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Study on the Policy Effectiveness of the Development of New Energy Industry in China

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Abstract

China's new energy industry started in 1986. In this process, government policy support has played a vital role. This paper collects 142 policies of the new energy industry issued by the central government from 1986 to 2018. By using the method of literature quantification, this paper makes a quantitative analysis of the effectiveness of relevant policies from two aspects: the year of publication and policy tools. The analysis results show that the policy issuance of the new energy industry shows a significant trend of periodic fluctuation and overall growth, and the continuity and stability of the policy gradually emerge after 2011; the policy tools are mainly regulatory policies, and the incentive and guiding policy design is somewhat insufficient. The target of the policy is to focus on technology research and development, plant construction and power generation in the new energy industry, but not on the incentives for talents, new energy trade and enterprise management. In view of the current situation, prospects and existing problems of the new energy industry, this paper puts forward corresponding policy recommendations.

Keywords

New Energy Industry; Quantitative Analysis of Literature; Industrial Policy.

1. Introduction

The use of global new energy began in 1970. Compared with developed countries, China's new energy industry started later. The Interim Regulations on the Administration of Energy Conservation issued by the State Council on January 12,1986 is the first national regulation on energy in China. The Renewable Energy Law of the People 's Republic of China promulgated in 2005 and its supporting regulations have laid the legal foundation for the development of renewable energy in China. The Energy Law in 2007 further established the development of new energy and renewable energy to become one of the basic strategic directions of China' s energy. Since new energy was listed as strategic emerging industries in 2009, with the support of policy, market, technology and capital, China's new energy industry has developed rapidly and completed the process from starting to the first in the world in 10 years. By the end of 2018, the total installed capacity of 184 million kilowatts and photovoltaic installed capacity of 174 million kilowatts. With China 's economy entering a new normal and the society entering a new era, the new situation and challenges facing China' s new energy industry in the future have put forward higher requirements on the development of China's new energy industry and brought a profound impact.

Through empirical observation of the development of new energy industry, the new energy policy has begun to take shape, the new energy construction, making great contributions to environmental protection, the new energy industry is in the early stage of the development, with the lack of new energy application and imperfect national policy support in some aspects. Therefore, in the process of the development of the new energy industry? Is the directivity of the policy been achieved? Is the choice and collocation of policy tools optimal? These questions

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all require us to give specific answers. In order to answer the above series of important questions, the traditional policy analysis method cannot get an accurate answer. We must use the latest policy literature quantitative analysis tools for quantitative analysis of large sample size and semi-structured policy documents. However, domestic research in this field has just started. Therefore, this paper selects 142 policy documents issued from 1986-2018 as research objects, introduces the quantitative analysis method of policy documents, convert policy text content into data information, further study the policy development process, characteristics and effect of new energy industry, analyze the policy selection and combination of policy tools, and provide reference suggestions for future policy optimization, so as to promote the high-quality development of new energy industry.

2. Review of Related Studies

At present, the research results on the new energy industry policy issues are mostly in the traditional qualitative research and case studies. In general, the research direction on the development of China's new energy industry has the following main aspects: the development status of the new energy industry[1-2]; Transformation and development of the new energy industry in China[3-4]; Analysis on the impact of policy subsidies on the development of the new energy industry[5-6]The main problems have the following aspects: First, high new energy cost, mostly also rely on import and foreign development[6]Second, policy problems, due to weak industry foundation, lack of policy encouragement, and mixed new energy market products[7]Third, innovation and technology backward, my new energy industry urgently needs to improve its own science and technology and management technology[8].

Through sorting out the existing research documents, we can clearly find that the major problems and solutions encountered in the new energy industry cannot be separated from government policy guidance, and the government plays an important role in industrial planning and management and the introduction of corresponding policies in the process of marketization in China's new energy industry. However, there is still a lack of systematic research on the policy characteristics and historical logic of China 's new energy industry reform logic, and at the same time a lack of standardized empirical research on the mechanism and effect of China' s new energy industry policy tools on the industrial life cycle. Therefore, it is necessary to study both the theory and practice through the quantitative analysis of policy documents and to scientifically explore the potential problems of China's new energy industry policy policies.

