
Research on the development trend of energy saving and consumption reduction in domestic and foreign building field

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ABSTRACT

Whether it is the fact that building energy consumption accounts for an increasing proportion in the whole energy consumption, or the fact that compared with developed countries, building consumption is seriously higher, it urges China to analyze the building energy conservation environment at home and abroad, and recognize the advantages and disadvantages of Building energy conservation in China, as a reference for formulating relevant policies.

KEYWORDS

building energy conservation ;
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INTRODUCTION

According to statistics, building energy consumption accounts for about 25% of the entire energy consumption at present, and with the continuous improvement of people's quality of life, the proportion will continue to increase. It can be seen that building energy conservation has a great impact on the whole energy conservation and emission reduction work, and even whether building energy conservation can be carried out smoothly will directly affect the success or failure of the whole energy conservation and emission reduction work. China's building energy conservation work has been carried out for more than 30 years, but it is still in its infancy. The most significant feature at this stage is that the enthusiasm of all parties is not high and the energy conservation effect is not significant. As the leader of building energy conservation, how to stimulate the vitality of building energy conservation and guide the orderly development of building energy conservation from policy measures is of profound theoretical significance and practical value.

THE CURRENT SITUATION OF BUILDING ENERGY CONSERVATION AT HOME AND ABROAD

In Europe and the United States and other developed countries, "energy conservation" is known as the fifth energy after coal, oil, natural gas, nuclear power. These countries have always attached great importance to energy conservation and combined energy conservation with development and efficient utilization, which has received good social effects and economic value. As an important part of energy saving ---- building energy saving, western developed countries also walk in the forefront of the world, its energy saving theory and practice have a lot for us to learn from. As early as the 1970s, western countries put forward the idea of reducing energy consumption, advocating the reduction of excessive energy consumption in building materials, heating and warmth. In the 1990s, the reduction of energy consumption was revised to improve energy efficiency, such as the introduction of insulation materials on the exterior walls of buildings, the use of water-saving sanitary appliances, etc. In the new century, western developed countries have put forward the advanced energy-saving concept of zero carbon dioxide emission.

In Developed countries such as Europe and the United States, the building energy conservation work has gradually evolved from the initial advocacy to compulsory promotion by the government. However, it was found later that it was difficult to develop the building energy conservation work deeply and sustainably by simply relying on political decrees and regulations. At present, they typically through the propaganda launch, build the public opinion atmosphere of the whole people to participate in an energy conservation, advocating people and related enterprises to participate in energy conservation work, using the policies and regulations to implement the building energy efficiency at the same time, actively through tax breaks, subsidized loans, capital support and other means to encourage section construction

work in the direction of further sustainable development. If the Japanese government buys energy-saving appliances identified by the government and uses them for more than one year, it can apply for the refund of taxes paid to the government on the purchase of such appliances. To encourage energy-saving renovation of existing buildings, the Dutch government has issued a catalogue of preferential tax rates for energy-saving renovation of buildings, guiding the public and enterprises to take the use of energy-saving building products as an important reference. The United States of the implementation of new energy-saving building tax policy, where in the IECC standard based on energy saving more than 30% and more than 50% of the new building, each set can be reduced taxes and fees of 1000 AND 2000 DOLLARS; The EU has put forward normative fiscal and tax policies, including energy tax, tax reduction, subsidy and investment bank loan. These economic incentive mechanisms have effectively accelerated the pace of building energy conservation.

At present, China has all kinds of built buildings with a construction area of about 60 billion square meters, among which more than 80% of the existing buildings are traditional buildings with high energy consumption or poor energy saving effect. It is expected that in the next five years, 15 billion square meters of building volume will be added. According to statistics, China's existing buildings due to the building itself is not energy-saving or energy-saving effect is poor, resulting in the use of building in the process of its energy consumption is 2 ~ 3 times that of developed countries. Building energy consumption accounts for more than one third of the entire social energy, which is significantly higher than the international average level. Both the fact that building energy consumption accounts for an increasing proportion of the whole energy consumption and the fact that building consumption is significantly higher than that of developed countries urge China to analyze the building energy conservation environment at home and abroad and identify the advantages and disadvantages of building energy conservation in China as a reference for formulating relevant policies.

