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WEEKLY EDITION

Sci-tech Blueprint for 2023 Outlined

By LU Zijian

Looking back the last decade, China has made major progress in its sci-tech journey.

According to China's annual sci-tech work conference, held via video on December 30, 2022, the country's investment in R&D soared from one trillion RMB in 2012 to 2.8 trillion RMB in 2021. Meanwhile, spending intensity rose from 1.91 percent to 2.44 percent, and China's rank on the Global Innovation Index list also rocketed from 34th place in 2012 to 11th in 2022.

The conference confirmed that promoting high-quality development will be the top priority for the year 2023, and required all sci-tech workers to focus on the following aspects:

- Studying, publicizing and implementing the spirit of the 20th CPC National Congress, and working on the comprehensive studying, understanding and implementation of the spirit.

- Reinforcing national strategic sci-tech strength, while taking into account the national strategic demand and long-term development.

- Improving a new system for mobilizing resources nationwide to achieve breakthroughs in core technologies in key fields.

- Accelerating the implementation of national major sci-tech projects and fostering new economic growth points.

- Strengthening basic research with perseverance and in-advance deployment of key areas.

- Implementing sci-tech policies focusing on self-reliance and self-strengthening, and deepening reform of the sci-tech management system.

See page 4

International Cooperation

Chinese-built Hospital Opens in Kuwait

By LIN Yuchen

The opening ceremony of a Chinese-built health insurance hospital was held in Ahmadi, Kuwait on December 18, 2022. Construction of the Kuwait Health Assurance Hospitals project was undertaken by Metallurgical Corporation of China (MCC), when ground was first broken in November 2017.

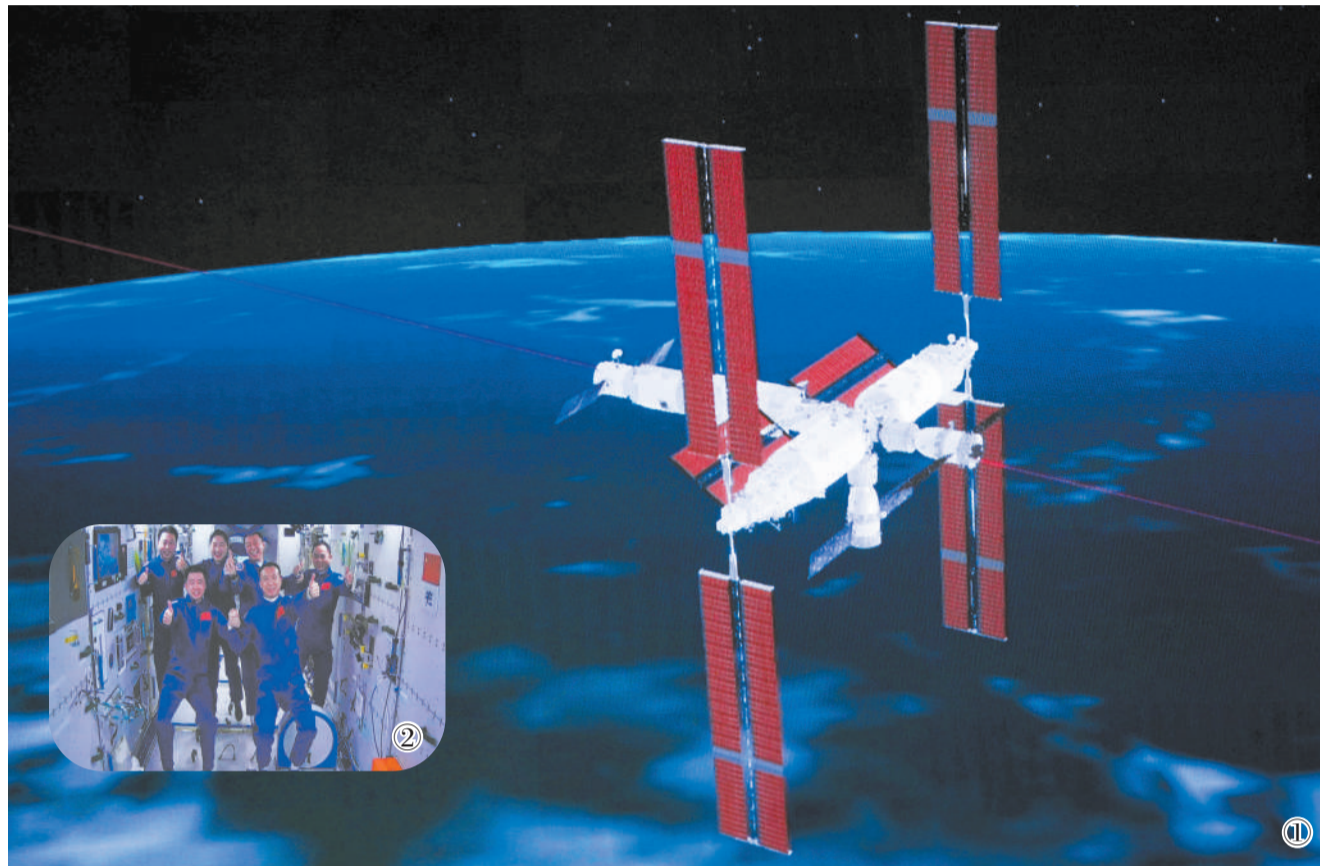
The construction includes two hospitals in Ahmadi and Al Jahra respectively, covering approximately 85,000 square meters, with a total contract value of around 500 million USD.

