Technology Map of Thailand 4.0 & Matching Strategy for The Science & Technology Resources in China

แผนที่เทคโนโลยีภายใต้นโยบายประเทศไทย 4.0 และยุทธศาสตร์การจับคู่กับทรัพยากรด้าน วทน. ของจีน

Consulting Project for Ministry Of Science & Technology, Thailand

CAS, PIM
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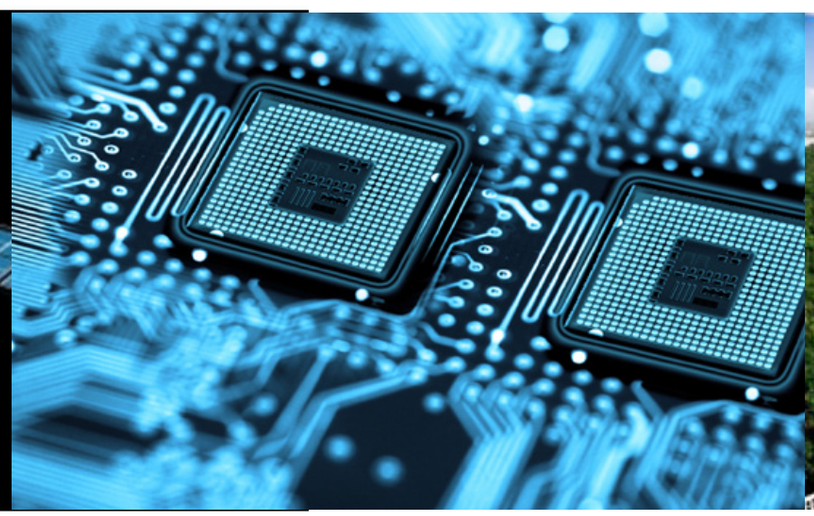



Agenda

1	Research Background
2	Technology Map of Thailand 4.0
3	Framework for Matching Strategy
4	Conclusion

1. Research Background

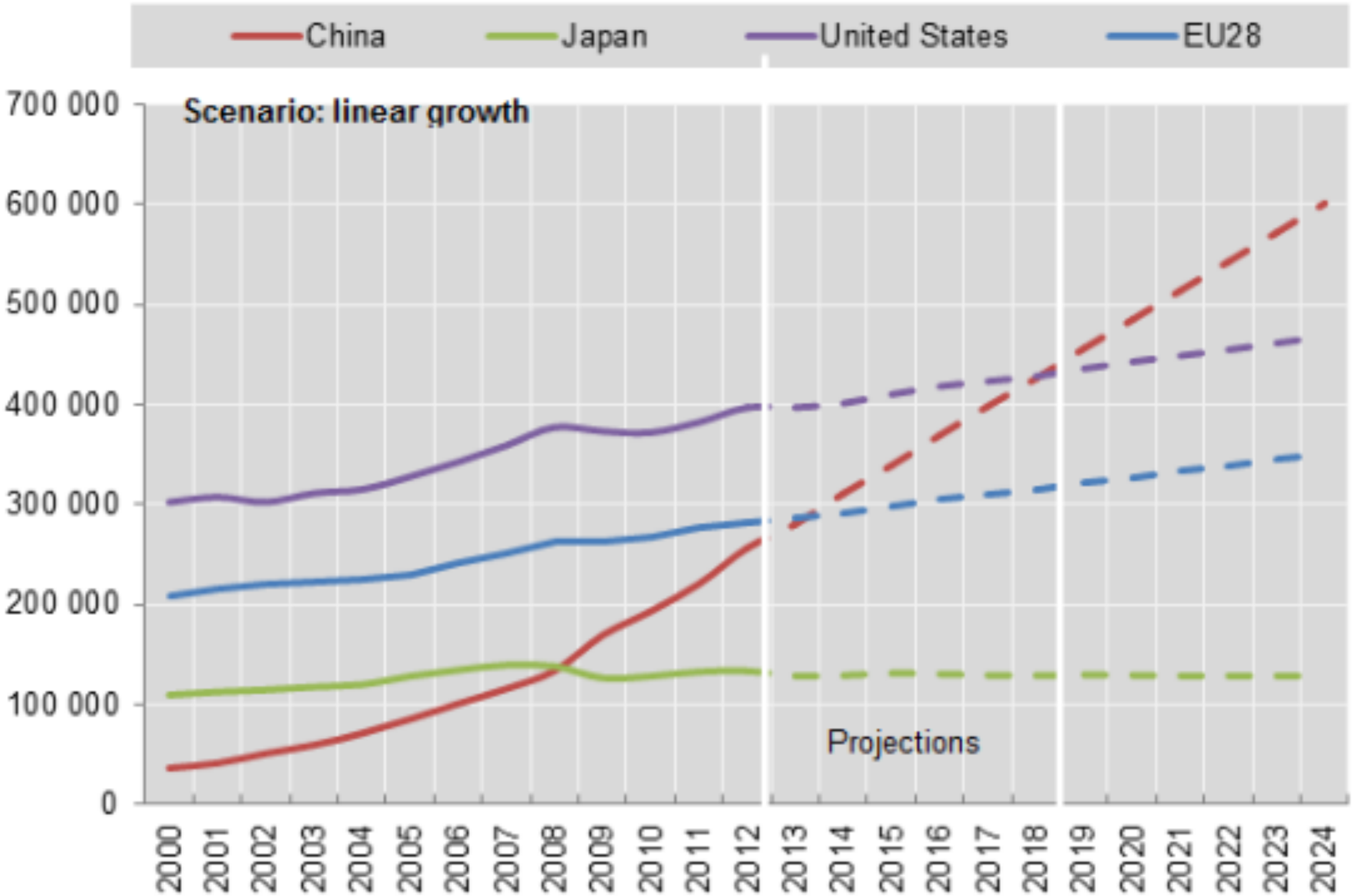
A	Science & Technology in China
B	Thailand 4.0
C	Research Objectives
D	Research Methodology

A. Science & Technology in China

a	R&D Resource of China in the World
b	World Class Achievement & Breakthrough
c	Made in China 2025
d	OBOR Science & Technology Cooperation

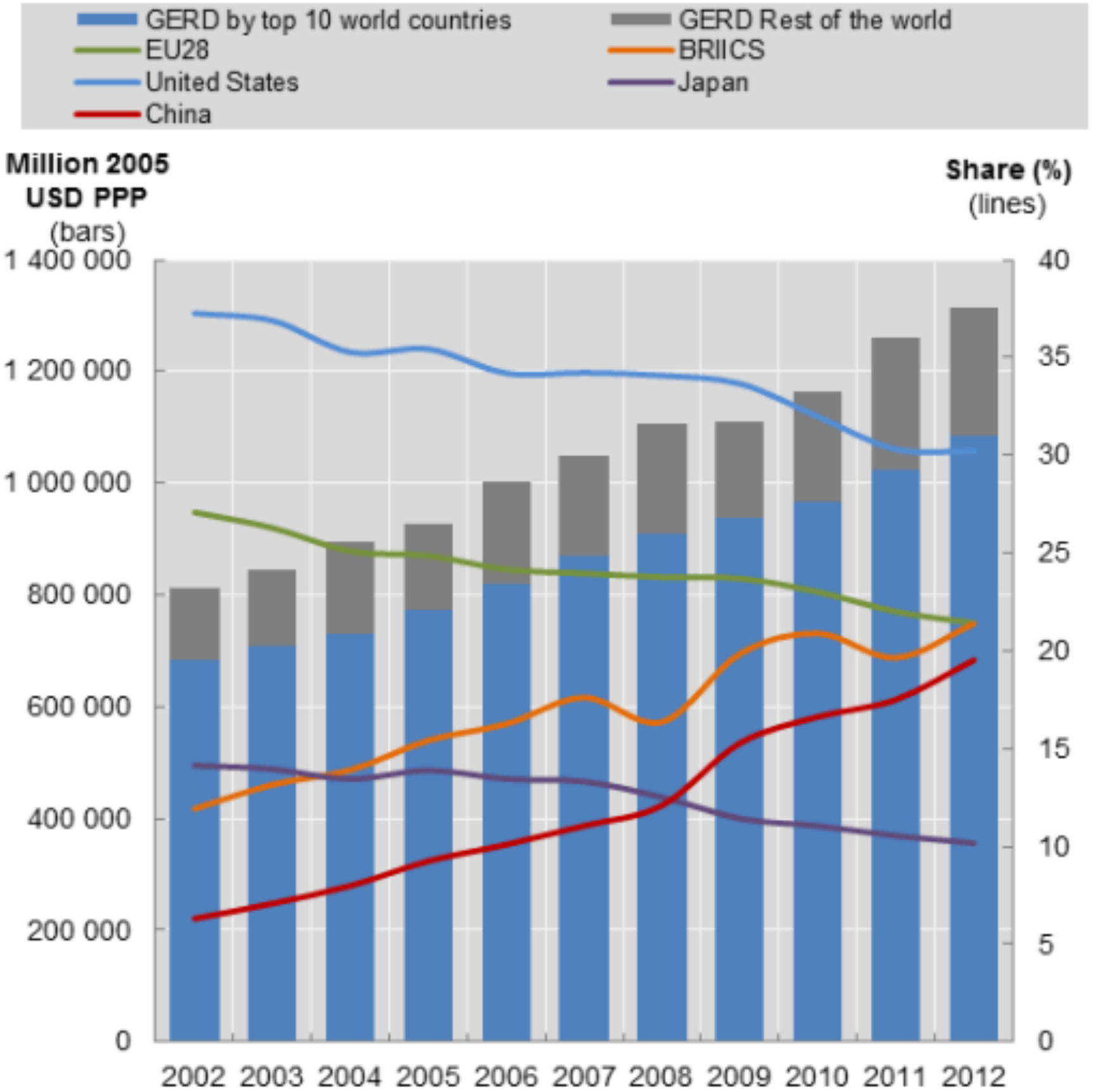
China poised to outpace the US in R&D spending around 2019

GERD, millions of 2005 USD PPP, 2000-12 and projections to 2024



Source: OECD Science, Technology and Industry Outlook 2014

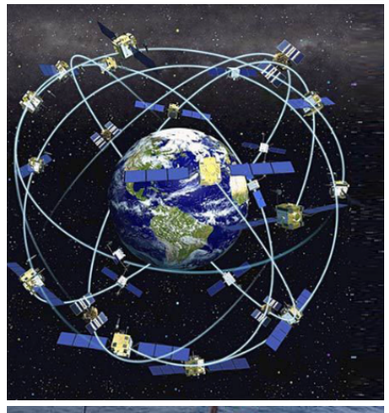
Share of top players in world R&D spending



Share of World R&D	
United States	30%
China	20%
Japan	10%

Source: OECD Science, Technology and Industry Outlook 2014

World Class Achievement in Basic Science (10)	Theory of continental origin of oil 陆相成油理论 Artificially synthesized bovine insulin 人工合成牛胰岛素 Theory of several complex variables 多复变函数论 High temperature superconductivity 高温超导 Neutrino physics 中微子物理 Quantum anomalous Hall effect 量子反常霍尔效应 Nanotechnology 纳米科技 Stem-cell research 干细胞研究 Biomarkers for early diagnosis of cancer 肿瘤早期诊断标志物 Human genome sequencing 人类基因组测序
Breakthrough in Technology & Engineering (13)	Atomic & hydrogen bomb, satellite 两弹一星 Supper hybrid rice 超级杂交水稻 Chinese-character laser phototypesetting 汉字激光照排 High-performance computer 高性能计算机 Three Gorges Project 三峡工程 Manned space flight 载人航天 Lunar exploration 探月工程 Mobile communication 移动通信 Quantum communication 量子通讯 Beidou navigation 北斗导航 Manned deep submergence 载人深潜 High-speed railways 高速铁路 Aircraft carrier 航空母舰



Source：Speech of Xi Jinping on May 30 2016

Made in China 2025

10 priorities sectors identified by the Made in China 2025 plan

1 New advanced IT

2 Numerical control robot

3 Aerospace and aeronautical equipment

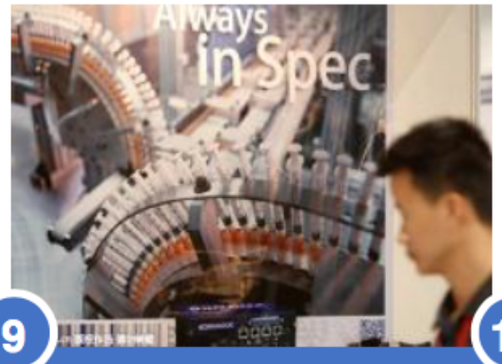
4 Maritime equipment and high-tech shipping

5 Modern rail transport equipment

6 New-energy vehicles and equipment

7 Power equipment

8 New materials



9 Biopharma and advance medical products

10 Agricultural equipment

Source: CKGSB Knowledge, Thaibizchina

OBOR Science & Technology Cooperation

Backgrounds	2016 Sep《推进“一带一路”建设科技创新合作专项规划》issuded by MOST, NDRC, MOFA & MOC
Short term aim (3-5 years)	Exchange and training in China more than 150,000，work in China more than 5,000 Form cooperation plan and MOU with key countries Build platform like joint research center (lab), technology transfer center, technology promotion demonstration bas, science park
Key Task	Communication & exchange: visit, training, commissioner, volunteer, policy coordination Platform & technology transfer: joint lab, technology transfer center, the enology demonstration base Support mega project & resource sharing: railway highway, port, electricity transmission share ST data, literature, equipment and materials ST park for enterprises: HNT park, Innovation demonstration park, agricultural ST park, maritime ST park, environment protection industrial park, green construction material industrial park Joint research: basic research area: high energy physics, biophysics, ecoclimate, astronomical observation, extreme weather, common problems: eco environment, energy security, food security, health, natural disaster, protection of cultural heritage
12 Key areas	Agriculture, energy, transportation, information and communication, resource, environment, maritime, advanced manufacturing, new material, aerospace, medicine & health, disaster prevention & mitigation,

B. Thailand 4.0

Agenda of Thailand 4.0	
a	Prepare Thai People 4.0
b	Industry & Technology For the Future
c	Nurture Enterprise Network For Innovation
d	Increase Competitiveness with 18 groups of provinces & 77 Provinces
e	Integrate ASEAN & Link Thailand to the World

Source: Blueprint Thailand 4.0: Model Towards Wealth, Security and Sustainability

Industry 4.0

First S Curve 5	New S Curve 5
Next-generation Automotive	Robotics
Smart Electronics	Aviation & Logistic
Affluent, Medical & Wellness Tourism	Biofuels and Biochemicals
Agriculture & Biotechnology	Digital
Food for the Future	Medical Hub

Working Committee for Promoting Private Investment 2015: Ten Industries as the New Engine of Growth.

