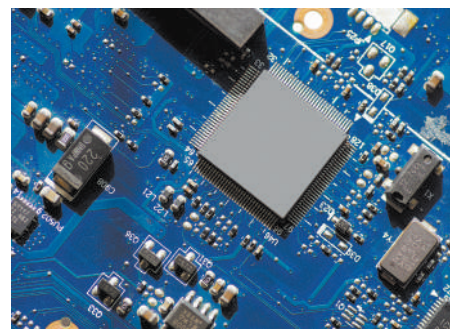




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WEEKLY EDITION

Implementation Plan for Sci-tech Supporting Carbon Neutrality Released

By Staff Reporters

An implementation plan was jointly released by the Ministry of Science and Technology (MOST) and eight other departments on August 18, proposing sci-tech innovation actions and guaranteeing measures to support the realization of China's carbon peaking goal before 2030, and making preparations for achieving carbon neutrality before 2060, from the perspective of technological R&D.

The plan puts forward ten actions to strengthen the sci-tech support for achieving carbon peaking and carbon neutrality.

- Sci-tech supporting green and low carbon transformation of energies.
- Working on a technological breakthrough for zero carbon industrial processes and remanufacturing of low carbon ones.
- Tackling challenges of low carbon and zero carbon technologies in architecture and transportation industries.
- Enhancing carbon negative capabilities with a focus on carbon capture, utilization and storage (CCUS), and emission reduction technologies, targeting non-CO₂ greenhouse gases.
- Strengthening innovation of frontier and disruptive low carbon technologies with an emphasis on basic research of key areas like new energy.
- Carrying out a series of demonstration projects for low carbon and zero carbon technologies, forming a batch of comprehensive solutions for energy saving and carbon reduction that can be replicated and promoted, and promoting the transfer and commercialization of low carbon technological achievements. *See page 3*

International Cooperation

Pakistani Barren Region Turns Green

By Staff Reporters

For the past few years, with help from Chinese specialists, green plants have spread over south Pakistan's Gwadar region, a place dominated by hot desert climate.

Abdul Rahim, Assistant Director Environment, Gwadar Development Authority, said that over 95 percent of local residents' income is dependent on fishing, and such dependence on a single industry has limited local development.

To develop a plant industry in hot and dry Gwadar, Rahim said, it requires high-level agricultural technology and expertise, a previous problem now solved by the arrival of Chinese specialists.

An engineering and research center on tropical arid economic forests was established in Gwadar several years ago by Chinese and Pakistani universities, research institutes and enterprises in order to improve local greening and climate.

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Staff checking the growth of flowers in a nursery in Gwadar, Pakistan. (PHOTO: XINHUA)



A robot dog patrolling at an expo during the World Robot Conference 2022 held in Beijing. (PHOTO: XINHUA)

Editor's Pick

Coal-to-Ethanol Technology Ushers in Green Future

By Wang Xiaoxia

Ethanol, a renewable fuel produced through grain fermentation or by hydration of ethylene derived from petroleum, is caught in a dilemma. Both production methods have flaws — the former threatens food security, while the latter is expensive and dependent on oil.

So, are there other ways to make ethanol on a large scale? Liu Zhongmin, academician at the Chinese Academy of Engineering, and his team from Dalian Institute of Chemical Physics (DICP), have explored a more economical and greener way of ethanol production from coal.

After years of technical optimization and scale-up verification, the technology is well ready for large-scale industrial production. Recently, based on Liu's research, the world's largest coal-based ethanol production project with an annual output of 500,000 tons was completed in Yulin, Shaanxi province.

High demand

Ethanol is one of the largest volume

organic chemicals used in industrial and consumer products. Absolute ethanol can be used as a gasoline additive, namely fuel ethanol, which can effectively improve the quality of gasoline and greatly reduce the pollutant emissions.

Bioethanol is by far the most common biofuel worldwide, which mainly uses grain as raw material. China produced 9.87 million tons of bioethanol in 2020, of which about 2.74 million tons were fuel ethanol, far from meeting the country's demand, said Liu.

Therefore, increasing fuel ethanol production is of great significance to ensure energy security of the country. However, bioethanol production may not be widely promoted in China, given the large demand for food from its enormous population.

In view of China's large coal reserves, which account for 95 percent of the country's fossil fuel resources, it is feasible to develop coal-based ethanol production technology, which would serve both energy and food security of China. This is the prime reason why Liu

and his team decided to develop this kind of technology.

New breakthrough technology

After years of research, DICP has come up with new technology to produce ethanol from coal-based syngas through methanol, dimethyl ether carbonylation and hydrogenation.

According to Liu, the dimethyl ether conversion reaction is very complex, as different catalysts can lead to completely different reactions, producing completely different products.

For a long time, the direct ethanol production from coal syngas has been stuck in the research and development stage, because it requires precious metals as catalysts and causes severe corrosion.

In order to develop a technology suitable for commercial use, researchers had to develop a proper catalyst for dimethyl ether carbonylation. After three years of testing and optimization, the research team achieved a breakthrough using a cheap catalyst with high activity and stability.

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Weather Modification UAS Test Successful

By Staff Reporters

A new weather-modification and remote-sensing-detection unmanned aerial system (UAS) successfully completed its first test flight in Shaanxi province recently. This is China's first UAS with capacity of medium altitude, large capacity, and long endurance.

Jointly developed by Aerospace Information Research Institute, Chinese Academy of Sciences, China Academy of Aerospace Electronics Technology (CAAET) and several other institutes, the UAS can be quickly deployed with a large payload, low cost, and high safety.

To tackle the challenges concerning weather modification technologies, CAAET designed an airborne remote sensing detection system targeting atmospheric factors, including cloud, rain, aerosol and wind. Another system was also developed for air-ground coordinated detection testing of weather modification.

