Study On The Development Path And Case Of Smart Energy In The Constructio n Of Smart City

Xiao Qishi

State Grid Shanghai Electric Power Company, Shanghai, 200122, China

Keywords: Smart energy, Construction of smart city, Development paths

Abstract: This paper focuses on the theory of urban development strategy and smart city analysis, analyzes and summarizes the development of smart energy construction to assist smart city development, and designs an evaluation system for smart energy construction. The overall structure of the article is mainly divided into six parts. First of all, it sorts out the domestic and foreign monographs and articles on smart cities, sorts out the current situation of smart cities at home and abroad, and analyzes and finds that there is no systematic explanation of the role of smart energy construction in the development of smart cities. ; Then, using the theory of urban development strategy to start thinking about smart cities from the phenomenon of smog, discuss how to continue the “APEC” blue, and conduct an in-depth analysis of smart city development strategies; then, the concept of smart energy construction is proposed, and The PEST analysis method is used to analyze the smart energy construction environment; then the summary of smart energy construction to help the development of smart cities is launched, focusing on the development of new energy vehicles, clean energy utilization, urban heating renovation, and power demand side management to show wisdom in four areas The application of energy construction projects; based on the above research, the Delphi method is used to design a smart energy construction evaluation system; at the end of the article, the research on smart energy is summarized in the previous parts. Smart energy is ensuring the safety and reliability of urban energy, promoting urban green development, Promoting the development of urban-related industries and enhancing the connotation of urban services have played a huge role in promoting the construction of urban smart, and has become an important foundation and driving force for the development of smart cities in China.

1. Introduction

The focus of a smart city is to make the city intelligent, while focusing on the sustainable development of human beings, making the city “better” inseparable from “wisdom.” Smart water, smart transportation, e-government, energy-saving and low-carbon, smart medical care...The genes of “smart” are integrated in the city, showing new faces and new features of the city, and strongly supporting the “Chinese Dream” in its vitality. Smart cities are also of far-reaching significance for industrial structure, economic development, and people's livelihood. At present, the construction of smart cities in my country is still in its infancy. When designing the project layer of smart cities, we can plan and construct around energy conservation, emission reduction and optimizing the environment, and take sustainable development as the starting point to improve the livability of the city. 16j. The main point of sustainable development is people-oriented, balanced with environmental conditions and resources. Unreasonable use and development of resources and serious urban pollution are major issues that hinder the sustainable and healthy development of cities. Therefore, we must accelerate the improvement of resource utilization, develop new types of energy utilization, and create a scientific energy supply system to promote the city. healthy growth. Smart cities and low-carbon cities are not realized by a single element such as clean energy. Renewable and distributed energy supply system is the practical need of every city and every village. The environmental, energy and low-carbon issues that plague us are essentially different aspects of the same issue. Fundamentally solving these problems must not be possible without energy intelligence. The development of human society will prove that the construction of smart cities and low-carbon cities is inseparable from our energy wisdom.

  DOI: 10.25236/edssr.2020.004

2. Smart Energy Concept

Energy is an important material resource indispensable for human survival, economic development, and social progress, and an important strategic material related to the survival and development of a country. Energy is closely related to human society, and is as important to economic and social development as human beings rely on food, air and water. With the rapid development of economy and science and technology, human demand for energy is increasing. Not only that, energy is also an important guarantee for the development of the national economy. There are many factors that affect energy consumption. The most important factor that affects energy consumption is the level of urbanization. Other factors are policy factors, technical levels, and energy management levels. According to research, if the level of urbanization increases by 1%, it will affect the increase of energy consumption by nearly 2%, indicating that the reason for the significant increase in energy demand is the comprehensive effect of urbanization. As China's urbanization accelerates, China's total energy consumption will increase dramatically. In order to protect the environment on which mankind depends, we must fundamentally solve the problems of energy security, stability, cleanliness and sustainable development. In order to achieve the safe, orderly, stable, and clean utilization of energy, we must study the dynamics of the development of human civilization, formulate solutions from the most fundamental needs, and keep up with the pace and high requirements of civilization. Thus we put forward the concept of smart energy. Smart energy refers to the use of human unique wisdom in all aspects of energy utilization, development, production, consumption, etc., through innovative technologies and new system reforms, to give full play to our human capabilities and wisdom to build integrated energy technology And the overall energy system, the system meets the requirements of urban ecological civilization construction and urban sustainable development, in order to form a new type of energy situation. As a result, the characteristics of smart energy are formed, that is, like the function of our human brain, it has the characteristics of self-organization, self-checking, self-balancing, and self-optimization, and finally realizes energy system, safety and cleanliness.

