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Research on the Path of Developing Modern Energy Economy

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Abstract. At present, factors such as outstanding energy security issues, severe environmental situation, and increased pressure coming from tackling climate change and etc. determine that the development model of supporting economic growth with high consumption and low efficiency is unsustainable. It is necessary to promote the optimization and upgrade of upstream and downstream energy industries and cross strategic transformation barriers in accordance with the requirements of high quality development. This paper bases on the connotation, characteristics and major obstacles of the modern energy economy. Taking into account new requirements of the new characteristics of modern economic and social development for energy development, and the role of energy industry in promoting high-quality economic development from the perspective of macro, system and development, this paper puts forward the development ideas of Modern Energy Economy, systematically studies the key measures and safeguard measures for the development of Modern Energy Economy, clarifies the path of developing Modern Energy Economy, formulates policies for the government to develop high-quality energy and enterprises to achieve innovation and efficiency, and provides a theoretical basis and practical basis for the energy industry to promote economic and social development.

Introduction

Energy is an important material basis for the survival and development of human society, which is vital to the prosperity and development of the country, the improvement of people's life and the long-term social stability. The relationship between energy and economy and the economic problems of energy development are paid much attention to when promoting the development of national economy. The 19th National Congress of the Communist Party of China pointed out that socialism with Chinese characteristics has entered a new era, and China’s economy has shifted from a high-speed growth stage to a high-quality development stage. As an important part of the national economy, energy must not only achieve its own high-quality development, but also further play the role of promoting high-quality economic development. This requires concept which adapts to the new era to guide. On March 5, 2018, General Secretary Xi Jinping proposed “Do a good job in the Modern Energy Economy, keep up with the new trend of the world’s energy technology revolution, extend the industrial chain, and improve the efficiency of comprehensive utilization of energy resources” in the deliberation of the Inner Mongolia delegation of the National People's Congress. To study the modern energy economy, we must think in terms of the development and evolution of the macroeconomic framework, from a historical perspective, systematic and developing perspective.

Modern Energy Economy’s Connotation, Characteristics and Obstacles

Modern Energy Economy is a theory which studies the relationship between the modern energy system and the modern economic system, clarifies the status and role of the modern energy system in the modern economic system, and the new requirements of the modern economic system for the modern energy system in terms of technology, systems and business models to achieve high-quality energy development. Strong supply guarantee is a basic feature of the Modern Energy Economy which means achieving multi-faceted energy services and complementary intelligent energy supply systems[1]. Affordable price is an

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important feature of the Modern Energy Economy. Prices should fully reflect the relationship between market supply and demand, the scarcity of resources, and internalize the environmental damage costs. Also, differentiated pricing policies should be implemented[2]. Clean low-carbon and environmental-friendly development is a core feature of Modern Energy Economy. Efficient resource allocation is an essential feature of modern energy economy. As China's economic development is driven by high efficiency and innovation instead of relying on resources and elements, resource allocation efficiency should be gradually improved, that is, resources are transferred from low-yield departments to high-yield departments. High economic and social benefits are the distinctive features of the Modern Energy Economy. Economic benefits can promote the formation of good social benefits in the energy industry. Social benefits can drive the growth of economic benefits.

The development of Modern Energy Economy currently faces three major obstacles: conceptual, institutional and objective obstacles. In the conceptual aspect, : The understanding of energy attributes is not comprehensive, that is, strategic and public attribute, instead of commodity attribute, becomes the main attribute of energy; The understanding of its strategic position is not deep enough, and the energy industry often lags behind economic and social development in the stage of rapid economic development of China; Relevant economy problems are not paid enough attention such as quality and benefits, for example, China's energy development is mostly based on the guarantee of supply and the scale effect of energy supply instead of energy quality and industry benefits is paid much more attention. In the institutional aspect: The unreasonable distribution mechanism of interests, the unreasonable distribution mechanism of interests in the process of energy development[3], and the imperfect distribution mechanism of energy resources input and output will hinder the transformation of energy advantages into economic advantages and hinder the development of Modern Energy Economy[4]; The lack of industrial integration mechanism is the main reason for the inefficiency of the energy system, the short and low level of the energy industry chain. The imperfect innovation incentive mechanism hinders the differentiation and diversification of energy products, resulting in the selection of energy products become limited[5]; Enforcement of regulatory mechanisms is insufficient. The obstacles at the objective level are China's development stage is insurmountable, resource endowments cannot be changed and technical bottlenecks are difficult to break through.

