Science and Technology Development in China and Chinese-Finnish Science and Technology Cooperation

中国科技发展现状及中芬科技合作

杨志军
YANG Zhijun
First Secretary
Science and Technology Section
Embassy of China in Finland
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2018 is the important year to China

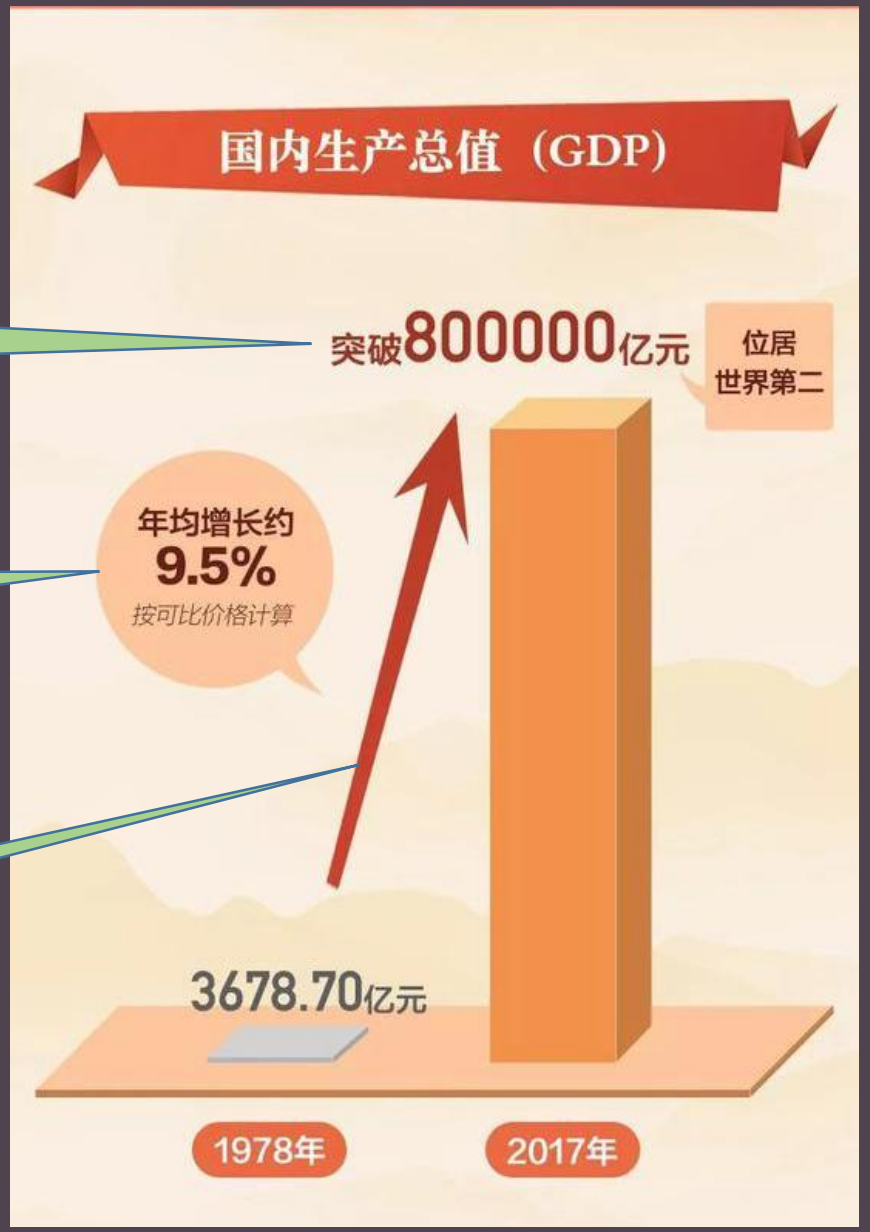
40th anniversary of reform and opening up
1978-2018

Achievements of the reform and opening up

GDP: $12 trillion
----China is the world's second largest economy

GDP grew at an average annual rate of 9.5%.

