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Xi Calls on BRICS to Unite Global South, Deepen Cooperation

Chinese President Xi Jinping on September 13 called on BRICS countries to strengthen unity among the Global South and play an active, stabilizing and positive role in global affairs.

In a speech when attending the second day of BRICS summit in New Delhi, Xi also outlined concrete proposals to further strengthen greater BRICS cooperation, with a focus on emerging areas including artificial intelligence, trade, digital industries and manufacturing.

Key driver of multipolarity

Xi pointed out that when changes unseen in a century are accelerating across the world, the Global South, with its collective rise, has become a key driver of world multipolarity.

At the same time, the international landscape is volatile and fraught with risks and challenges, Xi said, adding that to bring stability to the world and make it a better place, BRICS countries must seize the historical initiative, rally the Global South, and advance the well-being of all humanity.

Global South countries should jointly defend the rule of law in international affairs, safeguard the basic norms of international relations including sovereign equality, noninterference in internal affairs, and the peaceful settlement of disputes, Xi said. It should be ensured that international law and international rules are applied to all, and free from double standards, he added.

Global South countries should hold high the banner of multilateralism, uphold the authority and role of the United Nations, and support multilateral institutions in advancing reform and increasing efficiency, Xi said.

He also called for promoting the reform of the World Trade Organization in the right direction, as well as reforming and improving the international financial architecture to increase the representation and voice of developing countries.

Global South countries should stay committed to a people-centered development philosophy and strive to deliver on the 2030 Agenda for Sustainable Development, Xi said.

Global South countries should also jointly advance security governance, tackle both traditional and nontraditional security threats, and improve global climate governance, Xi said, also calling for working faster to evolve a consensus-based global AI governance framework, so that new technologies can light the way toward shared prosperity. *See page 4*



The Pinglu Canal in Guangxi Zhuang autonomous region becomes operational on September 16. (PHOTO: XINHUA)

STI Frontier

Landmark Pinglu Canal Advances High-standard Opening Up

By Staff Reporters

The Pinglu Canal, a landmark project four years in the making, opened on September 16, giving China's landlocked southwest a direct route to the sea and overseas markets.

The 134.2-kilometer canal connects Nanning, capital of south China's Guangxi Zhuang autonomous region, with the Beibu Gulf, the nearest sea access point for much of southwest China. It is China's first major river-to-sea canal project to be planned and coordinated at the national level since 1949.

The canal links inland rivers with the sea, a pioneering feature in China's modern waterway construction. As a backbone project of the New International

Land-Sea Trade Corridor, it opens the shortest, most economical and most convenient route from Guangxi and China's southwest to the sea.

World-class engineering and smart management

The canal can be navigated by 5,000-tonne vessels, making it the highest-grade river-sea connectivity canal in China and the world to date. It is built to inland waterway Class I standards, with hub ship locks designed for a 100-year service life.

"The project has exceeded industry standards and surpassed national standards, forming more than 300 high-level technical indicators," said Cheng Yaofei, chairman of Guangxi Pinglu Canal Construction Co., Ltd.

To overcome a natural drop of 65 meters in the water level, the canal has three cascade hubs: Madao, Qishi and Qingnian. The Madao hub is the world's largest inland water-saving ship lock and the world's highest-drop water-saving ship lock. The working valves at the Madao and Qishi hubs are the fastest of their kind, opening in just one minute and closing in only 30 seconds. Both hubs use a stacked three-tier water-saving pool system, the first of its kind in the world, with the water-saving rate exceeding 60 percent.

With a world-first technology, four world records, 21 major technological innovations and more than 220 invention patent applications, the canal has contributed a "Chinese solution" to global modern canal construction. *See page 3*

International Cooperation

BRICS STI Partnership Yields Fruitful Results

By LI Linxu

Through joint scientific expeditions, collaborative disaster relief, partnerships in mega-science projects, and cross-border transformation of sci-tech achievements, cooperation in science, technology, and innovation (STI) is continuously taking root and bearing fruit across BRICS nations.

Exploring the deep blue

This March, Indian scientist Shramik Maruti Patil boarded the research vessel Xuelong 2 to conduct a joint scientific expedition on the "Autumn Southern Ocean Ecosystem."

"The Xuelong 2 provided me with a valuable opportunity to exchange ideas with scientists from diverse research backgrounds," Patil said. His trip to Antarctica was made possible by an invitation from the BRICS Deep-Sea Resources International Research Center.

"We are advancing deep-sea research cooperation through joint scientific expeditions, co-construction of platforms, exchange and training programs," said Tao Chunhui, director of the Center.

Chen Qizhen, deputy director-general of the Administrative Center for China's Agenda 21, said, "As the center's administrative office, we will further play a coordinating role. Our goal is to build a collaborative platform for joint research and resource sharing for BRICS researchers, ultimately driving more practical cooperative outcomes."

Empowering rescue efforts

Last year, triggered by heavy rainfall, landslides struck Central Java province and floods hit Sumatra Island in Indonesia, causing severe damage and losses.

Indonesia requested emergency disaster relief support from China, and the Land Satellite Remote Sensing Application Center under China's Ministry of Natural Resources swiftly formulated satellite imaging plans for the affected areas, acquired local satellite imagery, and built a dedicated online service page to deliver real-time data.

"These activities supported emergency disaster relief efforts, and will be used to strengthen future related research," said Rokhis Khomarudin, head of the Research Center for Geoinformatics at Indonesia's National Research and Innovation Agency.

