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Editors

Energy Economics: CO_2 Emissions in China

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Energy Economics: CO_2 Emissions in China

(能源经济学：中国的二氧化碳排放问题)

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Preface

Energy is essential to socio-economic development in modern society. China is the largest developing country and the second largest energy producer and consumer in the world, as well as the second largest producer of CO_2 emissions after the USA. CO_2 emissions in China has become a common focus of academic communities and governments worldwide. Therefore, the study of China's CO_2 emissions is not only helpful in terms of fully implementing scientific development, but also significant in working towards the sustainable development of China and mitigating global climate change.

Beginning with energy use and CO_2 emissions, *Energy Economics: CO_2 Emissions in China* discusses topical issues related to the present CO_2 emissions status and its historical evolution. In addition, it analyzes CO_2 emission reduction technologies, the CO_2 market and CO_2 emissions reduction strategies and policies, in the hope of providing a reference resource for decision making in future CO_2 emission reduction and climate change resolution strategies and policies in China. The book focuses on several key issues, which are discussed further as below.

1) Energy use and CO_2 emissions

Global CO_2 emissions are increasing constantly and rapidly, resulting in a continuous rise in average temperature worldwide, and making global warming an indisputable fact. By analysing features of global energy consumption, *Energy Economics: CO_2 Emissions in China* examines the relationship between climate change and CO_2 emissions from an energy use perspective and describes the far-reaching impacts of global warming. This book also discusses the opportunities and challenges faced by China from the view point of CO_2 emissions reduction, within the parameters of sustainable development.

2) Characteristics of energy consumption and CO_2 emissions in China

The impacts of CO_2 emissions are global and continuous, and different countries assume different responsibilities for CO_2 emissions reduction. Understanding the history and characteristics of CO_2 emissions in different countries is helpful in working towards scientific and impartial emission reduction. The authors of *Energy Economics: CO_2 Emissions in China* provide a systematic analysis of China's CO_2 emissions by looking at accumulative emissions, per capita emissions, the intensity of CO_2 emissions, the evolutionary process of CO_2 emissions and end energy consumption.

3) Factors affecting CO_2 emissions at different economic development levels

To mitigate climate change, it is necessary to slow down the growth speed of greenhouse gas emissions. However, at different stages of economic development, the key determinant factors of CO_2 emissions vary greatly. Therefore, *Energy Economics: CO_2 Emissions in China* considers the factors that result in CO_2 emissions, which of those are decisive and the impact that different income levels have on emissions. Such points are already the subject of intense research within the scientific community.

4) Evolution characteristics of CO_2 emissions in CO_2-intensive sectors

CO_2-intensive industrial sectors are key areas of CO_2 emission reduction, and such sectors should be paid close attention when formulating emission reduction strategies. To understand the relationships between CO_2 emissions, economic growth, technical advancement and energy consumption, it is necessary to analyse the evolution of the quantity and intensity of China's CO_2 emissions in those sectors and find out the causes. The primary aim of *Energy Economics: CO_2 Emissions in China* here is to assist in providing scientific reference points for the formulation of future greenhouse gas emission reduction strategies.

5) The analysis of regional CO_2 emissions in China

China's CO_2 emissions are characterized not only by the growth of gross emissions, but also by the change in regional emissions. The unbalanced regional energy resource distribution and economic development in China, as well as the variation in economic development, industrial structure and energy intensity, have resulted in different levels of CO_2 emissions in different regions. Therefore, the regional comparison of regional CO_2 emissions, per capita CO_2 emissions, CO_2 emission intensity and the variation of CO_2 emissions in power generation provided by *Energy Economics: CO_2 Emissions in China* will help to increase current understanding and facilitate scientific decision-making in relation to reducing emissions.

6) Potential for, and impacts of, CO_2 emission reduction technologies

Technological advancement and innovation are essential ways of reducing CO_2 emissions. With efforts being made by different countries, a range of emission reduction technologies is in developing or has already been developed. Different CO_2 emission reduction technologies have different technical economic characteristics, emission reduction potential and development prospects. As *Energy Economics: CO_2 Emissions in China* discusses, the formulation of CO_2 emission reduction policies requires a detailed analysis on these technologies.

