



Basic Thinking of National Medium and Long Term Development for Science and Technology of China

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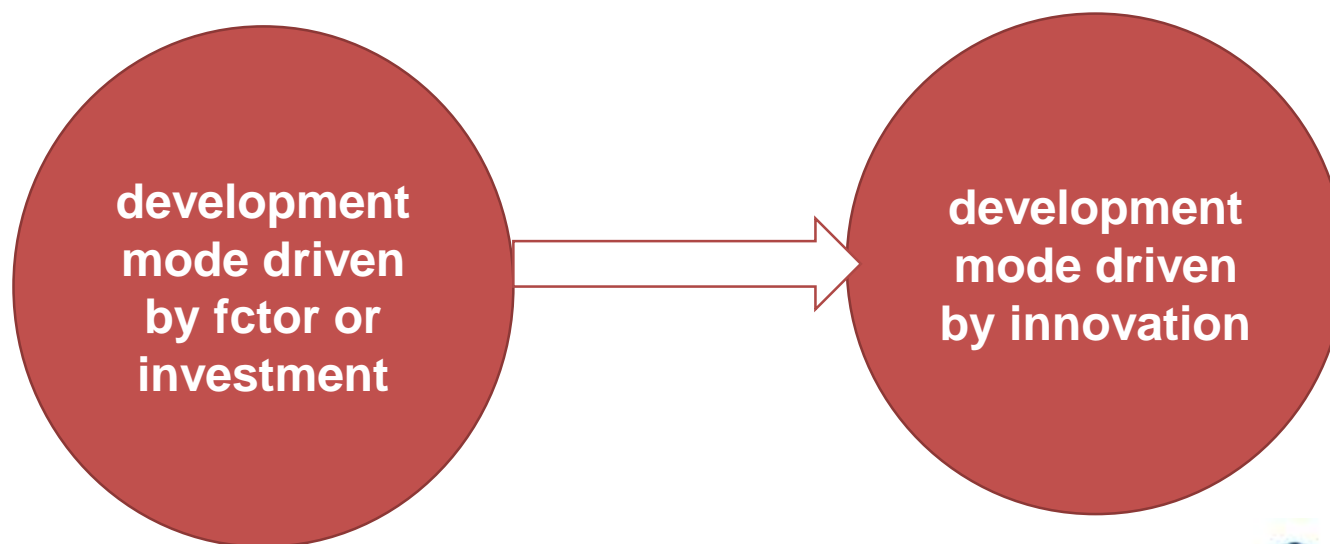
3. Prospect of the Development for S&T



1. Background of the Development for S&T



China's economy has been transforming from a phase of rapid growth to a stage of high-quality development that demands more development driven by innovation.



1. Background of the Development for S&T



New round technical revolution and industry transform demonstrates new trends:

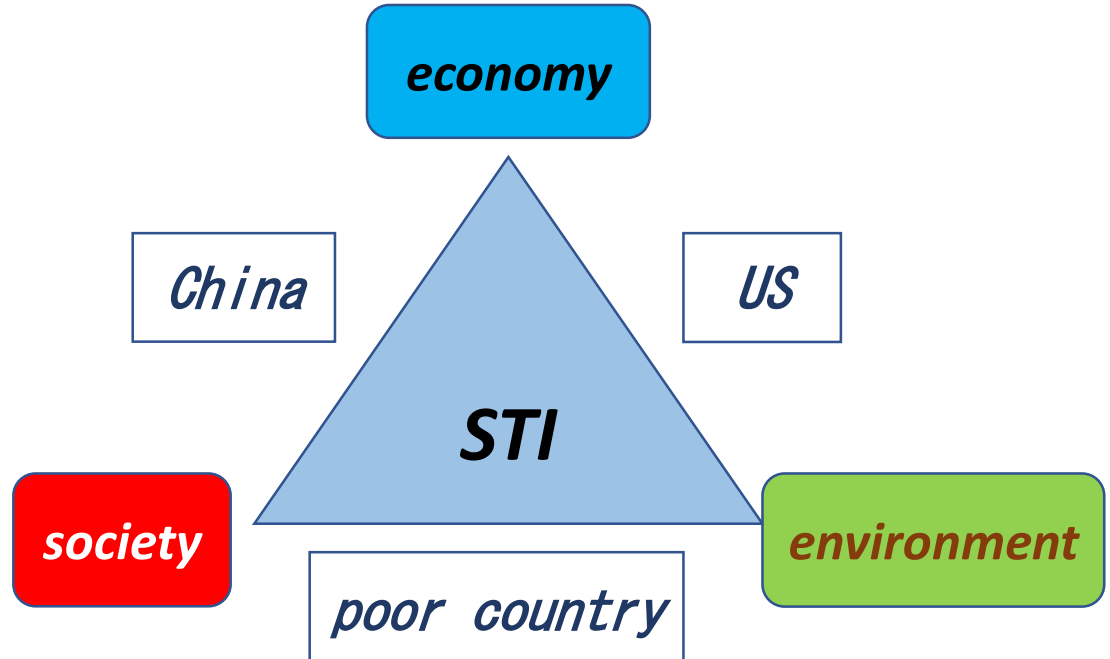
- **Cross and integration among different technology**
- **Group breakthrough of technology:** information and telecommunication, advanced materials, advanced energy, life science, etc.
- **Digitization and intelligence**
- **Significant disruptive technology spring up**
- **The speed of industrialization of scientific and technological achievements accelerates**



