



MADE IN CHINA 2025

China's push for global competitiveness
in advanced manufacturing

intouch
MANUFACTURING SERVICES

BEFORE WE BEGIN...



**Products made in China are
often thought of as cheap,
low-quality goods...**

BEFORE WE BEGIN...



**But you CAN import products
made in China that meet your
quality standards, if you let
go of these kinds of
misconceptions.**

NEED HELP WITH MANAGING PRODUCT QUALITY IN CHINA?



Download our eBook to learn how to avoid common mistakes
importers make when manufacturing in China!

**eBook:
5 Misconceptions
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in China**

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CHINA'S MOVE UP THE VALUE CHAIN



Made in China 2025 is a 10 year government initiative, and the first stage of a larger 3-part strategy, aimed at transforming China by 2049 into one of the world's most advanced and competitive economies.



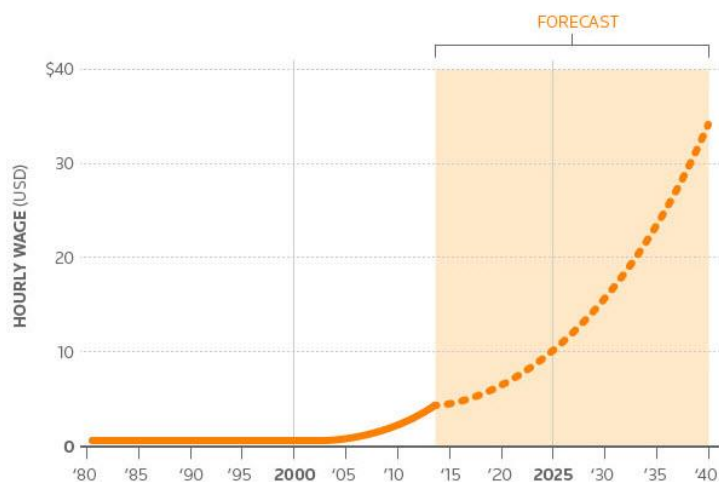
While China's manufacturing industry has undoubtedly earned its reputation as the "factory of the world," **rising labor costs** have recently led some foreign firms to move production to emerging economies in Southeast Asia.



China aims **to utilize innovative manufacturing technologies** ("smart manufacturing") to continue to move up the manufacturing value chain.

STRUCTURAL CHANGES IN CHINA'S ECONOMY

Forecasted hourly manufacturing wages in China



SOURCE: OXFORD ECONOMICS, THOMSON REUTERS DATASTREAM



China's **low-skilled, low-cost manufacturing model** is no longer sustainable as its economy changes.



Labor costs are rising in part due to an aging workforce, as well as rising worker expectations for higher paid and higher quality jobs.



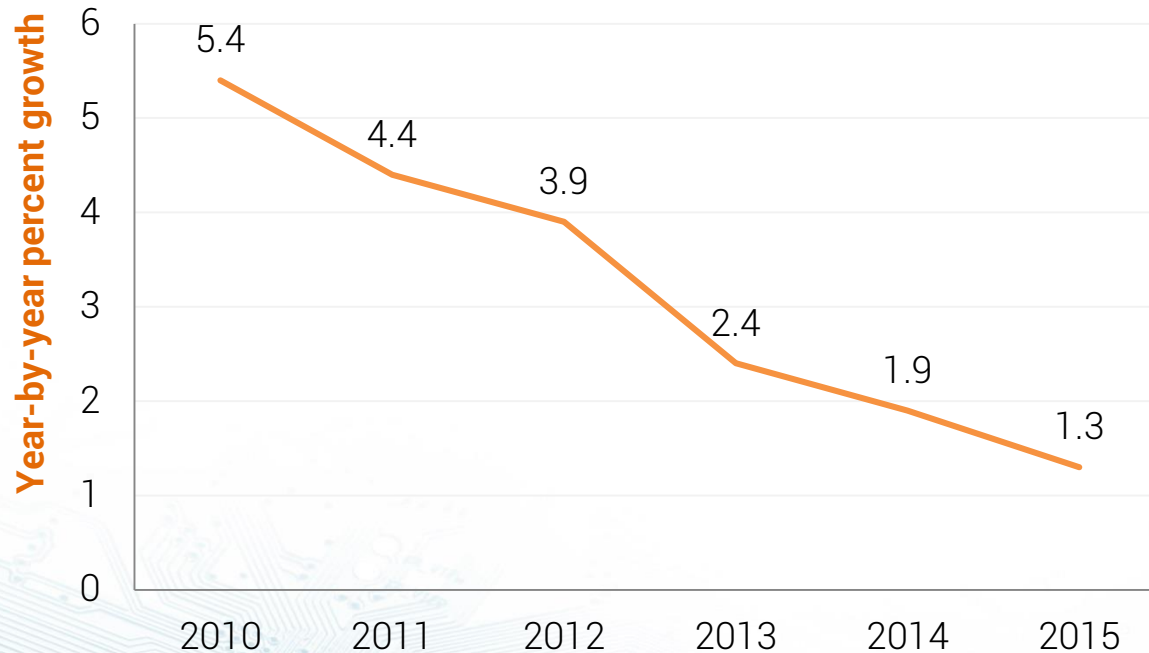
Decades population control have caused has caused China's population to already start shrinking and aging. Even with the recent relaxation of the one-child policy, China's workforce is expected to shrink by 1/3 by 2050.



