



Analysis on the Necessity and Feasibility of Building Regional Science and Technology Innovation Center

Yan Chang and Yunfei Xu*

State Grid Energy Research Institute Co. LTD, Changping, 102209, Beijing, China

*Corresponding author's e-mail:
xuyunfei@sgeri.sgcc.com.cn

Abstract. Under the new situation, it is imperative to speed up the construction of science and technology innovation center. At present, the international environment is undergoing profound changes, and the scientific and technological revolution and industrial transformation are reshaping the global order. This paper analyzes the urgency, necessity and feasible conditions of the construction of science and technology innovation center in the new period, which provides an important reference for accelerating the construction of science and technology innovation center and promoting innovation and development.

Keywords: Construction of Science and Technology Innovation Centers, Necessity, Feasibility.

1 Introduction

In the new era, China needs to speed up scientific and technological innovation to meet the challenges of unilateralism and protectionism, and maintain a leading position in the fierce international competition. Scientific and technological innovation is the key to improve the country's comprehensive national strength and ensure the safety and stability of the industrial chain supply chain. A new round of scientific and technological revolution and industrial transformation has provided great opportunities for scientific and technological innovation. Scientific research and technological innovation are developing at an unprecedented speed, especially in frontier fields such as artificial intelligence, quantum technology and biotechnology. China needs to seize this opportunity, speed up scientific and technological innovation, so as to achieve a leap in scientific and technological strength. Scientific and technological innovation is an important support to realize the goal of strengthening the country by socialist modernization. Chinese modernization needs the support of scientific and technological modernization, and scientific and technological innovation is a new kinetic energy to promote high-quality development. Therefore, accelerating the construction of science and technology innovation center is not only a response to the current international and domestic situation, but also an inevitable choice to realize the country's long-term development strategy ^[1].

2 Strategic Points of Building Regional Science and Technology Innovation Center

2.1 Clarify the Regional Positioning and Objectives

Under the guidance of national strategy, each regional science and technology innovation center needs to determine its unique industrial orientation according to its own resource endowment and industrial base. For example, for areas rich in natural resources, we can focus on technological innovation related to new energy, new materials and other industries. For example, Inner Mongolia, with its abundant wind and solar energy resources, has positioned itself as a new energy science and technology innovation center with the support of national strategy, focusing on the development and industrial application of wind power generation, solar photovoltaic and other related technologies. At the same time, upgrade and transform in combination with local traditional advantageous industries. Taking the old industrial base in Northeast China as an example, under the guidance of the national strategy of revitalizing Northeast China and based on traditional industries such as equipment manufacturing, the goal of regional science and technology innovation center is to promote the technological innovation of high-end equipment manufacturing, such as developing intelligent manufacturing technology for the upgrading and transformation of machine tools, heavy machinery and other equipment [2].

2.2 Focus on Core Technology Research

Closely around the national strategic needs and regional industrial advantages to screen key technologies. For example, under the strategic background of the country's vigorous development of semiconductor industry, the scientific and technological innovation centers in the Yangtze River Delta region can focus on key technologies of integrated circuit manufacturing, such as high-precision lithography technology and advanced packaging technology. These technologies are the key for China's semiconductor industry to break through the foreign technology blockade. Consider the relevance and systematicness of technology. For the field of new energy vehicles, we should not only pay attention to battery technology (such as the research and development of high energy density batteries), but also pay attention to the related electric drive system and intelligent networking technology to form a complete technical system to promote the overall innovation and development of the new energy vehicle industry. Establish a cross-regional, cross-departmental and cross-industry collaborative innovation network. Taking Guangdong-Hong Kong-Macao Greater Bay Area Science and Technology Innovation Center as an example, under the impetus of the national Greater Bay Area strategy, the integration of scientific and technological resources in Hong Kong, Macao and the mainland will be promoted by establishing a joint laboratory of universities, scientific research institutions and enterprises in Guangdong, Hong Kong and Macao. Through this collaborative innovation, key technologies can be tackled quickly. Strengthen cooperation in Industry-University-Research. Through policy guidance, the government urges enterprises to feed back the

market demand to universities and scientific research institutions, which provide technical support and talent transfer for enterprises [3].

2.3 Build an Open and Innovative Ecology

In accordance with the national opening-up strategy, actively expand the channels of international scientific and technological cooperation. For example, under the Belt and Road Initiative, science and technology innovation centers in the central and western regions can carry out scientific and technological cooperation with countries along the route. Shaanxi Science and Technology Innovation Center cooperates with Central Asian countries in the field of agricultural science and technology, introduces advanced irrigation technology, and at the same time exports China's crop planting technology to enhance the regional agricultural science and technology innovation level. Attract top international scientific and technological talents and innovative teams. By setting up an international scientific research environment and generous talent policy, we will attract overseas high-end talents. A science and technology innovation center like Shanghai can take advantage of its international city to provide international scientific research facilities, living conditions and project funding for foreign researchers, and attract global talents to participate in regional scientific and technological innovation activities. Strengthen cooperation and exchanges with other regional scientific and technological innovation centers in China.

