
Preface

China's Green Low-Carbon Economic Development is a series of studies on the theme of low-carbon economy, conducted and published annually by the Institute of Global Low-Carbon Economy (IGLCE.org), an international research platform cofounded by the University of International Business and Economics (UIBE), China, and Nagoya University, Japan. This book is the first time these works have been published in English.

In March 2011, when we were structuring and compiling this book, the Chinese government released its 12th *Five-Year National Economic and Social Development Plan*. Therefore, we chose the subjects of “green development” and “low-carbon economy” as key words to evaluate the success and problems regarding energy conservation and emissions reduction during the period of the 11th *Five-Year Plan*. For this purpose, the book focuses on reading and interpreting the green low-carbon development mode shift and relevant indicators of the 12th *Five-Year Plan*, as well as describing the trends of energy consumption, carbon emissions, environmental protection, and economic development in the next 5 years.

This book is characterized by the expertise of the authors, depth, realism, and forward-looking perspective. Each year we invite well-known world experts and scholars, including members of the IPCC working groups, negotiators of the United Nations International Climate Change Conference from various countries, government policy-makers, and experts and scholars in the field of low-carbon economy, to make contributions to the chapters. This year, we invited some leading experts from the Development Research Center (DRC) of the State Council of China, National Development and Reform Commission (NRDC), Chinese Academy of Sciences (CAS), and Academy of Social Sciences (CASS) who were involved in discussing and drafting the 12th *Five-Year Plan*. Using the latest statistical data, the experts give readers authoritative analyses of China's economic growth, development planning, energy strategy, carbon emissions, and other issues. These will provide references for a better understanding of the latest developments of the Chinese economy and prediction for the long term.

This book not only contains valuable data sets on climate change, carbon emissions, and energy consumption, but also detailed interpretation and analysis of various issues from experts and scholars. The reader will gain knowledge and

understanding of what is happening in the world and why these things are happening and how we should respond, and will be given inspiration and implications for making policies and decisions.

We closely follow domestic and international economic developments, focusing on the most pressing issues like the status of global climate change, the world energy strategy, and policy issues for renewable energy and low-carbon economic development; it shows progress and analyzes problems concerning the low-carbon economy in order to provide the latest information to readers.

The forward-looking perspective of the book gives experts' forecasts on important economic issues based on in-depth analysis. For example, on the energy issue, how fast will China's economy grow by 2015 and 2050? What fundamental changes will be undertaken in terms of the industrial structure? How much energy will be demanded? How much carbon emissions will occur by 2015? Will the target of reducing carbon emissions by 40–45 % be achieved? All of these questions are analyzed, making this book an important reference for studying the Chinese economy and for policy-making.

The following highlights are addressed in this year's book:

First, the book reviews and evaluates the main achievements of energy conservation and pollution control in recent years in China, especially during the period of the 11th *Five-Year Plan*. According to IEA, China's carbon dioxide emissions accounted for 23 % of the world's total emissions, and China surpassed the USA as the world's largest emitter in 2009. At the same time, China became the world's second largest economy in 2010. From this perspective, the book points out that China should assume greater responsibility for emission reductions. However, the outside world holds an image of China as a heavy emitter but, due to less media attention, has no further information about what China has done to reduce carbon emissions. In fact, China has already made great efforts for emission reduction; for example, between 2005 and 2010, China's energy intensity (energy consumption per 100,000 Yuan GDP) decreased by 19.1 %, saving 630 million t of coal, equal to 1.5 billion t of carbon dioxide emissions. Such a large emission reduction is definitely a major contribution China has made to the world, and it shows that China is taking the lead in carbon emission reductions (Chap. 1).

Second, we interpret the 12th *Five-Year Plan* from the point of view of energy conservation and carbon emission reduction, new energy strategy, environmental protection and ecological balance, low-carbon city construction, etc. We also decompose the indicators of energy conservation and emission reduction as well as environment and ecology, describe the blueprint of China's green development, make authoritative analyses of the latest trends of low-carbon development, and give policy implications to policy-makers.

