China’s STI Policies and Framework Conditions

Brussels, 12th June 2014
I. Introduction
II. STI Policies
III. Framework Conditions for STI in China
Second Stakeholders Workshop
Brussels, 12th June 2014

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I. Introduction

WP3: Assessing China’s Policies in Terms of Development of Its Domestic STI Capabilities and Its International Strategy

The objective of WP3 is to analyse and identify the main trends in policy-making and the funding system for STI development in China, and to analyse China’s international strategy concerning STI.

WP4: An Overview of Framework Conditions and the Development and Growth of Innovative Firms

The objective of WP4 is to provide an overview of the Chinese innovation system and of the consequences for innovative operators in China.
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- The results of these two WPs are presented together due to the overlap in the methodology used to obtain the information required for them.

<table>
<thead>
<tr>
<th>Survey (WP3)</th>
<th>Gathered data from both Chinese and European STI stakeholders regarding Chinese innovation performance from an overall perspective</th>
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<tr>
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<td>212 replies for the questionnaire were received:</td>
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<td>• 180 were Chinese (2/3 from research institutions)</td>
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<td>• 32 were foreign (3/4 from research institutions)</td>
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<tr>
<th>Desk Research (WP4)</th>
<th>Research main topics related to China's framework conditions and the development and growth of innovative firms, to provide a basis for the interviews</th>
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<th>Interviews (WP3&amp;4)</th>
<th>Total of 101 interviews focusing on key foreign and Chinese stakeholders in China</th>
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I. Introduction

Survey

- In order to analyse and identify the main trends in policy-making and funding system for STI development in China, and to analyse China's international strategy concerning STI, the project team sought the opinions from selected Europe-based and China-based stakeholders.

- The survey consisted of four different questionnaires:
  - Two in Chinese:
    - Chinese Research Stakeholders
    - Chinese Industry Stakeholders
  - Two in English:
    - European Research Stakeholders
    - European Industry Stakeholders
I. Introduction

Interviews

- Complement the survey questionnaire and ensure sufficient amount of data collected for the project analysis. One-on-one discussions with high-rank decision makers within relevant Chinese, European and third country organizations.

- Total of **101 interviews conducted** during the whole project.
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II. STI Policies

STI Policies

- Current Features of STI Policies
- Prospects for the Future
- Patterns of International Cooperation
- Human Capital for Innovation
- Industrial Innovation
- Indigenous Innovation
II. STI Policies

Current Features of STI Policies

- Main guiding policies for Science, Technology and Innovation include:
  - Medium and Long Term S&T Development Plan 2006-2020
  - Twelve Five-Year-Plan for Science and Technology Development

Increasing focus on STI as a means to address societal challenges

Building up indigenous innovation through strengthening university-industry linkages, attracting overseas talent, improving intellectual property rights protection and management, and strengthening international cooperation
Current Features of STI Policies (cont.)

Supporting policies include:

- Policy paper “Deepen the China-EU Comprehensive Strategic Partnership for Mutual Benefit and Win-win Cooperation”.
- White Paper on IP protection.
II. STI Policies

Current Features of STI Policies (cont.)

- Several governmental agencies offer STI research funding. At national level, funding programmes are provided mainly by the following four entities:
  - Ministry of Science and Technology (MoST)
  - National Natural Science Foundation of China (NSFC)
  - Chinese Academy of Sciences (CAS)
  - China Scholarship Council (CSC)
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Current Features of STI Policies (cont.)

- Several regional agencies provide S&T research funding.
- Major funding agencies include Beijing Municipal Commission of Science and Technology (BMCST), Science and Technology Commission of Shanghai Municipality (STCSM) and Guangdong Provincial Department of Science & Technology (GPDST).
- Main programmes open to European researchers include the following:
  - BMCST - Beijing S&T International Cooperation Programme
  - STCSM - Shanghai S&T International Cooperation Programme
  - GPDST - Guangdong S&T International Cooperation Programme
II. STI Policies

Current Features of STI Policies (cont.)

