

Review Article

Exploring the Construction of Long-Term Mechanism for Sustainable Development of Resource-Based Cities in the Mature Period

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Abstract - Given the objective reality of the resource-based cities in the mature period urgently need to develop alternative industries to achieve the sustainable development of the city, with the ISO3710 international standards of index system of sustainable development and national plans for the sustainable development of resource-based cities, by summarizing, reasoning and comparative analysis methods, expound the connotation of the long-term mechanism for sustainable development of resource-based cities, analyze the status quo and problems of the establishment of a long-term mechanism for sustainable development of resource-based cities, explore to set up the system of a long-term mechanism for sustainable development of resource-based cities and have a brief evaluation of advancement and feasibility.

Keywords - Resource-based cities; Sustainable development; long-term mechanism.

I. INTRODUCTION

Internationally and domestically, the sustainable development of resource-based cities is a long-standing problem, because it is on the premise of effective transition of cities. While the urban transformation involves multiple fields, including urban economy and social employment and people's livelihood, ecological environment, and infrastructure, and it takes a long process for more than ten years or even decades to completely get rid of dependence on resources, even develop resource substitution industry. For each resource-based city that enters the mature period, it is imminent to develop a resource substitution industry to achieve economic transformation. The resource-based cities in China generally have contradictions that are increasingly prominent in structural, functional, and ecological aspects and deep-seated contradictions that are historically accumulated, such as resources shortage and the heavy task of restoration of ecological environment, great pressure from safe production, and the contradiction of employment^[1]. To solve these issues, it is necessary to establish a long-term mechanism to protect the sustainable development of resource-based cities for guarantee.

II. PROBLEMS WITH THE LONG-TERM MECHANISM FOR SUSTAINABLE DEVELOPMENT OF DAQING CITY

A. The implication of long-term mechanism for sustainable development of resource-based cities

The meaning of long-term mechanism can be understood from two key words "long term" and "mechanism". In general, "long-term" means being effective for the long term or continuing to play a positive effect in a long period of time. "Mechanism" is the supporting system to enable the system to operate normally and play the desired function^[2]. It has two basic conditions: firstly, it is to be of the standardized, stable, and complete system; secondly, it is to be of "source" to promote the normal operation of the system, that is, it is to be of organization and individuals to actively promote and supervise the operation of the system for their own interests. There is a link and difference between the mechanism and the system. Mechanism is not equivalent to the system, and the system is only the external manifestation of the mechanism. Long-term mechanism is the system that can guarantee that the system can normally operate and play the expected function for the long term. The long-term mechanism is not, once and for all, immutable, and it must constantly get enriched, developed, and improved with the change of time and conditions.

Based on the above analysis, the long-term mechanism for sustainable development is the security system that promotes the planning, policy for sustainable development of resource-based cities to effectively operate and play the expected function for the long term. The sustainable development of resource-based cities should be combined with the elements of urban development and development construction in society, economy, resources, and environment, and other aspects. It is objectively necessary to establish systematic development planning and policy system to guarantee the operation of construction tasks, and the maintenance system that can guarantee it can be healthily and smoothly and effectively implemented is the



long-term mechanism for sustainable development of resource-based cities.

