Longing for the Blue Sky—With Green Building to Resist Haze

Xin LI1,a*, Xin-yu MA2,b, Ji WANG1,c and Fa ZHANG1,d

1Institute of architectural engineering, Shenyang University, Shenyang, Liaoning, China
2Shenyang Tianma Medicine Engineering Installation CO., LTD, Shenyang, Liaoning, China
a55047430@qq.com, b794014340@qq.com, c806813774@qq.com, d3216900924@qq.com
*Corresponding author

Keywords: Blue Sky; Green Building; Internet Plus; Clean Energy; Carbon Emission

Abstract. At the Fifth Plenary Session of the Eighteenth National Committee of the Communist Party of China, the "Five Development Concepts", including the Green Development, have been established, which fully embodies the ecological civilization of our party under the new situation. In this paper, based on extensive research, from the energy structure of China to start, get coal is the main source of haze pollution, especially in winter haze. Through the analysis of energy-saving environmental protection industry, in the "13th Five-Year" period, energy conservation and environmental protection industry will maintain nearly 20% of the high-speed growth. The use of green building to resist haze, through the active promotion of new energy technologies in green building applications, to accelerate the implementation of "green building action program" and the Internet + green building a new model to help strengthen the haze governance, improve air quality.

Introduction

"Breathe the fresh air and enjoy the beautiful blue sky, should be the basic right of every citizen." Today, China is facing extraordinary pressure to reduce emissions. In a China-US joint statement on climate change [1], China promised to 2030 unit GDP carbon emissions in 2005 fell by 60% to 65% and the proportion of non fossil energy reached up to 20%. Recently, the Ministry of Housing and Urban-Rural Development of the People’s Republic of China (MOHURD) issued on technical guidelines for passive ultra-low energy green building (Trial) (residential buildings). The notice said to further improve the level of building energy efficiency and green building development. It's not just a dream to have a blue sky like Australia.

Analysis of Air Pollution in China

Haze Causes

It is necessary to start from China’s energy structure to find the main cause of haze. Chinese thermal power accounted for about 80% of the total generating capacity, while hydropower accounted for only ten percent. Nuclear power, wind energy, solar energy and other new energy power generation accounted for only a few percent. Thus the power station is the main energy provider in China, and the power of almost all using coal as fuel. The iron and steel, cement, oil which the heavy pollution industry, without exception, need coal. Even the automobile fuel production also need to provide coal energy or raw materials. All these industries need to consume the electric power while the power about 80% come from coal.

By analysis from the data, a ton of coal produced about 2.5 tons of CO₂. In 2013, China’s coal consumption was about 3.5 billion tons and generated about 8.755 billion tons of CO₂. In 2014, the consumption of gasoline was about 100 million tons and the diesel oil consumption was about 160 million tons, about 800 million tons of CO₂ produced which less than 10% of CO₂ produced by coal combustion[2]. So, more than 80% of China’s energy comes from coal, that is to say about 80% of emissions from coal. Coal is the main source of pollution. In accordance with the blue sky action plan
to control the total amount of coal, coal pollution reduction is the top priority of the blue sky action in Northeast of China.

**Current Status of Air Pollution**

Into the 21st century, China's atmospheric governance efforts increased year by year, the relevant departments announced the overall trend of air pollution index was declining. Prospective industry Research Institute released the "2015-2020 Chinese air pollution control industry market outlook and investment strategy planning analysis report" shows that in 2012, the national industrial emissions was 6.35 trillion m$^3$ (normal), 5.8% less than the previous year and industrial emissions which was the first time in the fall; centralized exhaust emissions was 3.68 trillion m$^3$ (standard state) (Figure 1). 2013, the national industrial emissions was 61.34 trillion m$^3$, down 3.48%[3].

![Figure 1. Changes in China's industrial waste gas emissions during 2001-2014 (unit: 1 trillion m$^3$, %).](image)

(Source: Prospective Industrial Research Institute)

From the chart, the industrial exhaust emissions has been declining year by year in recent years, but in fact, although this summer there is a rare blue sky and white clouds, on the whole, it is more and more serious haze especially in the winter.

**Industry analysis on the energy saving and environmental protection**

Investment in energy conservation and environmental protection industry increased dramatically and continued to grow rapidly. During the 11th Five-Year, the investment in China's energy saving and environmental protection industry was 2.16 trillion. During the 12th Five-Year period, the investment is expected to more than 5 trillion, and grow by more than 130%[4]. By the end of 2015, the proportion of investment in energy saving and environmental protection industry in GDP will be more than 2% and investment continues to increase.
Policy support continues to strengthen. The output value on the China's energy-saving environmental protection industry will continue to grow rapidly. In 2014, the scale of the output value of energy saving and environmental protection industry was more than 900 billion (Figure 2). In the "13th Five-Year" period, energy-saving environmental protection industry will maintain rapid growth of nearly 20%.

Analysis of Air Pollution in China

It is understood that China's housing construction process accounted for 50% of the total energy consumption. While China's building energy consumption is the 2 to 3 times of the same latitude with the climate zone developed countries and about 1/3 of the building life in developed countries, these are known as the two weaknesses of Chinese architecture. Since 2013, the "Green Building Action Program" [5] has been fully implemented nationwide for further energy conservation. It is an effective measure to resist the haze and restore the blue sky with green building.

Actively Promote the Application of New Energy

In the green building, actively promote the application of new energy can effectively reduce the emissions of atmospheric pollutants. At present, the development of new energy sources include: solar energy, geothermal energy, biomass energy, tidal energy, ocean energy, wind energy, etc. Compared with coal, the proportion of China's new energy use is still small and need greater development efforts. In fact, China has abundant new energy resources: the part of "Three North" can be developed a lot of wind and solar energy resources. China has the first large-scale hydropower and wind power and solar power generation this year is expected to achieve the world's first...... With the development of technology and the reduction of the cost of new energy, the new energy has broad application prospects in the development of green building.

Implementation of green building program

The future of green building is not just "pan-green", but will be "all green". Northern cold regions occupy 72% of China's land area, the winter heating not only need to consume a lot of energy, but also the air pollution is more serious. Coal heating is regarded as an important source of pollution in northern haze. Reduce air pollution, not only to change the energy structure, the building itself is also very important energy-saving. So, green building will be an important way to reduce air pollution.
The new model of Internet plus green building

The integration development of the Internet and the industrial construction, has become an irresistible trend of the times. The new model of Internet plus green building will become the future development trend of building energy saving.

Internet plus green building focus on the visibility in the design. First is the Internet Design; Second is a new product, new components, green building materials, new materials, new technology internet. To achieve high strength, heat insulation, thermal insulation, automatic adjustment of light, winter and summer performance contrast and so on, and even some glass can production, storage. By user needs and cooperation with designers, it can design the software, technical support and achieve industrialization customized production. Green building's design, construction, commissioning and operation of the whole process of supervision should be implemented. Then, it can achieve the purpose of indoor environmental quality, energy saving and energy utilization, land and outdoor environment, water saving and water resources utilization, material and material resources utilization.

Summary

Try our best to do a good job of air pollution control to protect the blue sky. The development and application of the construction industry should accelerate new energy, accelerate the industrial upgrading of building construction, materials and equipment. By accelerating the full implementation of green building, to promote the sustainable development of economy and society, to achieve the country's sky bluer, the water is more green and beautiful tomorrow!

Acknowledgement

This work was financially supported by the Doctoral Scientific Research Foundation of Liaoning Province (201601218), Science and Technology Project of Shenyang (F15-114-9-00), General Research Project of Department of education of Liaoning Province (L2015058).

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