

# STEPHEN T. SATKIEWICZ:

## A History of Energy/Energy in History

Correspondence | Stephen T. Satkiewicz, [ssatkiewicz@yahoo.com](mailto:ssatkiewicz@yahoo.com)

Citation | Satkiewicz, Stephen T. 2020. "A History of Energy/Energy in History." Review of. *Energy and Civilization: A History*, by Vaclav Smil. *Journal of Big History* 4 (3): 102-103.  
DOI | <https://doi.org/10.22339/jbh.v4i3.4360>

### BOOK REVIEW

---

Smil, Vaclav. 2017. *Energy and Civilization: A History*. Cambridge, MA: The MIT Press.

---

What is energy? We know Albert Einstein's famous equation  $E = mc^2$ , but is that all there is to energy? What about the resources that power our modern world such as coal, oil, natural gas, nuclear power, wind, and the sun? It is hardly surprising that concerns about energy, the economic and environmental effects of our use of fossil fuels, the search for sustainable alternatives, and calls for a "Green New Deal" should figure so prominently in contemporary global dialogue. The emergence of the notion of the Anthropocene is born of such concerns, and part and parcel of the big history movement, and it is in these tumultuous circumstances that Vaclav Smil has produced in *Energy and Civilization*, a thorough reworking of his groundbreaking 1993 study, *Energy in World History*, a tour de force of historical scholarship that both describes the close interrelationship between human cultures and their use of energy and provides a useful blueprint for better understanding where our civilization may be heading in the near future.

Smil begins by looking at energy and social complexity (Chapter 1). This is followed by overviews of the various phases of the social evolution of energy: the prehistoric era (Chapter 2), agricultural civilizations (Chapter 3), and early industrialization (Chapter 5), followed by "Fossil-Fueled Civilization" (Chapter 6), and concluding with his take on "Energy in World History" (Chapter 7) that looks at grand patterns, long-term trends, costs, and, significantly, the limits of energy explanations.

Most of the technical work is at the beginning of the book, where Smil discusses in detail energy flows, stores, controls, concepts, measures, and complexities. Here he explains what energy is, what it does, and how it is related to social structures. From there it is a more traditional historical narrative covering the entirety of human history from the Paleolithic era to the present; nonetheless, the author provides sufficient detail throughout in this competent and compelling world history, which should come as no surprise because Smil, Distinguished Professor Emeritus at the University of Manitoba, has published forty books and nearly five hundred papers on a wide variety of interdisciplinary topics in not only the field of energy but also in environmental studies, population change, food production, nutrition, technical innovation, risk assessment, and public policy.

His chapter on traditional farming cultures is one of the most compelling, covering an immense span of time from the Neolithic through ancient civilizations, to the Middle Ages, and then into early industrialization in the latter half of the eighteenth century. In the process, Smil provides considerable comparative analysis of different regions around the world such as ancient Egypt, China, Mesoamerica, Europe, and North America. Such subject matter could fill several volumes, but Smil is able to provide an informative and pithy summary of this vast amount of data that puts it into a useful world history framework, but also a useful big history

one considering the fact that energy flow is so central to the big history story (see especially Eric Chaisson, *Cosmic Evolution: The Rise of Complexity in Nature* (2001) and Fred Spier, *Big History and the Future of Humanity* (2010)).

Smil emphasizes that early industrialization was a gradual process but goes on to show that the dependency of modern civilizations on finite fossil fuels at the rate we are using them is unsustainable in the long run. He underlines the severity of the challenge facing humanity, noting that two extreme positions are not viable: 1) a simple rejection of modernity and modern technology (long the dream of romantics and luddites) as well as 2) continuing as before. Noting the high costs of modern civilization is not an indictment of modernity altogether, for even Smil acknowledges that modern civilization has produced many positive qualities, such as “inventiveness, technical advances, gains in the standard of living, expanded information, and instantaneous communication” even though these have also unmistakably been accompanied by “deteriorating environmental quality and worrisome income inequality” (295).

This is the unfortunate paradox of modernity, and again, this book is not a call for turning back the clock and attempting to return to an idealized past period. Rather, Smil is looking for a proper critical assessment of the negative effects of modern civilization to allow for an arena to ponder viable solutions. One of the strengths of Smil’s work is that when addressing such questions, he avoids providing simplistic and reductionist analyses or solutions. This is a complex issue and thus requires complex thinking. Smil stresses that there are never easy answers to the challenges facing humanity while at the same time remaining hopeful for the future (417).

The last chapter is the most insightful as the author outlines his overall perspective on the role of energy in human history. There is often the tendency in works such as this to reduce complex historical processes to a single factor, in this case energy, but Smil avoids this and openly critiques such an attempt to explain history without also referring to “non-energy” factors as well (385). Civilizations cannot be defined on purely materi-

alist foundations. Although such factors are, naturally, crucial to our understanding, Smil examines the limits of one-cause analyses, stressing that *how* civilizations choose to use their energy is as important as *what* types of energy resources they use.

An argument can be made that the manner in which civilizations choose different means of using energy resources is mostly related to intangible “mental structures”—religion being the most common example (but not necessarily restricted to that). Smil does not explore this relationship in much depth, but in fairness he does provide ample references to scholars who have tackled the issue in a book that contains over seventy pages of densely packed notes.

It can be said that Smil touches upon so much in this one volume that, unfortunately, he himself cannot delve too deeply into any one topic in greater depth. Nevertheless, this is an important subject for debate not just for historical purposes, but also in regard to current debates on how best to use energy resources is tackling the issue of how prevailing mental structures and paradigms shape how the issue is framed and addressed.

With a wide scope of area to cover in one volume, some mistakes are, of course, inevitable. For example, when summarizing the developments of weapons during World War II, Smil writes that the T-42 was the critical Soviet tank design during the conflict (371), but while the T-42 was a prototype during the 1930s, it was never put into production nor witnessed combat. Rather, it was the T-34 that was the premiere Soviet tank design of the war. Even so, this factual error is minor and does not detract from the strengths of Smil’s overall argument.

Smil has gone into further depth in other writings about the interrelationship between energy and war, studies that will be useful to all scholars of modern warfare. In fact, this impressive, encyclopedic volume contains much that will interest scholars in a wide variety of fields as he covers issues related to technology, economics, social complexity, politics, and much more. This demonstrates the great accomplishment Smil has achieved by himself and speaks in general to a particular strength of the big history approach.