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New Changes and Achievements in STI since 18th CPC National Congress

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New Changes and Achievements in STI since 18th CPC National Congress

Since the 18th National Congress of the CPC, the Central Committee with General Secretary Xi Jinping as the core has put scientific and technical innovation (STI) at the center of the national overall development pattern and set up a well-established system from ideology to strategy and action. The innovation-driven development strategy implemented by the Central Committee has ushered in a new journey towards building a country strong on science and technology. Over the five years, we have come markedly improved our comprehensive strengths and international influence in STI, which has been a priority area featuring fast development, substantial outcomes and extensive impact. A new historical stage has come.

I. Enhance STI capacity systemically towards building a country strong on science and technology

1. The overall STI strengths have seen rapid improvement. The total social R&D expenditure in 2012 has soared from 1.0298 trillion yuan to 1.5676 trillion yuan in 2016, among which 77.5% came from enterprises. The R&D input intensity reached 2.11%. We have published 290,000 SCI papers in 2016, a 51.8% increase compared with 2012. And the number of citations ranked No.4 in the world. In 2016, there were 1.339 million applications of invention patents, 105% greater than 2012 and No.1 in the world for 6 consecutive years. And the effective invention patent ownership stood at 1.227 million, ranking No.3 in the world. The contribution rate of S&T has increased from 52.2% in 2012 to 56.2% in 2016. STI has provided strong support to economic and social development and people's livelihood.

2. China has achieved fast growth in multiple major areas. We have made a number of major original achievements in basic research areas of quantum anomaly Hall Effect, neutrino oscillation and iron-based superconducting. Chinese scientists have for the first time been awarded the Nobel Laureate in Physiology or Medicine; entered a new stage of comprehensive development in strategic hi-tech areas of space & aeronautics, supercomputing, satellite navigation and deep-sea exploration.

3. STI personnel team has been expanded. The total social R&D personnel reached a total of 3.81 million/year, No.1 in the world. By the end of 2016, the number of overseas returnees stood at 2.651 million.

II. Enhance our capacity in leading development by focusing on supply-side structural reform

1. STI has become the new engine of industrial transformation and upgrading. Core technology breakthroughs in emerging industries like mobile communication, e-commerce, nuclear power, hi-speed railway and NEV have underpinned the conversion between old and new growth drivers. In 2016, the gross revenue of the high and new tech enterprises across the country stood at 26.1 trillion yuan, a year-on-year increase of 17.5%.

2. Research findings can be better translated into practical productivity. We have composed a trilogy of the transformation of S&T achievements, as the Standing Committee of the National People's Congress has revised *the Law of the People's Republic of China on Promoting the Transformation of Scientific and Technological Achievements*, the State Council has promulgated several regulations and the General Office of the State Council has issued an action plan on the transfer and transformation of S&T achievements. The State Council has issued and implemented *the National Plan on Building Technology Transfer System*, which optimized the basic framework of technology transfer. In 2016, the national technology contract volume exceeded one trillion yuan for the first time, up by 77.2% compared with 2012.

3. S&T-oriented innovation and entrepreneurship has led to new driving forces of growth. The State Council has issued an *Opinion on Promoting Policy Measures of Mass Innovation and Entrepreneurship*, so as to facilitate integrated development between STI and mass innovation and entrepreneurship. Various new-type incubators with makers' space as the representative have emerged constantly. 17 specialized national makers' spaces will be built in the first phase. And the over 4,200 makers' spaces, over 3,600 incubators of tech-based enterprises and over 400 accelerators of enterprises have formed a systemic and orderly incubation chain of innovation and entrepreneurship. In 2016, they served nearly 400,000 entrepreneurial teams and start-ups, creating 1.8 million job opportunities.

4. Regional innovation highlands have become the growth poles and belts in boosting regional innovative development. The 17 national independent innovation demonstration zones and 156 hi-tech zones have created a sound system featuring systemic layout, multiple driving force, comprehensive boost and pioneering development. The national hi-tech parks have maintained an annual average growth rate of 17.4%. And in 2016, the gross industrial output reached 20.5 trillion yuan, up by 10.3% compared with the previous year.

III. Focus on unleashing the innovation vitality of the whole society and promote reform on S&T system in a systemic manner

1. Decisive progress has been made in the reform on central-budgeted S&T Program Management. We have basically completed the optimization and integration of nearly 100 S&T plans and established and run the open and unified national S&T management platforms. A system of five types of S&T Program has been put in place, including the National Natural Science Fund, National Major S&T Project, National Key R&D Program, Special Project (Fund) of Technical Innovation and Special Project and Base and Talent. Moreover, a supervision and review system embedded into the whole process has been established and played its role. The outstanding problems for allocation of S&T resources have been solved.

