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China, Turkmenistan Deepen Energy Ties

By Staff Reporters

Chinese President Xi Jinping's Special Representative and Vice Premier of the State Council of China Ding Xuexiang recently traveled to Turkmenistan to attend the ground-breaking of the fourth phase of the Galkynysh gas field.

During the visit, Ding Xuexiang met separately with National Leader of the Turkmen People and Chairman of the Halk Maslahaty of Turkmenistan Gurbanguly Berdimuhamedov, and Turkmen President Serdar Berdimuhamedov.

He also co-chaired the seventh meeting of the China-Turkmenistan Cooperation Committee with Turkmenistan's Deputy Prime Minister and Foreign Minister Rashid Meredov.

Ding and Gurbanguly Berdimuhamedov jointly attended the ground-breaking of the fourth phase of the Galkynysh gas field.

Ding said the phase embodies the ardent expectations of the leaders of both countries and the shared aspirations of the two peoples. The project will further elevate energy cooperation between China and Turkmenistan to a new level.

He proposed prioritizing quality and building a premium, high-standard project. He also noted that both sides should pursue innovation-driven development and make the project a benchmark, setting an example for major natural gas projects. He said China and Turkmenistan should adhere to win-win cooperation and make the project a symbol of friendship.

Natural gas cooperation is a cornerstone of China-Turkmenistan relations and has delivered tangible benefits to both peoples.

Ding also said the two countries should enhance cooperation in non-resource areas such as connectivity, economy and trade, investment, agriculture, as well as digital economy, and cultivate new growth drivers. They should jointly promote China-Central Asia cooperation and work together with regional countries for development and prosperity.

Serdar Berdimuhamedov said his country highly values its comprehensive strategic partnership with China, and is ready to deepen traditional friendship with the Chinese side, take natural gas development as the priority direction, and strengthen practical cooperation in various fields.

Turkmenistan highly appreciates the four global initiatives proposed by President Xi — the Global Development Initiative, the Global Security Initiative, the Global Civilization Initiative and the Global Governance Initiative. Serdar Berdimuhamedov said Turkmenistan will support China in hosting the third China-Central Asia Summit.

Ding witnessed the signing of cooperative documents for establishing cultural centers, transport and logistics, AI, science and technology, and traditional medicine.

He also attended the opening ceremony of a symposium marking the 20th anniversary of strategic cooperation between China and Turkmenistan in the natural gas sector and the launch of the Luban Workshop in Turkmenistan.



The first Hualong One nuclear power unit in the Guangdong-Hong Kong-Macao Greater Bay Area — Unit 1 of China General Nuclear Power Group Taipingling nuclear power project, commenced power generation on April 20 in Huizhou, south China's Guangdong province, officially entering commercial operation. (PHOTO: XINHUA)

Advancing Cooperation Under GDI

By LU Zijian, TANG Zhexiao & FU Lili

Hosted by the China International Development Cooperation Agency (CIDCA), the Third High-level Conference of the Forum on Global Action for Shared Development was held in Beijing on April 22.

This year marks the fifth anniversary of the Global Development Initiative (GDI) proposed by Chinese President Xi Jinping to boost global efforts to achieve the UN sustainable development goals. The attendees shared their thoughts on climate change and green development, and digital economy, which are among the eight prioritized cooperation areas of the GDI.

As global climate change intensifies, extreme weather events are having a significant impact on people's lives

and economic activities.

Zhang Xingying, director-general of the Department of International Cooperation of China Meteorological Administration (CMA), noted that the "MAZU" early warning system — a Chinese cloud-based meteorological system designed to help countries better broadcast extreme weather — has been deployed in seven countries since its launch in July 2025, including Pakistan and Djibouti. More than 40 other countries are using its cloud-based service.

During the meteorology sub-forum, the CMA launched the new-generation public cloud version of the MAZU system, and officially handed over customized MAZU systems to Sri Lanka and Jordan on site.

Ra'ed Ahmad Subhi Rafid, director of Jordan Meteorological Department,

pointed out that extreme weather events such as sandstorms, dusty storms and heat waves are increasingly affecting Jordan. The customized MAZU system integrates AI and satellite data models, supporting forecasters and decision makers in their work.

Athula Kumara Karunanayake, director general of the Department of Meteorology of Sri Lanka, said the customized MAZU system enables forecasts of varying lead times — from one day to three months — tailored to different sectors. With precise forecasts, relevant agencies such as the water authorities can take timely and necessary actions.

"This will bring more benefit. We can minimize our people's death and economic damage, and that is good for our nation," Karunanayake said.

