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SPECIAL ISSUES

New Plan to Boost R&D Infrastructures

Not long ago, the Chinese Ministry of Science and Technology released to the public a special plan for boosting China's R&D infrastructures during the 12th Five-year period (2011-2015), in a bid to effectively implement the tasks defined by the national medium and long term scientific and technological development plan (2006-2020), and the national scientific and technological planning for the 12th five-year period, enhancing the support to R&D infrastructures, and to building an innovative country. The plan says by 2015 China

will strive to accomplish the following objectives:

- 1) R&D infrastructures will be further optimized in distribution. Facilitate the development of major scientific and technological infrastructures, research and experiment bases, and R&D infrastructure platforms, making them more consistent with the needs of economic, social, and S&T development.
- 2) R&D infrastructures will be significantly enhanced for proprietary innovation activities. Develop new principles and new methods for scientific instruments making, striving to master the core technologies for key components, and to develop 20 or more original scientific equipment and 200 or more proprietary major scientific equipment enjoying the core competitiveness in the industry. Further enhance the R&D capability of reagents, laboratory animal resources, and national metrological standards, and further deepen the development and diffusion of innovative methods and processes.
- 3) Further enlarge the opening and sharing of scientific research infrastructures. Perfect the opening and sharing mechanism of scientific research resources, optimizing the configuration and raising the utilization of scientific research resources, and further enhancing the service capabilities of S&T infrastructures.
- 4) R&D infrastructures personnel contingent shall be further strengthened. Perfect the training, motivation, and evaluation system of R&D infrastructures personnel, and foster a stable S&T infrastructure personnel contingent with high quality.
- 5) S&T infrastructure management system shall be further improved. Boost the role played by the marketplace in optimizing the distribution of S&T resources, creating an agreeable policy environment for the proprietary innovation and opening/sharing of S&T infrastructures, and nurturing 3-5 businesses with proprietary innovations and an annual output exceeding RMB 2 billion.

Enhanced Safety Plan for Nuclear Power

Chinese National Energy Administration recently started a research and development program to enhance nuclear power safety. The program will initially stage 13 projects for passive emergency power supply (high-capacity storage), high-level cooling water sources, severe nuclear power accidents prevention and mitigation, severe nuclear power accidents simulation platform, hydrogen control device among others.

The projects are designed to turn the experience of the Fukushima nuclear accident into advanced nuclear power technologies that can be used to enhance nuclear power generating units' safety and resistance to extreme disasters in China, based on the technologies currently applied at Chinese nuclear power plants and associated site environment, and through studying the major mechanisms, developing the key equipment, and analyzing the typical site and associated core security technologies applied. The projects will be implemented by major domestic nuclear power developers and operators, including China National Nuclear Corporation, China Guangdong Nuclear Power Group, Tsinghua University Institute of Nuclear and New Energy and others.

RMB 2 Trillion from Advanced Materials

A plan, jointly prepared by the Ministry of Industry and Information Technology, the National Development and Reform Commission, and the Ministry of Science and Technology to develop an advanced materials industry during the 12th Five-year period, was recently released to the public. The plan says China will secure RMB 2 trillion worth of advanced materials output in 2015, enjoying an annual growth exceeding 25%.

The Plan adds that major advanced materials producers will have a raised R&D expenditure to 5% as a proportion of their total sales revenue. China will establish new platforms for advanced materials R&D and associated public services, fostering 10 leading enterprises with enhanced innovation capability, core competitiveness, and a sales revenue exceeding RMB 15 billion, nurturing 20 backbone enterprises with a sales revenue exceeding RMB 5 billion, and establishing a range of advanced materials industry bases and clusters with clearly defined businesses, supporting facilities, and an annual output worth RMB 30 billion or more. Meanwhile, China will raise the support to advanced material products to a level of 70%, and the support to key advanced materials to 50%, realizing the scale production and commercial application of carbon fiber, titanium alloy, corrosion resistant steel, advanced energy storage materials, semiconductor materials, membrane materials among others. Efforts will also be made to diffuse the application of 30 key advanced materials through a range of demonstration projects.

