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New Quality Productive Forces

Bio-manufacturing Industry Has Great Benefits and Potential

By QI Liming

Bio-manufacturing is considered to have the potential to lead the "fourth industrial revolution." A research by global consultancy Nova One Advisor indicates the global market size crossed the one trillion USD level in 2023, and it is now becoming a key area of competition among countries in the world.

Evolving bio-manufacturing has brought many benefits such as the hepatitis B vaccine, insulin, hyaluronic acid compounds and fuel ethanol.

In China, bio-manufacturing is a strategic emerging industry and a crucial means to develop new quality productive forces.

What is bio-manufacturing?

Bio-manufacturing is an advanced industrial model that uses biological tissues or organisms (enzymes, microbial cells, etc.) to process substances into products.

Combining biology, chemistry, engineering and other fields, bio-manufacturing is a new production technology that is clean, efficient and renewable. It has the potential to change the global industrial landscape in areas such as energy, agriculture, chemicals and medicine.

According to industry insiders, bio-manufacturing will bring at least three major changes: it will reconstruct the production route of the traditional chemical industry, replace the traditional way of obtaining natural products, and transform the traditional agricultural planting and breeding model.

Liu Wenqiang, vice president of the China Center for Information Industry Development, said, "Bio-manufacturing, different from traditional physical and chemical manufacturing modes, innovates the way of material production, and uses organisms as production media, which will bring a series of great changes to the manufacturing industry. In addition, bio-manufacturing uses renewable biomass as the raw material, which is also critical for the manufacturing industry to achieve the carbon goals."

China's 'green power'

As a transformative technology, bio-manufacturing is the "green power" of China's industrial transformation and upgrading, and a pivotal way to achieve green development.

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"Haikui No.1," Asia's first cylindrical floating production, storage, and offloading facility, is completed and delivered in Qingdao, marking a significant breakthrough in the independent design and construction of key technologies for deep-water oil and gas equipment in China. (PHOTO: XINHUA)

Editor's Pick

'Origin Wukong' Ushers in China's Quantum Computing Era

By WU Changfeng, HONG Jingpu & LIN Yuchen

On January 6, 2024, China's homegrown third-generation autonomous superconducting quantum computer Origin Wukong commenced operations, offering limited-time free access to global users.

In just three months, Origin Wukong had notched up over 8 million remote visits from 120 countries worldwide, completing approximately 180,000 global quantum computing tasks. This marks China's official entry into the era of accessible quantum computing, signifying the completion of China's indigenous superconducting quantum computer manufacturing chain.

Scientific legacy

The inception of China's quantum computing journey started 26 years ago with a low-key meeting on quantum science.

The meeting was organized by Guo Guangcan, a member of the Chinese Academy of Sciences. The meeting organizer wrote to prominent scientist Qian Xuesen, known as the father of China's aerospace, asking for advice on holding the meeting. Qian agreed that efforts should be concentrated on overcoming the technical challenges to China's quantum information systems.

Guo Guangcan then initiated a research project which obtained China's first national-level major project funding in quantum information in 2001.

Subsequently, Guo Guangcan's student Guo Guoping took up his mantle, leading significant projects in solid-state quantum chip research. In 2013, the team achieved a breakthrough in quantum logic gate operations, laying a robust foundation for semiconductor-based quantum computers.

Quantum computing revolution

Quantum computers, with their immense computational power and broad application prospects, are hailed as future industrial accelerators. A comparison test conducted by Google in 2023 showcased quantum computing's speed advantage — completing in under three minutes tasks for which the fastest supercomputers require approximately 50 years.

This year, the 72-qubit superconducting quantum computer Origin Wukong was finally unveiled.

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China-made Tunnel in Nepal Brings Farmers Hope

International Cooperation

By Staff Reporters

A 13.3-km-long irrigation tunnel has been completed in Nepal's Sindhuli district a year ahead of schedule, thanks to help from Chinese construction teams.

Wrapped up on May 8, the tunnel was constructed as part of the Sunkoshi Marin diversion multipurpose project. It was jointly undertaken by China Railway Second Bureau Group and China Overseas Engineering Group Company.