1. Background of the Development for S&T

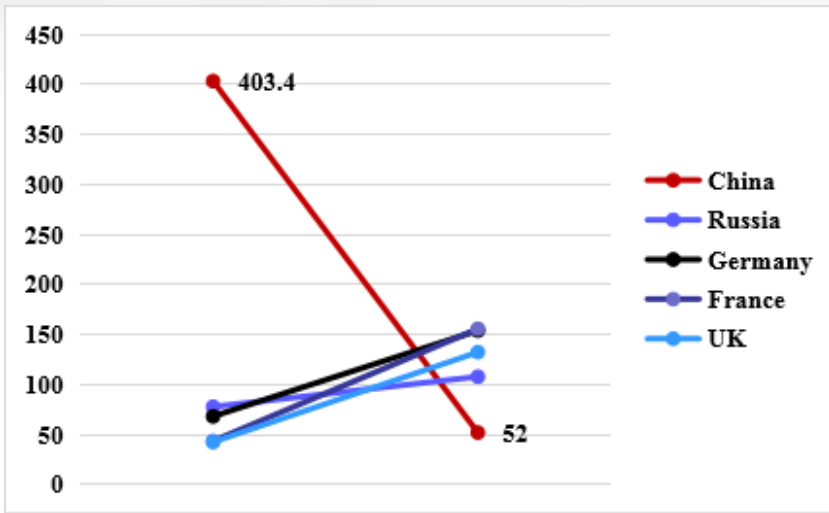
- Mankind society is facing severe challenge of sustainable development.

common challenge:
climate change
health
environment protection
disaster prevention
public safety



In the new stage, new guidelines, highlights and policy measures of S&T should be put forward

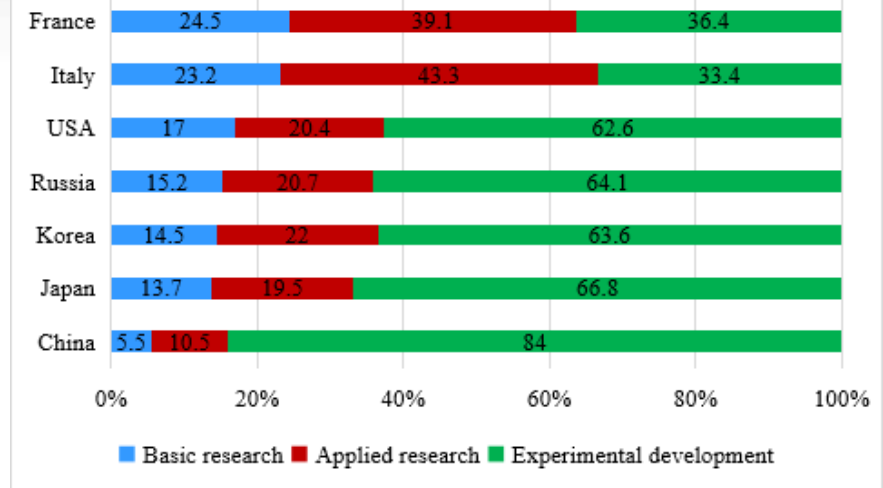
There is still a large gap between China and developed countries in S&T development.



