CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

Department of International Cooperation
Ministry of Science and Technology(MOST), P.R.China

No.7
April 10 2013

Headline News

Deepening Reform and Opening-up While Promoting Innovation-driven Development

During the first session of the 12th National People's Congress (NPC), General Secretary Xi Jinping joined Shanghai delegates for discussion on March 5, 2013. He put emphasis on science-enabled innovation as solutions to breaking bottlenecks and addressing deep-rooted issues. The guiding principle is upholding innovation, leapfrogging in key areas, underpinning development, and ushering in the future. A global perspective should be taken in facilitating innovation, improving human resources to break grounds in advantageous areas and key technologies, and form a batch of core technologies that drive industrial growth.

(Source: Xinhua News Agency, March 5, 2013)

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Minister Wan Stresses the Role of Technology Standards in Driving Emerging Industries

On February 21, 2013, Wan Gang, Minister of Science and Technology, emphasized at the National Standardization Working Meeting that China will give full play to the role of technology standards in driving the development of strategic emerging industries and upgrading traditional ones, and it will participate more in setting international standards.

In 2012, China approved the release of 1,986 standards, 247 of which are mandatory standards. As of the end of 2012, a total of 29,582 national standards, including 3,622 mandatory ones, had been unveiled. China submitted in 2012 a total of 64 international standard proposals to ISO/IEC, the largest number in a single year. Among them, 25 were adopted. As of the end of the same year, a total of 266 China-submitted proposals had been adopted as international standards, and 116 of them had been published; and China had assumed 95 important positions in international standardization organizations.

Wan Gang said that technology and standard are increasingly interconnected. Technology development cycle is rapidly shortening, and R&D and technology standard development, previously going in two different stages, are increasingly becoming one and the same process. Standard development has already been merged into R&D activities, providing important guarantee for technology commercialization and related industry to take hold. Standards are essential across the whole process from R&D, market to industry development, and technology standards hold the key. R&D activities are increasingly in need of technology standards, which, in essence, are to facilitate the commercialization of research results. As the bridge for technology commercialization, standards are a great boost to industrial upgrading and innovation activities.

According to Wan, in order to implement *the 12th Five-year Plan for Technology Standard Development*, China will make more efforts to develop technology standards, improve technology standard system, and integrate the standards into R&D process more closely for technology commercialization. Wan also highlighted the importance of pushing for more of China's technology standards to be embraced by the international community.

(Source: Science and Technology Daily, February 22, 2013)

S&T Management Information

National Medium- and Long-term Plan for Major R&D Infrastructure Issued

According to www.gov.cn, *National Medium- and Long-term Plan for Major R&D Infrastructure (2012-2030) (the Plan)* was recently published by the State Council. *The* Plan envisions that by 2030, China will establish a full-fledged, sophisticated, efficient and strong major R&D infrastructure system. Systematic arrangement of major R&D infrastructure in a far-sighted manner is of great significance to improving China's original innovation capacity, making a quantum leap in key areas, ensuring long-term scientific and technological development and transforming China from a big nation into a strong power in science and technology.

In the coming 20 years, China will, in light of international trends and domestic strengths, focus on R&D infrastructure improvement in 7 frontier fields of strategic importance to the country, namely, energy, life, earth system and environment, materials, particle physics and nuclear physics, space and astronomy, and engineering technology.

During the 12th Five-year Plan period, priority will be given to the following 16 major R&D infrastructure projects--seabed scientific observation network, validation device for high-energy synchrotron radiation light source, accelerator-driven transmutation research facility, comprehensive experimental facility for extreme conditions, intense heavy-ion accelerator, efficient and low-carbon gas turbine test equipment, high-altitude cosmic ray observatory, future network test facility, ground simulator for space environment, translational medicine research facility, south pole observatory, high-precision gravity measurement facility, large-scale low-speed wind tunnel, SSRF beamline station, model animal phenotype and heredity research facility, numerical simulator for earth system.

