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Development Direction and Focus of the New Energy Industry in Jilin Province

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***Abstract*—Jilin Province's new energy industry is a strategic emerging industry in Jilin Province and has broad prospects for development. In recent years, Jilin Province has made great efforts to adjust its energy structure and has made active explorations in the development and utilization of new energy, and has achieved significant results. The purpose of this study is to determine the direction and focus of development of the new energy industry in Jilin Province in light of the resources in Jilin Province, so as to increase the utilization efficiency of the new energy industry in Jilin Province and promote the sound and rapid economic development of Jilin Province. At the same time, it will provide a meaningful reference for the use of energy industries and sustainable economic development in other provinces and regions.**

Keywords—new energy; new energy industry; energy structure; emerging industries

I. THE CONNOTATION OF THE NEW ENERGY INDUSTRY

First, the connotation of new energy industry. New energy, also known as unconventional energy, refers to various forms of energy (energy use) other than traditional energy, including solar energy, wind energy, biomass energy, nuclear energy, geothermal energy, hydrogen energy, and ocean energy. It also includes new energy sources formed by the technological transformation of traditional energy sources.[1]

The new energy industry refers to the research, experiment, promotion, application, production and business activities of new energy technologies and products. It includes non-traditional energy sources such as solar energy, geothermal energy, wind energy, ocean energy, biomass energy and nuclear fusion energy. A high-tech industry that realizes industrialization. Simply put, the new energy industry refers to all new energy-related technologies and production activities, including all new energy-related technologies, including new energy development and utilization technologies.

The new energy industry includes three types of industries: one is the new energy equipment manufacturing industry, such as crystalline silicon cells and modules, thin film battery modules, wind turbines, gas turbines, large hydro turbine units and other equipment manufacturing industries; one is the solar energy, wind energy, water We can wait for new energy to be transformed into the energy (such as electric energy and heat energy) production industries that people need. There is also a category of industries that directly or indirectly use the energy generated by the transformation of new energy sources, such as the use of electric energy, biodiesel-driven new Energy cars, solar water heaters, etc. In these three types of industries, the first type of industry is the basis of the new energy industry, the second type of industry is the transfer station for new energy, and the last type of industry is the ultimate use of new energy.

II. STATUS OF NEW ENERGY INDUSTRY IN THE CONSTRUCTION OF CHARACTERISTIC MODERN INDUSTRIAL SYSTEM IN JILIN PROVINCE

As a leading industry in the characteristic industrial system of Jilin Province, the new energy industry plays an important role in effectively stimulating economic growth, promoting the upgrading of the industrial structure of Jilin Province, and promoting the coordinated development of economy, society and ecological environment.[2]

Historical experience shows that every time the global economic crisis engenders new technological breakthroughs, it will lead to new industrial changes. In the current global energy revolution, new energy is considered as a strategic fulcrum that can solve the financial crisis and the climate crisis at the same time, thus becoming the commanding height of the new round of international competition.

Vigorously developing new energy sources can increase domestic demand, increase employment, and effectively stimulate economic growth. More importantly, the development of new energy sources can foster new advantageous industries, promote scientific and technological innovation, and establish a low-carbon technology innovation and achievement transformation system that combines enterprises as the mainstay, production, education and research to form new models based on high-tech content and economies of scale. Industrial competitive advantage.[3]

Vigorously developing new energy sources will not only optimize the energy supply structure, promote the conservation of energy resources, increase the efficiency of energy conversion, but also drive the optimization of the industrial structure of Jilin Province and contribute to the sustainable development of the economy.

Vigorously developing new energy industries and actively developing low-carbon economy and circular economy can not

only promote the coordinated development of economic, social and ecological environment in our province, but also contribute to the reduction of greenhouse gas emissions in China. Status Quo of New Energy Industry Development in Jilin Province

III. Development status of new energy industry in Jilin Province

Jilin Province is relatively short of energy, and its primary energy self-sufficiency rate is only 50%. The lack of energy has become a bottleneck restricting the economic development of Jilin Province. In recent years, Jilin Province has made great efforts to adjust its energy structure in light of the resources of the province, to make the new energy industry a breakthrough point for solving energy problems, and has made active explorations in the development and utilization of new energy, and has achieved great results.[4]

A. Development and utilization of wind energy

Wind energy is an advantageous resource for the development of new energy industries in Jilin Province. Two regions in Jilin Province are located in the "Three North" region where wind energy resources are intensive in China. According to statistics, the province's effective wind energy reserves are 692 billion kWh/year, and the wind energy density is 60-70 watts/square meter. After more than 10 years of construction, a solid foundation of wind power industry has been formed. The wind farms that have been developed in Jilin Province are mainly concentrated in Baicheng, Songyuan, and Siping West. These areas are flat and open. The site is dominated by degraded pastures and saline-alkali lands. The wind power resources are relatively abundant and it is suitable for large-scale contiguous development of wind power. In the western region, the use of off-grid wind turbines generates electricity to meet the electricity needs of residents in terms of production, living, and communications. The research on small wind power and water extraction technologies has matured and has been applied in some areas. As a clean and renewable resource, wind power has become the second largest power source after Jilin Province's thermal power, and has made great contributions to optimizing the energy industry structure in Jilin Province.

