

Energy Structure, Carbon Neutral Performance and High Quality Economic Development

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Abstract

As socialism with Chinese characteristics has entered a new era, China's economic development has also entered a new era. The basic characteristic of China's economic development now is that China's economy has changed from a high-speed growth stage to a high-quality development stage. But without a solid material foundation, high-quality economic development and harmonious coexistence between man and nature cannot be achieved. In order to achieve the goal of carbon neutrality by 2060 while developing our economy at a high quality, we have conducted research. Based on the data of factors change, input quality, process quality and output quality of economic development, this paper studies the current stage of high-quality development of Chinese economy, and concludes that the high-quality development of Chinese economy still needs to adjust innovation, ecological protection, energy structure and other aspects. This paper studies the rate of decline of energy self-sufficiency, the rate of energy utilization and energy intensity compared with other countries and the rate of energy consumption and GDP growth from 2000 to 2016, and finds out some problems such as the pollution of fossil energy to the environment, the rate of energy self-sufficiency declining and the level of energy consumption declining. Based on the comparison of carbon dioxide emissions in various countries, the research data show that China's carbon emissions are growing, and the pressure to achieve carbon neutrality will be greater than that of other countries.

Keywords

Energy Structure; Carbon Neutral Performance; High-quality Development.

1. Introduction

In its report to the Party's 20th National Congress, the CPC stressed that high-quality development is the primary task for comprehensively building a modern socialist country. Without a solid material and technological foundation, it would be impossible to build China into a great modern socialist country in all respects and promote green development. Therefore, high-quality economic development needs the support of energy. However, with the rapid economic development, the proportion of fossil fuel use keeps increasing, causing serious damage to the global ecological environment. For the sake of our common home, we need to reduce the proportion of fossil fuel use and increase the proportion of clean energy use during the rapid economic development. This will reduce carbon dioxide pollution to the environment and promote the country's goal of carbon neutrality by 2060. Nowadays, we promote high-quality economic development by improving the quality of investment in economic development, the quality of economic development and the quality of economic output. At the same time, however, high-quality economic development faces problems such as weak driving force for innovation, still polluting the ecological environment, and developing economy mainly by using fossil fuels. We should seize the opportunity to develop original and forward-looking research breakthroughs to promote innovative development in our country. Reduce environmental pollution by adjusting energy structure and recycling waste; Through the

improvement of the production process, improving the requirements of environmental standards, increasing the investment in the control of pollutants, process equipment and other fields, so as to reduce the consumption of non-essential energy, conducive to the high quality development of our economy. High-quality economic development needs to adjust the energy structure, and the adjustment of energy structure faces the following problems: The pollution of fossil energy on the environment, the rate of self-sufficiency of energy in China is declining, and the level of energy consumption is on a downward trend. We need to reduce the use of fossil energy, reduce the demand for foreign resources, strengthen the cooperation among provinces throughout the country, and establish a resource database belonging to China, which is conducive to better protection of the environment and better allocation of our resources. So as to promote high-quality economic development. Now, most countries have reached the peak of carbon dioxide emissions, and China's carbon emissions are still high. Therefore, we need to adjust the energy structure, and constantly improve our use of primary energy technology, so as to promote carbon neutralization performance and achieve the goal of carbon neutralization by 2060, and promote the high quality development of our economy.

2. Current Situation of High-quality Economic Development

High-quality economic development is the economic development direction to adapt to the law of social change and development. Promoting high quality development is conducive to clear development ideas, planning economic policies and implementing macro-control. Without material basis, it is impossible to achieve high-quality economic development and promote harmonious coexistence between man and nature. Therefore, we need green development to achieve high quality economic development. Green development is also an important solution to solve pollution problem.

To meet the needs of our economic development, our economy needs to turn to a high-quality development stage. While implementing the new development concept, our economic development mode has changed fundamentally, mainly in the form of increasing input factors to promote high economic growth, to mainly rely on productivity improvement. Through continuous promotion of technological progress, improvement of energy consumption structure, enhancement of labor quality, the production of new input factor data information, promote the improvement of the quality of economic development input; More concentrated use of resources, promote the continuous improvement of environmental friendliness, improve economic benefits, and promote the improvement of the quality of economic development; The improvement of the quality of economic output has been promoted by the development of competitiveness level and economic scale, the increasing status of international division of labor, and the more reasonable and equitable distribution of resources. The quality of input, the quality of economic development and the quality of economic output work together to promote the high quality of economic development.