R&D personnel
(10,000 person-
years)

R&D personnel
per 10,000
employment
(person-year)

- ❑ Number of R&D personnel: 1st in the world
- ❑ Number of R&D personnel **per 10,000 employment** is small.

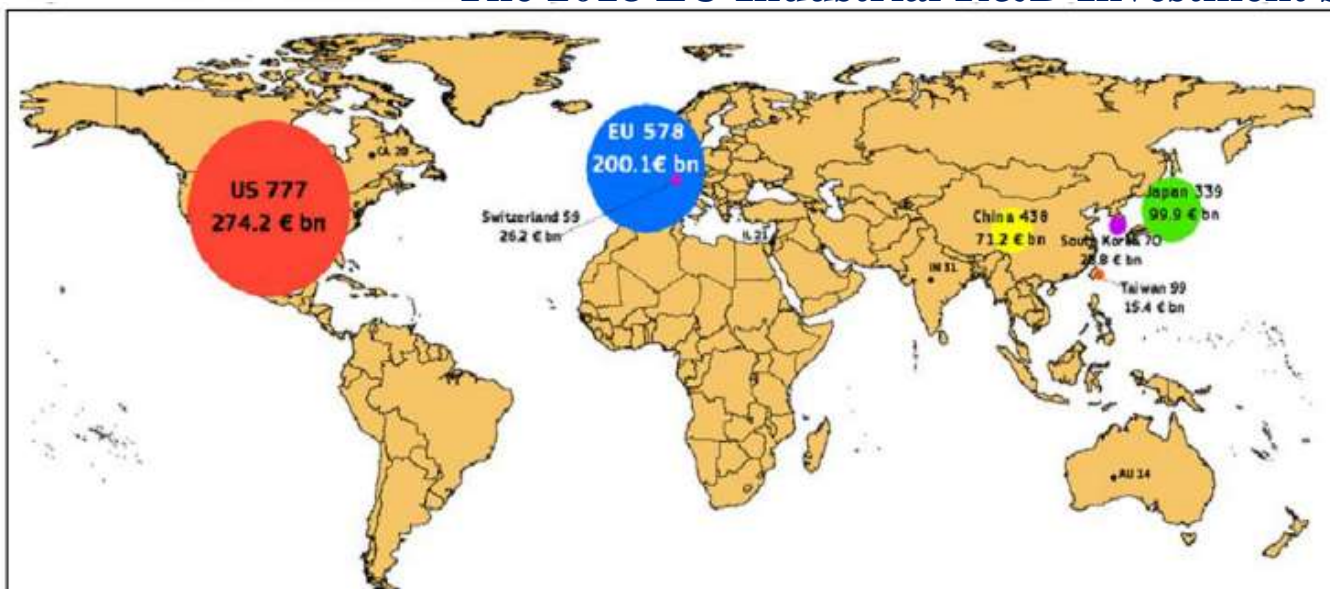


Proportion of basic research in China is about **5.5%** of R&D, lower than that of the developed countries such as Japan, France and the United States. It is also lower than the emerging economies such as South Korea, Russia and South Africa.

Expenditures on R&D of Enterprises are Relatively Lower.



World's top 2500 companies ranked by their investments in R&D —The 2018 EU Industrial R&D Investment Scoreboard



	Number of Companies	R&D Investment (€bn)	Average (€mn)
US	777	274.2	353
EU	578	200.1	346
China Mainland	438	71.2	163
Japan	339	99.9	295



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2. Basic Principles of the Development for S&T



- Stick innovation driven**
- deepen the opening policies: Strength international cooperation**
- Adhere to the reform direction of marketization: let market play the decisive role in allocating innovative resources, reducing or eliminating the systematic barriers, emitting reform dividends**
- Stick to people oriented.**
- Building good innovative ecology**

Innovation driven



- New development idea: innovation, coordination, green, open, share
- Innovation is the first dynamics to lead development
- Improving innovative capacity:
 - Strength basic research, original innovation
 - Grasp key technology,
 - Build S&T infrastructure



Open innovation



- Globalization of S&T is a big trend that can not resist
- Openness is the basic policy of China
- Stick mutual benefit and win-win guideline
- Improve the level of internationalization, because our level of internationalization is relatively low
- Build innovative community