"China's land remote sensing satellite data has played an important role across multiple BRICS nations, supporting emergency disaster response, foundational surveying and mapping, resource management, and ecological protection," according to Tian Haibo, director general of the Land Satellite Remote Sensing Application Center. *See page 2*

New Graphic

IN AUGUST 2026

China's Output of Industrial Robots Grew

34.6%
y-o-y

Source: National Bureau of Statistics
Designed by SONG Ziyan / Science and Technology Daily

Pujiang Innovation Forum Seeks Extensive Collaboration

By CHEN Chunyou, LIU Yin,
WANG Chun & LI Jun

"If you want to go fast, go alone. But if you want to go far, go with friends." During the 2026 Pujiang Innovation Forum held in Shanghai from September 11 to 14, Motlalepula Gilbert Matsabisa, professor of pharmacology at the University of the Free State, South Africa, recounted this proverb to *Science and Technology Daily*.

That spirit ran through the forum. Themed "Sharing Innovation and Shaping the Future: The Mission of the Global Sci-Tech Community amid a New Round of Sci-Tech Revolution," it brought together scientists, policymakers and industry practitioners from more than 50 countries and regions, plus over 20 international organizations.

Over four days, the event featured an opening ceremony, a main forum, 24 sub-forums under three major tracks: basic research, future industries

and innovation ecosystems, alongside a range of supporting exhibitions and themed sessions. Discussions spanned cutting-edge areas including AI, quantum science, brain-computer interfaces and biomedicine.

South Africa took on the role of this year's Country of Honor, the first African nation to hold this position, and as part of the Country of Honor program running alongside the forum, the South Africa Pavilion showcased more than 10 projects covering agriculture, medicine, aerospace and hydrogen energy.

Matsabisa, also one of the exhibitors at the pavilion, said the designation put South Africa on the global stage and let the world see its innovation capacity.

At the start of the forum, Eric Rafaele, political and economic counselor at the South African Embassy in China, hoped it would expand sci-tech cooperation between South Africa and China, and help both explore new areas

of collaboration.

Many frontier scientific and technological challenges facing the world today require joint efforts across borders. A string of landmark initiatives were announced at the forum to advance global open innovation and fair academic governance.

Shanghai reached consensus with UNESCO to jointly launch the Global Innovative Cities Alliance, a platform to pool urban innovation wisdom worldwide, boost cross-city collaborative innovation and foster an open, inclusive and sustainable global sci-tech future.

It also released the 2025 list of the world's leading sci-tech journals. The evaluation framework of the list delivers an impartial global academic assessment of journals from emerging economies and newly launched publications, helping build a more balanced global academic ecosystem.

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WEEKLY REVIEW

China Donates Chang'e-6 Lunar Sample to UN

China donated a lunar sample collected by the Chang'e-6 mission to the UN at a handover ceremony in Vienna on September 14. It was the first time that a lunar sample from the far side of the moon was presented to the organization.

Zhuque-2E Rocket Sends 10 Satellites into Space

China successfully launched a Zhuque-2E Y7 carrier rocket from the Dongfeng commercial space innovation pilot zone in the northwest on September 15, deploying 10 networking satellites for a mega-constellation into their preset orbits.

Scientists See DNA Molecules 'Zip' Together

Scientists have directly observed how two negatively charged DNA molecules can pair up despite normally repelling each other. The discovery confirms a theory proposed two decades ago and could help researchers understand DNA interactions involved in cancer and other cellular processes.

Physicists Discover 'Curveball' in Quantum Light

An international team at the Paul Scherrer Institute in Switzerland has experimentally demonstrated the optical Magnus effect for the first time, revealing that a tightly focused laser interacts most strongly with an atom slightly away from the beam's center.

Software and IT Service Industry to Reach New Heights by 2030

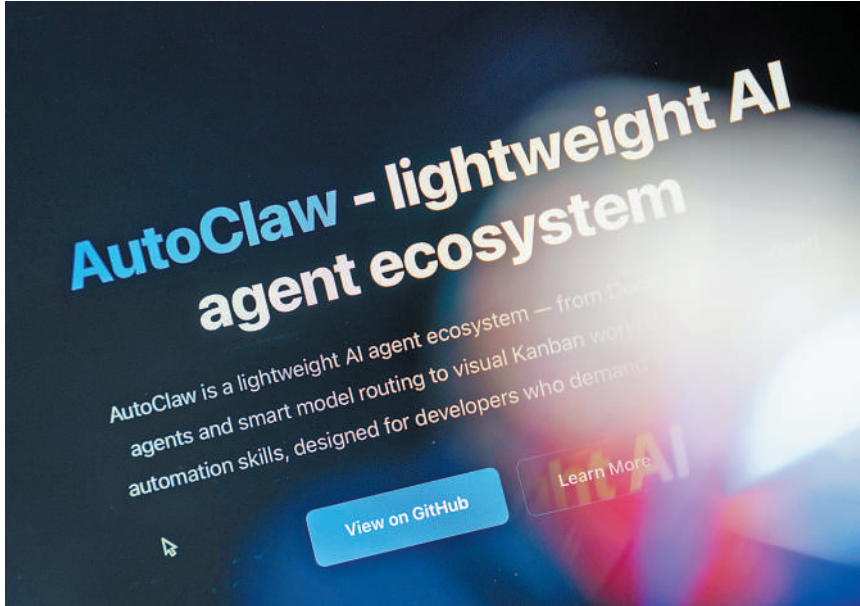
Policy Express

By TANG Zhexiao

China's integrated development of artificial intelligence (AI) and the software and information technology services industry will reach new heights by 2030, with new business models — including intelligent programming, AI agent software, and intelligent services — emerging as new growth engines for the sector, according to an action plan released by the Ministry of Industry and Information Technology (MIIT).

The plan specifies that by 2028, the intelligence level of the software and IT service industry will be markedly improved. Its promotion and application will cover 20,000 software enterprises above designated size. A total of 100 intelligent technological transformation projects for software firms will be rolled out, 100 benchmark applications of AI agent software will be built in key industries, and more than five high-quality open-source projects will be incubated.

AI is reshaping software product forms and transforming software development models, presenting a historic opportunity for the software industry to reshape its competitive landscape and achieve leapfrog development via new tracks, the MIIT said. The plan will accelerate the reshaping of software and infor-



The AI agent AutoClaw is arranged on a laptop in Shanghai, China. (PHOTO: VCG)

mation technology services powered by AI and improve the quality of IT services.

