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Analysis of and Thinking on New Energy Enterprises Engagement in Standardization Activities

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Abstract. With the unprecedented development of new energy industry in China, new energy enterprises are also facing many problems, the most important of which is that the transformation of scientific and technological achievements into real productive forces is not successful enough. The paper studies the relationship between new energy enterprises and standardization activities, analyzes the policies on, challenges in and institutional construct to new energy enterprises engagement in standardization activities, and identifies the role and impact of new energy enterprises engagement in standardization. And it intends to provide the technical program for new energy enterprises engagement in standardization, thus enable them to establish scientific management, promote technological innovation and the transformation and application of scientific and technological achievements, finally achieves the purposes of environmental protection and economic sustainable development.

1. Introduction

At present, with the development of global economy, the air and land pollution caused by energy consumption, the problems of global warming and resource depletion make the advantages of new energy more prominent. The problem of ecological environment has been paid more and more attention by all levels of the global society, which requires us to understand the crisis of resources and environment from a strategic point of view [1]. The new energy not only can effectively solve the problem of environmental pollution caused by energy shortage and the traditional energy usage, because of the low emission of the pollutants, and being the important measures to protect the ecological environment, it is the important growth point of the future global economy. Although China's new energy enterprises, especially small and medium-sized new energy enterprises, have a strong momentum of development, overall the start is relatively late, the research and development capacity is weak, and the core technology is lacking; most importantly, there is a problem that the transformation of scientific and technological achievements into real productive forces is not successful enough[2]. As the main body of new energy technology innovation, enterprises need to make use of limited innovation resources to transform it into sustainable competitive advantage.

Standardization work is an important means whereby a company builds modern production line, establish scientific management, and improve product quality and technological innovation. Additionally, it is a prerequisite for or a guarantee of specialized production, cost-effective and intensive resource utilization, safe production and environmental protection. Engagement in standardization can allow scientific and technological achievements to become standards, which can



promote the transformation and extensive application of scientific and technological achievements of new energy enterprises.

2. The relationship between new energy enterprises and standardization activities

2.1. Development status of new energy enterprises

In recent years, the new energy policies have formed a relatively complete policy system, which is conducive to encourage new energy to actively expand the market and realize the industrialization and scale of new energy. From 2005 to 2014, the number of new energy enterprises in China increased rapidly, from 1545 to 14219. The number of enterprises registered after 2010 accounted for 69.14% of the total number of new energy enterprises in China, and most of the new energy enterprises are distributed in economically developed areas. In terms of the size of the enterprise, the proportion of enterprises with less than 50 employees in the total number was 91.35%; the proportion of enterprises with registered capital of less than RMB 500000 Yuan was 67.31%. Although new energy enterprises are dominated by small companies in terms of employee number and capital, the income growth rate of 42.64% of new energy enterprises is more than 50%, which indicates that the development momentum is great[3].

However, after China's economic development has entered the new normal, the growth rate of electricity consumption has also gradually slowed down. According to *Analysis and Forecast Report on China's Energy Situation (26 issues)*, from January to February 2019, the electricity consumption of the whole society was about 1.1063 trillion kilowatt-hours, and the growth rate was 9 percentage points lower than that of the same period last year; according to the power supply, in addition to thermal power and nuclear power, wind power production growth rate fell down; from the point of view of the number hours used by power generation equipment, the number of hours utilized by wind power equipment and solar equipment decreased more than that of the same period last year. The main reason is that there are technology, consumer concept and national mechanism obstacles in the development of new energy industry in China, most importantly, the transformation of scientific and technological achievements into real productive forces is not successful enough. Taking the number of patents in photovoltaic enterprises as an example, after 2008, a large number of photovoltaic enterprises applied for patents, and steadily increased, matching with the rapid development of photovoltaic industry. According to the data of National Patent Office of China, the number of patents issued by photovoltaic enterprises peaked in 2011 and then declined obviously, and it can also indicate that the independent innovation ability of enterprises has declined.

2.2. Benefits of new energy enterprises engagement in standardization activities

Standardization is aimed at constructing the best order and increasing efficiency by establishing common and reusable practices for existing or potential issues and preparing, publishing and applying documents. Standardization work is an important means whereby a company builds modern production line, establish scientific management and improve product quality. Additionally, it is a prerequisite for or a guarantee of specialized production, cost-effective and intensive resource utilization, safe production and environmental protection.

It is understood that the most pressing problems facing the development of new energy enterprises especially small and medium-sized ones are: difficult to find customers; lack of technical staff and experienced managers; lack of competitiveness; wide gap in meeting regulatory requirements; relatively high production or labor costs; the financing channel is limited.