China's annual growth rate has slowed to less than 7%. China's economy now requires diversification to transition from a middle income to high income economy.

SLOWING MIGRANT WORKFORCE GROWTH

Growth in Chinese migrant workforce

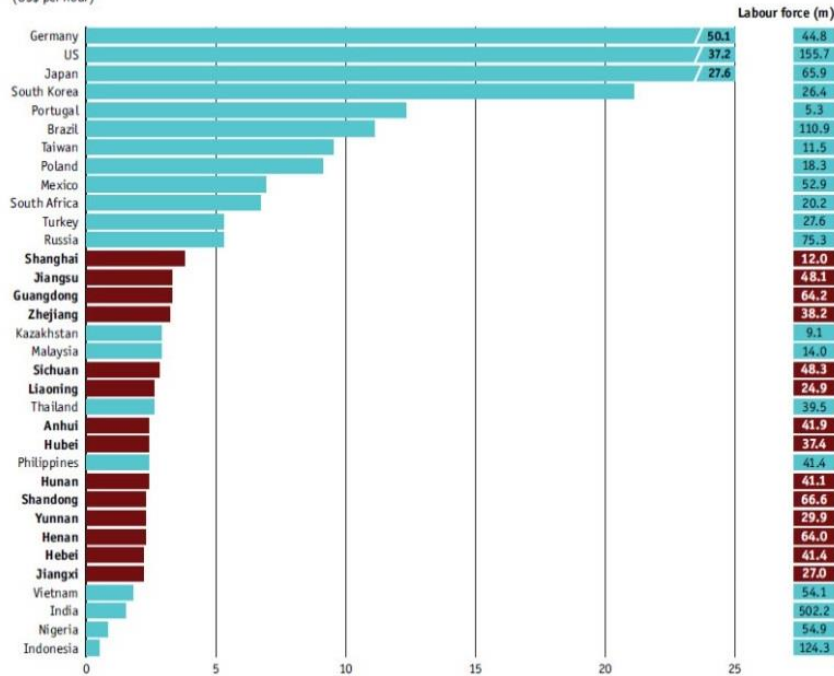


While **migrant workers** from China's internal provinces have provided a steady flow of lower-cost labor to factories, this rate has also been gradually slowing since 2010

Source: National Bureau of Statistics of China

DOUBLE PRESSURE

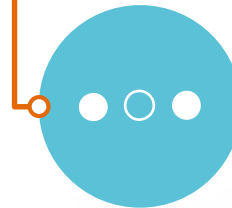
Manufacturing labour costs in select provinces and countries, 2014
(US\$ per hour)



Source: The Economist Intelligence Unit.



While China's labor costs are rising higher than its neighbors' in **Southeast Asia**, they are still much lower than in the developed world.