C. Research Objectives

Technology Map	Define the Need of Core Technology in Thailand 4.0
Matching Strategy	Propose a Tool which May Match the Need of Thailand with the Science & Technology Resources in China

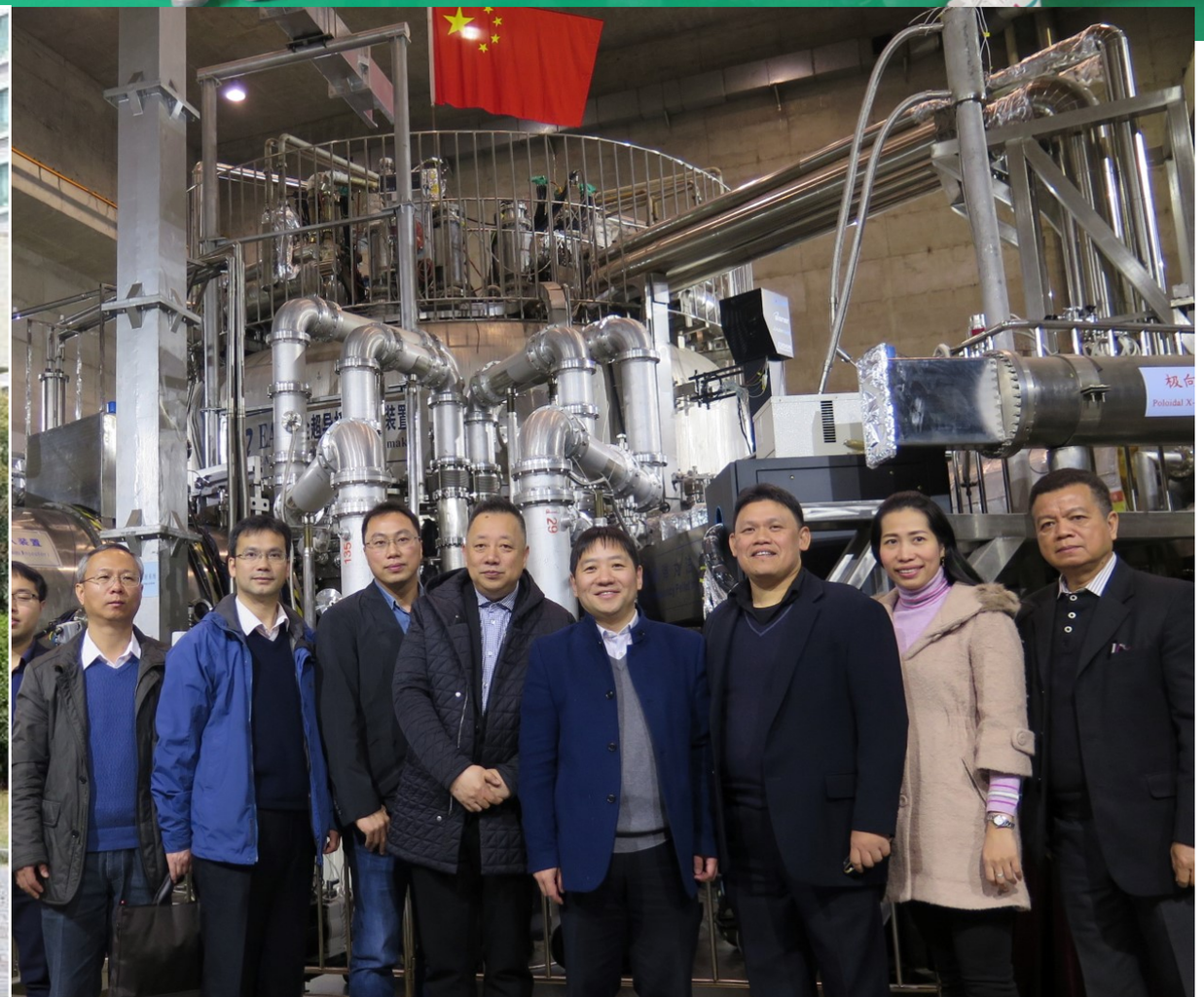
D. Research Questions & Methodology

Research Objective	Desktop	Focused Group	In-depth Interview	Field Observation
Technology Map	What are the Core Technologies of Thailand 4.0? What are the need of Thailand in cooperation with China?			
Matching Strategy	What are potential sector, partner, geographic location and mechanism for science and technology cooperation between Thailand and China?			

Interview in Thailand
National Electric & Electronic Institute (TAT)
Ministry of Public Health (MOPH)
National Food Institute (NFI)
Thai Transportation & Logistics Association (TTLA)
Ministry of Digital Economy & Society (MDES)
The Civil Aviation Authority of Thailand (CAAT)
Ministry of Transportation (MOT)
Thailand Automobile Institute (TAI)
Ministry of Agriculture & Cooperation (MOAC)
Thailand Research Fund (TRF)
Thailand-China Technology Transfer Center (TCTTC)
Tourism Authority of Thailand (TAT)

	Field Trips in China
1	Beijing
2	Shanghai
3	Jiangsu
4	Zhejiang
5	Anhui
6	Shaanxi
7	Shanxi
8	Hebei
9	Shandong
10	Liaoning
11	Hubei
12	Sichuan
13	Chongqing
14	Guangxi
15	Yunnan
16	Guangdong
17	Qinghai
18	Ningxia
19	Gansu


ing of Thai Scientists and Professionals
21st–22nd March 2017
ang University, Hangzhou, China



2. Technology Map of Thailand 4.0

A	5 Clusters of Technology
B	Technology in Focus of 10 Industries
C	Technology Map of Thailand 4.0

A. 5 Clusters of Technology

a	Food & Agriculture with Biotech	Subsector
b	Health & Wellness with Biomedical	Vision
c	Smart Devices & Robotics with Mechatronics	Key Project
d	Digital & IOT with Embedded Technology	Cluster of Technology
e	Creative & Culture & High Value Services	Killer Application

Source: Blueprint Thailand 4.0: Model Towards Wealth, Security and Sustainability

Example: Food & Agriculture with Biotech

Sector	Vision	Key Projects
Agriculture & Biotechnology	Bio technology in agricultural production to increase value added, quality and reduce cost Research base and export of agricultural technology for the region	Agro product champion bank Food Nutritious Fact Genomic Study Seed improvement & GxE studies
Food Processing Industry	Food for special segments in market Automation for production process & QA	Enhance Thai Food Processing Automation Food process technology: e.g. Plasma Special segment (Aged, Diabetes, etc)
Biofuels & Biochemical	Bio technology for raw materials of energy with high efficiency	Agro energy product champion bank

Source: Blueprint Thailand 4.0: Model Towards Wealth, Security and Sustainability

Example: Food & Agriculture with Biotech

Sector	Cluster of Technology	Killer Applications
Agriculture & Biotechnology	Precision Agriculture Digital Agriculture, Data Mining Biophysics Sensors, Genomics Breeding, Vaccine, Test for plant & animal disease, poison Genotype-Phenotype-Microclimate- Nutrition Organic Farming, Post harvest technology Logistic for agriculture	<u>Up Stream</u> Smart Farm & Food Innovation (sugar cane, rice, rubber, palm oil) Exotic crops Traceability & GI Niche Market Functional Food Ingredients <u>Mid Stream</u> Thai Food Ingredient, Thai Food Recipe Production technology to increase quantity, quality and shelf life Post harvest technology (e.g. Bioplastic Bags) Waste & By-Product Utilization <u>Down Stream</u> Analysis & research on market Supply chain & logistic
Food Processing Industry	Plasma Technology, Feed Technology Traceability, Food Processing (e,g, microwave, high Pressure, ohmic) Functional Foods, Fermentation Probiotics & Prebiotics Microbiota / Gut Health Logistic for food	
Biofuels & Biochemical	Bioconversion Smart Packaging , Materials Biopolymer/ Bio-based & Synthetic Materials	

Source: <u>Blueprint Thailand 4.0: Model Towards Wealth, Security and Sustainability</u>

B.Technology in Focus of 10 Industries

First S Curve 5	New S Curve 5
Next-generation Automotive	Robotics
Smart Electronics	Aviation & Logistic
Affluent, Medical & Wellness Tourism	Biofuels and Biochemicals
Agriculture & Biotechnology	Digital
Food for the Future	Medical Hub

Working Committee for Promoting Private Investment 2015: Ten Industries as the New Engine of Growth.

Vision & Technology in Focus

First S Curve 5	Vision & Technology in Focus
Next-generation Automotive ยานยนต์สมัยใหม่	High value activities like design & prototyping Technology for high efficiency and precision EV:,from OEM to battery and electric propelling system World class electronic apparatus & car parts (safety system, transmission system) Production of motorbike (>248 CC), with parts of the motor
Smart Electronics อิเล็กทรอนิกส์อัจฉริยะ	IC with higher complexity Electronic system used in automobile, and other electronic products (e.g. telecom) Design & produce electronic system for smart house & appliance linked with IoT Design & produce wearable electronic equipments (e.g. Fitbits) Design IC with microelectronics, embedded systems, Production of substance and plate for microelectronics

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First S Curve 5	Vision & Technology in Focus
Affluent, Medical & Wellness Tourism การท่องเที่ยวกลุ่มรายได้ดี/เชิงสุขภาพ	Attract middle to high income tourists from Asia Pacific Wellness, Rehabilitation & Medical tourism Thailand as a center for MICE
Agriculture & Biotechnology การเกษตรและเทคโนโลยีชีวภาพ	Advanced agricultural technology: (e.g. sensor, advanced analytics, autonomous system) Biotechnology: (e.g. breed improvement for plant & animal) Advanced technology for QC, packaging and storage of vegetable, fruit, & flower
Food for the Future การแปรรูปอาหาร	Food safety & traceability Research & production of nutrition for health: (Fortified foods, Food with low fat, low energy & low sugar, Food with active & natural ingredients, Medical Food & Food Supplement) Processed food with alternative source of protein (e.g. from plant)

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New S Curve 5	Vision & Technology in Focus
Robotics หุ่นยนต์เพื่อการอุตสาหกรรม	Industrial Robots (Automotive, Plastic & Electronic) Medical & Special Purpose Robots (Underwater)
Aviation & Logistic การบินและโลจิสติกส์	Modern Logistics Service Centers High Value Business with Time-Sensitive Products Aerospace Maintenance, Repair & Overhaul: MRO Manufacture of Aerospace Parts (OEM) Aviation Training Centers

Working Committee for Promoting Private Investment 2015: Ten Industries as the New Engine of Growth.

Atchaka Sibunruang 2015: Thailand Moving Ahead with Cluster Development

New S Curve 5	Vision & Technology in Focus
Biofuels and Biochemicals เพลิงชีวภาพและเคมีชีวภาพ	Second & third generation Biofuels Full cycle Biochemical Industry (by developing midstream industry) Bioplastics towards BioEconomy (agriculture, health, chemical, energy)
Digital ดิจิทัล	Software & Digital content E-commerce (Sell- Buy-Pay-Deliver) & Consumer Insight Analytics Data Centers & Cloud Computing Cyber Security Internet of Things (Smart City) Creative media and animation
Medical Hub แพทย์ครบวงจร	Telemedicine through internet & mobile phone (eHealth & mHealth) Remote health monitoring devices Research & production of Biosimilars of Biologics

Working Committee for Promoting Private Investment 2015: Ten Industries as the New Engine of Growth.

Atchaka Sibunruang 2015: Thailand Moving Ahead with Cluster Development

C. Technology Map of Thailand 4.0

No.	Industry	Code	Key Technology Category
1	A. Next-generation Automotive	A1	Motor driven vehicle (EV & Hybrid) & Battery
2		A2	ADAS (advanced driver assistance system)
3		A3	System for safety, health and energy saving
4	B. Smart Electronics	B1	Electronic components
5		B2	Electronic modules & systems (IoT)
6		B3	Electronic device (embedded technology)
7	C. Affluent, Medical & Wellness Tourism	C1	Tourist Service
8		C2	Destination & Facility
9	D. Agriculture & Biotechnology	D1	Agricultural machinery, equipment, device (precision agriculture)
10		D2	Breeding, Production, Post harvest Management
11		D3	Insect, disease control & waste management
12		D4	Bio-agriculture (gene selection, organic farming)
13	E. Food for the Future	E1	Food Products (ingredients, nutrition, function)
14		E2	Food processing & packaging
15		E3	Food safety, quality & traceability

No.	Industry	Code	Key Technology Category
16	F. Robotics	F1	Industrial, Service, Special Purpose Robot
17		F2	Automation system
18	G. Aviation & Logistic	G1	Aerospace vehicle
19		G2	Aircraft MRO
20		G3	Logistic solution
21		G4	Navigation & Traffic Management
22	H. Biofuels and Biochemicals	H1	Bio fuel
23		H2	Bio Chemistry (biomass, bioplastic etc.)
24	I. Digital	I1	Connection & Platform
25		I2	Software & Solution
26		I3	Digital Contents
27		I4	Data Analytic (AI)
28		I5	Cyber Security
29	J. Medical Hub	J1	Modern Pharmaceuticals & Treatments
30		J2	Traditional Medicine
31		J3	Medical Equipment, Device & Facility

3. Framework for Matching Strategy

A	System of Science & Technology in China
B	Mechanism of Science & Technology in China
C	Output of Science & Technology in China
D	Geography of Science & Technology in China
E	4F Framework for Matching Strategy

A. China's System of Science & Technology

Organizations at National Level
Organizations at Provincial & Local Level
Platforms
Universities, Institutes & Enterprises

National Level	
国家科技教育领导小组 The leading group of national science and education	Cross ministry steering group chaired by PM
科技部 Ministry of Science & Technology (MOST)	Policy making Plan, regulation for S&T in civil area
国家国防科工局 State Administration of S&T & Industry for National Defense (SASTIND)	Policy making Plan, regulation for S&T in national defense & Industry

National Level	
其他部委 Other Ministries & Commissions	Ministry of Education Ministry of industry & Information Ministry of Transport Ministry of Agriculture Ministry of Water Resources State Forestry Administration Ministry of Land & Resources National Health & Family Planning Commission etc.
中国科学院 Chinese Academy of Sciences (CAS)	The highest academic body in science, with 12 local academy & 114 research institutes
中国工程院 Chinese Academy of Engineering	The highest honorary & consulting body of engineering
中国科协 China Association of S&T	Public organization for ST workers

Provincial & Local Level
Government units reporting to MOST, SASTIND, Other Ministries & Commissions, Local academies of CAS

Universities, Institutes & Enterprises
State owned universities, research institutes reporting to MOST, SASTIND, Other Ministries & Commissions, CAS, provincial or local governments
High New Technology SOEs
Private universities Private research institutes High New Technology private enterprises

Platforms
国家重点实验室 State Key Laboratory
国家工程研究中心 State Engineering Research Center
国家工程实验室 State Engineering Laboratory
国家级孵化器 Starte Incubator
国家技术创新战略联盟 State Technology Innovation Alliance
国家高新技术产业开发区 State HNT Industry Development Zone

B. Mechanism of Science & Technology in China

a	National Level S&T Funding
b	National Level S&T Facility
c	National Level Innovative Firms

a. National Level Funding

i	国家自然科学基金 National Natural Science Foundation	NNSF Committee under the State Council	More the 30,000 Projects in 2016
ii	国家科技重大专项 National S&T Major Project	MOST MOF, NDRC related ministry	16 Areas
iii	国家重点研发计划 State Key R&D Plan	MOST MOF, NDRC related ministry	40 category 1073 projects in 2016

Source: MOST 2015: Plan for Deepening Reform the Management of S&T Plan Financed by Central Budget

i.National Natural Science Foundation

Program	Projects
面上项目 General Project	16934
重点项目 Key Project	672
人才项目系列的青年科学基金项目 Youth Science Foundation	16112
地区科学基金项目 Regional Science Foundation	2872
优秀青年科学基金项目 Excellent Youth Science Foundation	400
国家杰出青年科学基金项目 State Distinguished Youth	198
海外及港澳学者合作研究基金项目 Oversea Scholar	135

Source: 国家自然科学基金资助项目统计资料 2016 NNSF 2017 Statistics of National Natural Science Foundation 2016

NNSF: General Project 2016

	Total	Math & Physics	Chemistry	Biology	Earth	Engineering /Material	Information	Management	Medicine
Beijing	3343	385	267	558	443	490	417	150	633
Shanghai	1903	180	181	250	74	220	190	78	730
Jiangsu	1760	149	165	259	190	305	194	73	425
Guangdong	1278	63	102	204	123	120	108	55	503
Hubei	1022	72	69	216	129	177	84	65	210
Zhejiang	862	65	89	174	44	130	100	45	215
Shannxi	825	69	51	120	56	196	143	24	166
Shandong	678	46	72	135	94	103	54	15	159
Lioaning	629	48	86	68	33	169	63	38	124
Hunan	550	49	42	57	29	135	61	31	146
Sichuan	537	58	33	63	50	103	78	33	119
Heilongjiang	507	34	27	78	8	178	76	21	85
Anhui	458	82	64	56	37	75	71	19	54
Tianjin	455	43	64	54	10	106	49	28	101
Fujian	379	29	70	62	45	41	39	22	71