B. Current situation and problems of a long-term mechanism for sustainable development of resource-based cities

a) Classification of resource-based cities is lack of objectivity

Classification of resource-based cities should be determined according to the stage of recoverable reserves of the resources distributed in the life cycle. The recoverable reserves of urban mineral resources are the results through dynamic measurement and accurate calculation by the geological departments, and should become the national scientific basis for the classification of resource-based cities. But the National Development and Reform Commission does not often adopt the actual results on the basis of the local geological survey considering the national energy strategy or development strategy for the central enterprises or concerns about the pressure on transfer payments of the central finance. For example, in Daqing, where the "oil pumping" completely relies on water injection and polymer addition and it needs to be mined for more than three times, the comprehensive water content in the main oil field is up to 94.64%, and the cost per tone is from the original cost of a few dozen yuan to currently several hundred yuan, through a geological survey by the oilfield institute, the recoverable reserves of sandstone crude oil are only 197 million T, and the total reserves are only 300 million T^[4], the recovery degree of the recoverable reserves has reached 92.31%, low permeability, ultra-low permeability of newly proven reserves accounts for more than 80%, and it is difficult to maintain the sustainable production of the oilfield. It is projected according to the currently specified yield (the specified production yield was 36.5 million T in 2016, and then it will decline by 1.5 million tons per year), all the sandstone oil fields in Daqing oilfield will be closed in less than 10 years. In early 2005, Daqing declared the resource exhausted city, and has been recognized as the resource exhausted city, but Daqing is not included in the two batches of resource exhausted city confirmed through joint assessment by the NDRC and the Ministry of Land and Resources and the Ministry of Finance, and Daqing has always been listed as a mature resource-based city^[3]. This practice that is significantly political, lacks objective evidence, and is contrary to economic cost-effectiveness is bound to hinder Heilongjiang and Daqing from formulating development planning of continuous substitution industry and implementation of sustainable urban development. Affected by this, although Daqing put forward the economic transformation at an earlier time, it shouts "one-hundred-year oil field" every year, the development of continuous substitution industry is long on form and short on content, and it emphasizes call more than action. Faced with the future of the city, there is no sustainable development plan yet, not to mention the construction of a long-term mechanism.

b) Backward adjustment mechanism of economic structure

Most of the resource-based cities ignore the attention to the non-mine industry due to "half" of the value brought by the exploitation of mineral resources and mining industry service and inertia on taxes. Therefore, the adjustment mechanism for the economic structure and industrial structure is typically deficient. Even if they propose aspirations and demands for development of the local economy and the development of non-public economy and emerging economy, they rarely carry out policy actions, complacent that so few decent-scale enterprises or several supported listed companies can show the business "card" of an urban economy. There is neither specific target planning and implementation plan nor rules and regulations for implementation and accountability for the goal of the three industries in the industrial structure in each planning period, how the agricultural management system reforms and innovates, what new leading industry in the manufacturing industry needs to be developed, how the new industry of trade service to develop, how to construct the model of industrial chain agglomeration production of an urban economic system. From the economic type, the lack of state-owned and private coordinated development and mechanism to encourage the development of private economy cause mineral enterprises to significantly suppress the development of small and micro enterprises, and entrepreneurial innovation becomes empty.

c) Weakening of the policy of system reform of state-owned enterprises

The nationalization of mineral resources has determined that mining area enterprises in the resource-based cities are mostly built and developed by the national investment. State-owned enterprises rely on the huge assets and mining rights formed by the national financial investment to monopolize and dominate the market for energy and minerals, and constitute the leading strength of the local economy. Although the mining facilities and equipment are aging, with the administrative control transformed macroeconomic regulation and control, national finance also takes the opportunity to escape. The enterprises dominate state-owned facilities that can still maintain the operation to engage in mining operations and turn over profits and taxes to the State. The relationship between the State and enterprises has become almost pure distribution of interests, but they have to update the aging facilities on their own, the historical burden is very heavy, and safety accidents occur one after another. The continuous expansion of urban construction and construction of optimization and beautification of the community cost most of the financial resources of the government. They do not have enough stamina to rely on the only state-owned land resources to attract investment and build the new industrial economy. There is not power sufficient industrial policy and tax policy guidance for the development of the private economy. Combined with the labor social security burden of the labor force, the state-owned enterprises meet many difficulties in the management system reform.

d) The balanced development mechanism for regional economy is not complete

In the life cycle of development of resource-based cities, within the decades from entry into the growth stage to the mature stage, economic development in mining area has always occupied the absolute advantage, but there are also differences between the rich mines and lean mines; but the city (town) is in a relatively inferior position. In the face of serious imbalance between regional economic development, although the government is strengthening the construction of the new economic zone, actively using natural and economic resources to develop new industries, finally, it cannot achieve balanced development due to allocation of resources, geographical location, transportation facilities, logistics environment, and other factors. The reason is that the State not only predatorily exploits mineral resources, but also predatorily grabs the profits created by mining cities, does not allow the local authority to establish a provident fund system for sustainable development of resource-based cities from mining income, during the period of resources depletion, the reserve extracted for sustainable development is not enough to help the city, it cannot support the development of the poor district, and the State has never included local economic and social development of resource-based cities into the payment target of financial transfer. Thus, it is an objective necessity that the local government hands over the State the profit and tax created by the mining city during the boom period, backward urban economy has never been unable to recover, regional economic development is unbalanced.