2. Significant results have been made in alleviating the burden of scientists and engineers. In the reform of the policies of central-budgeted research project fund management, we have basically set up a research fund management system that is more in line with research rules. We have formulated a categorized management policy different from administrative staff, which markedly aroused the initiative and creativity of the scientists and engineers. Efforts have been made to refine the system for CAS and CAE members, so as to restore the title to its nature of academic honor. We have furthered the reform on S&T award system, promoted scientific research integrity and fostered a sound and healthy academic eco-system.

3. STI governance system has been constantly improved. We have accelerated the transformation of government functions and constantly furthered the reforms to streamline administration, delegate powers and improve regulation and services. With greater efforts made for open sharing of public S&T resources, a total of 580,000 (sets) large research devices have become open to the whole society through a unified national online management platform. After the establishment of the interconnected National S&T Report System, over 100,000 reports have been uploaded for sharing. As science popularization and innovative culture has been strengthened and the *National Outline on Science Literacy Action Plan* has been implemented, the proportion of Chinese citizens with scientific literacy has reached 6.2%.

IV. Work together against common challenges for mankind and strengthen international STI cooperation in all dimensions

1. Bilateral and multilateral innovation cooperation have been expanded. The innovation dialogue mechanisms for cooperation with major economies of the US and EU have become important platforms of policy exchange and equal cooperation. China has established S&T partnerships with 158 countries, regions and international organizations and signed 111 inter-governmental agreements on S&T cooperation.

2. New platforms of common development under the Belt and Road STI Action Plan have been built with joint efforts. We are building a road of innovation by focusing on four areas of S&T people-to-people exchange, joint lab, science park cooperation and technology transfer. We have signed inter-governmental agreements on S&T cooperation with nearly 50 countries along the Belt and Road, launched S&T Partnership Programs with ASEAN, South Asia, Arabian states and SCO, cultivate hi-level technical and managerial talents for developing countries in those regions. We have set up over 130 national-level international joint research centers and 22 international joint labs.

3. We have been an active player in international mega-science programs and engineering projects. We have contributed our wisdom and energy in dealing with scientific issues of common concern by playing a significant role in GEO, IODP and SKA. We also led international mega-science projects of BES III and Daya Bay Neutrino Reactor Experiment, which markedly enhanced the international influence of our STI.

(Source: Ministry of Science and Technology, October 21, 2017)

Vice-Premier Liu Yandong Attends China-US Workshop on Innovation-driven Development

On September 27, Vice-Premier Liu Yandong delivered a keynote speech at the China-US Workshop on Innovation-driven Development jointly sponsored by MOST and Brookings Institution. Minister of Science and Technology Wan Gang, Chinese Ambassador Cui Tiankai and Chairman of the Board of Trustees of Brookings Institution John Thornton attended the event. Nearly 120 representatives from governments, research institutes, think tanks and enterprises of both sides were present.

Vice-premier Liu said that over the 38 years since the establishment of diplomatic ties between China and the US, the two sides have conducted STI cooperation in multiples areas and layers, with various types of cooperation models and constant emergence of landmark achievements. As the world is entering a stage of booming innovative and entrepreneurial activities, China and the US, respectively the largest developing country and developed country, share the fundamental interests in closer STI cooperation, which is of utmost significance to global innovative development and strong economic growth. The two countries should strengthen policy exchange and strategic partnering, improve construction of cooperation platforms, support innovative dialogues and cooperation between governments, enterprises, universities, research institutes and non-governmental organizations, and advance long-term steady S&T cooperation between the two countries. For major issues of global common challenge and sustainable development and priority areas of shared concern for people's well-being, we should work harder against research difficulties, enhance the quality and efficacy of S&T cooperation and bring benefit of cooperation to more countries, especially developing countries. We should constantly deepen exchange between scientists and engineers, better cultivate innovative talented people, hold brand activities like China-US Young Scientist Forum and China-US Young Maker Competition and open up more channels of cooperation. Efforts should also be made to facilitate personnel mobility, encourage people from various social walks of life, especially the young to start innovative and entrepreneurial activities, further cooperation in science park development, create an environment with easy access to entrepreneurship, improve the commercial eco-system that is law-based, international and convenient, implement a strict system for IP protection, create a sound atmosphere for innovation and entrepreneurship and offer support to more people devoted to innovation and entrepreneurship.

(Source: Ministry of Science and Technology, September 28, 2017)

MOST and UNDP Sign Letter of Intent for Cooperation

On July 23 2017, MOST and UNDP signed a letter of intent for development of national sustainable development agenda innovation demonstration parks and decided to conduct cooperation for the implementation of building such parks by 2030. The letter was signed by Mr. Xu Nanping, Vice Minister of Science and Technology and Mr. Nicholas Rosellini, UN Resident Coordinator and UNDP Regional Director in China.