Based on new-generation satellite-borne radars for cloud, rain, aerosol and wind detection, new functions were realized by the detection system, such as double active composite detection via laser and microwave, combined active-passive detection and in situ de-

tection.

Those functions can facilitate multi-dimensional qualitative remote sensing detection for cloud, rain, aerosol and wind below the air route. The entire system also has the capability of real-time fine detection, smart analysis and judgment, precise catalyzing and scientific evaluation of results.

In addition to this, CAAET conducted the R&D of detection payload, organization and implementation of tests, and data processing of air ground coordinated detection, which greatly supported the successful development of the UAS and completion of tests.

Rural Areas Get Modern with Smart Home Appliances

By Staff Reporters

China has witnessed steady progress in the consumption of green and smart home appliances, and is expected to increase consumption in rural areas through carrying out favorable policies and improving infrastructure.

According to a report released by China Electronics and Information Industry Development Research Institute, a think tank under the Ministry of Industry and Information Technology (MIIT), China's home appliance market volume reached 881.1 billion RMB in 2021. The small cities and rural areas contributed 277.5 billion RMB, with an increase of 8.9 percent year-on-year, a higher growth rate than the national market.

Promoting green and smart home appliances is not only in line with the country's efforts to pursue a path of green, low-carbon and sustainable development, but also meets people's needs for a better life, said the think tank.

Recently, a series of supportive policies have been adopted to promote the consumption of green and smart home appliances. On July 29, the State Council proposed that local governments will provide moderate subsidies or subsidized loans for consumption of green and smart home appliances and green building materials.

Authorities, including the Ministry of Commerce, issued a guideline on July 28 to encourage the replacement of old household appliances with new ones, and bolster the consumption of green and smart home appliances in rural areas.

To promote smart home appliances, the MIIT said China will facilitate the construction of 5G and gigabit networks, while extending its coverage to towns and rural areas.

WEEKLY REVIEW

World Robot Conference Held in Beijing

The World Robot Conference (WRC) 2022 was held from Aug. 18 to 21 in Beijing. More than 500 sets of robots from 130 enterprises were displayed at the WRC, among which over 30 made their world debuts.

S&T Activities Carried out Nationwide to Inspire Innovation

The national science and technology week was launched on Aug. 20 in Beijing, where exhibition is held to display latest scientific and technological achievements applied in the Beijing 2022 Olympic Winter Games and the fight against COVID-19, among others. A variety of S&T-themed public activities will take place across the country as well.

New Remote Sensing Satellite Group Launched

A remote sensing satellite group, as the fourth batch of the Yaogan-35 family, were sent into space by a Long March-2D carrier rocket on Aug. 20. They will conduct science experiments, land resource surveys, estimation of agricultural production, and disaster prevention and reduction.

China Takes Lead to Set Int'l Standard for New Power Systems

At the 2022 International Standardization Forum held in Nanjing on Aug. 20, the International Electrotechnical Commission (IEC) proposed that China take the lead in formulating the world's first international standard framework for key technologies of new power systems, to accelerate the construction of new power systems and promote clean and low-carbon energy transition.

WECHAT ACCOUNT



E-PAPER



British Chemist Sparks Magic in Chinese Classrooms

By Staff Reporters

David G. Evans, 63, a member of Royal Institute of Chemistry, has been teaching in China for 26 years. British native Evans is a Distinguished Professor focusing on functional material systems in layered and intercalated structures at Beijing University of Chemical Technology. He was awarded the Chinese Government Friendship Award and the Meritorious Foreign Teacher award in 2001 and 2014 respectively for his unparalleled contributions to China's modernization drive.

In addition, his outstanding contribution to scientific research has earned him the International Science and Technology Cooperation Award of the People's Republic of China in 2005.

A "Beijing floater"
Evans prefers to be called by his Chinese name, Dai Wei, rather than his English name. As a "Beijing floater," he has lived and worked in Beijing for more than two decades. He now not only speaks fluent Chinese, but also has a good understanding of Chinese culture.

One summer, more than 30 years ago, the International Conference on Coordination Chemistry held in Nanjing attracted hundreds of foreign delegates, and Evans was one of them. At that time, China was still in its early stage of reform and opening up, and while many foreign experts knew little about this eastern socialist country, Evans was shown the hospitality and kindness of Chinese people. "Just take a map and point with your finger where you want to go, and many Chinese people will enthusiastically tell you how to get there," he recalled.

Moreover, the trend that all sectors of society, including academia, were poised for growth also made him aware



Professor David G. Evans. (COURTESY PHOTO)

of China's huge potential. So he made up his mind to pay more visits to the country. In the following ten years, he visited China many times through various international academic exchange activities. On each visit he was always amazed by the rapid development of China and became more determined to secure a closer relationship with the country.

In 1996, Evans made a bold decision to give up his lucrative job in England and settle in China. At that time, many of his colleagues and friends were not supportive, but he persisted. So far, time has proven that he made the right choice.

An online celebrity
Another focus of Evans' work is to popularize the science of chemistry. Science popularization implies disseminating scientific knowledge and fostering a scientific way of thinking, especially among young people, thereby inspiring them to work in the science field in

the future. "When primary school students in the UK see me doing chemistry experiments, they scream with joy when the reagents change color and explode; however, by the time they reach high school, they are not surprised any more. But in China, not only elementary school students, but also many high school students and even college students are still amazed when they see these experiments, since they have seldom gained any opportunity to witness them happen," he said. In contrast to British teenagers, Chinese high school students had relatively fewer opportunities for hands-on experiments in the learning process of natural science subjects, but experiments are precisely an indispensable part of building a correct perception of scientific phenomena.

