

# Unemployment Problems and Countermeasures Caused by the Government's Air Pollution Control Policy: Taking Hebei Province as an Example

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**Abstract.** China has achieved tremendous economic development in the past 30 years. However, the extensive way of developing the economy has also caused a certain degree of environmental pollution, such as air pollution caused by coal burning, especially in the Beijing-Tianjin-Hebei region. To solve this problem, China has made a series of policies to tackle the severe air pollution in this region. Although those policies are effective, they have also led to some social problems. This phenomenon has caught the attention of researchers. This paper aims to study the consequences of environmental policies on the Beijing-Tianjin-Hebei region and how to alleviate the negative impact of those environmental policies. Through analyzing the data of industrial structure in the past eight years, it is found that the pillar industry of this region is the secondary industry. China's designated environmental policies have increased the cost of taxes, basic materials, energy conservation and emission reduction equipment for small and medium-sized enterprises in the second industry, resulting in the decline of profits and even bankruptcy of small and medium-sized enterprises and causing the recession of the second industry and economy recession. It has led directly to the decline of manufacturing, higher unemployment and increased competition between The Beijing-Tianjin-Hebei region. This paper tries to provide some countermeasures and suggestions to Hebei province's social and economic problems, such as rising unemployment and recession. Finally, it analyzes the latest national air governance policies and the changes in industrial structure brought about by sustainable energy in the future, trying to solve the problem of worker unemployment caused by air policies through the development of green industries.

**Keywords:** Air governance policies, Unemployment, Green sustainable development.

## 1. Introduction

### 1.1 Background

After the reform and opening-up, China's rapid industrialization led to a substantial increase in energy demand. As a traditional industrial province with heavy industry as the mainstay, Hebei Province has many industrial enterprises.

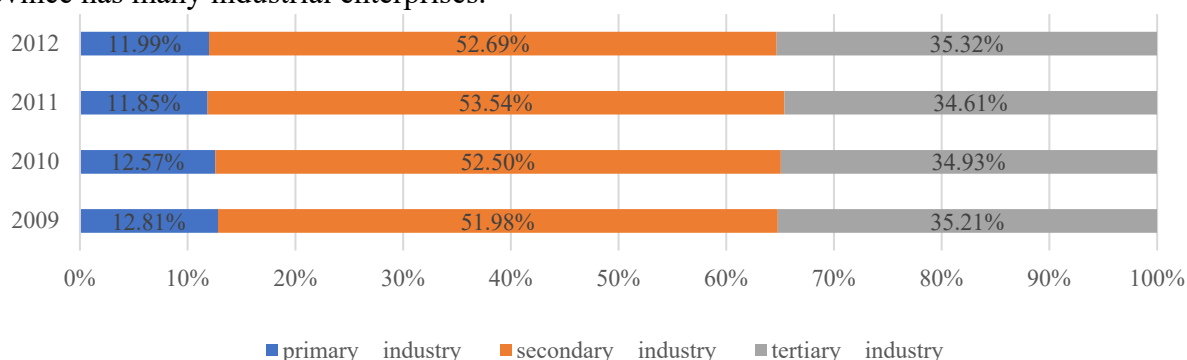


Figure 1. Proportion of Primary, secondary and tertiary industries in Hebei Province [1]

As shown in Figure 1, it can be seen that the economic development of Hebei Province mainly relies on the secondary industry, which occupies more than 50% of GDP.

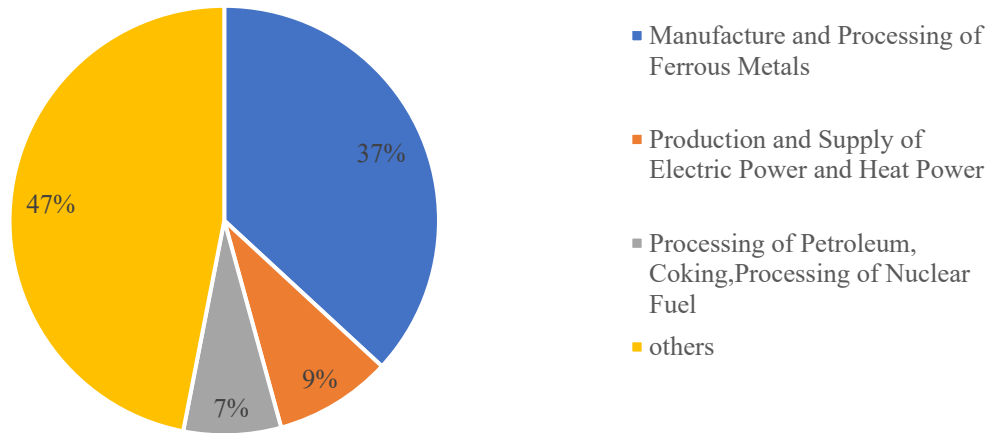


Figure 2. Major Indicators of Large and Medium-Sized Industrial Enterprises by Sector (2012) [1]