3 Practical Needs of Building Regional Science and Technology Innovation Center

It is conducive to enhancing national competitiveness. In the process of global economic integration, the competition between countries is increasingly dependent on the ability of scientific and technological innovation. As a gathering place of innovation resources and a high incidence area of innovation activities, regional science and technology innovation centers can make breakthroughs in key technical fields, such as artificial intelligence, quantum computing and other cutting-edge technologies. For example, through the collaborative innovation of a large number of high-tech enterprises and scientific research institutions, Silicon Valley in the United States has maintained a leading position in information technology and other fields for a long time, greatly enhancing the global competitiveness of the United States. The construction of regional science and technology innovation center in China will help to occupy a favorable position in the international science and technology competition stage, promote the overall scientific and technological strength of the country, and then enhance the right to speak in global trade, industrial division of labor and other aspects [4].

It is conducive to driving regional economic growth. Scientific and technological innovation is the core driving force of modern economic growth. Regional science and technology innovation centers can promote emerging industries and transform traditional industries. Taking Shenzhen as an example, the development from a small

fishing village to an international metropolis depends on its scientific and technological innovation in the fields of electronic information and communication technology. Regional science and technology innovation centers improve production efficiency, reduce production costs, develop new products and services, and create new market demand through technological innovation. For example, the innovation of new energy vehicle technology has promoted the development of battery manufacturing, automobile parts production and other related industries, also promoted the rise of supporting facilities industries such as charging piles, injected new vitality into regional economic growth, and promoted the coordinated economic development of surrounding areas, forming a regional economic growth pole.

It is conducive to promoting the upgrading of industrial structure. Traditional industries are facing the constraints of resources and environment and the pressure of market competition, and urgently need transformation and upgrading. Science and technology innovation center can provide technical support for industrial structure optimization. In manufacturing field, through the research and application of intelligent manufacturing technology, such as industrial robots, intelligent sensors, etc., the traditional manufacturing industry will be transformed into intelligence, digitalization and networking. At the same time, science and technology innovation center is conducive to cultivating emerging industries, such as biotechnology, new material technology and other fields, which can incubate emerging industries such as biopharmaceuticals and high-performance materials, change the regional industrial structure, improve the added value and competitiveness, and make the regional industrial structure more reasonable and high-end.

4 Support Points for Building Regional Science and Technology Innovation Centers

The first is policy support system. The state and local governments should provide sufficient financial support. The state can tilt to the key projects of regional science and technology innovation centers through special scientific research funds, such as the National Natural Science Foundation and key R&D plans. Local governments can set up industry guidance funds. For example, Suzhou Industrial Park has set up a special guidance fund for nano-industry to support the construction of nano-technology innovation centers and invest and support nano-technology enterprises. In terms of financial policy, financial institutions are encouraged to innovate financial products and services. For example, intellectual property pledge loans are carried out to enable technology enterprises to obtain bank loans with their patents, trademarks and other intellectual property rights as collateral. At the same time, the development of science and technology insurance will provide protection for the risks in scientific and technological innovation activities and reduce the innovation risks of scientific and technological enterprises. Tax relief shall be given to high-tech enterprises and science and technology service institutions in regional science and technology innovation centers. For example, corporate income tax relief can effectively reduce the burden on enterprises, and improve the profits of enterprises to be retained for re-research. Preferen-

tial policies of value-added tax can also be given to R&D equipment procurement, technology transfer and other links of scientific and technological enterprises to promote equipment renewal and technology circulation of scientific and technological enterprises. Tax preference shall be given to technology start-ups in the investment area of venture capital institutions ^[5].

The second is guarantee of human resources. Strengthen the coordinated development of higher education and vocational education in the region. Colleges and universities should pay attention to cultivating scientific research talents with innovative thinking and solid professional knowledge, and adjust the subject setting and course content according to the industrial needs of regional science and technology innovation centers. For example, under the demand of the development of artificial intelligence industry, colleges and universities can increase professional courses related to artificial intelligence, such as machine learning and deep learning algorithms. Vocational education should closely focus on the actual skills needs of the industry to train skilled workers. For example, in the science and technology innovation center of electronic information industry, vocational schools can offer courses such as semiconductor manufacturing technology, electronic product assembly and testing, and provide a large number of high-quality skilled workers for industrial development. The state and local governments should introduce attractive talent introduction policies. For overseas high-level talents, provide "one-stop" talent introduction services, including preferential policies in work visa processing, housing security and children's education. For example, some local governments provide talent apartments for imported overseas talents, solve their housing problems, and arrange for their children to attend local quality schools. Establish a scientific and reasonable talent incentive mechanism. In the regional science and technology innovation center, material rewards and honorary titles are given to scientific and technological talents with outstanding contributions.