According to the letter, MOST will give play to its role of S&T management, while UNDP will mobilize its resources of experts, network and international influence. There are seven areas of cooperation: provide various localities with consultancy services on recognizing bottlenecks impeding sustainable development; conduct training for the implementation of innovation demonstration parks; carry out joint research on the evaluation standards and indicator systems; encourage enterprises, young people and social sectors to be involved in the development of such parks; support local-level implementation in 17 sustainable development goals and the work range of UNDP; summarize the best practices and successful experience of the parks; jointly hold sustainable development innovation forums.

(Source: Ministry of Science and Technology, August 28, 2017)

MOST Delegation Visits UK for Preparation of China-UK Hi-level People-to-people Dialogue

From September 12 to 15, 2017, Mr. Zhu Xuehua, Deputy Director General of the Department of International Cooperation of MOST led a delegation to the UK. He held talks with representatives from Department of Business, Energy and Industrial Strategy, Research Councils UK, Innovate UK and Royal Society and exchanged views on the STI activities during the Fifth Meeting of China-UK Hi-level People-to-people Dialogue and the formulation of China-UK STI cooperation strategies.

The Fifth Meeting of China-UK Hi-level People-to-people Dialogue will be held in the UK in December. In the talk between MOST delegation and UK counterpart, they agreed on holding the ceremony for the issuing bilateral STI cooperation strategy as a major event during the Dialogue. In the meantime, an exhibition on China-UK STI cooperation achievements will be held and distinguished guests from governmental, academic and industrial fields will be invited. Besides the major event, the two sides planned to hold side events on priority areas. Moreover, the two sides discussed the formulation of STI cooperation strategy, talked on the form and content of the strategy and reached agreements on the future work in formulation of the strategy.

(Source: Ministry of Science and Technology, October 9, 2017)

1st China-Turkmenistan STI Forum held in Ashkhabad

From October 11 to 12, 2017, the 1st China-Turkmenistan STI Forum sponsored by MOST and Turkmen Academy of Sciences was held in Ashkhabad, to implement the agreement reached by President Xi Jinping and President Berdymukhamedov during the SCO Tashkent Summit in June 2016.

Mr. Chen Linhao, DDG of the Department of International Cooperation of MOST remarked that the Chinese government gives great prominence to STI development and treat international STI cooperation as an important approach to advancing S&T development. On the occasion of the 25th anniversary of the establishment of the diplomatic ties, the Forum is of utmost significance to the China-Turkmenistan relationship. China stands ready to deepen STI cooperation under the framework of the Belt and Road initiative, develop S&T cooperation to an institution and strengthen people-to-people exchange of scientists and engineers, especially the young, so as to lay a solid foundation for the pragmatic project cooperation in the area of STI between research institutes, universities and enterprises.

The President of the Turkmen Academy of Sciences remarked that his country appreciates the China's tremendous S&T achievements, gives great prominence to bilateral S&T cooperation and stands ready to further the mutually beneficial cooperation in areas of nanoscience, electric information, bio-medicine, seismology, renewable energy, agriculture and livestock.

(Source: Ministry of Science and Technology, October 18, 2017)

2017 China-Australia Young Scientist Exchange Program launched in Beijing

October 23, 2017 witnessed the launch of 2017 China-Australia Young Scientist Exchange Program sponsored by MOST and Department of Industry Innovation and Science of Australia and organized by CSTEC and Engineering Institute of Technology of Australia.

This year marks the 45th anniversary of the founding of diplomatic ties between the two countries. In recent years, STI cooperation has been increasingly valued by both leaders and the STI outcomes have been commended by both sides. The research personnel exchange has not only enhanced mutual understanding, but also helped facilitate pragmatic project cooperation between research institutes. Over the 11 years since the inception of the program in 2006, more than 200 outstanding researchers from both countries have conducted exchange activities in each other's countries.

This year, the Australian scientists came from Queensland University, The University of New South Wales, University of Adelaide and Commonwealth Scientific and Industrial Research Organization. And their research cover areas of food science, material science, environmental science, medicine, bioscience and information engineering.

(Source: Ministry of Science and Technology, October 31, 2017)

2017 China-New Zealand Scientist Exchange Program Launched in Beijing

October 17 2017 witnessed the launch of 2017 China-New Zealand Scientist Exchange Program sponsored by MOST and Ministry of Business Innovation and Employment of New Zealand and organized by CSTEC and Royal Academy of Sciences of New Zealand.

Over the 8 years since the inception of the program in 2009, 126 outstanding scientists from both countries have been funded to conduct exchange activities in each other's countries. This year, the New Zealand scientists came from Pastoral Agriculture Research Institute, Geology and Physics Institute, The University of Auckland, Victoria University of Wellington and Plant and Food Research. Their research cover areas of food safety, energy, agriculture and livestock.

(Source: China International S&T Cooperation Network, October 20, 2017)