

Research and development of enterprise transformation and upgrading in China's circular economy

XiaoYu Li^{1,*}, Shuang Guo^{2,a}

¹School of economics, Shanxi University of Finance and Economics, Taiyuan 030006, China

²School of Accounting (MPAcc Education Center), Shanxi University of Finance and Economics, Taiyuan, C030006, China

*Corresponding author: 1458779899@qq.com, ^a1135977469@qq.com

Keywords: Circular economy, Transformation and upgrading, Technical reform, Technology and innovation, Research and development.

Abstract: China has incorporated the construction of ecological civilization into the overall development strategy of the country, and put forward higher requirements for the industrial transformation and upgrading of resource-based cities. At present, all human beings are facing a crisis of population, resources and environment. They are facing the challenges of transformation of development mode and technological reform and innovation, so as to promote more efficient and fair sustainable development of economy. Therefore, according to the principle of circular economy, this paper analyzes the necessity of the transformation and development of Chinese enterprises, and on this basis, makes empirical analysis and draws conclusions, and puts forward some effective suggestions for the transformation and development of enterprises.

1. Introduction

In the face of the problems of high consumption, high pollution and resource and environment constraints in economic development, China began to seek a comprehensive transformation of its economic growth model and take a path of economic development. Circular economy is a kind of economic growth mode that takes the efficient utilization and recycling of resources as the core, the principle of "reduction, reuse and resource utilization", the basic characteristics of low consumption, low emission and high efficiency, and conforms to the concept of sustainable development. It is a fundamental change to the traditional growth mode of "mass production, mass consumption and mass waste". At present, there are many extensive enterprises in China, and the pollution discharge is large, which not only wastes our resources but also destroys our ecological environment. More and more enterprises and governments study the relationship between trade and environment, which affects the market competitiveness of enterprises. Therefore, it is necessary to study the transformation and development of enterprises according to the concept and principle of circular economy.

2. The necessity of developing circular economy.

2.1. Limitation of resources and energy.

(Data from national statistical offices)