And standardization can help to solve these problems, for example, engagement in standardization activities allows new energy enterprises to sharpen ability in innovation and the transformation and application of scientific and technological achievements, and are more likely to be favored by investors. Standardization benefits new energy enterprises in the following ways [4]:

- Compliance with specific standards brings in new opportunities for access to market;

- Availability of updated technical information helps sharpening ability in innovation and ensures sustainable development;
- Streamlining business process, cost reduction and profit earning;
- Helping to establish contact with industry-related enterprises;
- Voicing their claims so that they are well positioned to compete with large counterparts;
- Strengthening marketing, increasing recognition, raising popularity and building confidence in consumers;
- Getting investors' attention;
- Facilitating complying with laws and regulations and preventing the risk of compliance.

It shall be noted that the significance of standardization for a company is dependent on its size. Statistics from European Union-small and medium-sized enterprises (EU-SMEs) Observatory show that standardization-related issues are more important for medium-sized companies (with 50 – 500 employees) than miniature and small ones (with less than 10 or 10 – 49 employees respectively) [5]. Therefore, new energy enterprises, especially small and medium-sized new energy enterprises, should pay special attention to standardization activities and participate in them.

3. Policies on stimulating new energy enterprises getting involved in standardization

At present, most of the new energy enterprises in our country are SMEs, and the resources and voice of the large new energy enterprises participating in the standardization activities are also incomparable to those of the small and medium-sized ones. Thus, it is suggested that new energy enterprises should pay more attention to the relevant policies of SMEs participating in standardization activities and actively participate in relevant standardization activities in order to obtain the corresponding benefits. Chinese government has attached importance to standardization work and the role of companies in standardization. In recent years, major reforms have been taken to boost standardization and SMEs.

3.1. Standardization Law of the People's Republic of China

The State Council Notification of Issuing Program for Deepening Standardization Work Reform (Guo Fa (2015) No. 13)(hereinafter referred to as “the Program”), issued in Mar. 2015, lays the foundations of and provides a framework for revisions to the Standardization Law. Newly revised Standardization law (hereinafter referred to as “the Standardization Law”), issued in Nov. 2017, reflects the outcome of the Program [6]. Articles 7, 8 (2) and 20 of the standardization law indicate that the state encourages enterprises to participate in international and domestic standardization activities, and the state supports using independent innovation technology to develop enterprise standards in important industries, strategic emerging industries, key common technologies and other fields. The State Council and governments at all levels also have supporting measures. For example, the National Standardization system Construction and Development Plan (2016-2020), issued by the General Office of the State Council, encourages enterprises to participate in standardization activities; Local governments provide financial support to enterprises to participate in development of international standards and national standards, and to participate in the National Professional Standardization Technical Committee.

Following the promulgation of the Standardization Law, the State Council issued relevant policies on stimulating social organization standard development. Characterized by responsiveness and flexibility, social organization standard serves as an additional channel whereby SMEs engage in standard development to demonstrate its power as market force.

3.2. Small and Medium-sized Enterprise Promotion Law of the People's Republic of China

Small and Medium-sized Enterprise Promotion Law of the People's Republic of China (hereinafter referred to as “the SME Promotion Law”), issued in Sep. 2017, is aimed at creating a better doing business environment, ensuring fair competition, safeguarding SMEs' rights, supporting their start-up and innovation, advancing their expansion in a sustainable way, increase employment across both rural and urban areas and giving play to SMEs' role in national economic and social development.

Article 34 of the SME Promotion Law states, “SMEs and SME-related organizations are supported in their engagement in standard development”[7]. It is for the first time that supporting SMEs to engagement in standard development is included in a legal document in China.

3.3. Other relevant policies

According to newly revised Regulations for National Standardization Technical Committee issued in 2017, members of the committee shall represent their respective communities on a large scale while businesses (including SMEs) as an important stakeholder shall have the opportunity to engage in national standard development and thus voice their claims [8]. Advices on Supporting Small-sized and Miniature Business in their Sustainable Development, which was issued by the State Council in Nov. 2014, proposed 10 policies on promoting small-sized and miniature businesses. Advices on Further Implementing Measures for Streamlining Administration, Delegating Powers, Improving Regulation and Services, and Supporting Small-sized and Miniature Businesses, issued by State Administration for Industry and Commerce in May. 2017, provides for the implementation of these measures so as to provide small-sized and miniature businesses with exact support.

4. The challenges of new energy enterprises engagement in standardization

As these reform programs and the Standardization Law were issued, Chinese enterprises are increasingly taking the initiative in engaging in standardization and demonstrating increasing influence. And they are playing an increasingly important role in the implementation of the standards strategy. On the whole, a low percentage of new energy enterprises especially small and medium-sized ones engage in standardization, which have yet to play a leading role in standard development or application. Challenges of new energy enterprises engagement in standardization include but not limited to:

1) Poor awareness: As being poorly aware of the significance of standardization work, some new energy enterprises demonstrate little initiative in engagement in standard development and revision, participating in standardization technical committees in and outside China, and paying less attention to standard-related information.