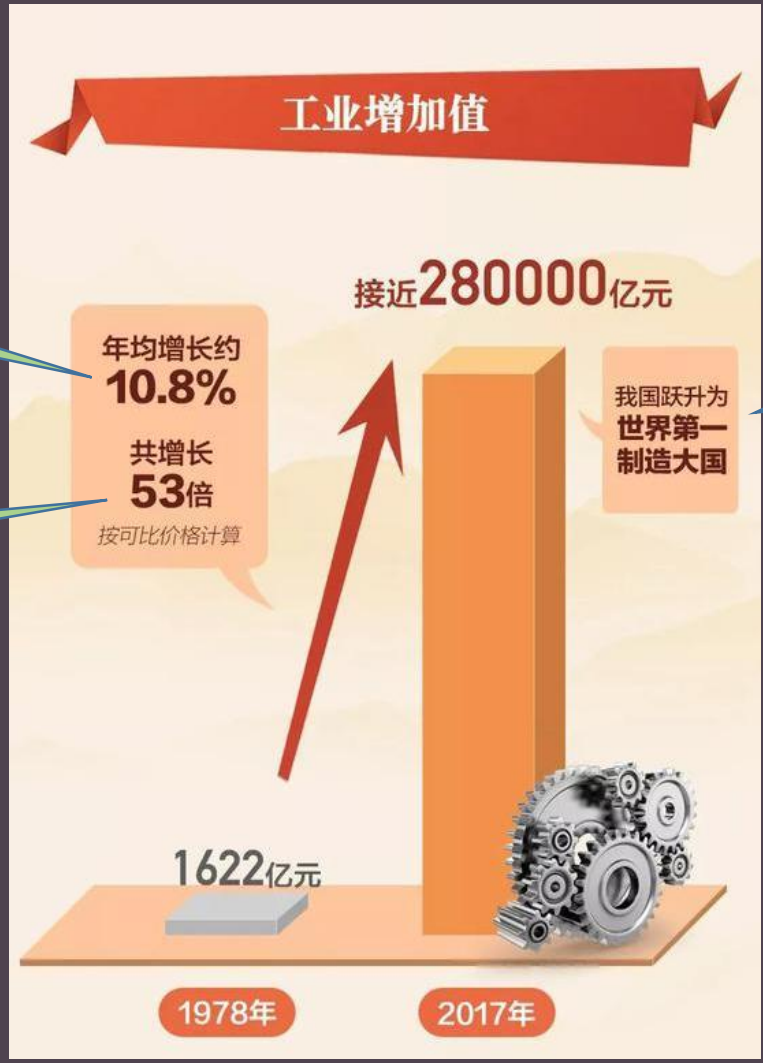
217 times increase



Industrial added value

Average annual growth rate： 10.8%

53 times increase



The world's largest manufacturing country

Foreign Trade

Annual average growth rate 14.5%

Total import and export of goods increased 198 times

Total import and export of Services Trade increased 147 times

Accumulating foreign investment $2 Trillions

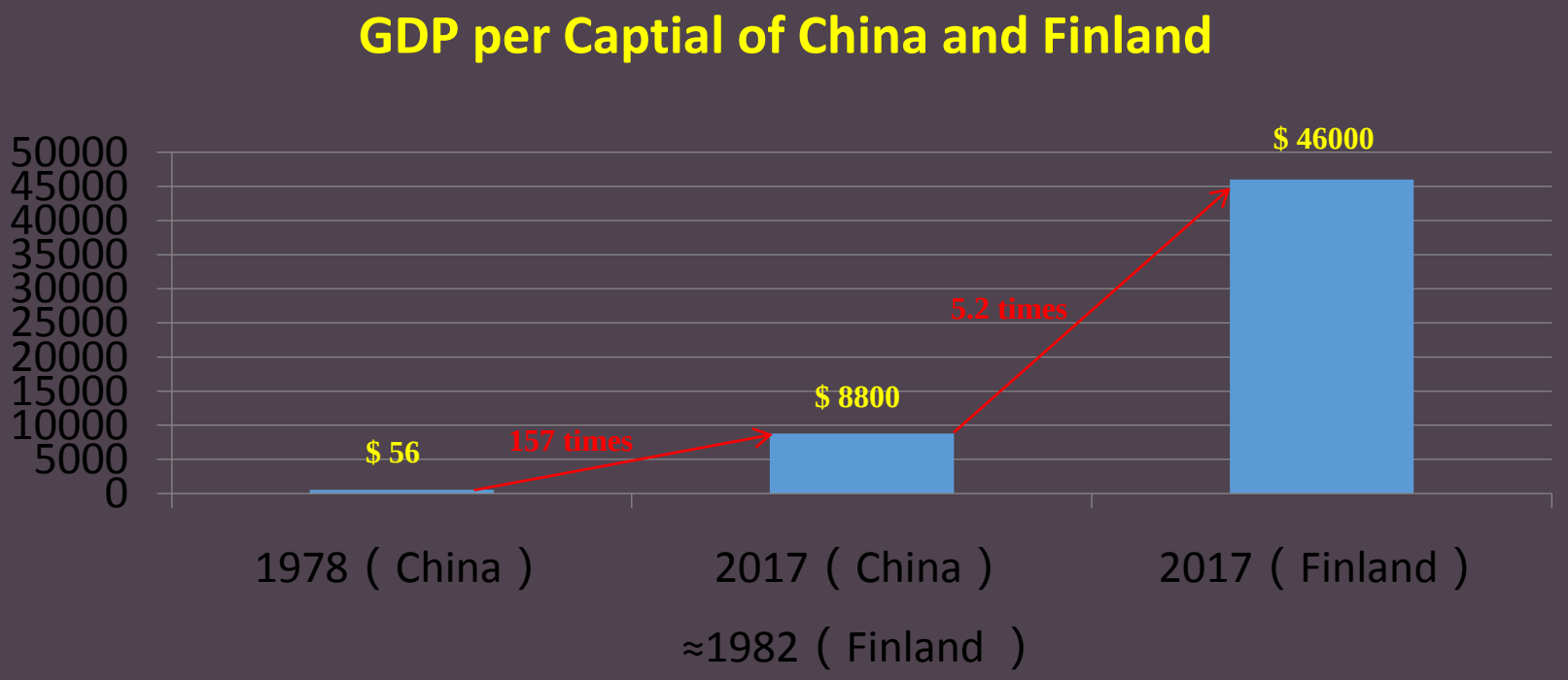
Foreign Trade

The world's largest trader of goods

The world's largest tourist market

The major trading partner of more than 130 countries in the world.

Achievements of the reform and opening up



R&D investment

- **The total number of R&D personnel: 1st in the world**
  ------2017 R&D personnel：6.21 Millions， Full-Time Equivalents as 4 Millions
  6 times compared with 1991

- **R&D expenditures: 2nd in the world.**
  ------ The total R&D expenditure : $ 251 Billions (1.76 trillions RMB yuan), 1/6 of the global
  123 times compared with 1991.

- **R&D expenditure as the percentage of GDP 2.13% (2017)**
  higher than the average of 2.03% of the EU countries (2017 Finland as 2.9%)

R&D outputs

- **scientific papers global ranking:**
  SCI: 2nd
  EI: 1st

- **citations of scientific papers: 2nd in the world**

- **invention patent applications and authorizations: 1st in the world**

- **chemistry, materials, physics, engineering, mathematics, and geosciences are close to the forefront of the world. According to the statistic, Among the 180 emerging and cutting-edge technology research fields in the world, there are 30 fields that China research performed very well , ranked second in the world behind USA.**

Mass entrepreneurship and innovation
大众创业 万众创新

- development concept--- innovative, coordinated, green, open, and shared development
  发展理念----创新、协调、绿色、开放、共享
- Outline of the National Strategy of Innovation-Driven Development 《国家创新驱动发展战略纲要》
- Intellectual Property Right protection: Patent Law, Trademark Law, Copyright Law
  《专利法》，《商标法》，《著作权法》
- the Law on Promoting the Transformation of Scientific and Technological Achievements
  《促进科技成果转化法》
- Platform: The 4,298 makers' spaces, 3,255 incubators, over 400 accelerators,
  19 national independent innovation demonstration zones and 156 national hi-tech zones

