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NEWSLETTER

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IN THIS ISSUE

SPECIAL ISSUES

Next Generation Internet

A document on deploying the next generation internet in the 12th Five-year period (2011-2015), jointly prepared by an array of government agencies, including National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Education, Ministry of Science and Technology, Chinese Academy of Sciences, Chinese Academy of Engineering, and National Natural Science Foundation, was recently released to the public. The document defines the objectives, development roadmap,

timetable, and support measures for China deploying its next generation internet in the 12th Five-Year period.

During the period, China will secure an internet penetration rate up to 45% or more, promoting the triple play mode and inter-connections between IPv4 and IPv6, with IPv6 broadband users reaching 25 million in number. Meanwhile, a well functioned network and information security system will be established with a noticeably raised security level. The unit network information flow will see a reduced energy consumption by 40%, and the network equipment manufacturing industry will strive to realize a reduced energy consumption per RMB 10,000 by 15%. Additionally, China will establish a number of next generation internet research institutions and enterprises with international visibility, and create more than 3 million new jobs.

The document defines six major aspects for the development of next generation internet, including network information infrastructure, major products development and associated industrialization, network commercial applications and innovative businesses, network and information security, theoretical study and technological breakthroughs, and standards/intellectual property.

National Development and Reform Commission officials said China will complete the construction of internationally advanced network infrastructures during the 13th Five-year period (2016-2020) for the smooth transition to the next generation internet, raising the internet penetration rate, and substantively narrowing down the digital divide.

Enhanced Air Quality Monitoring Network

Chinese Ministry of Environmental Protection recently released a document on enhancing the capacity building of ambient air quality monitoring, according to which, China will establish an integrated nationwide ambient air quality monitoring network in 2015. The document defines a range of objectives for the capacity building during the 12th Five-year period (2011-2015), including integrating national atmospheric background monitoring network, rural air quality monitoring network, acid deposition monitoring network, sand and dust storms monitoring network, and greenhouse gas monitoring network into one platform, adding new monitoring indicators, establishing a unified quality and station management system, and improving air quality assessment techniques and information dissemination mechanisms.

Some cities and areas, including Beijing, Tianjin, Hebei Province, the Yangtze River Delta, and the Pearl River Delta, will publicize starting from this year the indicators of PM2.5, ozone, and carbon monoxide in line with the newly enforced ambient air quality standards. Next year some 113 more cities will join the efforts, and in 2015 all the cities above the prefectural level will be made to comply with the new standards.

INTERNATIONAL COOPERATION

WAN and Italian Minister Visit Tsinghua University

At the invitation of WAN Gang, Chinese Minister of Science and Technology, an Italian delegation headed by Environment, Land and Marine Minister Corrado Clini visited China from March 16 to 20. WAN and Clini visited on March 19 Tsinghua University and attended a report meeting held there. In his speech, WAN said China and Italy have maintained a decade long fruitful cooperation tie in the fields of environment and sustainable development. With the support of the newly formed Italian government and thanks to the concerted efforts of both collaborating parties, China and Italy will deepen their collaborations in the future. Clini spoke under a title "green economy - opportunities and challenges for international cooperation on science and technology innovations". He pointed out that one has to change the mode of economic development to achieve a more efficient and rational utilization of natural resources, and to protect environment and health. He added that both sides shall seize the rare historical opportunity to promote the collaborations in the area of green low-carbon technology.

After their speeches, WAN and Clini jointly inaugurated a China-Italy innovation platform created for environmental technology and sustainable development. The two ministers also held a bilateral talk, and jointly inked a memorandum of understanding on cooperation in the field of sustainable development.

Agricultural Produce Traceability

A China-EU agricultural produce traceability symposium, co-sponsored by Chinese Ministry of Agriculture Department of International Cooperation and the EU Delegation in Beijing, was held from March 28 to 29 in Beijing. At the meeting, Chinese and EU experts discussed the practices and typical cases of agricultural produce traceability, and shared the information of government regulation and corporate quality control dealing with animal products, plant products, and processed agricultural products.

LIU Yingjie, Deputy Director of International Cooperation at the Ministry of Agriculture, said China has promulgated a range of laws and regulations to protect food safety, including Law of Food Safety, and Law of Agricultural Produce Quality and Safety. These laws makes a solid support to food safety management, allowing the authorities to establish a sound food traceability system. In addition, the by-laws on animal immunization identity management issued by the Ministry of Agriculture, and China barcode project staged by the State General Administration of Quality Supervision, Inspection and Quarantine, created a ground for perfecting China's food safety traceability system.

LI Zhenzhong, Deputy Director of Market Order at the Ministry of Commerce, briefed the audiences of the development of China's meat and vegetables traceability system. He said pilot projects have been staged in some medium and large cities in the country to track down meat and vegetables sources using modern information technology. He added that the traceability system will be built as an important support to food safety.

RESEARCH AND DEVELOPMENT

Jatropha Proved Anti-Cancer

A research group, led by QIU Minghua at Chinese Academy of Sciences Kunming Institute of Botany, isolated a new composite of cytotoxic activity from the roots of Jatropha curcas. The finding, published in the recent issue of *Tetrahedron* Letters, creates a theoretical ground for probing the possible role that can be played by the plant.

Previous pharmacological studies showed that Jatropha curcas root extracts have anti-inflammatory and anti-tumor activity. Unfortunately, no pharmaceutical preparations of a clinical worth have so far been developed. Researchers in this study worked on diterpenoids activity in the plant by sorting out some 20 new compounds from 40 terpenoids separated from the Jatropha roots. Two diterpenoids with novel structures showed certain cytotoxic activity. Meanwhile, researchers found that the curcusone composites in the plant enjoy fine cytotoxic activity with a content up to 1‰-5‰. Test results also defined the active site of such composites.

