

Since its origin 'system Earth' has gone through many radical changes and energy always played a determining role. Niele's book is an account of his search for the relationships between energy and development in the form of a scientific monograph.

Part I reports about a journey through the history of planet Earth along the tracks left by energy. The author blends numerous observations and reflections by scientists of many disciplines into a logical narrative about five successive energy revolutions that passed since the origin of life: the emergence of photosynthesis and aerobic respiration, the domestication of fire by mankind, and the Agricultural and Industrial Revolutions.

An energy revolution marks the boundaries between energy periods, and an energy period is characterised by an ecologically dominant energy regime. Each of the five energy revolutions induced new evolutionary developments and changed the face of the Earth.

Based on the observations precipitated in Part I, Part II develops a model, called the Staircase of Energy Regimes, describing the role of energy in the evolution of life. The model is used to explore possible pathways into the future. If, triggered by a new perception of reality, humanity chooses to unleash the sixth energy revolution in response to global forces of change, its development could continue in a sustainable way.



Frank Niele is a senior research scientist at the Royal Dutch/Shell laboratories in Amsterdam and a member of the global Shell coalition for radical innovation. He joined Shell in 1988 with a PhD in chemistry from Utrecht University and has worked on a variety of exploratory research topics in the fields of homogeneously and heterogeneously catalysed industrial processes.

Frank has a long-standing interest in sustainable development and his main interest has shifted to the search for innovative pathways towards a sustainable energy future. In his explorations of the future he incorporates evolutionary insights from the past 4.5 billion years and fuses perspectives from the natural and social sciences.



elsevier.com

ISBN 0 444 51886 X



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