

CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

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Headline News

China Drafts a Future Plan on Major S&T Infrastructure

The Medium-and Long-term Development Plan on National Major Science and Technology (S&T) Infrastructure (2012-2030), jointly drafted by the National Reform and Development Commission (NDRC), MOST and 7 other agencies, has been approved to issue recently by the State Council. It is the first systematic guideline which deploys the construction and development of major S&T

infrastructure in the mid-to-long run in China.

The construction of comprehensive facilities for science and technology in China is within an important time period and it has come into a new stage in terms of scale, level of technology and international influence. With abundant human capital, advanced technology and experience, China's S&T infrastructure will go an all-

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around development in future. However, it is noticed that some improvements still need to be made in the facilities with regard to scale, number, planning, sharing utilization, and management.

It is said that the Plan outlines future directions for major S&T infrastructure in areas of energy, life science, earth system and environmental science, material, particle and nuclear physics, space and astronomy, and engineering technology etc., which are based on the demands of big-science facilities for development of cross-disciplinary advancement and emerging scientific subjects, in regard with a consideration on the international trend and domestic foundation, disciplinary development and national strategy.

In the 12th Five-year Plan (FYP) period, 16 major S&T infrastructure are identified as priorities, including facilities for study of accelerator-driven subcritical reactor, facilities of high-efficiency and low-carbon gas turbine test in energy; facilities for translational medicine, model animal phenotype and heredity in life science; facilities for ocean-floor scientific survey network, precision gravity measurement, and earth digital simulator in earth and environmental science; facilities for high-energy synchrotron test, synergetic extreme condition scientific devices, and Shanghai Synchrotron Light Facilities Phase-II in material science; and others in particle and nuclear physics; and engineering technology.

(Source: Science and Technology Daily, April 17, 2013)

Minister WAN Gang Attends EV Expert Panel Meeting

On April 11, Minister of Science & Technology WAN Gang attended in Beijing the expert group meeting on the 12th FYP key project for electric vehicle (EV) development. The meeting was chaired by professor OUYANG Minggao, who is the chief of the expert panel, with the presence of the panel members and some officials from MOST.

Minister WAN Gang stressed two important tasks for taking EV development opportunity and responding to its technology and commercialization trend: firstly, enhancing program planning in a bid to take the lead in frontier technologies and make technical breakthroughs for commercialization; secondly, fostering international cooperation since the scientific innovation must be conducted in a way of internationalization.

Professor OUYANG briefed the participants on

the development trend of EV and other experts reported respectively on the latest progress in power battery, fuel cells and driving motor, etc. A discussion was followed on EV advancement around the world and technology innovation in China.



Minister WAN Gang at the EV Expert Panel Meeting

(Source: MOST, April 22, 2013)

Research Launched by MOST to Respond to Human Infections of H7N9

On April 10, an emergency preparedness & response research on H7N9 avian flu was launched by MOST and National Health and Family Planning Commission (NHFPC). The focus will be on the development of clinical diagnostic reagent and vaccine. Clinical trial of nucleic acid diagnostics is expected to be completed in 2 months, and the preventive vaccine against human H7N9 avian flu developed in 7 months.

As instructed by the State Council, MOST has acted swiftly in response to human infections with H7N9 avian flu. On April 4, a task force was established to draft relevant plans and experts in diagnostic reagent, vaccine, medicine and epidemiology were organized to keep close track of the epidemic and the needs in the preparedness

and control efforts and get the priorities right. The following priorities have been identified by MOST together with NHFPC: diagnostic reagent and vaccine development, pathogenic study, research of epidemiology and origin, clinical treatment, and animal model study, etc.

More specifically, full efforts will be made to develop nucleic acid detection reagent, most importantly confirmation reagent for screening tests and clinical diagnosis. Based on seasonal flu vaccine, preventive vaccine against human H7N9 avian flu will be developed at the earliest date. Meanwhile, pathogenic study will be conducted to produce more research evidence in virulence, pathogenicity and spreading force of the flu virus.

(Source: Science and Technology Daily, April 11, 2013)

China's Innovation Capacity Improves Steadily

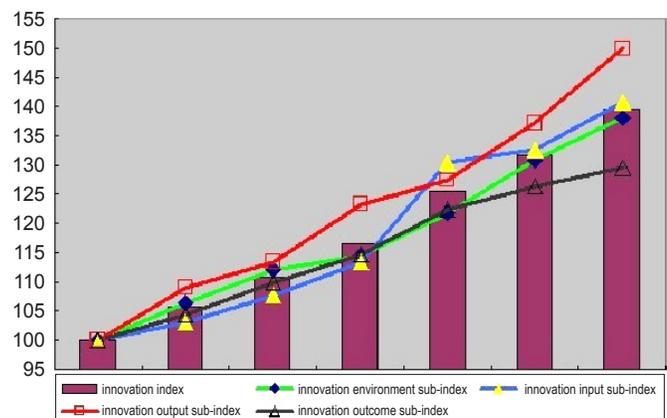
To implement the strategy of innovation-driven development put forward in the report of the 18th CPC National Congress and assess the progress in China's innovation capacity-building during the process of building an innovative country, the *China Innovation Index* research group organized by the National Statistics Bureau designed an index system and index-description methodology. The research group evaluated China's innovation index and four sub-indexes from 2005 to 2011. The results show a steady increase in China's innovative capacity since 2005, especially in innovation environment, innovation input and output, and innovation outcomes.

