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# SWOT Analysis of the Fushun Resource-Exhausted City's Transformation

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## Abstract

It is a city that develops because of coal resources to Fushun, once was called "the Coal City". Nowadays, coal resources' mining has already approached dried up, and the original advantage industry becomes weak gradually. It also results in a lot of problems which are the soil erosion, environment break, the economic structure irrationality etc. According to SWOT analytical method, this text carries on analysis towards the Fushun resource-exhausted city's transformation, and combines concrete condition and problem. It puts forward the measure of rationalization, and provides some reference opinions for the development of Fushun.

**Key words:** The Fushun resource-exhausted city; Transformation; SWOT

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In March 2009, Fushun City, Liaoning Province, included in which the State Council announced the second batch of 32 resource-exhausted cities. All sectors of society pay the high concern and support to this problem. There are a lot of models of resource-exhausted cities' transformation, such as Germany's Ruhr, Sheffield, UK, Lorraine, France and Kyushu, Japan, well-known in abroad, and Fuxin in Liaoning Province, Jiaozuo in Henan Province, and Tangshan in Hebei Province and so on in the domestic (Li, 2009).

The cases of these city transformations gave us a lot of reference, but it didn't have a completely successful mode to all resource-exhausted cities' transformation in the world (Yu, 2010). The transformation of these cities solved to the some existing problems, and also obtained the progress. However, it doesn't work out the negative problem due to excessive mining of resources. Different region has different performance and specific problem towards this transformation. To solve the problem of resource's transformation, our government should consider a problem from the city itself.

## 1. THE PRESENT CONDITION OF THE FUSHUN RESOURCE-EXHAUSTED CITY'S TRANSFORMATION

Fushun city is called for the resource-exhausted city, which has positive effect to transformation. The nation supports to these cities and regions which are included in list, and makes the corresponding policy. The nation will raise the solution for social problems which includes substituted industry, environment damages, unreasonable economic structure, unemployment etc.. It takes effective measure to get rid of a series of dominant and invisible problems of resource-exhausted cities.

The strength of support are becoming increasingly for the region in all aspects from nation and Liaoning province to Fushun City. It contains that widening and greening the transport routes, building the ecosystem engineering-the moon island ecosystem park in city and the project of ecological restoration at Dongzhou area, the improvement of the municipal infrastructure facilities and supporting financial and tax preferential policies and so on. Therefore, those make clear the attention and support of the country for the transformation of the resource-based city.

After several years of effort, the transformation of Fushun City makes progress to enhance and improve the quality of the urban environment, to promote the employ-

ment of population, and to adjust economic structural etc. But we are now faced with the problem still existence, which need a high degree of attention and support.

Problems of subsidence have come up, because of previous over-exploitation of coal resources in Fushun City. Thus those threats to the housing and life safety should be solved firstly. The city government for the transformations of shantytown continues to expand. However, due to economic restrictions and the transformation of large scale, many shantytowns still did not improve.

Industrial structure of the Fushun City is not reasonable. The second industry accounts for a larger proportion while the first and third industries have a smaller proportion, especially the first industry. The agricultural production is seriously affected, because of over-exploitation of resources, decreasing cultivated land and the soil erosion. The third industry has improved, but the problems which are slowing the development of service industry, low level of healthcare, imperfect level of science and technology, small-scale development of financial and commercial are still existence.

## 2. SWOT ANALYSIS OF THE FUSHUN RESOURCE-EXHAUSTED CITY'S TRANSFORMATION

### 2.1 The Superiority of Fushun Resource-Exhausted City's Transformation

#### 2.1.1 Petrochemical City Gradually Replacing City of Coal Mining

Along with the attention of Fushun City to the resource-exhausted problem, proportion of substituted industry is improved steadily. The mid 80's in last century, Fushun has proposed that it based on the advantage of resources and technology, to go the road of deep processing and comprehensive utilization. Due to petrochemical and fine chemical industry quietly rise, Fushun City set up the Fushun Fine Chemical Industry Institute of Technology, jointing technological resources of Tianjin University, Nankai University, Beijing University of Chemical Technology, Liaoning University, Liaoning Shihua University, Dalian University of Technology, Chinese Academy of Sciences the technology transfer center of Beijing Branch, Zhongyou incorporated company branch in Fushun etc..