The book points out that the core of the 12th *Five-Year Plan* is to accelerate the fundamental transition of the development mode to achieve "green low-carbon development." In order to implement this route, the 12th *Five-Year Plan* proposed a series of binding targets, like "bring the share of non-fossil fuels in primary energy consumption to 11.4 %, reduce energy consumption intensity (energy consumed per 100,000 Yuan GDP) by 16 %, and reduce carbon dioxide emissions

intensity (carbon volume emitted per 100,000 Yuan GDP) by 17 %.” Unlike the 11th *Five-Year Plan*, here the “emission reduction” in the “energy saving and emission reduction” targets not only refers to reducing the emissions of environmental pollutants such as sulfur dioxide, but also includes the emissions of carbon dioxide; therefore, after achieving these goals, the emissions of carbon dioxide and other pollutants will be significantly reduced in China, enabling the realization of a fundamental transition in China’s economic development mode.

The book stresses that these indicators will guarantee that the Chinese government will fulfill its promise to reduce carbon emissions per unit of GDP to 40–45 % below 2005 levels by 2020. Assuming a 7 % annual economic growth rate proposed by the “12th FYP” and using the carbon emission intensity in 2005 as a base, this target means that by 2020 there will be 7 billion t of carbon dioxide reductions. This will be a significant result, and no country except China can achieve this.

Third, the book analyzes the status quo of China’s energy supply and demand and describes the short-term energy development road map for the next 5 years and a longer-term plan for the next 15 years. The book points out that, along with rapid economic growth and steady improvement in people’s living standards, China’s energy demand has been experiencing unprecedented rapid growth. In 2010, the total energy consumption in China reached 3.25 billion t of coal equivalent, 1.2 times more than the level in 2000. China is relatively rich in oil resources: its accumulated oil reserves at the end of 2010 were 31.28 billion t as measured by the geologically explored amount, 3.14 billion t as measured by the surplus recoverable technology measure, and 2.043 billion t as measured by the economically productive measure. However, due to the energy demand greatly exceeding supply, China has changed from an oil-exporting country to an oil-importing country. In 2010, China’s oil dependence reached 54.8 %, and China became a country which needs to import all forms of primary energy except electric power. This has contributed to a high dependence on energy imports, which in turn increases the risks to China’s energy security.

The book notes that the 12th *Five-Year Plan* has set the average annual growth target for economic development for the next 5 years at 7 %, but most experts predict that the actual development trend in the average annual growth rate of China’s GDP in the next 10 years is likely to reach 8.5 %. This means that by 2020 China’s GDP will reach 71 trillion Yuan (in constant 2005 prices), and primary energy demand will reach 7.1 billion t of coal equivalent when calculated using the energy intensity of the 11th *Five-Year Plan*; in terms of energy supply capacity, environmental protection, the response to global warming, and other aspects, China’s sustainable development would face very severe stress. However, if China strictly implements energy saving and emission reductions to decrease its energy consumption intensity per unit GDP by 30 % over the next decade, then the total primary energy demand will be reduced to 5.1 billion t of coal equivalent, which would save 2 billion t of coal, equivalent to a reduction of 4.70 billion t of carbon dioxide emissions. The book also points out that in recent years, China’s green energy has been developing at an unprecedented speed: the growth rate of installed capacity of hydropower, the utilization of solar water heaters, the scale of

under-construction nuclear power, and the installed capacity of wind power all rank number one in the world. The Chinese government has also developed a more ambitious goal for green energy development: increasing the usage of non-fossil energy to the equivalent of 700 million t of coal equivalent. Given the base of 277 million t of coal equivalent in 2010, the usage of non-fossil energy will therefore increase by at least 400 million t of coal equivalent, thereby helping to alleviate to some extent China's energy demand crisis in 2015.

At a time when all local governments and departments are decomposing the indicators of the 12th *Five-Year Plan* and developing specific implementation plans, we bring experts in various fields and government officials together; set "green" as the theme; read and interpret the 12th *Five-Year Plan*; make authoritative analyses of China's green development, energy conservation and emission reduction, as well as the latest trends for future economic development; and make policy recommendations based on all of the above. We believe that this book will not only provide more valuable data on carbon and energy and policy interpretations, but will also be an important reference for government officials, policy-makers, researchers, businesses' strategic decision-makers, analysts of the international situation, students, and the general public.

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Jinjun Xue

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