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## **BOOK REVIEW**

***Astrid KANDER, Paolo MALANIMA,  
and Paul WARDE, Power to the People:  
Energy in Europe over the  
Last Five Centuries***

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# Power to the People: Energy in Europe over the Last Five Centuries

**Astrid KANDER, Paolo MALANIMA, Paul WARDE**

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The book presents an in depth-analysis of the root causes for Europe's world domination in the modern era, by putting energy at the center. The book is not only a book of economic history and development which sees the main difference between pre-industrial organic economies and modern economies as the utilization of different types of energy carriers, but it is also an anthropological study about bringing 'power to the people'. The main research questions of the study can be summarized as follows: 'Is energy a driver of economic growth?', 'What forces led to the energy transitions?', and 'How economic energy efficiency has developed in time and space?'. Although the scope and structure of study is highly impressive, it is not without problems.

The book differs from the similar works with its new time-series data, and its focus on long-term and internationally comparative economic development. It has a strict geographical focus on Western Europe; therefore, possible 'eurocentrism' critiques would be non-essential. It has a wide section devoted to clarifying definitions and concepts used in the study. The fundamental concept of the book, energy, is defined as "the capacity to perform work, useful for human beings" by the authors. Another key concept in the book is "development block" which is defined as "implementation, diffusion and wider impact on society of macro-innovations".

After some detailed analyses on many other concepts, the core chapters start with examination of traditional energy sources in the pre-modern societies. It touches upon anthropological approaches about nutrition of people and draft animals by emphasizing the photosynthetic constraint which limits the sole energy basis, vegetable products. Dramatic effects of a few degrees C drop or increase for several years are examined very well, with examples such as the effect of climate on the rise of Roman Empire. According to the book, temperature is of vital importance in pre-modern economies in which the only source of energy is photosynthesis and the only energy converters are "biological machines" having energy efficiency around 15-20%. In Europe, due to low soil fertility, farmers needed more capital in the form of animals to cultivate the soil and this required the allocation of more land for fodder, as "fuel" of working animals. They calculate that a farmer could exploit 0.3-0.5 horsepower in the medieval Europe.

Firewood, as the main fuel of household and industry, represented 50% in total energy consumption of Western Europe while having different rates in countries. It was, for example, only 4.3% in Britain, 80% in Sweden, and 60% in Germany. Britain had a geographical advantage and exploited coal instead of firewood as early as the sixteenth century. This advantage caused major developments,

as the book points out rightly. The fixed amount of land was the main obstacle in the agricultural economies, according to the authors. This led to deterioration in the ratio between two factors of production, land and labor, as population increased. However, in the following century, with the introduction of new products like maize and potatoes and new techniques like crop rotation, calories per head (energy) increased again in Europe significantly. Even in these centuries, Britain enjoyed its advantage in coal production which served like “ghost acres” in terms of energy production. Holland had a similar advantage with peat but, the authors show that the rest of Europe had no chance to use coal until a transport revolution. Authors seem correct in their claim that the energy transition was brought by the need to replace natural resources becoming scarce. A rich historical data set available on the book verifies these arguments of the authors.

About the first industrial revolution, the authors claim that coal was not enough on its own, and technical knowledge for converting heat into motion was needed for the development block to emerge. The development block could occur only thanks to the combination of coal, engine and iron. With this perspective, the authors highlight an interesting difference between contemporary and early-modern energy consumption: Today, the high energy consumption is a consequence of the wealth which has already been created; differently in the first industrial revolution, energy consumption was a cause of wealth and necessary for manufacturing industrial, and especially, intermediary products. With intense use of cheap fossil fuels, British products were so competitive that it became meaningless for many countries to compete. Alongside coal, the authors regard water power significant for its capacity to concentrate power at a small wheel when technical opportunities of doing this were strictly limited. Similarly, they regard wind power significant for essential role in integrating regions with sailing ships. Concentration of power has been the greatest achievement and the basic rationale behind of engines (of any kind), according to the authors and historical trends confirm this idea. They ask, without coal, how much wood might have been required to power the industrial revolution and claim that the answer indicates the physical limits of the traditional energy regime.

The second and third industrial revolutions are called by the authors as “internal combustion engine-oil development block” and “information communication technologies-electricity development block”, respectively. They simply argue that there were more than one energy transition and they changed the energy positioning of countries. Besides, between the first and the latter two energy transitions, there was a significant difference. The first one did not change people’s everyday lives since energy consumption was mainly about industry. However the oil and electricity transitions were mainly about people’s everyday lives. Another difference was the mobility of energy carriers; coal was less mobile but oil and electricity are more mobile. The degree of mobility of the dominant energy carrier closely affected competitiveness of countries, claim the authors.

Similar to the complementarity relation between coal and steam engine, there is a market suction effect between cars and gasoline and between electrical devices and electricity consumption. Another continuing trend in the following energy transitions is the combination of capital-deepening and knowledge-intensification. Uniquely for the electricity system, it works better as large, integrated infrastructure which pushes countries to each other. Fortunately, the political outcomes of this technical feature are examined well by the authors, unlike the other political aspects of the topics included.

On the other hand, the most significant weakness of the book is that it has an agency problem, the subjects are not clear in chapters. Although the book is the story of how power has come to the

people, the question 'who' has brought power to the people is unanswered. This basically sources from the authors' perception of 'country', they take countries as 'black boxes'. For example, in the book, 'Britain' corresponds to the 'British state' most of the time; yet, sometimes it refers to the 'British people'; or 'Sweden' imports coal, but it is not explicit if the Swedish state or Swedish companies import. The country names sometimes refer to the state or to people and companies. This, as an extension, causes a deficiency about defining the winners and losers of the game in every round of energy transitions, at both national and international level. Perhaps for this reason, there are quite few examples of legal or real persons mentioned from the earlier periods.

There are some other weaknesses of the book. For example, the authors take food production only as agriculture. However, especially in northern regions, fishery is a vital source of food energy. If data about the role of fishery as a part of food energy is not available, or if there is another reason for excluding it, it would have been better to state it. Lastly, the authors seem neglecting the political aspects of contemporary energy relations. Although energy is increasingly more often exploited in international relations, the study assumes that as if energy is a pure economic topic. Despite these deficiencies, the study fills a significant gap in the energy studies literature. It utilizes a wide range of data sets and has been enriched with many illustrations.