On Optimization Measures for the Layout of Major Technological Infrastructures in the Guangdong-Hong Kong-Macao Bay Area

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Abstract: in the new stage of development, China is striving to promote science and technology, constantly improve the level of science and technology development, and build a sound science and technology system. Guangdong, Hong Kong and Macao Bay area is the result of the strategic layout of regional science and technology development in China. In order to accelerate the pace of scientific and technological innovation and enhance the strength of national scientific and technological development, China needs to continue to optimize the layout of major scientific and technological infrastructure in Guangdong, Hong Kong and Macao Bay area, and comprehensively develop emerging industries. This paper mainly studies the status and function of major science and technology infrastructure, explores the role of major science and technology infrastructure in promoting regional industrial innovation ability, and analyzes the layout strategy of major science and technology infrastructure in Guangdong, Hong Kong and Macao Bay area, hoping to provide some guidance for the layout of major science and technology infrastructure in Guangdong, Hong Kong and Macao Bay area.

Keywords: Major science and technology; Infrastructure; Guangdong; Hong Kong and Macao Bay area; Layout; Optimization measures

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1. Introduction

With the development of society, the development level of international science and technology industry continues to improve. Science and technology is the

About the author: Youliang ZHOU (1982 -), male, Hengyang City, Hunan Province, lecturer, doctor; research field: regional economy, industrial economy, management decision-making, etc;
first productive force. In order to promote its sustainable development and improve its competitiveness, China needs to focus on the development of science and technology industry. Guangdong, Hong Kong and Macao Bay area is the forefront of China’s reform and opening up and the highland of scientific and technological innovation. Through the scientific layout of major science and technology infrastructure, improve the major science and technology infrastructure, is conducive to stimulate the development vitality of Guangdong, Hong Kong and Macao Bay area, improve the level of science and technology industry development, so we should build the major science and technology infrastructure development strategy of Guangdong, Hong Kong and Macao Bay area, to ensure the efficient development of emerging real estate activities.

2. Status and Function of Major Science and Technology Infrastructure

(1) Basic status of major science and technology infrastructure
The development of science and technology and high-tech industries cannot do without major science and technology infrastructure. With the support of major science and technology infrastructure, China’s scientific research institutions and high-tech enterprises can better carry out science and technology research activities, change science and technology, and provide power for social development. In the process of social development, China needs to pay attention to the construction of major scientific and technological infrastructure, improve the level of facilities construction and development, and give full play to the role of facilities in the development of science and technology. The construction and operation level of major science and technology infrastructure is an important standard to measure the regional economic development ability, scientific research strength and the development potential of high-tech industry. China should attach importance to the layout, operation and management of major scientific and technological infrastructure construction, so as to enhance the national scientific and technological strength and national development competitiveness.

(2) Main functions of major science and technology infrastructure
Major science and technology infrastructure is the infrastructure construction activities around science and technology, which directly drives the development of science and technology. At present, foreign countries are actively building major science and technology infrastructure to ensure the healthy development of science and technology industry. Foreign countries have formed major achievements in the construction of scientific and technological infrastructure, such as Brookhaven National
Laboratory in the United States, German electron synchrotron Research Institute, etc. These are the driving forces for the development of science and technology abroad. China has also established many research structures, focusing on the development of science and technology and various disciplines. In order to improve the research level, our country has selected excellent scientific and technological researchers, subject researchers, etc. to form a research team. In this case, our country can better carry out research work.

3. The Role of Major Science and Technology Infrastructure in Promoting Regional Industrial Innovation Capability

(1) Trigger major scientific and technological breakthroughs and lead the industrial leap forward development

Major science and technology infrastructure is an important driving force for regional innovation and development, which can improve the level of regional industrial development and deepen regional industrial development. The role of major science and technology infrastructure in leading the industrial leap forward development has been recognized by many people. For example, in the case of improving the major scientific and technological infrastructure, researchers have studied many scientific problems such as quantum entanglement, and made major breakthroughs in the research of these scientific problems, which has made the communication industry get deep development and greatly met people’s communication needs. With the deepening of scientific and technological research, China’s traditional industries are gradually upgrading and transforming. In the process of industrial development, China needs to do a good job in the construction of major scientific and technological infrastructure to provide continuous support for scientific and technological research.