Based on the understanding of the connotation and characteristics of Modern Energy Economy, aiming at the obstacles faced in the development of modern energy economy, this paper puts forward the development ideas of Modern Energy Economy, studies the key tasks and safeguard measures, provides a decision-making reference for the government to formulate policies related to high-quality energy development and for enterprises to achieve innovation and efficient development, also provides a theoretical basis and practical basis for the energy industry to promote economic and social development.

The Development Ideas Of Modern Energy Economy

Fully Consider the New Characteristics of Modern Economics and Social Development and Their New Requirment for Energy Development.

It is necessary to build a new relationship between economy and energy on the basis of persisting in embodying the new development concept of the new era. Modern Energy Economy must simultaneously consider the needs and characteristics of the modern economic system and the modern energy system. Through the energy system which agree with the modern economic and social development, modern economic and social development, continue to drive the development of the energy industry, and ultimately achieve high-quality energy development.

Economic grows in a higher-quality mode. China's economy, in the process of transforming the development mode, optimizing the economic structure, and transforming the growth momentum, is transforming from the high-speed growth stage to the high-quality development stage. The fundamental goal of energy development is to meet the people's demand for energy and for a better life. Take the people’s need at the center, make the energy and economic system as close as possible to the needs of the public and the government, meet the growing energy needs of the people, promote energy production to

be economical, efficient, promote energy quality to be cleaner, lower carbon and energy supply to be safer and more reliable[6].

Regions develop in more diversified ways and paths. High-quality development requires diversity and incremental economic competitiveness. There are great strategic choices for the development directions of various regions in China. Different energy resource sites should exploit their advantages to the full, location characteristics and environmental constraints to create their energy industry with their own characteristics and core competitive advantages.

Regions develop in a more balanced pattern. The high-speed growth stage is mainly characterized by "encourage the first rich" and the high-quality development stage is mainly characterized by "people sharing"[7]. In terms of the spatial distribution of population and economic aggregates, the famous "Hu Huanyong Line" has existed for a long time. China's energy supply and consumption are characterized by "reverse distribution". Especially clean energy is mostly distributed in the west, while the load centers are mainly in the eastern cities. It is necessary to build a cooperation and sharing platform between energy regions to promote the balance of energy and economic development between regions[8].

Industrial system is more modern. The modern industrial system is an industrial system with the real economy as the main body. As an important part of the industrial system, energy must also be integrated into the construction of a modern industrial system, combining capital, talent, technology and other elements with the adaptability of quality, balance of quantity, orderliness of time, aggregation of space and coordination of cooperation so as to form an energy industrial system that coordinates with scientific and technological innovation, modern finance and human resources[9].

Market economy system is more effective. The reform of institutional mechanisms is the fundamental way to promote the high-quality development of the economy. In the energy field, we should grasp the market-oriented reform direction, minimize the government's intervention in the market, improve the system and mechanism that play a decisive role in the allocation of energy resources, and give full play to the role of the market competition system, price mechanism, and supply and demand mechanism. More effective market economy system is a guarantee for the energy supply side reform and the energy transformation.

Open to the outside world more completely. The high-quality development of China's economy requires a new environment of completely opening-up. The implementation of the "One Belt, One Road" strategy, the cultivation of new modes of trade, the introduction and the emphasis on going out, and the optimization of the regional open layout need to be rapidly advanced. The energy industry is one of the main carriers for creating a new and open pattern. The "One Belt, One Road" energy channel is an important foundation and support for implementing the "One Belt, One Road" strategy and promoting energy sharing and cooperation. Through opening up to the outside world, we will build an energy trading system to solve the practical difficulties of overcapacity in equipment manufacturing in the energy sector and the elimination of renewable energy in the western region.