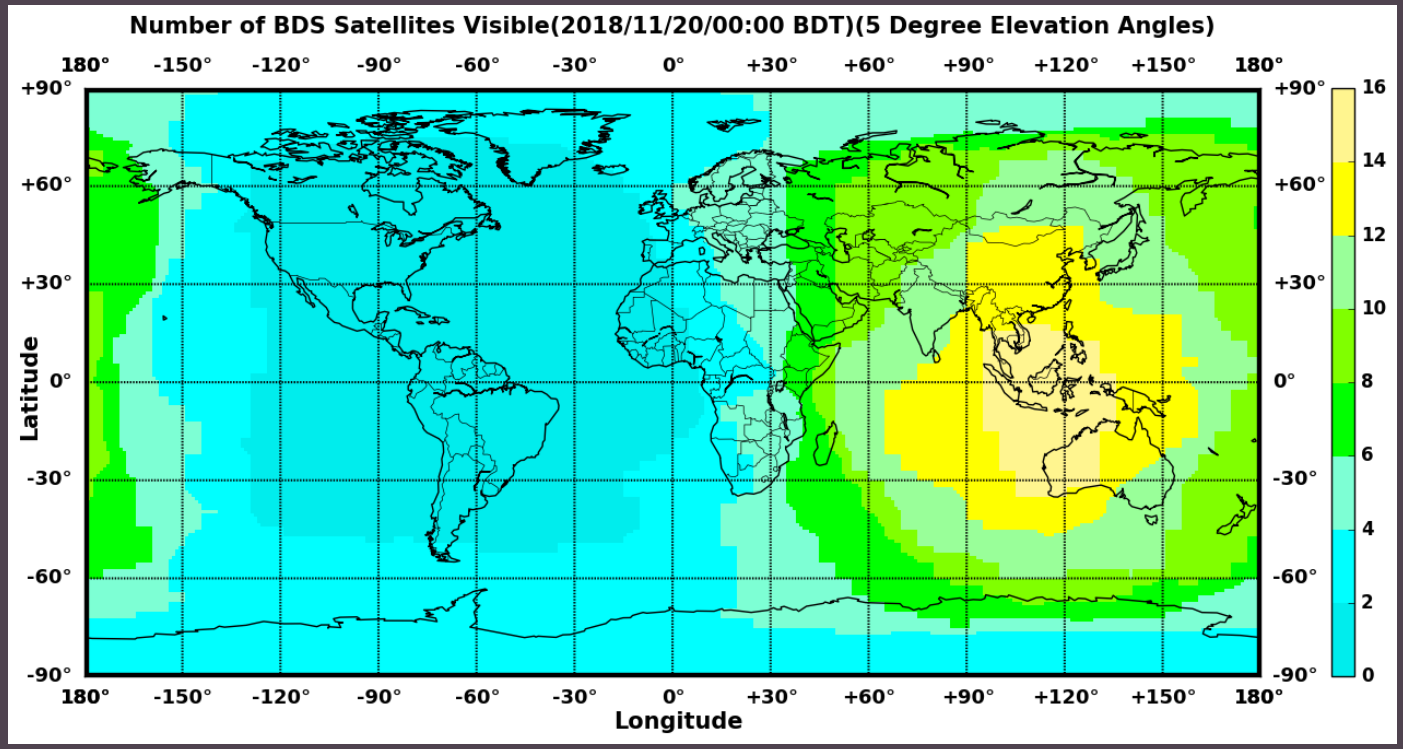
156 National High-tech Zones (2017)
---- The engine of China's economic development

- the total GDP : 11.5% of the Total China
- the R&D investment intensity: 7.09% , 3.3 times national average
- invention patent applications: 20.8% of the Total China
- every 10,000 practitioners authorized invention patents : 10 times the national average.
- number of high-tech enterprises : 38.2% of the country
- top 100 Internet companies of China: 96 in high-tech zones.

Hi-Tech Achievements

- **Beidou satellite navigation system, 43 satellites were launched, 2018: 10 launches--19 satellites**

2018: 10 launches--19 satellites



Goals:

end of 2018 ：cover along Belt and Road

2020： cover the whole world.

Hi-Tech Achievements

- Shenzhou spacecraft , Shenzhou No. 11 launched in 2016
- the sixth manned space mission
- docked with the Tiangong-2 space laboratory, 2 astronauts stayed 33 days and landed successfully

