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Editor's Note:

Scientific and technological cooperation is a crucial pillar of the Belt and Road Initiative (BRI). To give our readers a closer look at how such cooperation works in practice, we will share stories about several BRI joint laboratories.

A Tale of Two Museums

— China-Greece Belt and Road Joint Laboratory on Cultural Heritage Conservation Technology

By LI Linxu & WANG Xiaolong

During his state visit to Greece in 2019, Chinese President Xi Jinping and then President of Greece Prokopis Pavlopoulos visited the Acropolis Museum in Athens.

Xi said that China and Greece, both boasting abundant cultural heritages, can strengthen cooperation in the preservation and restoration of important historical and cultural heritages.

At that time, a museum staff member demonstrated advanced laser restoration technology for cultural relics to the guests. The staff member was Costas Vasiliadis. Six years later, he, now head of the Conservation Department and Casts at the Acropolis Museum, still remembers the scene vividly.

"I demonstrated laser cleaning on a philosopher's bust and introduced the contemporary approach of the Acropolis Museum and of the Institute of Electronic Structure & Laser (IESL) to conservation," Vasiliadis told *Science and Technology Daily*.

"What remains particularly memorable for me is the genuine and engaged interest shown by both presidents in the practical aspects of conservation," Vasiliadis added. "The visit was also decisive in strengthening our cooperation with the Palace Museum."

Ten months later, the China-Greece Belt and Road Joint Laboratory on Cultural Heritage Conservation Technology was launched for establishment. Its Chinese leading unit is the Palace Museum, and the Greek leading unit is IESL under the Foundation for Research and Technology-Hellas (FORTH).

"The mutual attraction between two ancient civilizations, the shared need for cultural heritage conservation, and a wonderful serendipity naturally brought the Chinese and Greek sides together." When discussing the process of their acquaintance and cooperation, Zhao Guoying, former deputy director of the Palace Museum and director of the joint lab, recounted the details with great clarity.

She vividly remembers the scene of her team's first visit to the IESL in 2023. "That day, under a blue sky with white clouds, the Greek side specially hoisted the Chinese national flag in front of the pristine FORTH building to welcome the arrival of the Chinese delegation," recalled Zhao.

During the subsequent symposium, all Greek partners attended, and all parties engaged in in-depth discussions on the development of the joint lab and cooperation in conservation technologies. *See page 4*



The Palace Museum (left) in Beijing, China and the Parthenon Temple (right) in Athens, Greece. Led by China's Palace Museum and Greece's IESL under the Foundation for Research and Technology-Hellas, the China-Greece Belt and Road Joint Laboratory on Cultural Heritage Conservation Technology is established to strengthen cooperation in cultural heritage conservation. (PHOTO: VCG)



STI Frontier

Harmonious Coexistence of Subways and Springs

Edited by WANG Xiaoxia

Building subways is nothing new, but building subways through a karst spring area is a formidable challenge.

Jinan in eastern China is called the "City of Springs" for its roughly 1,200 natural artesian springs. However, its karst geology also makes it one of the most fragile environments for underground construction.

It took more than 30 years to construct subway lines in the city while protecting its springs, from conception to reality.

Priority for spring protection

Jinan conceived of building a subway as early as the 1980s. In the 1990s, a professional institution was established to conduct investigations and research.

However, in 2002, experts from the Chinese Academy of Sciences, the Chinese Academy of Engineering and other institutions suggested, after detailed discussions, that the rail transit project should be delayed.

Also, at that time, the iconic Baotu Spring in downtown Jinan stopped flow-

ing and the protection of springs became the priority. Hence the rail transit plan was put on hold.

Subsequently, as China's spring protection knowledge and technology advanced, the construction of a subway in Jinan was taken up again. In 2009, the survey and design team of the project proposed building the subway by circumventing the karst aquifers of the springs.

In July 2015, construction of Jinan's first subway line began in its western urban area. After three and a half years, it started running. Built far from the cluster of springs, the first line provided experience for the following lines passing through the urban area.

Empowered by technology

A series of technical difficulties had to be resolved, such as passing under the Beijing-Shanghai High-speed Railway and crossing the Jinan-Hefei Expressway Bridge. It had also to be ensured that tunneling in the karst area with "water-rich high-strength limestone" could be done safely. Once these challenges were overcome, the project was fast-tracked.

With the accumulation of technol-

ogy and experience, lines 1, 2 and 3 of the first-phase project were completed, forming an H-shaped rail transit network around the main urban area. The second phase, based on a deeper understanding of the geological structure, has entered the core area of the city. Line 4 is the first metro line close to the spring cluster.

The Quancheng Park Station on Line 4 is the only one above ground to avoid the aquifer. If the groundwater level rises during the rainy season, the excess water would flow into the diversion channel beneath the station floor, explained Li Hu, general manager of Jinan Subway.

To analyze the geological characteristics of the area, the project team have accumulated geological data and hydrological conditions since the 1950s and 1960s and established an intelligent four-dimensional geological platform for the spring area.

While crossing the karst spring area, a new type of "anti-dynamic water sealing material" was used to quickly solidify and block the leakage point when encountering sudden water gushing.

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Innovation Pathway

Yangtze Belt Epitomizes Rivers as Shared Growth Engines

By LIN Yuchen & GUAN Jingjing

Rivers are both the arteries of Earth and vital channels of economic development.

China's State Council Information Office held a press briefing on January 5, reviewing 10 years of the development of the Yangtze River Economic Belt, in which ecological protection and high-quality growth have advanced in tandem.

The Yangtze River Economic Belt has followed a development path with environmental protection and green growth at its core. This strategic orientation has reshaped the relationship between development and conservation along China's longest river, turning ecological constraints into drivers of transformation. Today, the results are increasingly visible.

The "green index" of the Yangtze continues to rise.

