

# **Energy and Electricity in Industrial Nations: The Sociology and Technology of Energy**

**By Allan Mazur**

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Reviewed by Richard York<sup>1</sup>

How nations use energy—including how much and from what sources—has serious implications for societies and the environment. Climate change and air pollution, nuclear waste and the threat of nuclear accidents like the one at Fukushima, oil spills such as those from the Deepwater Horizon and the Exxon Valdez, the contamination of groundwater and contribution to earthquakes from “fracking,” and the decimation of landscapes from mountain top removal coal mining highlight some of the consequences that stem from the energy use practices of modern societies. The complexities of the technical systems involved in extracting energy resources and distributing energy in usable forms to industries and consumers are important to understand to get a grasp on our energy challenges, but few people, including most social scientists, understand these technical aspects in detail. The political, economic, social, and cultural systems that influence how societies use energy are as complicated, if not more so, as energy technologies and understanding these systems is essential if change to energy use is to be achieved, but few engineers grasp the intricacies and subtleties of social systems.

The author of the book under review here, Allan Mazur, is that rare individual who has a strong grasp on both the social and technical aspects of energy systems, having trained as an engineer and a sociologist, and having been a leading scholar of energy, technology, and society for decades. He has produced a valuable book aimed at a non-technical audience that deftly explains both the technology and sociology of energy, which will likely improve the understanding of energy issues for most people who read it and may serve to enhance scholarship across multiple fields dealing with energy systems. The book focuses on affluent industrial nations, particularly the United States, a limitation that Mazur acknowledges. In light of the fact that energy use is rising

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dramatically in China and India among other nations it is increasingly important to consider processes occurring outside of the wealthiest societies. Nevertheless, the focus is appropriate given that the lion's share of global energy resources over the past two centuries has been consumed by "developed" nations.

The book has 14 chapters, divided into five sections. The first section gives an overview of the rise of energy use, particularly fossil fuels, that occurred as part of the industrial transformation that unfolded over the past two centuries and how energy use in industrial societies differs from that in preindustrial societies. This presentation includes a discussion of the many environmental problems connected with various energy resources, how energy and electricity are distributed in industrial societies, and the connection between energy use and quality of life (roughly speaking, rising energy use in poor nations is associated with improvements in some indicators of quality of life, but this link is not apparent in affluent nations).

The second section covers the major sources of energy—fossil fuels, nuclear, and renewables—explaining where they come from, how they are used, and trends in their use over the past few decades in industrial nations. The section also includes a chapter assessing the contribution of population growth to the consumption of energy (which is substantial, but its effects differ across nations and are less important for electricity consumption than they are for overall energy consumption).

Part three focuses on electricity grids, particularly the United States grid system (now based on three main grids, two of which are linked with Canada) and how it developed from the end of the nineteenth century to the present. There is also a shorter discussion of the Japanese grid system and how it was affected by the 2011 earthquake and tsunami.

Part four focuses on the social conflicts that occur over energy use, including controversies about the contribution of fossil fuels to global climate change and the environmental impacts of energy extraction. Mazur notes how controversy often stems from the divergence of what seems "rational" from a technical point of view and what seems sensible from a more human perspective. Mazur discusses disputes about the appropriate weight given to "expert" opinion, how experts differ from one another in their assessments, and how risk-benefit analyses are conducted. This section includes a chapter on media coverage of energy-related issues, particularly reporting on global warming, discussing theories aimed at explaining changing patterns in news reportage over time.

The fifth and final section focuses on proposed solutions to our energy problems and offers some guidelines for energy policy. Mazur provides an intelligent discussion of energy use in transportation and in cities, and the potential

merits and limitations of energy efficiency and policies like cap and trade. The final chapter ends with a list of 10 points under the heading "What should we do?" These aren't so much suggestions as important matters that should be considered when making decisions about energy and include the need to consider all energy options, to recognize the virtues of renewable energy sources while not overlooking their shortcomings, and to question social institutions (corporations, governments) that work to spur energy consumption.

This is a well-written and informative book by an outstanding scholar who is unusually well qualified to analyze both the social and technical aspects of energy systems. Mazur is a hard-nosed realist who does not propose any technofixes or other magic bullets to solve our energy problems. Rather, he recognizes the many tensions, trade-offs, and limitations that exist in how societies use energy and what societies gain and lose by their energy use practices. He also recognizes that there are hard choices to be made about how to reduce energy consumption and how to produce the energy societies consume. Who makes these choices and what choices are made depend on inequalities of power; the consequences of decisions differ across people based on their social positions and across environmental systems.

The main shortcoming of the book is that, while it acknowledges the importance of political and economic power, including the role of corporations, in determining energy production and consumption practices, it does not draw on the substantial sociological literature on the political economy of the environment to any great extent. Political economists in environmental sociology have shed a great deal of light on how the dynamics of capitalist systems lead to environmental crises, and drawing on this work would have elevated the theoretical level of the book. Additionally, while he acknowledges public controversies, Mazur never seriously engages with a consideration of how social movements challenge powerful actors to bring about reform in energy policy and what potential movements have to bring about social change (and, thereby, to bring about change in energy use). Of course, there is only so much one can address in a single book, and Mazur clearly sticks to his strengths, giving authoritative information on many aspects of energy systems. Overall, this is an excellent book, fully worthy of attention from a variety of scholars as well as generally educated readers of all backgrounds.

Disclaimer: Gene Rosa, who was my adviser in graduate school, my friend, and one of my research collaborators and co-authors, was a former student of Allan Mazur, who is therefore in some sense my intellectual grandfather. Before publication, I provided Professor Mazur with some brief comments on an outline of the book reviewed here.

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