Main issues:

- Weak research – industry linkages
- Need for greater enforcement of intellectual property rights laws
- Insufficiencies in the evaluation of government R&D expenditures
- Progress in increasing basic research
- Need for greater coordination between the various government agencies with responsibility for science, technology and innovation
Prospects for the Future

- **STI Policy Reform** - Strategic document “Further reform of the S&T system and build enterprise-centred innovation system” was designed to strengthen “Industry-University-Research”.

- **Monitoring of STI Performance** - In July 2012, the State Council established a national innovation survey system. In November 2013, MOST published a draft report in order to monitor the innovation indicators.

- **Tax Incentives** - Recommendations in the evaluation of current tax incentives for R&D performing enterprises are for the expansion of this policy.

- **Research priorities** - CAS has published a road map for China's science and technology development “Technological Revolution and China's Future-Innovation 2050”
Patterns of International Cooperation

- EU-China cooperation

Basis for EU-China cooperation is summed up in the **EU-China 2020 Strategic Agenda for Cooperation**. Specific cooperation activities in targeted areas:

- Food, agriculture, biotechnologies (FAB)
- Sustainable urbanisation
- Aviation and aeronautics
- ICT

- R&D cooperation programmes

In 2013, MoST implemented a call for proposals for China-EU Science and Technology Cooperative Projects. The call is currently still open.
II. STI Policies

Human Capital for Innovation

- Existing human resources policies and instruments:
  - **Guidelines for Promoting Innovation and Entrepreneurship Education in HEIs and Self-employment Activities of University Graduates**: provides guidance for universities to create courses and curriculums on creativity, innovation and entrepreneurship.
  - **White Paper on Human Resources**: contains objectives for the enlargement of China’s S&T workforce over the next ten years.
  - **CPCCC 1000 Talent Plan**: aims to attract 2,000 leading talents under the age of 55, who hold professorships or equivalent positions in renowned foreign universities or research institutes.
II. STI Policies

Industrial Innovation

- Existing industrial policy:

  - **Development Plan of National Strategic Emerging Industries during the 12th Five-Year-Plan Period (2011-2015):** aims to promote and develop energy saving technology, next-generation information technology, biotechnology, high-end equipment manufacturing, new energy, new materials, and new energy vehicle industries.

- Existing industrial policy instruments:

  - **Technology Transformation Funds** subsidise the costs of equipment upgrading and new processes for specific purposes, such as energy saving, emission reduction, and the adoption of new generation technologies.

  - **Innofund** supports SME in technological innovation
II. STI Policies

Indigenous innovation

*Set of industrial policies to support innovation in China by “enhancing original innovation through co-innovation and re-innovation based on the assimilation of imported technologies.”*

- Chinese government encourages Foreign Invested Enterprise (FIEs) to offer their expertise and establish R&D centres in China.

- Joint Ventures (JV) agreements between China and FIEs drive technology transfer in two major ways:
  - Localisation of production;
  - Training engineers.

- Indigenous innovation strategy can increase difficulty in accessing public procurement, create barriers to market entry, encourage preferential treatment of domestic firms and products, as well as provide a higher risk of IPR infringement.
Indigenous innovation (cont.)

- New policies have been set up to encourage “indigenous innovation” products, including state funding for research, as well as directly favouring the commercialisation of “indigenous innovation” products.

- Indigenous innovation strategy has improved the innovation system, increasing collaborative innovation and acknowledgement among firms regarding the need for innovation.
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III. Framework Conditions for STI

Framework Conditions for STI

- Development of Firms
- Public Procurement
- Research and Technology Infrastructure
- Financing Innovation
- “Investment Catalogue”
- Patenting and Licensing System
- Development of Chinese Standards
Development of Firms

Foreign SMEs face several challenges for developing their business in China:

- **Minimum Registered Capital Requirements**: Wholly foreign-owned enterprises (WOFEs) in China need to have a stated registered capital, including the components from the initial investment.

- **Financing Restrictions**: Foreign SMEs do not have access to the same range of financing channels as Chinese companies.

- **New restrictions on Representative Offices**: Maximum number of representatives and shorter validity of the Registration Certificate.
Development of Firms (cont.)

Foreign SMEs face several challenges for developing their business in China:

- **Regulatory barrier and access to information:** Limited access to relevant regulatory information and difficulty in understanding the changes in the regulations.