The Plan proposes to improve management system, ensure funding for infrastructure construction, and open the infrastructure to the outside users. The document also stresses the need for training more people and boosting international collaboration in the field.

(Source: Science and Technology Daily, March5, 2013)

12th Five-year Plan for National High-tech Parks Issued by MOST

In order to implement *the National Outline for the Medium- and Long-term Scientific and Technological Development Plan* (2006-2020) and *the 12th Five-year Plan for National Scientific and Technological Development*, and accelerate the development of high-tech parks, the Ministry of Science and Technology (MOST) formulated *the 12th Five-year Plan for National High-tech Parks*.

This document aims to substantially enhance innovation capacity of national high-tech parks, sustain rapid economic growth, and optimize industrial structure. This involves the following:

--improve innovation capacity. Innovation resources and elements will be pooled to boost original innovation capacity. A host of the world's top-notch R&D bases will be established, innovators with strong entrepreneurial bent will be trained, and 3,000 overseas high-caliber professionals will be brought in for innovation and entrepreneurship within national high-tech parks.

--raise industrial competitiveness. New industry forms will be fostered within national high-tech parks. Efforts will be made to ensure strategic emerging industries become dominant, modern service sector accounts for a big share, traditional industries are upgraded, and industry quality is markedly improved. More important, top innovative industrial clusters will be established. Among them, 15 will be internationally competitive clusters with an annual revenue of over 100 billion yuan.

--increase the driving role. An innovation- and entrepreneurship-friendly culture will be created to bring together high-end elements such as talent, capital and technology. The parks will serve as a driving force for technological innovation, strategic emerging industries, shift of growth pattern and industrial structure, and social progress. The parks will see flourishing innovations by industrial organizations, big development of industrial technology alliances and gathering of intermediary service organizations. Amenities will be offered for more convenience. Moreover, the parks will drive the growth of surrounding areas and bigger regions.

--boost international profile. International high-end resources will be pooled to ensure the best culture, and working and living environment within the parks. International competitiveness of industries will be further increased: a number of global brand names and world-renowned enterprises and industrial clusters will be fostered. This aims to build a number of the world's top high-tech parks.

(Source: MOST, January 28, 2013)

12th FYP on National Innovation Bases Issued

In line with the *National Outline on Medium- and Long-term Science and Technology Program (2006-2020)* and the 12th Five-Year Plan for National Economic and Social Development, MOST and NDRC issued the 12th Five-Year Program for National Innovation Bases, to facilitate integration of scientific and economic progress and achieve innovation-driven development.

According to the program, the national innovation bases should aim at the following four tasks: 1) To discover, propose and undertake major scientific and engineering projects based on national strategic goals and upgrade national core competitiveness; 2) To build up open, sharing and coordinated innovation system based on integrated scientific resources, make indigenous and integrated innovation, improve innovation capacity and keep the leading role of innovation in the development of key sectors and industries; 3) To achieve rapid translation and diffusion of scientific outcomes, facilitate the combination of scientific and economic progress so as to support the sound development of economy and society; 4) To attract and nurture high caliber professionals on sci-tech innovation, engineering development and commercialization.

The general goal of the program is to put in place 15-20 national innovation bases in accordance with national requirements, current innovation infrastructure and strengths. In addition to targeting at key sectors and industries, the innovation bases should also be planned to facilitate fundamental research and public wellbeing, help with national key projects, underpin agricultural development, support emerging industries as well as traditional industries.

(Source: MOST, March 11, 2013)

Scientific Research Progress and Achievements

New Drugs Worth RMB 1.24 Billion in Market

The national major special project on new drug development has achieved remarkable outcome, bringing benefits to the public. Through the implementation of the project, licenses were issued to 62 new drugs by December 2012, 2/3 of which own indigenous intellectual properties and 12 were first class ones. In addition, 3000 patent licenses (560 were international) were approved out of the 9000 applications, and 2200 new set of standards were made. 23 of the new drugs were launched in the market, with a total output value of RMB1.24 billion.