More than 96 percent of the monitored sections along the river now report good water quality. Native fish species have increased, the population of the finless porpoises, listed as critically endangered by the International Union for Conservation of Nature, has rebounded to over 1,000, and rare species such as the Chinese sturgeon have resumed migration between the river and sea. Major lakes including Poyang and Dongting have seen eutrophication curbed, with aquatic ecosystems gradually recovering.

At the same time, innovation has become the core engine of this "golden economic belt."

In 2024, the Yangtze River Economic Belt generated over 63 trillion RMB in GDP, growing 5.4 percent year on year and accounting for nearly half of the national economic output.

In the first 11 months of 2025, its 11 provinces and municipalities recorded 19.12 trillion RMB in foreign trade, representing 46.4 percent of China's total. Ecological gains and economic performance are no longer in tension, but increasingly reinforcing one another. *See page 2*

WEEKLY REVIEW

Taikonauts Conduct Key Training, Experiments in Space Station

The Shenzhou-21 crew aboard China's Tiangong space station recently completed a series of crucial in-orbit training exercises and advanced scientific experiments. This has laid the groundwork for future missions and scientific discovery.

Low-cost, Eco-friendly Pigment Developed Using Rare Earths

Chinese scientists have recently developed a low-cost, eco-friendly rare-earth pigment that addresses the problems associated with traditional pigments, such as toxicity and environmental pollution. It could lead the next generation of pigment technology.

NASA Launches Exoplanet-observing Mission

NASA launched a new satellite mission, codenamed Pandora, into low Earth orbit on January 11 to study the atmosphere of exoplanets and their host stars. The mission's observations are expected to determine whether a planet's atmosphere contains hazes, clouds or water, or whether apparent signals of these substances actually arise from the star.

100-meter Lava Fountain Observed at Philippines' Mayon Volcano

The Philippine Institute of Volcanology and Seismology on January 13 reported a short-lived incandescent lava fountain that shot up to about 100 meters from the summit crater of Mayon Volcano on Luzon Island.

New Graphic

AS OF DECEMBER 31, 2025 ▶▶▶

748
generative AI services
had completed filing in China

446
were added in 2025

Source: Cyberspace Administration of China
Designed by SONG Ziyi / Science and Technology Daily

Edited by WANG Xiaoxia

With the explosion of AI, the demand for computing power has grown exponentially. However, ground data centers, being constrained by energy consumption and heat dissipation, are facing increasingly severe development bottlenecks.

Sending AI and computing power into space, and building data centers in space are seen as the ultimate solution to the global computing power supply problem. In 2025, the curtain on space computing power construction was lifted, and the vision of sending data centers "into space" was gradually achieved through the concerted efforts of all parties in the industry.

ties in the industry.

In May 2025, the Three-Body Computing Constellation led by China's Zhejiang Laboratory was successfully launched and entered into orbit. The 12 in-orbit computing satellites are all equipped with on-board intelligent computing systems and inter-satellite communication systems. They are able to carry out in-orbit computing and inter-connection of satellites throughout the orbit cycle, and finally establish an integrated space-ground computing network.

In July, geospatial company GEOVIS and supercomputer maker Sugon signed a cooperation agreement to jointly develop high-end space computing chips and

modules to support the computing services in space and reduce the delay caused by the transmission of satellite data to the ground.

In November, the Zero-Carbon Space Computing Center independently developed by Chengdu-based Adaspace Technology Co., Ltd., was recognized as one of the top 10 outstanding achievements at the 2025 World Internet Conference.

Globally, tech giants including Google, SpaceX and NVIDIA have all entered the space computing field and are making advances.

The rise of space computing power is not only a technological revolution but also the opening of a trillion-dollar market.

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China Sets Date for AI-Industry Integration

Policy Express

By Staff Reporters

China aims to establish a guaranteed supply of key core AI technologies by 2027, while maintaining the scale and empowerment of its AI industry so that it remains among the world's leaders, according to a government action plan released in January. The plan was jointly issued by eight departments, including the Ministry of Industry and Information Technology, the Cyberspace Administration of China, and the National Development and Reform Commission.

The action plan prioritizes the deep integration of AI with the manufacturing sector. It calls for the deployment of three to five general-purpose large AI models in manufacturing, alongside the development of specialized, industry-wide models with broad coverage. By 2027, China aims to roll out 1,000 high-level industrial intelligent agents, build 100 high-quality industrial datasets, and promote 500 representative application scenarios.

The plan also targets developing two to three market leading enterprises with global influence, as well as a group



At the Hubei Humanoid Robot Innovation Center, data collectors operate humanoid robots to collect data. (PHOTO: XINHUA)

of "specialized, refined, distinctive and innovative" small and medium-sized enterprises. In parallel, 1,000 benchmark enterprises will be selected, and a globally leading open-source and open AI ecosystem will be established, with overall AI security governance capabilities significantly reinforced.

Strengthening the supply of AI computing power is a key focus of the plan, alongside the development of high-

level industry-specific models. The plan emphasizes accelerating AI-enabled transformation across the full industrial value chain.

Efforts will be made to raise AI application levels among key enterprises, expand adoption in priority regions, advance intelligent upgrading in major sectors, and promote the iteration of intelligent equipment and smart terminals. New business models centered on

intelligent agents will be established, while standards development, open-source collaboration, talent cultivation and security safeguards will be further strengthened.

International cooperation also plays a prominent role in the plan. Chinese enterprises are encouraged to tailor AI products and application solutions to the specific needs of different countries and regions. To drive this, an "overseas version" of the AI-empowered new industrialization initiative will be promoted, with industry organizations and professional institutions providing support services for companies expanding abroad, including assistance with technical validation and compliance certification.

The plan also seeks to attract foreign investment into the AI sector and encourages foreign-invested enterprises to participate in the development and production of generative AI technologies.

In addition, China will work to establish international cooperation platforms and actively participate in AI-related discussions within multilateral frameworks, including BRICS, the Shanghai Cooperation Organization, China-ASEAN cooperation mechanisms, the G20 and APEC.



