The Existing Problems and Promotion Strategies of Green and Low-carbon Urbanization in China

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Abstract. This paper analyzes the problems existing in the green and low-carbon development of urbanization in China from the perspectives of concept, planning and management, industrial structure, technological innovation and policy system, and proposes corresponding measures and Suggestions to promote the green and low-carbon development of urbanization.

1. Introduction

China's urbanization has improved the level of energy consumption on the whole, while the energy structure dominated by fossil fuels such as coal is difficult to change in the short term [1], which makes China's urbanization face non-green development challenges such as high carbon emissions and air pollution. The national new-type urbanization plan has made it clear that the development of urbanization should embody the concept of ecological civilization and low carbon [2]. In particular, the 19th CPC national congress proposed to "promote green development". Green and low-carbon urbanization will be the only way to build a beautiful China, but there are still many problems.

2. Existing problems in the green and low-carbon development of China's urbanization

2.1. The whole society has insufficient understanding of the concept of green and low-carbon development of urbanization

For a long time, simply pursuing the scale and speed of urbanization has been the central task for local governments to promote the development of urbanization and achieve local economic growth under the current performance evaluation mechanism. Green and low-carbon development is often "marginalized" and "labeled" by local governments. At the same time, enterprises and ordinary people also have insufficient understanding of the concept of green and low-carbon development due to various reasons. On the one hand, due to the low level of popular science of climate change, energy resources and environmental issues behind carbon emission reduction, enterprises and the general public lack of understanding of relevant background knowledge, so there is a general lack of understanding of promoting green and low-carbon development. On the other hand, in the absence of relevant institutional constraints, individual rationality often encourages enterprises and the public to adopt short-sighted behaviors that are not conducive to low-carbon development. On the whole, the
social atmosphere of low carbon production, low carbon consumption and low carbon life has not been formed at present.

2.2. The planning and management of green and low-carbon urbanization development needs to be strengthened

At present, the urbanization planning of most provinces and cities still centers on "continuously improving the level of urbanization" and "enhancing the economic function of cities", and green and low-carbon development has not yet become the dominant idea of urbanization planning. Although some pilot low-carbon cities and provinces have proposed low-carbon development plans separately, it is difficult to balance the development of urbanization and carbon emission reduction due to the emphasis on economy and political performance [3], and there are often unreasonable and formalistic problems in planning and design. The execution of link, and due to the management level is not high, the lack of relevant supporting techniques used to evaluate the effective incentive measures and specifications, low carbon development planning in the construction of urbanization often poorly enforced, result in image engineering repetitive construction seriously, "old wine in new bottles" and "label" phenomenon, still blind expansion of urban population scale and disorderly, one-sided increased urbanization rate, city spread of low density, which in turn increased energy resources waste and carbon emissions.

2.3. Slow adjustment of industrial structure and large rigid demand for energy

At present, China is in the middle stage of rapid urbanization. The industrial structure in the urbanization process is still dominated by industry and the proportion of service industry is relatively small. The characteristics of industrialization in the process of urbanization are embodied in the rapid development of high-energy consuming industries. In other words, large-scale infrastructure construction and operation and maintenance, such as urban housing, roads and pipeline network, which are required by the rapid urbanization development, consume a large amount of energy resources, such as steel, cement, coal and oil. Most of China's cities and towns have a solid foundation for industrialization. At present, only a handful of cities and towns have a service sector that accounts for more than 50% of the total. Although in recent years, under the macro-control of the central government, the industrial structure has begun to change to a certain extent, the adjustment and upgrading of the industrial structure will go through a slow and long-term process. This is a huge challenge and problem for the realization of green and low-carbon urbanization.

2.4. The level of innovation in energy conservation and emission reduction technologies is in urgent need of improvement

The energy consumption dominated by coal and other fossil fuels in China's urbanization process is the main source of a large number of carbon emissions. In addition to the factor of energy and resource endowment, the most fundamental reason lies in the low innovation level of energy-saving and low-carbon technology. This is mainly reflected in the low level of energy-saving technology, low energy efficiency and excessive energy consumption. The technical level of renewable energy is not high, and the substitution of clean and renewable energy for traditional fossil energy needs to be improved. The level of low-carbon technology is relatively low, especially in the promotion and utilization of clean coal technology, as well as carbon dioxide capture, storage and utilization technology. The main reasons for the low level of energy conservation and low-carbon technology innovation at present are as follows: lack of technical innovation talents, shortage of research and development funds, lack of long-term dynamic mechanism for technical innovation, and difficulties in the transformation of energy-saving and low-carbon technology due to the lagging concept of low-carbon consumption.
2.5. The policy system to promote the low-carbon development of urbanization is not perfect

China's path of carbon emission reduction and low-carbon development is just starting, and there is no sound policy system for promoting green and low-carbon urbanization. On the one hand, laws and regulations related to climate change and carbon emission reduction are not complete enough to form effective restraint and punishment mechanisms. On the other hand, there is still no complete system of carbon emission reduction policy tools, such as emission charging system and carbon emission reduction subsidy policy, which need to be improved. In addition, it is also necessary to establish and improve the carbon trading market, so as to promote the carbon emission reduction behavior of enterprises and consumers as the main body of the market with an active market mechanism. At present, the carbon pricing mechanism is not perfect, the market transaction is not active, and the government needs to introduce relevant supporting policies and measures to support.

