

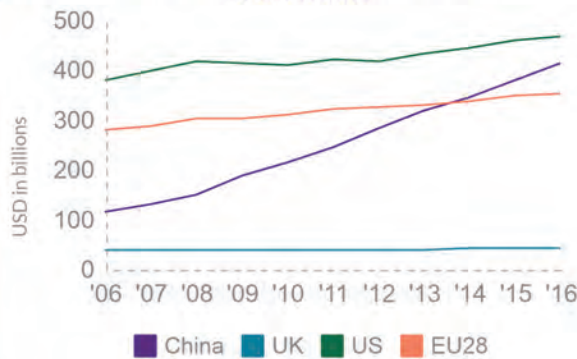
# CHINA & INNOVATION: THE COLLABORATION ENVIRONMENT

China's rapid innovation capability growth and technological advances are becoming more widely known. What can the statistics tell us about China's development and the environment for collaboration?

## GOVERNMENT DRIVEN ECONOMY

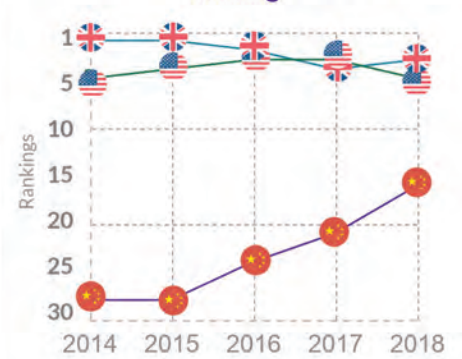
- Innovation is the number one guiding principle in 13th Five Year Plan.
- Significant R&D investment, which show no signs of slowing.
- OECD predicts that by 2020 China's R&D spend will overtake the US.

Gross domestic spending on R&D in the 2000s



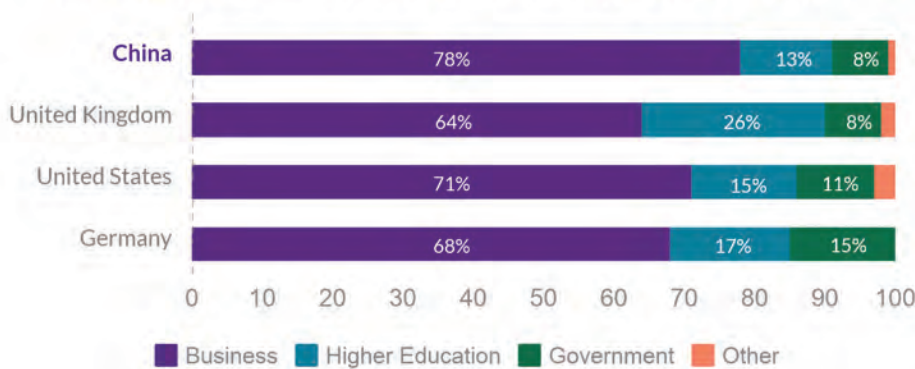
Source: OECD data

Global Innovation Index ranking



Source: Global Innovation Index Annual Reports

Total R&D expenditure by sector as a percentage of the whole in 2014



Source: Performance of the UK research base: international comparison, 2016, Department for Business, Energy and Industrial Strategy

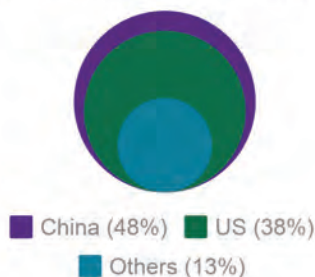
## DYNAMIC BUSINESS ENVIRONMENT

- China has globally leading start-up ecosystems and tech hubs, especially in Beijing and Shanghai.
- China accounted for 27% of global VC funds in 2016, up from 5% in 2013.
- Significant proportion of China's R&D is undertaken by business.

## FOCUS ON EMERGING TECHNOLOGIES AND THE INDUSTRIES OF THE FUTURE

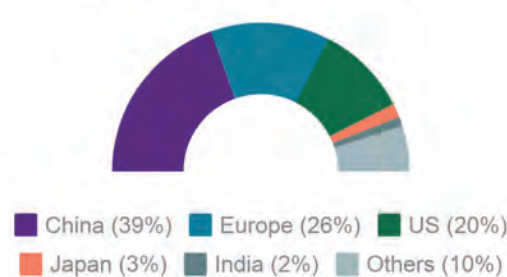
- Work motivated by key Government strategies, such as Made in China 2025, Internet Plus and the Innovation Driven Development Strategy.
- China is playing a role in international standard setting, especially in 5G, where they are working with Japan and Korea on the roll out across Asia.