Pay more attention to green development. The main concern of the high-speed growth stage is "GDP is at the top", and the high-quality development stage is more concerned about "green and environmental protection" and forms a new pattern of harmonious development of human and nature. Energy development should adhere to the concept of saving and recycling resources and focus on improving the comprehensive benefits of energy resource utilization.

Pay more attention to innovation-driven development. Vigorously implementing the innovation-driven development strategy and deepening scientific and technological innovation are the major decisions made by the 19th National Congress of CPC. These decisions are inevitable to promote the high-quality development of energy, objective to promote the energy technology revolution, and the impetus of energy transformation and upgrading. In the energy field, we should combine technological innovation, institutional innovation, management innovation, and business model innovation to form a new kinetic energy driven by innovation, promote the transformation of development mode, create new supply of industry, and promote the energy industry to the middle and high-end, making innovation a supporting force to achieve high-quality energy development[10].

Pay More Attention to the Role of the Energy Industry in Promoting the High-quality Development of Economy.

Help economy to change its development mode. The reason why the energy sector is the breakthrough for China to accelerate the transformation of the economic development mode is we can take advantage of the increasingly severe situation of energy supply and demand, promote the reform of the institutional mechanism in related fields through the determination of the mechanism of energy constraints , thus forming a fundamental breakthrough of the transformation of economic development mode. The energy revolution has accelerated the adjustment of traditional industrial structures with high consumption, high pollution and low efficiency, and promoted the development and utilization of new energy. It is the main way to realize the upgrading and expansion of the future economic development model and can bring new economic development momentum.

Create new points of economic growth. The energy technology revolution is the key to economic and social transformation and upgrading. Through the energy technology revolution, we can speed up the adjustment of traditional industrial structures with high consumption, high pollution and low efficiency, form a green, circular and low-carbon modern industrial system conducive to energy conservation and utilization by extending the upstream and downstream industrial chains. The development of industry, such as the development of related manufacturing and supporting facilities industries. In addition, the upgrading of the energy industry can also promote innovation in energy-saving models and create new economic growth points.

Promote balanced development of regional economy. Energy is an important material foundation and driving force in modern society. The energy industry plays an important role in “targeted poverty alleviation”, and energy development is inseparable from the improvement of people's livelihood. The energy industry can improve production energy conditions, promote industrial development in poverty-stricken areas, enhance the power of independent development, improve living conditions, and enable poor people to use reliable and clean energy as soon as possible.

Key Measures For Developing Modern Energy Economy

Speed up the Reform of Energy Institutional System and Improve the Ability to Resource Allocation.

The reform of energy system is mainly to change the government's energy management mode, Restore energy commodity attributes, build a free circulation of factors, fair and effective market mechanism for competition, and provide market basis, space and opportunity for new energy consumption mode and new business innovation. It mainly includes promoting diversification of energy investment, paying attention to market rules in the process of supervision, reducing obstacles to energy factor flow according to energy supply and demand, supporting reform of energy system through strengthening reform of energy price mechanism, liberalizing prices of competitive links of power and oil and gas supply, exploring pricing and subsidy modes conforming to development characteristics in new energy, and giving full play to the role of the government to ensure fairness, and thus play the role of energy to protect people's livelihood.

Promote Energy Consumption Reform and Guide New Energy Consumption Patterns. Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

According to the classification of consumers, we should guide energy consumers to complete the role change. China's energy consumption subjects mainly include residents, enterprises and public institutions. Different energy consumption subjects usually have different consumption behavior characteristics and influencing factors. According to the characteristics and changing trends of the behavior of different consumers, take into account the upgrading of energy consumption demand and the changing role of consumers, accelerate the formulation of relevant policies to encourage energy consumption upgrading, encourage energy consumers change to "producers and consumers", change from passive acceptance status to active choice status, pay attention to improving the consumption experience of energy consumers, and guide energy consumption to green, Low-carbon, efficient, economic, convenient, personalized direction of upgrading and development.