New Investment Tax Guidelines for Chinese Enterprises Overseas

By SUN Jin & LIU Yin

China's State Taxation Administration (STA) has released 90 new investment tax guidelines to help Chinese enterprises' development overseas.

These new guidelines provide an update on the changes in the tax systems of 85 countries and regions in recent years, including the United States, Canada and France.

In addition, five new ones have been introduced for Portugal, Chile, the

Democratic Republic of the Congo, Zimbabwe and Colombia.

They bring the total of such guidelines to 115, covering almost all major overseas investment destinations for Chinese enterprises.

Developed under the STA's TaxExpress service brand, these guidelines provide detailed information on the host countries' tax systems so that the enterprises can improve their tax compliance and mitigate tax-related risks.

The STA also provides monthly up-

dates on global tax developments through other TaxExpress products, including its Global Tax News.

An official from the International Taxation Department of the STA said global tax rules are undergoing profound and comprehensive reforms. This imposes higher demands on the tax compliance capabilities of multinational enterprises.

Service products like tax guidelines and Global Tax News help enterprises stay informed of changes in the host

countries' investment environments and tax systems, fully enjoy the benefits of bilateral tax treaties, and avoid tax risks. They have gained broad recognition among cross-border investors.

The updated guidelines are available on the official website of the STA. Taxpayers can access the guidelines and learn about other international tax knowledge products under the TaxExpress brand.



Framework on Overseas Corporate Social Responsibility

By LIN Yuchen

China has released a comprehensive guideline to strengthen and standardize how its enterprises fulfill their social responsibilities in overseas operations, underscoring its commitment to high-quality opening up, sustainable development, and the vision of building a community with a shared future for humanity.

The *Guideline on Corporate Social Responsibility in Overseas Operations* provides a systematic framework for Chinese companies operating abroad, aligning domestic laws with international norms such as the United Nations Sustainable Development Goals and China's national social responsibility standards.

It aims to guide enterprises "going global" to integrate social responsibility into corporate governance, strategic decision-making, and cross-border operations, while supporting host countries'

economic and social development.

It encourages enterprises to embed social responsibility into their international business strategies, comply with both Chinese and host-country laws, and enhance the sustainability of overseas projects.

The core principles are prioritizing shared development over short-term gains, combining international standards with Chinese characteristics, upholding enterprise leadership with responsible innovation, and pursuing mutual benefit and win-win outcomes.

A major focus is on supporting host countries' economic growth.

Companies are encouraged to participate in industrial upgrading, infrastructure development, and supply-chain integration through greenfield investment, mergers and acquisitions, and the establishment of service institutions.

The guideline also promotes the development of overseas economic and trade cooperation zones and high-quality,

resilient and inclusive infrastructure projects.

Improving local livelihoods and social harmony is another key pillar. Enterprises are urged to localize employment, ensure fair labor practices, prohibit forced and child labor, protect employee health and safety, and respect cultural traditions and religious beliefs.

The guideline highlights the role of "small but impactful" livelihood projects, community engagement, skills training, and public welfare initiatives in fostering people-to-people connectivity.

Environmental protection and green transition feature prominently. Companies are required to comply strictly with host-country environmental regulations, conduct environmental impact assessments, and integrate green principles throughout the investment lifecycle.

The guideline also encourages participation in global climate governance, expansion of clean energy investment,

and adoption of green production, procurement and construction practices.

Besides, it emphasizes compliance, risk management, anti-corruption, data security, intellectual property protection, and brand building for the healthy and orderly development of overseas industries.

To ensure implementation, enterprises are called on to establish dedicated social responsibility management systems, strengthen reporting and disclosure, and enhance coordination with governments, communities, and international partners.

Overall, the guideline signals China's determination to elevate overseas business from scale-driven expansion to quality- and responsibility-oriented development, reinforcing the role of Chinese enterprises as long-term contributors to global sustainable growth.



Harmonious Coexistence of Subways and Springs

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Another new "anti-dynamic water high flow retention material" can remain in the set position during groundwater erosion, preventing the slurry from expanding.

Long-term monitoring

What impact does the construction of subways have on underground springs? In 2025, monitoring data

showed that the water level of the Baotu Spring reached 30.32 meters, the highest recorded since 1966.

Jinan will continue long-term monitoring of the groundwater level and analyze the dynamics of the springs. A closed-loop system has been established for spring protection, covering the entire process from planning, construction to operation, ensuring the harmonious co-

existence of the subways and the spring water.

Li said the Jinan Rail Transit Group has established over 200 long-term groundwater monitoring stands, forming a complete monitoring system with 24-hour real-time monitoring of the groundwater level along the metro lines. This data can also be used to protect the springs and develop urban underground

space in the future.

The Shandong Provincial Bureau of Geology and Mineral Resources has developed a groundwater monitoring system platform that can issue centimeter-level fluctuation warnings 15 days in advance. It can also visualize and quantify karst water transportation.

Jinan is now planning the third phase of its urban rail transit. The harmonious running of subway trains along the flowing springs will continue in the "City of Springs."

Case Study

Dalian Customs Empowers Businesses to Unlock RCEP Benefits

By Staff Reporters

Dalian Customs has issued 87,000 certificates of origin to help local exporters reduce costs, speed up customs clearance, and gain stronger footholds in international markets, since the Regional Comprehensive Economic Partnership (RCEP) came into force in January 2022.

The RCEP has become a key instrument for Chinese companies seeking preferential access to Asia's major economies. In order to maximize benefits from the deal, customs authorities in the northeastern China port city of Dalian have rolled out a raft of targeted services to businesses, ranging from large manufacturers to small traders.

One success story is Changchun Chemical (Panjin) Co., Ltd., a high-level certified enterprise that produces epoxy resins and refined copper foil. With RCEP certificates of origin, the company successfully entered markets in Indonesia and South Korea in 2025.

