16	China International Nuclear Fusion Energy Program Execution Center (ITER China)
17	National Science and Technology Venture Capital Development Center
18	Center for Science and Technology Personnel Exchange and Development Service, MOST
19	Shanghai Training Center, MOST
20	China Association for International Exchange of Personnel
21	China International Talent Exchange Foundation
22	Foreign Talent Research Center, MOST

Source: Ministry of Science and Technology of PRC,
URL: http://en.most.gov.cn/eng/organization/Affiliated/index.htm

8.5 National Programmes

Science and Technology Programs in China

1. The National Program for Key Science & Technology Projects

First started in 1982, the "National Program for Key Science & Technology Projects" is critical component of the Five-Year Plans for the national economic and social development. It is updated every five years and submitted for approval by the National People's Congress.Its strategic objectives are: to find solutions to the scientific and technological bottlenecks in the medium and long-term national economic and social development; promote the modernization of traditional industries and the optimization of industrial structures; support development of high technology and its industrialization; improve the quality of national economic development and people's life; and enhance the nation's S&T capacity.

Its major contents are: in accordance with the international trend of development and taking the factors of scientific, economic and social development into account, to carry out study and research on key S&T issues based on the principle of S&T pioneering; to concentrate efforts and the nation's resources in personnel and materials on issues tackling major S&T snags encountered in the nation's economic construction and social development. 539 projects have been approved with 100000 items of achievement in scientific research after four five-year plans had been completed since 1982. By the end of 1999, the projects produced a gain of RMB 153.4 billion to the nation.

The Program is funded by the government and supplemented by financial inputs for different industrial sectors and institutions. The government investments are in three types: completely free support, partially free support, and loans.

2. National High Technology Research and Development Program (863 Program)

In March of 1986, four eminent Chinese scientists urged the initiation of a new national high technology program (also referred to as 863 Program). The guiding principles andobjectives are limited targets, striving for breakthroughs in defined priorities, rapidlyformulating high-tech industries in areas where China has advantages, closing the gap between China and developed countries in high technology, and enhancing the overall capacity of the nation.The Program has set eight fields as priorities: biotechnology, space

technology, information technology, lasers, automation technology, energy technology, advanced materials technology and marine technology. The financial support required for the Program mainly comes from special government appropriations.

3. National Key Basic Research Program (973 Program)

The State S&T Leading Group issued National Key Basic Research Program in 1997 after the group's third session for the basic research development in China. The guides for the implementation of the program include "Emphasizing some disciplines and doing something necessary". Its objectives are: to carry out high-level research on key scientific issues which are critical and of overall importance to the scientific and technological, economic and social development of the nation, therefore to make significant contributions to the science and technology development of the world and the social program in our country; to train and bring up young talents in basic research and strive to build up bodies of excellence in scientific research.

Several areas have been targeted as goals before 2010: carry out interdisciplinary research to get some main probes in the areas of agriculture, energy, information, environment, population and health, etc.; set up a number of major scientific engineering representing the nation's capability in S&T; launch a series of important basic scientific research in which exploration and frontier are emphasized; establish the talented-pool that are well-educated and trained, and match the needs for creativeness; set up a number of high level science centers which are capable of undertaking national key basic research projects. The Program is mainly funded by central government.

4. The Torch Program

The Torch Program was initiated in 1988. Its objectives are: to realize guiding principle of "develop high technology and realize its industrialization", to create an optimized environment, therefore to guide and organize the scientific and technological manpower to serve the economic development; to promote the commercialization, of the results of high and new technology, the industrialization of high and new technology products, and the globalization of high-tech industries; to establish High and Emerging Technology Industry Development Zones; to coordinate the implementation of the projects under the Torch Program, and to develop a pool of work force for implementing the Torch Program.

Its financial resource is mainly raise from the public with support of start-up funds from the State. New product projects listed in the Program are entitled to priority in getting bank loans and to preferential taxation policies over a specified period of time. The creation of High and Emerging Technology Industry Development Zonesre presents a major thrust of the Torch Program. Thus far, the central government has approved 53 such zones at the national level, resulting in clusters of burgeoning high and new technology industries in the coastal, frontier, border and inland cities all over the country.