	Total	Math & Physics	Chemistry	Biology	Earth	Engineering /Material	Information	Management	Medicine
Chongqing	378	25	20	60	8	74	30	6	155
Jilin	328	31	62	58	28	70	31	3	45
Henan	271	19	39	56	26	48	22	6	55
Gansu	200	41	24	32	62	23	1	2	15
Hebei	130	7	7	23	9	43	16	3	22
Yunnan	108	17	5	52	11	3	3	1	16
Shanxi	109	18	21	11	1	17	19		22
Jiangxi	47	2	6	9	3	13	2	1	11
Guizhou	42	2	1	4	28	2	1	1	3
Guangxi	44	8	3	6	6	6	5		10
Xinjiang	41	7	4	7	18	2	1		2
Hainan	20			15	3				2
Inner Mongolia	14	1	1	7	1	1	3		
Qinhai	7	1		3	3				
Ningxia	6			1	1	1			3
Xizang	3		1	2					

Source: 国家自然科学基金资助项目统计资料 2016 NNSF 2017 Statistics of National Natural Science Foundation 2016

ii National S&T Major Project

1	核高基,	Core Electronic Devices, High-end Generic Chips, Basic Software
2	大规模集成电路装备	Super Large-scale Integrated Circuit Manufacturing Equipment Technology
3	宽带移动通信	Broadband Mobile Telecommunication
4	数控机床	Numerically Controlled Machine Tools
5	油气开发	Large Oil-Gas Fields & Coal-bed Methane
6	大型先进压水堆及高温气冷堆核电站	Pressurized Water Reactors and High Temperature Gas-coolant Reactor Nuclear Power Stations
7	水体污染治理	Water Contamination Treatment
8	转基因	Genetically Modified Varieties
9	新药创制	New Drugs Discovery
10	传染病防治	Prevention and Treatment of Infectious Diseases
11	大型飞机	Large Passenger Aircrafts
12	高分辨率对地观测系统	High Resolution Earth Observation Systems
13	载人航天探月工程	Manned Space Flights & Moon Probe
14	惯性约束聚变点火工程	Inertial Confinement Fusion Ignition
15	新一代卫星导航(北斗)	Satellite Navigation (Bei Dou)
16	高超声速飞行器	Hypersonic Vehicle

核高基: 核心电子器件, 高端通用芯片, 基础软件

Source: 《国家中长期科学和技术发展规划纲要（2006-2020年）》State Council: National ST Long & Medium Term Development Plan 2006-2020

1	Core Electronic Devices, High-end Generic Chips, Basic Software	中科院计算技术研究所	Institute of Computing Technology, CAS	北京 Beijing	Beijing
		国防科技大学计算机学院	School of Computer National University of Defense Technology	长沙 Changsha	Hunan
		江南计算技术研究所	Jiangnan Computing Technology Research Institute	无锡 Wuxi	Jiangsu
		国家高性能集成电路（上海）设计中心	National High Performance Shanghai IC Design Center	上海 Shanghai	Shanghai
		上海兆芯集成电路	Shanghai Zhaoxin Semiconductor	上海 Shanghai	Shanghai
		龙芯中科	Loongson	北京 Beijing	Beijing
		天津飞腾信息技术	Phytium	天津 Tianjin	Tianjin
		深圳海思半导体	Shenzhen Hisilicon	深圳 Shenzhen	Guangdong
		上海中标软件	China Standard Software	上海 Shanghai	Shanghai
		中科方德	Zhongke Fangde	北京 Beijing	Beijing
		用友软件	Yonyou Software	北京 Beijing	Beijing
2	Super Large-scale Integrated Circuit Manufacturing Equipment Technology	中科院微电子所	Institute of Microelectronics, CAS	北京 Beijing	Beijing
		中科院上海微系统与信息技术研究所	Shanghai Institute of Microsystem & Information Technology., CAS	上海 Shanghai	Shanghai
		中芯国际	Semiconductor Manufacturing International Corporation	上海 Shanghai	Shanghai
		武汉新芯	Wuhan Xinxin Semiconductor Manufacturing	武汉 Wuhan	Hubei
		北方微电子	North Microelectronics	北京 Beijing	Beijing
		上海微电子装备	Shanghai Microelectronics Equipment	上海 Shanghai	Shanghai
		江苏长电科技	Jiangsu Changjiang Electronics Technology	江阴 Jiangyin	Jiangsu
		沈阳拓荆科技	Piotech	沈阳 Shenyang	Liaoning
		沈阳富创精密设备	Shenyang Fortune Precision Equipment	沈阳 Shenyang	Liaoning

3	Broadband Mobile Telecommunication	大唐电信科技产业	Datang Telecom Technology & Industry	北京 Beijing	Beijing
		中国普天信息产业集团	Potevio	北京 Beijing	Beijing
		华为	Huawei	深圳 Shenzhen	Guangdong
		中兴通讯	ZTE	深圳 Shenzhen	Guangdong
		中国移动研究院	China Mobile Research Institute;	北京 Beijing	Beijing
4	Numerically Controlled Machine Tools	机械科学研究总院	China Academy of Machinery Science and Technology	北京 Beijing	Beijing
		中国重型机械研究院	China National Heavy Machinery Research Institute	西安 Xian	Shannxi
		中国兵器北方重工	Northern Heavy Industries	沈阳 Shenyang	Liaoning
		沈阳机床集团	Shenyang Machinetool Group	沈阳 Shenyang	Liaoning
		中国第一重型机械集团	China first heavy industries	富拉尔基 Fulaerji	Heilongjiang
		中国第二重型机械集团	China National Erzhong Grou	德阳 Deyang	Sichuan
		齐重数控装备	Qiqihar Heavy CNC Equipment	齐齐哈尔 Qiqihar	Heilongjiang
		陕西秦川机械	Qinchuan Machinery Development	宝鸡 Baoji	Shannxi
		四川普什宁江机床	Sichuan Push Ningiang Machine Tool	都江堰市 Dujiangyan	Sichuan
		华中数控	Wuhan Huazhong Numerical Control	武汉 Wuhan	Hubei
		济南二机床集团	Jier Machine Tool Group	济南 Jinan	Shandong

5	Large Oil-Gas Fields & Coal-bed Methane	中科院 地质与地球物理研究所	Institute of Geology & Geophysics, CAS	北京 Beijing	Beijing
		中国石油天然气集团公司	China National Petroleum Corporation （CNPC）	北京 Beijing	Beijing
		中国石油化工	SINOPEC	北京 Beijing	Beijing
		中国海洋石油	China National Offshore Oil	北京 Beijing	Beijing
		中国石油大学	China University of Petroleum, Beijing	北京 Beijing	Beijing
		中联煤层气	China United Coalbed Methane	北京 Beijing	Beijing
		中煤科工集团	China Coal Technology Engineering Group	北京 Beijing	Beijing
6	Pressurized Water Reactors and High Temperature Gas-coolant Reactor Nuclear Power Stations	国家核电技术公司	State Nuclear Power Technology Corporation	北京 Beijing	Beijing
		清华大学 核能与新能源技术研究院	Institute of Nuclear and New Energy Technology Tsinghua University	北京 Beijing	Beijing
		上海核工程研究设计院	Shanghai Nuclear Engineering Research & Design Institute	上海 Shanghai	Shanghai
		山东海阳核电站	Shandong Haiyang Nuclear Power Station	烟台 Yantai	Shandong
		浙江三门核电站	Zhejiang Sanmen Nuclear Power Station	台州 Taizhou	Zhejiang
		华能山东石岛湾核电	Huaneng Shandong Shidaowan Nuclear Power	荣成 Rongcheng	Shandong
		中国广核集团	China General Nuclear Power Group	深圳 Shenzhen	Guangdong
		上海电气核电设备有限公司	Shanghai Electric & Nuclear Power	上海 Shanghai	Shanghai

7	Water Contamination Treatment	中国环境科学研究院	Chinese Research Academy of Environmental Sciences	北京 Beijing	Beijing
		中国科学院 水生生物研究所	Institute of Hydrobiology, CAS	武汉 Wuhan	Hubei
		中国科学院 南京地理与湖泊研究所	Nanjing Institute of Geography & Limnology, CAS	南京 Nanjing	Jiangsu
		环保部华南环科所	South China Institute of Environmental Sciences	广州 Guangzhou	Guangdong
8	Genetically Modified Varieties	中国农业科学院 棉花研究所	Institute of Cotton Research, CAAS	安阳 Anyang	Henan
		中国农业科学院 生物技术研究所	Biotechnology Research Institute ,CAAS	北京 Beijing	Beijing
		中科院微生物研究所	Institute of Microbiology, CAS	北京 Beijing	Beijing
		北京市农林科学院	Beijing Academy of Agriculture and Forestry Sciences	北京 Beijing	Beijing
		内蒙古农业大学 动物生物技术重点实验室	Inner Mongolia Agricultural University	呼和浩特 Huhehaote	Inner Mongolia
		吉林省农业科学院 农业生物技术研究所	Agro-Biotechnology Research Institute Jilin Academy of Agricultural Sciences	长春 Changchun	Jilin
		浙江大学 农业与生物技术学院	College of Agriculture & Biotechnology Zhejiang University	杭州 Hangzhou	Zhejiang
		华中农业大学	Huazhong Agricultural University	武汉 Wuhan	Hubei
		创世纪种业有限公司	Genesis Seed （bio-t）	深圳 Shenzhen	Guangdong

9 New Drugs Discovery	中国医学科学院药物研究所	Institute of Materia Medica, CAMS	北京 Beijing	Beijing
	中国医学科学院医学生物学研究所	Institute of Medical Biology, CAMS	昆明 Kunming	Yunnan
	军事医学科学院	Academy of Military Medical Sciences	北京 Beijing	Beijing
	中国人民解放军第三军医大学	Third Military Medical University	重庆 Chongqing	Sichuan
	中国中医科学院	Chinese Academy of Chinese Medical Sciences	北京 Beijing	Beijing
	北京大学药学院	Peking University School of Pharmaceutical Sciences	北京 Beijing	Beijing
	中国医药集团	Sinopharm	北京 Beijing	Beijing
	天津药物研究院	Tianjin Institute of Pharmaceutical Research	天津 Tianjin	Tianjin
	天津国际生物医药联合研究院	Tianjin International Joint Academy of Biomedicine	天津 Tianjin	Tianjin
	天津天士力	TASLY	天津 Tianjin	Tianjin
	华北制药	North China Pharmaceutical	石家庄 Shijiazhuang	Hebei
	石药集团	CSPC Pharma	石家庄 Shijiazhuang	Hebei
	中国科学院上海药物研究所	Shanghai Institute of Materia Medica, CAS	上海 Shanghai	Shanghai
	上海医药	Shanghai Pharma	上海 Shanghai	Shanghai
	上海复旦张江生物医药	Fudan Zhangjiang	上海 Shanghai	Shanghai
	前沿生物(南京)	Frontier Biotechnology (Nanjing)	南京 Nanjing	Jiangsu
	江苏恒瑞医药	Jiangsu Heng Rui Medicine	连云港 Lianyungang	Jiangsu
	江苏豪森药业	Hansoh Pharma	连云港 Lianyungang	Jiangsu
	浙江医药	Zhejiang Medicine	绍兴 Shaoxing	Zhejiang
	浙江贝达药业	Betta Pharmaceuticals	杭州 Hangzhou	Zhejiang
	杭州艾森医药研究有限公司	ACEA Biosciences	杭州 Hangzhou	Zhejiang
	成都康弘生物科技有限公司	Kanghong Pharmaceutical	成都 Chengdu	Sichuan
	厦门特宝生物工程股份有限公司	Amoytop Biotech	厦门 Xiamen	Fujian
	荣昌生物制药	RemeGen	烟台 Yantai	Shandong
	青岛杰华生物集团	Genova	青岛 Qingdao	Shandong

10	Prevention and Treatment of Infectious Diseases	中国疾病预防控制中心	Chinese Center for Disease Control & Prevention	北京 Beijing	Beijing
		军事医学科学院 生物工程研究所	Bioengineer Research Institute Academy of Military Medical Sciences	北京 Beijing	Beijing
		国药中生 北京生物制品研究所	National Vaccine and Serum Institute China Biotec, Sinopharm	北京 Beijing	Beijing
		中国科学院 上海巴斯德研究所	Institut Pasteur of Shanghai, CAS	上海 Shanghai	Shanghai
11	Large Passenger Aircrafts	中国商用飞机公司 上海飞机设计研究所	Shanghai Aircraft Design & Research Institute Commercial Aircraft Corporation of China	上海 Shanghai	Shanghai
		中航工业成飞	AVIC Chengdu Aircraft Industry	成都 Chengdu	Sichuan
		中航工业洪都	AVIC Hongdu Aviation Industry	南昌 Nanchang	Jiangxi
		中航工业沈飞民用	AVIC SAC Commercial Aircraft	沈阳 Shenyang	Liaoning
		中航工业西飞	AVIC Xi'an Aircraft Industry	西安 Xian	Shannxi
12	High Resolution Earth Observation Systems	中国科学院遥感地球所	Institute of Remote Sensing and Digital Earth	北京 Beijing	Beijing

13	Manned Space Flights & Moon Probe	中国航天员科研训练中心	Astronaut Center of China	北京 Beijing	Beijing
		中科院空间应用与工程应用中心	Technology and Engineering Center for Space Utilization (CSU)	北京 Beijing	Beijing
		北京测控通信技术研究所	Beijing Institute of Tracking & Communication Technology	北京 Beijing	Beijing
		中国空间技术研究院 (中国航天科技集团公司五院)	China Academy of Space Technology	北京 Beijing	Beijing
		中国运载火箭技术研究院 (中国航天科技集团公司第一研究院)	China Academy of Launch Vehicle Technology	北京 Beijing	Beijing
		中国酒泉卫星发射中心	Jiuquan Satellite Launch Centre	酒泉 Jiuquan	Gansu
		中国文昌航天发射中心	Wenchang Satellite Launch Center	文昌 Wenchang	Hainan
		中国西安卫星测控中心	China Xi'an Satellite Control Center	西安 Xian	Shannxi
14	Inertial Confinement Fusion Ignition	中国工程物理研究院	China Academy of Engineering Physics	绵阳 Mianyang	Sichuan
15	Satellite Navigation (Bei Dou)	地基增强：兵器工业集团	China North Industries Group Corporation	北京 Beijing	Beijing
		卫星：中国空间技术研究院 (中国航天科技集团公司五院)	China Academy of Space Technology	北京 Beijing	Beijing
16	Hypersonic Vehicle	中国运载火箭技术研究院 (中国航天科技集团公司第一研究院)	China Academy of Launch Vehicle Technology	北京 Beijing	Beijing
		中科院力学所	Institute of Mechanics, CAS	北京 Beijing	Beijing

ii. State Key R&D Plan

Agriculture	**化学肥料和农药减施增效综合技术研发**	Reduction Usage & Higher Effectiveness of Chemical Fertilizer
	七大农作物育种	Breeding of 7 Agricultural Plants
	智能农机装备	Smart Agricultural Equipment
	林业资源培育及高效利用技术创新	Usage & Cultivation of Forestry Resources
	畜禽重大疫病防控与高效安全养殖综合技术研发	Livestock and Poultry Husbandry & Disease Control
	粮食丰产增效科技创新	High Yield Grain Production
	农业面源和重金属污染农田综合防治与修复技术研发	Non-point Source & Heavy Metal Pollution of Farmland
Automobile	**新能源汽车**	New Energy Car
Biology	**生物安全关键技术研发**	Biosecurity
	蛋白质机器与生命过程调控	Protein Machine & Life Process
Construction	**绿色建筑及建筑工业化**	Green Construction & Industrialization of Construction
Digital	**网络空间安全**	Network Security
	高性能计算	High Performance Computation
	云计算和大数据	Cloud Computing & Big Data
Energy	**智能电网技术与装备**	Smart Power Grid
	煤炭清洁高效利用和新型节能技术	Clean Coal & Energy Saving
Environment	**典型脆弱生态修复与保护研究**	Fragile Ecosystem Restoration & Protection
	海洋环境安全保障	Ocean Environment Protection
	大气污染成因与控制技术研究	Cause & Control of Air Pollution
	全球变化及应对	Global Change