3. The Review and Text Quantitative Analysis of Chinese New Energy Industry Policy

This article has collected 142 new energy industry policies issued by the Standing Committee of the NPC, the State Council and various ministries and commissions from January 1,1986 to December 31,2018. Due to the large number of policies involving the new energy industry, in order to ensure the free omission and accuracy of the selected policies, this paper collects the new energy industry policies according to the principle of "separate search, cross-inspection and final summary". The principles of policy collection are: one is directly related to the new energy industry, including industrial research and development, power generation, power operation, etc.; second, the types of policy documents include laws and regulations, government planning, departmental opinions, interim measures, notices and announcements, etc.

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3.1. Annual Analysis of Policy Issuance

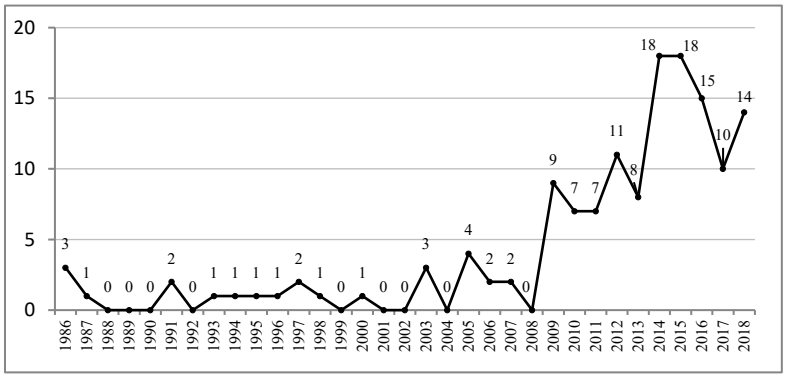

Fig 1. Quantity Distribution of Central Government in 1986-2018

In terms of the number of policy releases (as shown in Fig 1), it can be seen that the time series distribution of China's new energy industry policy presents the following characteristics: First, the trend of new energy industry policies in 1986-2018: 1986-2008 is 2008,23 policies, 23 1 per year on average, 2009-2013,42 policies, 9 in five years, 2014-2018 is the third stage, 75 policies, 15 on year, the intensity of policy release shows a sharp increase in the stage. Second, the release of the policy after 2011 showed significant stability and continuity. Since 2011, the number of policies on the new energy industry is about 13, which shows that after the Twelfth Five-Year Plan, the government pays high attention to the development of the new energy industry, and after the mass application of the new energy industry, it pays more attention to the continuity and stability of policy guidance signals. Third, the policy release presents an obvious intensive distribution of key time points. Since the central government has formulated a national economic and social development plan every five years, the number of new energy industry policies introduced in the five-year plan, 2005,2010 and 2015 has increased significantly compared with other time points.

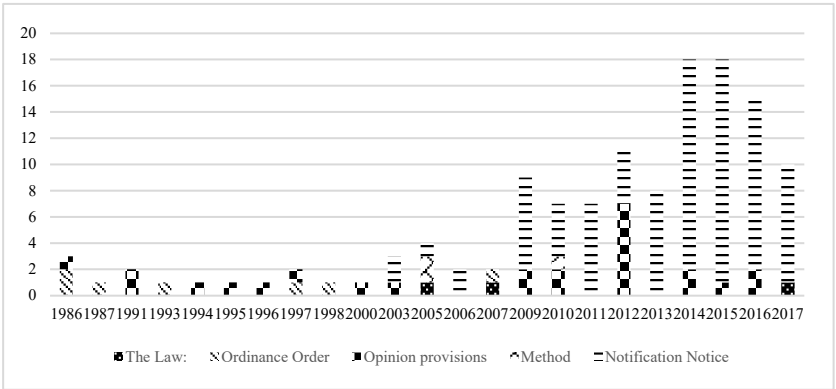

Fig 2. Distribution of New Energy Industry Policy Type of the Central Government in 1986-2018

As can be seen from Figure 2, the policy form issued by the new energy industry in 1986-1997 was single, with only the ministerial orders and opinions of the regulations. The Regulations and regulations from 1986-1997 accounted for 58.3% of all the number issued, and 41.7%. The policy control is extremely strong but the correlation of the subject is weak, for the purpose of regulating the development of the industry. After 2000, the competent government authorities were mainly announced, especially in years with low policy intensity. This illustrates changes in the government authorities at different stages of the development of the new energy industry.

