Sci-tech Innovation: New Highlight of BRI Cooperation

By LU Zijian



The photo shows construction workers carrying out operations at the cross-border connection point of the transmission conductors of the China-Laos 500-kilovolt interconnection project. (PHOTO: XINHUA)

Cooperation in digital economy and sci-tech innovation has become the new highlight of the Belt and Road Initiative (BRI), Liang Linchong, director-general of the Department of Regional Opening-up of the National Development and Reform Commission (NDRC), said at a press conference in Beijing on November 11.

China has signed BRI cooperation documents with over 150 countries and more than 30 international organizations, covering three quarters of the countries and major international organizations around the globe, according to Liang.

The NDRC is promoting cooperation in emerging industries such as digital, innovation, green and healthcare industries, facilitating the high-quality development of the BRI.

In the digital sector, China has 38 countries as its Silk Road E-commerce partners. China has signed new digital economy cooperation documents with eight countries. So far this year, and completed all 19 tasks for establishing a high-standard Pilot Zone for Silk Road E-commerce Cooperation.

There is substantial progress in cooperation on innovation. Over 80 BRI joint laboratories are being established. MAZU, a Chinese intelligent meteorological early warning solution, is now deployed in eight BRI partner countries and more than 50 countries have tried the cloud platform service of MAZU for early warning.

The Belt and Road Initiative International Green Development Coalition has 64 members and over 190 organizations from nearly 50 countries as cooperation partners.

In addition, China has deepened joint research in disease prevention and control with institutions from BRI partner countries. It has such partnerships with 48 hospitals in 43 countries, working together on joint research and clinical trials.

During the 15th Five-Year Plan period (2026-2030), the NDRC will work with relevant departments to continuously improve the international cooperation mechanisms of emerging sectors, so as to generate more pragmatic BRI cooperation achievements.

The cooperation areas include smart city, smart industries, smart agriculture, smart medical care and smart education. The development of new business formats and new modes such as cross-border e-commerce will be supported.

The Belt and Road Science, Technology, and Innovation Cooperation Action Plan will be further implemented to promote the deep integration of technological innovation and industrial innovation.

Green infrastructure, green energy, green transportation and green finance cooperation will be promoted, and cooperation in climate change deepened. A closer green development partnership will be established.

Cross-border cooperation in the prevention of and response to public health emergencies, as well as the prevention and control of infectious diseases, will be strengthened. Cooperation between partner hospitals will be deepened. Overseas centers for traditional Chinese medicine will be developed with high quality.

Case Study

Mianyang Builds Full-chain Nuclear Medicine Industry

By TANG Zhexiao & LIU Xia

At a nuclear technology application conference held in Mianyang city, Sichuan province in southwest China, in September, the Sichuan Province National Defense Science and Technology Industry Office released a series of documents on the high-quality development of nuclear technology and industry, proposing that the province's nuclear industry scale will exceed 200 billion RMB by 2030.

As the core of Sichuan's nuclear medicine industry, Mianyang has built a complete industrial chain spanning medical isotope production, radiopharmaceutical R&D, nuclear medicine equipment manufacturing, and clinical application.

Currently, the city hosts five chain-leader enterprises, 26 chain-affiliated enterprises, 17 national high-tech enterprises and technology-based small and medium-sized enterprises, and 15 industrial enterprises above designated size.

Leveraging a cluster of research institutes

Mianyang's greatest advantage in developing the nuclear medicine industry lies in its deep technical accumulation from research institutes and laboratories.

Compact Boron Neutron Capture Therapy (BNCT) is hailed as the "crown jewel" of radiotherapy, distinguished by its precise targeting and minimally invasive safety. At the Nuclear Medicine Health Industrial Park of China (Mianyang) Science and Technology City, the assembly and commissioning of China's first BNCT system is underway, with a market launch planned for 2028.

Last December, China General Nuclear Power Corporation's medical isotope production base in Mianyang was completed and entered trial production. The base has achieved scaled production of multiple key medical isotopes, including germanium-68, and now is focusing on the industrialization of copper-64 and zirconium-89.