There are 53 zones: Beijing, Wuhan, Nanjing, Shenyang, Tianjin, Xi'an, Chengdu, Weihai, Zhongshan, Changchun, Harbin, Changsha, Fuzhou, Guangzhou, Hefei, Chongqing, Hangzhou, Guilin, Zhengzhou, Lanzhou, Shijiazhuang, Jinan, Shanghai, Dalian, Shenzhen, Xiamen, Hainan, Suzhou, Wuxi, Changzhou, Fushan, Huizhou, Zhuhai, Qingdao, Weifang,

Zibo, Kunming, Guiyang, Nanchang, Taiyuan, Nanning, Urumchi, Baotou, Xiangfan, Zhuzhou, Luoyang, Daqing, Baoji, Jilin, Mianyang, Baoding, Anshan, Yangling.

5. The Spark Program

Approved by the State Council in 1986, the Spark Program is the nation's first guided development program designed to develop the rural economy through science and technology. Its long term development objectives are: to induce the rural economy in the direction of relying on scientific and technological progress and on improved labour performance; to realize a socialist modern rural society which is better-off in materials, cultural activities developed, flourishing in public services, achieving a synchronized development both in material life and in morality. Its priorities are to develop regional pillar industries in rural areas and to establish spark-intensive areas in conjunction with the construction of small cities and towns. Its financial resources mainly come from bank loans, self-raised by enterprises and the public, with some seed money from the State. Projects listed in the program are entitled to favourable bank loans and preferential taxation policies.

6. The National S&T Achievements Dissemination Program

The Program was initiated in 1990. Its objectives are: to inject advanced, appreciate, mature S&T achievements into the nation's economic and social development in a well-organized and planned fashion while creating a favourable environment and conditions; to mobilize S&T personnel and forces from the whole society into the implementation of the Program so as to generate benefits in large scale and promote the sustained and coordinated economic and social development and a close link between S&T and economy. Its financial resources come from loans, investments, and funds raised by enterprises and the public as well as start-up money provided by the government.

7. National New Products Program

The Program is a government-policy-supported program put forward by the Ministry of Science and Technology in 1988 with the purposes of guiding and encouraging enterprises and research institutes to accelerate technical progress and promote the capacity of technical innovation, carry out optimization of industrial structure and adjustment of product structure, facilitate the development and industrialization of high and new technology products that have a high economic competitiveness and big market share. The priority fields to be supported by the Program:

High and new technology products, including those of micro-electronics and electronic information, space science and aviation and space flight technologies; photoelectric science and opto-mechano-electronics integration technologies; life science and bio-engineering technologies; material science and material technologies; energy science and new energy and high efficiency energy saving technologies; ecological science and environmental protection technologies; geosciences and ocean engineering technologies; elementary substance science and radiation technologies; medical science and bio-medical engineering; and other high and new technology products; New products produced by use of the achievements of the state and provincial and ministry scientific and technological program, in particular those with a major promoting function for the

basic and mainstay industries of the national economy; New products with self-owned intellectual property rights; New products that are aimed at export or can replace import products, or produced with imported technologies with over 80% of the parts domestically made; New products that adopt international standards. The Certificate of National New Product for the products included in the Program will be issued. The government provides preferential policies of tax reduction or exemption in a certain period to the products of the Nation New Products Program. The state selects key ones from the products in the Program and provides a proper amount of subsidy from financial appropriation.

8. Program on the Construction of National Key Laboratories

The Program was launched in 1984. Focusing on the S&T reserves for long-term development, it aims at supporting the study and exploration in basic research, applied basic research and high technology through S&T capacity building. It is supposed to create a favourable environment for bringing up senior S&T personnel and stabilizing S&T research contingents. Under the Program, a number of laboratories have been built and equipped with facilities of world level in some higher education institutes and research organizations by the state, in selected scientific disciplines and emerging cross-section fields and in a planned and stage-by-stage way. By now, the construction of 153 key laboratories has been completed and put into operation, with total investment of RMB 1.4 billion Yuan.

9. The S&T Program for Social Development

The term of the Program is from 1996 to 2010. Its objectives are: to improve the quality of people's life and enhance the quality of the general public; to improve the living environment of the people and coordinate the relationship between human and nature; to promote the scientific and technological progress in social undertakings and related industries; and to promote the implementation of sustainable development strategy.

