



Science and Technology Daily

VOL.2-NO.38

THURSDAY, MARCH 31, 2022

WEEKLY EDITION

International Cooperation

BRICS Countries Go Big on Vaccine R&D

By Staff Reporters

An online ceremony, hosted by China's Ministry of Science and Technology, was held to launch the BRICS Vaccine Research and Development (R&D) Center on March 22, marking another solid step forward in strengthening cooperation in public health among BRICS countries.

During the ceremony, Chinese Minister of Science and Technology Wang Zhigang said that China will work with other BRICS countries to use the center's launch as an opportunity to promote exchanges and cooperation on vaccine R&D and testing, construction of plants and mutual recognition of standards among BRICS countries.

As the chair of BRICS this year, China is willing to work with all sides to

deepen BRICS partnerships, centering on the theme of "Forming a high-quality partnership to jointly create a new era of global development," and deliver hope and confidence for global economic recovery, said Wang.

The BRICS Vaccine R&D Center will bridge universities, institutes, health authorities and the industry to promote innovation on vaccine R&D, so that BRICS countries could perform better in future epidemic prevention and control, said Wang.

At the ceremony, BRICS countries jointly proposed an initiative to ensure the accessibility and affordability of vaccines in developing countries through their equitable distribution as global public goods, while also aiming to improve BRICS countries' capability to control infectious diseases and respond to public health events.



The piece of jade in the shape of Chinese dragon (left) dates back to the Neolithic era. Dating from Western Zhou Dynasty (1046 - 771 BC), the He Zun is a ritual wine vessel of bronze, known as the artifact with the earliest written Chinese characters meaning China. Both are displayed at an exhibition held at the Palace Museum in Beijing. (PHOTO: VCG)

New PCR Detection Kit to Accelerate Mass Screening

By Staff Reporters

A new PCR (polymerase chain reaction) detection kit for nucleic acid from the novel coronavirus was authorized to enter Chinese market on March 16, reducing the detection time from almost two hours to 30 minutes. This could greatly improve the efficiency of mass screening, especially in cases of mass infection breakout.

Apart from the drastic reduction in detection time, the new kit's function means the pressure of PCR equipment shortage for mass screening could be relieved.

"The elevated test speed boosts the test capability and decreases the reliance on the quantity of equipment, which met the need for mass screening in Shanghai recently," said Song Zhigang, professor at Shanghai Public Health Clinical Center. *See page 2*

China-funded Power Plant Swells Bangladesh Energy Needs

By TANG Zhexiao

With the inauguration of the China-funded 1.32 GW ultra-supercritical coal-fired power plant at Payra, Bangladesh has achieved its target of full electricity coverage in the country.

More than 100 officials of the Bangladesh government attended the inauguration ceremony on March 22. Bangladeshi Prime Minister Sheikh Hasina thanked the Chinese Embassy in Bangladesh for its support and assistance, saying that the China-Bangladesh joint venture project was a big achievement, and the electricity will be carried to every corner of the country to accelerate rural development.

Chinese Ambassador Li Jiming, said China and Bangladesh have been jointly building the plant since October 2016, based on the principle of equality and cooperation, and its Unit-1 began operation in 2020. The plant will boost industrial development in Bangladesh, while also making contributions to environmental protection and the well-being of the local people.

Located in the south Bangladesh's Patuakhali district and supported by

China's core technology and equipment, the plant is one of key projects of the Belt and Road Initiative.

As the first and largest power plant using ultra-supercritical technology, the plant is co-developed, co-invested and co-constructed by the China National Machinery Import and Export Co. and Bangladesh's North - West Power Generation Co. Ltd, with a total investment of about 2.2 billion USD. It is also Bangladesh's first PPP (public - private - partnership) project funded by China.

Officials said the plant will provide Bangladesh with about 8.58 billion kWh of electricity every year once fully operational, which will play an important role in improving the country's power structure and supply.

Compared with a conventional coal-fired power plant, an ultra-supercritical power plant requires less coal to achieve higher thermal efficiency and lower emissions, including carbon dioxide.

With this project, Bangladesh has become the 13th country in the world and seventh in South Asia to use the environmentally - friendly, ultra-supercritical technology in producing power.



The 1.32 GW ultra-supercritical coal-fired power plant in Patuakhali, Bangladesh. (PHOTO: XINHUA)

Editor's Pick

BeiDou: Homegrown System, Navigation for the World

By TANG Zhexiao

China's BeiDou Navigation Satellite System (BDS) has entered a new phase of sustained stable services and rapid development, according to China Satellite Navigation Office (CSNO). On March 21, the country's first Beidou positioning system for subways began its construction in Beijing. It is expected to be completed by the end of this year.