Food	**现代食品加工及粮食收储运技术与装备**	Food Processing & Grain Storage & Transportation
Machinery	**重大科学仪器设备开发**	Scientific Instrument & Equipment
	大科学装置前沿研究	Mega-science Equipment
Material	**材料基因工程关键技术与支撑平台**	Materials Genome
	重点基础材料技术提升与产业化	Basic Material
	战略性先进电子材料	Strategic Advanced Electronic Material
	增材制造与激光制造	Additive Manufacturing & Laser Manufacturing
	纳米科技	Nanotechnology
Medicine	**生物医用材料研发与组织器官修复替代**	Bio Medical Materials and Human Organ Repair & Substitution
	生殖健康及重大出生缺陷防控研究	Reproductive Health & Birth Defects
	干细胞及转化研究	Stem Cell & Its Transformation
	精准医学研究	Precision Medicine
	数字诊疗装备研发	Digital Medical Equipment
	重大非传染慢性疾病防控研究	Noninfectious Chronic Disease
Physics	**量子调控与量子信息**	Quantum Control & Quantum Information
Public Security	**公共安全风险防控与应急技术装备**	Risk Control & Emergency Response for Public Security
Quality Control	**国家质量基础的共性技术研究与应用**	Foundation Technology for Quality Control
Resource	**水资源高效开发利用**	Water Resource Development & Utilization
	深海关键技术与装备	Deep Sea Technology & Equipment
	深地资源勘查开采	Deep Earth Resource Prospecting & Mining
Space	**地球观测与导航**	Erath Observation & Navigation
Transportation	**先进轨道交通**	Advanced Rail Transportation

Source: MOST

State Key R&D Plan 2016

重点专项	Area	Proje
材料基因工程关键技术与支撑平台	Materials Genome	14
网络空间安全	Network Security	8
智能电网技术与装备	Smart Power Grid	19
新能源汽车	New Energy Car	19
重点基础材料技术提升与产业化	Basic Material	39
战略性先进电子材料	Strategic Advanced Electronic Material	27
高性能计算	High Performance Computation	19
地球观测与导航	Erath Observation & Navigation	26
煤炭清洁高效利用和新型节能技术	Clean Coal & Energy Saving	17
云计算和大数据	Cloud Computing & Big Data	15
增材制造与激光制造	Additive Manufacturing & Laser Manufacturing	27
先进轨道交通	Advanced Rail Transportation	6
重大科学仪器设备开发	Scientific Instrument	40
化学肥料和农药减施增效综合技术研发	Reduction Usage & Higher Effectiveness of Chemical Fertilizer	13
现代食品加工及粮食收储运技术与装备	Food Processing & Grain Storage & Transportation	16
七大农作物育种	Breeding of 7 Agricultural Plants	21
智能农机装备	Smart Agricultural Equipment	21
林业资源培育及高效利用技术创新	Usage & Cultivation of Forestry Resources	9
畜禽重大疫病防控与高效安全养殖综合技术研发	Livestock and Poultry Husbandry & Disease Control	16

State Key R&D Plan 2016

重点专项	Area	Project
生物医用材料研发与组织器官修复替代	Bio Medical Materials and Human Organ Repair & Substitution	31
生物安全关键技术研发	Biosecurity	23
国家质量基础的共性技术研究与应用	Foundation Technology for Quality Control	45
水资源高效开发利用	Water Resource Development & Utilization	31
典型脆弱生态修复与保护研究	Fragile Ecosystem Restoration & Protection	37
深海关键技术与装备	Deep Sea Technology & Equipment	41
深地资源勘查开采	Deep Earth Resource Prospecting & Mining	11
绿色建筑及建筑工业化	Green Construction & Industrialization of Construction	21
公共安全风险防控与应急技术装备	Risk Control & Emergency Response for Public Security	32
大气污染成因与控制技术研究	Cause & Control of Air Pollution	93
纳米科技	Nanotechnology	43
大科学装置前沿研究	Mega-science Equipment	19
量子调控与量子信息	Quantum Control & Quantum Information	28
蛋白质机器与生命过程调控	Protein Machine & Life Process	33
生殖健康及重大出生缺陷防控研究	Reproductive Health & Birth Defects	9
全球变化及应对	Global Change	29
干细胞及转化研究	Stem Cell & Its Transformation	25
粮食丰产增效科技创新	High Yield Grain Production	9
农业面源和重金属污染农田综合防治与修复技术研发	Non-point Source & Heavy Metal Pollution for Farmland	11
精准医学研究	Precision Medicine	61
数字诊疗装备研发	Digital Medical Equipment	69

b.National Level Facility

i	State Key Laboratory 国家重点实验室	MOST, MOE, MIIT, CAS	401 labs
ii	National Engineering & Technology Research Center 国家工程技术研究中心	MOST	346 centers
iii	Sate Engineering Laboratory 国家工程实验室	NDRC	167 labs
iv	National Engineering Research Center 国家工程研究中心	NDRC	101 centers
v	National Defense Science & Technology Key Laboratory 国防科技重点实验室	SASTIND GADPLA	59 labs
vi	National Science & Technology Infrastructure Platform 科技基础条件平台	MOST, MOF	6 categories

SASTIND: State Administration for ST & Industry for National Defense GADPLA: General Armament Department, PLA

vi. National Science & Technology Infrastructure Platform

Research Lab	研究实验基地
Instrument	大型科学仪器设备
Natural Science Resource	自然科技资源
Science Data	科学数据
Science & Technology Literature	科技文献
Computer Network	网络科技环境

Source: China e-Science Platform

Science Data Resources in China

Area	Resource	Institution	Authority	Place
Physics	High Energy Physics	Institute of High Energy Physics	CAS	Beijing
	Nuclear Science	China Institute of Atomic Energy	SASAC	Beijing
Chemitry	Engineer Chemistry	Institute of Process Engineering	CAS	Beijing
	Organic Chemistry	Shanghai Institute of Organic Chemistry	CAS	Shanghai
	Applied Chemistry	Changchun Institute of Applied Chemistry	CAS	Jilin
Astronomy	Astronomy	National Astronomical Observatories	CAS	Beijing
	Space Science	National Space Science Center	CAS	Beijing
Geography	Surveying & Mapping	National Geomatics Center of China	NASMG	Beijing
	Land Surface Resource	Institute of Geographic Science & Natural Resource Research	CAS	Beijing
	Lake & Basin	Nanjing Institute of Geography & Limonogy	CAS	Jiangsu
	Tibetan Plateau	Institute of Tibetan Plateau Research	CAS	Beijing
	Cold & Arid Region	Northwest Institute of Eco Environment & Resources	CAS	Gansu
	Loess Plateau	Institute of Soil & Water Conservation	CAS	Shannxi

SASAC: State-owned Assets Supervision and Administration Commission of the State Council
NASMG: National Administration of Surveying, Mapping & Geoinformation

Source: Center for National S&T Basic Platform 2016 ; Report on National Science Data Resource 2016

Science Data Resources in China

Area	Resource	Institution	Authority	Place
Geography	North East Black Soil	NE Institute of Geography & Agroecology	CAS	Jilin
	Polar Region	Polar Research Institute of China	SOA	Shanghai
	Meteorology	National Meteorological Information Center	CMA	Beijing
	Seismic Science	China Earthquake Network Center	CEA	Beijing
	Oceanography	National Marine Information Center	SOA	Tianjin
	Environment	China National Environmental Monitoring Center	MOEP	Beijing
	Earth Observation	Institute of Remote Sensing and Digital Earth	CAS	Beijing
Agriculture	Agriculture	Agricultural Information Institute, CAAS	MOA	Beijing
	Forestry	Institute of Forest Resource Information Technique	SAF	Beijing
Medicine	Basic Medicine	Institute of Basic Medical Sciences, CAMS	NHFPC	Beijing
	Genomics	Beijing Institute of Genomics	CAS	Beijing
	Genomics	BGI	-	Guangdong
	Proteomics	Academy of Military Medical Sciences	CMC	Beijing

SOA:State Oceanic Administration; CMA:China Meteorological Administration; CEA China Earthquake Administration
MOEP: Ministry of Environmental Protection; MOA: Ministry of Agriculture; SAF: State Administration of Forestry
NHFPC: National Health & Family Planning Commission, CMC: Central Military Commission

Science Data Resources in China

Area	Resource	Institution	Authority	Place
Medicine	Bioinformatics	Center for Bioinformatics, Peking University	MOE	Beijing
	Clinical Medicine	General Hospital of PLA	CMC	Beijing
	Public Health	China Center for Disease Control & Prevention	NHFPC	Beijing
	Traditional Medicine	China Academy of Chinese Medical Sciences	SATCM	Beijing
	Phamaseuticals	Institute of Materia Medica, CAMS	NHFPC	Beijing
	Reproduction	Institute of Science & Technology, NHFPC	NHFPC	Beijing
Material	Ferrous metal	University of Science & Technology Beijing	MOE	Beijing
	Non Ferrous metal	Institute of Metal Research	CAS	Liaoning
Transportation	Transportation	Research Institute of MOT	MOT	Beijing
Machinery	Machine Building	China Academy of Machinery S&T	SASAC	Beijing
	Instruments & Apparatuses	Instrumentation Technology & Economy Institute	SASAC	Beijing
	Foundry	Shenyang Research Institute of Foundry, CAMST	SASAC	Liaoning

MOE: Ministry of Education, CMC: Central Military Commission, NHFPC: National Health & Family Planning Commission
SATCM State Administration of Traditional Chinese Medicine, MOT: Ministry of Transportation
SASAC: State-owned Assets Supervision and Administration Commission of the State Council

c.National Firms of Innovation

i	Technology Innovation Demonstration Enterprise 技术创新示范企业	MIIT，MOF	283 from 2011 to 2016
ii	National Innovative Enterprises 国家级创新企业	MOST, SASAC ACFTU	356 for first 3 batches 207 for the latest 2 batches in probation

MIIT: Ministry of Industry & Information Technology, MOF: Ministry of Finance
SASAC: State Owned Assets Supervision & Administration Commission ACFTU： All-China Federation of Trade Union

C. Output of Science & Technology in China

a	State S&T Awards
b	ST Plan Achievement
c	Commercialization Achievement
d	SCI Citation & Patents

a. State S&T Awards

State S&T Awards	Focus
State Supreme ST Award 国家最高科学技术奖	Most esteemed
State Natural Science Award 国家自然科学奖	Basic research and its applications.
State Technological Innovation Award 国家技术发明奖;	Important inventions
State S&T Advancement Award 国家科学技术进步奖	Projects crucial to society
International S&T Cooperation Award 国际科学技术合作奖	Foreigners or international organizations

State S&T Awards

国家科学技术奖励工作办公室
National Office for Science & Technology Awards

首 页 | 组织机构 | 政策法规 | 新闻中心 | 通知公告 | 国家科技奖励
社会科技奖励 | 国外科技奖励 | 科技成果管理 | 奖励论坛 | 网上培训 | 下载中心

国家最高科学技术奖
国家自然科学奖
奖励介绍
获奖项目名单
国家技术发明奖
国家科学技术进步奖
国际科学技术合作奖

获奖项目名单

- 2000年度
- 2001年度
- 2002年度
- 2003年度
- 2004年度
- 2005年度
- 2006年度
- 2007年度
- 2008年度
- 2009年度
- 2010年度
- 2011年度
- 2012年度
- 2013年度
- 2014年度
- 2015年度

2015年度国家自然科学奖获奖项目目录

一等奖

序号	编号	项目名称	主要完成人	推荐单位
1	Z-102-1-01	多光子纠缠及干涉度量	潘建伟(中国科学技术大学)，彭承志(中国科学技术大学)，陈宇翱(中国科学技术大学)，陆朝阳(中国科学技术大学)，陈增兵(中国科学技术大学)	安徽省、中国科学院

二等奖

序号	编号	项目名称	主要完成人	推荐单位/推荐专家
1	Z-101-2-01	资产定价理论中的非线性期望方法	陈增敬(山东大学)	郭柏灵，陈木法，彭实戈
2	Z-101-2-02	自正则化极限理论和斯坦因方法	邵启满(香港科技大学)，荆炳义(香港科技大学)	香港特别行政区
3	Z-102-2-01	真空紫外激光角分辨光电子能谱对高温超导机	周兴江(中国科学院物理研究所)，	中国科学院

Leading S&T listed in Subject Areas

b. ST Plan Achievement

国家科技报告服务系统
National Science and Technology Report Service

报告导航 | 工作动态 | 标准规范 | 学习培训 | 收录证书 | 阅点领取 | 专题服务 | 政策解读

按来源 | 按学科 | 按地域 | 按类型

- 全部学科
  - 管理科学(436)
  - 自然科学总论(297)
  - 数理科学和化学(3739)
  - 天文学、地球科学(2299)
  - 生物科学(7646)
  - 医药、卫生(6255)
  - 农业科学(2781)
  - 一般工业技术(3963)
  - 矿业工程(557)
  - 石油、天然气工业(592)
  - 冶金工业(265)
  - 金属学与金属工艺(7466)
  - 机械、仪表工业(2108)
  - 武器工业(641)
  - 能源与动力工程(600)
  - 原子能技术(237)
  - 电工技术(1582)
  - 无线电电子学、电信技术(2431)
  - 自动化技术、计算机技术(3383)
  - 化学工业(2105)
  - 轻工业、手工业(3649)
  - 建筑科学(1240)
  - 水利工程(241)
  - 交通运输(1373)
  - 航空、航天(160)
  - 环境科学、安全科学(1748)

农业科学的报告共2780条，当前第 1 页，共 278 页

编号	报告名称	作者	第一作者单位	立项年
1	一种高密度SNP分型芯片在水稻生物学和分子育种中的应用	陈浩东等	北京大学	2014
2	水稻生物技术商业化育种技术研究与示范	陈美容	中国种子集团有限公司	2014

Leading S&T in S&T Plan Listed in Subject Areas

c. Commercialization Achievement

S&T Commercialization Projects Listed in Industrial Sectors

D. Geography of Science & Technology in China

a	Provincial Units in Mailand China
b	S&T Advancement & Innovation Capability
c	New Technology Zone & Innovation Area

a. Provincial Units in Mailand China

1	Anhui	Province
2	Beijing	Municipality
3	Chongqing	Municipality
4	Fujian	Province
5	Gansu	Province
6	Guangdong	Province
7	Guangxi	Autonomous Region
8	Guizhou	Province
9	Hainan	Province
10	Hebei	Province
11	Heilongjiang	Province
12	Henan	Province
13	Hubei	Province
14	Hunan	Province
15	Inner Mongolia	Autonomous Region
16	Jiangsu	Province
17	Jiangxi	Province
18	Jilin	Province
19	Liaoning	Province
20	Ningxia	Autonomous Region
21	Qinghai	Province
22	Shaanxi	Province
23	Shandong	Province
24	Shanghai	Municipality
25	Shanxi	Province
26	Sichuan	Province
27	Tianjin	Municipality
28	Tibet	Autonomous Region
29	Xinjiang	Autonomous Region
30	Yunnan	Province
31	Zhejiang	Province