MCC has made great efforts in the construction process of the project and the two hospitals are of high quality, said Mutlaq Al-Sane, chairman of Kuwait Health Assurance Hospitals Company, adding that as one of the largest development projects in Kuwait, they are highly prized by the Kuwait government.

The project aims to provide exclusive medical insurance services to foreigners in Kuwait. See page 4



The opening ceremony of a Chinese-built health insurance hospital is held in Ahmadi, Kuwait on December 18, 2022. (PHOTO: XINHUA)



①This simulated image shows the manned spaceship Shenzhou-15 conducting docking with the Tianhe module on November 30, 2022. ②China's Shenzhou-15 crew enter the country's space station and meet with another astronaut trio, adding the manpower at the in-orbit space lab to six for the first time. (PHOTO: XINHUA)

Editor's Pick

New Opportunities for Cooperation

Tiangong Space Station Completed

By LU Zijian

The lab module Mengtian, cargo craft Tianzhou-5 and the manned spaceship Shenzhou-15 were successfully launched for the past few months. The Shenzhou-14 and Shenzhou-15 crew had a historic gathering, making the number of astronauts at the in-orbit space lab reach six for the first time.

Tiangong, China's space station, was completed.

Cozy station packed with high-tech
With the docking of Mengtian and Wentian lab modules, the astronauts can enjoy a much bigger space for work and life, and the station can accommodate six astronauts at the same time.

An aerospace expert once described the Tiangong space station as a large house with three bedrooms, meaning the core module and two lab modules, and two living rooms, referring to Shenzhou manned

spacecraft and Tianzhou cargo craft.

The weight of the space station with three modules is only just over 60 tons, much lighter than the International Space Station (ISS), which weighs more than 400 tons. However, in terms of the proportion of scientific experiment payloads in total weight of space station, Tiangong is no less than the ISS.

Many technologies have also been adopted in the station to facilitate its function.

The flexible solar array wings installed on Wentian can reach 55 meters and each wing spreads 110 square meters when fully unfolded, with a photoelectric conversion efficiency of over 30 percent. The electricity generated can guarantee the normal function of the facilities and daily life of astronauts.

A space communications highway was built to make the communication between space, ground, and astronauts

more convenient. In addition, a sub system was enabled to provide wireless communications when astronauts were conducting extravehicular activities, which can be shown and recorded in real time.

Path to completion

It has been over a decade since the space station project was approved in September 2010, and in that time nearly 1,000 institutions joined the research and development of the space station.

Once the R&D in laboratories was completed, the project entered the phase of building the station, which is divided into two stages, key technologies verification and construction.

During the first stage, six flight missions were all successfully completed, including Long March-5B in May 2020, Tianhe core module, Shenzhou-12 manned spacecraft, Shenzhou-13 manned spacecraft, Tianzhou-2 cargo craft, and Tianzhou-3 cargo craft in 2021. See page 2

National Carbon Market Exceeds 10 Bln RMB

By Staff Reporters

The total transactions of China's national carbon market, the world's largest emissions trading system, surpassed 10 billion RMB by December 22, 2022. Meanwhile, the accumulated volume of carbon emissions allowance reached 223 million tons after 350 days of trading.