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In 2006 and 2011,2013,2013, for example, the annual industrial policy of the energy industry was almost entirely in the form of notice. At the same time throughout all 142 new energy industry policy, in the form of notice, notice issued 102, accounting for more than 71.8%, the notice announcement its language is "command execution", the strongest control, and has a clear subject point, which shows that our country in support the development of the new energy industry policy presents strong control and high distribution of correlation.

3.2. Policy Tool Analysis

The rational collocation of policy tools is of great significance to the realization of policy objectives. At present, the research on policy tools mostly follows the division standards of Rothwell and Zegveld (1981) [9], and divides policy tools into three types: supply, environmental and demand. Based on the characteristics of the new energy industry, each kind of policy tools has been specifically subdivided. After standardized treatment, 16 specific policy tools were finally obtained, basically covering the policy terms of the new energy industry in the past 20 years. in order to study the effectiveness of policy tools, it is necessary to classify and analyze the laws, regulations, regulations, industry norms and other policy documents of the new energy industry. We first extract the contents of various policy documents and form a coding unit for policy document text analysis. Secondly, the use frequency of each sub-policy tool will be quantitatively counted according to the coding table, and according to the sampling principle of "the same word", the same policy tool in the same policy document is only calculated only once. Finally, the proportional analysis results of the policy tool type are shown in Figure 3.

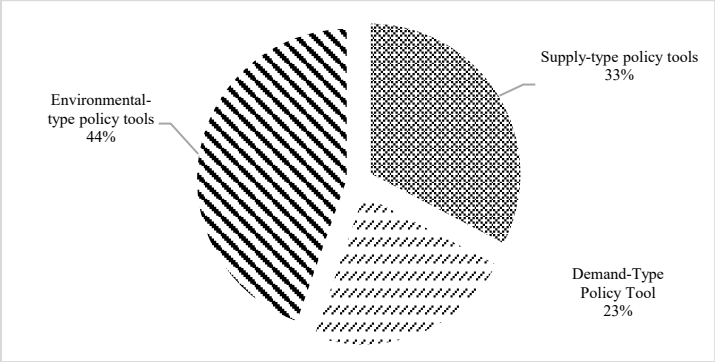

Fig 3. Distribution of Policy Tools for New Energy Industry

As can be seen from Figure 3, the proportion of China's new energy industry policies is unbalanced in the use of supply-type, demand-type and environment-type policy tools. Among them, environmental policy tools are the most commonly used policy means, accounting for 44%, followed by supply-based policy tools, accounting for 33%, and the demand policy tools are used at the least, only 23%.

As can be seen in Figure 4, In the proportion of supply-type policy tools, Technical support is the main type of tool, At 27.93%, The tools for talent incentive are the least frequent policy tools, Only 9.46% ratio, In the combination of supply-type policy tools in the new energy industry, Talent incentives is not in place, The type of tools that needed to be further strengthened; In the Demand-Type Policy toolkit, Demonstration projects are the most important tool, Up to 33.12%, Government-purchased tools are the least used, It for 8.44%; In the Environmental Policy Kit, Regulatory regulation has an absolute advantage, Specific gravity of up to 52.48%, The frequency of tax preferential tools is only 3.30%.Therefore, it can be clearly seen that in the use of policy tools in China, the regulatory policy tools occupy the dominant position, while the incentive and guiding policy tools are not designed. Especially on the supply side, the lack of

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policies and measures for talent incentive and education and training leads to a serious lack of high-quality human resources needed for the high-quality development of the new energy industry.

