ABSTRACT: As a response to energy crisis in many developed countries, the energy education has been accommodated in their energy and educational undertakings, and these countries vigorously promote the development of energy education. With the rapid development of China's economy and social transformation, the domestic energy problem is increasingly prominent, in order to build an economical society, we need to take the initiative to strengthen the energy saving, it is necessary for us to learn the experience of solving energy problems from developed countries, and vigorously develop energy education undertakings, in view of this, the author puts forward some suggestions for the development of energy education in China.

KEYWORDS: Energy education; Sustainable development.

Under the circumstance of increasingly serious energy problem in the world, countries around the world are facing new challenges in terms of energy demand and energy supply balance, energy efficiency and energy saving. With the rapid development of economy and society, China has become a big country of energy consumption, energy issues are increasingly becoming the bottleneck of China's further development. If our country wants to build an economical society, emphasis must be put on the saving of energy and resources, and improvement of utilization efficiency. From the international point of view, learning the experience of developed countries on energy education and strengthening China's energy education is a direct, realistic and effective way to build an economical society.

1. STATUS OF ENERGY EDUCATION IN MAJOR DEVELOPED COUNTRIES ABROAD

From an international perspective, countries that carry out energy education earlier are mainly developed countries, in this paper, the United States, the European Union and Japan, which are mainly engaged in energy education, are analyzed.

1.1 US energy education

In 1980, the United States signed the "US Energy Education Development" project plan to alleviate energy shortage, improve energy efficiency, arouse national energy awareness, improve national energy-saving technologies and consciousness, and actively develop energy-saving technologies. As a result, the United States began education on all types of energy issues and the exploration, production, use and conservation of energy.

The US Energy Education Development Program is based on the Nonprofit Education Association. Its core idea is to "integrate energy into education", whose basic mission is to design and deliver multidimensional energy education programs by creating effective networks of students, teachers, business, government and community leaders to raise national energy awareness and social responsibility.

Since the implementation of "US Energy Education Development" project plan, students and teachers of 50 states in the United States are covered comprehensively, innovative teaching materials on energy education, training programs, evaluation and incentive activities of teachers and students are provided from kindergartens to 12th grade students. The program includes eight topics: energy science education, energy and resources education, electricity education, transportation education, energy efficiency and conservation education, integration and consolidation, evaluation and reward.

To ensure the smooth implementation of the US Energy Education Development Program, the United States has established a nationwide teaching network. Teachers, students, mentors, collaborators, funders...
and community partners are all participants and supporters of the entire network. In addition, the Steering Committee and state energy offices are established, with regular publication of "energy exchange" and "career trends" to expand the radiation of educational resources, at the same time, a portal was set up to promote and popularize.

1.2 EU energy education

More than 50% of energy in EU countries comes from imports, especially oil and natural gas. Therefore, the EU puts energy utilization in the priority position of its energy strategy and proposes to improve the energy efficiency of European citizens by publishing the Green Paper on Energy Efficiency. In order to raise awareness and change the way consumers behave, the European Union will ensure that the EU’s energy consumption rate will be reduced by 20% by 2020 and realize that education plays a strategic role in improving energy efficiency. In order to achieve this goal, the European Union ensures "energy awareness" of all citizens through the school energy education and guidance of civic education, the European Commission takes the initiative in developing energy education activities and curriculum, disseminating information on energy sources, and promoting practical capacity. The EU member states should also play their roles respectively.

The EU’s energy education has three main objectives: to explain the effect of energy education; to arouse the awareness of citizens of energy issues and understand the background; let society and individuals to clear their own responsibilities and obligations on energy issues. The mission of the EU’s energy education calls for arousing citizens' energy awareness through schooling and changing the day-to-day behaviors that are closely linked to the regular education curriculum. The subjects of energy education should be integrated into the humanities, social, physical science and moral curriculum, and the subjects of energy education should have a historical perspective, which is applicable to practical learning and theoretical discussion, and integrated with art, culture and science courses. Energy education encourages young people, while it also affects wider social groups through their families and friends. The course content, resources and time allocation of energy education can be determined by the Member States. The main models for EU energy education are school education and social education.

1.3 Japan's energy education

Through the establishment of the "Energy Policy Basic Law", "New National Energy Strategy" and "Energy Basic Plan" and other laws and regulations, the Japanese government has not only clearly defined the energy strategic objectives, contents and implementation, but also attached great importance to energy promotion and energy education, and give clear, accurate positioning. The Japanese government through the important measure of enriching and promoting energy education to deepen people’s correct understanding of energy, only people have a correct understanding of energy can they can actively support the government to promote energy policies. This shows that energy education is the prerequisite and basis for Japanese government to promote energy policies.

The Japanese government attaches particular importance to the important role of relevant government agencies in the promotion and management of energy education. Ministry of Economy, Trade and Industry (METI), the Energy Information Planning Office bear important responsibilities in energy education management. The agency believes that it is necessary to start with children, to be concerned with energy, to have the right knowledge of the energy, and to have a deep understanding of the energy problem in order to enable the next generation of nations to take a practical basis for judging and acting on energy issues. It also stresses that energy is the basis of national life and economic activities, energy issues are closely related to every citizen, energy education as a lifelong learning issue, it is necessary to mobilize all citizens of the entire community to promote the development of energy education.