"The certificate of origin is a tax-saving document and a 'golden key' to global markets," said Hou Dan, head of the company's foreign trade department. "It allows our overseas customers to enjoy faster customs clearance and lower tariffs, which has significantly boosted our reputation abroad."

To deliver these benefits to more companies, Dalian Customs has maintained an ongoing upgrading of its services. Dalian Jinshengyuan Home Textile Co., Ltd., a local exporter of household cleaning products and pet wipes, is one such beneficiary. Thanks to the RCEP, the import tariff on its goods in destination countries dropped from 5.8 percent before the agreement took effect to 2.1 percent today. In 2025 alone, the company's export value under the RCEP rose by 28.59 percent compared to 2024.

"When the policy first came out, we wanted to use it but didn't know

how to apply the rules," said Han Xiangmei, head of the company's customs clearance department. "Customs officers came to us, explained everything step by step, and helped us get it right."

Dalian Customs also provides comparative analysis between the RCEP and other overlapping trade deals, such as the China-ASEAN Free Trade Agreement and the China-South Korea Free Trade Agreement, to help enterprises choose the most favorable option.

Beyond guidance, digital upgrades have dramatically simplified procedures. In the past, enterprises had to submit stacks of paper documents in person. Now, thanks to reforms like smart automated review, self-printing, and the removal of redundant registration steps, businesses can obtain certificates online within seconds.

Today, 95 percent of RCEP certificates in Dalian are processed without any physical visits to customs offices, and the average issuance time has fallen from half a day to immediate.

Over the past four years, Dalian Customs has held more than 150 training sessions, online and offline, reaching over 8,000 enterprises. In addition to smart visa facilitation measures for exporters, intelligent services for import enterprises have also been continuously upgraded. On December 31, 2024, the China Customs Preferential Origin Service Platform was officially launched on the China International Trade Single Window. To support businesses in maximizing the use of this platform, Dalian Customs has developed a user guide to help enterprises independently claim preferential tariff benefits under free trade agreements.

In total, RCEP-related imports and exports handled by Dalian Customs have exceeded 30 billion RMB, with tariff savings for businesses reaching nearly 200 million RMB.



The cruise ship Adora Mediterranea docks at a port in Dalian, northeast China's Liaoning province. (PHOTO: XINHUA)

Yangtze Belt Epitomizes Rivers as Shared Growth Engines

From page 1

This progress has been underpinned by integrated infrastructure and industrial coordination.

Major water conservancy projects and modernized shipping networks have significantly enhanced the Yangtze's transport capacity, providing low-cost, high-efficiency logistics support for industries along the river. Five globally competitive industrial clusters — electronics, high-end equipment, automobiles, home appliances and textiles — have taken shape.

Regional innovation collaboration has accelerated industrial upgrading. Along the river, cities have formed tightly linked production networks: Upstream and downstream regions specialize in research, manufacturing, assembly and testing.

In the new energy vehicle sector alone, a "four-hour industrial circle" has emerged, with the Yangtze River Delta

accounting for around 40 percent of national output and more than a quarter of global production.

China's planning framework has for the first time proposed "expanding the river-basin economy," extending successful practices from the Yangtze to other major river systems.

The concept emphasizes ecological co-governance, shared infrastructure, coordinated industries, and benefit-sharing across regions, transforming natural waterways into platforms for integrated development.

From the Yangtze to the Yellow River and beyond, coordinated basin development is gaining momentum. By combining top-level coordination with place-based specialization, China is steadily shaping a new development landscape in which technological innovation, ecological restoration, and regional cooperation flow together — much like the great rivers themselves.

EU CBAM Disrupts Global Trade Order



By LIANG Yilian & ZHANG Jiaxin

On January 1, the European Union (EU) began formally levying substantive charges under its Carbon Border Adjustment Mechanism (CBAM). According to China's Ministry of Commerce, the EU's move constitutes unfair and discriminatory treatment against China, is suspected of violating World Trade Organization regulations and the spirit of international climate agreements, and has also triggered China's serious concern and firm opposition.

In essence, CBAM functions as a "green tariff." Its rationale is that EU companies bear higher costs due to emissions-reduction requirements and should therefore impose a "carbon price differential" on imports. To fully understand it, however, it is necessary to revisit the EU's climate policy trajectory over the past two decades. Since 2005, the EU has relied on its Emissions Trading System (ETS) as the cornerstone of its climate strategy and a key market-based tool for cutting greenhouse gas emissions. However, as carbon prices soared to 70-100 EUR per tonne, the competitiveness of Europe's manufacturing sector gradually declined. CBAM consequently emerged as a remedial measure to address the unintended consequences of the EU's own policy design. Under this mechanism, exporters unable to provide EU-recognized "actual carbon emissions" are taxed based on EU-set default values for carbon intensity.

Evidence increasingly indicates that these default values are being deliberately inflated, amounting to potential covert trade discrimination. According to industry portal Eurometal, just before CBAM enters its charging phase in 2026,



Workers from the State Grid Cangzhou Power Supply Company conduct drone inspections at a "fish-solar hybrid" photovoltaic power plant in Huanghua city, Hebei province. (PHOTO: XINHUA)

the European Commission abruptly revised emissions benchmarks for several products. Take steel billets — a major Chinese export — as an example. Earlier draft regulations set the default value at 1.75 tonnes of carbon dioxide per tonne of steel, in line with China's industry average of about 1.8 tonnes in 2024. At that stage, the methodology remained grounded in actual industrial values.

Yet in the final regulations issued in December 2025, the default value for Chinese steel billets surged to an astonishing 3.167 tonnes — an increase of 81 percent. Under this revised benchmark, Chinese exporters would be compelled to absorb an additional carbon cost of approximately 144 EUR (around 168 USD) per tonne. This figure is nearly double China's industry average and even exceeds the emissions levels of Europe's own aging blast furnaces, generally estimated at 1.8 to two tonnes. Market analysts warn that such a sudden and drastic cost hike poses considerable challenges in international trade.