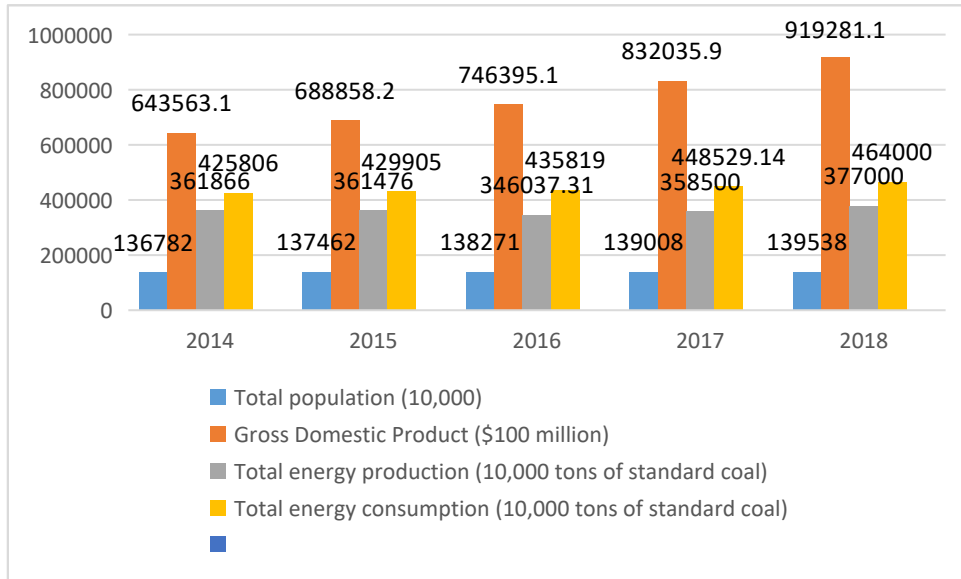


Figure 1. Trends in population, energy and economy in China, 2014-2018

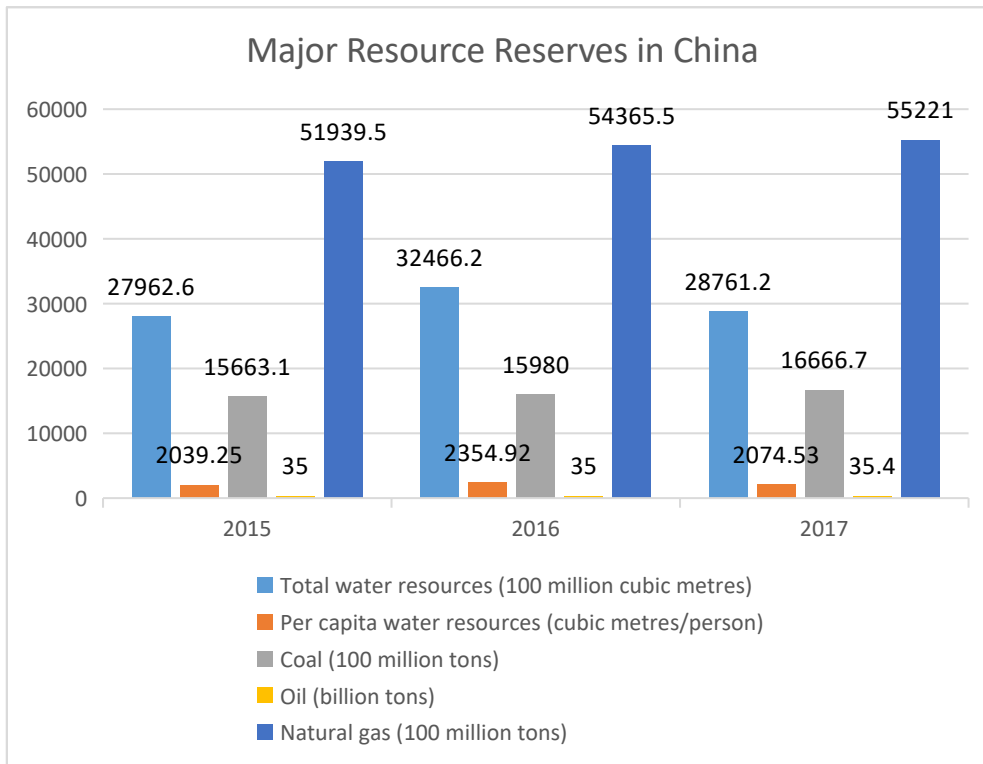


Figure 2. Main resource reserves in China 2015-2017

From figures 1 and 2, we can see that China is a country with a large population. With the opening of the two child policy, China's population has increased substantially, but resources and energy are limited. It will not increase with the population growth. It is a very cruel thing that a piece of "resources and energy" cake is divided by 1.4 billion Chinese. Gross domestic product and total energy consumption are rising continuously, but the growth of total energy production is slow and can not catch up with the speed of consumption. After the industrial revolution, China has been committed to the development of economy. The traditional extensive production mode of "high mining, high consumption, low output, high emission, high destruction and high pollution" has been adopted to maintain the rapid economic growth, which has accelerated the depletion of limited

resources and energy, and increasingly serious environmental problems. Therefore, the development of circular economy is imminent.

2.2. Compliance with national policies and regulations.

The report of the Third Plenary Session of the 18th CPC Central Committee pointed out that we should accelerate the transformation of economic development mode, build an innovative country, closely focus on building a beautiful China, deepen the reform of ecological civilization system, accelerate the establishment of ecological civilization system, and improve the mechanism of resource conservation and utilization and ecological environment protection. Xi Jinping pointed out that the environment is the livelihood of the people, the Castle Peak is beautiful, the blue sky is also happy. We should protect the ecological environment as we protect our eyes, and treat the ecological environment as we treat life. Circular economy can effectively improve the ecological environment and promote the implementation of sustainable development strategy. In recent years, with the introduction of many environmental protection policies, in the most stringent environmental protection law in the history of the new revision, the high standards and strict requirements for ecological and environmental problems have been strictly checked and the enterprises with "high pollution and high emission" have been fined. In order to fundamentally solve the ecological environment problems, we must vigorously promote the concept of sustainable development and circular economy, and develop circular economy.