But as wages continue to rise, China finds itself caught between **competing with low-cost developing countries and advanced economies.**

FOCUS ON INNOVATIVE MANUFACTURING TECHNIQUES



Made in China 2025 is China's blueprint to compete with the likes of the U.S., Japan, and Germany as a high-income, **modern manufacturing center** for innovation and high-tech production.



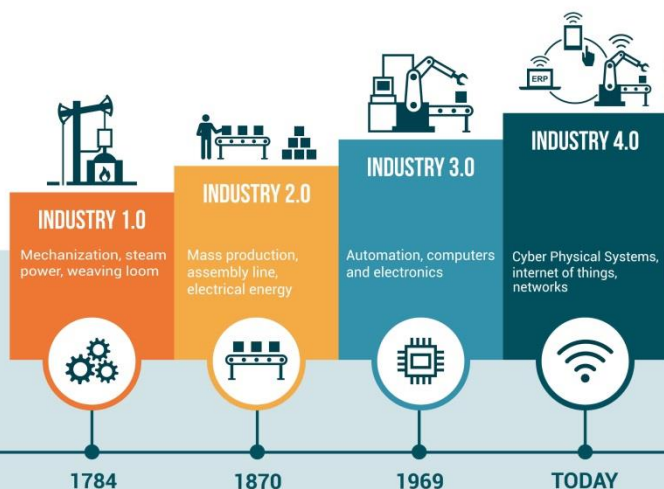
China's manufacturing industry still has many strengths to capitalize on as it goes through this transition:

- Well-developed infrastructure
- Accessibility to ports and partners in the dynamic Southeast Asian region
- Growing demand from a domestic consumer class

PRODUCTION ADVANCES IN THE INDUSTRIAL REVOLUTION

INDUSTRIAL REVOLUTION

TRANSFORMING INDUSTRIES AND INNOVATION



Mechanized production

- **The 1st Industrial Revolution:** Starting in **1784**, advances in steam power promoted the **transition from hand production to machines**. The cotton gin and steam engine improved efficiency

Mass Production

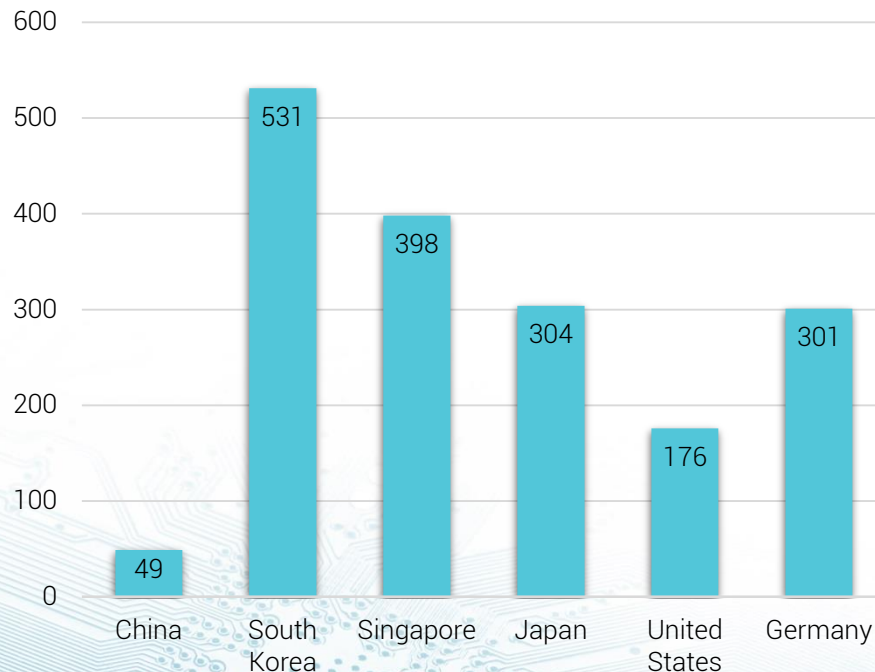
- **The 2nd Industrial Revolution:** Starting in **1870**, advances in electric power promoted the **division of labor and specialization**. The telephone, light bulb, phonograph and the internal combustion engine were invented. The assembly line was adopted