Of even greater concern, the regula-

tion has already come into effect, and charges have commenced. However, detailed operational guidelines and reporting regulations will not be released until sometime in 2026. As a result, many companies who are unable to complete complex certification processes within the short timeframe, are effectively forced to accept EU-mandated default values.

A leaked internal document revealed by U.S. media outlet *Politico*, sheds light on the reason behind this abrupt escalation. According to the document, EU technical teams carrying out on-site measurements, found that emissions from China's advanced production lines were in some cases even lower than those of European facilities. Confronted with this scientific reality, the European Commission, under pressure from vested interests, opted not to reflect on its own lagging industrial upgrades.

Instead, to erect barriers before CBAM regulations took effect on January 1, it inflated emissions values for Chinese products by altering calculation

methodologies.

This kind of "black-box accounting" is now drawing scrutiny worldwide. The Bipartisan Policy Center, a U.S.-based think tank, has questioned the artificially inflated results presented by the EU's Joint Research Centre, including default emissions values applied to U.S. steel.

Last month, Abhyuday Jindal, managing director of Jindal Stainless, also publicly criticized the lack of clarity in the regulations. This opacity grants the EU excessive discretionary power.

At its core, the EU's decision to erect high barriers serves to shield its own members that underperform in emissions reduction. According to *European Steel in Figures 2025*, published by the European Steel Association, around 60 percent of Europe's steel output still relies on traditional blast-furnace processes. On a genuinely transparent and level playing field, Europe's outdated, high-emission production lines would lose competitiveness. Instead, the EU exploits the technical hurdles faced by developing countries in building sophisticated carbon-tracking systems, inflating external default values to artificially prolong the life of inefficient domestic capacity. This practice — lenient toward itself, harsh toward others, reveals the EU's ambition to dominate the standard-setting process.

Cumbersome reporting requirements and opaque calculations are now distorting global trade. In response, China is accelerating efforts to establish its own carbon-footprint framework to safeguard "data sovereignty." Climate policy should not be weaponized to preserve industrial hegemony. If the EU persists in transforming CBAM into a global "cash machine," it will ultimately encounter collective resistance from its trading partners. What the world needs is fair, fact-based cooperation, not a biased and credibility-deficient technical barrier.

Voice of the World

Chinese Innovation Shines at CES 2026

By LI Linxu

At the recently wrapped-up Consumer Electronics Show (CES) 2026 in Las Vegas, the U.S., Chinese companies once again emerged as some of the most visible and influential innovators on the global stage.

"China's presence at CES 2026 was widely noted across press coverage," observed *Forbes*, characterizing it as the first show where China, not Japan or South Korea, dominated the show.

According to industry sources, Chinese companies accounted for about a quarter of all exhibitors at CES 2026, making them the second largest group after the U.S.

The annual tech showcase — regarded as a barometer of global technology trends — featured an unprecedented presence of Chinese firms spanning robotics, AI hardware, intelligent vehicles, wearable tech and smart home solutions.

One of the most striking narratives at CES this year was the dominance of Chinese robotics companies, particularly in the humanoid sector.

Official CES figures show that Chinese companies made up the majority of exhibitors in the humanoid robotics category this year. Of the 38 companies participating, 21 were from China, including Fourier, Unitree and AgiBot, giving the country more than half of the total presence.

Shanghai-based company Fourier made its debut at this year's CES with its humanoid robot GR-3. GR-3, the company's first full-size "care-bot," is designed to open new possibilities in human-robot interaction through

thoughtful design, advanced perception, and approachable intelligence. People can engage in natural conversation with the robot, touch-based interactions, or light, playful activities that demonstrate its ability to sense, understand, and respond.

From robots dealing blackjack to boxing opponents and running marathons, CES 2026 was a robotics spectacular, with nearly all of the standout innovations coming from Chinese companies, South Korea's *Korea JoongAng Daily* reported.

China filed 7,705 humanoid patents over the past five years, compared with 1,561 by the U.S., according to a report by Morgan Stanley in December.

"China is both the world's largest producer and consumer of robots, strategically deploying them to automate key manufacturing sectors, including electronics, automobiles and industrial machinery," a recent report by the Korea Institute for Industrial Economics & Trade said.

In addition to robotics, Chinese consumer electronics and AI hardware also drew considerable attention. Companies showcased augmented reality glasses, AI-enabled smart home devices, smart earbuds, wearable tech and more.

This reflects a broader shift: Chinese firms are increasingly emphasizing scenario-driven innovation, where technology is tightly integrated with user experiences across home, work and mobility.

International tech outlets reported that this year's show underscored China's growing role not just as a participant in global tech, but as a driver of innovation trends that resonate far beyond its home market.

Japan's Right Wing Challenges Non-nuclear Principles

Opinion

By QI Liming

The year 2025 marked the 80th anniversary of the victory of the Chinese People's War of Resistance Against Japanese Aggression and the World Anti-Fascist War. As a state defeated in World War II and a non-nuclear-weapon state party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), Japan is prohibited from developing nuclear weapons.

However, in recent years, Japan's right-wing forces have repeatedly sought to break the three non-nuclear principles long upheld by successive Japanese governments, namely, not possessing, not producing, and not permitting the introduction of nuclear weapons.

Present Japanese Prime Minister Sanae Takaichi has been making ambiguous statements about these principles, even hinting at the possibility of abandoning them. She has also stated that the option of introducing nuclear-powered submarines should not be ruled out.

Japan is capable of producing weapon-grade nuclear materials

According to the report *Nuclear*

Ambitions of Japan's Right-Wing Forces: A Serious Threat to World Peace jointly released by China Arms Control and Disarmament Association (CACDA) and China Institute of Nuclear Industry Strategy (CINIS) on January 8, Japan has plutonium stockpiles that far exceed civilian nuclear needs.

Japan's nuclear industry began to develop in the 1950s. In the field of nuclear power generation, Japan's first imported commercial nuclear power unit began operation in 1966. Thereafter, through technology introduction, assimilation and innovation, Japan independently designed and constructed multiple types of reactors.