As shown in Figure 2, according to the main index of large, medium and small industrial enterprises in different industries in Hebei Province in 2012, the pillar industry of the secondary industry in Hebei Province is manufacturing and processing Ferrous Metals.

Coal is the main fuel for manufacturing and processing ferrous metals in China due to its lower price. However, burning coal can also cause severe air pollution. Combustion produces coal combustion residues, such as particulate matter, sulfur dioxide and bottom ash, which contribute to smog and respiratory illness. In 2013, ambient air pollution caused more than 1.6 million deaths in mainland China, with a total economic loss equivalent to 10.9% of GDP [2]. Pollutants from coal-burning each autumn and winter pose a severe threat to public health. Therefore, the state has introduced a series of strict air pollution control policies to prevent further deterioration of air conditions in China. Those policies worked effectively. It also means that the number of companies engaged in related industries has dropped significantly



Figure 3. Private enterprises in coal and metal mines [3]

As shown in Figure 3, compared with 2013, the number of private coal mining, washing and metal mining enterprises in Hebei Province will decrease by 60.3% in 2020. Among them, the number of private metal mining enterprises dropped the most sharply, from 800 to 300.

## 1.2 Related research

Since many developed countries implemented environmental governance policies relatively early, scholars at home and abroad have conducted a lot of research on the impact of environmental governance on employment.

Data provided by the World Bank and the Institute of Health shows that in a context of scarce resources, air pollution has caused a substantial increase in the prevalence of respiratory diseases among the population, hampering economic development. The State Council has put forward a new direction to strengthen the adjustment of industrial structure and promote the efficient and green development of the industry through the analysis of the total emissions of air pollutants in the past three years. This has important implications for the sustainable development of the environment [2-3].

Qi et al.'s analysis of climate change policy over the past 20 years highlights the importance the Chinese government attaches to the high complexity of climate policy. Continuing to warm the climate and achieving net zero carbon emissions as soon as possible will make it possible to control the temperature rise. But in the long run, China also faces considerable challenges. With the development of the times, environmental pollution is still a long-term problem considered by many countries, and this policy is also of great significance to the development of clean energy and future environmental governance [4-5].

Hao et al. integrated research on the total amount of harmful emissions such as PM<sub>2.5</sub> in the Beijing-Tianjin-Hebei region. Industrial energy conservation, emission reduction and air pollution are facing major challenges. It is necessary for the government to propose some coordinated atmospheric governance policies, which will also provide protection for citizens' daily breathing, and more importantly, low-carbon travel can also achieve energy conservation and emission reduction. The air pollution in the Beijing-Tianjin-Hebei region after 2013 was analyzed. The results show that under the strict air pollution control policy, the air quality in the Beijing-Tianjin-Hebei region has reached the goal of the air pollution prevention and control action plan. And analyzed the unemployment of workers in Hebei Province due to environmental problems in recent years, and excess production capacity will also become the focus of future work in Hebei Province. Research shows that addressing overcapacity is facing severe challenges, including issues such as economic growth, fiscal revenue, and corporate debt [6-8].

Guo et al. analyzed the employment rate under air pollution in the Beijing-Tianjin-Hebei region. According to some current research findings, employment levels in heavy industry are more affected by air pollution than light industry. Although the social average employment level has improved in the short term, in the long run, the government's policy response is the most important thing. At the same time, the research on China's carbon emission data shows that China's economic structure needs to be transformed, and state-owned enterprises, especially energy enterprises, will be affected by market fluctuations. In response to these opportunities and challenges, they also put forward some economic suggestions to make the market-oriented reform more smoothly completed [9-12].