Strengthen Energy Technology Innovation and Develop New Forms of Energy Industry.

Whether it is a endogenous new type of Business or an "X + energy" and "energy + X" new type of Business, advanced energy technology is needed. Technological feasibility is the precondition for the development of new energy industry. On the one hand, we should concentrate our efforts on tackling key technical problems and promoting cross-disciplinary technological innovation cooperation. On the other hand, we should strengthen the cooperation of "Industry-college-institute" cooperation in the field of energy and build an open innovation ecosystem. Establish an energy technology innovation system with enterprises as the main body, market-oriented and deep integration of industry, education and research. When it comes to energy consumption mode and industrial innovation ,we should give full play to the main role of enterprise innovation, and guide enterprises to increase investment in R&D of key technologies in energy field through fiscal, taxation, financial, science and technology incentives and other policies[11].

Vigorously Develop the Real Economy and Give Consideration to the Development of Non-real Economy in Energy Industry.

In the field of energy, we should vigorously develop the real economy, focus on developing new energy and other strategic emerging industries, accelerate the development of energy equipment manufacturing industry, focus on developing a number of large-scale complete sets of equipment, and strive for breakthroughs in the field of key equipment of new energy, so as to improve national competitiveness. Speed up the construction of the global energy internet, promote the integration of energy, information and transportation networks, promote the integration of energy and finance, build a multi-level and all-round energy financial market system and product service system, reasonably guide the financial "break away from emptiness" and serve the real economy. Those measures will be of great significance to enhance China's advantages in the competition for energy resources, enhance the voice in global energy pricing, ensure energy security, and promote the internationalization of the RMB.

Establish an Energy Quality Development Evaluation System to Enhance its Role in Energy Planning, Service and Monitoring.

Establish indicators reflecting energy resources, energy construction, energy production, energy processing, energy circulation, energy consumption, energy stocks, energy technology, energy conservation, energy balance, energy prices, energy-consuming equipment, economic and social benefits of energy development, environmental costs of energy development, administrative efficiency, effectiveness and efficiency of energy management of relevant government functional departments. Combine with the evaluation system of high-quality energy development, improve the national and provincial, municipal and county-level energy monitoring system, improve the energy measurement system and timely access to or audit energy efficiency data from different dimensions, so as to give full play to the monitoring function of the system.

Help Regional Economic Boost and Build a New Pattern of Interconnected Energy Openness.

We will build a sound and interactive energy infrastructure system in the region and promote the realization of the strategy of promoting coordinated development of the region through the energy infrastructure system. Trans-provincial and inter-regional electricity trading is an important way to realize the optimal allocation of power resources in China. Building smart grid plays an important role in optimizing resource allocation and improving resource utilization efficiency. In addition, the layout of urban and rural areas should be optimized to achieve integrated development.

Promote the Extension of Industrial Chain and Transform the Advantage of Energy Resources into Economic Advantage.

For regions rich in energy resources, we should upgrade the energy industry, extend the industrial chain, improve the level of scientific and technological innovation, and attract industries from Eastern and developed regions to gather to the west, thus speeding up the process of new industrialization in the west. Deeply tap the resource advantages of poverty-stricken areas, combine the channel advantages and technological advantages of energy enterprises, promote the sustainable development of poverty-stricken areas by industrial poverty alleviation, enhance the income of poverty alleviation, and enhance the ability of hematopoietic poverty alleviation in poverty-stricken areas.

Strengthen the Promoting Role of Energy Industry to Achieve the Coordinated Development of Energy Industry and Supporting Industries.