Since the national carbon market began trading on July 16, 2021, it became the largest trading system of carbon emissions. The trading scale has expanded and the transaction price kept its range between 55 RMB to 62 RMB per ton.

It should be acknowledged that this carbon market has only traded for over a year, said Ma Wenjie, director of Shanghai Institute of International Finance

Center of Shanghai University of Finance and Economics.

The trial period for carbon trading began well before the official launch of the national carbon market. As early as October 2011, trials were carried out in Beijing, Tianjin, Shanghai, Chongqing municipalities, and Hubei and Guangdong provinces.

At the end of 2020, the country initiated the first compliance cycle of the national carbon market. The total transactions in trial municipalities and provinces was 11.4 billion RMB and the accumulated volume of carbon emissions allowance had reached 480 million tons of carbon dioxide equivalent by June 2021.

Currently, the national carbon market is open to over 2,000 power enterprises. Rui Meng, professor of finance

and accounting at China Europe International Business School, said that the carbon emissions of power and heating industry make up 46.33 percent of total domestic carbon emissions, the largest of all industries. Meanwhile, electric power enterprise data is more standardized, and enterprise management is more efficient, said Rui, adding that it conformed to the situation of China to start the carbon market with the power industry.

There are also calls for expanding the carbon market to other sectors. Zhao Yingmin, China's minister of ecology and environment, said that China will gradually enlarge the scale of industries and transaction subjects of the national carbon market based on the steady and effective operation of the current market.

Great Strides in 2022

By LIN Yuchen

On December 16, 2022, China's perennial rice, bred by Hu Fengyi's team at Yunnan University, made the top 10 list of world scientific breakthroughs of 2022, according to the journal *Science*.

But it is not only rice where achievements were made. The completion of the Tiangong space station, and delivery of C919 large passenger aircraft to China Eastern Airlines were just some of the great strides made by China in sci-tech innovation in 2022.

According to the 2022 Global Innovation Index released by the World Intellectual Property Organization (WIPO), China's overall ranking for innovation capacity is now 11th in the world, up one place from the previous year and a jump of 23 places from 2012.

Among 132 economies, China has 21 science and technology clusters that entered the global top 100, 14 more than 2017. This number equals that of the U.S. for the first time, ranked first in the world.

The evaluation results of the WIPO reflect the continuous improvement of the overall effectiveness of China's innovation system, said Xing Huaibin, deputy director-general of the Department of Strategy and Planning of the Ministry of Science and Technology.

In the first 10 months of 2022, the national public budget expenditure exceeded 20 trillion RMB, of which science and technology expenditure exceeded 700 billion RMB, up 8.8 percent year-on-year. In addition, for the first time the People's Bank of China launched science and technology innovation refinancing loans of 200 billion RMB.

The Growth Enterprise Market and Science and Technology Innovation Board listed 248 enterprises in the first 11 months of 2022, raising over 390 billion RMB in initial public offerings, accounting for about 66 percent and 81 percent of the total initial public offerings respectively for the two markets in the same period.

A total of 173 national high-tech zones achieved an industrial output value of 23 trillion RMB in the first nine months of 2022. By last November, the total output of green products, such as new energy vehicles and solar cells increased by about 100 percent and 44 percent respectively year-on-year.

WEEKLY REVIEW

More "Excellent" Scientific Papers Published in 2021

In 2021, China produced a total of 480,500 scientific papers classified as "excellent," which refers to those published in international and domestic scientific journals with high-impact factors and citations, an increase of about 17,000 over the previous year, according to the MOST.

Self-developed Deepwater Gas Field Starts Phase II Project

China's first independently-developed ultra-deepwater gas field Shenhai Yihao, or Deep Sea No. 1, has commenced the construction of its phase II project, the China National Offshore Oil Corporation said on December 30, 2022.

Chinese Scientists Find New Anti-aging Factors

According to the study recently published in the journal *Aging and Disease*, Chinese scientists suggest that activating transcription factor 7 (ATF7) is a longevity-promoting factor that lowers cellular senescence and inflammation in long-lived individuals.

New Space Experiment Satellite Launched

China launched a Long March-3B carrier rocket on December 29, 2022, to send the Shiyao-10 O2 satellite to a preset orbit. The newly launched Shiyao satellite will be used for in-orbit verification of new space technologies, such as space environment monitoring.

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