So Evans devotes much of his spare time to conducting experimental demonstrations in primary and secondary schools across the country, and even created accounts on Tiktok and Kwai to

reach more people. At present, he has more than 10 million followers on these platforms, after his fun chemistry videos went viral, making him an online celebrity scientist. He insists that chemistry experiments are as fascinating as the magic of J.K. Rowling, and has been dubbed the "Dumbledore" of Beijing University of Chemical Technology.

A messenger of intercultural communication and education

Evans is also known as a messenger of intercultural communication and education. His own unique experience is the best example of successful intercultural communication while also offering him a comprehensive perspective to observe society.

"Real cultural differences are not as simple as others describe, they can be extremely complex. So when one is in a foreign culture and wants to be able to seek better development, he should have a positive attitude in mind, and look for and explore new things rather than linger on the old ones," said Evans based on his own experience of dealing with different cultures for decades.

He also believes that, "Seize the opportunity" is another defining cross-cultural communication lesson, and encourages young people to make an effort to integrate into other cultures without being afraid to make mistakes. In today's age of information explosion, it has become increasingly more essential to acquire the confidence and skills to actively integrate into multiple cultures, and spontaneously explore cross-cultural phenomena and the philosophy behind them, said Evans.

This story is in cooperation with the International Talent Magazine published by Foreign Talent Research Center of MOST.

Service Info

Announcement of CICG on Selection of the Orchid Awards

The Orchid Awards is established by China International Communications Group (CICG). The Awards commend and reward non-Chinese nationals or organizations worldwide that have participated in the cause of international cultural exchanges and have committed to promoting cultural exchanges between China and the rest of the world. The Awards shall select winners in a professional, authoritative, fair and open manner.

CICG has now carried out the collection of the Award entry forms in 2022. The announcement on relevant matters is as follows :

I. Categories & Quotas
The Orchid Awards shall be bestowed on non-Chinese nationals or organizations worldwide in three categories, namely Lifetime Honorary Prize, Outstanding Achievement Prize and Friendship Envoy Prize, based on their achievements, contributions and international influence. In 2022, the Awards shall be presented to eight to ten individuals or organizations.

II. Eligibility
Potential candidates shall meet the following requirements:

1. Demonstrate international vision and authentic love for humanity, uphold the common values of humanity, and act on the vision of a global community with a shared future;
2. Work in cultural sectors in a broad sense, including but not limited to literature, art, film and television, publishing, translation, education, science and technology, health, media, folk culture, digital culture, and people-to-people exchanges;
3. Actively engage in international

cultural exchanges, make representative, marked and leading achievements in related fields, and demonstrate certain international influence.

III. Entry & Application
1. Nomination by an organization
Relevant Chinese and foreign institutions, international organizations, Chinese embassies and consulates abroad, foreign embassies and consulates in China, and relevant Chinese and foreign non-governmental organizations in cultural sectors in a broad sense are all eligible to nominate potential candidates.

2. Self-nomination
Non-Chinese nationals or organizations can perform self-nomination by submitting application documents with written recommendations from two pundits or dignitaries in relevant fields.

Application documents shall be sent to the Secretariat. Please download and fill out the entry form on the Awards page and email it with other documents to orchids2022@cicg.org.cn before the deadline September 7, 2022. Late submissions will not be accepted.

IV. Winners
CICG will organize an Expert Committee consisting of both Chinese and foreign professional who will select winners. The list of winners shall be disclosed on the official CICG website and shall be officially announced at an awards ceremony.

For further information:
Please contact
Zhu Diqiu: 86-010-68996119
Jiao Fei: 86-010-68995944
Fax: 86-010-68337118

Traditional Eastern Wisdom

Pagoda Stands the Test of Time

By Staff Reporters

The Yingxian Pagoda, located in Yingxian County's Fogong Temple, is

the oldest full-wooden pagoda still standing in China and is thought to be the most time-honored of its kind in the world. The ancient building,



The Yingxian Pagoda. (PHOTO: VCG)

which stands 67.31 meters tall, was constructed in 1056 during the Liao Dynasty.

The Yingxian Pagoda has been dubbed one of the world's three most remarkable towers, alongside the Eiffel Tower in Paris and the Leaning Tower of Pisa.

Seen from the outside, the pagoda appears to be a five-story building. However, it has nine stories (four blind stories inside the pagoda). In each story, there are two circles of wooden pillars supporting the upper level: 24 wooden pillars on the outside circle and eight wooden pillars on the inside circle.

It is a miracle that the wooden pagoda has survived this long. Chinese scientists discovered in the 1990s that the structure of the pagoda could not only

withstand lightning without requiring a lightning conductor, but can also resist earthquakes.

The Dougong (a system of brackets in Chinese buildings, wooden square blocks put between the top of a column and a crossbeam) is used extensively in the construction to connect various pillars and crossbeams. The most fascinating aspect of the pagoda is that no iron nails are utilized in its construction, and all connections are made using a Chinese mortise and tenon joint system, which can withstand enormous loads and allow for certain deformation in order to reduce the impact of earthquakes. Perhaps, this is the reason why the pagoda has survived multiple earthquakes for more than a thousand years.

Myth Buster

Busting Rumors on 'Air Conditioning Disease'

Rumor: The recent scorching days have made people realize just how important air conditioners are to society. However, the fact that some people have been admitted to the intensive care unit because of "air conditioning disease" has left many wondering if such a disease is preventable.

Truth: Most people have heard of the term "air conditioning disease" especially during hot summer days. In fact, it does not refer to a specific disease, but dizziness, headache, loss of appetite, upper respiratory tract infections, joint pains and other symptoms experienced

by people who have stayed in an air-conditioned environment for a long time. The main causes of "air conditioning disease" are as follows.

1. Air conditioning temperature is set too low. Staying in an environment with a low air conditioning temperature for a long time will lead to cold joints, waist and abdomen. It is recommended that the temperature be set 26°C or higher.