Based on the varying foundations and development stages of software enterprises, the plan has designed three transformation pathways have been designed to guide software companies to embrace the trend of intelligent transformation:

- ◆ Accelerating changes to production modes, and boosting quality and efficiency through intelligent programming tools.
- ◆ Guiding enterprises to build intel-

ligent product portfolios, and advancing intelligent upgrading of traditional products such as basic software and industrial software.

- ◆ Facilitating enterprises' transformation into AI application service providers, supporting their procurement of large models and AI agent services, and improving the effectiveness of AI adoption across the industry.

A series of arrangements have been made across six key areas including advancing transformation in software production, accelerating the

intelligent upgrade of software products, and fostering new business models of AI agent software.

Specific measures include developing AI agent-driven intelligent programming tools, supporting enterprises in utilizing large models, enriching the intelligent functions of software, and optimizing human-machine collaborative production organization.

For nurturing and expanding providers of intelligent software services, regions with the necessary conditions are encouraged to develop "AI + software" innovation and entrepreneurship clusters, coordinating the provision of supporting resources such as venues and computing power.

Software security capacity will be substantially enhanced. The plan requires strengthened security review for AI-generated code, prevention of new types of attacks such as malicious instruction injection against intelligent programming tools, and tightened access control for development tools and code repositories. Meanwhile, it calls for strengthening governance of intellectual property compliance of AI-generated code.

Support will be offered to eligible "AI + software" projects. Special funds will be deployed to accelerate R&D of key technologies, infrastructure development and scenario-based applications.



Fostering Integrated Innovation of Digital, Intelligent & Green Tech

By TANG Zhexiao

An action plan to advance coordinated digital and green transformation during the 15th Five-Year Plan period (2026-2030) is issued jointly by seven authorities including the Cyberspace Administration of China (CAC), the National Development and Reform Commission, the Ministry of Industry and Information Technology, and the Ministry of Ecology and Environment.

The plan targets to significantly improve energy efficiency in emerging sec-

tors such as computing power facilities and 5G base stations by 2030.

Digital and green transformation will be advanced in key areas including agriculture, manufacturing, trade, consumption and urban operation. The capacity of digital and intelligent technologies to empower ecological and environmental governance will be enhanced.

The CAC defined coordinated digital and green transformation as a process that fosters integrated innovation of digital, intelligent and green technolo-

gies, and advances coordinated development of the digital economy and green economy.

Centering on the development goals for the 15th Five-Year Plan period, the plan lays out 14 key tasks under four categories: advancing integrated innovation of digital intelligent and green technologies, boosting energy-use efficiency in emerging sectors, scaling up applications in key fields, and strengthening foundational support.

The specific measures are:

- ◆ Deploying general large models, industry-specific large models and agents, and promoting low-carbon and green development of computing power facilities, communication base stations and digital enterprises.
- ◆ Focusing on key technologies such as digital-twin simulation and multimodal perception, and expanding innovative applications of AI algorithms in green operation scenarios.
- ◆ Developing new energy agricultural machinery, and advancing digital-intelligence-driven green farming.
- ◆ Accelerating the development of

new generation smart manufacturing and green manufacturing.

- ◆ Researching and formulating a guiding catalog for the import and export of green goods and services.
- ◆ Increasing the supply of AI-enabled terminals, smart wearables, green home appliances, green building materials, new energy vehicles and other products to boost consumption of green and smart commodities.
- ◆ Promoting the construction and upgrading of city information modeling platforms, and deepening the application of digital-twin technologies in urban energy networks.

For deeper international exchanges and cooperation, the plan calls for dialogue and collaboration on digital and green economies through multilateral mechanisms and forums including the World Trade Organization, the Belt and Road Initiative, G20, BRICS, the Shanghai Cooperation Organization, APEC and the World Internet Conference.



In the production workshop of an energy-saving technology company in Tianjin, robotic arms carry out manufacturing tasks. (PHOTO: XINHUA)



A worker at the aluminum sheet and strip production line in Minhe's industrial park, Qinghai province. (PHOTO: ZHANG Tianfu / Science and Technology Daily)

BRICS STI Partnership Yields Fruitful Results

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Facilitating R&D

Since 2024, the Institute of Plasma Physics under the Chinese Academy of Sciences (CAS) has been organizing annual activities, including fusion training courses for young scientists, student summer camps, and summer research programs. To date, over 100 students from BRICS countries have participated in them.

Leveraging mega-science facilities, scientific research cooperation and personnel exchanges among BRICS nations continue to deepen.

Eduardo Granado, physics professor at the Brazil's University of Campinas, is currently researching a new type of magnetic material.

In March, he visited the China Spallation Neutron Source (CSNS). Utilizing its Multi-physics Instrument under low-temperature conditions, he successfully detected the magnetic peaks of the

material samples, providing crucial experimental evidence to unveil their microscopic magnetic structures.

To date, the CSNS has assisted 10 universities and research institutions from BRICS nations in completing over 100 experiments.

"Advanced neutron sources have been listed as a priority area for sci-tech cooperation among BRICS nations. The CSNS will continue to expand its open sharing, providing platform support for sci-tech cooperation among BRICS countries," said Li Xiao, deputy director of CSNS at the Institute of High Energy Physics, CAS.

Improving people's livelihoods

At the China-BRICS Science and Innovation Incubation Park for the New Era, headquartered in Xiamen, a company co-founded by scientists from China, India, and Russia has successfully tackled bottlenecks to develop an aquaponics recirculating aquaculture solution.

"Currently, Indonesian enterprises have clearly expressed their investment intentions for this technology," said Cao Weimin, deputy director-general of Xiamen Municipal Bureau of Science and Technology. This technology is expected to provide a new option for BRICS nations' fisheries to resolve the contradiction between environmental protection and industrial development.

