

Ecological Improvement Evaluation of Energy Saving and Emission Reduction in Renewable Energy Buildings

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Abstract: In the era of green economy, the development of any industry needs to take green environmental protection as its own responsibility. Especially in the construction field, improving the construction efficiency of renewable energy building, relying on energy saving and emission reduction technology to simplify and optimize the various technological processes of the construction industry, can not only adjust the environmental pressure, but also create a greener space for the survival and development of human beings, and then promote the progress of the society. This paper mainly studies the ecological promotion evaluation of energy saving and emission reduction in renewable energy buildings.

1. Introduction

In the traditional building structure, it not only takes a long time to build, but also needs to waste a lot of water resources, steel resources, resulting in a serious waste of resources, but also to a large extent caused environmental pollution. However, with the gradual acceleration of urbanization and the development of green technology, the application of renewable energy buildings is more and more extensive. Building units from the design drawings, according to the concept of green development, green new technology, research and development of green management means to create pollution-free buildings, to provide a dynamic support for the development of ecology.

(1) The area of application is constantly increasing

Since 2006, our country has carried out the demonstration work of renewable energy building in the whole country, integrated the related technology and technology, and issued a large number of guiding documents to promote the new construction and promote the ecological construction. Taking ground-source heat pump technology and solar photovoltaic technology as examples, according to statistics, before 2000, the installed capacity of buildings using solar photovoltaic technology in buildings was 30 MWp, which increased to 430 MWp in a short period of ten years, and the overall technical capacity was greatly increased, which provided new technology and technology for the development of the construction industry.[1].



Figure 1 Application of solar technology

(2) The type of technology has been effectively enriched

Still take solar energy as an example, at first, the construction industry of our country in the use of solar energy, only reflected in the preparation of domestic hot water, or solar cooker and other simple application devices. Nowadays, the application of solar energy in the construction industry has been transformed into solar power generation, lighting, heating and other technology types, and the photovoltaic power generation and ground heat pump are effectively combined to form a "sky and ground" two-line development of the coordinated process model. And for the application of ground heat pump, the construction field also from the original shallow underground application, to the mature underground water pump, river, lake and sea pump and soil pump. Especially in the treatment of industrial wastewater and construction wastewater, adopting ground heat pump and other related technologies can effectively alleviate the threat of wastewater to water resources, improve the utilization efficiency of wastewater, make it become renewable resources, and provide conditions for home and office heating.

(3) Large scale of industrial development

At present, some large and medium-sized cities in China have established renewable energy buildings with special characteristics of the city, and the solar photovoltaic industry layout in some areas has even been popularized among the major residential areas, forming a distinct natural industrial chain and realizing the rapid development of the industry. Even under the guidance of official designation, some developed regions share their own industrial chain and industrial structure with some non-developed areas, which greatly meet the national construction industry cluster of low energy consumption and renewable energy consumption, and provide a continuous stream of impetus and opportunities for the construction and development of urban ecology.

2. Ecological Improvement Evaluation of Energy Saving and Emission Reduction in Renewable Energy Building Applications

(1) Replacement of non-renewable limited resources

For now, most of the energy consumed daily by human society, as well as in construction projects, is dominated by fossil fuels such as coal, natural gas and oil. These sources of energy are very limited and mostly non-renewable, and if they are abused unchecked, they will cause the whole human society to back down. Based on this, any industry in the process of development should be prepared ahead of time, not only to save energy, but also to improve the efficiency of energy use, to prevent the large consumption of non-renewable resources and depletion. Especially in the field of construction, the consumption of building energy accounts for a quarter of the total energy consumption, which greatly threatens the development of human society and the progress of people's living standards. In this context, promoting the application efficiency of renewable energy buildings, applying the idea of energy saving and emission reduction and related technology to the construction of buildings, vigorously popularizing biomass energy, geothermal energy, wind energy and solar energy instead of fossil energy, or making a secondary transformation, can greatly improve the construction energy structure of our country, provide guarantee for the development of new energy and prevent the waste of non-renewable energy [2].



Figure 2 Renewable energy buildings

(2) be able to greatly protect the ecological environment

Energy as the most important material basis for social and economic development, human survival and development can not be separated from them, but once these energy consumption will not only aggravate the hidden dangers of future generations, but also cause damage to the atmosphere and the whole ecological environment. Global buildings emit more than a third of total CO₂ emissions after using energy, according to the materials. Based on this, how to prevent the damage of energy to the atmosphere and even the whole ecological environment under the premise of ensuring the survival and development of human beings has become a global consensus problem. In this context, the proportion of energy saving and emission reduction technology used in renewable energy buildings should be strengthened, such as treating waste gas from polluting air and then discharging it into the atmosphere. This can not only reduce carbon dioxide and sulfur dioxide in large areas into the air, prevent water pollution, but also create a more comfortable and comfortable living and natural environment for human beings, which is of great significance to the construction of a harmonious society.

