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Innovation Pathway

Industries of the Future to Be Boosted

By Staff Reporters

Xi Jinping, general secretary of the Communist Party of China (CPC) Central Committee, has urged efforts to leverage the country's comparative advantages, pursue progress while maintaining stability, and promote continuous breakthroughs in the development of industries of the future.

Xi made the remarks while presiding over a group study session of the Political Bureau of the CPC Central Committee on January 30.

Experts responded to his remarks with various insights and suggestions.

Yu Haibin, an academican of the Chinese Academy of Engineering and director of the Institute of AI for Industries, Chinese Academy of Sciences (CAS), said efforts will be made to tackle the barriers in general AI frontier technology in major application scenarios in the manufacturing industry. At the same time, the "AI Plus" initiative will be advanced and strategic support for the development of industries of the future strengthened.

Wan Jinbo, a researcher at the Institutes of Science and Development, CAS, suggested guiding enterprises to closely cooperate with universities and research institutions, identify sci-tech challenges aligned with industrial needs, and undertake joint research on key core technologies.

They should also coordinately advance efficient commercialization and application of sci-tech achievements.

This was echoed by Yu Xiaohui, president of China Academy of Information and Communications Technology, who said it is key to incubating and cultivating original innovative industries of the future.

In regions where scientific, educational, talent and financial resources are abundant, the focus should be on developing cutting-edge technologies, integrating full-cycle resources of basic research, applied research and industrialization.

Yu also said industries of the future should be developed according to local conditions.

Hangzhou in east China is establishing innovation projects in disruptive technology in the low-altitude economy and humanoid robots sectors, systematically establishing its competitive advantages in industries of the future.

Guided by the city's goal to become the premier city for AI innovation and development, Hangzhou will accelerate the construction of a higher-level dynamic innovation hub, Lou Xiuhua, head of Hangzhou's municipal bureau of science and technology, said.

Zhang Yong, deputy director of Industry and Information Technology Department of Shaanxi, said the northwestern province will focus on establishing a support system of "platform + policy + fund," and a batch of innovation centers and pilot-scale platforms for industries of the future in nine industrial chains. See page 2



Several large ships are under construction in Taizhou city, Jiangsu province on February 2. Latest data from China's Ministry of Industry and Information Technology show that the country maintained a leading position in the global market share for shipbuilding for 16 consecutive years. (PHOTO: XINHUA)

STI Frontier

Electricity Generated from Carbon Dioxide

By WANG Xiaoxia, CHEN Yu & WU Yefan

The world's first commercial supercritical carbon dioxide (sCO₂) power generator, Chaotan One, has recently begun commercial operation in Liupanshui, Guizhou province. The generator was developed by the Nuclear Power Institute of China (NPIC) of the China National Nuclear Corporation (CNNC), and its partners.

Compared with conventional waste-heat steam power generation technologies, Chaotan One offers over 85 percent higher generation efficiency and more than 50 percent higher net power output. Behind these achievements lies the 17-year dedication of the R&D team, who have successively solved a series of technical problems in design, manufacturing and integrated application.

Micro-channels required
sCO₂ is a fluid state of carbon dioxide

where it is held at or above its critical temperature and critical pressure.

The power generation technology uses sCO₂ as the working medium for energy transfer and thermal power conversion, replacing water vapor in traditional power generation to achieve the conversion from thermal energy to electrical energy.

Compared with water vapor, sCO₂ has high density, low viscosity, and does not go through a gas-liquid transition. It can not only improve efficiency but also reduce the volume of equipment, Huang Yanping, CNNC chief scientist and the general designer of Chaotan One, told *Science and Technology Daily*.

Since the concept of sCO₂ power generation was proposed in 1948, development of the generator has eluded R&D teams. The missing link was the essential stage of establishing a microchannel heat

exchanger with finer channels and higher heat exchange efficiency, said Huang, who began the research on sCO₂ power generation in 2009, and decided to start from this key problem.

However, using traditional photochemical etching methods, it is extremely difficult to precisely process hundreds of one-millimeter-diameter grooves on stainless steel thin plates, said Liu Ruilong, one of the R&D team members.

The samples provided by the manufacturer didn't meet required standards, so Liu and his colleague Fei Junjie visited the etching factory to cooperate with experienced technicians and create an innovative solution for the required manufacturing process.

Eventually, after a few weeks, hundreds of micro-channels were evenly and precisely carved on the plate.

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Rising Integration of Technology and Industry in 2025

By Staff Reporters

In 2025, the integration of technological and industrial innovation was no longer an abstract concept in policy documents, but a vibrant practice spreading across the country.