Hi-Tech Achievements

The C919, China's first large airliner

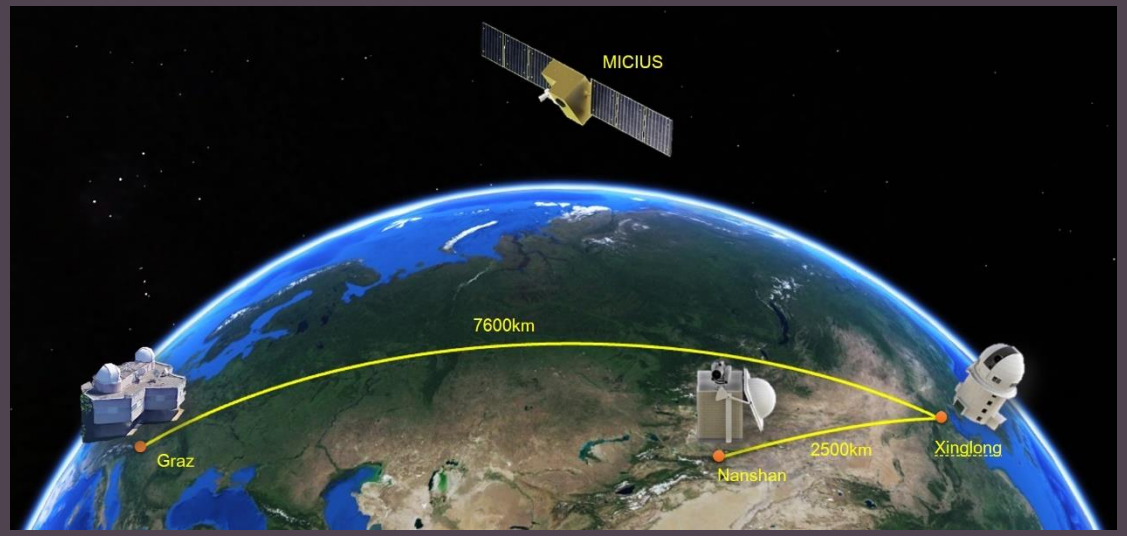
Orders have reached more than 800

Hi-Tech Achievements

- **Quantum communication**

Micius (Mozi, 墨子), the world's first quantum satellite

Realized 7600km secured quantum communication between China and Austria



Hi-Tech Achievements

CRH
China Railway High-speed
中国铁路高速

- **High-Speed Railway 400Km/h**
  ------the fastest train in the world

the hi-speed rail mileage : 25,000km
accounted for over 66% of the global total

Four Vertical and Four Horizontal high-speed railway network

Hi-Tech Achievements

High Performance Computer

TOP 500 The List.

Latest Rank on November 15, 2018

Performance

Rank	Site	System
1	DOE/SC/Oak Ridge National Laboratory United States	**Summit** - IBM Power System IBM
2	DOE/NNSA/LLNL United States	**Sierra** - IBM Power System IBM / NVIDIA / Mellanox
3	National Supercomputing Center in Wuxi China	**Sunway TaihuLight** - Sunway NRCPC
4	National Super Computer Center in Guangzhou China	**Tianhe-2A** - TH-IVB-FEP Cluster, NUDT
5	Swiss National Supercomputing Centre (CSCS) Switzerland	**Piz Daint** - Cray XC50, Xeon E5- Cray Inc.
6	DOE/NNSA/LANL/SNL United States	**Trinity** - Cray XC40, Xeon Cray Inc.
7	National Institute of Advanced Industrial Science and Technology (AIST) Japan	**AI Bridging Cloud Infrastructure (ABCI)** - Fujitsu
8	Leibniz Rechenzentrum Germany	**SuperMUC-NG** - ThinkSystem Lenovo
9	DOE/SC/Oak Ridge National Laboratory United States	**Titan** - Cray XK7, Opteron 6274 Cray Inc.
10	DOE/NNSA/LLNL United States	**Sequoia** - BlueGene/Q, Power IBM

Installations by countries

		Count	System Share (%)
1	China	227	45.4
2	United States	109	21.8
3	Japan	31	6.2
4	United Kingdom	20	4
5	France	18	3.6
6	Germany	17	3.4
7	Ireland	12	2.4
8	Canada	9	1.8
9	Italy	6	1.2
10	Korea, South	6	1.2

TOP 10 HPC manufacturer

		Count	System Share (%)
1	Lenovo	140	28
2	Inspur	84	16.8
3	Sugon	57	11.4
4	Cray Inc.	49	9.8
5	HPE	46	9.2
6	Bull	22	4.4
7	Fujitsu	15	3
8	Huawei	14	2.8
9	Dell EMC	13	2.6
10	IBM	12	2.4

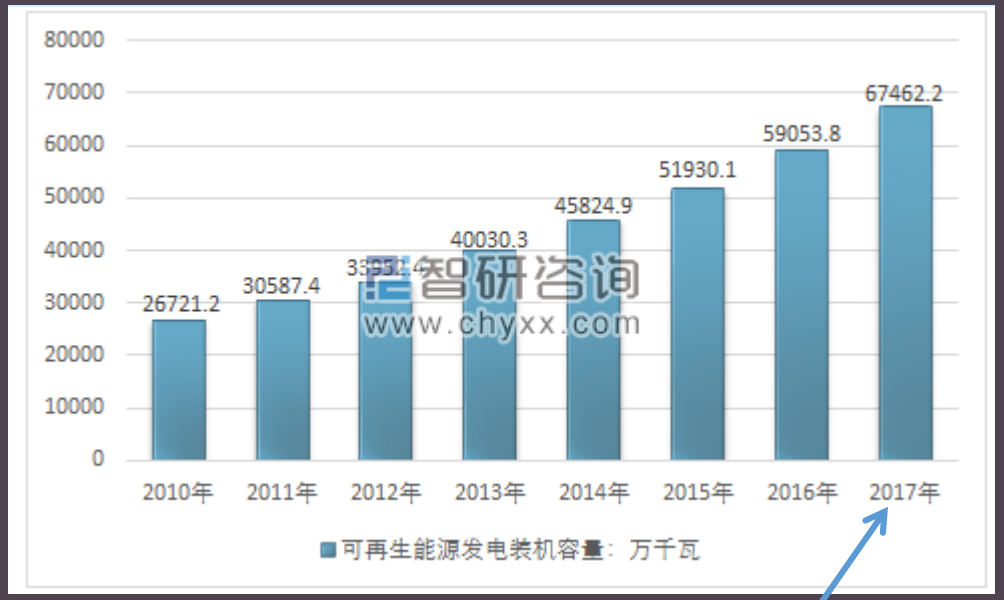
Hi-Tech Achievements

Renewable Energy

The installed capacity of hydropower, wind power, photovoltaic power ranked No.1 in the world

renewable energy installed capacity has accounted for 36.6% of the total installed capacity in China

power generation accounts for more than 26.5% of the total power generation in China