(3) To a large extent, the gap between urban and rural areas can be shortened

There are not only problems in the use of electricity and resources, but also great differences in the use of electricity and resources compared with the city. Up to now, there are still some areas in the rural areas have not been electrified, social contradictions are prominent. In this context, the use of renewable energy buildings in the city means to connect to the rural areas, all kinds of renewable resources to transport to the rural areas, through the processing of technology can also enable the vast number of rural people to power, watch TV, even can use hot water bath every day, improve rural living conditions. As a result, it not only increased the happiness index of the rural people, but also shortened the gap between urban and rural areas [3].

3. Application of Energy Saving and Emission Reduction in Renewable Energy Buildings to Promote the Future Development of Ecological Benefits

(1) Continuously improving the application level of energy saving and emission reduction technologies

the first is the application of shallow geoenergy. Technicians need to recognize that the comprehensive performance index of the enhanced geo-energy system is important for accessing renewable energy. Based on this, in the practical application, it is necessary for the construction units to jointly ensure that the ground source heat pump system goes through the process from debugging to adjusting, select the effective cold and heat source mode and system form according to the local conditions, and then make specific use of the characteristics of geothermal load for detailed debugging.

the second is to improve the integration level of photothermal technology. To promote the integration of photothermal, photovoltaic modules, for the optimization of building performance, not only can adjust the beauty of the building, but also can save materials, and even bring some additional effects, such as improving the permeability of the building, to achieve heat preservation and moisturizing effect. Therefore, technicians in the design process, can appropriately reduce air conditioning and heating load requirements, reduce building energy consumption.

(ii) Effective enrichment of energy conservation and emission reduction technology types

First of all, air source heat pump technology should be optimized. Developed countries, such as Australia, have included air-source heat pump technology in the renewable energy category, the policy has also given a lot of support. Based on this, the construction units and environmental protection departments of our country need to work together to optimize the air source heat pump technology from the point of view of analyzing the energy efficiency of electric power, to reduce the consumption ratio of conventional materials in the process of building construction, to increase the energy released, and to improve the level of solar energy refrigeration and heating from the point of view of winter and summer [4].



Figure 3 Renewable energy complex

Secondly, the relationship between industrial waste heat and urban waste heat should be effectively treated. According to the relevant survey data, there is a positive correlation between the heat density contained in urban sewage and the number of indicators needed for urban heating. On the same principle, the higher the thermal energy that sewage contains, the greater its effectiveness. Based on this, construction units and related technicians must effectively deal with the relationship between industrial waste heat and urban waste heat, and use these remaining heat effectively to prevent direct emissions. For example, for some low-temperature residual heat, it can be released into liquid coal for easy recovery.

(3) Reasonable control of total energy consumption

First of all, for the control of the total amount of building energy consumption, we need to improve the standard of building energy consumption. For example, energy-saving standards should be uniformly applied and enforced in severe cold periods and areas. Conditional cities can also appropriately improve the standards of implementation, once found to be illegal construction to take immediate punitive measures to ensure that the use of all types of materials and energy must meet the green building application standards.

Secondly, for the energy consumption control of existing buildings, the first unit needs to start from two angles, heating metering transformation and reconstruction of the building itself. In the light of the current living conditions and climate characteristics of the urban residents, the relevant units need to determine the re-engineering lines, choose to strengthen the heating, or choose the heating works, or transform the window ratio of the old houses, etc. In view of the phenomenon of excessive heating in some cities in the north, it is also necessary to control and maintain the central district heating to ensure that there will be no excessive heat consumption and improve the efficiency of urban heating.

4. Conclusions

With the increasing abundance of renewable energy buildings in China, the application of energy saving and emission reduction technology is becoming more and more extensive, which not only provides space for the development of the city, but also improves the living conditions of the residents, and also optimizes the development of the whole natural ecology. Based on this, in the application of energy saving and emission reduction technology in the future, renewable energy construction needs to be more standardized and three-dimensional, and all operations need to conform to the national standards, improve the shortcomings of current resource utilization, and provide guarantee for the construction of the city and the development of ecology.

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