2. Cold air blows directly at people. If cold air blows directly on the body, it could lead to joint pain, rhinitis and other diseases.

3. The air conditioning system is not well cleaned and maintained. After being used for a long period, the air conditioner will not only accumulate a lot of dust, but also become a breeding ground for bacteria. An air conditioner that hasn't been cleaned for three years could be 60 times dirtier than a toilet. Being exposed to such an air conditioning environment for half an hour is as harmful as walking in a heavy haze for 16 hours, which could cause rhinitis, cough and other respiratory diseases.

4. Spend too much time in an air conditioned room. If you stay in a room

with air conditioner on for a long time, you will feel discomfort due to lack of fresh air.

Is it true that we can only choose between "enduring the heat" and "the threat of air conditioning disease"? In fact, "air conditioning disease" is not unavoidable. With the development of technology, the above problems have been solved by air conditioning companies. Many air conditioners currently on the market are able to clear bacteria using different methods, and we just need to be cautious when using the air conditioner to help keep the disease away.



The Tianjin Municipal Science and Technology Bureau organized a themed tour on sci-tech development for foreign experts on August 12. Nearly twenty expats attended this activity to fully experience the progress in Tianjian. Foreign experts were impressed by Tianjin's significant sci-tech achievements in fields such as biomedicine, new energy, and new materials. Some of them carried cameras and captured these advancements from their own perspective. (PHOTO: Tianjin Municipal Science and Technology Bureau)

Coal-to-Ethanol Technology Ushers in Green Future

From page 1

At the same time, the new technology requires no iodide methane and other halide additives in the production process, which avoids corrosion to equipment, and reduces the cost of corrosion-resistant materials.

This technology can directly produce absolute ethanol with no or very little water, requiring no further purification, which reduces the energy consumption and saves costs.

Apart from coal, natural gas, biomass and steel plant gas can also be used as raw material for the new technology to produce ethanol, providing strong technical support for the clean and efficient utilization of fossil fuels and the realization of carbon neutrality, said Liu.

From laboratory to factory
The fundamental purpose of research is to apply it into production, so the collaboration between laboratory and industry should be put high on the agenda.

In 2012, the DICP and Shaanxi Yanchang Petroleum Group jointly carried out the project on ethanol production technology from coal syngas.

On January 11, 2017, the 100,000-ton-capacity coal-based ethanol project with China's domestic technology was completed to produce qualified absolute ethanol.

From lab research to production line, it took only six years, "Which is very fast," said Liu, adding that the intermediate product methyl acetate is also a bulk chemical, which can help adjust the product structure in a timely manner according to the market demand.

On the basis of the 100,000-ton demonstration project, the technology upgrade has been constantly iterated. The 500,000-ton coal-based ethanol project began construction in June 2020. After more than two years of construction, the project is expected to be put into operation this September.

Using low-grade coal instead of grain to make ethanol, the world's largest coal-based ethanol project can save 1.5 million tons of grain every year after coming into operation, equivalent to 65 percent of Yulin's annual grain output, said Guo Zunli, general manager of Shaanxi Yanchang Petroleum Yushen Energy and Chemical Co., Ltd.

Scientific Literacy : Sowing the Seeds of Self-reliance

Policy

By CHEN Chunyou

For many individuals, scientific literacy reflects their understanding of scientific concepts, phenomena and processes, which is also the foundation for a country to advance further and grow stronger.

Sci- tech innovation and science popularization are the two wings of innovative development. The coordinated development between science popularization and sci- tech innovation is good for the improvement of the scientific literacy of citizens.

To make science more popular in the new era, the *National Plan for the Popularization and Development of Science and Technology During the 14th Five-Year Plan Period* was released by the Ministry of Science and Technology and two other departments on August 16.

By 2020, the proportion of citizens with scientific literacy in China had reached 10.56 percent, thanks to a series of science outreach programs achieving the goal of over 10 percent set during the 13th Five-Year Plan period.

According to the plan, more than 15 percent of citizens will be science literate by 2025. Meanwhile, besides the funding support from government, a more diversified investment mechanism is expected to be established, which encourages enterprises, social organizations and individuals to contribute their share.



Children learn the knowledge of aerospace science and technology at an artificial intelligence experience center in Weifang, Shandong province. (PHOTO: VCG)

There were 1,525 sci-tech museums nationwide in 2020, an increase of 21.2 percent over 2015. In this plan, the establishment of science popularization bases with regional, industrial, and disciplinary characteristics is supported, and a number of national educational bases will be created to enlarge the infrastructure coverage.

The plan said that research institutes should motivate the enthusiasm of researchers and scientists to participate in science popularization through policy guidance, financial support and assessment. It also calls for promoting the spirit of scientists, and cultivating a fashion of advocating science and encouraging

innovation across society.

Moreover, the research institutes are expected to promote the popularization of sci-tech innovation resources, focus on frontier research fields to carry out targeted science popularization, and give full play to the role of science popularization in advancing the commercialization of sci-tech achievements.

Notably, rural areas feature prominently in this plan. Specialists and experts in culture and science will be dispatched regularly to the rural areas to share their experience with farmers and help them to live and do business in a scientific way.

With regards to such common chal-

lenges faced by humankind as food security, energy security, human health, disaster risks, climate change and environmental protection, China will plan and organize international activities to enhance global consensus on country-level cooperation.

In addition, non- governmental exchanges are to be expanded. The universities, social organizations and enterprises are encouraged to participate in this move. Science popularization products catering to global tastes will be developed and promoted worldwide, and the introduction of renowned international science popularization works is also welcomed, said the plan.

Active Support for Seed Industry Enterprises

By GONG Qian

Seed industry innovation is high on agenda for China's 14th Five-Year Plan (2021-2025), as the country is dedicated to meeting challenges in agricultural technology and accelerating agricultural and rural modernization.