As a collaborative research initiative, BRICS-Bioenergy from Eco-Sustainable Technology has evolved into an industry-university-research collaborative innovation platform spanning multiple countries.

At Tianjin University of Science and Technology, scientists from countries including China and South Africa are conducting joint research to tackle key technologies for next-generation bio-refining, specifically targeting sugar industry by-products such as sugarcane bagasse and molasses.

"Together with our partners, we have stepped onto the front lines of production to learn, research, and exchange ideas within real production scenarios,"

said Wang Zhengxiang, a professor at Tianjin University of Science and Technology. "We aim to transform sugarcane, a major agricultural resource, into green wealth for BRICS nations."

Data shows that BRICS nations publish over two million scientific papers annually. How to better facilitate the cross-border transformation of these sci-tech achievements from the "bookshelf" to the "market shelf" is exactly what the BRICS Technology Transfer Center has been promoting.

"The true success of scientific research achievements lies in taking root, and the key to the cross-border transformation of sci-tech achievements lies in mutual recognition of standards and the training of technology managers," said Li Mugian, a research fellow at the center.

Li believes that BRICS nations should establish a mutually recognized, practical, and applicable system for technical standards and technology managers based on their actual conditions, serving the flow of technology and common development among member states.

Pujiang Innovation Forum Seeks Extensive Collaboration

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Also rolled out were 10 landmark basic research questions covering the mathematical foundations of AI, quantum error correction, early-universe black holes, protein dynamic functions and aging heterogeneity. These questions are designed to guide high-risk, high-value basic research and support sci-tech strategic planning.

At the main forum, experts discussed how AI is transforming scientific research paradigms and bridging the gap between basic research and industrial translation.

Benoît Dubuis, president of the Swiss Academy of Engineering Sciences, stressed that openness and integration are vital to innovation. No single country can tackle today's complex sci-tech challenges on its own. China has unique strengths for joint innovation in scale and speed. He said that exchanges are only a starting point, and tangible,

trust-based cooperation is required to deliver real innovation outcomes.

"The Pujiang Innovation Forum offers a platform to learn from each other. I hope that one day, Switzerland will be the Country of Honor of the forum," Dubuis said.

At the opening ceremony, following a congratulatory message by South African President Cyril Ramaphosa, China's Minister of Science and Technology Yin Hejun, South Africa's Minister of Science, Technology and Innovation Blade Nzimande, officials from Shanghai and Hunan, which was the Province of Honor, as well as representatives of international organizations, shared their thoughts.

Launched in 2008, the annual Pujiang Innovation Forum is co-hosted by China's Ministry of Science and Technology and the Shanghai Municipal Government, serving as a weather vane for global innovation and a booster of collaboration.

U.S. Drone Ban Plan Meets Overwhelming Public Opposition

Clear Voice

By LIANG Yilian & HU Dingkun

The U.S. Federal Communications Commission (FCC) on July 21 proposed prohibiting the import and marketing of foreign-made "military-grade" drones, citing "unacceptable risks to the national security of the United States" and opened the proposal to public comment. The comment period closed on September 2.

Recently, U.S. drone industry news outlet DroneXL, citing data compiled by the prominent U.S. drone training organization Pilot Institute, reported that the FCC received 3,829 comments, of which 3,824 contained readable text. Over 98 percent of them opposed the proposal, while only 16 supported it — comprising a trade group, two venture investors, a think tank and a handful of domestic manufacturers that compete with the aircraft targeted.

The overwhelming opposition stems from the fact that the FCC's proposal effectively labels ordinary civilian drones as "military-grade" and imposes sweeping import restrictions under the broad banner of national security. Under the FCC's proposed definition, drones equipped with thermal imaging sensors or LiDAR, "docking stations", agricultural spraying equipment, or swarming capabilities would fall into the "military-grade" category.

This is clearly absurd because many civilian drones already have these features and capabilities. LiDAR, for example, has become a standard feature on drones equipped with obstacle-avoidance systems, while thermal imaging is indispensable for many search-and-rescue operations.



Visitors pause to look at a DJI EV50 vertical take-off and landing cargo drone on display at the DJI booth during the International Advanced Air Mobility Expo 2026 in Shanghai, July 22, 2026. (PHOTO: XINHUA)

According to Pilot Institute, 1,584 comments questioned whether the FCC's definition of "military-grade" drones was appropriate. Of these, 1,575 said the definition was overly broad, while 1,148 pointed out that thermal imaging and LiDAR are ordinary commercial sensors.

According to DroneXL, the FCC's proposal appears to include every drone currently manufactured by Chinese company DJI. In fact, this may be the real purpose behind the FCC's proposal: to escalate efforts to restrict and suppress Chinese drone manufacturers.

Chinese drones have a dominant position in the U.S. consumer, commercial and government drone markets. DJI-manufactured drones comprise more than 96 percent of detected platforms in the U.S. National Airspace System, according to the U.S. Alliance for System Safety of UAS through Research

Excellence 2025 annual report.

In December 2025, the FCC added foreign-made drones and critical components to its "Covered List", effectively preventing new models from receiving its authorization. While it allowed models that had already been authorized to remain on the market, the current proposal, however, explicitly targets equipment that had been "previously authorized", potentially closing that "loop-hole" as well.

Restricting imports of Chinese drones would come at a substantial cost to the U.S. economy and public safety. The American public have not hidden their concerns in the submitted comments.

In its request for comment, the FCC concluded that the proposal's economic impact would be "relatively minor and contained" and asked commenters whether they agreed. Of the

1,701 comments that addressed the question, 1,686 said the proposal would cause serious economic harm.

Pilot Institute put the issue bluntly, describing foreign-made drones as the "operating base of the American civil drone economy." According to DroneXL, the American Drone Data Protection Coalition estimates that replacing DJI drones registered in the United States in 2023 alone would cost an additional 1.12 billion USD.