The construction of Fushun Fine Chemical Industry is continuous improvement, which has created powerful conditions to lay a foundation for Fushun City's transformation. It will attract investment, to promote employment, to drive Fushun rapidly economic development and to promote the construction of the same city of Shen-Fu. High-tech zone will build a eco-chemical industry park of the integration of upstream and downstream and resource allocation, basically about petroleum chemical industry, deep processing of products and fine chemical industry as the main body, about the raw materials, new materials and special chemicals as the characteristic.

As a landmark project of the rejuvenating old northeastern industrial base, the project of total investment of 23.5 billion Yuan, "ten millions ton oil refining, millions tons of ethylene" will be concerned with more. When the project has been finished, it will mark the new transformation of the Fushun city from the resource-based city to deep processing of products. The project is expected to put into production in October this year, to process crude oil of 11.5 million tons and the ethylene production of 1 million tons. Through the efforts of all parts for many years, Fushun's petrochemical gradually replace coal mining.

#### 2.1.2 Exploration and Exploitation of Alternative Resources

Fushun, in addition to abundant coal resources, has a lot of resources to be the exploration and exploitation, such as copper, zinc, oil shale, peat, niobium and tantalum etc., ranking the province first, the major minerals in Table 1. At present it has been found that the mineral 52 species, which account for 47.3% of the whole province, and has producing area more than 500, including 3 large mineral beds, 6 medium-sized mineral beds, and more than 80 the small scaled mineral beds. Now it has been exploited to reach 24 kinds of mineral, of which 18 kinds of dominant mineral resources. The whole city has already explored mineral in total 6.413 billion tons, reserves of 5.735 billion tons. The advantage mineral includes oil shale, mineral coal, copper, zinc, gold, iron, magnesium, cement and so on.

**Table 1**
**Detailed List of Main Minerals in Fushun City**

| Product name | Units of measurement | Reserve of resources |
|---|---|---|
| coal | billion tons | 0.744 |
| iron ore | billion tons | 0.1625 |
| copper ore | million tons | 0.254 |
| magnesite | million tons | 10.21 |
| oil shale | billion tons | 4.64 |
| coal bed methane | billion cubic meters | 6.6 |
| Gold ore | tons | 11.23 |
| peat | million tons | 1.867 |
| cement rock | billion tons | 0.17642 |
| zinc | billion tons | 359 |

Through technological exploration, oil shale, 3.5 billion tons, can be exploited more than 50 years. CBM geological reserves of 8.9 billion cubic meters can be exploited 30 years. To some extent, these resources alleviate the resource-exhausted pressure of the Fushun City. At the same time, the workers of exploitation whose skills provide technical support for other exploitation of resources, and also work out the problem of unemployment.

#### 2.1.3 The Advantage of Industrial Development Environment

From the perspective of industrial development environment, old northeast industrial base provides its own advan-

tages for the transformation of Fushun City. The perfect infrastructure, convenience transportation, the Shen-Fu city promote the development of the Fushun City. Relying on the development strategy of the Shen-Fu city, and giving full play to its own location advantages and comparative advantage, it drives the economic and social development of the Fushun City by leaps and bounds. There are highly complementary advantage between Shenyang City and Fushun City. The advanced manufacturing industry in Shenyang City can bring great opportunity to Fushun city. The petroleum, ethylene and other petrochemical products can also provide energy and raw materials for the development of Shenyang chemical industry.

#### 2.1.4 Tourism Resource

Fushun City not only has an abundant mineral resources, but also owns 12 scenic spots of above AA level, including 5 scenic areas of 4A level, 6 forest parks of the provincial level, 5 national forest parks--Three Stone National Forest Park, Houshi National Forest Park, Red River Valley National Forest Park, Yuanshuai the National Forest Park, Hemu National Forest Park. Fushun has four big tourism gathering areas, including entertainment of Shen-Fu New City, ecological tourism, leisure culture tourism, agricultural tourism. The Royal Polar Ocean World and the Red River Canyon Rafting have become all the major projects and products of landmark, with more than 19.914 million the domestic and foreign tourists, and total tourist income 18.14 billion Yuan.

### 2.2 The Weaknesses of Fushun Resource-Exhausted City's Transformation

#### 2.2.1 The Nature of Non-Renewable Resources

Non-renewable resources mean that they have been developed and utilized by human being once, it is impossible to renewable natural resources for quite a long time. Main refers to a variety of minerals, rocks and fossil fuels, such as peat, coal, petroleum, natural gas, metal ores, non-metallic mineral etc.. The coal mining has made great contribution for the country in the last century. However, because of the nature of non-renewable resources, Fushun City will be faced with the problem of dried up resources. For these exploitation and utilization of resources, it isn't likely to keep its yield of balance or renew.