Although the work of building energy conservation has been carried out for more than 30 years in China, little effect has been achieved. Most people have not taken the initiative to participate in energy-saving work, and even the most basic energy-saving awareness is very low. Architectural design, construction and supervision units are forced to participate in building energy conservation, and their enthusiasm is not high. Most government policies are guided from the macro level, and the implementation rules are often missing. At the same time, most of the government's measures to carry out building energy conservation work are forced promotion, lack of incentive measures and other flexible means. Wang Guangxi, former minister of housing and Urban-rural Development, once said: "I want to urge everyone in society, whether it is developers, construction units or supervision units, to take social responsibilities and actively promote building energy efficiency." 'Construction authorities will seriously deal with construction that fails to meet energy efficiency standards,' Said Mr. Wang, referring to developers' responsibility for building energy efficiency.

Some government officials believe that "successful energy-saving projects should be a combination of policies and mature energy-saving technologies". The technical application of building energy conservation work has reached a very high level, the thermal insulation materials of building exterior walls and structural technology has been quite mature; The thermal insulation and sealing of doors and Windows have been greatly improved than ten years ago. Energy-saving lamps and lanterns, hutch defends appliance also is every year ceaselessly bring forth the new. But in contrast, such as energy saving policy is for many years to stay in place without too big change, these policies or in the interest of time already cannot adapt to the needs of the rapid social development, or broad empty without the possibility of actual operation, or appropriate incentives are not difficult to tune up the participant's positive initiative and creativity.

Building energy efficiency is the government an important aspect to assume the function of managing public affairs, the government in addition to formulate relevant policies and regulations, and to provide information, standards, and technology promotion measures, still should further consider the long-term energy price policy, with the design of the consumption patterns of sustainable development and guidance, make the energy supply and demand and the management mechanism to merge. Should take promoting building energy efficiency technology as promoting construction industrial structure adjustment, reform and improve the opportunity of construction, to implement the compulsory civil building energy efficiency design standards as a breakthrough for the development of building system innovation, the energy conservation transformation of existing buildings as a form a distinctive style of the city an opportunity to establish an effective means of guidance, foster and standardize the market for building energy efficiency,

Make the whole building whether to meet the energy saving standards, small to the door, window and other products whether to meet the performance standards required by the energy saving standards can have laws to follow, there are standards.

CHINA'S CURRENT BUILDING ENERGY CONSERVATION LAWS, STANDARDS AND POLICIES

China began to work on building energy conservation in the 1980s, and promulgated China's first building energy conservation standard, The Design Standard for Energy Conservation of Civil Buildings, in 1986. After several years of practice, the standard was revised in 1995. At the same time of the revision of the standard, China also issued "building energy conservation technology Policy", "municipal public utilities energy conservation technology policy" and other building energy conservation documents, which marks the comprehensive development of China's building energy conservation work. The Energy Conservation Law of the People's Republic of China was adopted at the 28th session of the Standing Committee of the eighth National People's Congress on November 1, 1997, and came into effect on January 1, 1998. The Law was revised in October 2007. Article 14 of the Law clearly points out that building energy conservation must strictly follow national, industrial and local standards; Article 34 to Article 40 clearly points out the specific requirements and supervision responsibilities of building energy conservation work; Article 79 and Article 80 clearly point out the punishment measures for relevant units violating building energy conservation standards. This marks the building energy conservation work has risen to the legal level, the promulgation and implementation of the law also laid a good foundation for the smooth development of building energy conservation. In the following years, China issued technical standards, regulations and other documents related to building energy efficiency: "Civil building energy efficiency management regulations" (1998), "regulations of technology of both heating residential building energy-saving renovation" (2000), the hot summer and warm winter area residential building energy efficiency design standard "(2003)," public building energy efficiency design standard "(2005), the Chinese energy-saving technology policy outline (2007), the cold and cold areas Energy Conservation Design Standard for Residential Buildings (2010), etc. The promulgation and implementation of this series of documents and policies marks that China's building energy conservation industry is moving towards a mature direction.

In 1986, China's first building energy saving standard - "Civil Building Energy Saving Design Standard" was issued, the Ministry of Construction and other ministries issued the "Opinions on accelerating wall material innovation and promoting energy saving building", which is equivalent to a refinement of the design standard, making it operable. At the same time, the introduction of this opinion greatly promoted the historic innovation of wall, which is the component with the largest consumption of building materials and energy consumption. From the promotion of building wall demonstration projects in the 1990s, to the nationwide ban on the use of a large number of traditional sintered clay bricks in 2007, it can be said that this opinion has contributed greatly.