School education plays an important role in children's understanding of energy in the future. As a result, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has always attached importance to energy education in primary and secondary schools, and has taken various measures to enrich and promote energy education, especially efforts on enhancing students' understanding of nuclear energy. In addition to enriching the energy education curriculum, the Ministry of Education, Culture, Sports, Science and Technology has created the "Nuclear Energy and Energy Education Support Project Subsidy" system as a mechanism to support the implementation of the nuclear energy and energy education programs by all the prefectural governments in accordance with the curriculum standards, to support the development of supporting materials, research guidance, education and training, facilities, visits and other energy education matters and activities in all regions. In addition, the Japanese non-profit organizations also actively support the cause of energy education.
2. ANALYSIS OF CHINA'S CURRENT ENERGY EDUCATION

2.1 The establishment of specialized energy-saving management departments to strengthen energy management

China is responsible for promoting the implementation of China's energy sustainable development strategy through the establishment of a national energy bureau, organizing the development and utilization of renewable energy and new energy resources, organizing and guiding energy conservation, comprehensive utilization of energy and environmental protection in the energy sector, but the work on energy education is not focused.

In addition, China has also set up a national energy leading group, its main tasks are: to study the national energy development strategy and planning; to study major policies on energy development and conservation, energy security and emergency response, and energy cooperation with foreign countries, and to make recommendations to the State Council. National Development and Reform Commission, the Department of Resource Conservation and Environmental Protection Department sets up the Energy Conservation Division, responsible for researching and putting forward strategies, policies, on water conservation, energy conservation and other resource conservation and comprehensive utilization which can promote the development of circular economy, drafting the relevant laws and regulations, organizing the preparation of plans to guide the development of relevant standards.

2.2 To strengthen energy-saving legislation and standard-setting


2.3 To carry out a national energy-saving publicity and education activity

Since 1990, China has decided to carry out the annual energy-saving publicity week in the country, and the time is generally in June each year. This activity is mainly to form a strong propaganda, to arouse people's awareness of conservation during the summer peak of electricity.

After years of development and improvement, the national energy-saving publicity week has plays a strong influence on the society. Each national energy-saving publicity week will have a specific propaganda theme and slogan, and in conjunction with the theme in various parts of the country to carry out various activities aimed at continuously enhance people's "resource awareness", "energy-saving awareness" and "environmental protection awareness". These activities carried out have achieved an energy-saving education effect to a certain degree.

3. ENLIGHTENMENT OF FOREIGN ENERGY EDUCATION ON CHINA'S ENERGY EDUCATION

3.1 To develop the national energy education development planning, standardize and guide China's energy education development

An important and successful experience of energy education in the developed countries and regions is that the government regards energy education as an important component of the national education undertaking, formulates the national energy education development plan and integrates energy issues into the national mainstream curriculum so as to enhance people’s energy crisis awareness and social responsibility.

China's various government departments at all levels have not introduced energy education development plan, which is an important reason for the lagging of the cause of China's energy education. It is recommended that governments at all levels should effectively recognize the importance and urgency of energy education and convene relevant departments, enterprises, organizations, experts and academics to discuss the development of national energy education development plans and national energy education curriculum standards to regulate and guide the promotion and development of the national energy education.

3.2 To clear the main responsibilities and obligations of educators in energy education to promote the development of energy education

International experience shows that national government agencies, enterprises, civil organizations, universities and research institutes, schools, communities, families are the implementation subjects of energy education, and each of them should be conscientious and work together to promote the development energy education.
Government agencies should introduce national energy education policies and implementation plans as soon as possible. Energy-related enterprises and civil society organizations should put energy education as a public welfare undertaking into the industry affairs, make use of capital and talent advantages, take the initiative and promote the cause of energy education, and make contributions to the enhancement of the national energy quality. Universities and research institutes can use the professional advantages and scientific research to provide professional support and guidance for the development of curriculum resources on energy education and training activities. Primary and secondary schools are central to the implementation of energy education. Energy education can be considered as an integral part of the curriculum, infiltrating energy education in relevant curricula. In addition, energy issues can be considered in integrated practical activities. Community can make full use of a variety of media and public opinion supervision and other forms to carry out energy-saving popularization activities, so that people can consciously establish energy-saving awareness. Within the family, parents set an example by educating their children with energy awareness in an earlier age.

3.3 To strengthen energy education international exchange and cooperation, and actively learn from international successful experience

The social effect of developed countries like the United States, Japan, and the European Union on energy education is remarkable, with rich experiences, so we can learn from them. China's government and relevant organizations should actively seek international exchanges and cooperation with institutions carrying out energy education in developed countries, learn the successful experience of other countries, and carry out energy education in China with China's national conditions, making China's energy education a new level.

In short, in order to achieve the goal of building an economical society, China must strengthen energy education work, to wake up the energy awareness of all citizens. China's energy education has just started, still has a long way to go. By drawing on foreign advanced experience, combined with China's national conditions, vigorously develop energy education, improve energy efficiency, achieve energy sustainable development strategy, and constantly promote the sustainable development of economy and society in our country.

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