- **Increasing tax burdens:** Foreign SMEs do not enjoy reduced taxes as before.

- **Protectionism and compulsory technology transfer:** Some JVs require compulsory technology transfer.

- **Human resources:** Limitations for foreign companies to hire people from abroad.
Public Procurement

- Public procurement in China has seen an average annual growth rate of 25% over the past seven years.
- Areas such as civil aviation, railways, airports, and energy are expanding rapidly.

Challenges for foreign companies:
- Equal Access to Public Procurement
- Non-transparent drafting of procurement catalogues
- Decentralization of the tendering and approval process
Research and Technology Infrastructure

- The gap between universities and industries is one of the main barriers for innovation in China.
- Examples of successful science parks include: Zhongguancun Hi-Tech Park, Tsinghua Science Park and Zhangjiang Hi-Tech Park.
- Many foundations for industry-university joint research in China and subsidies are available at provincial level, most of which are for Chinese companies and universities.
- 12th Five-year Plan for National Hightech Parks (2011-2015): aims to increase innovation capacity of national high-tech parks, attracting 3,000 overseas high-calibre professionals and establish 15 internationally competitive clusters.
Financing of Innovation

China’s financing for innovation will continue moving forward:

➢ **Government Financing:** main player in financing innovation but most of the funding goes to large SOEs and universities/institutions, not private companies.

➢ **Bank Financing:** improving during the past few years; only the most qualified SMEs can obtain loans from banks

➢ **Venture capital in China:** Developing rapidly with growing numbers of supporting policies from the central and local governments. However, there is still a lack of expertise as well as legal and regulatory conditions for an adequate venture capital system.

➢ **Angel Investors in China:** The number of angel investors in China is growing, although still being low
Role of the “Investment Catalogue”

Categorizes foreign investment in China in specific industries as “encouraged”, “restricted” or “prohibited”.

Investment catalogue no longer supports foreign investment in industries in which China has a competitive position.

- **Challenges for foreign companies:** Investment catalogue is still viewed as a domestic protection mechanism, not facilitating fair competition.

- **Encouraged industries in the 12th Five year Plan:** 1) Energy saving and environmental protection; 2) New-generation information technology; 3) Biotechnology; 4) High-end equipment manufacturing; 5) Renewable energy; 6) New materials; 7) Clean energy vehicles.
Patenting and Licensing System

- China is rapidly progressing in terms of IPR system development. One example is the Patent Law of the People's Republic of China launched by the government.
- Since 2006, there have been criminal penalties for breaking anti-piracy and anti-counterfeiting laws.
- China joined the Patent Prosecution Highway mechanism to promote the acceleration of patent prosecution procedures.
- Supreme People's Court (SPC) has adopted several US techniques for judicial interpretations of patent infringement.
Patenting and Licensing System (cont.)

**Barriers for foreign companies:** Hard for a foreigner to get an invention patent.

Strategies adopted by foreign companies:

- **Modular strategy:** Use different suppliers to provide different components for one product.
- **Two - phased implementation for research collaborations:** 1) Trial period 2) Actual technology transfer
- **Close collaboration:** Develop a comprehensive IP agreement, specifying the role of each partner.
Development of Chinese Standards

- Chinese standards are categorized into 4 groups: National Standards, Sector Standards, Provincial Standards and Enterprise Standards (Chinese Standardization Law)

- Chinese standard development is based on a top down approach

- Chinese standards system is overly complex and subject to fragmentation

- There is a lack of structurally defined concepts.

- Chinese standards inhibit transfer of technology to China.

- China’s strategy seems to be to use standards as a means to promote indigenous innovation, while participating in international standard-setting (promoting its standards)

- Increasing cooperation - Europe-China Standardization Information Platform (CESIP)
III. Framework Conditions for STI

Development of Chinese Standards (cont.)

- Supports the innovation process by providing an important basis for developing solutions, which is essential for market update.

- Benefits companies in China, as it filters unqualified organizations, acting as an important way to improve market access and conditions for European companies in China.

- Stimulates global competition and thus with positive consequences for innovation.
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