2) Shortage of financial resources: A low percentage of new energy enterprises are represented in standardization because of size and financial condition. They always don't have enough time, staff or financial resources for standardization. In other words, it takes too much time for new energy enterprises to engage in standard development. They cannot afford resulting costs such as R&D investment and standardization fund, which seem heavier than large-sized companies. Shortage of financial resources directly decreases new energy enterprises' ability to engage in high-level standardization activities such as standard research and development.

3) Poor technical competence: A majority of small and medium-sized new energy enterprises are not staffed by standard-related employees. They usually assign standardization work to one of its business units. Even if some create posts for standardization work, most of them are part-time and aren't tempting due to low treatment or incentives. As a result, small and medium-sized new energy enterprises are poorly equipped with standardization-related expertise. Most of these enterprises' employees do not know how to apply the theory of standardization to design, production and management but just fundamental work such as product standard development, filing and maintenance. It makes it difficult for a company to benefit from standardization work [9].

4) Unfavourable standardization environmental conditions: Now China is short on research force from the third party standardization technical organizations, cultivation of standardization ability in new energy enterprises and support for standard development process. Additionally, efficient incentives for standard development are not adopted by the government. Qualification requirements for standard development at national or sector level favor large-sized companies or those with technical competence, in such a way that they are too high for small and medium-sized new energy enterprises to engage in standardization.

As a result, new energy enterprises might benefit from or incur loss from engagement in standardization. Although being poorly aware of standardization is the key reason for a low percentage of small and medium-sized new energy enterprises being represented in standardization, shortage of financial resources and experts in standardization is another important one.

5. Institutional construct to new energy enterprises engagement in standardization

China is now at a critical point in the standardization reform, when new energy enterprises are thriving. We shall improve institutional construct to new energy enterprises engagement in standardization in a revolutionary, innovative way.

5.1. Broaden paths to new energy enterprises participating in standardization

Encourage new energy enterprises to participate in standardization activities of the National Professional Technical Commission. One hand, Regulations for National Standardization Technical Committee do not propose measures for new energy enterprises engagement in national standard development. It is recommended that new energy enterprises are represented in national technical committees and incentives are adopted for new energy enterprises engagement in their standard affairs. It helps including their claims into national standard development process. On the other hand, during the public comment of the national standards, make sure that new energy enterprises can know the relevant information and the feedback channel, at the same time, directly listen to opinions and suggestions from new energy enterprises with the greatest interest.

Make sure that new energy enterprises participate in standardization activities of association. One hand, through standardization of associations, new energy enterprises can have the opportunities to participate the development of association standards. Association standard is voluntary standard developed in response to market need, giving play to market's role in standardization. As an important part of Chinese enterprises, new energy enterprises should be explicitly included in the development of mass and influential association standards by relevant national institutions. It is based on the impartiality principle that any association standard shall be a product of consensus reached among stakeholders. One the other hand, through standardization of associations, new energy enterprises can participate in national or international standardization activities to express their own needs and appeal.

In addition, we need to give play to the leading role of enterprise standards themselves. Enterprise standard provides a basis of production and business. A well-defined enterprise standard facilitates technical improvement, quality control and improvement, business management, welfare and economic growth. Importance shall be attached to the role of companies of little giant or the hidden champion type in standardization.

5.2. Giving play to the role of the third party standardization services to new energy enterprises

We shall give play to the role of market and the third party standardization services to build a system of new energy enterprises standardization service. We shall boost standard-related research & development, provide consultation about standard subject and development, and improve standard quality. We shall provide consultation with standard implementation and custom solutions to standard implementation to guide new energy enterprises through standard implementation. We shall promote new energy enterprises expansion by supporting them in building standardization-related organizational structure and system, making policies on standardization, building standards system, and creating standardization talents.

5.3. Increasing new energy enterprises standardization talents building

Now standardization talents are classified into technical, management and implementation in China. They all are insufficient to meet needs from individual sectors. We shall therefore meet needs for standardization talents at every level and in each individual area by reinforcing standardization education, boosting standardization discipline building, creating standardization courses,

disseminating standard-related knowledge, developing a pool of standardization experts, and increasing training of technical, management and implementation talents in standardization.

6. Conclusion

China's new energy industry has the characteristics of late start, low level of technology and relatively backward overall level. Whether from the enterprise level or the industrial level, improving the technological innovation and the transformation ability of scientific and technological achievements is of great significance to promote the application of new energy products and the development of the new energy industry in China. And standardization is a good method to solve these problems. Standardization can provide new energy enterprises with technical support, improve product quality, help them to establish scientific management, maintain intensive resource utilization, promote technological innovation and the transformation and application of scientific and technological achievements, finally achieves the purposes of environmental protection and economic sustainable development.

But in fact, due to the problems of financial recourses or talent, a low percentage of new energy enterprises engage in standardization especially miniature businesses, which have yet to play a leading role in standard development or application. Therefore, it is very important to study the policies and paths of new energy enterprises engagement in standardization and to play the role of standardization in promoting the development of new energy enterprises.

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