To achieve self- reliance in seed technology and ensure that its germplasm resources are independent and controllable, a notification was released by the Ministry of Agriculture and Rural Affairs (MARA) early in August.

It is also vital to enhance the international competitiveness of the seed industry. In recent years, China's seed industry has witnessed rapid development, having two of the top 10 crop seed enterprises in the world listed.

Therefore, it is crucial to develop a

cluster of leading seed industry enterprises, so as to realize China's transformation to a country strong in the seed industry, said the notification.

A total of 276 seed industry enterprises and organizations have been selected from over 30,000 candidates, to provide support to grow the country's seed sector, including 69 crop seed companies, 86 domestic animal and fowl genetic resource companies and 121 centered on aquatic germplasm resources, according to the notification.

Based on their scientific research capacity, asset strength, market scale and development potential, the selected group can be divided into three categories.

The first are enterprises that can "solve difficult problems," focusing on imported germplasm resources. They are expected to cultivate new varieties with

independent intellectual property rights.

For example, to reduce dependence on imported white feather broilers, three leading enterprises were selected to improve their performance in independently breeding broilers, thus achieving the goal of self-reliance in five to 10 years, said an official from MARA.

The second category is to "shore up weakness," focusing on germplasm resources that are lagging behind those at advanced international level. The enterprises shall narrow the gap in many aspects, such as variety production and quality.

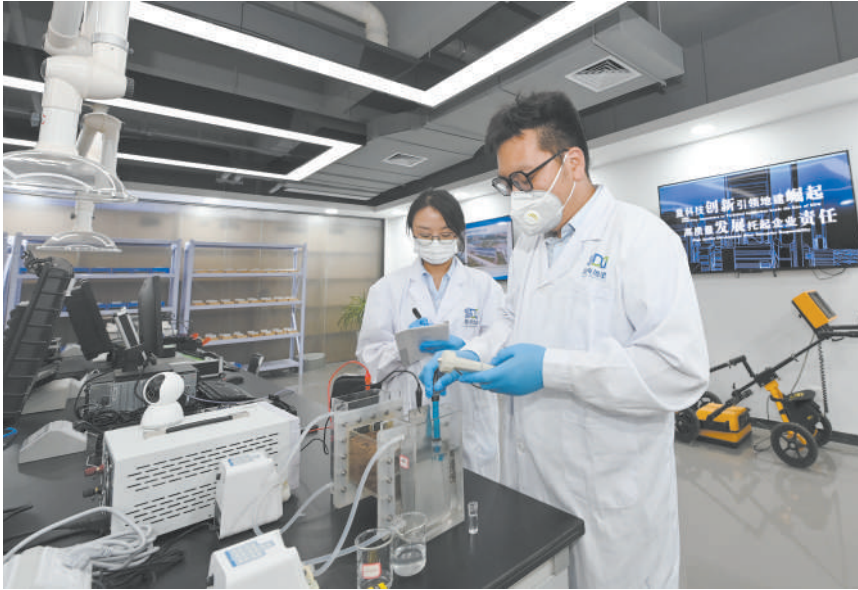
In regard to ensuring the supply of other grain and major agricultural products, 32 selected enterprises will center on crops including corn, soybean, cotton, oilseed rape and tubers, improving their quality to catch up with their international

counterparts, said the MARA official.

The last category is to reinforce the country's advantage over its competitive germplasm resources, accelerating the application of modern breeding technology.

For example, 19 selected enterprises will concentrate on two major food crops: rice and wheat, speeding up cultivating a batch of breeding materials and making new breakthrough while enhancing the level of yield and quality. The move can ensure absolute food security and support germplasm resources.

In the future, local agricultural authorities will make joint efforts to help the chosen enterprises solve their problems, introduce preferential policies for their development and crack down on illegal activities that infringe on their intellectual property rights, said the notification.



A series of policies have been rolled out recently to provide more opportunities to young researchers and reduce their burdens. Photo shows young researchers are doing experiment on electrokinetic remediation of soil in Xixian New Area, Shaanxi province. (PHOTO: XINHUA)

Demo Application Scenarios for AI Poised to Make a Splash

By LI Linxu

A batch of replicable experience is being developed to promote the application of AI.

Ten demonstration application scenarios for AI were recently highlighted by the Ministry of Science and Technology (MOST).

Smart application scenarios in farming, mining, ports, factories, education and supply chains are top of the list.

Innovation in these application scenarios will receive corresponding support, according to MOST, vowing to strengthen the coordination of upstream and downstream R&D, as well as the integration of new technologies.

It is a follow up policy to the *Guiding Opinions on Accelerating AI Application Scenario Innovation* released this month by six government bodies, including MOST.

Aiming to address major application and industrialization issues, the guiding opinions laid out goals, tasks and measures to promote scenario innovation and spur high- quality development of AI.

Enterprises are urged to play a leading role in application scenario innovation, said the policy, calling for forming a synergy among industry, university

and research.

AI, an emerging technology with great promise, is developing very fast in China. It has been applied in a wide variety of fields, ranging from smart manufacturing to new drug R&D.

Official statistics show that in 2021, the scale of the country's core AI industry surpassed 400 billion RMB, with the number of AI enterprises exceeding 3,000.

By 2030, AI could transform transportation and other key sectors in China, adding significant economic value, predicts McKinsey, a multinational consulting firm.

This month, driverless robotaxi service was launched in designated areas of Wuhan and Chongqing, marking a significant step in the country's commercialization of autonomous driving.

As a frontier area of AI technologies, autonomous driving is also among the list of ten demonstration application scenarios for AI selected by MOST.

China is striving to be on par with world-leading levels of AI technologies and applications by 2030, according the *New Generation AI Development Plan* released by the State Council in 2017.

