

Research on Realizing Sustainable Development Based on the Development and Utilization of Clean Energy

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Abstract: In the process of rapid social and economic development in our country, environmental pollution has been aggravated to a great extent, among which industrial pollution and energy crisis have become increasingly serious and caused a series of environmental pollution and energy problems. As for the current intractable environmental pollution problem, the society should pay more attention to it and intensify the development of new energy, so as to help achieve the sustainable development goals. Moreover, the problems related to environmental pollution and resource development have affected the whole world. Therefore, China should develop and use clean energy efficiently. This paper will focus on the basic connotation of clean energy and the actual situation of its development, and briefly analyze its future development path, so that it can better achieve sustainable development.

1. Introduction

In terms of clean energy, most of them were defined as environmentally friendly energy with low pollution and high cleanness, which is opposite to polluting energy. But from a practical perspective, this is very one-sided. In fact, "clean energy" is more inclined to the concept of technology system, which means that energy can be developed as cleanly and efficiently as possible with the highest standards of utilization and emission.

2. A brief analysis of the basic concept and connotation of clean energy

At present, the basic concept of clean energy is relatively vague. Some scholars define it as renewable energy and think that clean energy cannot include fossil energy. Based on such limited cognition, the connotation and extension of clean energy are also severely restricted, which makes all social members divide energy arbitrarily, restricting polluting energy to traditional coal and oil resources and defining clean energy as common-known water energy, wind energy, biological energy, nuclear energy, solar energy, etc. From this we can see that it is only a partial reduction of renewable resources and new energy and simple suppression of fossil energy, resulting in a very simple energy industry and scale. We have not realized the technical coupling and resource integration of various energy sources, but only focused on the effective development of the energy industry itself. Moreover, we have not mentioned the concept and mode of energy consumption and other social and environmental construction, which further intensified various challenges faced by the sustainable development of clean energy.

2.1 Concept

Based on the further development of information technology, the degree of industrial economic integration was greatly promoted, which made energy production and consumption process closely linked. In this paper, the concept of clean energy is defined as: in the whole process of development and use, including energy production and consumption, it has a strong conversion efficiency and high economy, and only causes low or zero pollution to the ecological environment. It is mainly divided into: (1) non-renewable energy. That is, in the whole process of energy production and consumption, pollution caused to the ecological environment should be minimized, such as natural gas, traditional fossil energy effectively processed through clean energy technology, like nuclear energy, clean oil and clean coal, etc. (2) renewable energy. That is, energy consumption can be restored and replenished, producing little or no pollution. For example: wind energy, solar energy, water energy, biological

energy and so on.

2.2 Connotation

In the new development trend, the connotation of clean energy is no longer the energy itself that will not cause pollution to the environment or damage to the ecological system in the current way of use. Its contents are more abundant and extensive. First, high efficiency and energy saving is a kind of clean energy. From the perspective of energy form, in addition to the objectively existing material energy, such as non-renewable energy and renewable energy, defined according to physical and chemical characteristics, it is also necessary to include "intangible energy" -- high efficiency and energy saving [1]. The so-called "high efficiency and energy saving" mainly means that it can achieve greater economic benefits at the minimum cost of resources, reduce the investment in energy for economic and social development, help protect natural ecological resources and optimize the relationship between nature and human development. It is a kind of clean energy that is very direct and widely used. Second, clean energy can also be interpreted as clean use of energy. From the perspective of "clean energy", it is not about the energy itself to classify it as clean and unclean, let alone to simply distinguish its use. No matter what type of energy, if its use effect will not cause pollution to the environment and contribute to the sustainable development of society, it should be included in the scope of clean energy. Its core point is whether it reflects feasible technology and commercial use conditions, and whether it has achieved clean use. Third, it belongs to a comprehensive technical system. When classifying clean energy, it should not only focus on energy itself, but also take into account the innovative technologies developed and applied in resource development, transportation, use and the whole industrial chain, as well as the integrated technology system constructed for sustainable and efficient use of energy. Fourth, it belongs to the brand-new market domain. Because there is a big difference between clean energy and traditional energy under the interpretation of the new concept, it is no longer just an important basis and guarantee for economic and social development. It is also focused on economy on the basis of cleanness, which can generate a new growth point for economic development and an important production factor to open up a new market area. Fifth, it is a combination of many industries. In terms of clean energy, it is not just a single energy industry, because the whole process of energy development and utilization needs to be highly clean. Therefore, all kinds of energy involved are integrated with each other and each industry is more coordinated and integrated. This combination is highly inclusive and open.

