

# ENERGY SECURITY IN TIMES OF ECONOMIC TRANSITION



Lessons from China

YAO LIXIA

# **Energy Security in Times of Economic Transition**

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# **Energy Security in Times of Economic Transition: Lessons from China**

BY

**YAO LIXIA**



United Kingdom – North America – Japan – India – Malaysia – China

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# Abbreviations

Acceptability by society	AC
Affordability of energy prices	AF
Analytic hierarchical process	AHP
Applicability of technology	AP
Asia Pacific Energy Research Centre	APERC
Availability of resource	AV
Barrels per day	bpd
Belt and Road Initiative	BRI
Billion cubic metres	bcm
British Petroleum	BP
Carbon capture and storage	CCS
Carbon dioxide	CO <sub>2</sub>
China Energy Conservation Investment Corporation	CECIC
China National Offshore Oil Corporation	CNOOC
China National Petroleum Corporation	CNPC
China Petrochemical Corporation	Sinoproc
China Statistical Yearbook	CSY
China's National Development and Reform Commission	NDRC
China-Pakistan Economic Corridor	CPEC
Chinese Academy of Social Sciences	CASS
Chinese Communist Party	CCP
Coal-bed methane	CBM
Coal-mine methane	CMM
Contract Responsibility System	CRS
Department for Business, Enterprise and Regulatory Reform	DBERR
Diversification of primary energy demand	DoPED
Driving force–state–response	DSR
Energy indicators for sustainable development	EISD
Energy Information Administration	EIA
European Union	EU
Five-Year Plan of economic and social development	FYP
Frontier Works Organisation	FWO
Global Terrorism Index	GTI
Greenhouse gas	GHG
Gross domestic product	GDP
Gross national product	GNP

Group company system	<b>GCS</b>
Gulf Cooperation Council	<b>GCC</b>
Household Responsibility system	<b>HRS</b>
Hydro, Eolien, Light, Insulation, Organomasse	<b>HELIO</b>
Independent power producer	<b>IPP</b>
Indicators for sustainable energy development	<b>ISED</b>
Initial public offering	<b>IPO</b>
International Atomic Energy Agency	<b>IAEA</b>
International Energy Agency	<b>IEA</b>
Kilowatt-hour	<b>kWh</b>
Kuomintang	<b>KMT</b>
Large and medium-sized enterprise	<b>LME</b>
Liquefied natural gas	<b>LNG</b>
Lawrence Berkeley National Laboratory	<b>LBNL</b>
Megawatt-hour	<b>MWh</b>
Memorandum of understanding	<b>MOU</b>
Middle East Oil Import Dependency	<b>MEOID</b>
Million tons	<b>Mt</b>
Modern enterprise system	<b>MES</b>
National Bureau of Statistics of China	<b>NBS</b>
National Energy Administration	<b>NEA</b>
National Environmental Protection Agency	<b>NEPA</b>
National Oil Company	<b>NOC</b>
National People's Congress	<b>NPC</b>
National Renewable Energy Laboratory	<b>NREL</b>
Net energy import dependency	<b>NEID</b>
Net oil import dependency	<b>NOID</b>
Non-carbon based fuel portfolio	<b>NCFP</b>
Non-governmental organisation	<b>NGO</b>
Not in my backyard	<b>NIMBY</b>
Oil vulnerability index	<b>OVI</b>
Organisation for Economic Co-operation and Development	<b>OECD</b>
Particulate matter-10	<b>PM<sub>10</sub></b>
People's Republic of China	<b>PRC</b>
Renminbi	<b>RMB</b>
Research and Development	<b>R&amp;D</b>
Reserve-to-production	<b>R/P</b>
State Electricity Regulatory Commission	<b>SERC</b>
Small and medium-sized enterprise	<b>SME</b>
State Development and Planning Commission	<b>SDPC</b>
State Economic and Trade Commission	<b>SETC</b>
State Electricity Regulatory Commission	<b>SERC</b>
State Environmental Protection Administration	<b>SEPA</b>
State Petrochemical Industry Bureau	<b>SPIB</b>
State Planning Commission	<b>SPC</b>
State Power Corporation of China	<b>SPCC</b>

State Power Investment Corporation	<b>SPIC</b>
State-owned enterprise	<b>SOE</b>
Sulfur dioxide	<b>SO<sub>2</sub></b>
Sustainable Energy Watch	<b>SEW</b>
Sustainability indicator	<b>SI</b>
Tons of coal equivalent	<b>tce</b>
Total primary energy supply	<b>TPES</b>
Township and village coal mine	<b>TVCM</b>
Township and village enterprise	<b>TVE</b>
United Nations	<b>UN</b>
United Nations Development Programme	<b>UNDP</b>
United States	<b>U.S.</b>
United States Dollar	<b>USD</b>
Work programme on indicators of sustainable development	<b>WPISD</b>
World Energy Council	<b>WEC</b>

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# Introduction

Despite unprecedented energy consumption rates and environmental sustainability threats, China has seen fast economic growth and its energy policy and energy security have gone through decades of transformation. As China's economy shifts from a planned to a market mechanism, it is valuable to find the root reason behind the transformation of the energy policy and energy security situation.

International political economy and security studies on China have yet to explore the interaction among three important factors: its energy policy, its energy security, and macroeconomic reform. This book aims to fill this gap in the literature with a new methodological approach to the study of China's energy security. It applies both quantitative and qualitative analyses to the energy security situation in China during the reform period. With this said, two primary objectives are achieved in this book. The first objective is to examine how the energy security situation in China has evolved during the economic reform period. This book establishes a quantitative framework based on a comprehensive concept of energy security which covers availability of resources, applicability of technologies, acceptability by society, and affordability of prices. The framework analysis shows that China's energy security situation has not improved during the reform period.

The second objective of the book is to explore qualitatively why the energy security situation has not improved. To answer the 'why' question, the book opens up a new perspective by analysing the relationship between energy policies and the macroeconomic reform. It is found that China's macroeconomic reform has restricted the formation of China's energy policies and determined its energy security situation. In essence, China's energy policies are only a reaction to the macroeconomic measures. In other words, China's energy policies are not originally intended to improve energy security, but passive reactions to China's macroeconomic reform. This explains why China did not improve its energy security situation despite 40 years of reform.

In addition, with a separate chapter, it also includes an international perspective by studying the impact of China's Belt and Road Initiative on its energy security situation. This book is not only meaningful for the case of China but also useful to explain energy security in other countries, especially those countries in economic transition.

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