Technology Takes Gansu's Agriculture Industry to Next Level

Case Study

By XIE Manbin and ZHONG Jianli

August is a fruitful season for northwest China's Gansu province, where the development of the agriculture industry is thriving.

In the past 10 years, Gansu has fully employed modern technology, tapped the potential of its resources, and developed a modern agriculture that can cope with cold and drought, which has played



A potato planting field in Dingxi, Gansu province. (PHOTO: VCG)

a major role in lifting the province out of poverty.

Potatoes, the "golden eggs"

By optimizing the modern seed potato production system of "basic seedlings — virus- free seedlings — virus-free original seed (basic seed) — original seed — first-class seed," Gansu Ailan Potato Seed Industry Co., Ltd. continues to expand the industrial chain, improve the seed potato production infrastructure and increase its production capacity.

The company's development is indispensable to its cooperation with related research institutions, including the Potato Research Institute of Gansu Academy of Agricultural Sciences.

The Institute, together with a number of organizations, implemented the project of "Mechanized Production Demonstration of New Staple Food Varieties of Potatoes in Anding District."

Wen Guohong, a researcher at the Institute, introduced that this potato project highlighted the application of supporting technology for new staple

food varieties called Longshu No.7 and Longshu No.10. The demonstration and promotion of the varieties was completed in 2016, with a planting area of 16, 798 mu (1120 hectares). The average yield is 2,241.8 kilograms of potatoes per mu, which helped increase farmers' income by 10.78 million RMB.

At present, Gansu has developed into an important seed potato base, commodity potato base and processing base in the country. In 2021, Gansu's potato planting area and output reached 10.2 million mu (680,000 hectares) and 15 million tons respectively, ranking among the top tier in the country.

Seed corn in Hexi Corridor

In the northwest of Gansu, there is a long and narrow flat land called Hexi Corridor, where the seed industry is well- developed. The corn seeds produced here can meet more than half of the country's needs.

"Corn will still be one of the main food crops in China in the future," said Hou Suiwen, dean of the School of Life

Sciences of Lanzhou University, adding that producers and the market will need the most resistant and widely suitable, medium and early maturing, and high and stable yielding varieties. He believes that to solve these problems, the improvement of the quality and efficiency of corn germplasm is imminent.

After years of R&D, his team has established a new way of precise molecular breeding of corn, created new germplasm resources, and solved the technical problems of grain crop breeding in Gansu.

With this technical support, corn breeding and seed production in Gansu is developing optimally. In 2021, the corn seed production area reached 1.41 million mu (94,000 hectares), producing 579 million kilograms of seeds, which accounted for 57.8 percent of the country's total corn seed output.

It is expected by 2025, that the output value of the entire industrial chain of corn breeding and seed production in Gansu should reach more than 12 billion RMB.

Comment

CHIPS Act: The Wrong Way to Compete

By TANG Zhexiao

U.S. President Joe Biden signed the *Chips and Science Act* into law on August 9, to improve the country's competitiveness with China.

However, China's increased focus on its domestic manufacturing is likely a function of U.S. restrictions on some of its biggest semiconductor companies, said Egypt Independent.

America invented the semiconductor, but today produces only about 10 percent of the world's supply, said the White House briefing, adding that the U.S. relies on East Asia for 75 percent of global chip production.

In contrast, data from the Semiconductor Industry Association showed that China remained the largest individual market for semiconductors, with sales totaling more than 190 billion USD in 2021, an increase of 27.1 percent.

The U.S. lacks capabilities to produce the most advanced chips at volume, said the Act, asserting that it would provide appropriations needed to implement the currently authorized programs.

Though the U.S. claims the Act is to ensure the country maintains and advances its scientific and technological edge, such decoupling restrictions is the wrong way to compete and will curb global technology progress. Meanwhile it reflects the country's growing lack of self-confidence in the face of China's rise.

The Act prohibits the recipients of federal incentive funds from expanding or building new manufacturing capacity,

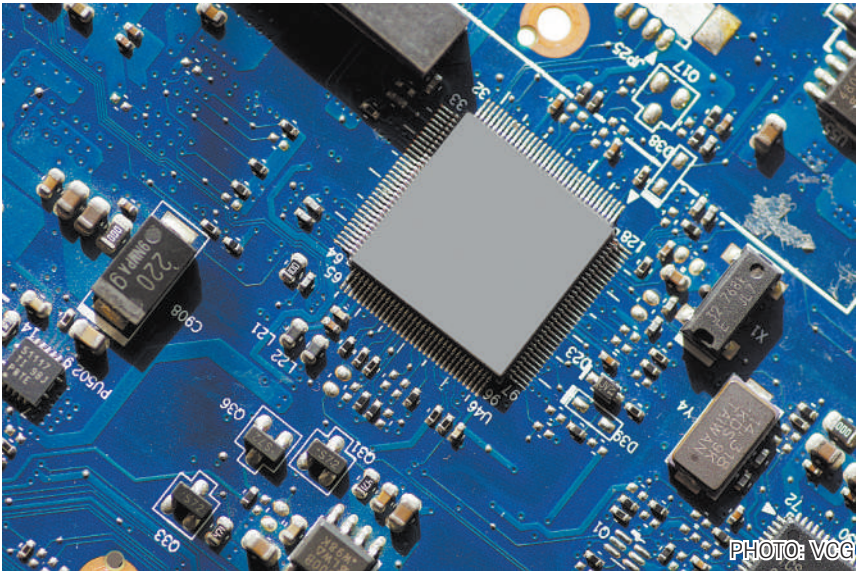


PHOTO: VCG

for certain advanced semiconductors in specific countries that present a national security threat to the U.S.

In particular, according to CHIPS and ORAN Investment Division A Summary, part of the Act, it would "require recipients of Federal financial assistance to join an agreement prohibiting certain material expansions of semiconductor manufacturing in People's Republic of China or in other countries of concern," to ensure the manufacturing incentives advance U.S. technology leadership and supply chain security.