On public safety, 598 comments raised concerns about search-and-rescue or firefighting capabilities, with 513 stating that the proposal would lead to casualties in emergency response operations.

Kyle Nordfors, UAS chair of the U.S. Mountain Rescue Association and drone coordinator for Weber County Search and Rescue in Utah, said thanks to the super capable and affordable platforms like DJI and Autel, "we are saving countless American lives". He argued that the FCC's proposal would take life-saving tools away from public-safety personnel and put more American lives at risk.

Nordfors emphasized that U.S.-made drones simply cannot meet all the functional requirements that search-and-rescue personnel need to perform their missions — they deliver less than half the performance of DJI products, yet cost three to eight times as much.

The public comments demonstrate that the FCC's crackdown on Chinese drones is deeply unpopular. Whether for ordinary American drone enthusiasts, commercial aerial photography and performance companies, or even public safety agencies that rely on drones to save lives, Chinese drones are cost-effective, high-quality tools and indispensable "good helpers". The FCC should heed public opinion, abandon the proposal as soon as possible, and stop doubling down on a misguided course of action.

Claim of China's 'Overcapacity' Nothing but a False Proposition

Opinion

By QI Liming

Lately, Western media outlets have been publishing articles accusing China of so-called "overcapacity," which is largely a political tag imposed by some Western politicians and media to advance protectionism, rather than an objective description of the economic realities.

Lin Weilong, director of the Policy Research Office of China's Ministry of Commerce, said overcapacity is a dynamic phenomenon in the market economy. It is related to changes in supply and demand and is influenced by the industrial life cycle. It is always in a dynamic cycle of "balance - imbalance - rebalance." Balance is relative, and imbalance is universal.

At the same time, the rate indicator of capacity utilization needs to be viewed separately based on the actual

situations of different countries and various industries.

"From the perspective of China's situation, the overall industrial capacity utilization rate is within a reasonable range," Lin said.

In 2025, the capacity utilization rate of large-scale industrial enterprises was 74.4 percent. In high-tech manufacturing, high-end equipment manufacturing, and strategic emerging industries, it was more. However, for some traditional industries such as raw materials, it was temporarily lower due to structural adjustments and green transformation, which are adaptive adjustments brought about by the process of industrial quality improvement and upgrading.

"Overall, China's industrial supply and demand are basically balanced and the operation trend is stable," Lin added.

As for the fallacy that subsidies lead to overcapacity, from the perspective of economic laws, there is no inevitable causal relationship between subsidies and overcapacity. Reasonable

industrial subsidies are used to correct market failures and support the growth of emerging industries. They are a common and legal policy tool worldwide.

Data from the United Nations Conference on Trade and Development shows that the number of global industrial policies continued to increase in the past five years. Research and development subsidies, tax incentives, and low-interest loans are all policy measures commonly adopted by World Trade Organization (WTO) members.

If the claim that "subsidies inevitably lead to overcapacity" held true, then all major economies in the world would face accusations of overcapacity — a conclusion plainly at odds with the facts. Forcibly tying subsidies to overcapacity runs counter to the prevailing practices of global industrial development.

To assess the correlation between subsidies and production capacity, the first step is to examine the actual intensity of the use of industrial policies. A

long-term tracking study conducted by a research team from the University of British Columbia in Canada on major economies worldwide found that between 2009 and 2020, Germany, Japan, Brazil, and the U.S. were among the economies that utilized industrial policies most frequently.

China ranked only 11th, with its frequency much lower than that of many emerging market countries. China's implementation of subsidy-based industrial policies was limited in terms of quantity. Therefore the conclusion that "subsidies lead to overcapacity" is unfounded.

The international competitiveness of China's industries stems from the support of domestic demand from an extremely large domestic market, the complementary advantages of a complete industrial system, and the long-term accumulation of technical talent. Attributing competitive advantages simply to subsidies lacks empirical research support and goes against the basic principles of industrial development.

to Eurasia, linking with the China-Europe Railway Express and rail-sea intermodal transport to deepen industrial and supply chain integration among Belt and Road partner countries.

According to Malaysia's national news agency Bernama, the canal is expected to strengthen trade links between western China and ASEAN and create new opportunities for Malaysian businesses through enhanced connectivity with Guangxi's Qinzhou hub.

From a century-old vision to a modern waterway, the Pinglu Canal stands as a landmark project in China's waterway construction history, opening a new chapter of connectivity, cooperation and shared development for China, ASEAN and beyond.

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Its full-lifecycle digital management model is also a first in China's canal construction history. Yan Qiang, head of the science and technology information department of the Pinglu Canal Group, said the canal has a monitoring system based on BeiDou, cloud computing and AI. The monitoring screen at the dispatch center displays risks related to slopes, hubs and navigation in real time, enhancing navigation safety. Once navigation begins, AI algorithms will help generate optimal plans for lock chamber allocation and

water-level regulation, with risks assessed in advance.

Economic benefits and regional connectivity

Goods from southwest China shipped via the Pinglu Canal will cut inland shipping distances by more than 560 km compared with the traditional route through Guangzhou Port in the south. Overall logistics costs are expected to fall by 18 to 30 percent, saving over 5 billion RMB annually.

The cost reductions are already drawing investment. In the first half of this year, the Nanning section of the

Pinglu Canal Economic Belt signed 133 new projects, with total investment reaching 56.56 billion RMB.

The canal changes southwest China's waterway access from a detour to a direct route, bringing the hinterland and ports closer. It also rewrites southwest China's seaward path, opening the most economical and convenient corridor to ASEAN. The canal fills the inland water transport gap in the Western Land-Sea New Corridor, completing a multimodal framework of river, rail, sea and road. It connects southward to ASEAN and northward

Voice of the World

China's Innovative Pharmaceuticals Gain Momentum

Edited by QI Liming

This year, drugs with independent intellectual property patents have emerged as a dark horse among the ranking list of China's export products, demonstrating strong innovative capabilities. Global pharmaceutical companies are eager to license Chinese innovative drugs with their improved quality and upgrading, marking a new phase in the development of China's pharmaceutical industry.

