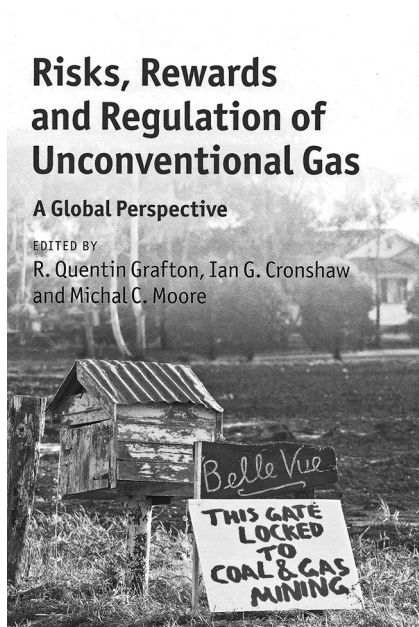


Risks, rewards and regulation of unconventional gas, by R. Quentin Grafton, Ian G. Cronshaw and Michal C. Moore, 2017. Cambridge University Press, Cambridge. 509 pages. Hardback: price £71.99, ISBN 9781107120082.



The present book, edited by specialists in the field of mineral energy economies, is a comprehensive study of the current state of knowledge of unconventional sources of natural gas. It covers a broad spectrum of issues, ranging from the development of the gas industry in unconventional deposits, through the political importance of unconventional exploitation of resources, to characteristics of economic indicators of a selection of major world gas fields. Issues related to the exploitation of unconventional natural gas resources have a special place. In 23 chapters, prominent specialists discuss not only the general geopolitical situation, but above all legal regulations and economic conditions, which on the one hand enable, and on the other limit possibilities of using unconventional natural gas resources. However, there is little information on the characteristics of the deposits themselves.

The introductory chapters, 'The rise of unconventional gas: the story so far' (pp. 1–7; Gronshaw,

Grafton & Moore) and 'Geopolitical Dimensions of global unconventional gas perspective' (pp. 8–34; Umbach), present the subject of unconventional energy sources to the reader. These chapters concern economics as well as legal and environmental regulations that apply in different parts of the world. The authors indicate the main problems related to the operation and legal supervision of gas exploitation and highlight the aspects of environmental protection in relation to the region where shale gas is extracted. They discuss the development of the industry in the United States in opposition to European countries and China. Similar to the United States, other countries rich in shale gas have also experienced a kind of industrial revolution associated with the development of technologies for the exploitation of unconventional minerals, which has covered all areas of life.

In the next chapter, J.R. Lozano Maya describes the development of unconventional gas industry within the APEC (Asia-Pacific Economic Cooperation), with special attention devoted to Australia, Canada, Chile and China. In the following chapters this issue is discussed in relation to other regions of the world: the United Kingdom (Bradshaw), Alberta (Moore), Colombia (Sanches-Torin & Cobrales, pp. 230–250) and India (Kelkar & Panandiker, pp. 251–266). However, the emphasis is definitely on unconventional gas deposits in Australia (Goldstein, Malavazos & Hayter, pp. 374–390; Cox, pp. 411–426), Canada (Moore, pp. 197–223; Nikolakis, pp. 451–466) and the United States, while other countries with less experience in this young industry are discussed more briefly. The most precious information for geologists involved in the management of deposits are the updated (up to 2015) tabular and graphic representations of gas production from areas of unconventional gas deposits, both known (e.g., Barnett Shale), as well as smaller or newly discovered (e.g., the Sydney Basin).

Chapters that the wider audience would find interesting are those related to unconventional gas

deposits in the USA, Canada and Australia, i.e., 'Technology Revolution' (pp. 59–91; Evans) and 'Risk and opportunities' (pp. 92–110; Cronshaw & Grafton). These are the chapters that summarise current knowledge and general issues of recognition and acquisition of shale gas resources. The development of the industry related to the exploitation of unconventional gas fields in various regions of the world is based on reliable sources, e.g., APEC EGEDA and IEA. Legal regulations, different in different countries, are shown in time and block diagrams, which help the reader to follow legislative changes over the past two decades. We find examples of visible progress in the development of unconventional deposits compared to conventional resources, such as those in British Columbia, where between 2005 and 2015, 90% of gas production came from unconventional deposits, while prior to 2005 it was exactly the opposite (pp. 340–373; Jeakins).

The analysis and evaluation of unconventional energy sources in geopolitical dimensions is of particular interest to the reader. Many chapters of the present book emphasise that the United States and Canada have achieved significant advances in gas recovery technology over the past decades and gained great economic success. In the wake of them, European countries, such as Poland, Romania, the United Kingdom and Ukraine, have tried to achieve similar developments. Some of the European countries have banned the hydraulic fracturing technology that enables gas exploitation, which was associated with fears of excessive consumption of water resources. In each of the chapters of the present tome, issues related to monitoring and use of groundwater and surface water resources as well as threats related to the emission of chemical substances are discussed (pp. 467–483; Day), as well as, in some regions, seismic stability of prospective deposit areas for unconventional gas fields. This takes place to varying degrees of detail, depending on the degree of recognition and advancement of works related to the provision of deposits. The authors of individual chapters express deep concern for the natural environment and discuss in detail the ju-

risdiction in various parts of the world regarding possibilities and limitations of unconventional gas extraction and processing, including shale gas, coal bed methane and, in some areas, also gas hydrates.

In Chapter 14 (pp. 268–283), 'Failure to frack: pitfalls of governance and risk in Polish shale gas', M.C. LaBelle presents the situation on the Polish market, emphasising the current inhibition in development. The author wonders about the reasons for this situation, which are ascribed to numerous risk factors associated with applicable legal regulations, the risk depending on geological conditions, as well as risks associated with economics, dependent on changes in global markets. Above all, however, this section draws attention to rigid, non-flexible, institutional regulations, requiring deep reforms, which concern not only the development of shale gas production, but also other energy technologies (such as renewable energy). The author's words at the end of the chapter, which read, "Wishful political thinking does not build an Energy system. Administrative flexibility, investment incentives and clarity are needed for all energy system", are an unsurpassed summary of the situation in the country that is making efforts to develop unconventional energy sources as an alternative to conventional deposits.

The present book, which details and broadly discusses geopolitical realities as well as legal, technical and environmental aspects of acquiring and using unconventional energy sources, including shale gas and coal bed methane, is not an easy-to-read item. Written in a rather hermetic, specialised language, full of abbreviations, it is addressed primarily to specialists in the field of economics. As seen from the title, the emphasis is on economic and socio-economic content. For readers who are concerned with the laws of the energy market from a global perspective, the book is a valuable, comprehensive study, containing current legal regulations regarding unconventional energy sources in various geopolitical systems.

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