Prior to the Fukushima Daiichi nuclear accident in 2011, Japan operated at most 54 nuclear power reactors at the same time, with a combined installed capacity of approximately 47.5 gigawatts. This accounted for around 30 percent of the country's total electricity generation.

According to the *Status Report of Plutonium Management in Japan* for year 2024, released by Japan's Cabinet Secretariat Office for Atomic Energy Policy in August 2025, as of the end of 2024, Japan managed a total of approximately 44.4 tons of separated plutonium both domestically and overseas.

The expanding nuclear ambitions

of Japan's right-wing forces send a dangerous signal of the revival of Japanese militarism, posing a serious threat to global peace.

The international community should be on high alert against Japan's expanding nuclear ambitions

Dai Huaicheng, secretary-general of CACDA, said Japan must fully abide by the provisions not to manufacture or acquire nuclear weapons, and not to receive whatsoever transfer of nuclear weapons or control over such weapons. However, the recent months have seen a number of dangerous attempts, including Takaichi implying the possibility of quitting the three non-nuclear principles.

These dangerous attempts, closely aligned with the inflated ambition to break free from international order, revive militarism and speed up re-militarization, are by no means isolated incidents or personal views. Rather, they are the result of long-standing, carefully orchestrated efforts by Japan's right-wing forces.

Luo Qingping, chairman of CINIS, emphasized that the international nuclear non-proliferation regime is an important part of the post-war international order. Japan's right-wing forces' attempt to revise the three non-nuclear principles and even advocate possessing nucle-

ar weapons gravely challenges the authority and effectiveness of the NPT, undermining the international nuclear non-proliferation regime. These dangerous developments warrant high vigilance by the international community.

The report *Nuclear Ambitions of Japan's Right-Wing Forces* puts forward 10 recommendations. They include urging the Japanese prime minister to clarify her erroneous remarks and Japan to strictly fulfill its non-proliferation obligations and address its plutonium stockpile imbalance. It calls on the 2026 NPT Review Conference, to take place in the United Nations headquarters in New York from April, to carefully consider this matter.

Also, the International Atomic Energy Agency must strengthen the safeguard on Japan's nuclear material and activities.

Besides, relevant countries should ensure their civil nuclear cooperation remains exclusively for peaceful purposes.

The UN chief and heads of other international organizations must express a clear stance defending the post-war international order.

The international academic community should be encouraged to strengthen research on this, providing intellectual support to maintain an international non-proliferation regime.

Under-road Heating for Safer Winter Driving

Hi-Tech

By QI Liming

With the onset of winter, high-altitude mountain roads in China are often covered with snow and concealed ice, posing a significant danger while driving. In the section of the newly opened Leshan-Xichang Expressway in Leibo county, Sichuan province, southwestern China, an innovative intelligent loop heat pipe snow-melting system has been implemented. This technology is like laying "floor heating" on the road surface, automatically eliminating snow and concealed ice, thereby reducing driving risks.

To make this possible, eight-millimeter diameter heat pipes are embedded 15 centimeters below the wheel track area of the main road's surface. A total of 27 sections, comprising 92 groups of heat pipes are laid out, covering a length of 2,374 meters. This includes the exit area of the upward tunnel, the entrance area of the downward tunnel, and the long and steep slope bridge section.

This technology has established a closed-loop system of "perception -

decision-making - execution." The laser snow depth meters, temperature and humidity sensors are fully covered. Based on the predicted kilometer-level ice and snow, together with data from AI models, satellites, the meteorological station and road surfaces, the power of the heat pipe can be automatically adjusted in accordance with the expected risk level.

The automatic start-up air source heat pump can preheat the heat medium to temperatures of 50 to 60 degrees Celsius. Through the efficient heat conduction of the heat pipe, the temperature of the wheel track is stably maintained and can automatically melt the ice within a range of one to two degrees Celsius.

Compared with traditional snow removal methods such as plowing, salting and the use of snow-melting agents, this new technology enables the transformation from passive ice clearance to proactive prevention and intelligent regulation.

This system has established a sophisticated meteorological monitoring network covering a five-kilometer area. It uses AI algorithms to achieve precise and dynamic temperature control, causing light snow to melt as it falls and heavy snow to melt quickly after being cleared by vehicles.



A staff member uses a thermal imager to test the effectiveness of the loop heat pipe snow melting system. (PHOTO: XINHUA)

AI Explores More Possibilities in Space

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As a cutting-edge field in global technological competition, an important development direction of commercial aerospace, and an important example of new quality productive forces, the appli-

cation prospects of space computing are extremely broad.

With advantages such as global coverage, high timeliness, and green and low-carbon features, it can effectively serve multiple fields including the digi-

tal economy, low-altitude economy and emergency relief.

At present, China has incorporated the development of the aerospace information industry, the promotion of satellite Internet and the construction of an

integrated space-ground information network into multiple national strategies, such as Digital China, which has a long-term goal of establishing a comprehensive digital development system by 2035.

Science Serves Society, Progress in Human Dignity

Dialogue

By LONG Yun & TIAN Nianping

"When the value created by a product stays where it's made through jobs, skills, and fair wages...that's what I mean by shared prosperity," said Shahbaz Khan, director and UNESCO representative to the Regional Office for East Asia, holding up his smartphone during a lecture at the China Academy of Science and Technology for Development (CASTED).

The device was a Realme, a brand born in China but assembled by young workers in Lahore, Pakistan. "I bought it there because I needed a phone that works in Pakistan," he said with a knowing smile. "But more importantly, local people are employed, trained and earning. That's not extraction. That's partnership."

In an interview following his lecture, Khan gave his version of the China story with his personal observation.

From catching up to setting the pace

"I've been coming to China since 1999," Khan began, recalling his early work on water-saving technologies and irrigation systems. "At that time, China was still catching up with the rest of the world." Back then, scientific infrastructure was developing, research output was modest, and innovation was largely reactive.

