Research on the Green Development of the coal resource-based cities in China

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In China, as the demand increasing and coal industry development and taking coal mining and processing as leading industries, more and more industrial cities have been formed gradually, e.g. these cities are coal resource-based cities to be discussed in the article.

Considered degree of coal mining, here the article will show three represents of the green development of the coal resource-based cities. In the process of the green development, the measures taken by the Chinese coal resource-based cities are still insufficient. And measures should be different from the city.
The notable feature of China's energy structure is that the coal accounted for a large proportion of China's energy consumption.

Coal is the one-time non-renewable energy, the development of the coal industry is bound to be subject to the degree of the occurrence of coal. To the city of coal industry as leading industry once failure, and if there is no other industry in the city, thus, the city will decline.

The green development of Chinese coal resource-based cities is imminent.
1. The formation and development of Chinese coal resource-based cities

- Coal resource-based city is a kind of the resource-based cities. It is from the occurrence of the type of resources point of view of the city divided from the kind of city.

- **Characteristics:**
  - With the size, nature and functions of the city
  - With a number of coal mining enterprises of a certain size
  - The rise and fall of the coal industry in these cities where the city has an important impact.
The emergence of the Chinese coal resources-based cities occur in modern times. For the long-term occupation and plunder of coal resources in China, some foreign powers started to planning and construction of some coal resources-based cities.

Because of the economy recovery and society construction, some coal bases were planned to be built up by steps. These coal bases were developed to coal resources-based cities. This was the first peak of coal resource cities in China.

During the 1980s there was 2n peak period to coal resources-based cities’ construction and development and some of coal resources-based cities are still in development period now.
Classification

- One classification is the degree of coal mining and coal storage.
  - Group 1, the coal resources-based cities in developing period
  - Group 2, the coal resources-based cities in matured period
  - Group 3, the coal resources-based cities in declining period

- The another one classification is the city size.
  - Large-scale coal-mining cities (with urban population over 500,000)
  - Medium coal-mining cities (with urban population between 300,000 to 500,000)
  - Small coal-mining cities (with urban population between 150,000 to 300,000)
2. The urban green development path of China's coal resource-based city

I have selected 3 representative coal resource based cities to analyze the green development from angle of different exploitation degrees.

- Fuxin City, Liaoning Province, is the earlier resource-exhausted cities in China, which is also one of the coal resource-based cities in recession in China.
- Shanxi Lu’an Mining Industry Group is located in Changzhi City, Shanxi Province and it is one of the five largest coal enterprise groups in Shanxi. It can be taken as the representative of coal resource-based city in the development of maturity.
- Yongcheng, Henan Province is the newly developed coal resource-based city. It is one of the six anthracite base. And it is biggest coal-chemistry base in Hanan Province.
Fuxin City, Liaoning Province

Fuxin Mining Bureau because of years of deposition and atrophy of the national coal resources are intertwined, resulting in the production and operation is very difficult, till 1999, the enterprise in a slump, and become one of the most difficult state-owned coal enterprises of Liaoning Province.

As the old industrial cities, the decline of the mine in Fuxin City, encountered many economic and social problems.
Fuxin City have explored and practiced in industrial structure transformation.

- In the 1980s, the Fuxin government find a new leading industry, building Materials. (But because the building materials industry is low technology production, no high technology content, the building materials industry did not develop into a leading industry in the later period.)

- In 1990s, the State Council, the provincial government, Fuxin City Council are all on the adjustment of industrial structure in Fuxin City and paid great attention, and also gave a lot of financial and policy support. (But a lot of policy has not been taken into a specific implementation.)
In 2001, Fuxin was to determine the pilot of the economic transformation of resource-exhausted cities in China. Fuxin City takes measures which mainly involved the following aspects in the green development process:

- the development of modern agriculture and the third industry;
- deep processing of the original coal industry;
- governance of the original mine environment;
- strengthen urban infrastructure construction;
- transform the old coal mines;
- relying on the University to train the adapted talents.
Changzhi City, Shanxi Province

- Shanxi Lu’an Mining Industry Group is located in Changzhi City, Shanxi Province and it is one of the five largest coal enterprise groups in Shanxi.
- It can be taken as the representative of coal resource-based city in the development of maturity.
Changzhi City takes "diversified development based on the coal" as the main tone. Be based on coal, Changzhi City has been formed coal, the power, the chemical five-degree products as extension of the recycling system.

In recent years, Changzhi City, began to try to construct non-coal emerging industries, industrial projects involving photovoltaic industry, optoelectronic industry, automobile manufacturing, fuel emulsification, polysilicon, environmentally friendly materials, modern service industry and other emerging industries.
Yongcheng, Henan Province is the newly developed coal resource-based city. It is one of the six anthracite base. And it is biggest coal-chemistry base in Hanan Provice.
According to local features of Yongcheng city, “Black & White economy” is proposed by developing the city.

- “Black economy” here is to build up Yongcheng city as an important coal resource production base, coal chemistry base and aluminum process base among west-middle of China.
- The “White Economy” means flour. Currently two integrated industrial chains have been formed already, one is to extend food processing from flour, the other one is to extend feed processing from flour.
Conclusions

- Now it is in searching and testing process to these coal resources-based cities during the green development, so although there has been certain success during the green development but it does not mean all measures and policies have been in matured period. On the other hand, each city is different so the three cities above could be taken as typical ones for different stage, but the experience of transition and process would not be suitable to other cities. So when searching and studying green development process to other cities, it should be depending on real situation.
Although these cities have been in the process of green development, there is still deviation between policy regulated by government with execution during the development; over focus on economic effectiveness, etc. Actually the green development of coal mining cities has been not only a economic issue but also concept and society issues. So the green development of coal mining cities would be paid more attention by all aspects of the society.
Thank you!