Share of global Artificial Intelligence funding in 2017 by country



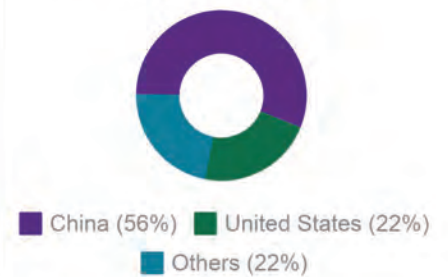
Source: CBI Insights State of Artificial Intelligence 2018

Share of global Electric Vehicles market in 2030 by country



Source: Electric Vehicle Outlook 2018, Bloomberg New Energy Finance

Share of Blockchain patents globally in 2017



Source: Thomson Reuters

## CHINA'S NATIONAL CHAMPIONS ARE BEGINNING TO RIVAL THE ESTABLISHED TECHNOLOGY DRIVEN MULTINATIONALS

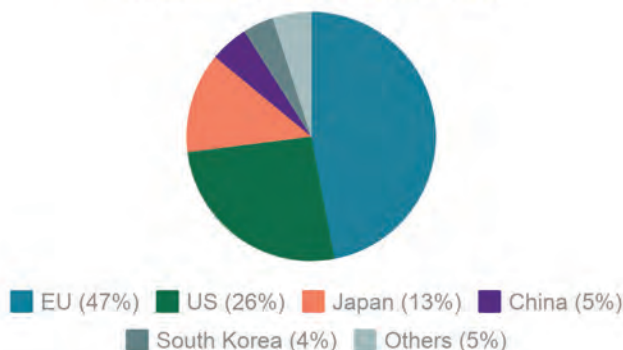
- In 2017 Huawei was the first Chinese company to file the most European patents in one year.
- However, China is still developing its innovation capabilities and overall numbers of Chinese patents filed in the EU remains low.

### Top 5 European patent filers

	2013	2014	2015	2016	2017
1	Samsung	Samsung	Philips	Philips	Huawei
2	Siemens	Philips	Samsung	Huawei	Siemens
3	Philips	Siemens	LG	Samsung	LG
4	LG	LG	Huawei	LG	Samsung
5	BASF	Huawei	Siemens	United Tech	Qualcomm

Source: European Patent Office Annual Reports

### Country of origin of European patent applications as % of total in 2017



Source: European Patent Office Annual Reports

## FAST MOVING MARKET

- Continual desire for new products. Large e-commerce market creates fast circulation of goods.
- Ease of transactions has increased with adoption of mobile payments.
- Chinese consumers adopt new technologies quickly. From 2013 - 2016 the number of transactions made through non-banking mobile apps increased from 3.4 billion to over 97 billion.

Most innovative German companies say their Chinese customers tend to look for new products all the time



Source: German Business in China, Greater Shanghai Innovation Survey, 2017

## How Chinese consumers see the future of e-commerce



Source: KPMG

## CIELA Rouse's innovative IP litigation analysis service

### Civil Invention Patent Litigation 2006 - 2017

	WIN RATE	INJUNCTION RATE	NUMBER OF CASES
ALL CASES (100%)	69%	68%	1,078
FOREIGN V. DOMESTIC (23%)	83%	79%	245
DOMESTIC V. DOMESTIC (77%)	64%	65%	833

### Statutory Damages for Civil Invention Patent Litigation 2006 - 2017

	MEAN COMPENSATION AWARDED (CNY)	MEDIAN COMPENSATION AWARDED (CNY)	NUMBER OF WINNING CASES
ALL CASES	203,049	100,000	688
FOREIGN V. DOMESTIC	258,477	150,000	186
DOMESTIC V. DOMESTIC	182,513	100,000	502

As China becomes more innovative there is a need to move away from the historic approach. New joint 'innoventure' is required which demands new models to reflect risk and opportunity.

## BARRIERS TO COLLABORATION

- Intellectual property is often cited as key barrier. The situation is more nuanced.
- A number of factors influence successful partnerships: technology landscape; regulations; funding sources; collaborators and competitors.
- China's IP system is developing rapidly. Focused on domestic activity but that doesn't mean foreign entities can't utilise the system.

# ROUSE