Today, the landscape is unrecognizable. "Now, the world is trying to catch up with China," he said.

He pointed to the scale of transformation: massive R&D investment, hundreds of young scientists collaborating in institutions like the Chinese Academy of Sciences, and universities in Wuhan, Beijing and Shenyang operating like "engines of discovery."



Professor Shahbaz Khan is reading the English Edition of Science and Technology Daily. (PHOTO: Science and Technology Daily)

The quality of research, publications, and technological output has surged across fields from solar energy and electric vehicles to robotics, nanotechnology, medical sciences and quantum computing.

But what distinguishes China's rise, Khan emphasized, is its integration of sustainability and inclusivity. "It's not just about building high-tech hubs. It's about cleaning polluted rivers, restoring lakes, improving air quality, and shifting entire industries toward ecological sustainability."

Equally important is how China has diffused the benefits of innovation beyond megacities. "Science and technology are reaching rural villages, small towns and remote provinces, lifting 800 million people out of poverty through systemic, tech-enabled development."

He cited Taobao as a quiet revolution in inclusive economics. "I use it for almost every purchase," he said. "Order a computer part from Shenzhen, and within days it arrives at my door in Beijing."

Behind that convenience lies a deeply integrated digital ecosystem: manufacturers, logistics networks, payment platforms, and last-mile delivery riders connected through information and communication technologies. "And it links consumers directly to primary producers," he added.

Shared prosperity, not zero-sum competition

Does China's rapid technological ascent pose a threat to other countries? "Not really. China's science and technology is not a threat because China is promoting shared prosperity."

He returned to the Realme example. "The same model appears in solar panel factories in Kenya, electric vehicle supply chains in Thailand, and vocational training centers across Africa supported by Chinese partnerships." Students from the Global South come to China, acquire engineering or AI expertise, and return home to contribute to joint ventures. "These aren't extractive relationships. Knowledge, jobs and profits stay where they're created."

China's industrial scale has driven down global prices, creating competitive pressure, but "competition isn't the same as threat. What matters is intent. And China's intent, as I've observed it over the years, is cooperation."

Given China's size, its environmental progress benefits the entire planet. "Global challenges, like climate change, water scarcity and AI ethics, do not respect borders. They require political goodwill and concrete action. In that context, China's contributions through South-South cooperation, UNESCO programs, and institutions like CASTED are invaluable."

Where ancient heritage meets quantum ambition

Even after more than two decades of close engagement, China continues to surprise him. "What still amazes me is the consistency of effort," he said. "People work hard and they also cherish family, tradition and festivals. During Spring Festival, you see red packets, fireworks and reunions. There's a balance between ambition and humanity."

Equally striking is how China harmonizes deep cultural roots with frontier innovation. "Take Zhejiang province as an example, it is home to Liangzhu, a World Heritage site over 5,000 years old, representing one of the world's earliest hydraulic civilizations, jade craftsmanship and social complexity. And it's also where DeepSeek, a leading AI company, is headquartered."

"How can a civilization honor Liangzhu while racing ahead in quantum computing, microchips and AI? That co-existence of memory and momentum is uniquely Chinese. It never stops amazing me," he said.

For Khan, China is a living model where science serves society, innovation lifts communities, and progress is measured not just in patents or GDP, but in human dignity. "That's the beauty of China," he said.

Tech+Culture

Reawakening Innovative Spirit of China's Traditional Culture

By Staff Reporters

In an era of rapid scientific advancement, China's contemporary drive for innovation is increasingly recognized not as a sudden departure from its past, but as a reawakening of deep historical currents.

In a recent interview with *Science and Technology Daily*, three leading Chinese scholars emphasized that the Chinese nation has long possessed a profound, resilient and distinctive tradition of innovation, which remains a source of inspiration for today's scientific and cultural endeavors.

Innovation as a core national trait

Zhu Changrong, director general and research fellow of the Institute of Historical Theory, Chinese Academy of History, Chinese Academy of Social Sciences, said the innovative "gene" embedded in China's fine traditional culture has often been overlooked, particularly during the time when Western-centric narratives obscured or dismissed China's civilizational achievements.

However, the Chinese civilization is the only ancient civilization in the world to have developed continuously without interruption, and innovation has always been central to its endurance.

Ancient Chinese thinkers championed renewal through ideas such as "Governing well begins with discarding the obsolete and creating the new" and "If you can improve yourself today, do so again tomorrow, and keep improving every day." This spirit manifested across three dimensions of civilization.

In material terms, China pioneered advanced systems of rice and dryland agriculture and led the world for centuries in technologies such as cast iron production, papermaking, printing, textile manufacturing, shipbuilding and navigation. It also developed comprehensive knowledge systems in astronomy, mathematics and medicine that sustained a vast population and traveled along the Silk Road to influence global development.

Spiritually, the Chinese civilization continually generated new philosophical and ethical insights amid historical change.

Sun Xiaochun, professor at the School of Humanities, University of Chinese Academy of Sciences, challenged the persistent misconception that ancient China lacked science and therefore had no foundation for innovation.

He contended that while modern experimental science emerged in Europe, ancient China cultivated its own robust scientific culture grounded in empirical observation, practical problem-solving and logical reasoning.

For example, *The Nine Chapters on the Mathematical Art*, compiled during the Western Han Dynasty (202 BC- 25 AD), addressed real-world problems and established a mathematical framework

blending arithmetic, algebra and geometry with a distinctive combination of logical and intuitive reasoning.

Wisdom rooted in people and governance

Zhu highlighted that Chinese innovation has always been characterized by pragmatism, a people-centered orientation, and integrative synthesis.

Zhu explained that throughout history, major reforms were all driven by the need to address concrete governance challenges.

Also, technological innovation served public welfare: The Dujiangyan irrigation system, constructed over two millennia ago by legendary engineer Li Bing and his son during the Warring States period (475-221 BC), transformed agriculture and ecology in Sichuan province in southwest China. It continues to benefit local communities today, embodying the principle of "enriching the people and nurturing life."