Automated Production

- **The 3rd industrial Revolution:** Starting in the **1980s**, this ongoing period is known as the **"Digital Revolution."** Noteworthy advances include the invention of personal computers, the Internet, and information and communication technology

CHINA IS STILL IN THE 3RD REVOLUTION STAGE

Industrial robots utilized per 10,000 industry employees



Source: International Federation of Robotics, World Robotics 2016 edition

- **The adoption of machines and automation** is pillar of the 3rd Industrial Revolution. All advanced economies have completed this stage, but China has yet to implement this technology universally
- Chinese enterprises utilize an average of just 49 **industrial robots** per 10,000 industry employees
 - Global average: 69, Europe average: 92, North and South America average: 86, Asia average: 57
- China's **robotic utilization** is close to reaching the Asian average, but is far behind the levels of advanced economies

SMART MANUFACTURING AS PART OF THE 4TH INDUSTRIAL REVOLUTION

Compared to the 3rd industrial revolution, the 4th revolution will have relatively high impact at comparatively little replacement of equipment

1st revolution
Water/Steam



2nd revolution
Electricity



3rd revolution
Automation



4th revolution
Cyberphysical systems



Replacement of equipment

Percent of installed base



SOURCE: Statistisches Bundesamt; Deutsche Bundesbank; Prognos; Thomas Nipperdey; McKinsey

The 4th Industrial Revolution builds on the digitization of production in the 3rd Revolution. In this stage, technology is combined and integrated into processes and societies in order to fuse the digital and physical world

It includes **technological breakthroughs** in robotics, artificial intelligence, nanotechnology, biotechnology, Internet of Things, 3D printing and autonomous vehicles

Smart manufacturing refers to the manufacturing industry's implementation of these technological breakthroughs

WHAT IS SMART MANUFACTURING?



Smart manufacturing processing can help manufacturers increase flexibility to customer demand, increase product customization, and reduce lead times



Implementation of technology like intelligent machines, advanced communication systems, big data and cloud computing



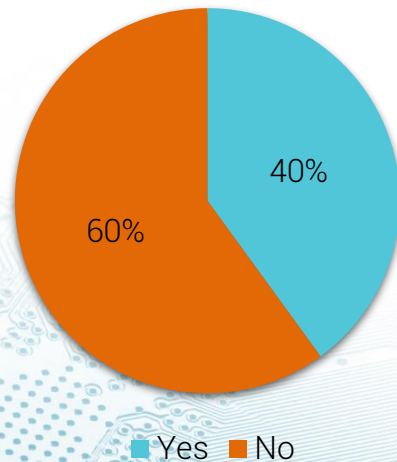
The use of **cyber-physical systems** that create and analyze **big data** to optimize production processes and logistics



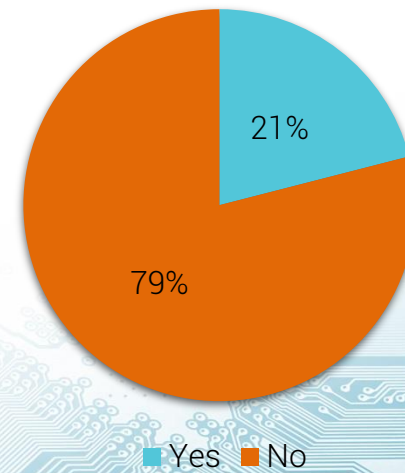
Adopting software that increases flexibility of production and degree of customization

- In a survey of 100 Chinese companies, only 10 firms have started operative projects to implement **smart manufacturing processes**
- The percentage of Chinese enterprises that are testing or using Industry 4.0 applications has not reached the level found in Germany