e) The special status of mineral enterprises restricts the long-term mechanism for the sustainable development of cities

Mining enterprises compete against the local government by virtue of the special status of the central enterprises and higher administrative levels. Local government not only has no right to obtain the benefits of sustainable urban development, but also provides services for them. From the perspective of local finance, the province where the mining city is located lacks awareness of future demand for sustainable development of resource-based cities, often turns it into "fat" to support budget, keeps an eye on the grip of tax of mining city, resulting in the fact that the collected resource tax and the shared value-added tax are turned over to the provincial finance strictly according to the higher proportion than that of the non-mining city, the retained share by the mining city is limited, and the arrangement for the production budget is weak. In short, the allocation right of the national budget, tax policy, system pattern of integration of government and enterprises, and the fact that the province of mining area lacks vision and seeks quick success and instant benefits seriously hinder the sustainable development of resource-based cities from the construction of long-term mechanism.

f) Supervision mechanism for tax policy is missing

The majority of domestic local government leaders intervene in the completion of budget targets of tax revenue and fail to grasp information about the

implementation of fiscal policy, which causes the tax authorities to actively collect tax and negatively implement preferential policies of fiscal and tax, pay more attention to finance than the economy and the thought of "finance security" has been raging, it has become popular to collect "overhead tax" and assign tax collection index to tax inspection authority, that is, "tax replaced by inspection". It must be borne in mind that the world can be momentarily steady if there is something wrong with finance, but the world will get into turmoil if the economy declines, and the revenue is a booster for the economic development, but economic development shall never be regarded as a stepping stone for revenue. As the main force of resource substitution industry, the development of private enterprises come to a standstill, even capital outflows, they shut off after registration because they lack fiscal policy support or the related tax policies become a mere formality. Such as, according to the plan approved by the State Council, all manufacturing enterprises in Daqing city would enjoy the VAT policy after 2005, but Daqing has not implemented it; it required Daqing to implement the provisions of Z F No. [2003]11 document to exempt the historical tax for central enterprises, local enterprises of the whole city, but Daqing has not implemented it; refer to the western development policy (G F [2000] No. 33) to collect new income tax at a reduced rate of 15% on the new enterprises in Daqing City before 2020, or refer to regulations of the western region policy (C S Z [1994] No. 001) to exempt the new income tax on the new enterprises within 3 years, Daqing still has not implemented it. According to the survey, the above problems are widespread in the majority of resource-based cities, because the government lacks the supervision system necessary to implement fiscal policies and objectively tolerates policy authority.^[3]

II. CONSTRUCTION OF THE LONG-TERM MECHANISM OF SUSTAINABLE DEVELOPMENT OF DAQING CITY

A, Key points of construction of long-term mechanism for sustainable development of resource-based cities

Mineral resources development is related to the national energy strategy. The sustainable development of resource-based cities involves the national reputation and new economic construction, environment, resources, society, and other aspects. Therefore, the key points of construction of the long-term mechanism should start from the State, through the provinces, and end in the resource-based cities.

a) Perfect legal system guarantee system

The national laws and regulations should be established for sustainable development of resource-based cities, the relevant provinces shall develop corresponding local regulations, and the resource-based cities should strictly carry them out, develop supporting laws and regulations system to promote balanced economic development between urban and rural areas and non-mining economic development; build the integrated

development mechanism of equal land rights between urban and rural areas, promote homestead, rural collective construction land to enter market, establish a unified and effective land market in urban and rural areas, protection mechanism of the inviolable residential property, prevent the local government from taking the pretext of urban reconstruction to wantonly violate residents property; based on the full completion of "replacing business tax with value-added tax(VAT)", further promote the reform of replacing value-added tax with consumption tax, eliminate the economic motives of local government to blindly attract investment; establish public service mechanism of urban local government, the lifelong responsibility system of the administrative heads shall be implemented for the infrastructure investment project; establish the most stringent, impassable, effective system of ecological environmental protection, the system implement the off-office auditing of resources and environment for leading cadres and establish lifelong accountability system of damage liability.