3. A brief analysis of the actual development of clean energy in China

3.1 Industrialization level is relatively low.

From the development and utilization of clean energy in major western developed countries, one of the most obvious features is that economic benefits can be achieved based on the effective development of industrialization, and the current energy structure can be reformed to make energy supply more diversified. At the present stage, China is also gradually developing towards the direction of industrialization in the development of clean energy. However, compared with western developed countries, we need to admit that not only did we started late, but also degree of industrialization is relatively low, and there is a significant gap between China and western countries, which is reflected in the following aspects.

(1) Wind energy. China is a vast country with abundant wind energy resources. At the same time, China also pays more attention to wind power generation, and the electric energy generated by wind power is also increasing. Although China's wind power generation has been able to generate electricity in the world's forefront. However, compared with countries represented by the United States and the Netherlands, its industrialization level is relatively low. Moreover, most of the wind turbines in China are difficult to meet the demand of grid connection, and it is also very difficult to improve the power of the generator set. Therefore, there is still a lot of room for the development of wind energy resources in China.

(2) Water energy. China is also a big country in water resources. According to incomplete

statistics, the water resources for development and utilization in China is more than 1/7 of the world's total. From the actual situation, there is a significant gap between China and western developed countries in its development and utilization [2]. According to the survey results, the development rate of water resources in Canada is about 53%, while that in Japan is about 66%. However, the development rate of water resources in China is only 15%. Therefore, China has a large space for water resources development [3].

(3) Solar energy. Solar energy is widely used and has made a lot of achievements. However, in terms of photovoltaic industry, China is still in the initial stage of development and the market scale still needs to be strengthened. Solar energy is one of the key energy sources. If it can be developed effectively and utilized efficiently, the economic benefit generated by it is difficult to estimate.

(4) Geothermal and tidal energy. Compared with the developed countries in the west, China has a very low ratio of tidal and geothermal energy exploitation. The reasons are as follows. Firstly, the objective geographical environment in China seriously hinders the development and utilization of these two kinds of energy. Secondly, due to the relatively low level of relevant technologies that China has mastered, it is not only unable to improve the scale of development, but also difficult to generate ideal economic benefits, so it has a certain impact on its production and investment.

(5) Hydrogen and nuclear energy. According to the current actual development situation, compared with the developed countries in the west, there is a big gap in the development and use of nuclear energy and hydrogen energy in China.

(6) Clean coal technology. This technology has obtained certain substantial development in our country, and has reached the small-scale industrialization, but compared with the western developed countries, there are still many deficiencies for either the industrial scale or the technology itself. From the perspective of the nationwide market, the proportion of clean energy in the market is increasing year by year. It can be seen that the market is gradually accepted by the society. This paper believes that in the near future, clean energy industry is bound to become an important industry pillar of China, and the development momentum will be better and better.

At the same time, we also need to be clear about the challenges faced by the clean energy industry in the current and future development: (1) there hasn't been a complete industrial chain;(2) the transition from clean energy technology to industry is relatively slow and economically inefficient. Based on this, improving the industrialization level of clean energy is still the key task for the future development of clean energy in China.

3.2 The development difficulty coefficient is high.

Although China has a very rich clean energy reserves, due to various reasons, the development of clean energy is difficult. First, it is influenced by the objective geographical environment. For example, most of the water energy that has not been developed in China is mainly concentrated in the mountains and valleys in southwest China, while most of the wind energy is concentrated in the areas with high wind speed. As for tides and geothermal energy, they are only in a few areas. Based on this situation, the distance between the key development area of clean energy and the load center is very far, so the development is difficult. Second, the exploration technology level of clean energy is relatively low, because the exploitation is suffering and the cost of exploration for clean energy is also high. Therefore, it is difficult to get a higher economic efficiency. Compared with other energy sources in China it has no strong market competition. Therefore, there is not enough financial support to invest in clean energy to achieve large-scale development.

4. Analysis on the suggestions to strengthen the development and utilization of clean energy and realize sustainable development

4.1 Plan and formulate the strategic development layout rationally and scientifically.

Because of the different levels of development in different parts of China and the obvious differences in various energy sources, the development of clean energy in China should not be limited or divorced from the actual basic conditions, but should form a scientific and strategic development layout. Based

on the strategic perspective, its layout should not only be limited to the regional layout of various energy sources, but also include the actual situation of its development region, various stages of development and the actual development environment, so as to reflect the comprehensiveness of the overall design of the arrangement.

(1) Geographical space. The core area of clean energy development should be optimized based on the local resource conditions. For example, in the areas with dense fossil energy resources, clean energy industry dominated by fossil energy should be developed. In the regions with relatively abundant renewable energy resources, the energy industry should be dominated by renewable energy.