3. Necessity of enterprise transformation and upgrading

3.1. The enterprise has a large amount of pollution discharge, which endangers the ecological environment.

(Data from national statistical offices)

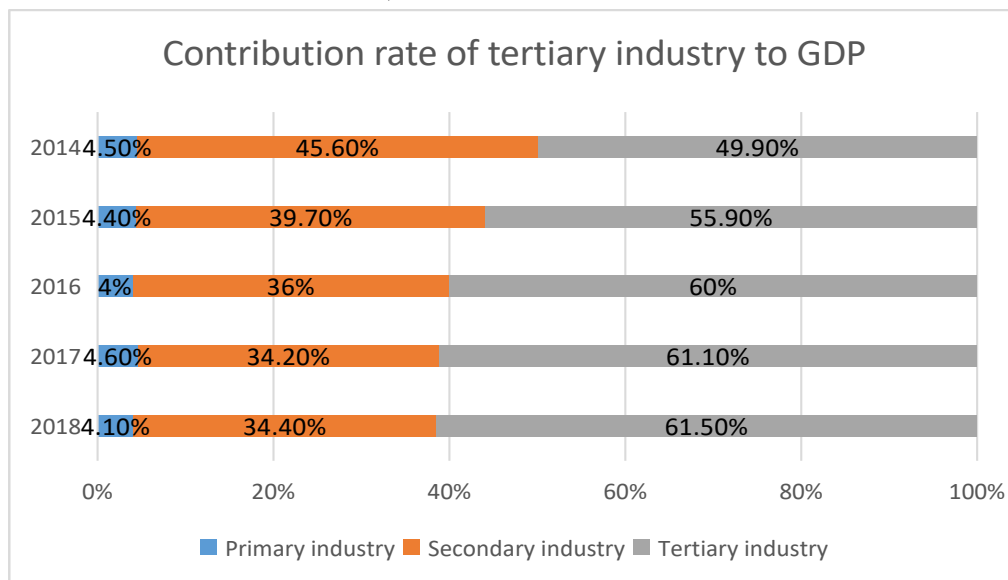


Figure 3. Contribution of tertiary industry to GDP

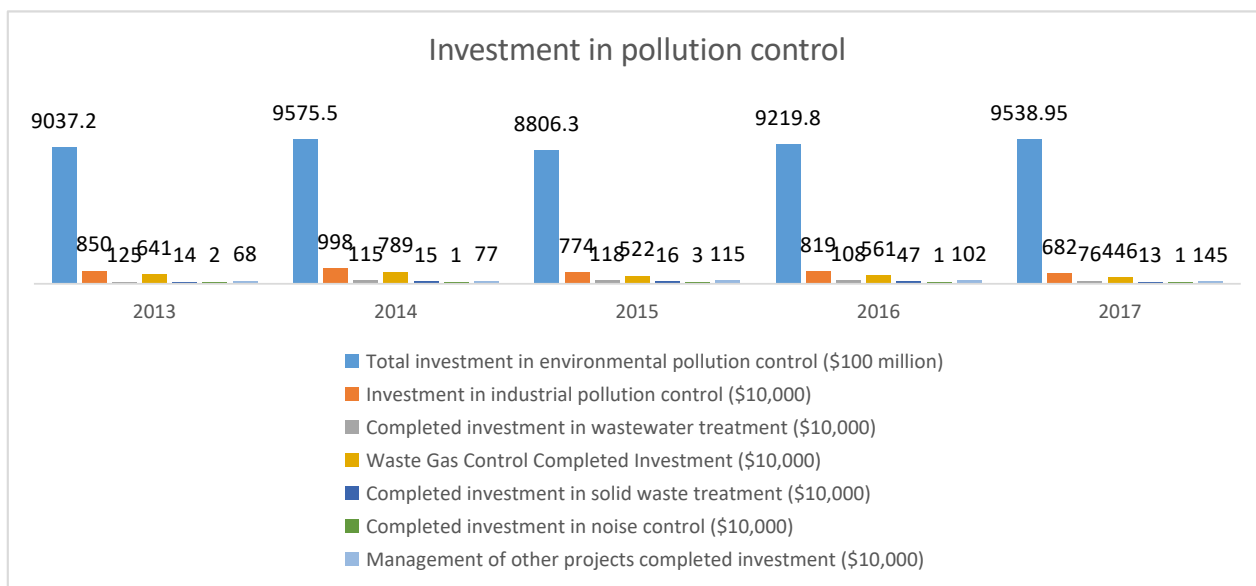


Figure 4. Investment in pollution control projects 2013-2017

From Figure 3 and Figure 4, we can see that the contribution of the secondary industry and the tertiary industry to GDP is more prominent, while the secondary industry is mainly industry (including mining industry, manufacturing industry, tap water, electricity, steam, hot water, gas) and construction industry. The third industry is mainly other industries except the first and second industries, which are divided into circulation department and service department. The state invests more in the treatment of industrial waste water and waste gas projects, so we should focus on the second and third industries, use the principle of circular economy, change its production mode from extensive production to intensive production, from the traditional production mode of "resources--products--waste discharge" to the circular economy mode of "resource--product--renewable resources"; From "high exploitation, high utilization and high emission" to "low consumption, low emission and high efficiency". While ensuring the development of economy, we should improve the utilization efficiency of resources and energy, improve environmental problems, develop circular economy, improve clean production technology, and realize the unification of environmental, social and economic benefits.

3.2. Comply with the environmental management system and improve the competitiveness of enterprises themselves.

At the Third Plenary Session of the 18th CPC Central Committee, it was proposed to accelerate the transformation of economic development mode, accelerate the construction of an innovative country, and promote more efficient, fair and sustainable economic development. It puts forward higher requirements for industrial transformation and upgrading of resource-based cities. To realize the magnificent turn of resource-based cities, it needs the comprehensive transformation of ecology, culture, society and mechanism. Since the implementation of the newly revised "environmental protection method in People's Republic of China" in January 1, 2015, many high polluting and high emission enterprises are facing a threat. Xi Jinping pointed out that the destruction of the ecological environment can not be soft and can not be taken for granted. In order to improve the ecological environment of our country, the enterprises with serious pollution and hopeless treatment are closed, stopped, merged