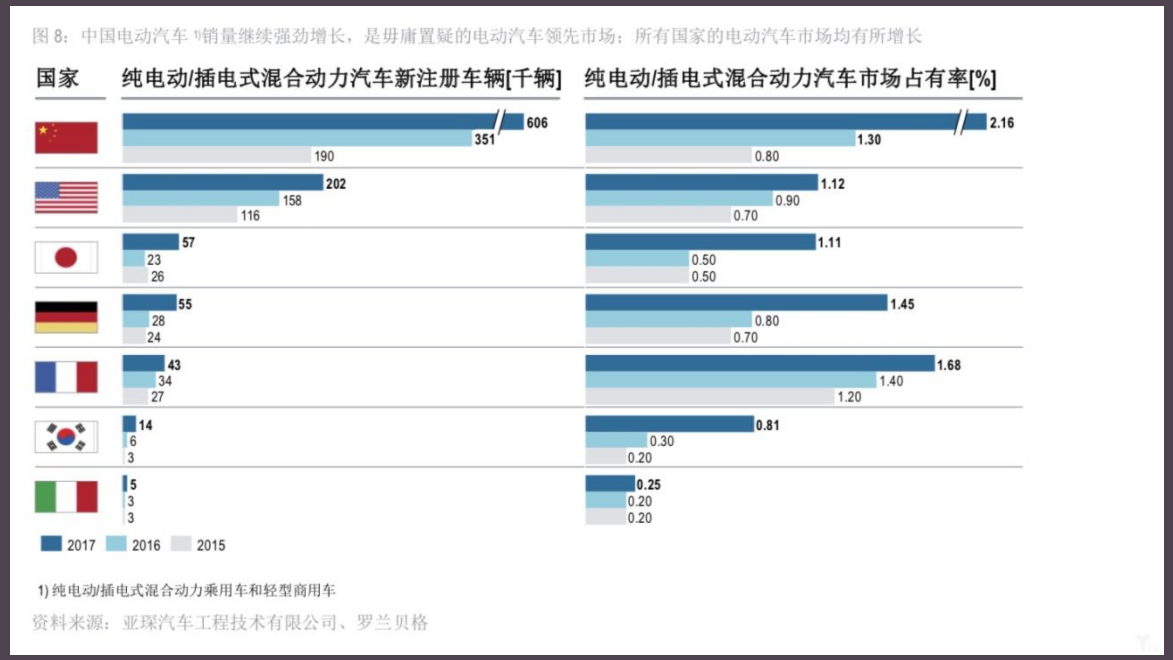


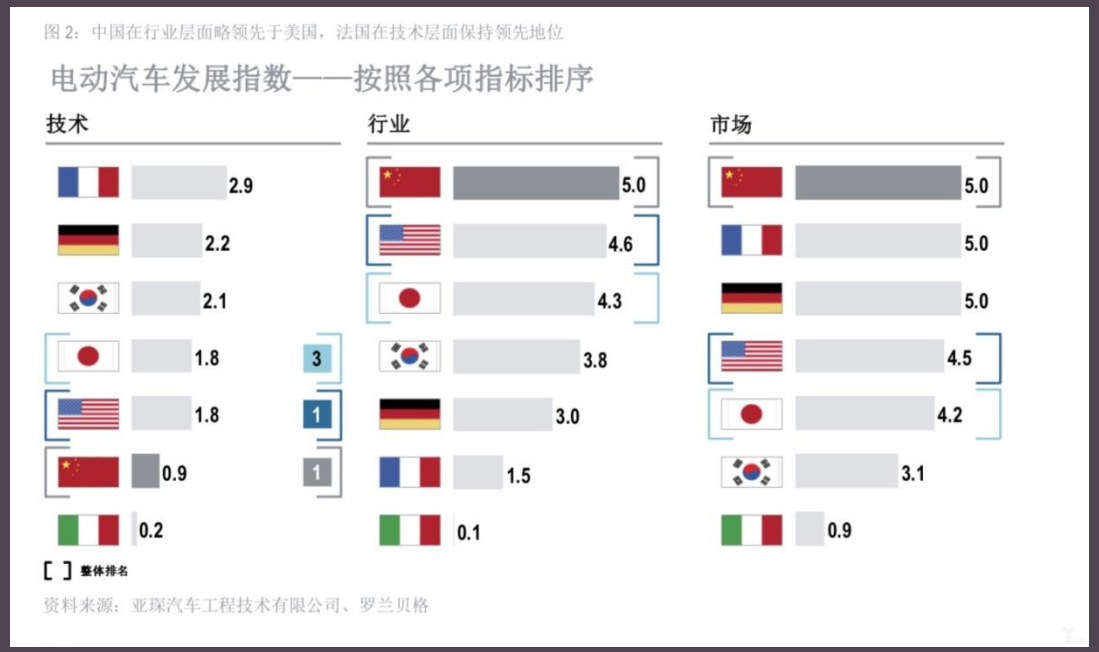
2017 China's renewable energy installed capacity is 674 million KW