## 1.3 Objective

By summarizing a series of air control policies issued by the Chinese government in recent years, this paper analyzes the possibility that the punishment of polluting enterprises may lead to the bankruptcy of enterprises, unemployment of employees, and regional conflicts caused by the relocation of factories. Finally, combined with the emission reduction and sustainable energy development in the policy of "Winning the Blue-Sky Three-Year Action Plan", the future national policies are analyzed to provide new employment opportunities for the population of Hebei Province (as an industrial province). Previously unemployed due to environmental protection policies.

## 2. Situation Description

In response to public health problems caused by air pollution, from the 2013 Air Pollution Prevention and Control Action Plan to the Three-Year Action Plan for Winning the Blue Sky, the government has become more and more strict with air standards. Although these policies play an important role in air governance, they also cause serious social problems, that is, the increase of unemployment in society. In addition, problems in the implementation of these policies have also contributed to the exacerbation of unemployment.

The first is the problem of excessive implementation of policies in the process of implementation. Qi Ye & Wu Tong argued that due to the existence of China's hierarchical governance structure, it reflects the top-down governance characteristics of the central government [4]. Specifically, the central government formulates plans, sets mandatory targets, and requires local governments to implement responsibilities when strictly implementing the targets. Since 2013, when air pollution was severe, the central government issued the Action Plan for Air Pollution Prevention and Control, formulated a strict plan to reduce pollutants, and emphasized that achieving these goals is directly related to the government's performance evaluation. Therefore, Tang Xiao et.al. said: "the leaders of local governments are eager to significantly improve air quality in the short term during their term of office, ignoring the closure of enterprises and operational difficulties caused by air governance policies" [5]. For example, when the air pollution in a certain place is extremely serious, the local government will take one-size-fits-all measures to all local polluting enterprises, requiring them to stop production in order to improve the environment. Hao Jiming & Michael P. Walsh reported: "Government leaders have made air governance a priority during their tenure, ignoring the economic and social implications of these regulations." [6] These leaders were promoted for outstanding achievements in environmental protection, but economic development within Hebei province was deliberately ignored. The economic losses of local finance and worker unemployment can only be paid by society in the end.

The second point is the issue of policy unsustainability. Since the government issued the "Air Pollution Prevention and Control Plan" in 2013, the haze problem in Hebei has not been fully resolved for nearly ten years. The main difficulty of the government in the process of policy implementation is that the management and supervision of full implementation are not in place. These problems make the environmental protection policies issued by the government unsustainable, prompt the government to continuously introduce new environmental protection regulations, and increase the burden on polluting enterprises. Wang Li et.al. argue that: "For state-owned enterprises, local governments do not have enough power to implement effective supervision over state-owned enterprises, and it is difficult for the enforcement and enforcement of laws to keep up with." [7] For small and medium-sized enterprises, it is difficult for the government to fully implement supervision due to their scattered and remote characteristics. For example, Bian Lina reported that industrial enterprises located in remote rural areas often choose to operate at night, and these enterprises are usually energy-intensive with very high emissions [8]. While the government may require companies to limit or stop production during the day, the government's inability to regulate at night can lead to highly polluting production. This has led companies to evade routine government inspections during the day and shift their main production to night. Therefore, due to the inability to supervise, the government can only continue to increase the charging standards for enterprises to discharge pollutants. Industrial enterprises in Hebei province have to bear more costs for this, forcing them to lay off staff. The third point is the pain caused by the industrial transformation of Hebei Province. As China fulfills its commitments under the Paris Climate Agreement, the Chinese government has made air governance and energy conservation and emission reduction a common goal to achieve. For example, the "Three-Year Action Plan for Winning the Blue Sky" calls for speeding up the relocation, renovation and closure of heavily polluting enterprises in urban built-up areas, and intensifying efforts to eliminate outdated production capacity and reduce excess production capacity [9]. A large number of coal mining and metal smelting enterprises in Hebei Province can only choose to move out or close their enterprises, which has caused a large number of enterprise employees to suddenly lose their jobs

due to policy issues. According to Guo Xiaojie & Zhang Xiaohong, by 2017, industrial restructuring may lead to the unemployment of more than 1 million people in Hebei Province [10].