China has made great achievements in the quality of its development, notably improving the quality of inputs, processes and outputs. According to the provincial panel data, there is still a gap between China's economic development and high-quality development, which is highlighted by the lack of scientific and technological innovation intensity, ecological environmental pollution, and urgent transformation and upgrading of the manufacturing industry.

3. Energy Issues

In the early days of the People's Republic of China, due to the need of economic development, China had to take the path of energy consumption and expansion to meet the demand for manufacturing products in economic construction and continuously promote the development

of manufacturing industry. But as China enters the later stages of industrialization, manufacturing is increasingly polluting and consuming the environment, making it difficult for this approach to continue.

From the historical change of the global primary energy structure, the share of low-carbon energy is increasing. The country's policy also indicates the goal of energy self-sufficiency, which should be maintained at above 80 percent by 2020. Since 2000, the country's energy self-sufficiency rate has declined rapidly, until 2016, the country's energy self-sufficiency rate has dropped to below 80 percent. Therefore, energy self-sufficiency rate will constrain the change of energy structure. Along with the rapid economic growth, the total amount of primary energy consumption will also continue to increase, but through the data research, we know that in most years, the GDP growth rate is higher than the energy consumption growth rate, which indicates that the energy consumption has a downward trend.

From the comparison of the data of the ratio of energy utilization and economic or material output of various countries in 2017, there is still a large gap between the ratio of energy utilization and economic or material output of China and the world average level. According to the data analysis, the ratio of energy utilization and output of economic or material resources in China accounts for 180% of the world average level, 250% of the United States and 330% of the European Union. There is a big gap between the ratio of energy utilization and output of economic or material resources in China and that of other countries. Therefore, the ratio of energy use to economic or material material output still has a large space to decline. It is expected that the ratio of energy use to economic or material material output will continue to decline for a long time after energy efficiency management is optimized and economic structure is improved.

With the diversity of energy structure, the characteristics of resources themselves may change due to the development of technology, war and other special events, which will also cause the uncertainty of the development of energy structure.

Since the end of the 20th century, China's total energy production is lower than the total energy consumption, energy demand will increase day by day, and dependence on foreign energy supply will continue to increase. However, with the increasingly serious global religious, political and cultural conflicts, the rise of political and economic ideas supported by populists in some countries, the increasing geopolitical conflicts in the Middle East, the constant trade friction and the obstruction of normal trade, the escalating tide of "anti-globalization" led by the United States, and the increasingly prominent issue of energy security. The risk of maritime transportation of fossil energy is gradually increasing, and the hidden danger of China's energy security is also gradually prominent. The adjustment of energy structure is conducive to solving the security problem of China's energy structure, so the adjustment of China's energy structure cannot be slowed down.

We adjust the energy structure and increase the use of primary energy, but to the use of primary energy we will be faced with the following problems: energy science and technology of our country is generally backward. The unbalanced use of primary energy, the problem that the storage of fuel ethanol will affect human food security, and the difficult coordinated development of isolated energy systems.

Now, most countries have already reached the peak of carbon dioxide emissions, the trend of carbon emissions in our country is still growing, so compared to other countries, our country will be under greater pressure to achieve carbon neutrality. At the same time, China is a developing country, and the average income of its population still needs to be greatly improved. We cannot give up economic growth while reducing carbon neutrality. Reducing carbon emissions is also a key part of high-quality development. However, according to the data from provincial panels, China's energy structure is dominated by fossil energy under the constraint

of resource supply, and China's economic growth leads to an increase in carbon emissions. So we have a long way to go to achieve carbon neutrality by 2060.

