

# Application of energy-saving and environmental protection technology in construction engineering

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## Abstract:

*With the continuous development of the economy, energy consumption is increasing, at this time people are more and more concerned about the energy-saving and environmental protection technology of housing construction engineering. Energy saving and environmental protection in the construction process of housing construction engineering mainly refers to the use of energy-saving, environmentally friendly materials to carry out construction through reasonable design and to promote the quality of housing construction in line with national energy-saving standards. This paper mainly analyzes the energy-saving and environmental protection technology in the construction process of housing and building projects to promote the healthy development of housing and buildings.*

## Keywords:

*Energy saving and environmental protection technology; construction engineering; application*

## Introduction

With the continuous development of the economy, the scarcity of energy is more and more people's attention, people then enhance the awareness and concept of environmental protection, but also green energy saving as an important focus of the current national development. Therefore, in the housing construction process should also be added in the construction of green application technology, and the use of natural resources and energy-saving environmental protection technology to promote the energy reuse of housing construction, in order to build green housing construction. But in order to realize this goal in the process of housing construction, it is necessary to add energy-saving technology in the process of construction, so as to reduce the waste of resources and environmental pollution in the construction, so as to promote the continuous development of energy-saving and environmental protection technology in China's construction industry, so that China's housing construction can take the road of sustainable development.

## 1. The development and characteristics of energy-saving and environmental protection technologies

Construction technology affects both building quality and energy consumption. With the increasing scale of construction investment and building scale in recent years, the problem of energy consumption and pollution in building construction has become more and more prominent, and the traditional construction technology and construction concepts have obviously failed to meet the requirements of modern building construction. Under the background of the new era, in order to solve the problem of building energy consumption and building pollution, people began to try to integrate the concept of ecological environmental protection and energy saving into building construction, and energy-saving and environmentally friendly construction technology was proposed. With the continuous deepening of practice, the scientific nature of energy-saving and environmentally friendly construction technology has been verified, and building energy-saving and environmentally friendly construction has become the focus of heated discussions in the construction industry, and environmentally friendly and energy-saving construction has begun to be widely recognized. Energy-saving and environmental protection technology is a necessary requirement for the sustainable development of the construction engineering industry, and green building has become the mainstream direction of modern building development. The realization of energy-saving and environmental protection construction technology is through the development and utilization of new building materials, equipment, and technology to achieve low-carbon construction, reduce construction

energy consumption and pollution, improve construction quality, use natural factors and conditions, reduce construction costs, and realize the growth of economic and environmental benefits. For example, the application of fair-faced concrete, and glass wool can play a good energy-saving and environmental protection effect. Shimizu concrete, for example, in finish construction is not only smooth and even surface, color, and luster, but also has no universal concrete pollution problems, molding, no plastering, no chiseling repair, no paint, reducing a large amount of construction waste. It is of great significance to actively apply energy-saving and environmental protection technology to building construction.

## **2 Energy-saving measures for house buildings**

### **2.1 Construction raw materials**

In the process of housing construction, some materials, such as steel, cement wood, etc., in the selection of materials, to ensure that the raw materials used and housing design standards, so that the quality of housing construction and the actual project needs to match. In the process of housing construction, we should enhance the construction technology as much as possible, which can not only reduce the total amount of material application but also reduce the consumption of energy. At the same time choose the appropriate energy-saving materials, so as to be able to fully realize the building energy saving. For the construction unit, when choosing construction materials, we should fully consider the health, economy, and energy saving of construction materials. In recent years, with the continuous development of science and technology, in the actual building design process, new materials have been developed, and have a strong energy-saving effect. At this stage, in the process of house construction, new materials have been widely used. Insulation and waterproof materials have been widely used in walls and roofs; new light-transmitting and heat-insulating glass has been widely used in doors and windows.

### **2.2 Energy savings**

In order to achieve the effect of energy saving, the following points should be paid attention to: firstly, choose suitable materials to continuously meet the specific needs of building energy saving. In the process of house building construction, the use of advanced construction technology, and to application of solar energy to the construction of the house, so can play a role in saving energy. Second, the energy-saving work of the building envelope should be strengthened. In general, the building envelope requires a large amount of heat, and the overall thermal insulation of the building should be continuously strengthened. Most of the buildings in China do not have better thermal insulation performance, and the thermal environment effect is poor, so we should use advanced construction technology to strengthen the role of external wall enclosure insulation to achieve energy energy-saving effect.