### 3. Problem Analysis

#### 3.1 Difficulties in business operations and fewer employees in the secondary industry

A series of strict air pollution control policies have played a positive role in "forcing" the transformation of enterprises and changing the mode of economic development. But strict environmental policies and problems arising from the policies have had a serious negative impact on employment in the industries involved. Small and medium-sized industrial enterprises with coal as their main energy have been severely impacted in environmental governance. The government implements structural adjustment to industrial enterprises, and implements policies for atmospheric control and energy conservation and emission reduction. Due to the outdated facilities of enterprises and the difficulty in monitoring scattered emissions, small and medium-sized industrial enterprises need funds to purchase pollution treatment equipment on the one hand, and on the other hand, faced with the high environmental protection tax imposed by the government and the sudden production restriction and suspension regulations, the business situation of the enterprises has become extremely difficult. , which has led companies to cut expenses by laying off staff. Small and medium enterprises are an important carrier of social employment. The layoffs of a large number of small and medium-sized industrial enterprises in society have caused serious social unemployment.

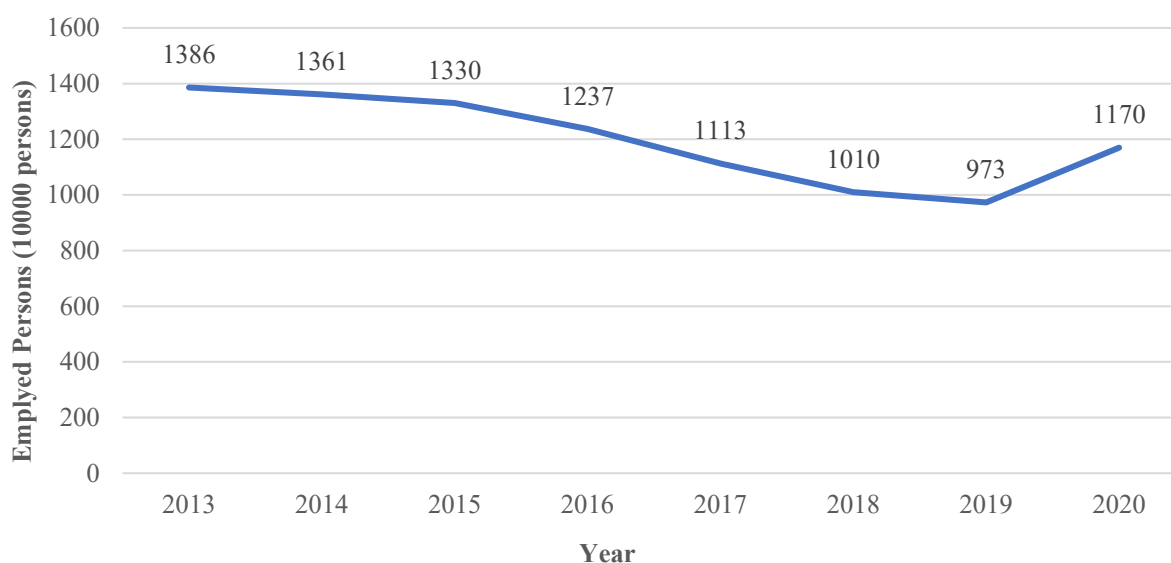


Figure 4. Employment in Secondary Industry [11]

As shown in Figure 4, the number of employed people in the secondary industry in Hebei Province has generally shown a downward trend. Compared with 2013, the number of employed people in the secondary industry in 2020 has decreased by 2.16 million, and the employment ratio has dropped by 15.6%.

According to the data, the government has achieved effective supervision over the coal-based energy structure and the heavy industry-based industrial structure in Hebei Province. Although some of it flows into the primary and tertiary industries, the large reduction in employment in the secondary industry also means an increase in the number of unemployed.

#### 3.2 The characteristics of the unemployed population and the increase in government management costs

Affected by strict pollution control policies, the secondary industry has experienced serious layoffs and a reduction in the number of unemployed workers. Among these unemployed groups, most of the layoffs are due to the deterioration of the operating conditions of small and medium-sized private

enterprises. These businesses are generally located in villages surrounding the county seat. Most of the employees are migrant workers. Their role in factories is to provide cheap labor. Due to China's unique household registration system, their household registration is still in rural areas, which means that they cannot enjoy social security in cities and towns. Li Na argued in her paper that due to inequality in education and background, they are often unable to access knowledge and skills in other fields throughout their lives, and it is difficult to find a job once they lose their jobs [12]. For example, they may be familiar with equipment operating procedures in an industrial enterprise, but completely ignorant in other areas. Also, their age is an important issue, with a significant number of unemployed people in their 40s and 50s. They were originally employees of small and medium-sized industrial enterprises, but were laid off due to policy and other reasons that led to difficulties in business operations. If they are rehired, they do not have enough time and ability to learn new skills. Companies are also reluctant to spend time and money on training older employees, which increases costs for companies. Based on the above situation, the knowledge and ability mastered is single, and being too old is the main reason for the low competitiveness of the unemployed in the job market. Hebei University pointed out many unemployed people have not found new jobs after the government's resettlement program [13]. This also makes unemployment resettlement an important social issue. The increase of a large number of unemployed people in the society has greatly increased the management cost of the government. The government needs to provide financial relief, skills training and job placement for the unemployed. These measures all require government financial appropriation and personnel input, which increases the government's management costs.