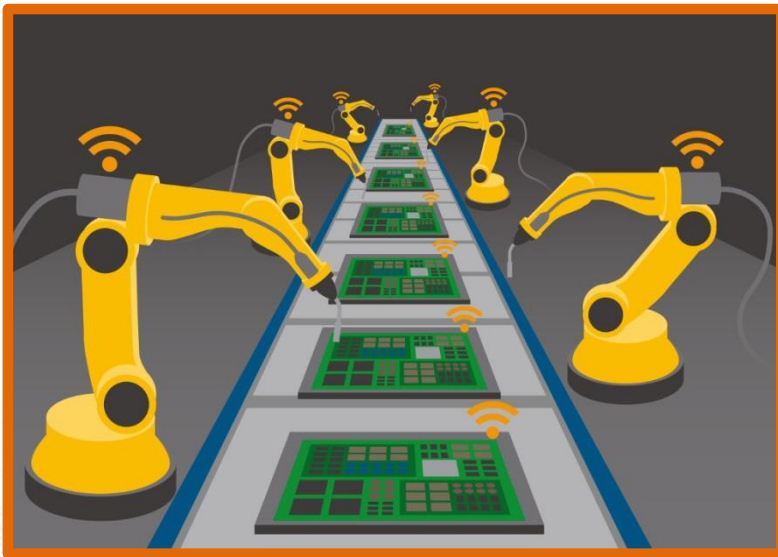
German enterprises testing or using Industry 4.0 applications



Chinese enterprises testing or using Industry 4.0 applications



MADE IN CHINA 2025 COMBINES 3RD AND 4TH REVOLUTION TECHNOLOGIES



3+4

Made in China 2025 therefore differs from the U.S. and Germany's Industry 4.0 strategies in that it **combines advances in 3rd and 4th revolution technology**



The rate of adoption of **Industry 4.0 technology** will vary among companies depending on their existing usage of industrial robots and machinery

TARGETED KEY SECTORS



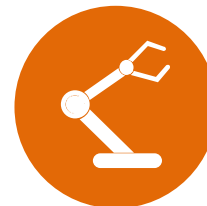
Automotive



Aviation



Agricultural
Machinery



Numerical control
tools and robotics



High-tech maritime
equipment



Railway
transportation
equipment



Energy-saving
vehicles



Medical
devices



Information
technology

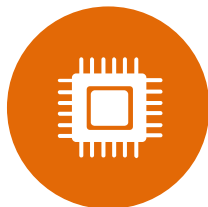


Power equipment

9 SPECIFIC GOALS WITHIN KEY SECTORS



Improving
manufacturing
innovation



Integrating
technology
and industry



Strengthening
the industrial
base



Fostering Chinese
brands



Enforcing green
manufacturing



Promoting
breakthroughs
in the above key
sectors



Advancing
restructuring of
the manufacturing
sector



Promoting service-
oriented manufacturing
and manufacturing-
related service
industries



Internationalizing
manufacturing

5 PROJECTS TO ACHIEVE GOALS



1. Construction of manufacturing innovation centers
 - Industrial technology research bases



2. Smart manufacturing projects
 - Automation, use of smart manufacturing in production, optimizing supply chains



3. Manufacturing base strengthening projects
 - Focus on overcoming outdated technology bottlenecks

5 PROJECTS TO ACHIEVE GOALS



4. Green manufacturing projects

- Reduce environmental and resource restrictions on economic development
- 1000 model green factories and 100 model green industrial parks are to be established by 2020.

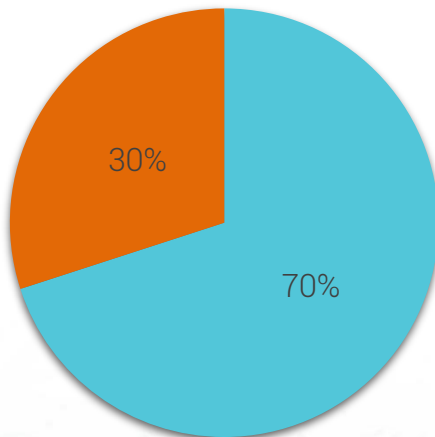


5. High-end equipment innovation projects

- Attain intellectual property rights

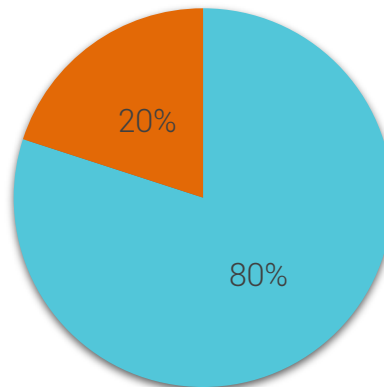
KEY PRODUCTION TARGETS FOR THE CHINESE MARKET BY 2025