and transferred, the legislation system of resources and environment is accelerated, the means of environmental management is strengthened, the measures of rewards and punishments are increased, the enterprises with reasonable pollution discharge and optimized industrial structure are given bonus, and the enterprises with high penalty pollution are not up to standard. The total amount control system of pollutants promotes enterprises to optimize resource allocation, save resources, improve the utilization efficiency of resources and energy, and improve their own

competitiveness. If enterprises want to survive, they must transform and upgrade to achieve "zero emission" of pollutants and no ecological damage.

4. Example Analysis -- Taking Shandong Paper Industry Transformation and Development as an Example

China is the world's largest papermaking country, and in the process of papermaking, there are many environmental problems. The paper industry used to be a heavy polluter in Shandong Province. Since 2003, Shandong Province has taken the lead in implementing the water pollutant discharge standard of the paper industry, which is several times stricter than the national standard. It has taken the path of forcing the transformation and development of high pollution and high emission industries with environmental standards, forcing the technological innovation, transformation and upgrading of enterprises, and promoting the industrial reform. Under the pressure of high environmental protection standards, a large number of paper-making enterprises in Shandong Province have been eliminated, and a number of enterprises continue to increase investment in environmental protection to promote the transformation and development of enterprises to adapt to the high standards of pollutant emissions. Quanlin paper industry, once included in the "blacklist" that was planned to be shut down, has invested billions of yuan in R&D(Research and Development) over the past 10 years, conquered world-class problems, has more than 180 patented technologies, and has embarked on a path of development of scientific and technological innovation oriented enterprises. The independently developed and improved cooking process has turned black liquor into organic fertilizer, bringing 10 billion yuan of income from one black liquor technology alone. It has not only turned the world's difficult straw pulp into a low pollution high-tech industry, but also brought paper mills to the United States, where environmental protection standards are very strict. Some of the enterprises represented by Chenming paper industry have been transformed into imported wood pulp papermaking. There are also some small enterprises that can not meet the standards, or are closed down or merged.