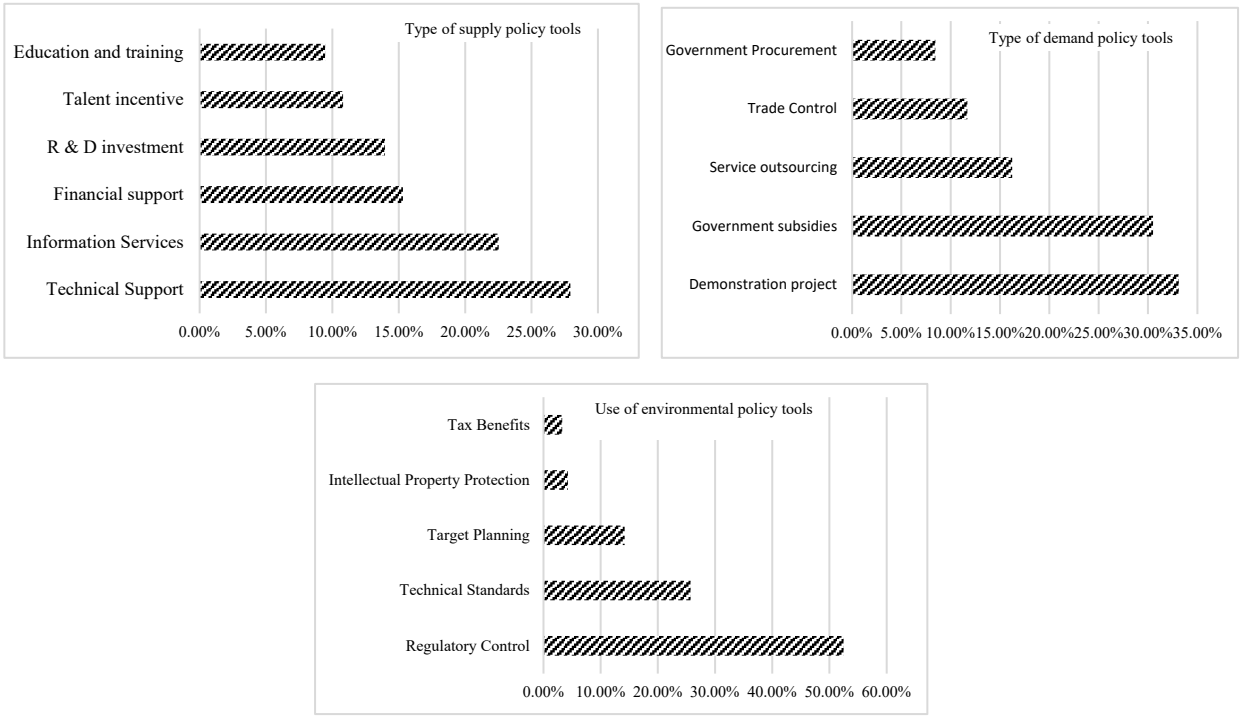

Fig 4. Classification of policy tools

4. Research Conclusion

China's new energy has developed rapidly. It began to develop in 1986. In the past 10 years, China has formed an international competitive advantage in many fields in the development of the new energy industry. Policy support is the main driving force for the rapid development of the new energy industry. Through policy content analysis, the policy effect of the development of new energy industry:

(1) From the annual analysis of the policy issuance, we can see that the government has vigorously supported the photovoltaic industry since 2000, and the new energy industry has begun to take shape. Since 2011, China's new energy industry has entered a period of large-scale application, and new energy power generation has developed rapidly, and its installed scale and power generation have ranked first in the world. With the diversification and refinement of government management departments, the policies of China's new energy industry have gradually become standardized, systematic and stable in terms of formulation and implementation.

(2) Research on the effectiveness of policy tools found that there is an overflow problem of regulatory policy application in the implementation of the new energy industry policy, especially the "regulatory control" tools are used too frequently, which indicates that the previous policy objectives did not meet expectations, so it needs to be repeated mention in the following policy documents, so the overflow problem occurred. The "demonstration projects" and "government" subsidies " are the most frequent policy tools, which shows that the development of China's new energy industry is still mainly government subsidies. However, with the continuous improvement of the economy of new energy power generation projects, it

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is the general trend to encourage the development of new energy power generation projects without subsidies.

5. Policy Recommendations

Based on the analysis of the path and problems of new energy industry, this paper puts forward the following policy suggestions: First, focus on strengthening the pertinence, stability and continuity of policies. In the future process of new energy industry policy making, according to the new energy development background, industry characteristics and industry chain development to formulate targeted industrial policy, at the same time need to consider and open the consumer market, ecological environmental protection and technology innovation related policy cooperation, through constantly update technology to further reduce costs, make photovoltaic power generation and other new energy get effective market positioning. Second, optimize the collocation of policy tools, increase the use of incentive and guiding policy tools, and reduce the proportion of regulatory policies. In terms of incentive policies, increase financing support for technology research and development of relevant enterprises, expand market financing channels of enterprises, and enhance enterprise management; provide relative support policies for new energy, standardize and effective use of fiscal subsidies and preferential policy tools, to further expand the industrial scale of the new energy industry.

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