b) Supporting sustainable development planning system

The State has established the *Sustainable Development Plan of the National Resource-based Cities* (released, G F [2013] No.45), clarified the response stage of the life cycle of national resource-based cities, and established the guiding index of economic, social, environmental and resources required for the sustainable development; the corresponding provinces need to develop resource limitation of the provincial resource-based cities (towns) and development planning of the related areas and fields, set the goals and tasks of the construction to achieve in every planning period; resource-based cities (towns) should be combined with the plans on the national and provincial levels to develop and implement the "planning for sustainable development of one-hundred-year city", and construct the goal, task and content around the long-term planning, decompose and develop five-year development planning and related policies and regulations to promote the development of continuous substitution industry, society, environment and infrastructure construction.

Focus on the development needs for urban transformation, give priority to develop development plan for oil continuous substitution industries, utilize mineral resources to develop deep processing and fine processing of minerals in a centralized way, extend the industrial chain and strengthen the research and development of core technology; draw lessons from the mode of agricultural production to develop and implement planning of demonstration area including modern agriculture, organic agriculture, green agriculture, special agriculture, high and stable yield crops in the county; establish and implement the long-term plan of infrastructure upgrading in the mining area, with the help of "The Belt and Road" and China, Russia and Mongolia trade development plan to build environmentally friendly and low carbon development policy system of industry promotion park, establish and develop industry promotion mechanism

including modern services, processing of agricultural products, import and export processing and trade that is of high technical content, strong ability to absorb employment and broad market prospects, and ask the government to deploy the management and control measures the "head" of the specialized agency shall be responsible for. Strive to complete the transformation of the mode of production of resource-based cities within 30-50 years, when the exploitation of mineral resources is on the brink of recession, realize the situation of urban development of production continuity of the associated and secondary resources and the "replacement" of resources economy by the economic combination of traditional industries and emerging industries; realize the construction of humanities and social and ecological environment, infrastructure in the mining areas in "urban and rural copula", constantly promote and drive urban culture, social security, community management, and other livelihood projects, strengthen environmental management and maintenance and repair of ecological environment, establish the low-carbon economic system and plan and establish low-carbon economic development zone [5].

B. Long-term mechanism system architecture of sustainable development of Daqing City

Resource-based cities should follow the guidance documents of sustainable development of the international and domestic-related resource-based cities, and gradually establish and improve the long-term mechanism for urban transformation and sustainable development.

a) International standard

ISO 37120 International Standards for Sustainable Development Index System of Resource-based Cities released by the United Nations has the authoritative guidance value for countries in the world to evaluate the sustainable development level of the resource-based cities, and can become the objective basis for the resource-based cities to establish and improve the long-term mechanism for sustainable development. In accordance with the provisions, the resource-based cities should carry out an evaluation of sustainable development of resource-based cities around economy, society, environment, and infrastructure. Therefore, the long-term mechanism for sustainable development of the resource-based cities also includes economic development (economic transformation and transformation of economic growth mode) mechanism, mechanism of social service (government services and quality of life), the mechanism of environmental protection, and infrastructure construction mechanism.

b) National legal system

At present, the State has not yet established the laws and regulations on sustainable development of resource-based cities, but it does not mean that there is no legal system. *Planning for the Sustainable Development of the Resource-based cities (2013-2020)* approved by the State Council has the legal effect, it is an important program for the State to lead the transformation of national mature

resource-based cities and regeneration of exhausted resource-based cities, and also the legal basis the successful transformation of resource-based cities and sustainable development shall comply with and implement. A clear plan to establish a long-term mechanism for the transformation of the resource-based city and sustainable development includes the establishment of order constraint mechanism of resource development, price formation mechanism, resource development compensation mechanism, benefit distribution sharing mechanism and support mechanism of continuous substitution industries, and ensure the realization of the sustainable development of resource-based cities of the whole country. The establishment of these mechanisms includes both the task on the national level and the deployment of work in the resource-based cities. Therefore, it has become an important legal basis for the long-term mechanism framework of the sustainable development of resource-based cities in Daqing.