"Promoting transformation by environmental protection" is the secret of Shandong paper industry's success. Without strict environmental standards, there will be no sound development of paper industry in Shandong Province. Nowadays, the paper industry in Shandong Province has transformed from the traditional growth mode of "resources--products--waste discharge" to the circular economic growth mode of "resources--production--waste utilization". Today, more than 700 paper-making enterprises in Shandong Province have only a dozen left through market survival, merger and reorganization, but the output is twice of the original, the profits and taxes are four times of the original, and the industry's emissions have dropped by more than 80%. Inferior class IV sea water have been eliminated in the coastal waters of Shandong Province, and all 59 key rivers under provincial control have recovered the growth of fish.

5. Proposals for enterprise transformation and development

5.1. Introduce innovative talents and independently develop innovative technology

The competition of enterprises is the competition of technology. High environmental standards are the norm. If we want to survive in this competitive era, we must continue to innovate and adapt to the development of the times. The key to industrial transformation and upgrading is technological progress. Some advanced technologies are good, but they are not applicable to their own enterprises. Therefore, we should actively introduce innovative talents, independently research and develop, improve their competitiveness, or digest and absorb on the basis of the introduction of advanced technologies, and study, improve and innovate them to establish their own technological system. Putting their own innovative technology into the international market is conducive to their long-term development.

5.2. Establish technology exchange platform and innovate under the pressure of competition.

Only when there is competition, there will be pressure, and only when there is pressure, there will be power. Establish a technology exchange platform, improve environmental information disclosure policies, invite talents from the same industry to carry out technology exchange, think in the exchange, and find the way of innovation in the thinking. We can also reserve some successful transformation enterprises, visit and learn the innovative technology of the industry, and cooperate to promote the successful transformation and development of enterprises.

5.3. Develop circular economy and improve clean production technology.

The competition of enterprises is to improve the efficiency of resources and energy. In order to realize the strategic adjustment of China's economic structure and the optimization and upgrading of industrial structure, it is necessary to adjust the way of resource utilization and management. To manufacture and sell "environmentally sound" products, the "3R principle" is applied to the demand for resources and energy in the economic operation, that is, "reduce, reuse and recycle". In the process of production and consumption, use less resources, energy and renewable resources to create the same or even more wealth, and make full use of and recycle various wastes to the maximum extent.

6. Conclusion

Enterprises are the core force to solve the problem of environmental pollution. More and more enterprises are marching towards "environmentally friendly enterprises" and more and more cities are marching towards "circular economy cities". Industrial transformation and upgrading is to develop in a direction more conducive to the economy, society and environment. Enterprises need to accelerate the reform of science and technology system and promote the development of high-tech content and high added value industries. To promote structural adjustment by means of reform, reduce ineffective and low-end supply, expand effective and medium to high-end supply, and enhance the adaptability and flexibility of supply structure to demand change. Only by following the trend of world economic development and developing circular economy can enterprises remain invincible.

References

- [1] Feng Niu, Huixin Li. Study on the Countermeasures of Developing Circular Economy in Fujian Province [J]. Energy and Environment, 2006 (2): 12-15.
- [2] Shu Li. Circular economy: the inevitable choice of the mode of social and economic development in China [J]. theoretical guide 2002(6).
- [3] Ying Huang. directions, approaches and ideas for industrial transformation and upgrading [J]; China Economic and Trade Guide Journal; 2011 (22).
- [4] Xingming Jiang. Study on the connotation path of industrial transformation and upgrading [J]. Exploration of economic issues, 2014 (12).
- [5] Baohong Zhu. a review of the current domestic research on technological innovation [J] science • economy • society. , 2003 (3).