Hi-Tech Achievements

➢**electric vehicles （ EV ）**

China accounted for over 50% of the world (both in Production and sales volume)





E-mobility Index 2018

Hi-Tech Achievements

Huawei ：R&D=10 Billion Euro, 6th in the world, R&D/income: 19.2%

Weaknesses ?

- Innovative ability is not strong， global innovation ranking about 20th
  Finland 7th
- The contribution rate of scientific and technological progress to the economy is only 55%
  Innovative country: >70%
- Manufacturing is big but not strong enough
- Dependence upon foreign technology > 40%,
- native brands high-tech exports account for 10% of total
- We need development our own Key core technology: high-end chip……

Bilateral S&T Cooperation
------ Mechanism

Science and Technology Cooperation Agreement Between China and Finland Signed in 1986

Joint Session under the Scientific and Technological Cooperation Agreement between the People's Republic of China and the Republic of Finland :

- **Total 17 Joint Sessions was held so far;**
- **Before 2016, Joint Session was held every two year**
- **From 2017, Joint Session held every year**

Ministry of Economic Affairs and Employment of Finland

中华人民共和国科学技术部
Ministry of Science and Technology of the People's Republic of China

Bilateral S&T Cooperation

------Joint R&D Projects

In last 15 years, Tekes has already support 700+ projects, 200 Millions Euro, for Sino—Finnish R&D Projects.

Tekes

中华人民共和国科学技术部

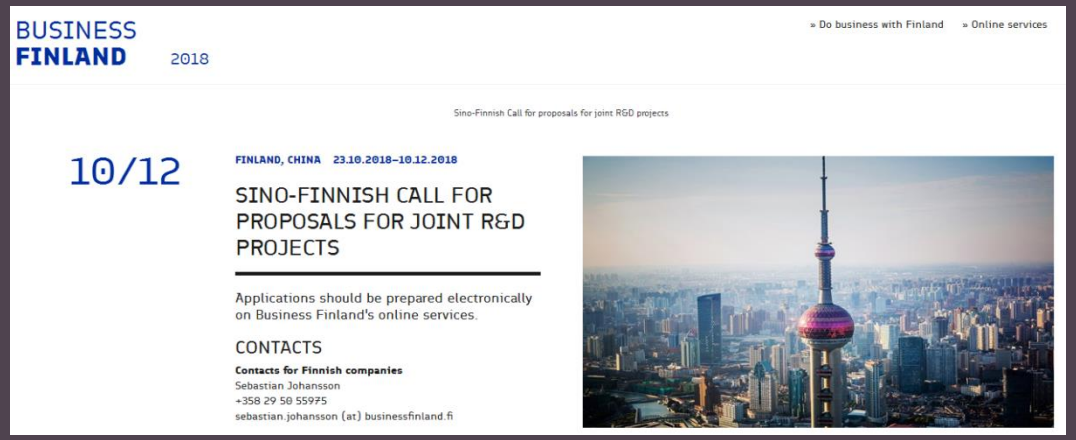
Ministry of Science and Technology of the People's Republic of China

BUSINESS FINLAND

Bilateral S&T Cooperation
------Joint R&D Project s in China

China ---- 国家重点研发计划 “政府间国际科技创新合作重点专项” **Intergovernmental International Science, Technology and Innovation Collaboration Key Project**

Finland ---- SINO-FINNISH JOINT R&D PROJECTS



Priority areas of cooperation during 2018-2020:

1) IoT Factory
2) Medical Science (e.g. Digital Health, Preventive & Predictive Healthcare
3) Smart and Flexible Energy
4) Intelligent Transportation (e.g. Mobility as a Service)

Sino-Finnish Joint R&D Projects Between MoST and Business Finland

- **MoST and Business Finland announce the call for Proposals in same time**
- **China and Finland support their own research Team**
- **Both research Team in China and Finland should apply for same Project**
- Deadline ： 10 December 2018.
- MoST support：20M RMB (2.5M€) for 10 projects.
- Business Finland ：not limited, Typically 100 k€ - 1 M€/ Project (only accepts applications from Finnish companies)
- encourages： academia-industry cooperation, with the potential of commercialization

Bilateral S&T Cooperation
------Joint R&D Projects

both sides have co-funded 31 projects

JSTD has funded about 4 M Euro.