Steady improvement in China's innovation capability

By assigning a score of 100 for 2005, the innovation index is 139.6 in 2011, representing an annual increase of

5.7%. In four sub-indexes, the innovative output increases by 7.0% per year, and the innovation input, innovation environment, and innovation outcome increase by 5.9%, 5.5%, and 4.4% per year respectively.

China's Innovation Index and Sub-indexes, 2005-2011



China's Innovation Index, 2005-2011

	2005	2006	2007	2008	2009	2010	2011
China's Innovation Index	100	105.7	110.8	116.5	125.5	131.8	139.6
1.Innovation Environment Sub-index	100	106.4	112.1	114.4	121.7	131.0	138.1
2.Innovation Input Sub-index	100	103.1	107.8	113.5	130.5	132.7	140.7
3.Innovation Output Sub-index	100	109.0	113.4	123.2	127.4	137.2	150.0
4.Innovation Outcome Sub-index	100	104.4	110.0	114.7	122.3	126.4	129.5

Scientific Research Progress and Achievements

Chinese Company Inspur Unveils its K1 Server

Tiansuo K1 system, the first home-grown server, was officially launched by the Chinese company Inspur on January 22, indicating China to become the third country capable of making its own new-generation server after the US and Japan.

The K1 system marks the completion of key layout for indigenous information development in China, and plays a key role in breaking the dominance of foreign technology vendors. It also indicates the transfer from R&D to technology commercialization for server development.

According to an official from MOST, the government will support the use of K1 system in financial, ICT, energy sectors and government departments through pilot projects, so as to drive forward the development of related software and services and upgrade the competitiveness of the

whole industry. Officials from China Banking Regulatory Commission expressed the willingness to work with MOST in promoting K1 in the banking sector and looked forward to a benign interaction between server development and upgrade of banking information technology in China.

The central government supported a project for research and application of high-end fault-tolerant computers during the 11th Five-Year Plan period, and the K1 system was developed by Inspur in collaboration with universities and research institutes.

The system satisfies the needs of key industries and meets the international standard. So far, the system is in full operation and performs well in Xinjiang branch of China Construction Bank.

(Source: Science & Technology Daily, January 23, 2013)

First "TS-SEED" Technology Developed by Company FiberHome

In accordance with the needs of the "Broadband China" strategy, the company FiberHome developed

"TS-SEED" optical fiber technology, which avoided the drawbacks of preform rod and found solutions to

five technology bottlenecks to raise the drawing speed to 2400 meters per minute, 400m/m higher than top international level, thus paving the way for China to produce cost-efficient optical fiber.

Based on the core techniques of TS-SEED, FiberHome developed its own technology, intellectual property rights and manufacturing equipment for “optical preform, fiber and cable”, and set China’s first standard

document for “Fiber to the Home” (YD/T 1636-2007). The technology has brought in a revenue of 2.078 billion yuan in sales and \$ 33.31 million in export to Europe, the US and Middle East. It has been used by Alcatel-Lucent, China Mobile, China Telecom, China Unicom, State Grid, PetroChina, etc.

(Source: MOST, April 12, 2013)

China’s Deep Space Exploration Network in Shape

In 2012, China’s network for deep space exploration was put in place with the operation of 35-meter antenna Kashgar station, 66-meter antenna Jiamusi station and 65-meter very-long-baseline interferometry station in Shanghai.

According to academician QI Faren, the chief designer of Shenzhou space shuttle, China may launch Mars probe in 2015. He said that China is ready to explore and use the space, and will improve its capacity in the following three aspects.

Firstly, China will upgrade its deep space exploration capacity by continuing its current work

on manned spacecraft, lunar probe and other space exploration programs, so as to get a better understanding of the solar system.

Secondly, China will improve its earth observation capacity. The high resolution earth observation system, a major national R&D project, is under construction and its first satellite Gaofen-1 will be launched soon.

Thirdly, China will make better use of the information and data obtained through space programs and complete the building of Beidou global navigation system by 2020.

(Source: Science & Technology Daily, April 19, 2013)

High Resolution Quantum Measurement Achieved at USTC

Led by Academician GUO GuangCan, in the University of Science and Technology of China, Dr. Sun Fang-Wen and his research group at the Key Lab of Quantum Information of the Chinese Academy of Sciences, by using a quantum statistical measuring techniques, has realized for the first time measurement and identification to adjacent luminous objectives

which are not restricted by conventional diffraction limit. Such a novel quantum measurement method can make the measurement accuracy to reach the resolution of nanometers, and the finding has been published in “Physical Reviewer Letters”.