Data from China's National Medical Products Administration shows that in the first half of the year, 81 out-licensing deals for innovative drugs were struck, with a total transaction value of approximately 110 billion USD. This is more than double the value of 2024 and over 80 percent of 2025.

In terms of product types, the licensing transactions of China's innovative drugs cover 10 major therapeutic fields including oncology, metabolism, immunology and neurology. The main acquiring companies are from 20 countries and regions such as the U.S., France, the UK and Italy.

Reuters reported that global drugmakers are stepping up their search for China-developed experimental medicines as they cut costs ahead of patent expirations. Industry analysts predict biotech licensing deals would surge to a fresh record this year.

Jiangsu province in eastern China will support enterprises in participating in global trade and licensing cooperation, the provincial government said in a statement on its three-year plan for promoting the local bio-pharmaceutical industry.

This will boost pharmaceutical companies developing new medicines and help bring potential treatments faster to the market for patients overseas.

According to *The New York Times*, clinical trials in China received attention at an international oncology gathering in Chicago. In what appeared to be a first, one of the five coveted headliners at the conference was a presentation of a clinical trial conducted only in China.

That milestone at the meeting of the American Society of Clinical Oncology (ASCO), the world's biggest annual cancer conference, reflects the growth of China's biotechnology sector. In just a

few years, it has transformed to a juggernaut, rapidly inventing and testing cutting-edge medicines.

"This tells us that the Chinese biotech industry has arrived," said Dr. Otis Brawley, a professor at Johns Hopkins who has attended the ASCO meeting every year since 1989.

According to a Bloomberg article, for U.S. drugmakers, the expanding tie-ups with Chinese companies mean lower costs and more access to breakthrough treatments.

Executives of U.S. pharmaceutical Merck & Co. are excited. They are working on a drug with the potential to become a "cornerstone" treatment for cancer, with 17 late-stage trials pitting it against lung, breast and other tumors. "It is one of the broadest programs in our pipeline," senior vice president Marjorie Green told analysts at the ASCO conference. But the 135-year-old American drugmaker hasn't invented the treatment itself. It has licensed the drug from China's Sichuan Kelun-Biotech Biopharmaceutical Co.

Merck isn't alone in scouting China for ideas. U.S. and Chinese drugmakers have struck at least 32 licensing deals this year through the end of July, putting 2026 on track to surpass last year's record of 45, data from Bloomberg Intelligence shows. *Bloomberg Businessweek* calculates that in addition to Merck's trials, Western drugmakers are running at least 38 global late-stage trials of drugs created in China, including possible treatments for cancer and obesity. "China is now becoming an alternative to the Bay Area; to Cambridge, Massachusetts; to Oxford," said Diederik Staudig, a senior healthcare economist at ING. "Pharma companies would be foolish to ignore this."

For U.S. drugmakers, the expanding tie-ups with Chinese companies are a no-brainer. "You can go twice as fast at half the cost in China," Merck CEO Rob Davis told reporters in July.

Jacob Van Naarden, Eli Lilly & Co.'s head of oncology and business development, also likes what he sees: "There's a ton of innovation coming out of China," he said in an interview in June. "We're shopping there just like we're shopping everywhere else."

Hi-Tech

Robot Marks Football Pitch with High Precision

By GONG Qian

How long does it take to paint white lines on a competition-grade football pitch? In the traditional way, it generally takes five workers pushing the line-marking machines manually a full day. But with the help of a marking robot a single operator can complete the work in 40 minutes with a positioning precision of ± 4 millimeters.

The marking robot, independently developed by Changsha-based GooGol Robot, is an intelligent construction equipment automating the task of marking construction layouts.

Its core technical challenge lies in "dynamic movement" and "high precision." According to Liu Zijiang, founder of the company, marking lines in a fixed position is not difficult. The real challenge is drawing straight, even lines with minimal error while moving at high speed. It is like drawing a perfectly straight line on a wall with a pen without any deviation while running fast, Liu said.

With the marking robot, its operators need to only import CAD construction drawings via tablet PC, and the robot can automatically analyze the files

and plan the marking path.

The robot uses a laser tracking and positioning system different from conventional satellite positioning and avoids the errors caused by satellite signal drift. It can achieve high-precision marking within a 60-meter operating radius of ± 2 mm, far outperforming manual operation in stability.

Compared with manual marking, the lines sprayed by the robot have highly consistent width, and are uniformly straight and round. In addition, robotic operation greatly shortens venue downtown and improves site utilization.

Previously, the robot was mainly used for marking tasks in electromechanical installation, decoration installation, and main structure. It was used in on-site construction like the Shanghai Grand Opera House project.

By meeting International Federation of Association Football (FIFA) standards, the robot has expanded its application scenarios and has been deployed for major events including the 2026 FIFA World Cup AFC Asian Qualifiers (Hangzhou leg) and Singapore Premier League. GooGol is now preparing to present the marking robot at the 2030 FIFA World Cup.

Finding the Soil for Research Translation

Dialogue

By LONG Yun & BI Weizi

When Sze Shin Low began her research on flexible bioelectronic sensors, her motivation was straightforward: to improve patients' quality of life. Now an associate professor at the University of Nottingham Ningbo China (UNNC) and named among the World's Top 2% Scientists, she has developed a graphene-based wearable patch that captures the mechanical pulse waveform continuously outside hospital settings.

Her recent paper in *Chemical Engineering Journal* has drawn attention not only for its gradient-density architecture, but also for its candid discussion of the gap between laboratory prototypes and real-world medical devices.

