations: Understanding the Biophysical Economy

Charles A. S. Hall, Kent A. Klitgaard
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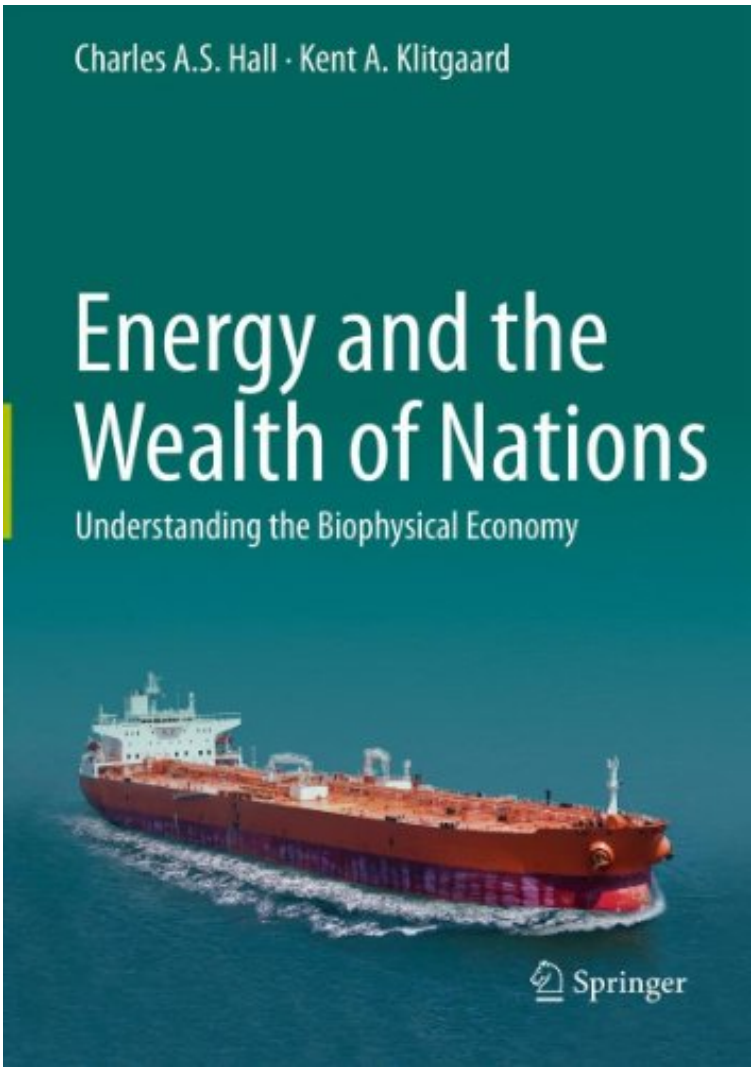

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Charles A. S. Hall, Kent A. Klitgaard : Energy and the Wealth of Nations: Understanding the Biophysical Economy before purchasing it in order to gage whether or not it would be worth my time, and all praised Energy and the Wealth of Nations: Understanding the Biophysical Economy:

19 of 20 people found the following review helpful. A Breath of Fresh Air for EconomicsBy Dick_BurkhartThis very readable advanced college text by Hall and Klitgaard lays out a scientific approach to economics. This is truly a breath of fresh air for a profession mired in simplistic concepts and models that often defy common sense and that sometimes lead to equally wrong-headed predictions and policies. A prime example would be the financial crash of 2008, unforeseen by mainstream economists, and in defiance of Alan Greenspan's belief in the magic of markets. Yet the