#### **4. Suggestion**

To solve the social unemployment problem caused by air pollution control policies, the government needs to consider the following aspects.

##### **4.1 The government changes its hierarchical governance model to maintain policy sustainability**

To solve the problem of unemployment, we must first solve it from the source, that is, from the operating difficulties of enterprises. The top-down management model is one of the reasons for the difficulty of business operations. It is impossible to completely change the hierarchical governance model unique to China in a short period of time. This is determined by China's vast territory and large population. The central government puts enormous pressure on local governments to set mandatory targets, forcing local officials to sacrifice economic interests to achieve environmental goals set by higher-level governments. Therefore, the central government needs to make a more comprehensive and unbiased assessment of the performance of local officials. For example, in the performance evaluation of local leaders, the achievement of environmental protection goals should not be regarded as the only important factor in the evaluation, but also whether it is at the expense of the economy while protecting the environment. In addition, the environmental protection department formulates enterprise pollutant discharge standards and issues pollutant discharge licenses. Limit production, suspend production or impose fines on enterprises that exceed pollution discharge standards, and strictly prohibit local governments from taking various unreasonable shutdown and production restrictions on polluting companies for political performance. Keeping the policy sustainable requires the central government to empower local governments to monitor State-Owned Enterprises. Wang Pu et.al. researched: "The government should also pay enough attention to small and medium-sized industrial enterprises and provide specific economic and policy incentives for polluting enterprises." [14] For example, through economic compensation, enterprises are encouraged to upgrade pollution control equipment. Establish a carbon emission trading market. Enterprises with excessive emission reduction can sell the remaining emission rights to enterprises with high emission reduction costs or emission quotas. Enterprises with excessive emission reduction will obtain additional benefits, and will also help emission quotas and emission reduction costs. High businesses avoid the problem of

being fined. Both parties benefited and increased the enthusiasm for emission reduction. Reduce government management costs through free market distribution. Alleviating the difficulty of business operation through the above methods will also help to change the air quality in Hebei Province and achieve the sustainability of the policy.

#### 4.2 Development of Green Energy Industry

With the implementation of the national air pollution control and energy conservation and emission reduction policies, the state hopes to adjust the energy structure and industry to realize the transformation of energy and industry. In new national air governance policies, such as the "Winning Blue Sky Three-Year Action Plan," the state intends to promote industrial transformation and economic development by developing green, sustainable energy. Beginning in 2013, Hebei Province began to vigorously reduce coal mining and production and intensified efforts to develop sustainable energy. In the northern part of Hebei Province, wind and solar energy resources are abundant and have good development potential.