#### 2.2.2 The Problems of Soil Erosion, Environmental Pollution and Ecological Damage After the Development

Fushun City has abundant resources, but, due to the limitations of pre-technical level and the irrational exploitation of resources, resulting in resource-based city facing a series of natural problems, which are soil erosion, desertification, degradation of grassland, falling water tables, ecological destruction and environmental pollution.

Fushun City is located in mountain area in the east of Liaoning province, its soil layer about 0.3 m to 0.6 m, topographic slope craggedness, previously over-exploitation of coal resources, and a weak awareness of the ecological system, made soil run off speed quickly. The sand and dust weather often appear a wide range in the spring and autumn, there are a lot of suspended dust and blowing sand, air pollution is more serious in the downtown.

#### 2.2.3 The Problem of Development of Resources Deep-Processing Industry

In Fushun City's transformation, it insists on the idea of development from the resources type to the deep-processing urban. The petrochemical industry play a certain role in economic development, but for promoting economic growth and its value is not appropriate. Deep-processing industry mainly concentrated in upstream industry, while the development of downstream industry is comparatively backward and scattered. Fushun adhere to the "Industrial building the city", but it has some of shortcomings, namely short industry chain, the high consumption of resources, the low added value and structure efficiency, the few technological content of products, so these still need us further research.

#### 2.2.4 The Development of Small and Medium-Sized Enterprise is Quick, But the Scale Still is Small

According to statistics, the small and medium-sized enterprise has become main force in China's scientific and technological progress, which has provided the whole country about 65% invention patents, 75% of the innovation of enterprise and more than 80% of new product development. It also played an irreplaceable role in the aspects of increasing the fiscal revenue, extending employment, optimizing the economic structure. The development of small and medium-sized enterprise is quick in the Fushun City. But it did not play a significant role in the aspects of the scale effect and the guidance of the economy and promoting employment.

### 2.3 The Opportunities of Fushun Resource-Exhausted City's Transformation

#### 2.3.1 Deepening Products Processing and Extending the Industrial Chain

Fushun will make a development strategy based on its energy characteristics and economic structure, focusing on the extension of industry chain, improvement of deep processing and added value of products, use of existing resources and industry. Take advantage of this development strategy, it will strongly promote the strategic transformation and economic development.

#### 2.3.2 Make Use of the Governmental Investment Projects to Pull the Development of Local Enterprise

The cooperation of product meeting is held by the Fushun Municipal Government. The Construction Committee, Department of Transportation and other departments have signed procurement contracts of materials totaling more than 3000 million, which opened the prelude to the matching work of local products. The projects of investment of local government not only arouse the enthusiasm of local enterprise but also solve the currently economic downturn, unemployment, livelihood issues.

#### 2.3.3 Carry Out the Carving-Out Projects, Promoting Employment

It puts forward "ten greatest people's livelihood engineering" in "Acting Outline for Improvement People's Livelihood in Fushun City three years", which encourage carving-out projects to promote employment. "Employment is vital to people's livelihood. carving-out is outline of employment". In order to accelerate carving-out business and to create jobs, Governmental implement carving-out projects to promote economic development and solve the problems of the economic recession and unemployment due to exhausted resource.

### 2.4 The Threaten of Fushun Resource-exhausted City's Transformation

#### 2.4.1 The More Problems Leaved Behind in Process of Transformation of Resource-Exhausted City

Resource-based cities have long been dependent on natural resources, so urban transformation may encounter many obstacles. For long time, the historical problems of the exploitation of natural resources has not been properly resolved, and accumulated a lot of social problems. What's worse, the center of city formed a kind of structure - "city on the coal, the coal under the city", which gradually endanger city security. At the same time, the transformation is a long-term problem, and the nation gives strong support to solve the resource-exhausted problems. This requires a clear division at all levels of government, clear rights and responsibilities, power of the implementation and monitoring, in order to realize the sustainable development of the city.

#### 2.4.2 The Financial Bottlenecks of Resource-Exhausted City's Transformation

The Government gives strong support for the transformation of resource-exhausted cities, but for this huge problem, it can not be solved only through providing present funds. The financial bottleneck is common problems of the economic development, which is a new challenge to the Fushun City also. Fushun City depends heavily on plenty of money as a backing to city's transformation.

## 3. THE MEASURE OF FUSHUN RESOURCE-EXHAUSTED CITY'S TRANSFORMATION

This text mainly analyzes the resource-exhausted city's transformation, according to the SWOT method, and to see Table 2. Combine the concrete circumstance of the Fushun City, so it puts forward some measures to promote the progress of Fushun city's transforms as the following.