crash itself and the current anemic recovery were no mystery at all to biophysical economists.In fact, their dictum is that the best way to understand any geological or biological process, including the human ecosystems known as economies, is to first analyze the sources and flows of energy for that process. Markets are secondary. Since the current global economy is driven mostly by fossil fuels (around 85% of all energy), and since oil is by far the most critical of these, any good oil resource geologist is in a far better position to forecast the overall performance of the economy the coming decades than all the Nobel Prize winning economists put together.The most prescient of these geologists, such as Colin Campbell, understand that the first half of the "Age of Oil" (cheap oil, growing production) is now over and that we are entering the second half (expensive oil, stagnant then declining production). And that the global economy will decline in tandem. Thus the financial crash of 2008 was due in part by the failure of world oil supply to meet the demand caused by financial inflation (oil reached $147 a barrel in July, 2008), radically decreasing the discretionary income available to the public. And now there is no more cheap oil to fuel the recovery. In fact a stronger recovery would be self-limiting, with demand once again overshooting supply. Indeed the CEO of Shell recently suggested that gasoline in the US could reach $7 to $8 a gallon by 2015, enough to cause severe recession.This text looks not only at the current global economy but at historical economies and re-analyzes them from an energy point of view. For example, land was the primary source of wealth in agricultural economies because it was the primary way to capture solar energy, via photosynthesis. Long distance trade added to wealth because the primary energy for wind-driven water transport was free. But major industry awaited the development of the ability to exploit fossil fuels (ancient sunlight). Studies of modern economies show that economic growth closely tracks energy usage, though sometimes you must include embodied energy, such as all the consumer imports from China to the US.Looked at from the point of view of energy, the short comings of traditional theories of economics are also made clear. For example, the Cobb-Douglass production function of traditional macro-economics has far more validity if the arbitrary productivity factor is replaced by energy. But Hall and Klitgaard also point out that the neo-classical way to do economics, based on a paradigm derived from 19th century physics, is severely outdated. The simulations and scenarios of the limits to growth studies, incorporating non-linear feedback loops, need to be brought into the mainstream.In this book, faith in markets is replaced by analysis of net energy, or "energy returned on energy invested" (EROI). This is simply the ratio of the useful energy obtained from a resource to the energy required for its production. This may be analyzed further in several ways. For example, the energy produced could be the energy if burned at the mine-mouth or well-head, or after processing (such as oil to gasoline), or conversion (such as coal to electricity). The energy of production could include the embodied energy of materials used in the production, as well as the direct energy. It could also include the energy required for transportation to the point of usage and other "downstream" energy costs of usage, such as infrastructure, insurance, and depreciation, yielding an "extended EROI". Several studies lead the authors to conclude that modern civilization may require an "extended EROI" of around 10 to 1 or more. Renewables and unconventional fossil fuels typically aren't up to the task.Turmoil ahead is a foregone conclusion. Yet the authors hold out hope from the knowledge that people can react in creative and positive ways to crises if they understand what is happening. This book is in itself a sign of hope - that the fortress of neo-classical economics is starting to crumble from the escalating bombardment by real world economists and their allies. Let's hope that Hall and Klitgaard now set their sights on a totally new Econ 101 text that will tell students how real world economies actually function (descriptive economics) and how they could function better (prescriptive economics), especially as economic growth turns toward contraction.21 of 22 people found the following review helpful. Great ideas, terrible editorBy Kevin S.I am mainly writing this review to warn everyone that this is probably the most poorly edited book they'll ever read. There are loads of typos, misspellings, sentence fragments, run-ons, awkward phrasing, and other errors that the editor should have caught. It seriously impacts the reader's ability to absorb what is otherwise a great book. Another mistake the editor, proof readers and authors all make is citing things like "sustainablemiddleclass.com" for US Census and BEA data. That is pretty embarrassing. Somebody should have known to go to the source for this data, not some random web site that apparently doesn't even exist anymore.All that said, I still gave the book four stars. The authors are on to something, and the ideas they express are important. They should get this work republished by a publisher who will give them a proper edit.1 of 1 people found the following review helpful. I am an educator of environmental science and I would ...By Linda E SchweitzerI am an educator of environmental science and I would say this is the most important book I have ever read that pertains to economics and the environment. I wish we could make this mandatory for every American to read.