### **2.3 Energy saving measures for each part of the house building**

#### **2.3.1 Energy saving in walls**

Wall insulation should be set up on the inside and outside of the wall, and the wall insulation layer mainly adopts plaster, paste, or composite method, and should be organically combined with the actually required insulation materials to promote the smooth progress of housing construction. For example: in the light aggregate should be added to the appropriate gypsum, lime, cement, or chemical polymers, and in accordance with a certain proportion to be adjusted. In most cases by using plastering techniques. Before spraying, in order to be able to ensure that the grass-roots level is clean as well as dry, especially to ensure the uniformity of the protective coating, so as to have a better thermal insulation effect. In the construction process, the application of the air layer plays the role of thermal insulation and can improve the waterproofing effect can be improved. However, this method has a high cost, so it is not widely used in residential construction. In the process of dry-hanging construction, the influence of climate, earthquake, and other negative factors should be fully considered, so as to ensure the strength and stability of the overall building. In the actual construction process, take into account the dry hanging system and the stability of the wall anchorage, which not only can make the node quality effect be enhanced, but also can avoid the metal parts suffering corrosion. In the selection of thermal insulation materials, choose a lower capacity, lower water absorption, and smaller thermal conductivity of the material, such as a polystyrene board and so on. In the process of use, these materials should be reviewed; in storage, they should be waterproof and moisture-proof; and in construction, they should pay attention to the construction process. By doing these things well, quality problems during the construction of housing buildings can be reduced.

#### **2.3.2 Energy efficiency of windows**

For building construction companies, it is necessary to rationalize the design of windows and doors. In order to improve

the energy-saving effect of the building, it is required to limit the ratio of the area of windows and walls. At the same time, the air density of the windows should be continuously enhanced, and the total amount of cold air entering the house can be reduced by applying sealing strips. The gap between the window frame and the wall should be sealed with flexible materials and sealing paste. In addition to the choice of window materials, to take into full account the impact of climatic factors on the choice of window materials, choose plastic and plastic steel and other materials, and also the reasonable use of double-glazing and insulating glass, etc., and ultimately make the window thermal insulation performance can be enhanced.

### 2.3.3 Energy efficiency in roofing

In the process of roof energy saving, the actual application of house building should be fully considered, and suitable thermal insulation materials should be selected. In general, the roofing energy-saving process will choose insulation materials with lower thermal conductivity, higher strength, and lower water absorption, which can be placed in the waterproofing layer and the layer board. For example: lightweight aggregate concrete panels, polystyrene panels, etc. There are also bulk materials as well as cementitious materials that are poured on site, for example slag and pumice. When selecting thermal insulation materials for roofing, it should be combined with the actual situation of the project, and should fully consider the product specifications, thermal conductivity, and other factors, but also pay attention to the waterproof and moisture proof role of building materials. At this stage, most of the house building will use inverted roofing, and to change the location of the insulation layer and waterproof layer, the waterproof layer should be set on the insulation layer, to enhance its thermal insulation effect. In the construction process of a housing construction project to realize the green roof, which can reduce the energy consumption of housing construction, so that the greenhouse gas emissions can be reduced. Greening can adjust the temperature around the house at the right time, and can play the effect of beautify the environment. Therefore, the construction unit should pay attention to green roof construction technology to improve the quality of housing construction.

## 2.4 Building space

The rational design of housing space, not only to meet the relevant requirements of the building function, but also to take into account the rationality of the housing building, and ultimately make the temperature regulation in the housing building can be improved. The rational design of the overall space of the housing building, not only can change the ventilation effect of the house as well as lighting and other states, but also can play an energy-saving effect.

## Conclusion

In short, along with the drive of the severe situation, the rational application of energy-saving technology to promote the development of the construction industry has become inevitable. In order to better highlight the advantages of energy-saving technology, should be combined with the specific construction situation, looking for obvious gaps between domestic and foreign countries, and taking appropriate countermeasures in a timely manner to balance the development of the construction industry, which ensures that the role of energy-saving technology is fully realized.

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