Experience and Perspective

Standardization for New and Renewable Energy in China

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ABSTRACT

Standardization plays an important role in promoting the progress of new and renewable energy. The recent year's experience of standardization is reviewed in this article, with the obtained achievements analyzed and summarized. Combined with preparation plans made by the Chinese standardization body, future trends of standardization on new and renewable energy are interpreted.

Keywords: new energy, renewable energy, standardization

INTRODUCTION

To meet the requirements of construction in a progressive society, the Chinese government has made great efforts to build an ecological civilization and to achieve the industrial structure, ways of growth, and consumption patterns that energy conservation and ecological protection require (Zhang PD et al., 2008). The objectives are to develop a circular economy on a larger scale, one in which the proportion of renewable energy increases significantly, emissions of major pollutants are under effective control, and the quality of the environment is improved.

Standardization is one of the effective approaches to actuate modern production, to popularize advanced manufacturing technologies,

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to improve quality and enhance varieties, and to lower the production cost of new and renewable energy industries (Li CT, 2004). In this article the standardization practices and future development, particularly standards preparation and revisions, are reviewed and forecasted.

Standards for new and renewable energy refer to standards prepared to obtain efficient utilization in aspects of the basis, management, methods, and products of energy such as wind, solar, hydropower, biomass, geothermal, ocean, and hydrogen energy. The achievements are reviewed in this article, and future perspectives of standardization are discussed, combining domestic development and policy trends for new and renewable energy.

ACHIEVEMENTS AND EXISTING PROBLEMS

Achievements

Practical steps have been taken by responsible departments and industries in the past few years. Through these, work standardization is becoming increasingly important for promoting the applications of new and renewable sources of energy. The major achievements are summarized as:

a) **A standards system for new and renewable energy has been preliminarily established.**
In the past two years, cooperation among relevant departments has been strengthened to prepare previously planned standards, most of which have been completed and issued. Through the effort of standardization, a total of more than 100 national standards are available for new and renewable energy, including a large quantity of standards for thermal and photovoltaic utilization of solar energy and wind power generation. Standards preparation for biomass energy and hydrogen energy have been enhanced as well.

b) **Standards implementation has been strengthened to increase the contribution of new and renewable energy to energy conservation and emission reductions.**
After promulgation of national standard GB 18351-2004 *Ethanol gasoline for motor vehicles*, ethanol gasoline has been popularized in nine provinces, such as Henan and Jilin. By 10 percent addition to gasoline,

the consumption of ethanol gasoline has been substituted in much of the total vehicle fuel nationwide. Another national standard, GB/T 22030-2008 *Blendstocks of ethanol gasoline for motor vehicles*, was issued in June and brought into effect in December.

c) **Adoption of international standards has been enhanced to boost the quality of national standards.**
Advanced international standards were adopted as an effective measure to spur the standardization for new and renewable energy and to achieve scientific and technological progress in comprehensive utilization. The adoption also helps improve the quality of national standards, since China is still backward in the fields of energy exploration and utilization. Through years of rational adoption of international standards, the majority of national standards regarding energy efficiency have arrived at an international level.

d) **Standardization organizations have been established and improved to provide a basic guarantee for execution of standardization.**
The standard system for new and renewable energy is thus far subdivided into 10 sectors (see Figure 1), one for each of the standardization organizations already established. The standardization organizations are responsible for the investigation, preparation, revision, and technical censoring of standards in their respective fields of expertise. Technical explanation, propaganda, and implementation, as well as consulting services for corresponding standards, are also obligations that organizations have to fulfill.