	GDP bil RMB	Rank	GDP growth %	Rank	Population mil	Rank	GDP p.c. RMB	Rank	Area 1000 sq km	Rank
Anhui	2412	13	8.7	6	61	8	39254	25	140	22
Beijing	2490	12	6.7	28	22	26	114690	2	16	29
Chongqing	1756	20	10.7	1	30	20	58199	10	82	26
Fujian	2852	10	8.4	8	38	15	74288	6	121	23
Gansu	715	27	7.6	19	26	22	27508	31	426	7
Guangdong	7951	1	7.5	20	108	1	73290	8	178	15
Guangxi	1825	18	7.3	23	48	11	38042	26	237	9
Guizhou	1173	25	10.5	2	35	19	33242	29	176	16
Hainan	404	28	7.5	22	9	28	44396	17	33	28
Hebei	3183	8	6.8	26	74	6	42866	19	188	12
Heilongjiang	1539	21	6.1	29	38	16	40362	22	455	6
Henan	4016	5	8.1	9	95	3	42363	20	167	17
Hubei	3230	7	8.1	10	59	9	55191	11	186	14
Hunan	3124	9	7.9	13	68	7	46063	16	210	10
Inner Mongolia	1863	16	7.2	24	25	23	74204	7	1183	3
Jiangsu	7609	2	7.8	14	80	5	95394	4	103	24
Jiangxi	1836	17	9	4	46	13	40220	23	167	18
Jilin	1489	22	6.9	25	28	21	54073	12	187	13
Liaoning	2204	14	-2.5	31	44	14	50292	14	146	21
Ningxia	315	29	8.1	11	7	29	47157	15	66	27
Qinghai	257	30	8	12	6	30	43750	18	720	4
Shaanxi	1917	15	7.6	17	38	17	50528	13	206	11
Shandong	6701	3	7.6	16	98	2	68049	9	157	19
Shanghai	2747	11	6.8	27	24	24	113731	3	6	31
Shanxi	1293	24	4.5	30	37	18	35285	28	156	20
Sichuan	3268	6	7.7	15	82	4	39835	24	485	5
Tianjin	1789	19	9	5	15	27	115613	1	12	30
Tibet	115	31	10	3	3	31	35496	27	1228	2
Xinjiang	962	26	7.6	18	24	25	40466	21	1665	1
Yunnan	1487	23	8.7	7	47	12	31359	30	394	8
Zhejiang	4649	4	7.5	21	55	10	83293	5	102	25

Top 5 in Mainland China

	GDP	GDP p.c	GDP Growth	Population	Area
1	Guangdong	Tianjin	Chongqing	Guangdong	Xinjiang
2	Jiangsu	Beijing	Guizhou	Shandong	Tibet
3	Shandong	Shanghai	Tibet	Henan	Inner Mongolia
4	Zhejiang	Jiangsu	Jiangxi	Sichuan	Qinghai
5	Henan	Zhejiang	Tianjin	Jiangsu	Sichuan
	top 5=40% of nation	top 9> $10000	top 5>9% nation= 6.7%	top 5=1/3 of nation	top 5=55% of nation

b. S&T Advancement & Innovation Capability

S&T Advancement Index 科技进步水平	
Environment	ST HR, ST Facility, ST Mindset
Input	HR Input, Financial Input
Output	Output of ST Research, Output of Commercialization
High New Tech Industry	HNT Industry Output, HNT Industry Profit
Contribution	Economy, Environment, Social Life

Innovation Capability Index 创新能力	
Knowledge Creation	R&D Input, Patent, Research Paper
Knowledge Acquirement	S&T Cooperation, Technology Transfer, FDI
Enterprise Innovation	R&D Input, Design Capability, Technology Upgrade, New Product Sales
Innovation Environment	Infrastructure, Market, Labor, Finance, Entrepreneurship
Innovation Performance	Economy, Structure, Competitiveness, Employment, Sustainability

S&T Advancement Index

	Environ-ment	Input	Output	Hi New Tech Industry	Contribu-tion	Overall
1	Tianjin	Shanghai	Beijing Shanghai	Tianjin	Guangdong	Shanghai
2	Shanghai	Jiangsu	-	Beijing	Shanghai	Beijing
3	Beijing	Zhejiang	Tianjin	Shanghai	Beijing	Tianjin
4	Jiangsu	Tianjin	Guangdong	Chongqing	Zhejiang	Jiangsu
5	Shandong	Guangdong	Jiangsu	Jiangsu	Jiangsu	Guangdong

Provincial	Environment	Rank	Input	Rank	Output	Rank	HN Tech Industry	Rank	Contribution	Rank	Overall	Rank
Beijing	82.83	3	75.57	6	100.00	1	80.50	2	80.16	3	83.43	2
Tianjin	89.45	1	76.81	4	89.06	3	52.61	1	74.41	6	81.43	3
Hebei	48.21	21	48.19	19	19.36	27	36.04	28	63.24	20	44.37	24
Shanxi	47.67	22	54.46	15	35.43	18	43.48	26	71.29	9	25.20	17
nner Mongolia	51.10	16	45.11	22	17.89	28	44.98	25	62.50	21	44.89	23
Liaoning	57.55	12	56.70	13	61.87	7	48.38	21	70.94	11	60.17	11
Jilin	48.84	20	43.17	23	35.74	17	49.33	20	67.35	16	49.50	19
Heilong jiang	53.45	15	49.08	18	60.92	8	45.56	24	68.69	23	56.48	14
Shanghai	84.42	2	81.10	1	100.00	1	76.72	3	80.50	2	84.57	1
Jiangsu	79.23	4	79.24	2	69.96	5	73.59	5	77.96	5	76.21	4
Zhejiang	68.16	6	79.02	3	57.37	11	55.53	13	78.46	4	69.40	6
Anhui	59.91	10	64.91	8	39.65	16	55.81	12	53.82	29	54.97	15
Fujian	61.33	9	60.58	10	35.20	19	55.30	14	73.18	7	57.98	13
Jiangxi	45.50	25	40.99	24	24.32	23	49.84	19	62.04	22	44.92	22
Shandong	70.58	5	67.97	7	47.38	13	59.86	10	68.22	15	63.09	7
Henan	47.27	23	51.58	16	20.06	26	57.70	11	58.21	26	47.21	20
Hubei	55.44	13	63.99	9	57.84	10	64.97	8	68.86	12	62.84	10
Hunan	49.55	18	56.84	12	40.32	15	54.17	15	65.82	18	54.29	16
Guangdong	67.56	7	75.96	5	75.48	4	66.73	7	82.02	1	74.73	5
Guangxi	42.09	27	35.53	26	14.13	30	60.39	9	60.04	25	42.09	25
Hainan	39.67	28	26.00	30	22.87	24	43.37	27	71.00	10	41.28	26
Chongqing	59.52	11	55.92	14	53.11	12	75.88	4	72.59	8	63.06	8
Sichuan	54.26	14	50.97	17	60.51	9	70.27	6	64.37	19	59.62	12
Guizhou	38.92	29	35.66	25	15.86	29	49.94	18	52.57	30	38.56	30
Yunnan	36.13	30	29.67	28	27.24	21	51.45	17	51.36	31	38.84	28
Xizang	23.47	31	14.20	31	6.58	31	46.27	23	56.40	28	29.43	31
Shaanxi	66.73	8	59.20	11	67.54	6	53.59	16	66.41	17	62.96	9
Gansu	50.05	17	46.86	20	43.32	14	47.23	22	58.14	27	49.51	18
Qinghai	48.93	19	25.55	29	34.04	20	29.72	31	61.61	23	41.14	27
Ningxia	47.26	24	46.04	21	22.71	25	35.86	29	68.36	14	45.61	21
Xinjiang	42.61	26	31.09	27	24.58	22	30.52	30	60.68	24	38.83	29

Innovation Capability Index

	Creation	Acquire-ment	Innova-tion	Environ-ment	Perfor-mance	Overall
1	Beijing	Shanghai	Jiangsu	Beijing	Guangdong	Jiangsu
2	Jiangsu	Jiangsu	Guangdong	Jiangsu	Jiangsu	Guangdong
3	Shanghai	Beijing	Zhejiang	Guangdong	Tianjin	Beijing
4	Guangdong	Guangdong	Beijing	Shanghai	Henan	Shanghai
5	Zhejiang	Chongqing	Shanghai	Shandong	Shanghai	Zhejiang

Provincial	Creation	Rank	Acquirement	Rank	Innovation	Rank	Environment	Rank	Performance	Rank	Overall	Rank
Jiangsu	47.54	2	51.93	2	66.26	1	50.58	2	65.35	2	57.20	1
Guangdong	35.88	4	37.95	4	64.73	2	49.08	3	70.47	1	53.62	2
Beijing	75.26	1	49.03	3	48.99	4	50.71	1	45.23	8	52.61	3
Shanghai	42.78	3	62.08	1	46.09	5	37.52	4	47.23	5	46.04	4
Zhejiang	34.48	5	26.95	7	49.94	3	32.22	6	40.92	11	37.94	5
Shandong	31.45	8	24.34	11	41.07	6	34.08	5	45.66	7	36.29	6
Tianjin	24.13	14	29.28	6	36.95	8	27.65	8	49.93	3	34.15	7
Chongqing	23.31	15	31.79	5	31.24	11	27.07	10	46.01	6	32.04	8
Anhui	30.05	10	12.88	28	40.05	7	23.49	16	38.47	13	30.02	9
Shaanxi	34.25	6	24.6	10	23.04	15	25.93	12	41.1	9	29.29	10
Sichuan	31.7	7	19.44	16	27.16	14	25.57	13	41.09	10	29.07	11
Hubei	24.36	13	22.16	13	28.55	12	27.37	9	40.54	12	29.07	12
Hunan	20.9	19	15.56	23	34.71	10	24.42	14	37.6	14	27.77	13
Fujian	21.03	18	25.24	9	27.2	13	24.23	15	37	15	27.20	14
Henan	19.35	23	13.87	26	21.31	20	26.69	11	47.32	4	26.44	15
Hainan	27.18	11	20.17	14	36.51	9	15.82	30	27.48	24	25.68	16
Guizhou	25.9	12	22.6	12	22.14	17	27.76	7	29.46	21	25.64	17
Liaoning	20.38	21	26.21	8	21.18	21	23.02	17	32.12	19	24.46	18
Guangxi	30.38	9	13.28	27	19.74	24	18.93	24	32.95	17	22.81	19
Gansu	21.49	17	18.59	18	22.48	16	20.71	21	26.23	26	22.06	20
Jiangxi	11.81	30	19.51	15	20.09	23	20.38	22	35.18	16	21.85	21
Heilong jiang	22.94	16	18.93	17	17.43	27	22.09	18	27.99	28	21.16	22
Hebei	15.47	27	14.82	24	21.54	19	20.77	20	28.85	22	20.89	23
Ningxia	18.57	25	18.21	19	22.11	18	17.85	26	22.66	31	20.04	24
Xinjiang	20.6	20	17.07	20	20.32	22	17.62	27	23.64	29	19.86	25
Yunnan	19.14	24	14.68	25	18.6	25	19.59	23	25.49	27	19.72	26
Jilin	17.53	26	11.29	30	14.15	29	16.98	29	32.12	19	18.53	27
Nei Menggu	9.28	31	16.39	22	14.38	28	17.44	28	32.08	20	18.22	28
Shanxi	12.04	29	16.95	21	17.73	26	15.05	31	28.12	23	18.17	29
Xizang	19.67	22	10.99	31	7.41	31	21.15	19	27.1	25	17.16	30
Qinghai	15.2	28	12.71	29	9.61	30	18.25	25	23.13	30	15.78	31

New Technology Zone & Innovation Area

State High New Technology Development Zone 国家高新技术产业开发区	Approved by State Council Directed by MOST	146 by 2016 240 by 2020
Self-Dependent Innovation Demonstration Area 国家自主创新示范区	Approved by State Council Directed by MOST	17 by 2016

Source: MOST 2017: 《国家高新技术产业开发区“十三五”发展规划》The 13th FYP for State HNT Development Zones

State High New Technology Development Zone

Region	Province	城市	City	Since
North East China (16)	Liaoning (8)	沈阳	Shenyang	1991
		大连	Dalian	1991
		鞍山	Anshan	1992
		本溪	Benxi	2012
		锦州	Jinzhou	2015
		营口	Yingkou	2010
		阜新	Fuxin	2013
		辽阳	Liaoyang	2010
	Jilin (5)	长春	Changchun	1991
		长春净月	Changchun Jingyue	2012
		吉林	Jilin	1992
		通化	Tonghua	2013
		延吉	Yanji	2010
	Heilongjiang (3)	哈尔滨	Ha'erbin	1991
		齐齐哈尔	Qiqiha'er	2010
		大庆	Daqing	1992
North China (11)	Beijing (1)	北京中关村	Beijing Zhongguancun	1988
	Tianjin (1)	天津滨海	Tiānjīn Bīnhai	1991
	Hebei (5)	石家庄	Shijiazhuang	1991
		唐山	Tangshan	2010
		保定	Baoding	1992
		承德	Chengde	2012
		燕郊	Yanjiao	2010
	Shanxi (2)	太原	Taiyuan	1991
		长治	Changzhi	2015
	Inner Mongolia (2)	呼和浩特	Huhehaote	2013
		包头	Baotou	1992

Region	Province	城市	City	Since
East China (57)	Shanghai (2)	上海张汀	Shanghai zhangjiang	1992
		上海紫竹	Shanghai zizhu	2011
	Jiangsu (16)	南京	Nanjing	1991
		无锡	Wuxi	1992
		汀阳	Jiang yang	2011
		徐州	Xuzhou	2012
		常州	Changzhou	1992
		武进	Wujin	2012
		苏州	Suzhou	2006
		昆山	Kunshan	2010
		常熟	Changshu	2015
		南通	Nantong	2013
		连云港	Lianyungang	2015
		盐城	Yancheng	2015
		扬州	Yangzhou	2015
		镇汀	Zhenjiang	2014
		泰州	Taizhou	2009
		苏州工业园	Suzhou Industrial Park	1992
	Zhejiang (8)	杭州	Hangzhou	1991
		萧山临汀	Xiaoshan lin jiang	2015
		宁波	Ningbo	2007
		温州	Wenzhou	2012
		嘉兴	Jiaxing	2015
		莫干山	Mo gan shan	2015
		绍兴	Shaoxing	2010
		衢州	Quzhou	2013
	Jiangxi (7)	南昌	Nan chang	1991
		景德镇	Jiangdezhen	2010
		新余	Xianyu	2010
		鹰潭	Yingtan	2012
		赣州	Ganzhou	2015
		吉安	Ji'an	2015
		抚州	Fuzhou	2015

Region	Province	城市	City	Since
East China (57)	Anhui (4)	合肥	Hefei	1991
		芜湖	Wuhu	2010
		蚌埠	Bangbu	2010
		马鞍山慈湖	Ma'anshan ci hu	2012
	Fujian (7)	福州	Fuzhou	1991
		厦门	Xiamen	1991
		莆田	Putian	2012
		三明	Sanming	2015
		泉州	Quanzhou	2010
		漳州	Zhangzhou	2013
		龙岩	Longyan	2015
	Shandong (13)	济南	Jinan	1991
		青岛	Qingdao	1992
		淄博	Zibo	1992
		枣庄	Zaozhuang	2015
		黄河三角洲	Huanghe sanjiaozhou	2015
		烟台	Yantai	2010
		潍坊	Weifang	1992
		济宁	Jining	2010
		泰安	Tai'an	2012
		威海	Weihai	1991
		莱芜	Laiwu	2015
		临沂	Linyi	2011
		德州	Dezhou	2015
South Central China (36)	Henan (7)	郑州	Zhengzhou	1991
		洛阳	Luoyang	1992
		平顶山	Pingdingshan	2015
		安阳	Anyang	2010
		新乡	Xinxiang	2012
		焦作	Jiaozuo	2015
		南阳	Nanyang	2010