(Source: Science & Technology Daily, April 19, 2013)

Trial Run of 80,000-ton Die Forging Press

On April 10, a large-size forging used in the landing gear of a domestically-made commercial aircraft underwent a successful pressure test, marking the trial production of the 80,000-ton die forging press. This means China has realized independent and local manufacturing of large-size forging products, hence removing a bottleneck in large aircraft manufacturing.

The 80,000-ton die forging press represents one of the ten landmark facilities supported by the major national science and technology project for high-end numerically-controlled machine tools and basic manufacturing equipment. Our self-developed die forging press measures 42 meters in height and weighs 22,000 tons, including 68 parts weighing above 75 tons each. Its size, overall quality, and weight of the biggest part all rank No.1 in the world. The 80,000-ton die forging

press adopts advanced operational control technology, which allows the equipment to forge any products within 80,000 tons. The press, with its strong pressure, forces common metal materials to flow in the molds so as to refine interior grains and strengthen stiffness, thereby achieving precise forming of large-scale die forging products. Moreover, the press features a synchronization precision of 0.01mm/m and strong resistance to eccentric load. Additionally, the press can realize stepless speed control through voltage control. The press is equipped with the biggest working platform of 4000mm×8000mm in the world and can produce all kinds of existing large-scale die forging products, especially high-strength alloy die forging products used in aviation, aerospace, nuclear power, and petrochemical industry.

(Source: MOST, April 23, 2013)

Main Pipes for AP1000 Nuclear Unit Constructed by China

AP1000, a generation-III nuclear technology introduced from U.S.-based Westinghouse Electric Company, is currently the world's safest, most advanced passive pressurized water reactor design. China's first AP1000 unit is already under construction in Sanmen, Zhejiang Province.

The reactor's main coolant pipes, made of stainless steel through casting and machining, connect reactor pressure vessel, steam generator and coolant pump and thus known as "the main artery" of nuclear power plant. Through 18 days' efforts, China's nuclear power engineering team installed the main coolant pipes of unit No.1 in Sanmen not long ago.

The project has received support from major national R&D projects. Through more than 3 years'

efforts, Bohai Shipbuilding Heavy Industry Co. Ltd and its partners have mastered stainless steel smelting, electroslag remelting, pipe forging and bending techniques. This makes it possible for China on its own to manufacture main pipes for generation-III nuclear plants with comprehensive technical specifications meeting the design standards of Westinghouse Electric Company, thus cutting main pipes' procurement costs by a big margin.

In 2012, AP1000 main coolant pipes were identified as one of the focuses for national support. The manufacture and installation of main pipes in Sanmen unit No.1 signals China's new progress in construction of nuclear power plant.

(Source: MOST, April 15, 2013)

Cooperation Projects and Channels

International Science and Technology Cooperation Base (11): National Modern Agriculture Innovation Park

As China's only national-level agricultural high-tech demonstration zone, Yangling Demonstration Zone is home to Northwest Agriculture and Forestry University and Yangling Vocational & Technical College, covering 64 disciplines in agriculture, forestry, animal husbandry and water resources, and bringing together 5,000-plus agricultural experts. The Zone is a domestic leader in the research of fine variety breeding, dryland farming, water-efficient irrigation, livestock reproductive endocrinology and embryo engineering, control of water and soil erosion on Loess Plateau, and plant resource protection, development and utilization. It even leads the world in some of the above-mentioned areas.

National Modern Agriculture Innovation Park is located within Yangling Demonstration Zone, and was designated in 2012 as an international science and

technology cooperation base. By bringing in and training competent personnel, and building innovation and start-up incubation platforms and unique industries, the Park has promoted the rapid development of agricultural industries and boosted the carrying capacity of the Demonstration Zone. The Park is committed to bilateral and multilateral international cooperation by boosting agricultural exchanges, the efficiency of assistance to the outside world and agriculture-related foreign investment, among others, in an effort to become a top-notch park in the world.

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International Training Workshop on Satellite Application Technology

June, 2013

Beijing, China

Working Language: English

Objectives:

The aim is to help the participants get to know and master the business scope of satellite application field; to obtain the basic technology of the application of communication satellite and remote-sensing satellite; to obtain remote and communication satellite application system, such as equipment, facilities and working process of teleport, remote sensing satellite digital image processing center; to promote

cooperation and exchange in the field of satellite application technology between China and other developing countries.

Organizer:

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International Training Workshop on Safety Evaluation and Quality Control of Food, Health Care Products and Pharmaceuticals

June, 2013

Guangzhou, China

Working Language: English

Objectives:

The aim is to help the participants to acquire the basic concepts and knowledge on food safety control technology, current pharmaceuticals analytical technology, food safety regulations and so on; to promote the participants' technical ability of scientific research, product developing and management on bioscience, food safety and some other relevant crossover disciplines.

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