By the end of 2012, 1251 research tasks were set up under the project, with a central budget of RMB9.7 billion, local investment of RMB4.1 billion and RMB19.3 billion from enterprises. Moreover, the large drug companies (with an output of over RMB300 million) invest 6.6% of their gross output value into R&D.

(Source: MOST, March 1, 2013)

China's 1st MW High Temperature Superconducting Motor Born

China's first 1MW high temperature superconducting motor has been developed by 712 Research Institute of China Shipbuilding Industry Corporation. The project passed evaluation by MOST on October 16, 2012, signifying that China has become one of the few countries capable of designing and manufacturing the motor.

The 712 Research Institute has long been studying superconductors, and was the first in China to start research on superconducting motors. The institute accomplished the "1MW high temperature superconducting motor" project under 863 Program in 2012 and achieved major technology breakthroughs. The sample motor has been tested under diversified conditions, and the motor efficiency, including cryogenic system, reached 95% in full operation with 500RPM, meeting the design objective. The motor and its cryogenic system are stable in full operation, reaching international advanced standard.

Through years' efforts, the 712 Research Institute has set up design and analysis system exclusive for high temperature superconducting motors, built experiment facilities and testing platforms, accumulated valuable experiences and brought up a professional team for research on cryogenics and cooling, motor design, superconducting use, system and control. The institute is now capable for R&D on large capacity high temperature superconducting motor for practical use.

(Source: Science & Technology Daily, October 17, 2012)

Successful Operation of Advanced Research Reactor

President Wan Gang of the Chinese Institute of Atomic Energy (CIAE) briefed journalists on full-power operation of the advanced research reactor last year, reaching the designed target. As the largest of its kind in Asia, the research reactor could help with testing of nuclear fuels and flaw detection of large mechanical parts for new-generation nuclear power plants.

Launched in 2002, the research reactor reached the critical point in 2010. It is an important platform for scientific experiment, designed and built by China. It replaced the old reactor that had been running since the founding of CIAE.

The advanced research reactor is a fission reactor. Not for electricity generation, the experiment equipment provides environment for radiation of materials in the reactor.

Besides, the reactor could release neutron flux for study of the inner structure of atoms and detection of large mechanical equipment.

According to Wan, data has been available from the experiment on neutron scattering based on the advanced reactor, with 20 experiments to be conducted on the same platform.

(Source: Science and Technology Daily, March 2, 2013)

910-meter Poloidal Field Conductor Produced

The moulding and coil winding of PF2/3/4 conductors in Phase II procurement package of 910-meter poloidal field conductors for International Thermonuclear Experimental Reactor (ITER) were completed in the Institute of Plasma Physics of the Chinese Academy of Sciences (Hefei). The conductor will be shipped to the ITER headquarter for coil winding experiment of poloidal field. Throughout the production, the equipment operated well, meeting the parameters as specified in the procurement agreement.

The Institute of Plasma Physics conducted research on welding of shaped tubes, nondestructive testing of conductor jackets and welding seam, conductor moulding and coil winding. The moulding machine is extremely important in manufacturing PF conductors. It undertook 30 tonnes of pressure in the process of moulding. The Institute has developed a series of key technologies, such as manufacturing of shaped tubes, welding and nondestructive testing of shaped tubes, super-conductive coil winding, coil inserting, and conductor moulding.

TF conductors, poloidal field coil conductor and magnetic feeder conductor have been verified, passing the evaluation of ITER.The production of PF2/3/4 was a good test of technologies for manufacturing of PF conductors. The Institute has completed research and production of six types of conductors.