7) Simulation research on CO_2 emission reduction policies

Energy environmental policies will have significant impacts on CO_2 emission reduction. By introducing policies that are favourable to promote emissions reduction, the cost of emissions can play a part; for example, by regulating market behavior, production methods and consumption can be changed to decrease CO_2 emissions. The research in *Energy Economics: CO_2 Emissions in China* analyses two major emission reduction policies: (i) carbon taxes; and (ii) CO_2 trading; and discusses the potential impacts of different carbon tax schemes on major socio-economic indicators such as economic growth, residents' income, consumption and investment, the impacts of different tax schemes on the production and international competition capability of energy intensive sectors, and the sensitivity of different countries to the CO_2 emission trading polices of China.

8) International CO_2 trading mechanism and its impact on emission reduction

The launch of the "*Kyoto Protocol*" draft in 1997 not only meant that the greenhouse gas emission reduction goal for all countries is legally binding, but also began the process of using market mechanisms to reduce greenhouse gas emissions. Currently, global CO_2 trading schemes are taking shape and promoting CO_2 emission reduction to a large extent. For the purpose of facilitating the understanding and utilisation of international CO_2 markets, *Energy Economics: CO_2 Emissions in China* analyses the trading volume of international CO_2 markets, transaction values, factors influencing CO_2 trading, relationships between the CO_2 markets and energy markets, the liquidity of CO_2 markets and the social-economic impacts of CDM (clean development mechanism) projects.

9) China's CO_2 emissions prospects

What are the CO_2 emissions prospects for China? What are the effective ways to reduce emissions? What are their social-economic impacts? *Energy Economics: CO_2 Emissions in China* discusses such vital issues and offers corresponding policy advice on the basis of predictive analysis.

As well as the policy analysis on specific issues, *Energy Economics CO_2 Emissions in China* also discusses the model-based research approaches of each issue and the characteristics of data sources and processing. In addition to offering a reference resource for decision makers, the book also aims to encourage interactions between energy and environmental policy researchers.

Energy Economics: CO_2 Emissions in China is based on the second volume of the "China Energy Report" series in Chinese, biennial research reports compiled by the Center for Energy and Environmental Policy Research (CEEP), with each volume focusing on specific themes. Since its publication, the Chinese version has received positive responses from domestic and international energy-economy and management study counterparts, governmental agencies and energy-related enterprises. With the specific aim of broaden-

ing and opening up communication with international researchers, *Energy Economics: CO_2 Emissions in China* has now been published in English by CEEP.

The overall deployment of this project was conducted under the leader of Prfessor Yiming Wei. The authors of the chapters are as follows: Yi-Ming Wei, Gang Wu, Hua Liao and Haibo Wang (Chapter 1); Hua Liao, Gang Wu, Lancui Liu, Xiaowei Ma and Yiming Wei (Chapter 2); Lancui Liu, Ying Fan and Yiming Wei (Chapter 3); Lancui Liu and Yiming Wei (Chapter 4); Lancui Liu and Yiming Wei (Chapter 5); Yiming Wei and Lancui Liu (Chapter 6); Bin Fang, Qiaomei Liang, Yiming Wei and Lancui Liu (Chapter 7); Qiaomei Liang, Jie Guo and Yiming Wei (Chapter 8); Yuejun Zhang, Kai Wang, Yiming Wei and Lancui Liu (Chapter 9); Hua Liao, Qiaomei Liang, Gang Wu, Ying Fan and Yiming Wei (Chapter 10). Zhiyong Han, Jianling Jiao and Lele Zou participated in the research, discussion and proof-reading of certain chapters. This book is the pearl of wisdom of the CEEP.

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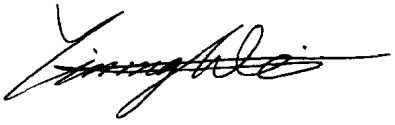

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