Industrial Robots



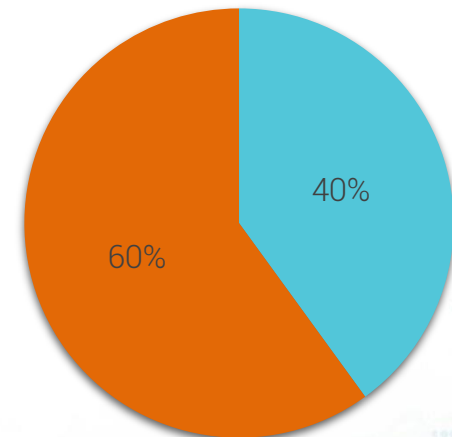
■ Domestically Produced
■ Foreign Produced

Renewable Energy Equipment



■ Domestically Produced
■ Foreign Produced

Mobile Phone Chips

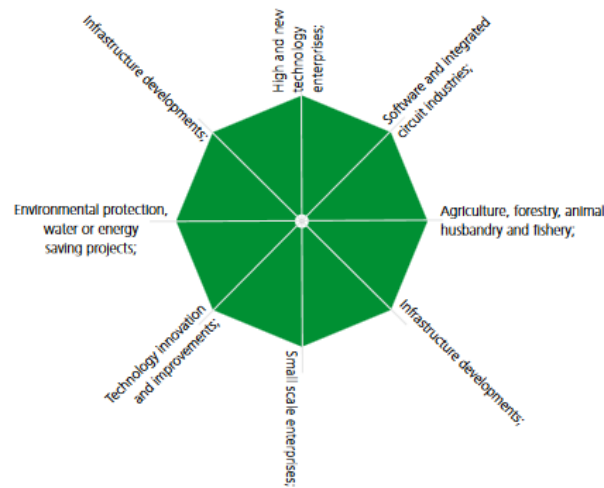


■ Domestically Produced
■ Foreign Produced

Source: Mercator Institute for China Studies, Made in China 2025

HOW CAN WE SEE MADE IN CHINA 2025 IMPLEMENTED TODAY?

Under the EITL (Enterprise Income Tax Law), preferential tax treatments are offered to the following encouraged activities and industries:



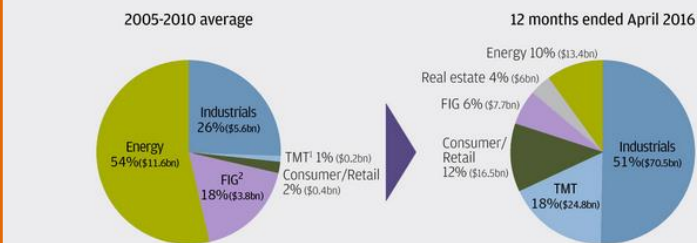
Adoption of preferential taxation policies to stimulate further growth in the targeted sectors

- Expansion of the Enterprise Income Tax Law policies enacted in 2007
- Important high-tech enterprises that are deemed necessary to be supported by the state benefit from a reduced tax rate of 15%, compared to the standard 25%

Source: Deloitte, China Factors: A Guide for Investing in China

HOW CAN WE SEE MADE IN CHINA 2025 IMPLEMENTED TODAY?

China outbound M&A by target sector



Source: Dealogic (M&A Manager), as of May 6, 2016; includes deals with value greater than \$10mm; the percentages have been rounded to the nearest whole number.

¹ Technology, Media & Telecommunications. ² Financial Institutions Group.



Mergers and acquisitions of international high-tech companies by Chinese investors

- To supplement lack of innovation domestically and achieve technological catch up faster

China's share of M&As in the Asia-Pacific region has increased from 7% in 2005 to 50% in 2015



Over the same period, M&As in industrials increased from \$5.6 billion to \$70.5 billion. Technology, media & telecommunications (TMT) increased from \$0.2 billion to \$24.8 billion

Asia Pacific M&A volume (\$bn)



Source: Dealogic (M&A Manager), as of May 6, 2016; includes M&A activity where Asia Pacific company acted as acquirer, target or divester; deals with value greater than \$10mm