Researchers said they will try to sort out the curcusone composites with better activity, working on their structural modification, so as to create a theoretical basis for mining the anti-tumor composites in the plant.

Rice Fertility Restoration Mechanism Found

Professor ZHU Yingguo and coworkers at Wuhan University School of Life Science published their findings on HL hybrid rice fertility restoration mechanism and the concept of Restoration of Fertility Complex (RFC) in the recent issue of *Plant Cells*.

Researchers found through repeated experiments that HL rice restorer gene RF5 cannot be directly combined with infertility RNA, though they can be assembled into a restorer, or RFC, to marry and cut the male sterile RNA, completing the fertility restoration mission. Researchers also found in RFC a major subunit composite named GRP162 that interacts with the restorer gene. The study unveiled the biological mechanisms of fertility restoration from the perspectives of DNA, RNA, and protein. The Restoration of Fertility Complex, proposed for the first time by the study, deepens the people’s knowledge of fertility restoration mechanism.

Advanced MPD system

A PCDS-I Managed Pressure Drilling (MPD) system, independently developed by Chinese Institute of Oil Drilling Engineering Technology, has registered a successful operation at No. 102 Well in the Huabei Oilfield. The new system raised mechanical drilling speed by 90%, and realized "zero leakage" and “zero complications" at the target layer.

Before this, the PCDS-I system has been successfully tested at a number of oil wells, including No. 9 Well in Penglai, Sichuan, and No. 105H Well in Tarim. The current operation

at the Huabei Oilfield is designed to see the adaptability to complicated geological conditions. For example, the target site sits at a great depth that is difficult to drill, with a drilling cycle exceeding 1 year. In the past, the drilling attempt was made using conventional technology, left an array of accidents, including missed drill, borehole collapse, and kick. To shorten the drilling cycle, the gas drilling process was applied to No. 101 and No. 102 wells, which was unfortunately ceased due to wellbore instability caused by stratum water leaking. The new system, applied to No. 102 well starting from a depth of 5,378 m, saw no spills or borehole collapse in further 380m, with a raised ROP from 0.63 m/h to 1.20 m/h, or an enhanced efficiency by more than 90%, or 1.5 times the speed registered at the wells in the same section.

Bamboo Better Utilized

YU Wenji and coworkers at Chinese Academy of Forestry Institute of Timber Industry completed a study of the technology to produce high performance bamboo fiber materials. Researchers developed applicable solutions to addressing the bamboo bounding problems in traditional bamboo processing, allowing a raised utilization rate of large caliber bamboo from 20%-50% to 90%.

After years of research and experiments, YU and coworkers developed, through technical integration, a new raw bamboo processing process able to produce high-strength bamboo fiber materials. The new technology is able to enhance bamboo fiber materials' performance and flexibility, without removing the bamboo yellow, making them desirable materials for wind turbine blades, container flooring, outdoor flooring, furniture, and cement templates.

The technology has been tested repeatedly for a production process since 2009, which led to the establishment of a number of demonstration production lines with an annual capacity of 8,000 cubic meters of wind blades, 200 sets of wind power blades, and 80,000 cubic meters of container flooring. The wind blades (40.3 m long and 5.9 tons heavy) manufactured in Dezhou, Shandong satisfy the strength requirements for a wind blade at the 1.5 MW level. Comparing with traditional reinforced glass fiber materials, the new material is 30% lighter and 10% cheaper.

NEWS BRIEFS

Supercomputer into Genetic Applications

The National Supercomputing Center in Tianjin recently signed a cooperation accord with Beijing Genomics Institute (Shenzhen), in a bid to make Tianhe-1 supercomputer available

for genetic research. The partnership will start from high-performance computing applications, including developing high quality bioinformatics calculation and analysis tools for mass data storage and processing, and mining out from massive biological data the secrets behind different life phenomena.

At the same time, the two collaborating parties established a joint bioinformatics laboratory to raise the efficiency of research and development, and widen the applications of Tianhe-1 supercomputer in the civic sectors.

Tianhe-1 supercomputer has found its applications in a range of areas, including film and television animation, biomedical data processing, and oil exploration and data processing. The Center has signed application contracts with PetroChina, Sinopec, and CNOOC, respectively, in addition to other some 300 registered users.

"Tian Yi" Mobile Operating System

The second generation "Tian Yi", a Godson processor based mobile operating system, recently made its debut at China Aerospace Science and Industry Corporation No. 706 Institute. The new operating system provides an enhanced graphical interface and user experience, allowing improved network functionality for fast and accurate interactions with mobile communication. In addition, the product enjoys a fine compatibility and scalability, desirable not only for a mobile phone, but also for an integrated PC, tablet PC, and PDA. The development marks that China's aerospace industry has possessed a proprietary software product for mobile infrastructures.

Marine Telemetry Engineering Center

The State Oceanic Administration and China Aerospace Science and Technology Corporation jointly undersigned on March 28 a strategic cooperation framework accord. A marine telemetry engineering research center, jointly established by the two organizations, was also inaugurated on the same day.

According to the accord, the two organizations will, under the principle of "act on demand, driven by technology, promote each other, and improve together", collaborate in the areas of marine satellite engineering, marine communication and information, and ocean observation, including preparing strategic development planning, system top-level engineering design, key technology and equipment R&D, and personnel training. The signing of the strategic cooperation framework agreement will reinforce the existing cooperative ties between the two organizations, allowing the aerospace industry to provide a better service to the marine industry for a leaping development.

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