Region	Province	城市	City	Since
South Central China (36)	Hubei (7)	武汉	Wuhan	1991
		宜昌	Yichang	2010
		襄阳	Xiangyang	1992
		荆门	Jiangmen	2013
		孝感	Xiaogan	2012
		随州	Suizhou	2015
		仙桃	Xiantao	2015
	Hunan (6)	长沙	Zhangsha	1991
		株洲	Zhuzhou	1992
		湘潭	Xiantan	2009
		衡阳	Hengyang	2012
		益阳	Yiyang	2011
		郴州	Chengzhou	2015
	Guangdong (11)	广州	Guangzhou	1991
		深圳	Shenzhen	1991
		珠海	Zhuhai	1992
		佛山	Fushan	1992
		江门	Jiangmen	2010
		肇庆	Zhaoqing	2010
		惠州	Huizhou	1992
		源城	Yuan cheng	2015
		清远	Qingyuan	2015
		东莞	Dongguan	2010
		中山	Zhangshan	1991
	Hainan (1)	海口	Haikou	1991
	Guangxi (4)	南宁	Nanning	1992
		柳州	Liuzhou	2010
		桂林	Guilin	1991
		北海	Beihai	2015

Region	Province	城市	City	Since
South West China (12)	Chongqing (2)	重庆	Chongqing	1991
		璧山	Bi shan	2015
	Sichuan (7)	成都	Chengdu	1991
		自贡	Zigong	2011
		攀枝花	Panzhihua	2015
		沪州	Hu zhou	2015
		德阳	Deyang	2015
		绵阳	Mianyang	1992
		东山	Dongshan	2012
	Guizhou (1)	贵阳	Guiyang	1992
	Yunnan (2)	昆明	Kunming	1992
		玉溪	Yuxi	2012
North West China (15)	Shaanxi (7)	西安	Xi'an	1991
		宝鸡	Baoji	1992
		杨凌	Yangling	1997
		咸阳	Xianyang	2012
		渭南	Weinan	2010
		榆林	Yulin	2012
		安康	Ankang	2015
	Gansu (2)	兰州	Lanzhou	1991
		白银	Baiyin	2010
	Qinghai (1)	青海	Qinghai	2010
	Ningxia (2)	银州	Yin zhou	2010
		石嘴山	Shizuishan	2013
	Xinjiang (3)	乌鲁木齐	Wulumuqi	1992
		昌吉	Changji	2010
		新疆兵团	Xinjiang Corps	2013

Self-Dependent Innovation Demonstration Area

	Chinese Name	Name	Since	Province
1	中关村国家自主创新示范区	Zhongguancun	2009	Beijing
2	东湖国家自主创新示范区	Donghu	2009	Hubei
3	上海张江国家自主创新示范区	Shanghai Zhangjiang	2011	Shanghai
4	深圳国家自主创新示范区	Shenzhen	2014	Guangdong
5	苏南国家自主创新示范区	South Jiangsu	2014	Jiangsu
6	西安国家自主创新示范区	Xian	2015	Shannxi
7	珠三角国家自主创新示范区	Pearl River Delta	2015	Guangdong
8	天津滨海国家自主创新示范区	Tiānjīn Bīnhai	2015	Tianjin
9	长株潭国家自主创新示范区	Chang-Zhu-Tan	2015	Hunan
10	成都国家自主创新示范区	Chengdu	2015	Sichuan
11	杭州国家自主创新示范区	Hangzhou	2015	Zhejiang
12	郑洛新国家自主创新示范区	Zheng-Luo-Xin	2016	Henan
13	山东半岛国家自主创新示范区	Shandong Peninsula	2016	Shandong
14	沈大国家自主创新示范区	Shen-Da	2016	Liaoning
15	福厦泉国家自主创新示范区	Fu-Xia-Quan	2016	Fujian
16	合芜蚌国家自主创新示范区	He-Fu-Bang	2016	Anhui
17	重庆国家自主创新示范区	Chongqing	2016	Chongqing

Source: State Council, MOST

Example: Vision of Jiangsu

	16 Key Areas
1	集成电路及专用设备 IC & Specialized Equipment
2	网络通信设备 Network Communication Equipment
3	操作系统及工业软件 Operating System & Industrial Software
4	云计算大数据物联网 Cloud Computing, Big Data & IoT
5	智能制造装备 Smart Manufacturing Equipment
6	先进轨道交通装备 Advanced Rail Transportation Equipment
7	海洋工程装备及高技术船舶 Marine Engineering Equipment & High Tech Shipbuilding
8	新型电力装备 New Electric Power Equipment
9	航空航天装备 Aerospace Equipment
10	工程与农业机械 Engineering & Agricultural Machinery
11	节能环保装备 Energy Conservation & Environment Protection Equipment
12	节能型与新能源汽车 Energy Conservation & New Energy Automobile
13	新能源 New Energy
14	新材料 New Materials
15	生物医药Biomedicine
16	医疗器械 Medical Equipment

江苏省人民政府 2016:《中国制造2025》江苏行动纲要
Government of Jiangsu Province 2016: Jiangsu Outline for Action for Made in China 2025

E. 4F Framework for Matching Strategy

a	Value for Matching
b	Strategic Directions
C	The 4F Framework

a. The Value of Cooperation

China as a source of fund and technology
Thailand's strength in selected areas
Thailand as the hub in ASEAN
The common problems faced by two countries

b. Strategic Directions

New S&T Sectors
New Geographic Locations
New Institutional Partners
New Operation Mechanisms

New Operation Mechanisms

Exchange, training of personnel （scholarship）
Joint research project （matching fund）
Platform such as joint lab
Technology transfer
Technology standard development
Business start up: capacity building and incubator
Strategy and policy development

c. The 4F Framework

Science & Technology Resources of China in a Database of		
I	Funding	Sectors & institutions Receiving State S&T Funding
II	Facility	Sectors & institutions Hosting State Laboratories
III	Firm	Sectors & Firms Recognized for S&T Innovation
IV	Field	Zones Recognized for HNT and Innovation Base for International ST Cooperation Vision of Provincial Units

The 4F Framework

First Tier Information			
Fund	Facility	Firm	Field
State Key R&D Plan	State Key Laboratory National Engineering & Technology Research Center National Defense Science & Technology Key Laboratory	National Innovative Firm	State Key HN Technology Zone Base for International ST Cooperation Vision of Provinces

Second Tier Information			
National Natural Science Foundation National S&T Major Project	Sate Engineering Laboratory National Engineering Research Center	Technology Innovation Demonstration Enterprise	HN Technology Firms

Output		
State S&T Awards	ST Plan Achievement	Commercialization Achievement

i. Funding

National Level Funding for China S&T Project			
i	国家自然科学基金 National Natural Science Foundation of China (NSFC)	NSFC Committee under the State Council	more than 30,000 projects in 2016
ii	国家科技重大专项 National S&T Major Project	MOST MOF, NDRC related ministry	16 Areas
iii	国家重点研发计划 State Key R&D Plan	MOST MOF, NDRC related ministry	40 category 1073 projects in 2016

Source: MOST 2015: Plan for Deepening Reform the Management of S&T Plan Financed by Central Budget

Example: State Key R&D Plan 2016

5	Automobile	新能源汽车	长续航动力锂电池新材料与新体系研究	中国科学院物理研究所	Institute of Physics, CAS	Beijing
6	Automobile	新能源汽车	高比能动力电池的关键技术和相关基础科学问题研究	北京大学	Peking University	Beijing
7	Automobile	新能源汽车	高比能量动力锂离子电池的研发与集成应用	合肥国轩高科动力能源有限公司	Hefei Guoxuan High-Tech Power Energy	Anhui
8	Automobile	新能源汽车	新一代锂离子动力电池产业化技术开发	宁德时代新能源科技股份有限公司	Comtemporary Amperex Technology	Fujian
9	Automobile	新能源汽车	高比能量动力锂离子电池开发与产业化技术攻关	天津力神电池股份有限公司	Tianjin Lishen Battery	Tianjin
10	Automobile	新能源汽车	高温车用SiC器件及系统的基础理论与评测方法研究	中国科学院电工研究所	Institute of Electrical Engineering, CAS	Beijing
11	Automobile	新能源汽车	高功率密度车用逆变器产品平台开发及产业化	上海电驱动股份有限公司	Shanghai Edrive	Shanghai
12	Automobile	新能源汽车	高功率密度电机控制器	上海大郡动力控制技术有限公司	Shanghai Dajun Technologies	Shanghai
13	Automobile	新能源汽车	智能电动汽车的感知、决策与控制关键基础问题研究	清华大学	Tsinghua University	Beijing
14	Automobile	新能源汽车	电动汽车智能辅助驾驶关键技术研究与产品开发	北京经纬恒润科技有限公司	Beijing Jingwei Hirain Technologies	Beijing
15	Automobile	新能源汽车	电动汽车智能辅助驾驶技术研发及产业化	东软集团股份有限公司	Neusoft	Liaoning

ii. Facility

i	State Key Laboratory 国家重点实验室	MOST, MOE, MIIT, CAS	401 labs
ii	National Engineering & Technology Research Center 国家工程技术研究中心	MOST	346 centers
iii	Sate Engineering Laboratory 国家工程实验室	NDRC	167 labs
iv	National Engineering Research Center 国家工程研究中心	NDRC	101 centers
v	National Defense Science & Technology Key Laboratory 国防科技重点实验室	SASTIND GADPLA	59 labs
vi	National Science & Technology Infrastructure Platform 科技基础条件平台	MOST, MOF	6 categories

SASTIND: State Administration for ST & Industry for National Defense GADPLA: General Armament Department, PLA

Example: State Key Laboratory

Medicine	医学基因组学国家重点实验室	上海交通大学	Shanghai Jiao Tong University	Shanghai
Bioindustry	微生物技术国家重点实验室	山东大学	Shandong University	Shandong
Medicine	天然药物与仿生药物国家重点实验室	北京大学	Peking University	Beijing
Medicine	医药生物技术国家重点实验室	南京大学	Nanjing University	Jiangsu
Medicine	医学神经生物学国家重点实验室	复旦大学	Fudan University	Shanghai
Medicine	医学遗传学国家重点实验室	中南大学	Central South University	Hunan
Agriculture	植物病虫害生物学国家重点实验室	中国农业科学院植物保护研究所	Institute of Plant Protection,Chinese Academy of Agricultural Sciences	Beijing
Medicine	遗传工程国家重点实验室	复旦大学	Fudan University	Shanghai
Agriculture	植物生理学与生物化学国家重点实验室	中国农业大学	China Agricultural University	Beijing
Agriculture	农业微生物学国家重点实验室	华中农业大学	Huazhong Agricultural University	Hubei
Agriculture	作物遗传与种质创新国家重点实验室	南京农业大学	Nanjing Agricultural University	Jiangsu
Agriculture	作物遗传改良国家重点实验室	华中农业大学	Huazhong Agricultural University	Hubei
Agriculture	动物营养学国家重点实验室	中国农业科学院畜牧研究所	Institute of Animal Science, Chinese Academy of Agricultural Sciences	Beijing
Medicine	华南肿瘤学国家重点实验室	中山大学	Sun Yat-sen University	Guangdong
Medicine	传染病预防控制国家重点实验室	中国疾病预防控制中心	Chinese Center For Disease Control And Prevention	Beijing
Medicine	病毒学国家重点实验室	中国科学院武汉病毒研究所	Wuhan Institute Of Virology, CAS	Hubei
Medicine	病原微生物生物安全国家重点实验室	中国人民解放军军事医学科学院	Academy of Military Medical Sciences	Beijing
Digital	脑与认知科学国家重点实验室	中国科学院生物物理研究所	Institute of Biophysics, CAS	Beijing
Digital	认知神经科学与学习国家重点实验室	北京师范大学	Beijing Normal University	Beijing
Medicine	生物治疗国家重点实验室	四川大学	Sichuan University	Sichuan
Agriculture	系统与进化植物学国家重点实验室	中国科学院植物研究所	Institute of Botany, CAS	Beijing
Medicine	肿瘤生物学国家重点实验室	中国人民解放军第四军医大学	The Fourth Military Medical University	Shaanxi
Medicine	神经科学教育部重点实验室	北京大学	Peking University	Beijing
Environment	实验海洋生物学重点实验室	中国科学院海洋研究所	Institute of Oceanology, CAS	Shandong
Medicine	医学免疫学国家重点实验室	中国人民解放军第二军医大学	The Second Military Medical University	Shanghai
Agriculture	家畜疫病病原生物学国家重点实验室	中国农业科学院兰州兽医研究所	Lanzhou Veterinary Research Institute, Chinese Academy of Agricultural Sciences	Gansu
Environment	城市和区域生态国家重点实验室	中国科学院生态环境研究中心	Research Center for Eco-Environmental Sciences, CAS	Beijing
Medicine	眼科学国家重点实验室	中山大学	Sun Yat-sen University	Guangdong

iii. Firm

China National Firms of Innovation			
i	Technology Innovation Demonstration Enterprise 技术创新示范企业	MIIT，MOF	283 from 2011 to 2016
ii	National Innovative Enterprises 国家级创新企业	MOST, SASAC ACFTU	356 for first 3 batches 207 for the latest 2 batches in probation

MIIT: Ministry of Industry & Information Technology, MOF: Ministry of Finance
SASAC: State Owned Assets Supervision & Administration Commission ACFTU： All-China Federation of Trade Union

Example: National Innovative Enterprises

3	Energy	内蒙古伊泰集团有限公司	Inner Mongolia Yitai Group Co., Ltd.	Inner Mongolia
3	Medicine	吉林敖东延边药业股份有限公司	Jilin Aodong Pharmaceutical Group Co.,	Jilin
3	Metal	吉林吉恩镍业股份有限公司	Jilin Jien Nickel Industry Co., Ltd.	Jilin
3	Chemical	大庆华科股份有限公司	Daqing Huake Company Limited	Heilongjiang
3	Medicine	上海药明康德新药开发有限公司	Shanghai PharmaTech Co., Ltd.	Shanghai
3	Medicine	上海复星医药(集团)股份有限公司	Shanghai Fosun Pharmaceutical (Group	Shanghai
3	Automobile	上海汽车工业（集团）总公司	Shanghai Automotive Industry Corporati	Shanghai
3	Electric	上海新时达电气股份有限公司	Shanghai STEP Electric Corporation	Shanghai
3	Energy	无锡尚德太阳能电力有限公司	Wuxi Suntech Power Co., Ltd.	Jiangsu
3	Digital & Energy	亨通集团有限公司	Hengtong Group Co., Ltd.	Jiangsu
3	Chemical	江苏扬农化工集团有限公司	Jiangsu Yangnong Chemical Group Co.,	Jiangsu
3	Transportation	江苏天奇物流系统工程股份有限公司（	Jiangsu Miracle Logistics System Engine	Jiangsu
3	Medicine	浙江康恩贝制药股份有限公司	Zhejiang Conba Pharmaceutical Co., Ltd	Zhejiang
3	Chemical	浙江新安化工集团股份有限公司	Zhejiang Xinan Chemical Indusyrial Grou	Zhejiang
3	Machinery	聚光科技（杭州）股份有限公司	Juguang Science & Technology (Hangzh	Zhejiang
3	Automobile	安徽江淮汽车股份有限公司	Anhui Jianghuai Automobile Group Corp	Anhui
3	Metal	马钢（集团）控股有限公司	Magang (Group) Holding Co., Ltd.	Anhui
3	Transportation	安徽安凯福田曙光车桥有限公司	Anhui Ankai Futian Shuguang Axle Co.,L	Anhui
3	Material	福建福晶科技股份有限公司	CASTECH Inc.	Fujian
3	Textile & Clothing	福建凤竹纺织科技股份有限公司	Fujian Fynex Textile Science & Technolo	Fujian
3	Metal	崇义章源钨业股份有限公司	Chongyi Zhangyuan Tungsten Co.,Ltd.	Jiangxi
3	Transportation	威海广泰空港设备股份有限公司	Weihai Guangtai Airport Equipment Co.,	Shandong

iv. Field

State High New Technology Development Zone 国家高新技术产业开发区	Approved by State Council Directed by MOST	146 by 2016 240 by 2020
Self-Dependent Innovation Demonstration Area 国家自主创新示范区	Approved by State Council Directed by MOST	17 by 2016