3. Smart Energy Construction Helps Smart City Development Measures

3.1 Renewable Clean Energy Utilization

To develop smart energy to facilitate the development of smart cities, we must increase the consumption and utilization of renewable clean energy. Effective use of renewable energy is an important way to build low-carbon cities. The carrier of smart energy is renewable energy. To develop smart energy, renewable energy must be popularized, especially solar and wind energy. Through the development of smart energy, the development of green energy is promoted, the urban energy structure is transformed, and the urban energy structure is transformed from fossil energy to green energy. The development of smart energy to facilitate the development of smart cities and the promotion of electric vehicles are the general trend. The vigorous development of electric vehicles has been promoted as a national energy strategy. The fundamental purpose of transportation construction in low-carbon cities is to reduce carbon emissions. Through the promotion of electric vehicles, cities will reduce the carbon emissions of companies and individuals using transportation, thereby achieving the goal of reducing carbon emissions throughout the city. In the context of relatively slow battery technology upgrades, it is possible to consider seeking breakthroughs in improving supporting facilities such as charging piles and charging stations to drive the true rise of the new energy vehicle market. In the case of not increasing the area of land supply, effective evasion from a technical point of view will solve the charging problem. The development of smart energy to facilitate the development of smart cities requires greater efforts to reduce energy consumption during building construction and daily high-speed operations of buildings. A very key component of low-carbon cities is green buildings. Green buildings must not only provide people with healthy, comfortable and efficient working and living spaces, but also save resources, protect the environment and reduce pollution to the greatest extent. In the process of reducing carbon emissions, promoting green buildings is of great significance.

3.2 Save Energy, Reduce Emissions to Build Smart City

The development of smart energy to facilitate the development of smart cities requires encouraging urban industrial and commercial enterprises to save energy, reduce emissions, and reuse waste energy. In the low-carbon city development plan, it is necessary to reduce the carbon emissions of various industries, eliminate backward and highly polluting processes and equipment; support the use of advanced, efficient and clean processes and equipment; promote the replacement of electric energy and the reuse of waste energy by industrial and commercial enterprises. In order to save energy, reduce carbon emissions, and realize low-carbon industry. The development of smart energy to facilitate the development of smart cities requires full integration of independent and decentralized information platforms to form a comprehensive energy service platform. Independent decentralized platforms include energy efficiency monitoring platforms, power dispatch platforms, oil and gas network platforms, water affairs platforms, smart grid platforms, renewable energy platforms, hydrogen and fuel cell platforms, road and rail transportation platforms, sustainable chemistry platforms, etc. The integrated energy service platform will improve the process architecture system of traditional energy, and then build an overall architecture for new energy utilization, development, and consumption, and become a more efficient smart configuration and smart exchange in each energy network architecture, thereby promoting the accelerated health of low-carbon cities development of. The development of smart energy to facilitate the development of smart cities requires top-level design to build a flat system of energy organizations. The flattening of energy organizations ultimately promotes the benign and sustainable construction of low-carbon cities by encouraging technological innovation, optimizing the industrial structure, advocating energy conservation, and promoting multi-party cooperation.

4. Specific Applications of Smart Energy Construction Projects

Smart energy construction means the mature application of traditional energy improvement technology and new energy alternative technology. With the intersection and progress of these two energy technologies, energy consumption will be reduced, pollution will be reduced or even eliminated, and energy supply will be more systematic and safe. Clean and economical. At the same time, smart energy means innovation and change in the system. This change is conducive to integrating resources and energy, increasing its input-output ratio, and reducing negative impacts on the environment and ecology. By changing the traditional energy development and consumption concepts, we take the sustainability of the ecological environment as the premise and the sustainable development of the economy and society as the goal. We use advanced new technologies and equipment to vigorously develop clean energy, use clean energy, and optimize Energy consumption structure, improve the efficiency of energy use, establish scientific and reasonable energy production methods and consumption patterns, thereby alleviating energy bottlenecks and ecological environmental pressures, and promoting the harmonious development of the economy and society. The following mainly demonstrates the application of smart energy construction through four areas: new energy vehicle development, clean energy utilization, urban heating renovation, and power demand management.