Reform of marketization



- Market plays the decisive role in the allocation of resources
- Enterprise is the subject of innovation
- Government should play better function
 - Basic research
 - Frontier research and core technology
 - Research on the important public interest



People oriented



- By people: talent is the first resource.
- For people : let innovative results serve people
- Means of inspiration and constraint both should be used
- Material inspiration and spirit inspiration both should be used



Innovative ecology



- Transform from management to governance, from management to service
- Encourage innovation
- Train the spirit of doubt
- Tolerant failure
- Inspect every people, treat every people equally



3. Prospects of the Development for S&T



Basic Researches and Frontier Technologies

Major Demands for Social Development

Innovation Platforms and Infrastructures

Coordinated Development among Regions

International Cooperation

Technology Transfer and Commercialization

1. Basic Researches and Frontier Technologies



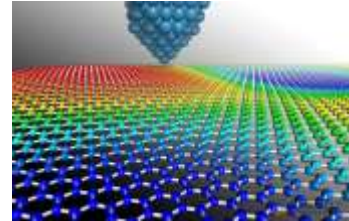
Artificial Intelligence



Big Data



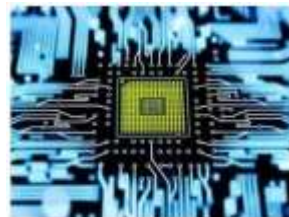
New Materials



Quantum information



Intelligent Manufacturing



Integrated Circuit



Mobile Communication



Aeronautics and Aerospace

- ◆ Optimize mechanism of project management
- ◆ Highlight interdisciplines and disruptive technologies

2. Major Demands for Social Development



Life & Health

- ❑ Brain science and brain-like artificial intelligence research
- ❑ Development of major new medicines
- ❑ Prevention and treatment of serious diseases such as cancer, angiocardopathy and diabetes



Food Supply

- ❑ Characteristic improvement research of staple crops
- ❑ Innovation in seed industry



Environmental Protection

- ❑ Comprehensive environmental governance in Beijing-Tianjin-Hebei region
- ❑ Control and treatment of water pollution
- ❑ Participation in global climate governance



Clean Energy

- ❑ Clean and efficient utilization of coal
- ❑ Smart grid
- ❑ Large-scale advanced nuclear power plants with pressurized water reactors (PWR) and high-temperature gas-cooled reactors (HTGR)

3 Innovation Platforms and Infrastructures



Major S&T Facilities

- Shanghai Synchrotron Radiation Facility
- China Spallation Neutron Source
- BPL and BPM Time Service Systems
- Guoshoujing Telescope
- Beijing Electron Positron Collider
- Heavy Ion Research Facility in Lanzhou
- ...

State Key Laboratories

- ❑ Total number: 501 (175 in enterprises)
- ❑ Covering all provinces in mainland China, as well as Hong Kong and Macao

National Technological Innovation Center

Comprehensive Industrial Technology Innovation Platform



- ◆ Reform the system of state key laboratories
- ◆ Optimize distribution of innovation platforms and infrastructures

4.Coordinated Development among Regions



Improving Regional Innovative and Coordinated Development

Innovation Demonstration Zone of National Sustainable Development Agenda



Coordinated development of the Beijing-Tianjin-Hebei region



Guangdong-Hong Kong-Macao Greater Bay Area



Integrated development of the Yangtze River Delta region



Shenzhen

- Innovation Leads Sustainable Development of Super-large Cities



Taiyuan

- Transformation and upgrading of Resource-based Cities



Guilin

- Sustainable Utilization of Landscape Resources

Poverty alleviation by S&T

- S&T support for Xizang, Xinjiang, Qinghai, Ningxia, Yunan, ...
- Agricultural S&T Parks



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5. Technology Transfer and Commercialization



Incubators

Innovation Spaces

University Science Parks

Technology Trade Markets

Innovation funds and Venture capital

Laws and Policies

High-Tech Zones



6. International Cooperation



- ◆ Enhance cooperation with other countries in S&T
- ◆ Address global challenges together
- ◆ Open up national S&T programmes
- ◆ Participate and initiate international major science programs & projects
- ◆ Implement "the Belt and Road" Science, Technology and Innovation Action Plan



"the Belt and Road" International Scientific Organization Alliance



In September 2018, Mr. Wang Zhigang met with Mr. Carlos Moedas in MOST.



China-Italy Innovation Cooperation Week



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Thanks