According to the plan, firstly, it is necessary to strengthen the development order constraint mechanism to guide the resource-based cities to be aware of "confusion" of strong resource development, be consciously aware of the underlying risk of resource depletion, actively research and formulate the coordination evaluation method for resource development and sustainable urban development, and strengthen early warning and regulation of sustainable development; secondly, constantly improve the price formation mechanism. Work with the State to promote the reform of resource tax, constantly improve fee collection of use of the mining right and distribution policy, adjust national oil reserve and the strategy of opening up, improve the pricing mechanism for resource products, and calmly respond to price changes of international oil and other mineral products; thirdly, establish and implement the compensation mechanism of resource development, require the State and mineral enterprises to compensate for the atmospheric environment, geological structure, soil erosion and pollution caused by the development of local mineral resources, and maintain environment for the sustainable development; fourthly, explore and establish benefit-sharing mechanism of resource-based enterprises, the mining enterprise cannot turn over all the profits and tax of mining to the State and ignore the urban life, through the extraction of reserve for the sustainable development, mining enterprises give portion of the economic added value to local government, and establish and improve the management system of use; finally, research and establish the support mechanism of continuous substitution industries. Establish and improve the continuous substitution industries of resource-based cities, focus on the development of agglomeration industries and labor-intensive industries, solve the re-employment problem of mining workers, so that the city can still be recycled and sustainably develop after it is separated from mineral resources.

c) Provincial planning

Provincial planning refers to the plan for sustainable development formulated by the governments from provinces, autonomous regions, and municipalities directly under the municipal government and separately planned cities for the resource-based cities in a united way. In accordance with international standards and national laws and regulations, the provincial government under the jurisdiction of mining areas needs to study and construct planning for the sustainable development of mineral resources type cities. In accordance with international practice, the most important part in the sustainable development of resource-based cities is industry support mechanism and compensation mechanism for resource development; at the same time, combined with the right of development restraint and right of pricing of mineral resources in our country especially oil and natural gas, the actual situation shall be controlled by the central government. Therefore, the long-term mechanism on the provincial level should be in line with the guiding ideology that complies with but is not limited to international rules and national planning, reflect the objective, superior, practical, and operational, promotes the policy system of the sustainable development of resource-based cities, implement the long-term mechanism system including the support mechanism for resource substitution industry, compensation mechanism of resources development, optimization mechanism of social development, reserve system of sustainable development and mechanism for infrastructure construction, at the same time, combine with the special situation of domestic and international development of low carbon economy and construction of environmental society in recent years, it is necessary to add a special environmental protection mechanism.

d) Policy level of resource-based cities

The long-term mechanism formulated by the national and provincial governments is a direct basis for cities (towns) and counties where the mineral is located to develop and implement the long-term mechanism for sustainable development, and strongly protect the policy system separately established and implemented in the transformation of the resource-based cities. On the other hand, the policy system that needs to be established and improved in the transformation of resource-based cities is specifically detailed in the long-term mechanism of the "provincial planning", and it is the powerful guarantee for development and implementation. Among them, the support mechanism for continuous substitution industry governs the development policy of non-public economy, support policy for development of emerging industries, policy support of small and medium-sized enterprises and high-tech industrial policy of park agglomeration; optimization mechanism for social development governs the industrial registration system for laid-off miners, policy to prevent outflow of senior talent, community beautification and service system, employment and social security system; compensation mechanism for resource development includes the compensation system of the natural environment pollution, development and

compensation system of wind and water resources, sharing mechanism of government and enterprise interests, wetland protection mechanism; environmental protection mechanism is responsible for the recycling system for explored and produced mineral, air pollution and noise control, mine (pit) sewage treatment system and land and water resources protection system and other protection; infrastructure construction mechanism specifies the maintenance transformation system for facilities in the mining area, utilization system of abandoned wells and

mine facilities and takeover and maintenance system of roads in mining area; reserve system of sustainable development maintain payment management of oil and gas enterprises and regulations of special financial management.

According to this, the long-term mechanism system framework for sustainable development of the resource-based cities is shown in figure 1.