Next Generation Internet into Commercial Application

The National Development and Reform Commission will initiate a range of special projects to enhance the development and commercial application of next generation internet technology, in a bid to spur up the deployment of new internet technology in China, achieving the following objectives:

- 1) Network development and user population: major trunk network and 10% of the metropolitan area network will support the application of IPv6; preparing a plan for the smooth transition from IPv4 to IPv6, allowing inter-network web browsing between IPv4 and IPv6, and securing an IPv6 user population exceeding 8 million.
- 2) Business applications and terminals: 100 major commercial portals will become IPv6 supported, encouraging government agencies, municipal government, enterprises, institutions, and telecom companies to make their websites or new services IPv6 supported. Meanwhile, the new fixed or mobile internet terminals shall be technically IPv6 supported.
- 3) Technology breakthroughs and associated industrialization: accelerate the smooth transition from IPv4 to IPv6, enhancing the study, test, and demonstration of new network architecture and technology, mastering the core and key technologies, and establishing a solid standard system. Network users shall see an annual drop of energy consumption by 8%, and the network equipment manufacturing industry an annual drop of energy consumption for added value per RMB 10,000 output by 3 or more.

More Agricultural Innovations

Not long ago, the Ministry of Science and Technology staged a briefing to elaborate the progresses achieved in agricultural science and technology innovations and associated entrepreneurship.

- 1) China's national food science and technology program has introduced farming technology and technique demonstrations in 13 major grain-producing regions, in a bid to support the country's food security, with a newly increased grain yield of 48 million tons in five years;
- 2) China launched a range of projects for tree, animal, and plant breeding, animal and plant functional genomics, hybrid crops, marine culture seeds, and new livestock species;
- 3) As of the end of 2011, China has sent S&T envoys to 90 percent of the counties (townships) in the country, helping farmers to use new farming technologies and techniques. The S&T envoy population has reached 17 million people;
- 4) China has established a range of modern agricultural demonstration bases, including Beijing Modern Agricultural Town, Yangling National Agricultural Demonstration Park, the Yellow River Delta National Agricultural Science And Technology Park, and a strategic alliance for modern agricultural science and technology demonstration made up of some 100 agricultural science and technology parks;
- 5) Since 2010, the Ministry of Science and Technology, in collaboration with the CPC Central Committee Organization Department and the Ministry of Industry and Information Technology, has made a number of provinces a pilot province for rural information technology demonstration;
- 6) A range of special actions have been initiated, including S&T advancement assessment, the Spark Program, enriching a county through science and technology, S&T findings transfer fund, and science and technology based poverty alleviation and development in the rural areas, which diffused numerous practical techniques, created a number of pillar industries, and established a novel rural science and technology service system; and
- 7) China promotes the three-in-one rural scientific and technological service system, designed to promote public good technologies, encourage entrepreneurships, and provide diversified services, making the institute of new rural development the carrier for such services, and promoting the mode of university providing science and technology services to the rural areas.

INTERNATIONAL COOPERATION

WAN Met with Australia Guests



WAN Gang, Chinese Minister of Science and Technology met with Chris Evans, Australian Minister for Industry, Innovation, Science, Research and Tertiary Education on February 20, 2012. The two sides spoke highly of the bilateral scientific and technological cooperation, and are willing to continue the collaboration and exchange under the existing mechanism. Evans informed his Chinese counterparts of the preparation of Australia-New Zealand Square Kilometers Array project. WAN said China is willing to be part of the project, and hope the project be implemented smoothly as planned.

RESEARCH AND DEVELOPMENT

Monkey Manipulates Robots

Zhejiang University announced on February 21, 2012 that its researchers have successfully made the robot to grab, hook, grip, and pinch through a microchip implanted in the monkey's brain. The microchip, implanted in the monkey's cortex, is connected to some 200 monkey brain neurons on one side, and to a computer on the other, recording the nerve signals depicting the monkey's every move in a real-time manner. Researcher from different disciplines, including biomedical engineering, computer, and medical science, worked together to decipher the signals for grab, hook, grip, and pinch through analyzing the 200 nerve discharge signals recorded by a real-time nerve signal recorder.