In an interview, Low spoke about why the heart rate alone is insufficient for showing cardiac health, how an everyday conversation inspired her sensor design, and what it takes to move a laboratory technology closer to something that could ultimately benefit patients.

Beyond the beat
"Heart rate tells us the tempo, but the waveform contains the melody, rhythm and variations," Low said.

Two individuals may both register 70 beats per minute, yet the timing, strength and shape of their pulse signals can be entirely different. The waveform reveals beat-to-beat intervals, rhythm regularity and the cardiovascular system's responses to exercise, stress, temperature and recovery. "Knowing only the tempo does not tell us whether the music is smooth, irregular or suddenly changing."

She emphasized that the sensor measures the mechanical pulse at the skin and is not intended to replace clinical tools such as electrocardiography (ECG) or professional cardiac assessment. Its real value lies in long-term monitoring outside hospitals,



Dr. Sze Shin Low. (COURTESY PHOTO)

where tracking changes over time may help determine when further professional assessment is needed.

This vision of making healthcare more comfortable and convenient is what drew her to wearable bioelectronics. She asked herself whether healthcare could become less intrusive while still providing clinicians with the information they need. Flexible sensors, lightweight and conformable, offered an answer by allowing continuous monitoring without requiring patients to remain in hospital or be confined to bed.

From loudspeakers to a gradient design

The sensor's distinctive feature — three zones of different densities, densest at the center and progressively more porous outward — came from a conversation with her husband, who was explaining how loudspeaker drivers handle different frequency ranges because no single driver performs optimally across the entire spectrum.

That prompted Low to consider a similar division of labor for pressure sensors, with different regions specializing in different pressure levels. She

first reviewed the literature to examine whether the concept had been explored and whether the underlying mechanics indicated that it could work. After simulations and experiments, the team grew confident the concept was feasible, and the final structure was developed through multiple rounds of optimization.

"Research ideas can come from anywhere," she reflected, "but transforming an interesting idea into a scientifically validated innovation requires careful literature review, critical thinking and rigorous experimentation."

She also found a way to manage a common limitation. Graphene's temperature sensitivity can introduce unwanted interference, so the team incorporated a separate serpentine temperature sensor to independently measure temperature and compensate for thermal drift.

This reflects her research philosophy: Instead of asking how to eliminate a problem, she asks whether the problem can help solve a bigger one. She encourages her students to stay curious when unexpected results emerge, noting that the most interesting discoveries often "begin with something that does not

behave as originally expected."

Reliability over record-breaking
Despite promising results, the device remains a proof of concept. Low identified the single biggest gap as reliability in non-laboratory environments. A laboratory device has to work under selected conditions, but a usable product must work for different people over time under conditions that cannot be fully controlled.

Her team tested the device at rest, during cold stress and after high-intensity running, and performed 10,000 loading cycles to examine mechanical stability. However, these experiments were only necessary steps, not the final destination.

Low envisions the technology as initially serving patients recovering at home after surgery, older adults with cardiovascular risk factors, and people affected by stress, fatigue or intensive physical activity.

"The growing emphasis on translation has shifted the discussion from whether a sensor can simply produce a signal to whether it addresses a genuine clinical need, can be manufactured consistently and performs reliably in realistic settings," she said.

Since arriving in China in 2018 as a postdoctoral researcher at Zhejiang University, she has witnessed growing support for translating research into real-world impact. "What has impressed me most is the strong emphasis on translating research into real-world impact," she said. "For researchers working in wearable bioelectronics, this is especially valuable because developing a medical device requires close collaboration between materials scientists, engineers, clinicians and industry partners. China has built an ecosystem where these interdisciplinary collaborations are increasingly encouraged."

"If our work can make healthcare more accessible, more comfortable and more proactive while improving patients' quality of life," she concluded, "then I believe we have achieved the true purpose of scientific innovation."

that) perform the tasks. Rather, adapting to each new scenario requires a massive investment of time and R&D resources to collect and process the necessary data, which can actually exceed the value of the task itself."

The key to breaking this deadlock is continuous evolution of foundation models. Currently, completing a task may require two days of data collection. In six months, that could drop to just five hours. Within two years, robots may no longer need to gather prior data, enabling them to learn instantly when they see a task or hear a command.

This evolution will bring a qualitative shift in cost and efficiency. "Only when costs are low enough and efficiency is high enough will a laboratory technology evolve into a product that ordinary people can afford and use with ease," Wang said.

Multi-scenario competitions are continuously expanding the capabilities of humanoid robots, from being remote-controlled manually to independently completing entire task sequences.

If they can successfully complete multiple tasks in the competition arena, how long is it before we have robot butlers? Wang He, founder and CTO of the robot company Galbot, addressed this common question. He said the core issue lies in the robots' insufficient capability of generalization across different robotic applications. "Being able to fold one specific garment doesn't mean a robot can handle another style," he said.

He explained further, "It's not that we lack the ability to (make robots

Letter to the Editor

How China's Innovation Ecosystem Turns Scale into Knowledge

By Sergio Parra

Most diagrams of innovation omit half the arrows. They show a discovery leaving the laboratory, becoming a prototype, entering a factory and eventually reaching society. Knowledge seems to flow in one direction.

In reality, technological systems contain arrows pointing backwards too. Factories expose weaknesses in designs. Suppliers suggest alternative components. Users encounter situations engineers never anticipated. Innovation is therefore not simply a pipeline. It is a loop.

Scale as learning mechanism
This perspective may help explain an important feature of China's technological development. China is often described as having an advantage of scale.

But scale has another function. It can produce knowledge. A laboratory may establish whether a robot can perform a task. Thousands of robots operating in factories, hospitals, warehouses and homes reveal something different. Components deteriorate, humans behave unpredictably and workers develop routines designers never imagined.

Each encounter between a machine and the real world becomes a small experiment. If the information returns quickly to manufacturers, suppliers and researchers, deployment itself becomes part of the research process.