B. Development and utilization of solar energy

Jilin Province belongs to the solar energy available area. The annual sunshine hours are 2200-3000 hours, and the sunshine percentage is about 60%. The distribution of solar energy resources is increasing from east to west. The sunshine hours in Fusong and Jingyu in eastern mountainous areas are 2000-2400 hours, the percentage of sunshine is 50-55%, and the sunshine hours in Changchun and Siping in the middle are 2600-2700 hours. The percentage of sunshine is 60% to 65%; in west of Tongyu and west of Da'an, the sunshine hours are more than 2900 hours, and the percentage of sunshine is more than 65%. It is the most abundant area of illumination resources in Jilin Province. At present, there are three main forms of solar energy use in Jilin Province: [5]

- Passive solar thermal insulation rooms are used to improve the living conditions in rural areas and to save heating energy in winter.
- Solar water heaters mainly provide hot water for people's lives.
- Solar cooker, mainly for boiling water and cooking.

C. The use of biomass energy

Although Jilin Province lacks mineral energy, it has a large amount of biomass energy. As a big agricultural province, it has a unique advantage in the development of biomass energy. At present, I have already found the technology for converting citrus crops into flammable gas. The development of technologies such as fuel ethanol and biodiesel has also made significant progress. Jilin Province ranks first in the domestic use of fuel ethanol.

D. Development and utilization of geothermal energy

The development and utilization of geothermal energy includes power generation and direct utilization. The direct use of geothermal energy requires less technology and the required equipment is relatively simple. Therefore, the direct utilization of geothermal energy is developing very rapidly.

IV. The development direction and focus of the new energy industry

A. The wind power industry strives to develop in the direction of regional clustering.

Strengthen wind power planning and attract large domestic backbone enterprises to develop and construct wind farms in Jilin Province, expand the scale of wind power installation in Jilin Province, and promote the development of wind power in scale. We will make full use of the abundant wind resource advantages in the western regions of Jilin Province (White City, Songyuan, and Siping) to speed up the construction of thousands of kilowatts of wind power bases. For the areas with good wind resources in the central part (Changchun, Jilin, Yanbian, etc.), the development and construction of wind farms will be initiated in an orderly manner. At the same time, a high starting point for the introduction of wind power equipment projects, optimize the industrial structure, improve the wind power equipment manufacturing industry chain, and gradually form the advantages of industrial clusters; eventually build into China's wind power equipment manufacturing industry base to meet the needs of the domestic wind power equipment market. With the improvement of industrial competitiveness, wind power equipment manufacturing industry can also target the international market and take the road of international operation.

B. Actively promote the development and utilization of solar energy and encourage the development of different forms of solar power generation

Build independent solar power plants and household photovoltaic power sources in remote areas, develop grid-connected photovoltaic power sources in cities with better

economic conditions, and build large-scale solar power plants in regions with good resource conditions. Through the construction of different types of solar power demonstration projects, we have obtained technical breakthroughs and summarized experiences. Actively attract investors to locate the upstream industries required for solar power generation in the region and extend the industrial chain. Focus on the development of solar photovoltaic modules and thin-film solar cells, on the technical aspects of polysilicon production projects must be strictly controlled, moderate development. Explore the application of solar building integration.

C. Actively promote the development and utilization of biomass energy

Actively promote the development and utilization of biomass energy. Develop biomass power plants fueled by straw and municipal solid waste to promote the development and utilization of biomass liquid fuels. Focus on the development of biological (non-food) ethanol, bio-butanol and other projects; accelerate the construction of straw gasification, transformation and biomass solid fuel projects. The development and utilization of biomass energy should strive to adopt advanced technologies at home and abroad, improve the efficiency of development and utilization, and bring it into a scale as soon as possible. At the same time, speed up the development and industrialization of biomass technology.

D. Do a good job of Akamatsu nuclear power project

Do a good job in the construction of the Chisong Nuclear Power Project and start construction and put it into operation according to the plan. At the same time, it actively promoted the research and development of nuclear power equipment and the construction of the production base.

V. CONCLUSION

The Jilin Province should adapt to the development trend of new energy in the world, seize the policy development opportunity and focus of its new energy industry, and take the new energy industry as the foundation and leading industry for Jilin Province's industrial upgrading and the construction of the characteristic industrial system in Jilin Province, and then the whole To enhance the future economic competitiveness of Jilin Province and discover new economic growth points. Combining the development of new energy with strengthening the capacity for independent innovation, strengthening energy substitution and environmental protection, and promoting the development of ecological economy, it is based on the direction of marketization and industrialization and based on the abundant natural resources and land resources of Jilin Province, based on policy. Protection, with enterprises as the main body and technological progress as the support, with project construction as the carrier, highlighting key points, coordinating and promoting, promoting the development of scale, systematic, and clustered development of new energy, forming scale advantages and benefits as soon as possible, and striving to make Jilin Province It has become an important new energy technology demonstration base, industrialization base, and ecological economic demonstration area. At the same time, guided by market applications, the company will further highlight end-products, brand building, independent innovation, and high-end technology, actively introduce leading-edge complementary companies, extend and increase the industrial chain, and create R&D, design, manufacturing, procurement, and logistics. The new energy industry system is integrated with, display, and transaction.

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