A RECORD \$249 BILLION IN M&A DEALS IN 2016



- HNA Group purchased the U.S. high-tech technology distributor Ingram Micro Inc for \$6.3 billion
- Haier Group bought General Electric's home appliance division for \$5.4 billion
- ChemChina bought German industrial machinery maker, KraussMaffei Group for \$1 billion
- Wanfeng Technology Group, a privately-owned Zhejiang-based robotics maker, acquired the U.S. industrial robot manufacturer Paslin for \$300 million
- ChemChina's acquisition of the Swiss pesticide and seed producer Syngenta AG for \$43 billion – the largest overseas acquisition by a Chinese company to date – is currently under review, but expected to be finalized in April 2017
- China's Fujian Grand Chip Investment Fund LP wanted to acquire Aixtron, a German semiconductor equipment company, but the U.S. government blocked it over national security concerns (as semiconductor equipment is also used in weapons systems

HOW CAN WE SEE MADE IN CHINA 2025 IMPLEMENTED TODAY?

Increased Research and Development Funding

- Percentage of R&D funds of large manufacturing companies should increase from 0.95% in 2015 to 1.68% by 2025
- From 2013 to 2015, Chinese inventors registered more than 2,500 patents for Industry 4.0-enabling technologies. In the U.S., this number was 1,065 and in Germany 441
 - Experts estimate that only around 35 percent will actually meet the criteria for patentability
- So far, only 30% of technological research is being put in practice in China, compared with nearly 70% for advanced economies
 - Due to lack of sufficient protection for intellectual property rights and the lack of channels for technologies to transition from labs into the real world

China

2500

United States

1065

Germany

441

**Number of Industry 4.0 Patents Registered,
2013-2015**

HOW CAN WE SEE MADE IN CHINA 2025 IMPLEMENTED TODAY?

- **Increased lending by government of China policy banks and commercial banks to key sectors**
- China's allocated funding for Made in China 2025 greatly eclipses that of other big-spenders on manufacturing, like the U.S. and Germany

China

\$23.1B

- 20 billion RMB for the Advanced Manufacturing Fund (2.9 billion USD)
- 139 billion RMB for the National Integrated Circuit Fund (20.2 billion USD)

Germany

\$213 M

- German government providing €200m (213.5 million USD) for Industry 4.0 technologies

United States

\$70 M

- U.S. government providing 70 million USD (to be matched by private investment for total 140 million USD) for the Smart Manufacturing Innovation Institute

COMPANIES IMPLEMENTING SMART MANUFACTURING



The Fujitsu logo, consisting of the word "FUJITSU" in red capital letters, with a red infinity symbol above the 'i'.

Fujitsu, a Japanese information technology company, and INESA, a state-owned company in China that provides smart city solutions, have partnered together to turn a color-filter plant into a smart factory. This is to be accomplished with the use of tools such as Fujitsu's sensors, network technologies, a dashboard solution, and a big data analysis platform

The Wasion logo, featuring the word "WASION" in blue capital letters, with a stylized blue 'W' symbol to the left.

Wasion, a supplier of advanced energy metering products, expects to invest RMB 159 million (\$23.1 million) in smart manufacturing, focusing on metering and electrical equipment production, as well as research and development, with robotics technologies playing a pivotal role. It is collaborating with Rethink Robotics, a U.S. company, to implement robots on its assembly line

The QCMT logo, featuring the letters "QCMT" in blue, with a stylized blue 'Q' and 'C' to the left, and Chinese characters below.

The third-largest machine tool manufacturer in China, Qinchuan Machine Tool & Tool Group (QCMT&T), has built a complete Industry 4.0 production line with the help of Bosch Rexroth, a German engineering firm

The EWP logo, featuring the letters "EWP" in a bold, blue, stylized font.