Shenzhen provides a vivid example. Official data show that the city had more than 2,600 AI enterprises above designated size by the end of 2025 and had released nearly 300 "City + AI" application scenarios.

This month, Shenzhen published a plan for its intelligent robotics industry that seeks to create a "half-hour supply circle," bringing components close to software, algorithms, simulation tools and manufacturing capabilities.

This density can shorten the distance between an idea and the information needed to improve it. What becomes shorter is not only physical distance, it is the feedback loop.

Innovation as emergent property
An innovation ecosystem is not merely a collection of companies in the same place. Some of its most valuable capabilities emerge from interaction. No individual company manufactures "iteration speed." It arises from relationships among laboratories, suppliers, factories, software developers and users.

This helps explain why the Shenzhen-Hong Kong-Guangzhou cluster in south China ranked first in the World Intellectual Property Organization's 2025 global innovation cluster ranking.

China's clean-technology industries show the same mechanism at a larger scale. According to the International Energy Agency, China accounted

for around three-quarters of global investment in clean-technology manufacturing in 2023.

This is often discussed through economies of scale. Producing more units can reduce costs. But learning effects are different. Economies of scale make an existing process cheaper. Learning changes the process itself.

Manufacturing millions of batteries, solar modules or electric vehicles generates information about materials, component failures, logistics, maintenance and consumer behavior. Engineers do not learn merely how to manufacture more units. They learn how the next generation should be different.

Scale, in this sense, becomes a way of knowing. There is a useful analogy with AI. A model trained on a narrow dataset may perform well under familiar conditions while failing elsewhere. Greater diversity of experience can reveal assumptions that were invisible during training.

Technologies behave similarly. A prototype tested under controlled conditions encounters only a thin slice of reality. Large-scale deployment exposes it to more environments, users and failures.

Scale alone, however, is not enough. A million repetitions of the same experiment may produce less useful knowledge than a thousand experiments conducted under different conditions. What matters is the combination of scale, variation and rapid correction.

This is where complex systems offer a useful perspective. Technological ecosystems evolve through interaction, variation, feedback and selection. Companies explore different solutions. Users test them. Suppliers adapt. Successful ideas spread. Others are discarded or recombined.

The traditional question about technological leadership asks who invented a technology first. That remains important. But invention is only the beginning of the learning process.

Another question may be just as revealing. Which ecosystem learns fastest after the invention appears?

Laboratories discover what might work. Factories discover what can be manufactured reliably. Users discover what engineers overlooked. Failures expose assumptions hidden inside successful prototypes.

The strongest innovation ecosystems are those capable of connecting all these forms of knowledge. Innovation then stops looking like an arrow. It begins to look like a network.

Sergio Parra is a Spanish science communicator and author of more than 20 books. His work lies at the intersection of science, technology and social transformation.

How Long Before Smart Robot Butler Is a Real Thing?

Science Outreach

By Staff Reporters

A pile of laundry sits in the washing machine, waiting to be hung out to dry. Another pile of clean clothes lies haphazardly on the bed. The wet clothes have to be taken out and hung on the washing line and the pile on the bed has to be dealt with by folding each item and keeping them in the wardrobe. And all this is to be done by robots.

This was a real-world challenge in

the home scenario competition at the recently concluded 2nd World Humanoid Robot Games in Beijing. The robot participants had to complete the entire sequence autonomously and continuously. No points were awarded if the process was interrupted.

The winning team completed the sequence in 26 minutes, a complex autonomous operation almost unimaginable last year. In industrial settings, robots handle tasks such as transporting materials, stocking shelves, picking items, and packing them for storage. Hotel-based competitions take place in actual hotels, where robots navigate real-world obstacles while performing multi-step tasks such as transporting luggage, restocking rooms and tidying up.

Xi Calls on BRICS to Unite Global South, Deepen Cooperation

From page 1

BRICS countries should continue seeking common interests, he said, noting that the grouping's expansion had placed greater demands on internal coordination.

Greater BRICS cooperation
During the speech, Xi proposed five initiatives on "greater BRICS" cooperation in areas of AI, trade and investment facilitation, digital industry, intelligent manufacturing, and science and technology talent development.

To accomplish great things and achieve major progress, the foundation of greater BRICS cooperation must be cemented, Xi said, calling for leveraging BRICS' close ties with fellow emerging

markets and Global South countries, upholding open cooperation for mutual benefit, safeguarding stable and smooth industrial and supply chains, and fostering a large integrated market.

"We should build incubators for innovation, upgrade traditional industries, develop emerging industries, and deploy future industries," Xi said.

On the open source and inclusive AI initiative, Xi said that China will be a pioneer in establishing a BRICS AI open source community, support the cooperation in developing and applying large language models, hold specialized AI seminars and training courses, and build an open ecosystem for AI.

On the trade and investment

facilitation initiative, China proposes to establish a BRICS special economic zone partnership, under which countries can set up an intelligent portal, coordinate policies, and build a new frontier for open development, Xi said, adding that in an effort to cultivate new drivers of economic and trade cooperation, China will hold the BRICS Forum on Trade in Services next year.

On the digital industry cooperation initiative, Xi said that China will push for establishing a BRICS digital ecosystem cloud platform, and conduct digital skills training, technological exchange and industrial alignment, so as to jointly enable the development of the digital economy.

On the intelligent manufacturing

cooperation initiative, China stands ready to assist fellow BRICS countries in building smart factories and developing standards and norms, and jointly promote manufacturing transformation and upgrading, he said.

On the science and technology talent development initiative, China proposes to set up a BRICS engineer cultivation alliance for joint development of engineers and mutual recognition of competency standards, Xi said, adding that China will launch a BRICS youth exchange program for scientific and technological innovation, so as to cultivate more high-caliber talent.

Source: XINHUA



A robot inserts a letter into a mailbox during the 2026 China International Fair for Trade in Services at Shougang Park in Beijing. (PHOTO: XINHUA)