We should vigorously develop the impetus role of energy industry, take energy industry as the starting point, strive to do a good job in the vertical extension and horizontal expansion of the industrial chain, increase the added value of the industrial chain, and gradually form an industrial system of vertical division of labor, horizontal division of labor complementary and mechanism-related symbiosis. Under the premise of vigorous development of the energy industry, focusing on the huge demand for energy equipment such as mining equipment, power generation and transmission and distribution, wind power equipment, photovoltaic equipment, and shipping equipment, we should focus on building service bases for equipment design, manufacturing and maintenance to create new economic growth points.

Guarantee Measures For Developing Modern Energy Economy

Strengthen Research on the Theory and Practice of High-quality Energy Development.

Combine the actual situation of China's national conditions, strengthen the theoretical research on the high-quality development of energy. Combine the actual situation of the energy industry to set possible future development paths, support the high-quality development of energy from the theoretical level, and reduce the trial and error costs of actual investment. A series of pilot demonstration zones should be formed by setting up a pilot industrial system of modern energy economy, giving birth to a number of industrial demonstration zones and developing upstream and downstream industries according to local conditions. pilot demonstration zones establish the system of Modern Energy Economy, forming a group of leading enterprises, incubating entrepreneurs, scientific and technological talents and workers with creative competitiveness.

Improve the Innovation Incentive Mechanism to Help the Construction of Modern Energy System.

We should clarify the new requirements of the modern economic system for the modern energy system and strengthen the supporting role of innovation in the process of high-quality energy development. We should improve the incentive mechanism for innovation in technology, system and business model in the process of high-quality energy development, accelerate the transformation of scientific research results, implement incentive policies for innovators, and provide an innovative environment for innovative talents.

Improve Policies Related to Environmental Protection and Provide a Political Environment for High-quality Energy Development.

Strengthen the supporting system, promote the unification and coordination of environmental protection policy and energy policy, ensure the coherence and unification of various policies and measures, and improve the comprehensive effectiveness of policies. We should further improve policies on renewable energy and environmental protection electricity prices, establish and improve relevant mechanisms and institutional environments, integrate the total energy consumption and the “double control” indicators into relevant laws and regulations, strictly restrict the management of indicators, appropriately grasp the examination and approval matters, and increase decentralization efforts. We should reform the management mode of EIA to promote high-quality development, and use emission standards to force the technological upgrading of energy industry. We must strengthen macro-control over the red line of ecological protection, the bottom line of environmental quality, the upper limit of utilization of resources and the list of access to ecological environment , and implement price policies and preferential tax policies conducive to resource conservation and ecological environmental protection to guide enterprises to reduce emissions on their own initiative.

Improve the Existing Statistical Data System and the Evaluation Index of High-quality Energy Development System.

Comparing with the high-quality evaluation index system of energy economy and drawing lessons from the advanced experience of international statistics, we should promote the standardization, legalization and standardization of statistics, gradually improve the unified standard of statistical classification standards, improve the legal system, ensure data security, authenticity and integrity, and ensure the authenticity of data sources. Combining with the technology of big data analysis, the energy

statistical data can be classified effectively. Improve the statistical monitoring system, use advanced big data analysis technology, integrate automation and intelligence technology, timely feedback and analysis of energy statistics, improve the efficiency and accuracy of statistical supervision. Establish an open data network platform, open, publish and share energy data information in time, and develop applications to facilitate the public to browse and use data anytime and anywhere, so as to improve the application value of energy data.

Continuously Optimize the Business Environment, Optimize Energy Structure to Promote Industrial Upgrading.

Based on the optimization of business environment, we should strive to promote the construction of credit system in energy industry, promote the healthy development of energy industry by credit supervision, and create an atmosphere of honesty and credit industry. We should further improve the openness of the energy market, create conditions for private enterprises to participate in equal competition, expand private investment space, continue to increase openness in the field of competition, attract private investment to participate actively in project construction, and actively introduce private investment into some monopoly industries through mixed reforms to promote the healthy development of enterprises with different ownership systems. We should streamline the negative list of foreign investment access, relax market access for energy industries and enhance the predictability of openness.

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