(Source: Science and Technology Daily, January 16, 2013)

Cooperation Projects and Channels

Chinese Scientists in Collaboration with American Reserchers Report the First Experimental Observation of Quantum Anomalous Hall Effect

The research team led by Professor Qikun Xue from Tsinghua University, in collaboration with researchers from the Institute of Physics of Chinese Academy of Sciences and Stanford University, made a breakthrough in the field of condensed matter physics. They reported the first experimental observation of the quantum anomalous Hall effect, which represents a very important physical phenomenon discovered first by Chinese scientists. The research finding was published on March 15 Beijing Time in Science as a Science Express paper. It was American scientist Edwin Hall who discovered Hall Effect in 1879 and Anomalous Hall Effect in 1880.

(Source: Science and Technology Daily, March 16, 2013)

International Science and Technology Cooperation Base (8): China-Korea Research Center for New Materials

Jointly approved by the Ministry of Science and Technology (MOST) and State Administration of Foreign Experts Affairs, China-Korea Research Center for New Materials was established under Beijing Research Institute for Nonferrous Metals (the Institute) in 2007. In 2008, it was certified as a national-level international joint research center. It is designed to improve the preparation, processing and application of China's new non-ferrous materials, boost innovation capacity and employees' competence of the Institute, and promote the development of high-tech industry. With the support from International Science and Technology Cooperaton Program of MOST, the center builds upon the work of China-Korea Cooperation Center for New Materials, which was set up in 1997 with the approval of the two countries' ministries of science and technology, and focuses on light metal materials in the cooperation between the two countries. Meanwhile, it also actively explores collaboration with the UK, Russia, Germany, France and Japan in semiconductor and new energy materials. In executing joint projects, the center also brings in professionals and trains top researchers.

With more than 1,000 R&D personnel, the center is China's biggest non-ferrous metal research institution. It is mainly engaged in R&D of semicondutor materials, rare earth metallurgy and materials, rare and precious metals, light metals and light metal composites, energy and environment materials, powder metallurgy and materials, non-ferrous metal processing, metallurgical flotation, material analysis and testing, equipment and automation. A number of national-level centers under the Institute, such as National Non-ferrous Composites Engineering Research Center, State Key Laboratory of Non-ferrous Materials Preparation and Processing, National Semiconductor Materials Engineering Research Center, and National Rare Earth Engineering Research Center, give strong technological support to the center for its all-dimensional R&D cooperation with other countries.

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Since reform and opening-up, China has seen rapid progress of science and technology (S&T), with many technologies meeting the needs of developing countries. Under the principle of equality and mutual benefits, results sharing and intellectual property protection, the Chinese Government is ready to share technologies through training workshops so as to seek common development in the fields of S&T and economy.

In 2013, Ministry of Science and Technology of PRC is going to hold 35 international training workshops dedicated to developing countries, covering a variety of topics such as agriculture, new energies, resources, environment, healthcare, science and technology management etc. We are going to publish the related information of the workshops in succession from this issue.

International Training Workshop on New Technologies of Agricultural Products Processing

April, 2013

Beijing, China

Working Language: English

Objectives:

The aim is to provide up-to-date information, knowledge and practical management experience on agricultural by-products processing to the participants from other developing countries, who are engaged in research & development, manufacturing, management, utilizing and sales in agricultural industry; to help them use these newly gained experiences to make greater contribution to the development of agricultural economics under their own geographical social economic conditions.

Organizer:

Chinese Academy of Agricultural Mechanization Sciences (CAAMS)

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International Training Workshop on New Technology of Vegetable Varieties

May, 2013

Hefei, China

Working Language: English

Objectives:

The aim is to cultivate technicians of vegetable breeding and planting for other developing countries; to help improve the industry level in vegetable breeding and planting among other developing countries; to increase agriculture yield and efficiency and make farmers become well-off in other developing countries.

Organizer:

Hefei Jianghuai Horticulture Research Institute

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(Editor's Note: All news in the issue are translated from Chinese texts for your reference. They are subject to checks and changes against official release of original Chinese or English texts.)