3. Countermeasures and Suggestions on promoting green and low-carbon development of urbanization

3.1. Strengthen publicity and education on green and low-carbon development of urbanization

In order to promote the green and low-carbon development of urbanization, China should formulate and implement a long-term green and low-carbon publicity and education plan, make efforts to raise the awareness of green and low-carbon development of the whole people, and form a green and low-carbon mode of production, consumption and lifestyle. First, extensive use of television, the Internet, radio and newspapers and other media communication means to carry out publicity and education on the green and low-carbon development of urbanization and create a good social atmosphere. Second, integrate green and low-carbon development into the evaluation mechanism of local governments' achievements in urbanization development, and carry out paperless office work, and create energy-saving organs. Third, to promote the green and low-carbon production behavior of enterprises by conducting lectures, strengthening staff training and changing production methods. Fourth, schools and colleges should be encouraged to offer relevant courses to cultivate the green and low-carbon consciousness of the younger generation. Fifth, promote household energy conservation and advocate green and low-carbon lifestyle through community activities [4].

3.2. Attach importance to the planning and management of green and low-carbon urbanization development

First of all, in the planning of the idea, we must take into account the development requirements and the concept of green low-carbon, and develop a green and low-carbon development plan in line with China's national conditions. On the one hand, it is necessary to change the development ideas and directions of blind expansion and quickness in the urbanization planning. On the basis of taking into account the green low-carbon concept of new urbanization, it is advancing in an objective and regular manner with appropriate development speed and level. On the other hand, promote its low-carbon development with a reasonable scale of urbanization, and promote the coordinated development of large, medium and small cities and small towns through scientific and rational planning and spatial layout. At the same time, urbanization of green and low-carbon development should take into account regional differences. Secondly, strengthen the evaluation and feedback on the implementation of the urbanization green low-carbon development plan, and improve the management capability of the whole process.

3.3. Strengthen the driving role of low-carbon technology innovation

"Science and technology are the primary productive forces", and low-carbon technological innovation and progress are important driving forces for promoting low-carbon development of urbanization and low-carbon transformation of economy and society. In the future urbanization development, China should put the driving role of low-carbon technology innovation in the key position, learn from the us, Japan and other foreign experience, focus on improving the level of low-carbon technology
development, in order to promote the low-carbon development of urbanization. First, we will increase investment in research and development of low-carbon technological innovation, so as to lay a solid financial foundation for China to promote low-carbon technological innovation and progress, and better promote low-carbon urbanization. Second, attach importance to the education and training of low-carbon technical personnel, and promote low-carbon technological innovation with strong talent advantages. Third, we will promote innovation in key low-carbon technologies, such as accelerating energy efficiency, developing low-carbon technologies such as clean coal, renewable energy, and carbon removal technologies such as carbon storage and capture (CCS).

3.4. Accelerate industrial restructuring and low-carbon development
To promote the green and low-carbon development of China's urbanization, it is necessary to further accelerate the adjustment of industrial structure, optimize industrial upgrading, reduce the proportion of industries with high energy consumption and accelerate the development of service industry, so as to promote the green and low-carbon development of urbanization with the development of low-carbon industries. First, adjust and optimize the proportion of tertiary industry in the industrial structure. Actively adjust and optimize the industrial structure by reducing the proportion of industries with high energy consumption, encouraging and supporting the development of service industry, etc., and promote the low-carbon development of urbanization with an ideal proportion of tertiary industry. Second, Chinese enterprises should seize the opportunity of green and low-carbon economic development at home and abroad, and actively promote the development of low-carbon industries such as solar energy utilization and electric vehicles under the support of relevant low-carbon policies, so as to take low-carbon industry as a new economic growth point and promote the green and low-carbon development of the entire industrial chain.

3.5. Strengthen legislative and policy support for green and low-carbon development
On the basis of learning from foreign experience, China should strengthen the legal and policy support for the green and low-carbon development of urbanization. First, formulate and implement laws and regulations related to carbon emission reduction. In the future, we can follow the example of the UK and incorporate the exploration of green and low-carbon development goals into national legislation to form favorable hard constraints. At the same time, relevant laws and regulations promoting low-carbon development should be constantly improved, such as more specific laws and regulations in low-carbon industry, low-carbon transportation and other fields, so as to continuously improve the guiding role of low-carbon development in urbanization. Second, on the basis of learning foreign experience, strengthen the research and promotion of incentive policies such as carbon tax. Third, we will improve the carbon trading system and promote the development of the carbon market. Especially through the guidance of relevant policy measures, and constantly improve the carbon trading system, strengthen the monitoring of carbon, certified and evaluation, such as foundation ability construction, improve the overall carbon emissions quota setting and rational distribution, cultivating good carbon pricing market mechanism, and perfect the performance mechanism and punishment mechanism design, guide the development of urbanization in various stakeholders actively participate, to active and effective market mechanism to achieve carbon reduction green low carbon development and urbanization.

4. Conclusion
This paper argues that to promote the green and low-carbon development of China's urbanization, efforts should be made from five aspects, including strengthening publicity and education, attaching importance to planning and management, strengthening low-carbon technology innovation, accelerating industrial restructuring and low-carbon development, and strengthening legislation and policy support.
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References
[1] Zhuang Guiyang, Analysis of the difficulties and obstacles of China's development of low-carbon economy, Jiangxi Social Sciences. 7 (2009) 20-26.
[2] National new urbanization plan (2014-2020) on http://www.gov.cn/
[3] Li Aimin, Prominent problems and Suggestions faced by China's new urbanization, Urban development research. 20 (7) (2013) 104-109.
[4] Liu Shaohua, Xia Yueyao, The development of low-carbon economy under the background of new urbanization, Journal of social science of Hunan Normal University. (3) (2012) 84-87.