Shenzhen Everwin Precision Technology Ltd's "zero-labor" project aims to scale down its workforce from 2000 employees to 200 by implementing 1000 robots on its assembly line

TECHNOLOGY IS THE KEY TO ACTUALIZATION OF MADE IN CHINA 2025



The promotion and dissemination of smart manufacturing technology is the centerpiece of the strategy. The target industries, goals, and projects all rely on **technological advances**



In order to be a leader in the industry, China must drive its own **technological acquisition and innovation**. Current imports of foreign technology will need to be replaced by domestically produced technology

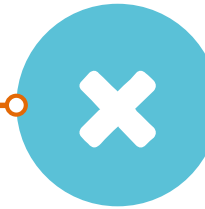


Goal of Made in China 2025 is that in the long term, domestically produced technology will **replace foreign imports**

CHINA'S TECHNOLOGICAL GAP



But China must overcome it's **current technology gap**



Chinese suppliers are not able to meet demand for smart manufacturing technology at their current technological level due to:

- Lack of knowledge and qualifications of employees and executives
- Limited standardization of technology and processes
- Insufficient broadband internet connections
- Legal uncertainties regarding protection of patents and data



In the short term, there will be profits and opportunities for international companies as Chinese companies look abroad for technology. But in the long term, the Chinese government hopes domestic demand will be met by **Chinese manufacturers**

EVALUATING THE CHALLENGES TO MADE IN CHINA 2025



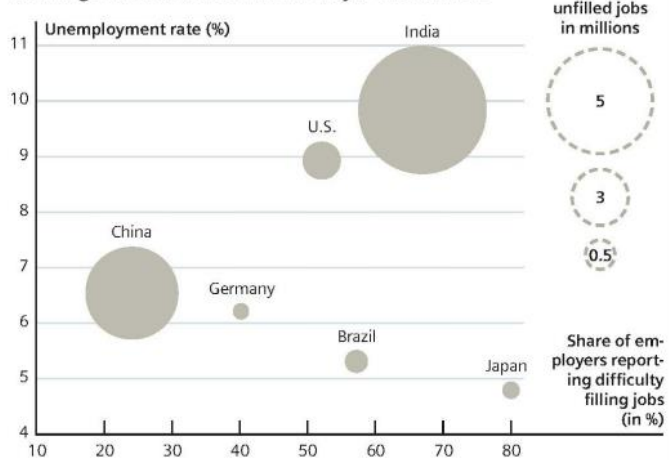
There is **a lack of bottom-up initiative and investment**, as the initiative is still largely promoted from the state at the top

- Chinese enterprises are still reluctant and risk-averse to investing in high-tech equipment for production. They are content to opt for **low-cost solutions** that only require low upfront investment
- No market-forces are pressuring enterprises to modernize and maintain competitiveness like in Western liberal economies. Instead, **Chinese enterprises rely on the state** for market dominance

EVALUATING THE CHALLENGES TO MADE IN CHINA 2025

Unfilled Jobs in Manufacturing

Shortage of skilled workers in major economies



Source: Deloitte, The Future of Manufacturing, 2012



Workforce skills gap

- Upgrading production processes is likely to result in **job losses** among low skilled workforce – a phenomenon that is already visible in the United States
- Low-skilled workers will be replaced with a need for a high-skilled workforce. But **China's educational system** is not equipped to adequately educate enough high-skilled workers yet

CONCLUSION



Made in China 2025 reflects China's **move up the value chain** that can already be seen in the manufacturing industry today



China's ability to **develop innovative products** and stake a claim on the global stage is essential. China's brands are slowly gaining momentum internationally, but this must continue for it to compete with Western, advanced economies



Implementing **Industry 3.0 and Industry 4.0 technology** in production is the key to transforming China's factories from low-skilled workhouses into competitive modern facilities

IMPLICATIONS FOR CHINA AND THE WORLD



The actualization of this strategy has widespread implications for **China's economy, government and population**



The **manufacturing industry** remains the main pillar of the Chinese economy and therefore the Chinese government's legitimacy rests on ensuring the manufacturing industry remains competitive worldwide in order to support the livelihoods of much of China's population



If **Made in China 2025** is successful, advanced economies will be forced to reckon with a new competitor on the global stage. But in the short term, foreign companies can benefit by filling China's technological gap



Developing countries like Vietnam, India, Thailand and Cambodia will likely see more opportunities as foreign firms opt to set up low-cost manufacturing outside China

BEFORE YOU GO...



Download our free eBook to learn more
about managing product quality in China!

eBook: 5 Misconceptions of QC Inspection in China

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