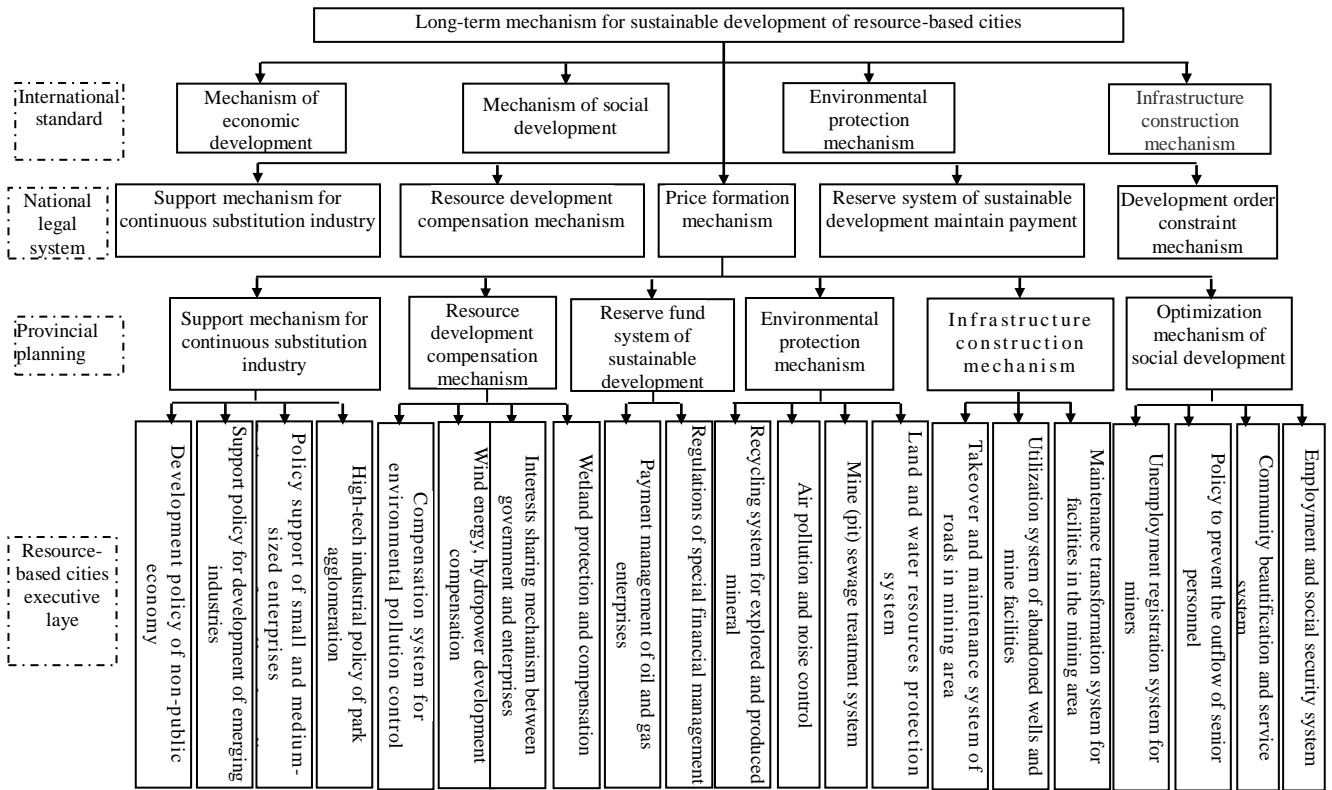


Fig. 1 Long Term Mechanism System Of Sustainable Development Of Resource Type City

In summary, the long-term mechanism system framework for sustainable development of the resource-based cities is a vertically and horizontally distributed system. Vertically, it is based on international standards, the national legal system as the guide, provincial government planning as the pointer, and establishes the policy protection mechanism for sustainable development that shall be specifically implemented in the resource-based cities; horizontally, resource-based cities needs to be based on their own functions and powers, combined with the international and domestic relevant standards and regulations, plans 21 specific policies in a detailed way to promote sustainable development, and instructs the relevant government departments and enterprises to implement them.