At the same time, In the past 30 years, China has also made several special plans for energy conservation, among which building energy conservation has been explicitly proposed for many times. For example, in 2012, The State Council issued the Development Plan for Energy Conservation and Environmental Protection Industry during the 12th Five-Year Plan period, and proposed a new development target for building energy conservation during the 12th Five-year Plan period in China's building energy conservation special plan: namely, by the end of the 12th Five-year Plan period, the building energy conservation capacity will be 116 million tons of standard coal. Among them, we will develop green buildings and strengthen the energy saving work of new buildings to form an energy saving capacity of 45 million tons of standard coal. We deepened the reform of the heating system, carried out metering and charging for heating across the board, and improved the metering and energy conservation of existing buildings in the northern heating region, saving 27 million tons of standard coal. We strengthened the construction of a supervision system for energy conservation in public buildings, and promoted energy-saving renovation and operation management to save energy by 14 million tons of standard coal. We will promote the integrated application of renewable energy and construction, and develop the capacity to replace 30 million tons of standard coal with conventional energy. It can be seen that the national top management level attaches great importance to building energy consumption and saving work, the setting of work objectives is very clear, and the focus and starting point of work is also very clear. These laws, standards and policies will undoubtedly become the foundation and guarantee for guiding the vertical in-depth sustainable development of building energy conservation work in China.

REFERENCE OF SUCCESSFUL EXPERIENCE OF BUILDING ENERGY CONSERVATION ABROAD

Western developed countries started building energy conservation work earlier, developed rapidly, and achieved remarkable achievements. The research on its development process can provide positive reference for the formulation of policy measures in the field of building energy conservation in China. Western countries began to focus on building energy conservation in the 1960s, focusing on reducing energy consumption in buildings at the earliest. By the end of the 1980s, it was focusing on improving energy efficiency in buildings. In recent years, the key work of building energy conservation has evolved into the sustainable use of building energy. With the continuous development and deepening of the building energy conservation work, the governments of western developed countries have gradually introduced many corresponding mandatory decrees, regulations and technical standards. However, the governments also guide enterprises and the public to actively participate in the energy conservation work through financial support, tax reduction and other economic incentives. For example, while vigorously promoting the implementation of mandatory energy conservation policies, the FEDERAL government and state governments in the United States encourage and guide the continuous development of building energy conservation through incentives such as tax reduction and exemption for enterprises, increased investment in technological innovation research and development, and promotion of demonstration projects. Another example is the German government, which attaches great importance to the research and development, promotion and utilization of renewable energy in the field of construction. When the Renewable Energy Law was promulgated in 2004, economic incentive measures such as energy price difference, preferential capital lending and tax reduction were introduced to ensure the full utilization and sustainable development of renewable energy in the construction sector.

The US government: from the federal government to the state and local governments have successively issued laws, regulations and relevant implementation rules on building energy efficiency; At the same time vigorously promote building energy efficiency incentive measures, such as discount interest loans, tax exemptions, technology demonstration project promotion.

French government: to actively participate in the building energy conservation of individuals and companies issued energy-saving honor certificate, for the original building energy conservation transformation to give financial support, the replacement of energy-saving appliances can be replaced with old for new.

The Dutch government: it has specially issued the building energy saving catalogue to guide the public and enterprises to choose energy-saving building materials or appliances according to the catalogue, and at the same time, they can enjoy corresponding financial subsidies.

Japanese government: to increase the support for new energy-saving technologies and products, the annual investment in new energy research and development funds accounts for about 1% of the national GDP, of which about 8% is used for the research and development of new building energy-saving technologies and products.

CONCLUSION

At present, building energy conservation has risen to the key field of energy conservation and emission reduction. Whether the building energy conservation task is completed or not is directly related to the realization of the overall task of energy conservation and emission reduction. Although China's building energy conservation work has been carried out for many years, up to now, the implementation initiative of Building energy conservation in China is still weak, and most of it is forced by the government. Among them, the management system is not smooth, the lack of comprehensive policy support system and the government's insufficient coordination of all aspects of the force are the important reasons that lead to China's building energy efficiency market cannot be activated. Although the building energy conservation work is still in its infancy in China, the building energy conservation work is still a long way to go, and there are many policy measures to be formulated and improved, but as long as the government actively participates in this work, the building energy conservation work is bound to have a great breakthrough and development.

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