国际科技合作基地 Base for International ST Cooperation	国际创新园 (IIP) International Innovation Park	Approved & Directed by MOST	29
	国际联合研究中心 (IJRC) International Joint Research Center		169
	国际技术转移中心 (ITTC) International Technology Transfer Centre		39
	示范型国际科技合作基地 (DBISTC) Demonstration Base for International ST Cooperation		405

Source: MOST 2017: 《国家高新技术产业开发区"十三五"发展规划》The 13th FYP for State HNT Development Zones

Example: Base for International ST Cooperation

	Sector	国合基地名称		依托单位名称		所在省份/升级行政区/计划单列市	
DBISTC	**Automobile**	奇瑞汽车及零部件国际科技合作基地	Chery Automobile & Parts	奇瑞汽车股份有限公司	Chery Automobile	安徽省	Anhui
DBISTC	**Bioindustry**	生物技术应用研究国际科技合作基地	Biotechnology	合肥天麦生物科技发展有限公司	Hefei Tianmai Biotechnology Development	安徽省	Anhui
DBISTC	**Physical Science**	科学岛物质科学国际科技合作基地	Science Island Material Science	中科院合肥物质科学研究院	Hefei Institute of Physical Science， CAS	安徽省	Anhui
DBISTC	**Agriculture**	安徽农业大学农林科学与生物资源开发国际科技合作基地	Agriculture, Forestry & Bio-resources Development	安徽省农业大学	Anhui Agricultural University	安徽省	Anhui
DBISTC	**Environment**	节能环保大功率发动机国际科技合作基地	High Power Engine for Energy Conservation & Environmental Protection	安徽华菱汽车有限公司	Anhui Hualing Automobile	安徽省	Anhui
DBISTC	**Agriculture**	水稻分子育种国际科技合作基地	Molecular Rice Breeding	安徽省农业科学院水稻研究所	China National Rice Research Institute, Anhui Academy of Agricultural Sciences	安徽省	Anhui
DBISTC	**Material**	蚌埠玻璃工业设计研究院国际科技合作基地	Bengbu Glass Industry Design & Research Institute	蚌埠玻璃工业设计研究院	Bengbu Glass Industry Design & Research Institute	安徽省	Anhui
DBISTC	**Social Service**	智慧养老国际科技合作基地	Smart Service for Senior Citizen	合肥工业大学计算机与信息学院	School of Computer and Information, Hefei University of Technology	安徽省	Anhui
IIP	**Automation**	合肥国家中德智能制造国际创新园	Hefei Sino-German Smart Manufacturing	合肥高新技术产业开发区管理委员会	Management Committee of Hefei High & New Technology Industrial Development Zone	安徽省	Anhui

Example: Vision At Provincial Level

16	**Agriculture**	Hunan	农业机械 Agricultural Machinery	
17	**Automation**	Anhui	智能装备 Smart Equipment	
18	**Automation**	Beijing	智能制造系统和服务 Smart Manufacturing System	
19	**Automation**	Shanghai	智能制造装备 Equipment for Smart Manufacturing	
20	**Automation**	Tianjin	机器人 Robotics	
21	**Automation**	Shandong	高档数控机床和机器人Advanced Numerical Control Machine Tool & Robotics	
22	**Automation**	Sichuan	高档数控机床和机器人Advanced Numerical Control Machine Tool & Robotics	
23	**Automation**	Guangxi	智能制造装备和产品 Smart Manufacturing Equipments & Products	
24	**Automation**	Zhejiang	机器人与智能装备 Robotics& Smart Equipment	
25	**Automation**	Jiangxi	智能装备(机器人) Smart Equipment (Robotics)	
26	**Automation**	Jilin	机器人与智能装备 Robotics & Smart Equipment	
27	**Automation**	Liaoning	高档数控系统 Advanced Numerical Control System	
28	**Automation**	Liaoning	机器人及智能制造装备 Robotics & Smart Manufacturing Equipment	
29	**Automation**	Shaanxi	高档数控机床机器人 Advanced Numerical Control Machine Tool & Robotics	
30	**Automation**	Henan	数控机床和机器人 Numerical Control Machine Tool & Robotics	
31	**Automation**	Hubei	智能装备 Smart Equipment	
32	**Automation**	Hunan	高档数控机床和机器人 Advanced Numerical Control Machine Tool & Robotics	
33	**Automation**	Jiangsu	智能制造装备 Smart Manufacturing Equipment	
34	**Automobile**	Gansu	新能源汽车 New Energy Cars	

The Case of Yunnan Province

4F	Sector	Institute	Matching with Thailand 4.0
Funding	Medicine	Kunming University of Science and Technology	Medical Hub
Facility	Agriculture Bio-Industry	1. Kunming Institute of Botany, Chinese Academy of Sciences 2. Yunnan University	Agriculture & Biotechnology
Firm	Agriculture Bio-Industry	Walvax Biotechnology	Agriculture & Biotechnology
	Digital	Yunnan Nantian Electronics Information	Digital
	Medicine	1. KPC Pharmaceuticals 2. Yunnan Baiyao Group	Medical Hub
Field	Bio-Industry Digital Automation	Kunming State High & New Technology Development Zone	Medical Hub Digital Automation and Robotics
	Medicine Digital Automation	Yuxi State High & New Technology Development Zone	Medical Hub Digital Automation and Robotics

4. Conclusion

Technology Map	The Need of Technology in Thailand 4.0 can be summarized in a map of 31 core technologies
Matching Strategy	The S&T cooperation between China & Thailand could be explored in terms of new sectors, partners, locations & mechanisms
	Tool to May Match the Need of Thailand is proposed based on the 4F Framework: Fund, Faculty, Firm and Field

Appendix: Sector Classification

Existing Classification	GB/T 4754-2011 National Bureau of Statistics, China Global Industry Classification Standard (GICS) by MSCI and S&P
Modified Classification	Classification used in this research: with reference to existing classification modified for relevance to 10 industries in Thailand 4.0 and focus of Made in China 2025

Classification by NBS China

A	Agriculture
B	Mining
C	Manufacturing
D	Electricity & Water
E	Construction
F	Whole Sale & Retail
G	Transportation
H	Hotel & Restaurant
I	Communication
J	Finance
K	Real Estate
L	Business Service
M	Science & Technology
N	Environment
O	Household Service
P	Education
Q	Health
R	Culture
S	Public Administration
T	International Organization

C. Manufacturing

13	Agro-industry
14	Food
15	Beverage
16	Tobaco
17	Textile
18	Clothing
19	Leather & Shoe
20	Wood
21	Furniture
22	Paper
23	Printing
24	Cultural
25	Fuel
26	Chemical
27	Medicine

28	Chemical Fabric
29	Rubber & Plastic
30	Non Metal Mineral
31	Ferrous Matal
32	Non Ferrous Metal
33	Metal Products
34	General Equipment
35	Special Equipment
36	Automobile
37	Rail, ship aerospace
38	Electric equipment
39	Computer & Electronic
40	Meter& Instrument
41	Other
42	Waste recovery
43	Repairing

Source: National Bureau of Statistics

China 4F Sector Map

Sector	Definition
Agriculture	crop farming, forestry, animal husbandry and fishery, including their inputs & output, trading, and specialized machinery & equipment
Automation	robotics, automation process, including components, and specialized machinery & equipment
Automobile	car, truck, bus, motorbike, industrial vehicles, EV, including components, specialized machinery & equipment
Aviation	airplane and drone, and specialized machinery & equipment
Basic Science	Basic scientific research, natural science or social science, not restricted to a particular industry
Bioindustry	products or service with biotechnology such as bio fuel , bio medicine, bio chemical
Business Service	service in general like QA, standard, technology transfer etc, not specified elsewhere
Chemical	chemical products (including petro chemical) industrial or consumer, and specialized machinery & equipment
Construction	construction service, including architecture design, specialized machinery & equipment and construction materials like cements
Cultural & Education	cultural & educational products or services, including publication, sports, and specialized machinery & equipment
Defense	military products like weaponry and ammunition, or aerospace vehicles and equipment under national defense system
Digital	internet & communication infrastructure, hardware and software, ecommerce, network security, digital contents, AI
Electric	components to products, industrial or consumer, electricity powered, including photoelectric & lighting, laser, and electromagnetic, not specified elsewhere
Electronics	components to products, industrial or consumer, with semiconductor

Sector	Definition
Energy	coal ,oil, from mining and exploration, nuclear, renewable energy, electricity generating, transmission & storage (battery), energy saving, specialized machinery & equipment
Environment	land, ocean & atmosphere, geology, eco system protection, marine engineering, clean energy, recycle, waste management, water resource management, specialized machinery & equipment
Food	food & beverage and tobacco, and specialized machinery & equipment
Machinery	general purpose machinery, engine, equipment, apparatus, & instrument not specified elsewhere, including components, industrial or consumer
Material	including non-metal mineral like rubber, plastic, glass, ceramics new materials like Additive Manufacturing (3D printing), not elsewhere specified
Medicine	including pharmacy, hospital and medical equipment, for mental and physical health
Metal Products	ferrous or nonferrous, from smelting to forging , and metal products not specified elsewhere, and specialized machinery & equipment
Mining	mining and primary processing, not specified elsewhere, and specialized machinery & equipment
Non Metal Products	including wood products, furniture & paper, rubber products, not specified elsewhere, and specialized machinery & equipment
Social Service	public security, disaster prevention & relief, urbanization, senior citizen
Space	outer space exploration and utilization, and specialized machinery & equipment
Textile & Clothing	including clothing, leather, shoe, outfit, and specialized machinery & equipment
Tourism	product & service, equipment and facility for tourism industry
Transportation	Infrastructure logistic & service, rail and sea transportation (including deep sea exploration) , related specialized machinery & equipment

Thailand 4.0 Technology Map

No.	Industry	Code	Key Technology Category
1	A. Next-generation Automotive	A1	Motor driven vehicle (EV & Hybrid) & Battery
2		A2	ADAS (advanced driver assistance system)
3		A3	System for safety, health and energy saving
4	B. Smart Electronics	B1	Electronic components
5		B2	Electronic modules & systems (IoT)
6		B3	Electronic device (embedded technology)
7	C. Affluent, Medical & Wellness Tourism	C1	Tourist Service
8		C2	Destination & Facility
9	D. Agriculture & Biotechnology	D1	Agricultural machinery, equipment, device (precision agriculture)
10		D2	Breeding, Production, Post harvest Management
11		D3	Insect, disease control & waste management
12		D4	Bio-agriculture (gene selection, organic farming)
13	E. Food for the Future	E1	Food Products (ingredients, nutrition, function)
14		E2	Food processing & packaging
15		E3	Food safety, quality & traceability

No.	Industry	Code	Key Technology Category
16	F. Robotics	F1	Industrial, Service, Special Purpose Robot
17		F2	Automation system
18	G. Aviation & Logistic	G1	Aerospace vehicle
19		G2	Aircraft MRO
20		G3	Logistic solution
21		G4	Navigation & Traffic Management
22	H. Biofuels and Biochemicals	H1	Bio fuel
23		H2	Bio Chemistry (biomass, bioplastic etc.)
24	I. Digital	I1	Connection & Platform
25		I2	Software & Solution
26		I3	Digital Contents
27		I4	Data Analytic (AI)
28		I5	Cyber Security
29	J. Medical Hub	J1	Modern Pharmaceuticals & Treatments
30		J2	Traditional Medicine
31		J3	Medical Equipment, Device & Facility

Matching with Thailand 4.0

China 4F Sector	Thailand 4.0 Map
Agriculture	D
Automation	F
Automobile	A
Aviation	G1, G2
Basic Science	-
Bioindustry	H, D
Business Service	-
Chemical	H2
Construction	J3, C2
Cultural & Education	-
Defense	-
Digital	I
Electric	B
Electronics	B
Energy	-
Environment	-
Food	E
Machinery	-
Material	-
Medicine	C,J
Metal Products	-
Mining	-
Non Metal Products	-
Social Service	C
Space	-
Textile & Clothing	-
Tourism	C
Transportation	G3, G4

Thailand 4.0 Map		China 4F Sector
A	Next-generation Automotive	Automobile
B	Smart Electronics	Electric Electronics
C	Affluent, Medical & Wellness Tourism	Medicine, Social Service Construction
D	Agriculture & Biotechnology	Agriculture Bioindustry
E	Food for the Future	Food
F	Robotics	Automation
G	Aviation & Logistic	Aviation Transportation
H	Biofuels and Biochemicals	Bioindustry Chemical
I	Digital	Digital
J	Medical Hub	Medicine Construction

The 4F Framework

First Tier Information			
Fund	Facility	Firm	Field
State Key R&D Plan	State Key Laboratory National Engineering & Technology Research Center National Defense Science & Technology Key Laboratory	National Innovative Firm	State Key HN Technology Zone Base for International ST Cooperation Vision of Provinces

Second Tier Information			
National Natural Science Foundation	Sate Engineering Laboratory National Engineering Research Center	Technology Innovation Demonstration Enterprise	HN Technology Firms

Output		
State S&T Awards	ST Plan Achievement	Commercialization Achievement

A. Next-generation Automotive

Province	Fund	Facility	Firm	Field	Vision
Anhui	1	1	6	1	Y
Beijing	7	2	-	2	Y
Chongqing	1	1	2	2	-
Fujian	1	-	1	1	Y
Gansu	-	-	-	-	Y
Guangdong	-	-	3	-	-
Guangxi	-	-	2	-	Y
Guizhou	-	-	-	-	-
Hainan	-	-	-	-	Y
Hebei	-	-	1	1	-
Heilongjiang	-	-	-	-	-
Henan	-	-	-	-	Y
Hubei	-	-	2	-	Y
Hunan	1	1	-	-	Y
Inner Mongolia	-	-	1	-	-

A. Next-generation Automotive

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	1	-	-	-	Y
Jiangxi	-	-	1	-	Y
Jilin	-	1	1	-	Y
Liaoning	3	-	-	-	Y
Ningxia	-	-	-	-	-
Qinghai	-	-	-	-	Y
Shaanxi	-	-	-	-	Y
Shandong	1	-	5	2	Y
Shanghai	2	-	1	2	Y
Shanxi	-	-	-	-	-
Sichuan	-	-	1	1	Y
Tianjin	1	-	1	-	Y
Tibet	-	-	-	-	-
Xinjiang	-	-	-	-	-
Yunnan	-	-	-	1	-
Zhejiang	-	-	3	-	Y

B. Smart Electronics

Province	Fund	Facility	Firm	Field	Vision
Anhui	4	-	5	1	Y
Beijing	19	6	2	4	Y
Chongqing	-	-	-	-	-
Fujian	-	-	4	1	-
Gansu	-	-	1	-	-
Guangdong	8	1	12	5	-
Guangxi	-	-	-	-	-
Guizhou	-	-	1	-	-
Hainan	-	-	-	-	-
Hebei	-	2	-	2	-
Heilongjiang	-	1	2	-	-
Henan	-	-	1	-	-
Hubei	-	4	1	3	-
Hunan	1	-	3	-	-
Inner Mongolia	-	-	-	-	-