Its priorities include: to promote the implementation of China's Agenda 21through scientific and technology progress; to provide guidance and coordinate the S&T activities in the main areas of social development; to facilitate the development of S&T industries in such fields as medicine, environmental protection, natural resources and housing construction; to support a number of S&T research projects of great significance to the nation's social development; to arrange for batch of key applied basic research and high and new technology development projects; to establish several emerging industrial development bases and industrial parks for social development; to establish a number of comprehensive experimental zones for social development and to promote the sustainable development in communities. Its financial resources come from loans, financial inputs from various sectors, self-raised by enterprises and the public, government appropriations and international aid.

10. Innovation Funds for Small and Medium S&T Enterprises

The Innovation Fund for small technology-based firms (STF) is a government special fund that was set up upon the approval of the State Council to support technology innovation. By ways of appropriation, loan interest subsidy and equity investment etc., the fund is

aimed at supporting and encouraging technology innovation activities of STF, facilitating transformation of scientific research achievement, fostering a batch of STF with Chinese characteristics and expediting the industrialization of high and new technology industry. The fund will surely play an active role in optimizing the industry and product mix, expanding internal market demand, creating new jobs and promoting health stable and rapid development of national economy. As a special fund of Central Government, The Innovation Fund for STF will be managed and operated according to objective laws of market economy to support STF with various ownership; lure effectively investment from local governments, enterprises, venture capital firms and financial institution; promote gradually the establishment of investment mechanism for high and new technology industrialization conforming to objective laws of market economy; further optimize technology investment resources and build up an environment conductive to innovation and development of STF.

11. Ten Projects to Vitalize West Areas

There are 10 projects in the western regions to speed up the development of central and western China. The 10 projects, mainly in infrastructure, are expected to speed local development. A railway will be built between Xi'an in northwestern Shanxi Province and Nanjing in eastern Jiangsu Province to facilitate transport. The State will invest 23.23 billion Yuan (USD 2.8 billion) in the 955-kilometer-long Xi'an-Hefei section. Another 18.23 billion Yuan (USD 2.2 billion) will be invested in the construction of the 640-kilometer-long Yuhuai Railway from Chongqing to Huaihua in Central China's Hunan Province, to improve the western transportation network. The focus of road construction is to solve the transportation problems of poor counties and to build State-level highways in the western regions. The State plans to build 35000-kilometers of highway, 17000-kilometer of which will be in the West. The construction of Xi'an-Xianyang International Airport will begin this year as a part of an aviation transportation network in the western regions. To relieve the pressure on transportation in Chongqing, the State will invest 3.258 billion Yuan (USD 392.5 million) into the construction of light rail network. The first phase of construction will be 13.5-kilometer long with 14 stations. A natural gas pipeline will be built from Sebei in the Qaidam Basin, through Xining of Qinghai Province, to Lanzhou of Gansu Province. The 953-kilometer pipeline can send 2 billion cubic meter of natural gas each year to Xining and Lanzhou. Key water control projects will be carried out in Zipingpu, Sichuan Province, and Shapotou, Ningxia Hui Autonomous Region. The Zipingpo project with 6.2 billion Yuan (USD 747 million) of investment is expected to provide 550 million cubic meter more water to Dujiangyan and Chengdu, and generate 3400 million kilowatt-hours of power each year. The Shapotou project, with an investment of 1.3 billion Yuan (USD 156.6 million), is expected to improve local areas' ability to prevent floods by irrigating 76600 hectares of land and generating 700 million kilowatt-hours of electricity per year. The country plans to turn 343300 hectares of land back into forest in the 13 western provinces this year. The project will organize villagers to cultivate 780720 hectares of forest and grassland. The project to develop potash fertilizer will be implemented in Yanhu, Qinghai, which has abundant potassium resources. It aims to support agricultural production and boost Qinghai's development. The State will support the colleges and universities in the western regions.12.Some focal points of the "Measurements for vitalizing the West".

According to the nation's Strategy of West Vitalization, some measurements are put forward from the standpoint of S&T to ensure the implementation of the strategy.

1. As the process of economic globalization is getting fast China is about to face much more challenges than ever especially after China's entry to WTO, and West vitalization will be more challengeable at the same time. To ensure the attainment of the goal, one thing should be noted that S&T would take a key role in the promotion of productivity.