Moreover, China's civilizational continuity was sustained through large-scale knowledge integration, as seen in encyclopedic works such as Yongle Dadian and Siku Quanshu, which systematically preserved and reinterpreted cultural heritage across generations.

Cultivating a 'Chinese heart' for modern science

Looking to the future, Zou Guangwen, professor at Tsinghua University's School of Marxism, argued that China's fine traditional culture is not a relic of the past but a living reservoir of values and wisdom essential for navigating contemporary challenges.

Core traditional concepts such as "the people as the foundation of the state," "virtue sustains all things," and "harmony between humanity and nature" offer ethical guidance for addressing modern dilemmas like AI ethics, digital inequality and ecological crisis.

He proposed leveraging modern technology to bridge tradition and innovation: using big data and AI-driven semantic analysis to systematically extract principles like "discard the old, establish the new" from classical texts, building dynamic databases of traditional innovation concepts, and employing VR, AR and virtual avatars to reconstruct historical workshops and interpret canonical works in engaging ways.

However, he also stressed the need to "discard the dross and retain the essence" by reinterpreting tradition through a modern, scientific lens.

Sun echoed this balanced perspective. He remarked that ancient Chinese thought offers a holistic, organic and relational worldview that is increasingly relevant in modern sci-tech fields.

"What we need next is to fuse scientific rationality with the soul of Chinese civilization to cultivate a 'Chinese heart' for science. Only then can our innovation be truly original and future-oriented," he concluded.

Qimin Yaoshu : Encyclopedia of Ancient Chinese Agriculture

Traditional Eastern Wisdom

By BI Weizi

Qimin Yaoshu (Essential Techniques for the Welfare of the People) is the most complete ancient Chinese agricultural text, written by Jia Sixie during the



A copy of Qimin Yaoshu is exhibited at the China Agricultural Museum, Beijing. (PHOTO: VCG)

Northern Wei Dynasty (533-544 AD). As one of the most important works in the history of world agriculture, it has exerted a lasting influence on agricultural practices.

Consisting of 10 volumes and 92 chapters, the book systematically summarizes the agricultural and livestock production experiences of working people in the middle and lower reaches of the Yellow River, prior to the sixth century. It also covers food processing and storage, the uses of wild plants, and strategies for mitigating famine. In addition, the book provides detailed information on the relationship between the seasons, climate and differ-

ent soil and crop varieties.

The structure of each chapter is similar, consisting of an introduction, main text and cited references. The introduction provides an overview of the plants and animals covered in the chapter, detailing their origins and characteristics. Following this is the main text, which makes up the core of the book. Drawing on his interviews and personal experience, the author provides meticulous descriptions of the characteristics, production processes and technical information of various agricultural, forestry, livestock and fishery products. The main text is followed by cited references, which are excerpts from other documents that augment the technical knowledge presented in the main text.

Qimin Yaoshu emphasizes the importance of selecting superior species varieties and the interrelationship between organisms and the environment. Jia believed that seed quality played a

crucial role in crop yield and quality. Using grains as an example, the book describes over 80 grain varieties and compares and contrasts them based on characteristics such as maturity period, plant height, yield, quality and resistance to adverse conditions. The book also explains how to maintain seed purity and prevent contamination, as well as the specific preparation required before sowing, to ensure optimal seed development and growth of healthy seedlings.

Qimin Yaoshu was introduced to Japan during the late Tang Dynasty (618-907 AD). Later, around the 19th century, it was introduced to Europe by French Jesuit missionaries in China. In his famous work *On the Origin of Species*, the British scholar Charles Darwin mentioned consulting the "Encyclopedia of Ancient China" and cited relevant examples from it as evidence for his theory of evolution.

A Tale of Two Museums

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Now, the joint lab has established facilities totaling 650 square meters on the Chinese side and 100 square meters on the Greek side.

It has formed a complete innovation chain spanning scientific research, equipment, standards and applications, achieving significant progress in multiple areas, such as laser cleaning, laser holographic speckle interferometry, non-destructive testing, and digital technologies.

Laser cleaning is one of the key areas of collaborative R&D. The conservation of Lingzhao Xuan provides an excellent opportunity for in-depth cooperation. Primarily constructed of masonry and metal, Lingzhao Xuan, one of the few Western-style buildings in the Forbidden City, stands out distinctively amid the red walls and yellow tiles.

Lingzhao Xuan is not only a witness to historical exchanges between Eastern and Western building materials and cultures, but also a calling card for today's international cooperation in stone cultural relic conservation technologies," said Duan Hongying, section leader of the Material Science Group, Department of Architectural Heritage at the Palace Museum. Currently, the joint lab is making advances in the R&D of a new laser cleaning equipment tailored for on-site operation at the Palace Museum.

Through the collaboration, the Chinese and Greek sides have established a solid foundation of mutual trust, achieved remarkable results, and fostered deep friendship.

In the view of Paraskevi Pouli, senior application scientist at the IESL and Greek head of the joint lab, the joint lab is not only an interdisciplinary international collaboration platform, but also a bridge for the exchange and mutual learning among diverse civilizations.

To date, the joint lab has established two workstations in China and expanded its collaborative research institutions to 12 units across China and Greece.

"In the future, the joint lab will continue to deepen international cooperation. It has already collaborated with the UAE on archaeological excavations and plans to establish a workstation in Malta to jointly conduct research and conservation of local sites, ancient architecture, and murals," said Qu Liang, director of the Palace Museum's Conservation Standard Department and executive deputy director of the joint lab.

"The joint lab aims not only to benefit the Chinese and Greek partners but also to become an exchange and cooperation platform across China, Europe and beyond, making more contributions to international cooperation in cultural heritage conservation technology and the mutual learning among global civilizations," Qu added.



The headquarters of the National Archives of Publications and Culture in Beijing. (PHOTO: XINHUA)