Major Existing Problems

Difficulties still exist despite the success that has been made. In summary, the drawbacks China is facing in standardization of new energy renewable energy can be interpreted as:

a) **The standard system needs to be further improved.**
The establishment of a standard system for new and renewable energy is a great engineering effort that embraces many fields, depending much on high technology and being closely related to almost every industry. Timely revision of standards should be proposed to detail and supplement the standard system, since emerging technologies in related industries update rapidly.

b) **Basic research for standardization is still deficient.**
Standards preparation, which should certainly be based on scientific research and experimental study, is challenged by complicated situations and tough tasks that the new and renewable energy industry are confronted with. The contradiction between the continuous emergence of new technologies and the shortage of basic research for standardization is outstanding. More support in both finance and policy approaches is expected.

c) **Studies and adoption of advanced international standards should be reinforced.**
The overall level of standardization in the new and renewable energy industry still falls below world-class level, and the adoption of international standards is currently unbalanced for different energy fields. Accordingly, the adoption of international standards will be reasonable and valid only after completing the detailed tracing, analysis, and study of international standards, as well as profound consideration of domestic situations.

d) **Implementation of standards needs more effective supervision.**
Preparation and implementation of standards are two closely associated steps in the whole process of standardization. Preparation lays a foundation for standard enforcement within the industry, and information and feedback from the implementation step are valuable for further revisions or amendments. The fact is, however, that preparation is highly emphasized and implementation is to some extent neglected. Measures for supervision, rewards, and sanctions are not adequate, impairing the implementation and therefore lowering the force of standards.

FRAMEWORK OF A FUTURE STANDARD SYSTEM

According to the Standardization Administration of China (2008a), the standard system for new and renewable energy includes 10 sectors, as illustrated in Figure 1. Although systematic divisions were not proposed for the whole range of new and renewable energy, from the details inferences can be made that the listed areas are no doubt the key ones to be intensively explored by the Chinese government.

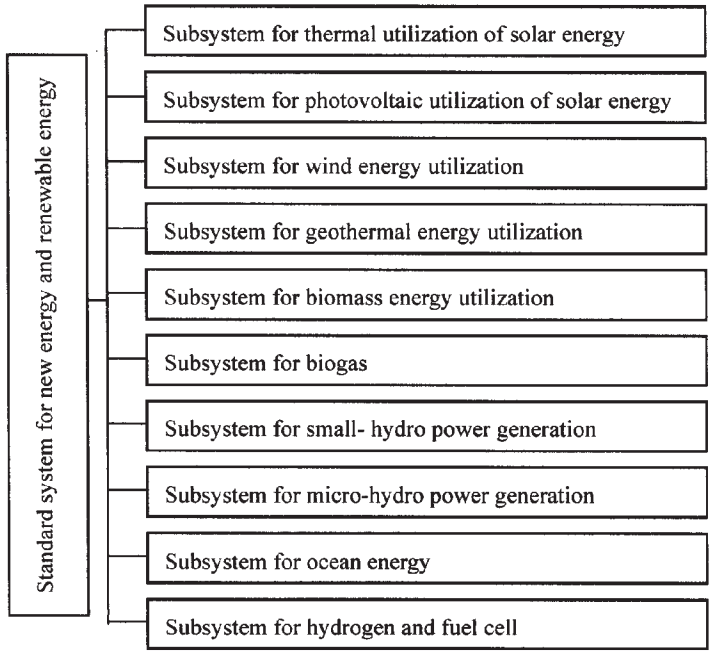

Figure 1. Standard system for new energy and renewable energy

A list of 124 national standards (Standardization Administration of China, 2008b) and 60 industry standards (Standardization Administration of China, 2008c) to be prepared from 2008 to 2010, has been posted by the Standardization Administration of China on its official website. Importance is attached relatively evenly to solar, wind, biomass, hydro, and fuel cell energy in the planned list of national standards, while biomass and hydro energy dominate the list for industry standards.

CONCLUSION AND SUGGESTIONS

The recent year's progress in standardization for new and renewable energy is of great value in promoting reconstruction of China's energy structure, and it is helpful in realizing the goal of energy conservation and emission reduction. For better development of new and renewable energy industries, more finance input into standardization is required, and stronger supervision and management of standards

implementation are also indispensable. From the view of long-term development, building a close linkage between standards preparation and scientific research is crucial for the successful training of specialized personnel in standardization.

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