4.1 Development of New Energy Vehicles.

Infrastructure is the foundation of the development of electric vehicles. Inadequate infrastructure construction, especially the lack of charging stations and charging piles, severely restricts the practicality and convenience of electric vehicles, and consumers’ lack of confidence in electric vehicles will directly affect automobile companies. Don't dare to invest too much energy in electric vehicles. The lack of sufficient market competition has caused the cost and market price of electric vehicles to remain high. Although the state and local governments have introduced many relevant industry support policies, they have not fundamentally solved the convenience problem of electric vehicles, which eventually led to the slow expansion of electric vehicles in the civilian market. Therefore, only by solving the “difficulty in charging” and allowing consumers to feel the

convenience and practicality of electric vehicles, will it be possible to gradually promote electric vehicles. To develop new energy vehicles on a large scale, the construction of supporting facilities for charging must be a step ahead. This is not only a consensus for the development of new energy vehicles, but also a new idea for the development of new energy vehicles: the establishment of new charging facilities. In the case of unable to lead the upgrade of battery technology, it is possible to consider seeking breakthroughs in the improvement of supporting facilities such as charging piles and charging stations in order to drive the true rise of the new energy vehicle market. In the case of not increasing the area of land supply, effective evasion from a technical point of view will solve the charging problem. At the same time, the state should support local governments and operating companies to innovate their own operating models, encourage more market-oriented operations, and truly realize the great development of the charging pile industry. In the context of the global energy crisis and the serious environmental crisis, the construction of charging piles, as a supporting infrastructure for the development of electric vehicles, plays a vital role and is of great significance in terms of social and economic benefits.

4.2 Clean Energy Utilization.

Clean energy is energy that can be used sustainably, such as hydropower, wind energy, solar energy, biomass energy, and ocean energy. There is no problem of resource depletion. As many countries around the world formulate policies and implement clean energy incentives, clean energy is constantly expanding its production scale and scope of use. In 2007, the global renewable energy power generation capacity reached 240,000 megawatts. It is predicted that the world population will increase to 8.9 billion in 2050, and the energy demand will be three times the current one. The proportion of various primary energy sources in the world energy consumption composition will be: natural gas 13%, coal 20%, Nuclear energy 10%, hydropower 5%, clean energy (including solar, wind, biomass, etc.) 50%.

5. Conclusion

In recent years, with the vigorous advancement of smart cities, my country’s energy smart construction has also quietly emerged. At the same time, smart energy construction has also played an important role in the development of smart cities, mainly reflected in ensuring the safety and reliability of urban energy. Promoting the green development of the city, stimulating the development of the city's industry and improving the level of urban service. Therefore, the construction of smart energy is an important foundation in the development process of my country's smart city construction. Through literature collection, this article sorts out the impact and role of smart energy construction in promoting smart city development, and collects and outlines domestic policies and construction content related to smart cities and smart energy.

References

[1] Huang Xiaoli, Li Zhenjie, Zhang Tao, et al. Energy development demand and smart grid construction under the new situation. China Electric Power, vol. 5, no. 9, pp. 25-30, 2017.

[2] Pan Minyi, Zhang Xiaogang. Analysis of the Status Quo and Path of Talent Reserve in the Construction of Smart Cities in my country. Contemporary Educational Theory and Practice, vol. 2, no. 8, pp.169-172, 2015.

[3] Liao Qian, Zhang Xiaoling, Huang Ting. Research on the Development and Application of 5G in the Construction of Ganzhou Smart City. Operator, vol. 3, no. 10, pp. 279-280, 2020.

[4] Du Liting. The goal and path selection of smart city construction. China Science and Technology Information, vol. 2, no. 11, pp.190-190, 2013.

[5] Liu Xiaojing, Wang Ruying, Wei Wei. Construction and application of a comprehensive service platform for regional smart energy. Power Supply, vol. 36, no. 6, pp. 34-38, 2019.