Moreover, to make semiconductor manufacturers focus their next cycle of investment in the U.S. and other partner nations, the restrictions would apply for 10 years after the receipt of financial assistance, said the Act.

These measures obviously violate

market rules and distort the global chain.

No matter how many countries try to shore up their local manufacturing bases, it will likely be virtually impossible to decouple from the global supply chain, particularly for products as integral and intricate as semiconductors, according to Zachary Collier, an assistant professor of management at Virginia's Radford University.

The design, fabrication, manufacturing and raw materials for chips are distributed across different countries and regions. "It's really a huge web," said Collier, adding that no matter how many countries try to localize production, a degree of interdependence is inevitable. "It's global, one way or the other," he said.

Effects and endurance of the Act

has also been doubted by experts. Hu Qimu, chief research fellow at the Sino-steel Economic Research Institute, said he doubts the Act will be able to block China's semiconductor development, as the cost to remodel the semiconductor industry and bring manufacturing back to the U.S. far exceeds the funding offered by the U.S. government.

"The research and development cost of integrated circuit is very high. The 52 billion USD can only be allocated to [a] very limited number of enterprises for rebuilding production facilities, maybe only one or two," said Hu.

In comparison, customs data showed that China has imported chips valued about 440 billion USD in 2021, far exceeding the amount of subsidies the U.S. plans to give to companies to help them restructure industrial chains.

Experts also said that the impact of the Act would be limited to China's semiconductor sector. More importantly, it would be a great chance to boost the growth of China's electronic-design-automation suppliers.

To artificially isolate China from the global chain or set up barriers to normal sci-tech exchange and cooperation between China and the U.S., obviously, won't work. It will definitely turn back the wheel of history and impede global tech development.

China has no intention to replace the U.S. Both China and the U.S. stand to gain from cooperation and lose from confrontation. Tech war is not the answer, peaceful co-existence and mutually beneficial cooperation is.

The Plan to Undermine BRI Set to Failure

Voice of the World

Edited by TANG Zhexiao

Rebranding the previous Build Back Better World (B3W) program, the G7 nations launched the Partnership for Global Infrastructure and Investment (PGII) on June 26, aiming to raise 600 billion USD in funding to support infrastructure in developing and middle-income countries by 2027.

Sputnik news agency said this plan is apparently ramping up tensions in the region to impede China's infrastructural projects, including the Belt and Road Initiative (BRI).

According to *National Interest*, an American bimonthly international relations magazine, PGII was to outcompete China in owning global infrastructure, saying that "However, even worse than failing to outcompete China would be leaving much of the developing world to China."

Trust deficit & economic hurdles

According to a G20 report published in 2017, 94 trillion USD was needed in global investment by 2040 to close infrastructure gaps.

Obviously, the 600 billion USD investment pledge is not enough to plug global infrastructure holes or replace the BRI, said He Weiwen, a former economic and commercial counsellor at Chinese consulates in New York and San Francisco.

Furthermore, it is dubious that the G7 countries will manage to deliver the promised 600 billion USD amid a period of growing inflation and recession.

"Washington claims they are going to be sending over 200 billion USD. But where's the money coming from and how is it going to be really used?" asked Thomas W. Pauken II, a consultant on Asia-Pacific affairs and a geopolitical guest commentator for China's CCTV.

All Africa news website said the G7 also urges using public money to leverage private sector funds. But such initiatives have previously failed to mobilize significant private funding, hardly inspiring hope of meeting the trillion-dollar financing gap.

To make things worse, the U.S. aid effectiveness ranks worst among the world's 27 wealthiest nations, not to mention its pledge to give 100 billion USD annually in climate finance.

Meanwhile, China has built trust in the global community. IMF Managing Director Christine Lagarde approved China's new debt sustainability framework and green investment principles to evaluate BRI projects in 2019. She expected BRI 2.0, "Will serve all of its members well, both today and tomorrow."

Little interest from emerging economies

The PGII cannot be regarded so far as a viable alternative to the Belt and Road Initiative, Sputnik reported.

"First of all, the G7 actually needs to make these projects work," said Pauken, "Other than that solar plant in

Angola, I don't see any of these initiatives really working."

In particular, China's outbound direct investment into countries involved in BRI has reached 10.03 billion USD in the first half of 2022, a year-on-year increase of 4.7 percent, according to Chinese Ministry of Commerce.

While the G7 is still considering building an undersea cable linking Europe and Southeast Asia, China kicked off its Digital Silk Road seven years ago.

Many emerging economies including African countries, are increasingly frustrated with the U.S. and the Europe. As Russia's *Nezavisimaya Gazeta* said, it was not easy for the West to challenge the BRI.

According to a survey released in June, China is viewed as the most influential foreign country with a positive contribution in the eyes of African youth. China is already seen as a reliable partner in fulfilling its commitment in cooperation among African countries, said Alexey Maslov, director of Institute of the Asian and African Studies, Moscow State University.



Karot Hydropower Project, the first hydropower investment project under the China-Pakistan Economic Corridor, will provide Pakistan with clean and cheap electricity and promote its green development. (PHOTO: SCREENSHOT)

Improving infrastructure good for development

Since the BRI's proposal in 2013, the initiative has profoundly brought positive change and benefit for more than 60 nations in Asia, Europe and Africa.

"China continues to welcome all initiatives to promote global infrastructure development," said Zhao Lijian, Chinese Foreign Ministry spokesperson, insisting that China is, "Opposed to pushing forward geopolitical calculations under the pretext of infrastructure construction or smearing the Belt and Road Initiative."

Infrastructure has been at the center of global order and development. China has been the developing world's willing, ready, and able infrastructure partner over the past decade, said *National Interest*.