In the lab, one can see the monkey making different hand gestures, in an attempt to get the drink from the straw. A mechanical arm, sitting half a meter away from the monkey, is mimicking the monkey's hand movements. When the monkey wants to grab and grip an

object, the brain signals would be intercepted and deciphered by the external computer, which passed the signals directly to the mechanical arm for “telepathy”.

First City-wide Quantum Communication Network

A quantum banking information verification network, jointly built by the University of Science and Technology of China and the Xinhua News Agency, was put into a trial operation on February 21, 2012. The development marks the trial operation of a city-wide quantum communication network, which makes Hefei the first city in the country and in the world as well enjoying a scale quantum communication network.

In the quantum communication network, one sees no difference when working on phone calls, e-mail, and files transfer, but with a reduced worry about information theft. Researchers have to this day established a city-wide quantum communication network made up of 46 nodes.

NEWS BRIEFS

11th Compass Navigation Satellite Launched



China successfully blasted off at 0012 February 25, 2012 a new Compass navigation satellite, the 11th of its kind, aboard a CZIIIC launch vehicle from the Xi'chang Satellite Launch Center. The satellite has entered the transfer orbit as planned. China will launch more Compass navigation satellites in the year to cover more areas and improve the performance of the Compass navigation system, allowing a service capability for part of the Asia Pacific region at the end of the year. Around 2020, China will wind up the construction of the Compass navigation system consisting of some 30 satellites, providing high-precision and highly reliable positioning, navigation and timing services to the global users.

First Subway Crossing the Yangtze River

Metro Line 2 in the City of Wuhan, the first subway crossing the Yangtze River in China - was run through on February 26, 2012, and entered the rail laying and inner decoration phases. With an investment of RMB 14.913 billion for phase I, Metro Line 2, covering a length of 27.98 kilometers with 21 stops, will be put into operation in the year. The new subway will take up 50% of the passengers crossing the river from the city proper, with a

planned passenger volume up to 600,000 people in 2015.

The river-crossing tunnel subway has recorded a number of firsts in the country: first subway crossing the Yangtze River, the longest tunnel paved through using a single shield, the deepest subway tunnel under the largest water pressure, and the first tunnel built on the river floor equipped with a pumping and communication station, which provides precious experience for building urban subways in the future.

Super Cloud Computing Center to Build

A super cloud computing center, to be jointly built by the Beijing Municipal Government and the Chinese Academy of Sciences, recently broke ground in Huairou. The new center will be initially built with a petaflop supercomputing system, followed by a 10-quadrillion architecture to become a national super cloud computing center.

Physically located at the Huairou Science & Education Industrial Park, the Center will be financed by the Chinese Academy of Sciences Computer Network Information Center to build the supporting facilities for the super cloud computing center under a package of RMB 120 million. Phase-I part of the project will reach 17,000 square meters, including 8,500 square meters for the super cloud computer room. The center will be initially built with a petaflop supercomputing system, followed by 10-quadrillion architecture when further investment pours in.

Beijing Computing Center: 200 Trillion Operations Per Second

According to a plan, the Beijing Computing Center, built by DAWNING, will have an enhanced computing capability for 200 trillion floating-point operations per second, thanks to a scaled up capacity for the industrial cloud platform originally designed to achieve 50 trillion floating-point operations per second. The new platform will provide the state-of-the-art hardware and software for the government and small and medium-sized enterprises, covering the areas of industry, commerce, transportation, energy, environmental protection, banking, taxation, and social affairs. The Center is built to reduce the operating costs of government agencies and small and medium-sized enterprises, and enhance industrial R&D capabilities, making DAWNING's "city cloud network" dream a reality on the ground.

Clusnap, a hardware product developed by DAWNING to meet the needs of high performance computing market, provides users with fault tolerance support for major computing tasks. In addition, DAWNING made the debut of its new generation high-density blade product TC4600, desirable for high performance, scale-up, and on-demand configurations.

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