B. Smart Electronics

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	6	1	5	1	Y
Jiangxi	1	-	-	-	Y
Jilin	-	3	3	1	-
Liaoning	-	1	2	2	Y
Ningxia	-	-	1	-	-
Qinghai	-	-	-	-	-
Shaanxi	-	1	1	2	Y
Shandong	-	-	5	1	Y
Shanghai	6	3	7	2	-
Shanxi	-	1	2	1	-
Sichuan	-	4	3	-	-
Tianjin	3	1	4	-	Y
Tibet	-	-	-	-	-
Xinjiang	-	-	-	-	Y
Yunnan	-	-	-	1	-
Zhejiang	2	-	3	1	Y

C. Affluent, Medical & Wellness Tourism

Province	Fund	Facility	Firm	Field	Vision
Anhui	-	-	-	1	-
Beijing	1	-	-	-	-
Chongqing	-	-	-	-	-
Fujian	-	-	-	-	-
Gansu	-	-	-	-	-
Guangdong	-	-	-	-	-
Guangxi	-	-	-	-	-
Guizhou	-	-	-	-	-
Hainan	-	-	-	-	Y
Hebei	-	-	-	-	-
Heilongjiang	-	-	-	-	-
Henan	-	-	-	-	-
Hubei	-	-	-	-	-
Hunan	-	-	-	-	-
Inner Mongolia	-	-	-	-	-

C. Affluent, Medical & Wellness Tourism

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	-	-	-	-	-
Jiangxi	-	-	-	-	-
Jilin	-	-	-	-	-
Liaoning	-	-	-	-	-
Ningxia	-	-	-	-	-
Qinghai	-	-	-	-	-
Shaanxi	-	-	-	-	-
Shandong	-	-	-	-	-
Shanghai	-	-	-	-	-
Shanxi	-	-	-	-	-
Sichuan	-	-	-	-	-
Tianjin	-	-	-	-	-
Tibet	-	-	-	-	Y
Xinjiang	-	-	-	-	-
Yunnan	-	-	-	-	-
Zhejiang	-	-	-	-	-

D. Agriculture & Biotechnology

Province	Fund	Facility	Firm	Field	Vision
Anhui	1	1	-	2	Y
Beijing	62	16	2	13	-
Chongqing	-	-	-	2	Y
Fujian	2	-	-	4	-
Gansu	2	1	-	4	Y
Guangdong	5	2	1	2	-
Guangxi	-	1	-	6	Y
Guizhou	-	-	-	1	-
Hainan	1	1	1	1	Y
Hebei	1	-	-	2	-
Heilongjiang	2	2	-	3	Y
Henan	2	1	-	3	-
Hubei	5	6	-	6	-
Hunan	2	4	2	1	-Y
Inner Mongolia	1	1	-	4	-

D. Agriculture & Biotechnology

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	10	3	-	2	-
Jiangxi	-	1	-	1	-
Jilin	4	1	-	3	Y
Liaoning	-	-	2	2	-
Ningxia	-	1	-	2	-
Qinghai	-	-	-	1	-
Shaanxi	1	5	-	2	-
Shandong	7	3	5	7	Y
Shanghai	4	2	1	1	-
Shanxi	-	-	-	1	-
Sichuan	1	-	2	2	Y
Tianjin	3	1	-	-	-
Tibet	-	-	1	-	Y
Xinjiang	1	5	2	7	Y
Yunnan	-	1	-	1	Y
Zhejiang	4	1	-	5	-

E. Food for the Future

Province	Fund	Facility	Firm	Field	Vision
Anhui	-	-	-	-	Y
Beijing	9	1	2	2	-
Chongqing	-	-	-	-	-
Fujian	-	-	2	-	-
Gansu	-	-	-	-	-
Guangdong	-	-	1	-	-
Guangxi	-	-	-	-	-
Guizhou	-	-	-	-	-
Hainan	-	-	-	-	-
Hebei	-	-	-	-	-
Heilongjiang	-	1	-	-	-
Henan	-	-	1	-	Y
Hubei	-	-	1	-	-
Hunan	-	-	-	-	-
Inner Mongolia	-	-	-	1	-

E. Food for the Future

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	1	2	-	-	-
Jiangxi	-	-	-	1	-
Jilin	1	-	-	-	-
Liaoning	1	-	-	1	-
Ningxia	-	-	-	-	Y
Qinghai	-	-	-	-	-
Shaanxi	-	-	-	-	-
Shandong	-	-	2	-	Y
Shanghai	-	-	-	-	-
Shanxi	-	-	-	-	-
Sichuan	-	-	2	-	-
Tianjin	1	-	-	1	Y
Tibet	-	-	-	-	Y
Xinjiang	-	-	-	-	Y
Yunnan	-	-	-	-	-
Zhejiang	2	-	-	-	-

F. Robotics

Province	Fund	Facility	Firm	Field	Vision
Anhui	-	-	1	1	Y
Beijing	1	2	3	1	Y
Chongqing	-	-	1	2	-
Fujian	-	-	-	1	-
Gansu	-	-	1	-	-
Guangdong	-	1	1	-	-
Guangxi	-	-	-	-	Y
Guizhou	-	-	-	-	-
Hainan	-	-	-	-	-
Hebei	-	-	-	1	-
Heilongjiang	-	2	-	-	-
Henan	-	-	-	-	Y
Hubei	-	1	-	-	Y
Hunan	-	-	-	1	Y
Inner Mongolia	-	-	-	-	-

F. Robotics

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	-	-	-	2	Y
Jiangxi	-	-	-	-	Y
Jilin	-	-	-	-	Y
Liaoning	-	1	2	1	Y
Ningxia	-	-	-	-	-
Qinghai	-	-	-	-	-
Shaanxi	-	1	-	-	Y
Shandong	-	-	-	-	Y
Shanghai	-	-	-	-	Y
Shanxi	-	-	1	-	-
Sichuan	-	-	-	-	Y
Tianjin	-	-	1	-	Y
Tibet	-	-	-	-	-
Xinjiang	-	-	-	-	-
Yunnan	-	-	-	-	-
Zhejiang	-	2	1	1	Y

G 1-2 Aviation

Province	Fund	Facility	Firm	Field	Vision
Anhui	-	-	-	-	Y
Beijing	2	5	-	1	Y
Chongqing	-	-	-	-	-
Fujian	-	-	-	-	-
Gansu	-	-	-	-	Y
Guangdong	-	-	-	-	-
Guangxi	-	-	-	-	-
Guizhou	-	-	-	1	-
Hainan	-	-	-	-	-
Hebei	-	-	-	-	-
Heilongjiang	-	-	-	-	-
Henan	-	-	-	-	-
Hubei	-	-	-	-	Y
Hunan	-	-	-	-	Y
Inner Mongolia	-	-	-	-	-

G 1-2. Aviation

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	1	1	-	-	Y
Jiangxi	-	1	-	2	Y
Jilin	-	-	-	-	Y
Liaoning	1	-	1	-	Y
Ningxia	-	-	-	-	-
Qinghai	-	-	-	-	-
Shaanxi	-	3	-	1	Y
Shandong	-	-	-	-	-
Shanghai	-	-	-	-	Y
Shanxi	-	-	-	-	-
Sichuan	2	-	-	-	Y
Tianjin	1	-	-	-	Y
Tibet	-	-	-	-	-
Xinjiang	-	-	-	-	-
Yunnan	-	-	-	-	-
Zhejiang	-	-	-	-	-

G 3-4. Logistic

Province	Fund	Facility	Firm	Field	Vision
Anhui	-	-	1	1	-
Beijing	7	5	-	1	-
Chongqing	-	-	1	-	-
Fujian	-	-	-	-	-
Gansu	-	-	-	-	-
Guangdong	-	-	-	-	-
Guangxi	-	-	-	-	-
Guizhou	-	-	-	-	-
Hainan	-	-	-	-	-
Hebei	-	-	-	-	-
Heilongjiang	-	-	-	-	-
Henan	-	-	-	-	-
Hubei	-	-	-	-	-
Hunan	-	-	-	-	-
Inner Mongolia	-	-	-	-	-

G 3-4 Logistic

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	1	1	2	-	-
Jiangxi	-	-	-	-	-
Jilin	-	-	-	-	-
Liaoning	-	-	-	-	-
Ningxia	-	-	-	-	-
Qinghai	-	-	-	-	-
Shaanxi	-	-	-	-	-
Shandong	-	-	-	-	-
Shanghai	-	-	-	-	-
Shanxi	-	-	-	-	-
Sichuan	-	-	-	-	-
Tianjin	-	-	-	-	-
Tibet	-	-	-	-	-
Xinjiang	-	-	-	-	-
Yunnan	-	-	-	-	-
Zhejiang	1	-	-	-	-

H. Biofuels and Biochemicals

Province	Fund	Facility	Firm	Field	Vision
Anhui	-	-	2	1	-
Beijing	3	5	1	6	-
Chongqing	-	-	-	-	Y
Fujian	-	-	1	-	Y
Gansu	-	-	-	-	Y
Guangdong	-	1	-	3	Y
Guangxi	-	-	-	2	Y
Guizhou	-	1	-	-	-
Hainan	-	-	-	-	Y
Hebei	-	-	-	2	Y
Heilongjiang	-	1	-	1	Y
Henan	-	-	-	1	Y
Hubei	-	1	-	-	-
Hunan	-	1	-	-	-
Inner Mongolia	-	-	1	1	-

H. Biofuels and Biochemicals

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	-	3	-	-	Y
Jiangxi	-	-	1	-	Y
Jilin	-	-	-	1	-
Liaoning	-	-	1	2	Y
Ningxia	-	-	-	-	Y
Qinghai	-	-	2	1	Y
Shaanxi	-	-	-	1	-
Shandong	-	1	2	1	-
Shanghai	-	4	-	-	-
Shanxi	-	-	-	-	-
Sichuan	-	1	-	1	-
Tianjin	-	-	-	2	Y
Tibet	-	-	-	-	Y
Xinjiang	-	1	-	-	Y
Yunnan	-	-	1	-	-
Zhejiang	1	-	-	1	Y

I. Digital

Province	Fund	Facility	Firm	Field	Vision
Anhui	2	-	2	-	Y
Beijing	21	19	14	3	Y
Chongqing	-	-	-	1	Y
Fujian	-	-	7	1	Y
Gansu	-	-	-	-	Y
Guangdong	4	-	5	2	Y
Guangxi	-	-	-	-	-
Guizhou	-	-	-	-	Y
Hainan	-	-	-	-	Y
Hebei	1	-	-	1	Y
Heilongjiang	-	-	-	-	Y
Henan	1	1	1	-	Y
Hubei	-	5	3	-	Y
Hunan	4	1	-	-	Y
Inner Mongolia	-	-	-	-	Y

I. Digital

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	2	5	3	2	Y
Jiangxi	-	-	-	1	Y
Jilin	-	-	1	-	Y
Liaoning	-	-	3	1	Y
Ningxia	-	-	-	-	Y
Qinghai	-	-	-	-	Y
Shaanxi	-	3	1	3	Y
Shandong	1	-	3	6	Y
Shanghai	2	2	4	3	Y
Shanxi	1	1	-	-	Y
Sichuan	1	1	1	2	Y
Tianjin	-	-	-	1	-
Tibet	-	-	-	-	-
Xinjiang	-	-	-	-	-
Yunnan	-	-	1	-	Y
Zhejiang	1	2	4	2	Y

J. Medical Hub

Province	Fund	Facility	Firm	Field	Vision
Anhui	3	-	3	-	Y
Beijing	81	13	4	18	Y
Chongqing	1	2	7	5	Y
Fujian	1	1	-	4	-
Gansu	-	-	-	3	Y
Guangdong	20	6	3	8	-
Guangxi	-	-	1	3	-
Guizhou	-	-	3	-	Y
Hainan	-	-	3	2	Y
Hebei	-	-	3	6	Y
Heilongjiang	3	-	2	1	-
Henan	1	1	-	3	Y
Hubei	13	2	-	3	Y
Hunan	2	2	3	3	Y
Inner Mongolia	-	-	-	-	Y

J. Medical Hub

Province	Fund	Facility	Firm	Field	Vision
Jiangsu	15	2	2	9	Y
Jiangxi	-	-	4	-	-
Jilin	2	-	3	4	Y
Liaoning	4	1	2	5	Y
Ningxia	-	-	1	-	-
Qinghai	-	1	2	1	-
Shaanxi	6	1	-	-	Y
Shandong	8	3	5	1	Y
Shanghai	48	9	5	8	Y
Shanxi	2	-	1	1	Y
Sichuan	22	3	4	5	Y
Tianjin	6	2	3	6	-
Tibet	-	1	3	-	Y
Xinjiang	-	-	1	2	-
Yunnan	1	1	2	2	Y
Zhejiang	12	2	4	2	Y

Thailand 4.0 Technology Top 5 China Provinces

Thailand 4.0 Map		Fund	Facility	Firm	Field
A	Next-generation Automotive	Beijing Liaoning Shanghai Tianjin Chongqing	Beijing Anhui Chongqing Hunan Jilin	Anhui Shandong Guangdong Zhejiang Chongqing	Beijing Chongqing Shandong Shanghai Anhui
B	Smart Electronics	Beijing Guangdong Jiangsu Shanghai Anhui	Beijing Hubei Sichuan Jilin Shanghai	Guangdong Shanghai Shandong Anhui Tianjin	Guangdong Beijing Hubei Liaoning Hebei
C	Affluent, Medical & Wellness Tourism	Beijing	-	-	Anhui
D	Agriculture & Biotechnology	Beijing Jiangsu Shandong Guangdong Hubei	Beijing Hubei Shaanxi Xinjiang Hunan	Shandong Beijing Hunan Sichuan Liaoning	Beijing Shandong Xinjiang Guangxi Hubei
E	Food for the Future	Beijing Zhejiang Jilin Tianjin Liaoning	Jiangsu Beijing Heilongjiang	Beijing Fujian Shandong Sichuan Guangdong	Beijing Inner Mongolia Jiangxi Liaoning Tianjin

Thailand 4.0 Technology Top 5 China Provinces

Thailand 4.0 Map		Fund	Facility	Firm	Field
F	Robotics	Beijing	Beijing Heilongjiang Zhejiang Liaoning Shaanxi	Beijing Liaoning Guangdong Anhui Shanxi	Chongqing Jiangsu Liaoning Beijing Zhejiang
G	Aviation & Logistic	Aviation — Logistic Beijing — Beijing Sichuan— Jiangsu Jiangsu —Zhejiang Liaoning —- —— Tianjin ————	Aviation — Logistic Beijing — Beijing Shaanxi— Jiangsu Jiangsu ——— Jiangxi ——-	Aviation — Logistic Liaoning Jiangsu —-— Anhui — —- Chongqing	Aviation — Logistic Jiangxi Anhui Beijing Beijing Guizhou ——— Shaanxi ———
H	Biofuels and Biochemicals	Beijing Zhejiang	Beijing Shanghai Jiangsu Guangdong Hubei	Anhui Shandong Qinghai Beijing Jiangxi	Beijing Guangdong Liaoning Tianjin Hebei
I	Digital	Beijing Guangdong Hunan Shanghai Jiangsu	Beijing Hubei Jiangsu Shaanxi Shanghai	Beijing Guangdong Shanghai Zhejiang Jiangsu	Shandong Beijing Shanghai Shaanxi Jiangsu
J	Medical Hub	Beijing Shanghai Sichuan Guangdong Jiangsu	Beijing Shanghai Guangdong Shandong Sichuan	Chongqing Shandong Shanghai Beijing Jiangxi	Beijing Jiangsu Guangdong Tianjin Hebei