In nuclide production, Mianyang has developed full industrial-chain capabilities for the research, production and application of isotopes, covering reactors, accelerators and generators, and has built five reactor-based nuclide production lines enabling stable, independent and large supply of six reactor-produced isotopes, including iodine-131, lutetium-177 and molybdenum-99.

As for nuclear medicine equipment, Mianyang has become the only domestic leading hub for all four types of radiation used to treat tumors — protons, electrons, photons and neutrons.

From R&D to application

At the workshop of a technology company in the city, a medical radiation-protection glove is under production. With a fingertip thickness of just 0.12 millimeters, the glove enables doctors to block radiation without compromising fine manipulation.

It entered Sichuan's special review and approval procedure for innovative medical devices in August.

This glove is an example of research outcomes moving from the laboratories of scientific institutes to the production line.

Mianyang operates a working mechanism of "one industrial chain, one chain-leader enterprise, one chief scientist, one dedicated work team and one set of support policies," bringing all parties to the same table — research institutes supply technology, manufacturers handle implementation, industrial platforms coordinate capital and resources, and hospitals communicate clinical needs in advance.

The city has also established nine industrial investment funds to steer social capital toward early-stage, small-scale, long-term and hard-tech investment.

A high-quality construction project for nuclear medicine diagnosis and treatment was recently launched at Mianyang Central Hospital. Mianyang Sanjiang Hospital, a Grade III, Class A general hospital with a focus on nuclear medical care, has also officially started operation.

With sustained collaboration between R&D, manufacturing and clinical practice, Mianyang is set to accelerate its rise as a globally influential nuclear medicine health industry hub.



China (Mianyang) Science and Technology City in Sichuan province. (PHOTO: VCG)

China Maps 'AI + Natural Resources' Push

Policy Express

By TANG Zhexiao

China will accelerate scaled and industrialized innovative application of artificial intelligence (AI) in the natural resources sector, supporting the intelligent upgrading of the "One Map" for territorial spatial planning.

The Ministry of Natural Resources and the National Development and Reform Commission issued a guide on "AI + Natural Resources," setting out phased development goals.

By 2028, the natural resources sector will be achieved demonstration applications of AI, and the intelligence level of the "One Map" will be comprehensively elevated.

By 2030, AI will be deeply integrated into the entire chain of natural resource management, and an integrated intelligent platform for territorial spatial governance will be built.

The guide proposes coordinating the layout of five AI pilot testing platforms covering spatiotemporal geographic information, territorial spatial planning and governance, oceans, geology and mineral resources, and forestry and grassland. The goal is to create a service system that integrates computing power supply, model training, algorithm iteration, scenario validation and ecosystem building.

Eight demonstration application scenarios in natural resources have been rolled out, covering AI plus integrated "sky-ground-sea-network" monitoring and supervision, territorial spatial planning and governance, natural resource asset management, and natural resource disaster governance.

To meet prevention and control needs for typical disasters such as geological hazards, marine disasters, and forest and grassland fires, an intelligent perception system will be built, and intelligent monitoring and early warning models developed.

In marine resource development and governance, the focus is on deep-sea and polar exploration, marine resource development and marine environmental protection. Breakthroughs will be made in the intelligent screening of marine compounds, and AI-empowered marine environmental forecasting models. R&D of autonomous and controllable marine intelligent equipment will be prioritized to form new AI+ capabilities serving marine energy, pharmaceuticals, shipping, and tourism.

An "AI Super Brain" for earth sciences will be built. Early warning technologies for key processes of the Earth system will be developed focusing on lithosphere, hydrosphere, atmosphere, and biosphere.



At the Taishan Deep Earth Laboratory, a Ph.D. student is calibrating an unshielded SERF atomic magnetometer. (PHOTO: XINHUA)

A Super Stabilizer for New Energy Grids

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While the three-turn water-cooled bar was a world first, joint sealing became a stumbling block — the slightest seepage could cause a short-circuit shutdown. Lei Juchun's welding team built 1:1 mock test pieces and spent six months adjusting parameters, performing flaw detection after each weld, and starting over after each failure. In the end, all joints passed flaw detection at the first attempt, and the machine passed the airtightness test, with not a drop leaked.