The third is infrastructure construction. Build a number of high-level scientific research infrastructures, such as national laboratories and scientific apparatus. For example, in the field of high-energy physics research, large-scale scientific devices such as the Large Hadron Collider will be built, which can provide advanced experimental conditions for regional and even national researchers, attract top scientific research teams at home and abroad to carry out cooperative research, and enhance regional scientific research strength and international influence. Strengthen the construction of sharing platform for scientific research instruments and equipment. Regional science and technology innovation center can integrate the resources of scientific research instruments and equipment of universities, scientific research institutions and enterprises in the region, and realize the services of reservation, use and lease of instruments and equipment by establishing an online sharing platform, so as to improve the utilization rate of instruments and equipment and reduce the cost of scientific research. Improve public service facilities such as transportation, communication and energy. Good traffic conditions can facilitate the exchange of scientific researchers and the transportation of scientific and technological achievements. For example, build a high-speed transportation network connecting the science and technology innovation center with major cities at home and abroad, including high-speed rail and

airports. In terms of communication facilities, high-speed broadband networks and 5G networks will be built to ensure the rapid transmission of scientific research data and the efficient remote collaboration. Supporting the construction of living facilities, such as housing, medical care, education, culture and other facilities. A comfortable living environment can attract and retain scientific and technological talents.

5 Favorable Conditions for the Construction of Science and Technology Innovation Center

5.1 Advantage of Human Resources

Many areas are rich in higher education resources and scientific research institutions. For example, in Shanghai, there are many domestic first-class universities and many scientific research institutes, which train a large number of scientific and technological professionals every year, covering science, engineering, medicine, agriculture and other disciplines, providing intellectual support for scientific and technological innovation. At the same time, the regional economic development level and living environment are also attractive to talents, which can retain talents and promote the rational flow and cooperation of talents. In addition, by formulating talent introduction policies, such as providing housing subsidies, research start-up funds and other preferential measures, high-end talents at home and abroad can be further attracted to join the construction of regional science and technology innovation centers.

5.2 Support of Industrial Base

Some areas have formed industrial clusters with certain scale and competitiveness. Taking the Yangtze River Delta as an example, it has a profound industrial foundation in automobile manufacturing, machinery and equipment, electronic information and other industries. There is a close relationship between enterprises in these industrial clusters, and there is an upstream and downstream industrial chain relationship, which provides a broad application scenario and market demand for scientific and technological innovation. Based on market competition and self-development needs, enterprises have strong motivation to carry out technological innovation, and can integrate resources through industrial alliances and Industry-University-Research cooperation to jointly carry out scientific and technological innovation activities and promote the construction of regional scientific and technological innovation centers.

5.3 Complete Transportation and Information Infrastructure

Modern transportation and information infrastructure are important conditions for the construction of science and technology innovation center. Developed transportation networks, such as highways, railways and aviation, facilitate the rapid flow of talents, materials and information. For example, the convenient transportation between cities in Guangdong-Hong Kong-Macao Greater Bay Area is conducive to the integration

and coordination of innovative resources in the region. At the same time, the construction of high-speed broadband network, 5G and other information infrastructure enables the rapid transmission and sharing of scientific research data, promotes the development of innovative activities such as remote scientific research cooperation and online technical exchange, and provides a solid infrastructure guarantee for the efficient operation of regional scientific and technological innovation centers.

6 Conclusion

Science and technology innovation center is a city or region that occupies a dominant position in the global or regional innovation network, is the gathering place of innovation elements and the growth pole of innovation economy, and is also the spatial carrier for cities or regions to participate in international science and technology competition and cooperation. The construction of science and technology innovation center is of great significance and imperative. There are good conditions and environment to accelerate the construction of science and technology innovation center in the new period.

References

1. Wang, Y.H., Yin, T., Chen, H.Y. Comparative Study on the Construction of Three International Science and Technology Innovation Centers [J]. China Science and Technology Forum, (08):1-8(2022).
2. Liu, D.M., Jue, C., Xuan, Z.H. Selection of regional science and technology innovation centers in the new era and related suggestions [J]. China Science and Technology Forum, (07):98-105(2022).
3. Li, G.P. Building an international science and technology innovation center to support the high-quality development of the capital [J]. Urban Issues, (12):13-18 (2022).
4. Chen, S.B., Chen, Y.P. An international comparative study of China's construction of a world science and technology innovation center [J]. Scientific Management Research, 40(05):31-38 (2022).
5. Chen, L., Yuan, M., Chen, Z.Y. The working mechanism, risk deconstruction and implementation path of the construction of higher education empowerment science and technology innovation center [J]. University Education Management, 18(05):26-37 (2024).

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