For the past 150 years, economics has been treated as a social science in which economies are modeled as a circular flow of income between producers and consumers. nbsp;In this ldquo;perpetual motionrdquo; of interactions between firms that produce and households that consume, little or no accounting is given of the flow of energy and materials from the environment and back again. nbsp;In the standard economic model, energy and matter are completely recycled in these transactions, and economic activity is seemingly exempt from the Second Law of Thermodynamics. nbsp;As we enter the second half of the age of oil, and as energy supplies and the environmental impacts of energy production and consumption become major issues on the world stage, this exemption appears illusory at best. In

Energy and the Wealth of Nations, concepts such as energy return on investment (EROI) provide powerful insights into the real balance sheets that drive our ldquo;petroleum economy.rdquo; Hall and Klitgaard explore the relation between energy and the wealth explosion of the 20th century, the failure of markets to recognize or efficiently allocate diminishing resources, the economic consequences of peak oil, the EROI for finding and exploiting new oil fields, and whether alternative energy technologies such as wind and solar power meet the minimum EROI requirements needed to run our society as we know it. This book is an essential read for all scientists and economists who have recognized the urgent need for a more scientific, unified approach to economics in an energy-constrained world, and serves as an ideal teaching text for the growing number of courses, such as the authorsrsquo; own, on the role of energy in society.

From the reviews:ldquo;This is an important book. It should also prove of use to many involved with energy-related issues, and to students hellip; . main strength and argument of the book is indicated by its sub-title. hellip; the importance of energy as a factor of production, its relevance to the rise and fall of past cultures, and the stresses that the provision and use of energy will place upon the world in future are well argued in this book and for that reason it can be recommended.rdquo; (Michael Jefferson, Energy Policy, Vol. 42, 2012)ldquo;A centrally important book for sustainability educators, upper division and graduate students, and members of the general public who are interested in understanding and addressing some of the fundamental challenges to socio-ecological sustainability. hellip; Faculty and students from multiple disciplinary and interdisciplinary backgrounds will find Energy and the Wealth of Nations to be a highly accessible, informative, well-argued, well-supported, insightful, and important read. hellip; I highly recommend this book principally as a course text but also as a relevant book for anyone interested in sustainability.rdquo; (Tina Lynn Evans, Journal of Sustainability Education, March 2012)ldquo;This book should be brought - free of charge - to the attention of NGOs and political leaders worldwide. It is certainly recommended for college students taking courses in sustainability, the environmental sciences, and sustainable engineering. In particular, it is highly recommended for all leaders involved in Earth Day 2012, the International Year of Sustainable Energy for All, and the Rio+20 Conference on Sustainable Development.rdquo; (Luis T. Gutieacute;rrez, Mother Pelican ndash; A Journal of Sustainable Human Development, Vol. 8 (3), March 2012)ldquo;It offers such a compelling story about how our world economy is so completely empowered by the ability to find, extract and consume energy. hellip; Energy and the Wealth of Nations is worthwhile read for anyone who is interested in gaining a deeper understanding of the lsquo;sciencersquo; behind economic growth and the critical yet often misunderstood role that energy plays in our world economy. Engineers involved in the electric power industry may be especially interested in the influence of biophysical economic principles hellip; .rdquo; (Jim MacInnes, Today's Engineer, June 2012)ldquo;This book on economics is quite readable, addressing many difficulties that the energy world (including renewable energy) faces hellip; . This book is about the economic facts of life, in renewable energy and in the rest of the energy world. The facts presented are quite revealing, and reading the book is a must if you want to understand the past, current and future problems in energy.rdquo; (Francis de Winter, Solar Today, March/April 2012)ldquo;This book is focused on energy and economics. This book seems to be aimed as a text book, or at an audience who is already familiar with some of the issues, and wants to dig deeper. hellip; Readers will find that the Energy and the Wealth of Nations contains a wealth of information and a lot of useful references. There is also an extensive index. hellip; Many sections are more historical in nature, or more narrative, and are easy for anyone to understand.rdquo; (Our Finite World, April 2012)ldquo;When our society relies on an understanding of economics that did not predict, prevent, or mitigate the current economic crisis, and that, more importantly, does not effectively address climate change or resource depletion, it is time for a new and different approach to understanding the economy. That premise is the foundation of Energy and the Wealth of Nations, an important book by ecologist Charles Hall and economist Kent Klitgaard, who together are pioneering the new discipline of biophysical economicshellip;.Hall and Klitgaardrsquo;s work has important implications for financial planners....The more planners understand about how the world works, what constraints may be looming, and how to evaluate various scenarios, the better will be the advice we give our clients. Just as planners have embraced behavioral economics for the insights it provides, learning about biophysical economics will add considerably to our skills and our wisdom.rdquo; (Richard Vodra, Peak Oil , June 2012)From the Back CoverFor the past 150 years, economics has been treated as a social science in which economies are modeled as a circular flow of income between producers and consumers. nbsp;In this ldquo;perpetual motionrdquo; of interactions between firms that produce and households that consume, little or no accounting is given of the flow of energy and materials from the environment and back again. nbsp;In the standard economic model, energy and matter are completely recycled in these transactions, and economic activity is seemingly exempt from the Second Law of Thermodynamics. nbsp;As we enter the second half of the age of oil, and as energy supplies and the environmental impacts of energy production and consumption become major issues on the world stage, this exemption appears illusory at best. In Energy and the Wealth of Nations, concepts such as energy return on investment (EROI) provide powerful insights into the real balance sheets that drive our ldquo;petroleum economy.rdquo; Hall and Klitgaard explore the relation between energy and the wealth explosion of the 20th century, the failure of markets to recognize or efficiently allocate diminishing resources, the economic consequences of peak oil, the EROI for finding and exploiting new oil fields, and whether