Stabilizing the grid

By 2026, the grid had become "lighter." Traditional grids rely on massive generator rotors — iron lumps weighing tens to thousands of tons — whose spinning inertia buys seconds before collapse when voltage fluctuates. But solar panels don't rotate, and wind power passes through electronic converters with no rotational inertia. The synchronous condenser is the ballast that adds weight back.

Structural design engineer Shi Shilei's team halved the rotational speed and made the rotor thicker and heavier, achieving six times the inertia of older models. But slower speed means a bigger machine, constrained by the wind farm's nacelle and transport corridors. The team innovatively adopted a three-turn bar structure that accommodates 35 kV while slimming the machine — offsetting the inertia loss.

On June 27, the final assembly passed the test, and the voltage was raised to the design limit with the parameters holding steady. The machine was then shipped to Sunwu, and on August 16, connected to the grid. The 168-hour continuous full-load trial run passed on the first attempt.

Data showed that short-circuit capacity has more than doubled and the short-circuit ratio is up 50 percent, which means the system is stronger and more stable. The inertia support rose by 70 percent, and wind farm capacity has doubled from 100,000 kW to 200,000 kW.

This equipment is an efficient domestic solution to ensure stable control in high-proportion new energy power grids — a "key cornerstone" of the new-type power system, said Cai Wei, a national outstanding engineer and professor at Harbin University of Science and Technology.

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"China has been an advocate, promoter and forerunner in Asia-Pacific economic cooperation," Xi said at the Shenzhen meeting, adding that the country is ready to work with all parties to build the four key pillars of an Asia-Pacific community — economy and trade, connectivity, innovation, and development.

The Chinese president called for stronger economy and trade as a pillar underpinning such a community. Efforts should be made to align various regional economic and trade agreements, boost trade and investment facilitation and digitalization, and reduce barriers to trade and investment, he said.

Xi underscored the importance of upgrading connectivity in building the Asia-Pacific community. He called for measures to improve infrastructure network, harmonize policies and regulations, advance people-to-people exchanges, and promote mutual understanding and closer bonds among peoples.

Innovation should be fostered as another pillar of the Asia-Pacific community, Xi said. Greater efforts need to be made to develop digital infrastructure and encourage the broad application of artificial intelligence, he added.

Xi also stressed the importance of development in building the Asia-Pacific community. He called on regional economies to advance cooperation on energy and food security, anti-corruption governance across borders, and green and low-carbon transition. He also expressed support for improving the people's well-being and called for increased investment in human capital.

Turning consensus into action

China is rooted in the Asia-Pacific and will continue to support Asia-Pacific cooperation, Xi said.

He announced that China would contribute 20 million U.S. dollars to support APEC practical cooperation.

China will also establish a Center for Asia-Pacific Community Studies in Shenzhen to conduct policy research and exchanges, and set up cooperation institutions in such areas as digital technology, cross-border data flow, clean energy and the development of small and medium-sized enterprises, according to Xi.

Leaders and representatives of APEC member economies shared their views at the meeting on building an Asia-Pacific community to prosper together.

They spoke highly of the achievements of China's APEC host year and expressed their readiness to step up cooperation to advance APEC's development.

In his closing remarks, Xi called for strengthening confidence to translate the consensus on building an Asia-Pacific community into concrete action, and to turn the vision into reality.

He stressed the need to focus on development as the broadest common ground for cooperation and deliver more tangible benefits through Asia-Pacific cooperation.

The meeting adopted by consensus the 2026 APEC Leaders' Declaration, which sets out the Shenzhen Outlook on building an Asia-Pacific community, and three outcome documents on trade, connectivity and innovation.

Vietnam took over as APEC host for 2027, with President To Lam inviting leaders and representatives of member economies to attend next year's meeting in Vietnam.

Source: XINHUA