Technological foundation

The advancement of technology determines the depth of integration between technological innovation and industrial innovation. Over the past year, multiple breakthroughs have been made in key core technology R&D, providing a source of vitality and fundamental support for industrial upgrading.

Carbon fiber, dubbed "black gold," is an indispensable strategic material for high-end equipment in industries such as

aerospace. The Institute of Coal Chemistry, under the Chinese Academy of Sciences, and Shanxi Huayang Carbon Materials Technology Co., Ltd. have jointly built a production line in Datong, Shanxi, in north China, with an annual output of 200 tons of high-end T1000 carbon fiber.

It was put into operation last November. The products will be widely used in fields such as aerospace, rail transit, new energy and low-altitude economy, providing support for strategic emerging industries and future industry development.

Breakthroughs in quantum communication technology are promoting the industrial application of the technology in areas such as digital and intelligent office and cities.

In the field of biomanufacturing, material innovation company Bluepha uses waste bio-oils as carbon sources, mass production of PHA and opening up a trillion-RMB market for bio-based materials.

In new energy, the Experimental Advanced Superconducting Tokamak (EAST) has laid the foundation for nuclear fusion energy.

Booming industries

Industry serves as the carrier and amplifier of technological innovation. Over the past year, cutting-edge technologies represented by AI have empowered traditional industries such as manufacturing, and expanded the boundaries, scenarios and possibilities of the technology-industry integration. See page 3

International Cooperation

Chinese Experts Help Upskill Sierra Leone Farmers

Edited by WANG Xiaoxia

At Njala Farm, located in a village on the outskirts of Bo, the second largest city in Sierra Leone, patches of rice fields are inlaid on the mountain slopes shining like jade, a testament to the bumper harvest of high-quality rice.

The high-yield demonstration rice field is a cooperation project developed by the 14th China Agricultural Technical Expert Group to Sierra Leone, in West Africa.

Li Youliang, the team leader, said that experts began the field reclamation in October 2023. One year later, they reclaimed five hectares of land on the wasteland and planted two seasons of rice in 2024 and 2025.

It is not easy to reclaim wasteland in a mountainous country like Sierra Leone. The experts meticulously planned and designed the project based on the local conditions, dividing the whole field into 16 small plots, and dug a drainage ditch every six meters while sowing the seedlings.

Compared with local varieties, the Chinese rice varieties have higher resistance to diseases and pests, and the yield has risen from the one to three tons per hectare produced by local rice to nine tons per hectare.

In addition to cultivating high-quality rice varieties, Chinese experts also trained local farmers in practical farming techniques, for high-yield cultivation of rice and corn, hybrid breeding of rice, and operating agricultural machinery. A local farmer named Mike is now proficient in driving tractors and combine harvesters, while also capable of performing basic repairs.

Agriculture is one of the important cooperation areas between China and Sierra Leone. The Chinese agricultural experts have helped Sierra Leone establish six agricultural demonstration bases, presenting local farmers with modern agricultural methods to improve yields and promoting the application of advanced farming technologies.

WEEKLY REVIEW

China's 'Bolt' Robot Runs 10m/s

Zhejiang University in east China has unveiled "Bolt," a full-size humanoid robot capable of running 10 meters per second, closing in on the speed of sprint legend Usain Bolt.

A New Flexible Chip for Wearable Technology Unveiled

Chinese researchers have unveiled a new flexible chip that could drive the next wave of innovation in wearable technology. The breakthrough, detailed in a study published in the journal *Nature*, aims to enable more efficient and powerful computing directly on the body — such as on skin or integrated into fabrics — reducing reliance on distant data centers.

Jupiter Smaller, Flatter than Previously Believed

An international team of researchers has measured Jupiter with unprecedented precision and found that the solar system's largest planet is smaller and more flattened than previously thought. The new study, published in *Nature Astronomy*, used data from NASA's Juno spacecraft.

Artificial Organ Keeps Patient Alive for 48 Hours After Lungs Removal

A groundbreaking case recently published in the journal *Med* reported the successful use of an external, artificial lung system to sustain a critically ill patient for 48 hours after the complete removal of both lungs. This won enough time for the patient to have lung transplants.

New Graphic

IN 2025

China's Fiscal Expenditures on Science and Technology

1206.2 billion RMB

4.8% y-o-y

Source: China's Ministry of Finance
Designed by SONG Ziyun / Science and Technology Daily

WECHAT ACCOUNT



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