(2) Development stage. The industry foundation and technology maturity level should be taken as key standards, and key development areas and relevant scientific research institutions should be set. For example, Shanxi, Inner Mongolia and other places in China should actively develop local clean coal industry jointly with coal-based energy enterprises. Xinjiang and other regions in China should cooperate with petrochemical energy enterprises to increase development efforts for clean oil industry [4].

4.2 Spread the scientific idea of clean energy.

People do not have a relatively clear understanding of clean energy. On the one hand, it believes that the vigorous development of clean energy is contrary to the mainstream of the world. It would be better to focus on conventional energy; On the other hand, clean energy is misidentified as the "savior" [5]. In this regard, only by helping people establish a scientific and correct concept of clean energy, can the problem of concept be thoroughly solved and people's actions be correctly guided.

(1) More publicity should be given to clean energy. From an objective point of view, clean energy is still a new thing, because only through increased publicity can it have a chance to gain people's recognition. For example, solar energy, which is very common in daily life, is not only widely used but also highly appraised in China. As for the reasons, first it is because the government encourages the use of solar energy. Then it is the successful publicity work, making common people realize that solar-energy water heater is not only very clean but also economic and practical. Therefore, if we want to change people's one-sided understanding, we need to pay more attention to popularize relevant knowledge.

(2) Conduct comprehensive training for relevant employees. People who are familiar with clean energy are usually those who work in the energy industry. To some extent, their awareness of clean energy determines the development of clean energy in China to a large extent. In addition, the knowledge of relevant policy makers should be enhanced to ensure that the relevant policy makers have a correct understanding of clean energy.

4.3 Increase the technology innovation.

In order to ensure the sustainable development of clean energy in our country, we should pay attention to its related technological innovation, because the realization of large-scale development and utilization of clean energy should take technology as the entry point. If we cannot effectively solve this essential problem, but only rely on the technology introduced by western developed countries, the development will be limited by technology and our energy security will be threatened. In addition, although China is a major manufacturer, in terms of the manufacturing process and manufacturing technology of clean energy equipment, there is still a certain distance from the western developed countries. The lack of strong technical equipment support will hinder the industrialization development. At the present stage, China is relatively backward in technological innovation, research and development. How to promote its research and development as soon as possible and achieve industrialization in the shortest time is a formidable challenge facing us. To solve this problem, we should start with the followings.

(1) Create a favorable environment for the development and application of new technologies, which should be positively guided by the Chinese government in the construction of the external environment. The government should provide necessary policy support for technology research and development and innovation, which is also an important prerequisite for the application of new technology.

(2) Increase funding for research and development of clean energy technologies. It is far from enough to rely only on the investment of government departments. The government should effectively guide social funds to gradually shift the investment direction to clean energy technology, so as to provide sufficient financial support for its research and development.

(3) Actively introduce talents and do a good job in personnel training.

4.4 Realize intimate cooperation and deep communication with other countries.

Since China's development of clean energy started late, we should learn from western developed countries that have excellent experience and strengthen cooperation with other countries in the field of clean energy. Because of the relatively small scope affected by the global "financial storm" and China's strong support for the development of clean energy in recent years, the connection between China's clean energy and the international community is getting closer and closer. For example, solar products produced in our country are now sold to thousands of households in the United States. However, we also need to recognize the disadvantages and gaps between China and western developed countries. For example, China lags far behind developed countries in the research and development of clean energy technologies. Therefore, China should take an active part in the international cooperation and competition of clean energy, and further improve the exchanges and cooperation among "technological powers" that master advanced clean energy technologies. We will actively introduce the technologies and equipment needed for the development of clean energy in China, continuously learn from its strengths and learn from its successful experience. But more importantly, we should actively develop our own core technologies.

4.5 Build and further improve a modernized public service system

(1) The association of clean energy industry should give full play to its functions and promote the intermediary services extensively to improve the relevant information service level;

(2) We should intensify the construction of infrastructure, eliminate the "energy poverty" completely, and realize the wide spread of energy services and the equal provision of public services;

(3) By cooperating with the Internet, animation and other modern creative industries, we can actively publicize knowledge about clean energy with the community as the unit and the public as the object, cultivate people to form scientific consumption concepts and patterns, and further improve the modern public service system of clean energy.

5. Conclusions

In this new era of development, the effective development and utilization of new energy is very important for social development, and whether the sustainable development of clean energy can be achieved determines China's economic development to a certain extent. Therefore, China has increased the development and utilization of clean energy, through the high development of low-carbon economy, efficient use of clean energy, active use of energy saving technology and other ways to relieve China's energy pressure, so as to realize the sustainable development of social economy and clean energy.

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