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Economic Benefit and Environmental Impact Assessment of Energy Transformation Path

-- Evidence from Guangdong-Hong Kong-Macao Greater Bay Area City

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Abstract: Energy transformation is a systematic change that affects the national economy and society. It is not only the change of internal supply and demand structure of energy, but also closely related to economic industry and environment. In order to achieve the goal of carbon neutrality and "double carbon" in peak carbon dioxide emissions, it is very important to do a good job in energy transformation. This paper evaluates the impact of energy transformation path on the economic and industrial benefits and environmental health of Guangdong-Hong Kong-Macao Greater Bay Area city, and concludes that energy transformation has a good impact on the economic and environmental health of the country and society. Therefore, cities in Guangdong-Hong Kong-Macao Greater Bay Area should do a good job in carbon emission reduction, steadily promote energy transformation in the new era, and realize green energy transformation and coordinated development of energy, economy and environment.

Keywords: Guangdong-Hong Kong-Macao Greater Bay Area; Energy Transformation; Economic Benefits; Environmental Impact; Estimate.

1. Introduction

As one of the four Greater Bay Area in the world, the construction of Guangdong-Hong Kong-Macao Greater Bay Area has been widely concerned. Guangdong-Hong Kong-Macao Greater Bay Area, including 11 cities, is one of the regions with the highest degree of openness and the strongest economic vitality in China, and has an important strategic position in the overall development of the country. Guangdong-Hong Kong-Macao Greater Bay Area actively promotes the goal of peak carbon dioxide emissions and carbon neutrality, and develops rapidly in carbon emission trading, energy utilization structure and green and low-carbon development.

Guangdong-Hong Kong-Macao Greater Bay Area city is undergoing energy transformation, changing the structure of energy supply and demand, promoting the investment and transformation of energy system through the policies of relevant departments, and actively doing a good job in the top-level design of the low-carbon goal of the whole economy and society. Guangdong-Hong Kong-Macao Greater Bay Area's different energy transformation paths have a good impact on Greater Bay Area's economic benefits and environment.

Through energy transformation and institutional innovation, Guangdong-Hong Kong-Macao Greater Bay Area can explore a path to achieve peak carbon dioxide emissions and carbon neutrality, which is low-cost and efficient. It can effectively reduce the cost of promoting peak carbon dioxide emissions and carbon neutrality in Guangdong-Hong Kong-Macao Greater Bay Area, and also provide a more suitable new model for the country to better deploy peak carbon dioxide emissions behavior and carbon neutrality related work.

2. Economic Benefit Evaluation of Energy Transformation Path

Energy transformation is an important measure to achieve the goal of carbon neutrality and "double carbon" in peak carbon dioxide emissions. Under the scenario of energy transformation, Guangdong-Hong Kong-Macao Greater Bay Area cities deepen the supply-oriented structural transformation. Through the renewable energy development target and carbon emission constraint target, development can effectively increase the total economic output of China and realize the green and sustainable development of the national economy. Guangdong-Hong Kong-Macao Greater Bay Area's urban economy has developed rapidly, its scientific and technological innovation ability is strong, and its openness is high. The green and low-carbon development of energy transformation is at the forefront of the country.

Guangdong-Hong Kong-Macao Greater Bay Area's urban energy transformation is based on new energy, so as to promote the rapid development of energy Internet, hydrogen energy and energy storage industry. The reduction of the cost of wind and light power generation can drive down the cost of electricity and energy consumption, and promote the development of automobile industry, transportation equipment manufacturing and other related industries, which can become a new kinetic energy to support economic development and ensure energy security.

Expanding the scale of wind power and photovoltaic industry can also drive the increase of jobs in related industries. With the transformation of urban energy in Guangdong-Hong Kong-Macao Greater Bay Area, the number of jobs provided by the wind power industry in China has increased by nearly 10,000.

Guangdong-Hong Kong-Macao Greater Bay Area cities should also do a better job in unified regional energy planning, scientific and perfect Greater Bay Area's carbon reduction

targets, and the carbon reduction mechanism of synergy. In addition, with the rising energy consumption, Greater Bay Area is facing the challenge of carbon reduction. Therefore, it is necessary to give full play to Guangdong-Hong Kong-Macao Greater Bay Area's advantages, promote institutional innovation, and make greater contributions to achieving the national goal of "double carbon".

3. Environmental Impact Assessment of Energy Transformation Path

According to the energy transformation path of Guangdong-Hong Kong-Macao Greater Bay Area city, effective industrial structure adjustment, carbon pricing mechanism and the implementation of pollutant terminal treatment measures can significantly reduce carbon dioxide emissions, improve air quality, and realize the coordinated control of carbon dioxide and PM2.5, which is environmentally friendly.

The total energy consumption and energy consumption structure can directly determine the carbon emission of the energy system. Doing a good job of clean and low-carbon energy to promote carbon emission reduction can realize peak carbon dioxide emissions ahead of schedule. Clean electricity and low carbonization of energy can also reduce the cost of pollutant treatment at the same time.

Guangdong-Hong Kong-Macao Greater Bay Area should set reasonable carbon emission reduction targets, steadily promote energy transformation, and realize green energy transformation and coordinated development of energy, economy and environment.

4. Conclusion and Recommendations

4.1. Conclusion

(1) Increase R&D investment and policy support in the field of new energy technology and energy storage technology, and reduce the cost of new energy and energy storage technology.

(2) Through power structure optimization and carbon emission restriction, industrial transformation and upgrading, energy efficiency improvement, energy structure optimization, and terminal electricity substitution are forced to realize energy saving and carbon reduction.

(3) Cultivate innovative talents and technical talents in new energy technology research and development, new energy project management and other fields, and talents in related fields can support the large-scale development of new energy.

(4) Deepen the reform of the power system, and build a power market mechanism with new energy participation, so as to meet the needs of the development of strategic emerging industries in China and ensure the accelerated transformation of the energy system.

(5) Strengthen the research and development of advanced power equipment technology, and rationally manage the coordinated development of energy systems, mechanisms and systems.

(6) Energy transformation not only reduces CO2 emissions, but also reduces pollutant emissions. Set reasonable carbon emission reduction targets, steadily promote energy transformation, and realize green energy transformation and coordinated development of energy, economy and environment.

4.2. Suggestions

(1) Improve the development goals of non-fossil energy and encourage the electric power industry to invest in or transform clean energy. Combine non-fossil energy development goals with energy dual-control indicators to promote the orderly development of renewable energy.

(2) Increase investment in green sustainable development and encourage technological innovation.

(3) Set carbon emission reduction targets reasonably, and make a smooth and orderly transformation to prevent the impact of rapid energy transformation and avoid the excessive transformation from having a great impact on the economic industry.

(4) Strengthen the energy efficiency benchmarking of key energy-using industries, promote the penetration rate of new energy-saving technologies as industry assessment indicators, and promote the transformation and upgrading of various industries.

(5) Strengthen the guidance of public opinion on energy transformation and low-carbon transformation, raise public awareness of low-carbon environmental health, consciously change ideas from low-carbon life and low-carbon behavior, and create an atmosphere of low-carbon transformation in the whole society.

(6) Promote the coordination of wind power, photovoltaic, pumping and storage, power grid construction and natural ecological space, and improve the recycling system of wind power, photovoltaic and electric vehicle wastes.

(7) Strengthen the protection and restoration of ecological environment in the whole process of "developing, repairing and managing", improve the system and mechanism of promoting ecological environment improvement in coordination, and better promote the coordinated development of energy transformation and ecological environment improvement in the future.

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