2. Take advantages of west area and utilize the unique resources in the region, push forward the S&T industrialization in the area.

3. Draw up the S&T development blueprint tailored for the west, in which some important issues like ecosystem protection, sustainable development, etc. should be addressed.

4. Some measurements including incentive policies should be taken into account to ensure the adequate talented-pool for the regional development. At the same time the infrastructure for S&T activities in the wset are supposed to be improved including the set-up of key labs, engineering centers, S&T information network and field operation test bases, etc.

5. Pay much attention to the ecosystem in the region. The development of the region should be coordinated with the capacity of regional environment resources to ensure the sustainable structure.

6. Boost the industries that are peculiar to the west and introduce some advanced technologies to the agriculture and animal husbandry for the promotion of value-added products.

7. Forster hi-tech agriculture to incite the development of the sector, in particular by means of the experience from those hi-tech industry development zones in Xi'an, Chendu, Lanzhou and Yangling. In addition, business incubators, university and college-based technology parks, technology transfer centers also need to be set up.

8. IT infrastructure will be significantly essential to all industries in the west, more advanced information technologies and much data should be introduced and delivered to different sectors. Remote sensing, GIS, GPS, and so on should be emphasized to the resource investigation in western region. What is more, Internet backbone, internet-based education and library, e-commerce should be improved to match the needs.

9. Much effort should be made to promote the development of medium and small-sized cities in western area. Some hi-tech-based sample zones are supposed to be established so as to transfer technologies and experience to the undeveloped areas.

10. S&T popularization in the west must be taken into account in order to promote the S&T quality of the labour. A systematic structure for S&T popularization throughout the area should be carried out to cover the every corner. That will be the first of the first to help people realize the power of knowledge.

11. International and domestic cooperations in science and technology are highly encouraged including the exchange of scholars, sharing of information, co-research on certain subjects.

12. Some preferential policies should be made to favor the west when S&T programs are under consideration. S&T administrations and academic institutions such as Chinese Academy of Sciences should work together on the issue.

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8.6 Economic and Technological Development Zones

8.6.1 A Brief Introduction

At the beginning of 1984, to further open to the outside world, China government decided to establish economic and technological development zones (ETDZ)[1308] along seas by using successful experiences of special economic zones in the previous period.

From 1984 to 1988, 14 ETDZs including Dalian, Qinhuangdao, Tianjin, Yantai, Qingdao, Lianyungang, Nantong, Minhang, Hongqiao, Caohejing, Ningbo, Fuzhou, Guangzhou, Zhanjiang are the first that had been established after the approval of the State Council.

In 1992 and 1993, eighteen other national ETDZs including Yingkou, Changchun, Shenyang, Harbin, Weihai, Kunshan, Hangzhou, Xiaoshan, Wenzhou, Rongqiao, Dongshan, Guangzhou Nansha, Huizhou Dayawan, Wuhu, Wuhan, Chongqing, Beijing, Urumchi are the second to be set up.

From 2000 to 2002, the State Council decided to build the third group including Hefei, Zhengzhou, Xi'an, Changsha, Chengdu, Kunming, Gunyang, Nanchang, Shihezi, Xining, Huhhot, Taiyuan, Nanning, Yinchuan, Lanzhou, Lasa, Lanzhou.

Besides, it also ratified Suzhou Industrial Park, Hainan Yangpu ETDZ, Shanghai Jinqiao Export Processing Zone, Ningbo Daxie ETDZ and Xiamen Haicang Investment Zone to enjoy the same preferential policies with these national ETDZs.

The state-level ETDZ is a relatively small piece of land carved up in the coastal cities and other open cities. It attaches great importance to improving hard and soft investment environment and adheres to the policy of "mainly developing the high-tech industry, focusing on industrial projects, absorbing foreign fund and building up export-oriented economy" to strive for a fast and sound development. Serving as "Windows and bases" in the fields of opening-up, capital attraction, export enlargement, hi-tech development and regional economy promotion, it now becomes a powerful engine in developing regional economy and plays an important role in adjusting regional economy and industry

[1307] Consulate General of the People's Republic of China in San Francisco, Science and Technology Programs in China issued on November 18, 2003 available online at URL: http://www.chinaconsulatesf.org/eng/kj/kjjh/
[1308] ETDZ comes under Ministry of Commerce of People's Republic of China.