IMPROVE THE UTILIZATION OF SALT-LAKE RESOURCE WITH THE PRINCIPLE OF RECYCLE ECONOMY

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Abstract: In this paper, the investigation, development and utilization of lake salt resource have been analyzed with the principle of recycle economy. The several proposals or methods for the sustainable development of lake salt companies were advanced.

Key Words: Lake salt; Recycle Economy; Resource comprehensive utilization

1. THE RECYCLE ECONOMY IN THE SALT-LAKE

To develop the recycle economy, we shall be guided by Scientific Outlook on Development, centralize with the optimization of resource utilization methods, and be drived by technical innovation and institution innovation. We shall faster the economic structure adjustment, change the economic growth pattern, and follow the path of new industrialization. We shall strenghten the legal construction, perfect policies and measures, and establish mechanisms of government promoting, market driving and public participating step by step, to form the development model of recycle economy with the regional and industrial characteristics, and to fasten on the building of resource-economical society. The basic methods to develop recycle economy are as below:

I. push forward energy saving and loss reducing strongly, improve resources utilization;

II. promote cleaner production, reduce polluted wastes from the beginning of production and service;

III. encourage comprehensive utilization of resources strongly, utilize all wastes with the maximum permissible limit, recycle renewable resources, and reduce the final amount of wastes;

IV. develop environmental protective industry vigorously, to provide physical and technical support for effecitve use of resources.

2. THE CENTRAL ISSUES THAT AFFECT THE DEVELOPMENT OF THE SALT-LAKE RECYCLE ECONOMY

The key point in the aspect of salt-lake resources exploitation is improving the Recover Rate of resource with the principle of recycle economy in the guide of the Scientific Outlook on Development. The central issues that affect the development of the recycle economy in lake salt industry are (1) What is the current situation of the lake salt resource? (2)What are the potentials in the comprehensive utilization and deep productions in the extended industrial chain of the salt and its mineral paragenisis and association? (3) How to protect the resources and the ecology of the lake salt, to achieve the harmonious development between the enviornment of lake salt resources and their sustainable utilization?

2.1 The current situation of the lake salt resources

We should do overall planning for lake salt

resources,and enhance the comprehensive development and utilization of their mineral paragenisis and association, to accomplish the comprehensive exploration, development and utilization.

In foreign countries, some lake salt resources have been developed basically with the recycle economy production model, and solved the issues of single resource, low economic benefit, and large resource waste. This have given us some enlightenment and reference.

In foreign lake salt resource development, the productive lakes are Salar de Atacama salt lake of Chile and Hubulemule salt lake of Argentina. Their main products are Potassium Chloride, Potassium Sulfate, Boric Acid, Lithium carbonate、potassium nitrate、sodium nitrate、iodine and iodine Derivatives，and other by product, such as Sodium Sulfate. At the same time, they also utilize the local Nitrate mine and combine the development of salt lake resource with the utilization of potassium nitrate. For nitrate, there are Sodium nitrate for industrial level, refined sodium nitrate, mixture of sodium Nitrate and Potassium Nitrate, orbicular Potassium Nitrate, and standard Potassium Nitrate.During the development of the salt lake industry of the Dead Sea, the main proudct is Potassium Chloride at the beginning. In the further development, including Potassium Chloride, they proudce bromine and brominate chemicals, halite, Magnesium chloride, phosphoric acid, Potassium Nitrate, magnesium oxide, and hydrochloric acid. The main products of the American big salt lake are sylvite, magnesium salt, edible salt, and lithium salt. They have speical achievements in the utilization of the recycled magnesium. There is 35‰ Magnesium chloride in the final brine of the salt pan. It is not only used as the original material to produce Magnesium, bischofite, dust suppressants, anti-freezing admixture, and fertilizer spray, but also used to exchange resin.The potassium sulfate products include the products that have the shape of pellet, which can be used to produce compound fertilizer, and also include the potassium sulfate of industrial level to produce artificial plaster board, refractory bricks, ceramics and water softener. In recent years, Chile and Bolivia have developed their salt lake resources with recycle economy very fast. They have modernized the production of lithium, boron, bromine, iodine, magnesium.

The change of development of foreign salt lake resources from simple to recycle, is the result of thinking over the limits of the industrial production, and is the improvement to the weakness of the industrial production.

From now on, in the development of salt lake resources,we must establish the concept of recycle economy, make a whole plan during salt lake resources development, fasten the building of the evaluation index system based on salt lake resource production rate, resource consumption decreasing rate, resource renewable rate, resource recycle rate, decreasing rate of final waste disposal. This must be considered in the management planning, and be implemented.

2.2 The management of the mining of salt lake resource

Ehence the management of the mining of salt lake resource, perfect the resource exploitation and development access permit, improve the methods of resource development utilization, and accomplish the protective development of resources.