C. Evaluation on a long-term mechanism for sustainable development of resource-based cities

It is necessary to refer to the ISO 37120 international evaluation standards and national planning regulations to study and formulate the long-term mechanism system for sustainable development of resource-based cities, to ensure

that it is both in line with international standards and in accordance with the will of the State and it is practical.

a) Sound long-term mechanism system

The long-term mechanism system for sustainable development of resource-based cities generally includes the international standard level, national planning level, and resource-based cities, covering the long-term mechanism in the fields including economy, society, resources, environment, infrastructure, and mining resources development compensation, and can realize full coverage of policy system in the development of continuous substitution industries, optimization of social development, compensation for resource exploitation, environmental protection, infrastructure construction and reserve of sustainable development in the sustainable development of resource-based cities [5]. The reason why the "reserve system of sustainable development" is established is mainly based on the construction of interest sharing mechanism. The resource-based cities devotes mineral added value to the State, when the resources are exhausted and endanger the survival and development of

urban life, it is necessary to work together to apply to the State to appropriately give profit to the local, mineral central enterprises and associated local leadership should abandon the idea of power, be aware of the necessity that the mining area will rely on the development of the city in the future, calm think of the profound meaning of "city used to rely on mining, and mining will rely on city in the future", consciously abide by the municipal government to establish the fund for sustainable development of city or reserve system for sustainable development of resource-based enterprises according to the national call, urge the mineral enterprises to pay according to a certain percentage of its main business income, so that the government allocates the money for resources development compensation, environmental repair and protection and the development of continuous substitution industries, and truly realize profit sharing of government and enterprise in the resource-based cities.

b) Vertical and horizontal complementary

The system construction of the long-term mechanism, give full consideration to the international is quasi cohesion and between the national legal system and planning, considering the mining area and urban (town) and the policy of balanced development between urban and rural areas, considering the coordination between the management system of central enterprises, enterprises, and private enterprises, considering the overall development of the three industry policy system, especially to consider six long-term mechanisms of resource type city supporting layer. Is the continuity is connected with each other, such as the long-term mechanism of infrastructure construction is not only related to the protection system running and upgrading urban infrastructure construction and mining infrastructure transformation, but also the development of emerging industries and modern service industry and other industries such as landscaping, supporting the optimization of community social service mechanism, to ensure the economic and social development planning system planning, coordination, steady and orderly operation.

c) Structure is concise and practical

The long-term mechanism constructed in the project not only conforms to the international evaluation standard but also is in concert with the national plan. The vertical structure is concise, and the command relationship is clear; the horizontal implementation target of the resource-based cities is specific, which is convenient for the implementation by the division of labor. With the development of the resource-based cities in recent years, It coincides with the development of continuous substitution industries in the resource-based cities to achieve the transformation of the model of economic growth and the construction of better homes and other related decision-making activities and construction operations and thus is more operational.

III. CONCLUSION

In short, for the resource-based cities accounting for 1/4 of the total number of cities, its sustainable development is related to the leadership of the Party and national stability for a long period and the overall situation

of sustainable development of the whole society ^[6], the ultimate goal of the establishment of a long-term mechanism for sustainable development of resource-based cities is to break the myth of "one-hundred-year mining enterprises" and strive to build the "one-hundred-year city". Therefore, the resource-based cities have to vigorously develop non-public economy, be "serious" in policy incentives and protection level, and actively cultivate the entrepreneurial base in the mining area, focus on supporting small and micro businesses and the labor-intensive industry with strong employment ability and good market prospects, provide a broad employment platform for difficult miner group; pay attention to social and environmental construction, the government should first take practical action to impel society, dare to admit the mistakes and review negligence, inspire people to transfer positive energy, focus on urban residents' rights to life, development and freedom, ensure the measures to benefit the people shall be implemented, promote the urban function, strive to create high-quality living environment, maintain advanced talents in technology, management and scientific research; while ensuring the national strategic task, improve the average environmental quality including air quality and solid waste and rubbish etc. ^[7]; strengthen construction of the urban water, electricity, gas, heat and other public utilities and infrastructure, make efforts to upgrade the infrastructure in the mining area, do not stay dead in the distance, build the urban infrastructure into "exemption project" for 50 years, and lay the foundation for economic transformation and urban sustainable development.

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