Independently developed and operated by China, BDS is the country's largest space-based system and one of four global navigation networks, along with the United States' GPS, Russia's GLONASS and the European Union's Galileo. It provides all-time, all-weather and high - accuracy positioning, navigation and timing services to global users.

Since its inception, BDS has been used in national significant infrastructures. Official data shows the sales volume of domestic Beidou compatible chips and modules has exceeded 150 million by the end of 2020, with the do-

mestic output value of the BDS industry chain reaching 403.3 billion RMB.

BDS's construction background

The idea to develop the BDS was conceived in the 1980s. Experts and scholars proposed the idea of using two geosynchronous orbit satellites to measure ground and air targets. After much research, the concept of the dual-satellite navigational system gradually formed.

In 1994, a research team was built to initiate the first phase of the BeiDou Navigation System (BDS-1). Ten years later, the BDS - 1 was finally completed, making China the third country to have an independent satellite navigation system after the U.S. and Russia.

BDS-2 achieved the best coverage effect with the least number of satellites, realizing hybrid constellation regional satellite navigation for the first time in the world.

On July 31, 2020, China formally commissioned the BDS, launching the third generation of BDS-3 system to provide global coverage for timing and navigation.

Currently, 45 BDS satellites are operational in orbit, while 15 BDS-2 satellites and 30 BDS-3 satellites jointly provide services to global users.

BDS-based positioning brings benefits

Achieving large-scale civilian promotion and forming a strong Beidou industrial chain is essential for the sustainable development of the Beidou system.

In recent years, the system has been used in many industries such as transportation, disaster relief, agriculture and other infrastructure. Particularly in the fight against COVID-19, BDS-based precise positioning has facilitated the supply and circulation of COVID-19 protection and prevention materials.

For now, there are more than eight million road operating vehicles, 40,000 postal and express delivery vehicles, 80,000 buses in 36 major cities, 3,200 inland navigation facilities, and 2,900 marine navigation facilities using the Beidou system.

See page 4

Recalculating China's Land Carbon Sink Area

By Staff Reporters

A group of Chinese scientists have recalculated the size of China's land carbon sink with the result recently published in *Nature*, noting that it had been previously overestimated in research also published in *Nature* in 2020.

Adopting the Copernicus Atmosphere Monitoring Service (CAMS), scientists found that the estimated average land carbon sink in China between 2010 and 2016 was 920 million tons of CO₂ per year, after they had amended the lateral carbon flux.

However, the result could be 2.57 billion tons of CO₂ per year if the CO₂ concentration data from the Shangri-La Atmosphere Watch Station, in Yunnan

province, had been included in the inversion calculation.

To figure out the difference, the scientists conducted analysis and simulation of the station's observation footprint via a high-resolution atmospheric transmittance model.

The result showed that the CO₂ concentration in spring and autumn in the area of the station was evidently underestimated, because previous research used the CO₂ concentration data from the station as the average CO₂ concentration for the coarse-resolution atmospheric transmittance model grid where the station is located. This caused the overestimation of land carbon sink in southwest China by the coarse-resolution inversion model.

Scientists also updated the estimation of China's land carbon sink via the bottom - up approach for the past 10 years, based on the forest inventory data and other inventory data during the same period. The result demonstrated that carbon storage of the land ecosystem went up 280 million tons of carbon per year, equaling the emission of 1.03 billion tons of CO₂, which basically matches the inversion estimation of carbon sink via the top-down approach.

In response to this recalculation, the authors of the previous research noted that China's land ecosystem owns a large carbon sink despite the fact that there is certain systematic bias between different chemical transmittance models.

WEEKLY REVIEW

Tianzhou-2 Cargo Craft Starts the Return Journey

Tianzhou-2 left the core module of China's Tiangong space station after completing all of its scheduled tasks at 3:59 pm (BT) on March 27, according to the China Manned Space Agency. The spacecraft will enter the Earth's atmosphere at an appropriate time under ground control.

Hualong One Reactor Realizes Full Operation

Located in the city of Fuqing in east China's Fujian province, the No. 6 unit, the country's second nuclear power unit using Hualong One, has met requirements for commercial operation, according to the China National Nuclear Corporation. This also marks the full operation of Hualong One reactor demonstration project.

Most Precise Large Samples of Stellar Ages Gained via LAMOST and Gaia Data

Astronomers obtained the most accurate information regarding the large samples of stellar ages based on the observation data by the Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST) in China and the European Space Agency's Gaia satellite, and drew the images in terms of how the Milky Way took shape and evolved in its infant and juvenile stages.

Rapid Nucleic Acid Test Developed to Detect COVID-19 Variants

Scientists from Guangdong Provincial People's Hospital and South China University of Technology developed an RT-LAMP method to detect the novel coronavirus and Delta variants, which takes only about an hour and appears to be 100 percent accurate in the detection.

WECHAT ACCOUNT

E-PAPER