4. The Solution Path

Innovation-driven development is the main feature of a modern economic system, and scientific and technological innovation capability is a key factor affecting high-quality economic development. The most critical problem is that the economy cannot develop in a high quality and the innovation ability of science and technology is not strong. The most prominent problem is that the innovation ability of enterprises and industries is not strong, and the lack of core technologies and major original innovation. Research data show that the key parts of our industry are still in the weak stage of international competitiveness. If the products produced by industry are ranked in order of technology, the technology content of China's industrial products shows a U-shaped distribution. However, the foundation and main body of industrial economy is statistically classified as "medium technology" industries, such as materials, chemicals, electronics, machinery, transportation equipment, precision instruments, etc., which are also the key supporting sectors that determine the overall quality of industry technology. From the perspective of process and technology level, the relative best advantages of many industrial industries do not appear in China, and even some of the extremely cost-effective, large market share, independent innovation ability strong Chinese industries, their key technologies or core components are dependent on foreign countries. Therefore, we need to constantly increase the elements of innovation, improve the basic capacity of industry; To address major needs in strategic areas, systematic arrangements should be made to enhance industrial innovation capacity. It is necessary to set up a complete innovation ecosystem between the innovation subjects and the innovation environment, which is conducive to realizing the synergistic effect of multi-subjects and multi-fields, so as to make the innovation resources accumulate and better allocate to the required place, and solve the problem of the technology monopoly of the developed country in our industrial development. We should also be good at spotting and seizing opportunities, strengthen research on basic technologies, deepen reform of the science and technology system, promote the joint development of applied research and basic research, commit ourselves to forward-looking basic research, and promote breakthroughs in original innovative achievements. We should also focus on the key industrial chain, take advanced production and management technologies, leading cutting-edge technologies, widely used technologies in multiple industries or fields, and technological disruptive innovation as the breakthrough point, create a powerful and efficient supply system of key technologies with common characteristics, and strive to achieve major breakthroughs in key technologies. Therefore, we must plan according to the needs, problems and goals, start from the needs of national development, from relying on late mover advantages in the past to creating more first-mover advantages, enhance the system layout planning, and break the problem of technology monopoly of foreign developed countries.

The endogenous factor that affects the high-quality economic development is ecological environment. The important criterion to test the high-quality development is whether the ecological environment is good or not. Green development is an important way to realize the high-quality development. Therefore, pollution of the ecological environment will have an impact on the high-quality development of the economy. If we do not pay attention to the protection of the ecological environment, although the economy keeps growing in the short term, in fact, people's health is sacrificed, and the quality of development will continue to decline. It will promote high-quality economic development and make important contributions to the realization of China's carbon neutrality target by 2060.

We must move to a resource-intensive, environmentally friendly model. On the one hand, we need to change the energy structure to increase the proportion of products produced by low-pollution and low-energy technologies. On the other hand, we should constantly improve the production process, raise the requirements for environmental protection standards, increase investment in the control of pollutants, process equipment and other fields, pay attention to resource saving and resource recycling, reduce the pressure on the development of manufacturing industry, so as to better achieve high-quality economic development and achieve the goal of carbon neutrality.

In order to reduce uncertainty in the development of the energy mix, we should improve the technology required to use energy and reduce the possibility of factor endowment changes. Secondly, we need to improve the mechanism of energy market in our country and establish the diversified mechanism of energy market. Then, through the change of the energy structure, constantly reduce the use of fossil energy which causes irreversible impact on the environment, increase the use of clean energy, so as to reduce the possibility of special accidents. Finally, we need to actively strengthen the cooperation among domestic provinces and establish a good energy allocation mechanism among provinces, so as to better control energy, so as to solve the problem of declining energy self-sufficiency.

If the energy structure is adjusted, the proportion of primary energy will continue to increase. China is a country with a vast territory and abundant natural resources. After the energy structure adjustment, China can be self-sufficient in primary energy and reduce the supply of foreign energy demand. The increase of the proportion of primary energy will not only reduce the hidden dangers of energy security in China, but also benefit the realization of the goal of carbon neutrality in 2060, and benefit the high-quality economic development of our country.

We should accelerate the improvement of our energy innovation system, and push forward the construction of our primary energy national laboratory; We need to move forward with more efficient energy technologies; We also need to establish a complete national resource base, and unite the energy systems of various provinces to help our country regulate resources, improve the overall utilization rate of resources, and establish an energy system suitable for the present national production environment, so as to better realize the high-quality economic development and achieve the goal of carbon neutralization. China can adjust the energy structure, adjust the proportion of clean energy and fossil fuel, improve the refining technology of primary energy, and reduce the cost of clean energy. Through continuous research to upgrade the machine that needs to use fossil fuels to use primary energy, it will help to achieve carbon neutrality and reduce the performance. The continuous reduction of carbon neutralization performance not only benefits the high-quality economic development of our country, but also provides a development direction for all countries, especially developing countries.

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