alternative energy technologies such as wind and solar power meet the minimum EROI requirements needed to run our society as we know it. This book is an essential read for all scientists and economists who have recognized the urgent need for a more scientific, unified approach to economics in an energy-constrained world, and serves as an ideal teaching text for the growing number of courses, such as the authorsrsquo; own, on the role of energy in society.Integrates energy and economicsUses predictive tools and measures, such as EROI, to show how the economy is embedded in a biophysical world subject to scientific rules and constraintsProvides a fresh approach to economics for those wondering ldquo;Whatrsquo;s next?ldquo; after the Great Recession and the recent increases in oil pricesAssesses energy sources from the perspective of peak oil, the role of alternatives, and potential impacts such as climate changeAbout the AuthorCharles A.S.nbsp;Hall is a Systems Ecologist who received his PhD under Howard T. Odum at the University of North Carolina at Chapel Hill. Dr. Hall is the author or editornbsp;of seven books and more than 250 scholarly articles. He is best known for his development of the concept of EROI, or energy return on investment, which is an examination of how organisms, including humans, invest energy into obtaining additional energy to improve biotic or social fitness. He has applied these approaches to fish migrations, carbon balance, tropical land use change and the extraction of petroleum and other fuels in both natural and human-dominated ecosystems. Presently he is developing a new field, biophysical economics, as a supplement or alternative to conventional neoclassical economics, while applying systems and EROI thinking to a broad series of resource and economic issues. Kent A.nbsp;Klitgaard is Professor of Economics and the Patti McGill Peterson Professor of Social Sciences at Wells College in Aurora, New York, where he has taught since 1991. Kent received his Bachelorrsquo;s degree at San Diego State University and his Masterrsquo;s and PhD at the University of New Hampshire. At Wells, he teaches a diverse array of courses including the History of Economic Thought, Political Economy, Ecological Economics, The Economics of Energy, Technology and the Labor Process, and Microeconomic Theory, andnbsp;is a co-founder of the Environmental Studies Program. Kent is active in the International Society for Ecological Economics, and is a founding member of the International Society for Biophysical Economics. Recently, his interests have turned towards the degrowth movement, and henbsp;has published multiple papers on the subject for Research and Degrowth.nbsp;He has two children, and is interested in the outdoors in general: from hiking to beach walking to the occasional round of golf (despite the high energy use of golf courses).nbsp;Kent is a Californian whonbsp;still surfs the frigid waters of New England when he gets a chance. This is his first book.