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STI Frontier

Powerful TBM: Digging Deep into the Earth

By LU Zijian & SUN Yu

Named Gangtie Jiliang, or Steel Backbone, it is the world's first kilometer-scale, vertical shaft, hard-rock, full-face tunnel boring machine (TBM). The revolutionary borer recently wormed its way deep into the ground at an iron ore project site of Ansteel Group Corporation Limited in Anshan, northeast China's Liaoning province.

Since 2021, China Railway Construction Heavy Industry Corporation Limited (CRCHI) has assembled a dedicated R&D team to tackle key earth boring challenges, successively overcoming three core technologies — excavation, muck removal, and support. The end result was the development of Gangtie Jiliang.

'Pencil sharpener' breakthrough

The geological conditions get more complex as the TBM goes deeper, and

excavating hard rock becomes a key challenge.

The research team first upgraded the cutterhead for Gangtie Jiliang. To comply with the characteristics of vertical shaft excavation, the researchers designed a conical cutterhead with automatic alignment correction based on the cutterhead used by conventional shield TBMs, along with selected cutters that are highly effective in breaking rock.

However, the new cutterhead took a major battering when the test TBM dug to around 160 meters of a highway project vertical shaft in Panzhihua, Sichuan province.

Due to the sudden increase of rock hardness to 140 MPa, the excavation efficiency of the test TBM dropped from 10 mm per minute to five mm per minute. The team inspected the cutterhead and found uneven wear on the cutter rings

and damaged bearings. Measures were needed to reduce the lateral forces acting on the cutterhead during excavation.

Pencil sharpening inspired the research team. "Previously, we assumed that equipment in a vertical shaft achieves maximum rock-breaking force when excavating horizontally, which is why the standard cutting tools on the cutterhead were always oriented perpendicular to the face," said Ke Wei, a designer of the excavation system of Gangtie Jiliang.

"But the experience of sharpening a pencil reminds us that when the blade is held against the pencil, a smaller cutting angle actually makes sharpening easier. This suggests that angling the cutting tools when drilling rock might actually result in greater rock-breaking force," said Ke.

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International Cooperation

AI Weather Alert System for BRI Countries

Edited by WANG Xiaoxia

An intelligent AI driven weather forecasting system for Belt and Road Initiative (BRI) partner countries, was recently launched in China.

Initiated by the Ministry of Science and Technology and led by the Earth system numerical prediction center at the China Meteorological Administration (CMA), the forecasting system demonstration project focused on the urgent needs of BRI partner countries.

Relying on China's technological accumulation in AI, meteorological satellites, and numerical forecasting, it will build an all-day intelligent meteorological forecasting system, and upgrade the cooperation mechanism from single-way technology transfer to joint R&D and capacity building.

Han Wei, project leader and deputy chief engineer of the Earth system numerical prediction center at the CMA, said the project promotes the localization and application of AI technology in the BRI partner countries, through various means such as joint research and development, data sharing, and application demonstrations.

The project plans to develop five core AI models, covering key areas such as intelligent fusion of multi-sphere observations, intelligent short-term and near-term forecasting, and regional downscaling. At the same time, it will develop an intelligent weather forecast all-in-one machine that can flexibly adapt to the infrastructure of different countries.

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WEEKLY REVIEW

Pakistani Astronauts Selected for China's Space Mission Training

Two Pakistani candidates Muhammad Zeeshan Ali and Khurram Daud have been selected as the first foreign astronauts for China's space mission training, the China Manned Space Agency announced on Wednesday. The agency said they will come to China soon as reserve astronauts for training. After completing all training and evaluations, one of them will participate in a space mission as a payload specialist, becoming the first foreign astronaut onboard the Tiangong space station.

Math Wiz Chinese Women Win Breakthrough Prize

Three Chinese women mathematicians — Wang Hong, Tang Yunqing, and Zhang Mingjia — have been recognized in the 2026 Breakthrough Prize awards for their exceptional contributions to mathematics. Often dubbed the "Oscars of Science," the Breakthrough Prize honors groundbreaking achievements in life sciences, fundamental physics and mathematics.

Black Hole Jets Measured for First Time

Scientists have measured black hole jets by using a planet-sized network of radio telescopes. Focusing on Cygnus X-1, one of the first known black holes, they measured jets blasting out with the energy of 10,000 Suns and moving at half the speed of light. The study was published in *Nature Astronomy*.

Missing Vitamin B7 Could Stop Cancer Cell Growth

In a study published in *Molecular Cell*, researchers at the University of Lausanne have uncovered a new biological mechanism that exposes a critical vulnerability in tumor cells when they are deprived of vitamin B7. Mutations in a cancer-linked gene can make this vulnerability even stronger, offering a promising new target for therapy.

New Graphic

IN Q1 2026

China's Gross Domestic Product (GDP)

33.4 Trillion RMB

5.0% Y-O-Y

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

WECHAT ACCOUNT



E-PAPER