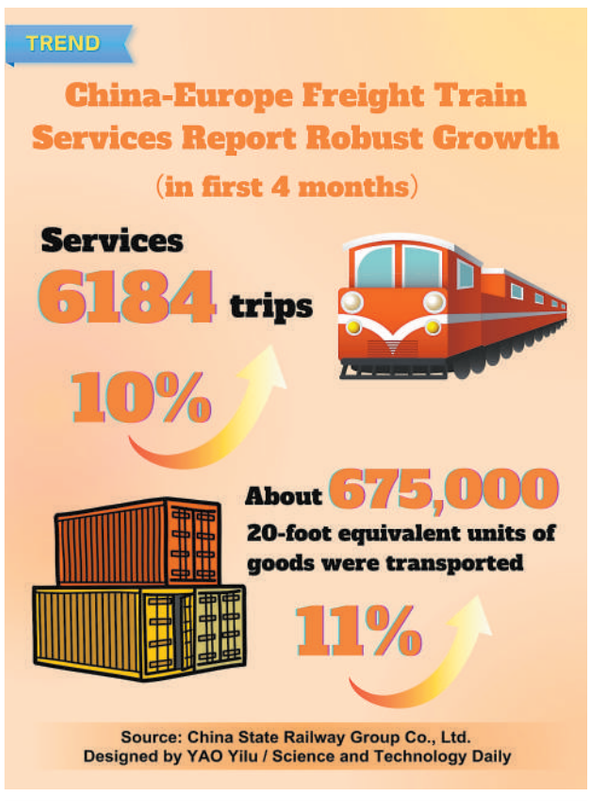
When fully operational, the tunnel will divert the Sunkosi River to the Marin River to irrigate 122,000 hectares of agricultural land in Barra, Tahat, Salahi and other areas, while the project also includes building a hydropower station with an installed capacity of 28.62 MW. This will provide 250 gigawatt hours of hydropower annually to alleviate the shortage of electricity in the surrounding areas.

Speaking at the inauguration ceremony, Nepali Prime Minister Pushpa Kamal Dahal hailed the tunnel as a "transformative national pride project." In his opinion, once the tunnel begins full operation it will improve irrigation facilities and bring economic opportunities. "The completion of such projects contributes to the country's national economy, productivity and prosperity," said Dahal.

Agriculture contributes a third of Nepal's GDP, but the Terai region, which accounts for 60 percent of Nepal's arable land, is short of water in winter and spring, and this project will help Nepal's economic development and reduce the trade imbalance caused by Nepal's large imports of agricultural products, according to the prime minister.

"Chinese enterprises have used their skills, wisdom and solutions, and cooperated with the technical personnel from Nepal to overcome all [construction] difficulties such as geological conditions, logistics problems and the long monsoon period, still finishing the project 12 months ahead of schedule, which shows the Chinese [construction] speed, with high quality and high standards," Chinese Ambassador to Nepal Chen Song said at the ceremony.

New Graphic



WEEKLY REVIEW

China-U.S. Inter-governmental Dialogue on AI

China and the U.S. held the first meeting of the inter-governmental dialogue on AI in Geneva on May 14 local time. The two countries exchanged views on the technological risks of AI, global governance and other issues of concern. The meeting was held to implement the consensus reached at the San Francisco summit between the two heads of state.

Marine Heatwave Forecast Device in Operation

China's first independently developed marine heatwave forecast device was officially put into operation on May 12. It can accurately forecast the occurrence and development of marine heatwave events and their influence range and intensity.

Endangered Rose Spotted in Southwest China

The Rosa lucidissima, a critically endangered wild rose species endemic to China, was found by a joint expedition team in Guizhou province in southwest China. The extremely rare flower, sporadically distributed in southern and central China, is on China's biodiversity red list of endangered species.

'Phonetic Alphabet' Discovered in Whale Calls

A new study suggests that whales' communication system is much more complex than previously thought. By analyzing thousands of recorded calls, researchers discovered a kind of "sperm whale phonetic alphabet" embedded in their strings of "click" sounds, which indicates that they can communicate complicatedly.

Int'l Day for Biological Diversity: A Call to Action

By LI He & LIANG Yilian

The theme of this year's International Day for Biological Diversity (IDB), observed on May 22, is "Be Part of the Plan." IDB 2024 calls on all stakeholders to halt and reverse the loss of biodiversity by supporting the implementation of the Kunming-Montreal Global Biodiversity Framework, also referred to as the Biodiversity Plan.

For this year's IDB, China's Ministry of Ecology and Environment (MEE) and the Hainan provincial government will organize activities jointly. Representatives from state departments, as well as delegates from parties to the Convention on Biological Diversity, the EU, UN organizations and other international organizations will also participate in various activities, according to an MEE press conference.

The Chinese government attaches great importance to biodiversity conservation.

At the beginning of this year, the MEE issued the *China National Biodiversity Conservation Strategy and Action Plan (2023-30)*, promoting the implementation of the Kunming-Montreal Global Biodiversity Framework and advancing global biodiversity governance, according to Pei Xiaofei, MEE spokesperson. The action plan has been submitted to the Secretariat of the Convention on Biological Diversity in Montreal, Canada.

Looking back in history, China was one of the first countries to sign the Convention on Biological Diversity in June 1992, showing its dedication to global biodiversity preservation.

Demonstrating this commitment, since then, the government has issued more than 40 policy documents on the construction of an ecological civilization. It has also issued or revised over 30 laws and regulations on the protection of the environment, wild animals, the marine environment and other sectors.

The action plan commits that at least 30 percent of degraded ecosystems in terrestrial, inland water, coastal, and marine areas will be restored by 2030.

The commitment and efforts have led to remarkable results. China has established 11,800 protected areas of various types and levels, protecting 90 percent of vegetation types and terrestrial ecosystem types, 65 percent of higher plant communities, and 85 percent of key protected wildlife populations.

An official guideline has also been issued to strengthen law enforcement, protection, and restoration, and maintain the national ecological protection red line area above 3.15 million square kilometers.

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