Salt administration department shall realize the necessity and importance of the small salt lake management, and prohibit the mining of small salt lakes without permission. These small salt lakes must be closed. The salt lakes with permissions shall be closed if its products can not reach to the national standard or its management is confused. We shall strengthen the supervision, carry out the exploitation in small salt lakes frequently, and fight with mining without permission. At the same time, we shall actively search new ideas and new methods for the integration of salt lake resources, based on a scientfic principle.

We shall implement the policy of "harmonious development and protection" conscientiously, and furthure enhance the protection work of salt lake by Wind Protection and Sand Fixation, controlling flood and siltation, refilling of water to salt lakes, and preventing pollution by human beings and chemicals, to achieve the harmony between the development and utilization of salt lake and the nature, and build a solid foundation for the sustainable development of salt industry.

2.3 Improve the additional value of the products

Actively push forward the technical research for the deep production of salt lake resources, and improve the additional value of the products, and accomplish the optimization of the salt industry.

We shall clear the direction of the lake salt industry development precisely, based on resources and geographic conditions. Production companies shall jump out of the simple production model of salt mainly, and shall take the adjustment and optimization of the industrial structure and product structure as the cardinal line, extend the production chain by developing a featured and competitive extension product and non-salt product, such as salt chemicals, salt lake biology, and bio-pharmaceutical, and accomplish the upgrade of the industry, improve the core competence of companies, and enhance the sustain momentum of development for companies.

For the deep production of lake salt resources and its product structure adjustment, we shall take the important strategic development opportunity, and accept the industrial transfer from the domesitc coastal area selectively, and build the important chemical production bases in the autonomous region and in national west. We shall enlarge the strength of attracting investment continuously, and take the way of multiple investment, attract the foreign and domestic famous enterprises, and lanch chemical projects of large scales. We shall use the international advanced technology actively, develop and extend the industrial chain, evolve into high degree of processing, update the industrial structure, and improve the comprehensive competence of enterprises in the foreign and domestic market. We shall, according to the requirement of Comprehensive, Coordinate and Sustainable scientific Development concept, change the economic growth pattern, develop recycle economy strongly, and find a new way of high technology, better economic benefits, low resource consumption, low environment pollution, and taking the advantage of the labor resource effectively.We shall choose the projects based on the advantage of the location, and develop the competitive industry, attend the competence in the market actively, and develop with characteristics. For product research, we shall keep rolling model of producing, constructing, stocking and developing, and try to put the research results, that have the intellectual properties, into production.

2.4 Improve the recovery ratio

Improve the recovery ratio, decrease the dilution ratio, lengthen the lifetime of salt lakes, and achieve the sustainable development of lake salt towns.

The total recycling rate of salt lake resources is the product of salt lake recovery ratio and production recovery ratio. We shall develop the salt lake resources reasonably, and utilize the resources effeciently. No matter mining manually or mechanically, or producing all kinds of salt product, we shall improve the mining recovery ratio and production recovery ratio maximumly by advanced technology, advanced production process and equipment, and scientific management. Comparatively, the recovery ratio of salt lake solidus mineral deposit water dissolving mining is even higher than that of the open-pit mining. This is because: salt lake deposit does not need safety pillars, and it can be extracted completely; the non-industrial mineral beds (thin ore deposit,lean ore deposit) can be dissolved during mining, which increases the extraction; the surface water and ground water will bring salts to make up salt lakes. After considering the make-up water and the water dissolving conditions of salt lakes, we shall extract the ore buried by mud and sand and haloid water around the salt lakes, to improve the comprehensive recycling ratio of salt resources.

To decrease the mining loss, we shall work mainly in below aspects: plan the railway, roads and buildings inside salt lake mining area reasonably, avoid ore pressing;decrease the damage of the resources by natural disaster through wind protection and sand fixation, controlling flood and siltation, and protect the pollution to the resources from the industrial waste at the same time; make the scientific mining plan, define the mining depth, extract the resources effeicently in the rich areas by deep mining; try to utilize gangue, brine cover and salt powder, to change the waste to the worth; prohibit extraction without permission, and abandon the unreasonable extraction of only rich but not thin, only thick but not slight, only easy salt mine but not difficult, only main block but not by-product.All in all, we should pay more attention to the ecological construction

of salt lake and the resources protection, to decrease the minig loss by effective measures, and improve the mining recovery ratio, to make the limited lake salt resources to function more effeciently continuously.

2.5 The towns of salt-lake development

The towns with salt lake resources shall develop the resources reasonably, enhance resources protection, and implement the policy of "lengthen resources' lifetime ", at the same time, transfer the single mineral economy model to multiple economy model. We shall make the long term sustainable development plan when the salt lake is in its early mining stage; and push forward the multiple development strategy when the salt lake in the middle mining stage. We shall take the town as a unit to develop the recycle economy. Only in this way, the towns with lake salt resources can avoid "Mine and city exhaustion", and achieve the sustainable development.