(2) Create new industries based on scientific discovery and promote the development of high and new technology

Innovation is the driving force of social development, so China needs to take the initiative to carry out innovation activities to improve its own innovation and development ability. When scientific researchers find new things in their research, they are easy to innovate industries. For example, when new discoveries are made in biological science research, emerging industries at home and abroad, such as bioengineering, biomedicine, bio agriculture and bio energy, have also developed. The development of brain science leads to the development of artificial intelligence and promotes the development of social intelligence. The further development of science and technology and scientific research is closely related to the construction and development of major scientific and technological infrastructure.
Major science and technology infrastructure itself integrates many technologies, so that major science and technology infrastructure can provide reliable development support for science and technology research. For example, in the process of developing a number of major science and technology infrastructure clusters, CERN has conducted in-depth research on network technology, information technology and communication technology to ensure the exchange and sharing of data among laboratories. Through the study of these technologies, not only can improve the level of laboratory science and technology, but also can promote the development and progress of the whole society.

(3) Gather top technology elites and incubate industrial innovative talents

The development of science, technology and industry is inseparable from talents. Universities and scientific research institutions provide talents for the construction of major scientific and technological infrastructure. These talents apply their own theoretical knowledge and practical knowledge to provide dynamic support for the construction and development of major scientific and technological infrastructure. In order to strengthen the construction effect of major scientific and technological infrastructure, not only Chinese universities and scientific research institutions have joined in the construction work, but also foreign scientific research institutions have been invited to join in the construction work. The development of data acquisition and storage equipment and imaging system are the key research and optimization tasks for researchers. By participating in the construction and operation of major scientific and technological infrastructure, researchers themselves will be developed. At the same time, universities and scientific institutions can also summarize the experience of major science and technology infrastructure construction, understand the types of talents needed for major science and technology infrastructure construction, and then build targeted talent training programs, so as to ensure the effect of talent training.

4. Guangdong, Hong Kong and Macao Big Bay District: Strategy of Major Science and Technology Infrastructure Lay out

(1) Based on two demands

China has formulated the development strategy of science and technology innovation to guide the development of science and technology innovation. As the major scientific and technological infrastructure is the basis for the innovation and development of science and technology, China should pay close attention to the construction of major scientific and technological infrastructure and improve the system
of major scientific and technological infrastructure. In order to promote the development of Guangdong, Hong Kong and Macao Bay area and promote the development of science and technology industry, China needs to scientifically layout the major science and technology infrastructure of Guangdong, Hong Kong and Macao Bay area. Among them, we need to lay out a number of provincial-level leading regional facilities, and then lead the development of the whole industry. It is suggested that by 2035, there will be about 18 provincial facilities, and by 2050, there will be about 25 provincial facilities. At the same time, China also needs to build national facilities in Guangdong, Hong Kong and Macao. It is suggested that by 2035, there will be about 6 facilities, and by 2050, there will be about 10 facilities. In this case, Guangdong, Hong Kong and Macao Bay area can well lead the regional science and technology, and constantly enhance the strength of China’s science and technology research.

(2) Overall planning of three types of facilities construction

In the process of the development of science and technology industry, China needs to plan major science and technology infrastructure in Guangdong, Hong Kong and Macao Bay area, and build and improve the development system of science and technology industry. Scientific, communication and testing infrastructure is an important part of China’s major science and technology infrastructure construction, so it is necessary to carry out these three types of infrastructure construction. In the construction of these three types of infrastructure, we should do a good job in scientific and technological research, and promote the development of intelligent and automatic infrastructure.

(3) Build four facilities clusters

By promoting the cluster development of major scientific and technological infrastructure, the benefits of scale development can be generated. Therefore, we need to do a good job in the major scientific and technological infrastructure work in Bay District in order to improve the level of scientific and technological development. Among them, we need to focus on the construction of major science and technology infrastructure around Guangming Science City, Songshanhu Neutron Science City, Nansha Science City and Huizhou Science City. At the same time, we need to introduce technical research talents, build a perfect scientific and technological research system, and provide financial support for scientific and technological research, so as to promote the development of regional science industry.
Focus on five university disciplines

Our country needs to pay attention to scientific development and promote industrial development by discipline. The development of materials science, life, information, ocean, energy and nuclear is the competitiveness of a country’s development. Therefore, China needs to do a good job in the layout of major science and technology infrastructure in Guangdong, Hong Kong and Macao Bay area around the five university disciplines. In other words, China needs to understand the needs of the five university disciplines in the construction and operation of major science and technology infrastructure, so as to provide facility support for the development of the five university disciplines. At the same time, China needs to do a good job in strategic planning, scientifically layout the major science and technology infrastructure construction related to the development of five universities, so as to link the major science and technology infrastructure corresponding to different disciplines, so as to improve the level of discipline development.

5. Conclusion

To sum up, Guangdong, Hong Kong and Macao Bay area is an important area of China’s science and technology strategic layout, and Guangdong, Hong Kong and Macao Bay area already has major science and technology infrastructure. In the future, China needs to continue to improve the construction of major science and technology infrastructure, do a good job in the layout of major science and technology infrastructure, ensure the linkage development of major science and technology infrastructure, and produce cluster development benefits.

Works Cited