Despite the G7's new plan being designed to exclude China in telecommunications, clean energy and digital infrastructure, the best results would come from collaborating through joint investments, said He Weiwen.

The ultimate goal of infrastructure is to assist with development, not for ideology. The PGII should serve a greater purpose for collaboration, rather than striving to impede China.

Pakistani Barren Region Turns Green

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Zhang Hanyang, deputy director of the research center, said that there used to be very few plants in the region due to the local climate and saline-alkali soil. The researchers discovered plant species that fit the local climate after soil amelioration and researching water and growth habits of local plants, said Zhang, adding that more of such plant seedlings were developed and bred to improve the local environment as a whole.

Income generating plants, such as juncao and alfalfa, were among the research topics.

With the help of Chinese experts, juncao has grown as tall as a man in

the test field. A local livestock farm manager said that the goat meat from his farm was very tender and ewes had more babies, because they fed the livestock with grass selected and bred by Zhang's team.

Planting technology of vegetables and fruits also produced good results. Local bananas, dates and ginger have flourished after farms applied the breeding and grafting techniques taught by the Chinese.

Bugichi, a local greenhouse administrator, said that they are now able to grow many kinds of fruits and vegetables, despite the fact that such plants did exist previously or were one found in small quantities.

Hi! Tech

Hydrogel Helps Burn up Tumors

By Staff Reporters

Chinese researchers have developed a hydrogel that could have a double effect in the fight against cancer, by helping to burn up tumors more accurately and boost one's anti-tumor immunity.

The study published in the journal of *Science Advances*, showed that adding calcium ions into conventional hydrogel helped improve both the accuracy and efficacy of the treatment.

Compared to the traditional treatment that could cause severe heat dam-

age to normal tissues surrounding the cancerous tumor, the new material could direct the heat at the tumor more precisely.

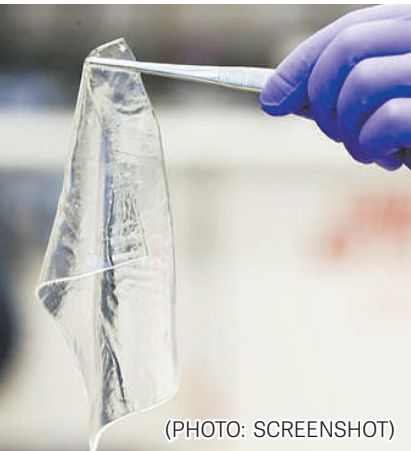
Combined with microwave ablation, a local tumor ablation strategy used clinically, the calcium-infused hydrogel could kill the cancer cells at 45°C and enhance the effectiveness of the treatment, according to Feng Liangzhu, the paper's co-corresponding author at Soochow University.

Feng said the treatment involves placing a needle through the skin into

the tumor. When microwave is transmitted from the needle, it will create a small region of heat and kill cancer cells in five to ten minutes.

The hydrogel has also improved the outcome from the conventional microwave ablation treatment in lab animals. This study showed the treatment could fully destroy the tumors without noticeable recurrence for up to 60 days.

Possibilities of clinical translation are currently being explored by researchers, hoping to help ease the severity of side effects and curb tumor recurrence.



(PHOTO: SCREENSHOT)

Dexterity of Robotic Limbs Improved by Metamorphic Theory



Stability Margin of a Metamorphic Quadruped Robot With a Twisting Trunk. (PHOTO: Tianjin University)

By CHEN Xi & QI Liming

Inspired by the process of human evolution and cell division and recombination, scientists from China and UK have formed the metamorphic theory based on the metamorphosis mechanism and bifurcation control mechanism.

Machines with traditional structure can only complete a single task. They are often ineffectual when faced with complicated tasks that require changing

their own structure.

However, guided by the metamorphic theory, in the design of deformation machines, designers just need to set the parameters and follow the "formulas" provided by the theory.

Take a wheeled robot as an example, while it can smoothly move across an even surface, it will be "powerless" if it encounters steps. So, if the wheel changes into a wheel-leg configuration when encountering a step, the robot can

easily climb up the steps or jump over obstacles.

The research team has developed a number of metamorphic electric robots and foot robots with various morphologies and crawling postures. In addition, the multi-fingered dexterous hand developed by the team has been used to test equipment of special protective suits for China Astronaut Research and Training Center, serving China's manned space program.

ing and monitoring of carbon neutrality technologies, pay close attention to R&D and application of such technologies, and promote the optimization and iteration of such technologies via sci-tech assessment and evaluation mechanisms.

In addition, MOST will fortify intellectual property rights (IPR) protection of technological achievements, by promoting the improvement of relative national sci-tech IPR laws and regulations, registering violation of low carbon IPR and involving the violation information in National Credit Information Sharing Platform.

Implementation Plan for Sci-tech Supporting Carbon Neutrality Released

● Accelerating the improvement of incubation and service systems for green and low carbon sci-tech enterprises, and cultivating a batch of leading low carbon sci-tech enterprises.

● Deepening international cooperation on the innovation of low carbon sci-tech.

To make sure the proposed actions are thoroughly implemented, MOST will

take the following measures.

First, MOST will create a suitable environment for the sci-tech development of carbon peaking and carbon neutrality by establishing a coordination mechanism and a sci-tech expert committee, and continuously promoting the reform of scientific research systems and mechanisms.

MOST will also strengthen the track-

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● Providing support for management and decision making in terms of carbon peaking and carbon neutrality by bolstering the support of sci-tech innovation for the technology system of emission reduction monitoring, accounting and evaluation.

● Lifting the synergy of innovation projects, bases and talent through reinforcing the systematic deployment of low carbon sci-tech innovation by national sci-tech plans, and promoting the construction of national green, low carbon innovation bases and talent cultivation.