BUSINESS FINLAND

JSTD Jiangsu, China Science and Technology Department

Finland - Jiangsu IRDCP Industrial R&D Cooperation Program 江苏－芬兰产业研发合作计划

浙江省科学技术厅 Science Technology Department of Zhejiang Province

Other Fund opportunity
------Academy of Finland (AF) cooperation with China

- **Active cooperation since the early 1980s with relevant Chinese Organizations:**
  - **------NSFC , Nature Science Foundation of China**
  - **------CAS, Chinese Academy of Sciences**
  - **------CASS, Chinese Academy of Social Sciences**
- **AF supports bilateral mobility activities between the Finnish and Chinese universities.**
- **AF allocates annually EUR 175 K to support researcher mobility to China**

During the last 15 years, AF has supported 54 Chinese-Finnish joint research projects with almost 18 M Euros.

Other Funding opportunity

------China-EU cooperation

China-EU Co-funding Mechanism for Research and Innovation (CFM)

- **Start from 2015.**

- **2015—2020**

Support Up to Euro 28 million

for the China-based entities that participate in joint projects with European partners under Horizon 2020.

Other Funding opportunity
------China-EU cooperaiton

The call seeks applications by China-based full participants in Horizon 2020 Work Programme 2018 proposals addressing nine broad priority areas:

- ✓ new generation information network
- ✓ intelligent and green manufacturing
- ✓ safe, clean and efficient energy
- ✓ advanced, effective, safe and convenient health technologies
- ✓ marine equipment
- ✓ space
- ✓ new materials
- ✓ large research infrastructures
- ✓ public security

Support around 15 projects for a total budget of CNY50 million(€6.3M)

The deadline for submission of pre-applications is 10 December 2018.

Other Funding opportunity
------Funding from **China**

Strategy projects on international scientific and technological cooperation under the National Key R&D Program (NKP)

国家重点研发计划----战略性国际科技创新合作重点专项

priority areas:

Agriculture, energy, information and communication, Resources, environment, ocean, advanced manufacturing, new materials, medical health, disaster prevention and mitigation, Transportation, etc.

Support around 30 projects for a total budget of CNY2400 million(€300M) , average €10M

The deadline for submission of pre-applications is 14 January 2019.

中华人民共和国科学技术部
Ministry of Science and Technology of the People's Republic of China

搜索

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信息名称: 科技部关于发布国家重点研发计划“战略性国际科技创新合作”重点专项2018年度联合研发与示范项目申报指南的通知
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发布机构: 科技部 发文日期: 2018年11月19日
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科技部关于发布国家重点研发计划“战略性国际科技创新合作”重点专项2018年度联合研发与示范项目申报指南的通知

国科发资〔2018〕264号

各省、自治区、直辖市及计划单列市科技厅（委、局），新疆生产建设兵团科技局，国务院各有关部门科技主管司局，各有关单位：

根据国务院印发的《关于深化中央财政科技计划（专项、基金等）管理改革的方案》（国发〔2014〕64号）的总体部署，按照国家重点研发计划组织管理的相关要求，现将战略性国际科技创新合作重点专项2018年度联合研发与示范项目申报指南予以公布。请根据指南要求组织项目申报工作。有关事项通知如下。

Chinese-Finnish Hi-Tech Commercial Cooperation

Investment

≈ $10 Billions

NOKIA

UPM

rethink. storaenso

Tencent 腾讯 SUPERCELL

HUAWEI

PowerVision

ZenRobotics

WÄRTSILÄ

Outotec

AAVI TECHNOLOGIES

RIGHTWARE

KONE

metso Expect results

Alibaba Group 阿里巴巴集团

progman

OKMETIC

Find Partnership in China

If you would like to find Partner in China for:

----Science and Technology search
----Technology Commercialize in China
----investment cooperation
----any other science and Technology cooperation

Science and Technology Section of Chinese Embassy In Finland will circulate your cooperation proposals to all over the China.

Send your proposal to me : science@chinemb.fi

THANK YOU

谢谢

YANG Zhijun

Tel：+358 9 22890 166 (O);　　+358 40 5176488(M)

E-mail: science@chinemb.fi