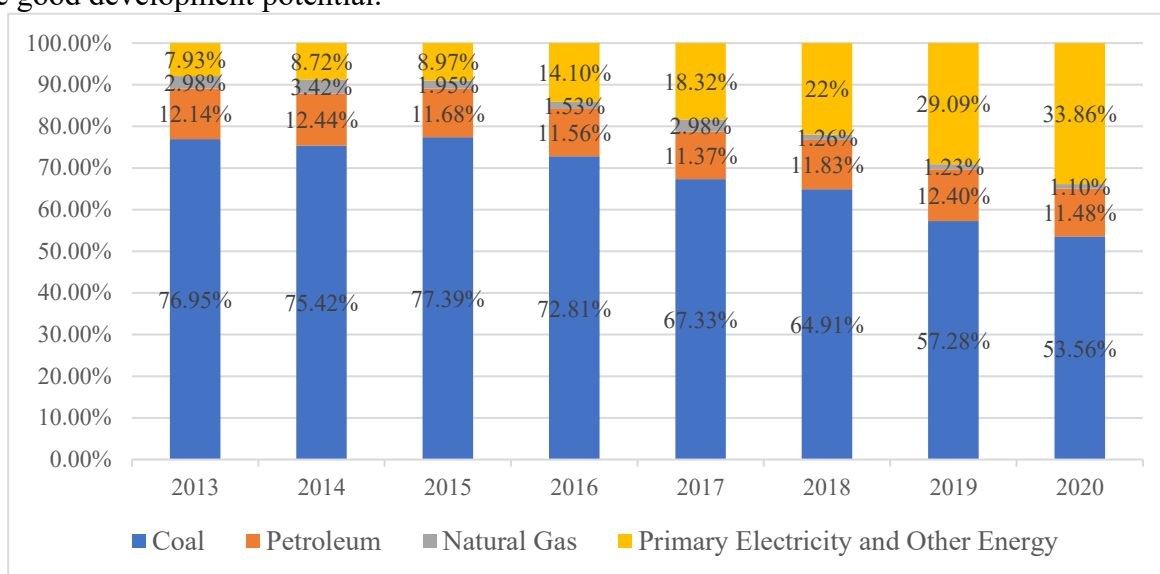


Figure 5. Proportion of total energy production in Hebei Province [11]

As shown in Figure 5, the proportion of total coal production in Hebei Province has dropped from 76.95% to 53.56%, the proportion of oil and natural gas production has not changed significantly, but the proportion of primary electricity and other energy production has increased. close to 26%. The primary power refers to the power generated by nuclear power, hydropower, wind power and solar power. The growth of primary power indicates that Hebei Province has developed a green and sustainable energy structure.

According to the data in the figure, Hebei Province's energy structure is gradually reducing its dependence on coal and instead vigorously developing green energy. Green, sustainable industries have received strong support from the government. At the same time, Hebei Province is an important steel production province in the country, and many enterprises, including small and medium-sized enterprises, are engaged in steel production. In the face of a possible decline in steel demand in the future, the government can issue regulations based on current green energy and industry-related policies to encourage small and medium-sized industrial enterprises to engage in green product production, such as solar panels and wind turbines. These measures will help alleviate the operational difficulties of enterprises caused by the control of air pollution. In the face of social unemployment caused by the implementation of air control policies, the government can also absorb the unemployed through emerging industries by increasing investment in green and sustainable energy and industries. However, considering the special situation of the unemployed, for the young and middle-aged unemployed groups, the Hebei provincial government can train the unemployed by opening vocational and technical schools, teach them green and sustainable energy-related technologies and skills, and provide them with priority employment channels to promote the re-employment of the

unemployed. For the elderly unemployed, the government needs to provide corresponding subsidies to encourage them to enter the city to engage in related industries in the tertiary industry and service industry. On the one hand, urban infrastructure and medical facilities are more complete, which can provide specific social security for the elderly; on the other hand, due to the particularity of the unemployed, some industries in the tertiary industry do not require specific skills and knowledge. Such as security guards, street inspectors. It is feasible to promote the reemployment of the unemployed through green industries. Although the state's measures to strengthen environmental protection may increase the operating costs of polluting enterprises and prompt them to lay off employees, the development of environmental protection has also led to the development of green industries. As a newly emerging industry, green industries have also created a large number of employment opportunities. Therefore, the green industry in Hebei Province can be used to absorb the unemployed people caused by air pollution control and energy conservation and emission reduction policies, which solves serious social conflicts and promotes the further development of the green industry in Hebei Province.

## 5. Conclusion

This paper introduces the air pollution control policies introduced in China in recent years, and analyzes the problems existing in the policies. Among them, the deficiencies of government-level management and the unsustainability of policies are found in policy implementation. These problems have seriously affected the operation of industrial enterprises and may cause serious unemployment in society. Faced with the government's determination to control air pollution, the development of small and medium-sized enterprises is still facing difficulties. However, the problems faced by enterprises can be alleviated to a certain extent by researching and revising the problems found. In addition, in view of the existing unemployment problem in the society, this paper finds that the government tends to develop green sustainable energy industry through the study of the latest government policies. Therefore, this provides new employment opportunities for the socially unemployed and a transformational development direction for enterprises. Finally, the large-scale unemployment problem caused by the operating difficulties of enterprises in Hebei Province also exists in the Northeast, Shanxi and Shaanxi regions where heavy industry is the mainstay. These provinces can rectify the existing problems in Hebei Province, develop green and sustainable energy according to local conditions, and absorb the unemployed.

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