**Table 2**
**SWOT Analysis Matrix of Fushun Resource-Exhausted City's Transformation**

| External \ Interior | Superiority (S)<br>1. Petrochemical city gradually replacing city of coal mining<br>2. Exploration and exploitation of alternative resources<br>3. The advantage of industrial development environment<br>4. Tourism resource | Weaknesses (W)<br>1. The nature of non-renewable resources<br>2. The problems of soil erosion, environmental pollution and ecological damage after the development<br>3. The problem of development of resources deep-processing industry<br>4. The development of small and medium-sized enterprise is quick, but the scale still is small |
|---|---|---|
| Opportunities(O)<br>1. Deepening products processing and extending the industrial chain<br>2. Make use of the governmental investment projects to pull the development of local enterprise<br>3. Carry out the carving-out projects, promoting employment | SO Strategy<br>1. To drive the third industry, the government encourages the rapid development of tourism.<br>2. Develop circulating economy<br>3. The further development of the fine chemical and petrochemical industry | WO Strategy<br>1. It focuses on the development of small and medium-sized enterprises and private enterprises.<br>2. It continues to deepen the processing of product. |
| Threat(T)<br>1. More problems leaved behind in process of the transformation of resource-exhausted city<br>2. The financial bottlenecks of resource-exhausted city's transformation | ST Strategy<br>1. Make good use of the capital and policy support of city government for the transformation<br>2. Attract foreign investment | WT Strategy<br>1. It protects the construction of ecological environment, paid attention to repair work of environmental and ecological damage<br>2. Accelerate the phase-out of industry of high pollution, low productivity and ecological damage |

### 3.1 The Strategy of Economic Restructuring in Resource-Based Urban

To drive the third industry, the government encourages the rapid development of tourism. This is mainly because the Fushun City is not only has the advantageous natural landscape and rich ethnic customs, but also has world cultural heritage and history cultural landscape. In the process of transition, it fully develops these tourism resources. Base on the unique characteristic of the Manchu style, the source of the culture of the Qing Dynasty, natural ecosystem landscape, it devotes major efforts to develop the tour industry of Fushun.

It focuses on the development of small and medium-sized enterprises and private enterprises. The industrial structure - "Oligarch-dominated, large, medium and small symbiosis" - is becoming a reasonable state of organization of the resource-based industries (Kong & LI, 2012). Fushun, while strongly supports the development of large

enterprises, should be to promote the development of small and medium-sized enterprises and private enterprises.

It continues to deepen the processing of product. Fushun City develops own industrial production chain, making use of each other complementary advantages of the Shen-Fu City, relying on the Shenyang advanced manufacturing level of science and technology.

### 3.2 The Ecological Strategy of Resource-Based Urban

In recent years, different sectors of the society give strong concern and support to protection of the ecological environment and take appropriate measures. however, problems of natural environment cannot be resolved overnight. It is no wonder that this wants to manage in a long time.

Pay more attention to the renovating of ecological environment, and implement sustainable development policies. Fushun Industrial Zone, which is built for picturesque scenery, the fresh air and great views, residential areas and industrial areas in the green plant communities, will be built as the area of eco-city construction.

In the aspect of environmental planning, project approval and pollutant emissions, it should strictly enforce the system in order to ensure that environmental quality improved gradually. The supervision and examination work of supervision agency will be increased. The government should accelerate the phase-out of industry of high pollution, low productivity and ecological damage, and constantly promote the upgrading of the industrial structure, and develop circulating economy, increasing the level of recycling and utilization of waste (DU, 2012).

### 3.3 The Strategy of Policy Support of Resource-Based City's Transformation

In the early stage of urban transformation, the Government provided special preferential policies to drive by rapid economic recovery and development. It develops and introduces appropriate investment policies, simplifying approval procedures, in order to attract foreign investment. With good environment of social public order, it promotes ascent of social economy and people's living level. It establishes a society based on the rule, service-oriented and clean and efficient government, and improving the administrative capacities of the government (Wang & Guo, 2012).

It strongly develops perfect infrastructure construction, especially in the programming of urban transportation systems, public activities space and planning and design of mixed land use of center in city, which is improvement of the capacity of urban roads, perfection of the city infrastructure construction and reinforce of culture, education, medical treatment, commerce and residential construction. So it provides a favorable investment environment to attract foreign investment, which solves the problem of funds shortage in Fushun city transformation.

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