



MADE IN CHINA 2025

China Manufacturing in the 21st Century -Opportunities for UK-China Partnership









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Foreword

Dr Mark Wareing Director Advanced Manufacturing & Transport UKTI China, British Embassy, Beijing



UK Trade & Investment (UKTI) is the part of UK Government that is responsible for growing the UK's exports and attracting investment into the UK.

In terms of UK exports, China is already our second largest single export destination with exports of £18.7 billion, of which £15.5 billion (83%) are manufactured goods which demonstrates the

importance of manufacturing to the UK economy.

Chinese businesses and consumers are demanding the best in design and quality and they recognise our long history of producing the very best in products, services and brands.

UKTI China is the largest in the UKTI network - we have over 150 staff across our Beijing Embassy and our British Consulates in Shanghai, Guangzhou, Chongqing and Wuhan. We work closely with UKTI Hong Kong, the Embassy's Outreach team and our service delivery partner CBBC.

Together we provide a comprehensive service for British companies who are looking at the incredible opportunities in China and we bring more Chinese companies to the UK to join the UK's leading innovation landscape to create the products for the future, for China and the world.

Made in China 2025 is a truly exciting strategy and it is fantastic to see how closely the skills, experience and capability of the UK's industrial base align with China's ambitions. In all of the 10 priority sectors China has identified, the UK is a world leader with the expertise to help China reach its goals.

We see the next stage of China's emergence as an economic superpower in its ambition to design and make the products of the future required not only by the Chinese consumer, but consumers around the world.

Creating products with greater intrinsic value and quality, and incorporating our environmental responsibilities are areas where our world leading academic institutions, our innovation and catapult centres, the rich open and collaborative new product development networks and our open and supportive business climate can take a leading role.

Mark Wareing Director Advanced Manufacturing & Transport



Made in China 2025 is a truly exciting strategy and it is fantastic to see how closely the skills, experience and capability of the UK's industrial base align with China's ambitions.

Foreword

Stephen Phillips Chief Executive China-Britain Business Council



I am delighted to introduce the latest report from the China-Britain Business Council, prepared in collaboration with UK Trade & Investment, examining the implications for UK business of the Chinese Government's Made in China 2025 Initiative. This is a highly ambitious initiative to comprehensively upgrade, consolidate and balance China's manufacturing industry.

Recognising the world-leading strengths of the UK, this report sets out to help companies and institutions understand both the opportunities and, indeed, challenges that this initiative will present. The UK is already world leader in so many relevant fields and this report demonstrates that there will be a wide range of new opportunities including:

- Technical and management consultancy services
- Standards, testing, compliance and certification
- Joint R&D and joint bidding
- Financing and investment
- Outbound investment
- Financial and professional services
- Design
- · Education and skills training

Made in China 2025 is ambitious and wide-ranging. It focuses on 10 priority sectors and in each of these we believe there are going to be new opportunities for British business. Each sector is analysed in detail in the report, including identifying how UK companies can get involved. It prioritises five nationwide initiatives with clear objectives to:

- · establish new innovation centres
- establish new research bases
- implement smart manufacturing projects
- implement green manufacturing projects
- prioritise high-end equipment manufacturing

Again it is clear that the UK has so very much to offer in these five areas, with our enviable R&D and innovation credentials both in industry and education.

Opportunities will be across the whole country. Indeed most provinces and cities have already published action plans for local implementation.

Whilst we see tremendous opportunity, we also recognise that there will be challenges. These may include IP protection, over-supply and over-investment, pace of change and favouring of indigenous innovation amongst others. It will be important to do comprehensive due diligence and carefully select projects and partners. The teams at CBBC and UKTI are here to help.

Stephen Phillips **Chief Executive**



This is a highly ambitious initiative to comprehensively upgrade, consolidate and balance China's manufacturing industry.

Executive Summary

Overview

Made in China 2025 (MIC 2025) is a national strategy, announced by China's State Council in May 2015, to comprehensively upgrade, consolidate and balance China's manufacturing industry, turning it into a global manufacturing power able to influence global standards, supply chains and drive global innovation. It has very specific objectives to 2025 and also in the longer term with general objectives onwards to 2049 (the 100th anniversary of the founding of the People's Republic of China).

The MIC 2025 initiative is to some extent inspired by Germany's Industry 4.0 with reference to the inclusion of SMEs in the supply chain, and extensive use of new information technologies. However, MIC 2025 extends much more widely to address issues of quality, consistency of output, safety, and environmental protection, which are all considered strategic challenges to China's development. The initiative is intimately connected to the government's long-term Chinese Dream of a harmonious and moderately prosperous society. It is the proposed answer to China's declining competitive advantages in manufacturing, and oversupply in some industries.

The MIC 2025 plan details nine strategic tasks, including: to encourage innovation and the use of digital technology in manufacturing; to improve the quality and efficiency of manufacturing; to enforce green manufacturing methods; to globalise Chinese brands; and to improve service-oriented manufacturing and manufacturing-service industries.

There are also 10 designated priority sectors:

- Advanced marine equipment and high-tech vessels;
- Advanced rail and equipment;
- Agricultural machinery and technology;
- Aviation and aerospace equipment;
- Biopharmaceuticals and high-end medical equipment;
- Integrated circuits and new IT technology;
- High-end electronic equipment;
- High-end manufacturing control machinery and robotics;
- Low and new-energy vehicles:
- New and advanced materials

New Opportunities

Despite its overt theme of Chinese technological independence, MIC 2025 is in reality a source of great opportunity for UK companies that can help China to implement the changes required. The UK has extensive expertise in all areas of manufacturing and experience of moving up the value chain and transferring basic low-cost manufacturing to new locations. Britain is a leader in process innovation, standardisation, efficiency, productivity, and integration all of which will be of great value to Chinese companies during MIC2025 implementation.

There are many specific opportunities for UK companies such as:

 Technical and management consultancy services to improve productivity, quality and efficiency and to minimise risks through process design and optimisation, and operation and project management;

- Standards, testing, compliance and certification to support Chinese companies to comply with and influence international standards and achieve international certifications;
- Joint R&D and joint bidding (in China and globally) as a channel for British companies to build early-stage partnerships with new and growing Chinese enterprises;
- Financing and investment where Chinese companies seek to grow through private equity, venture capital investments and listing on public technology exchange markets;
- Outbound investment to work with Chinese partners on third-country projects and UK-based R&D centres;
- Financial and professional services, including accounting, auditing, consulting and HR, where Chinese projects have an overseas element;
- Industrial and architectural design, virtual reality modelling, prototyping and testing to build better infrastructure and to increase output quality and efficiency;
- Education services to build vocational skills and expertise in standards, management and software.

UK companies may also need to review their ability to react to the sheer pace of change in some industries to provide solutions for feet to provide solutions for fast growing Chinese players.

MIC 2025 is a national strategy and as such there will be opportunities across China. Furthermore, in conjunction with China's Belt and Road Initiative, opportunities may quickly spread beyond China's borders as its leading manufacturers seek to develop global supply chains and to access new markets.

Risks and Challenges

Such an ambitious project inevitably incurs challenges, and the increased push for technological development will drive demand for foreign intellectual property and potential cases of infringement (although China's IP environment has improved considerably in recent years). Due diligence remains as important as ever. UK companies may also need to review their ability to react to the sheer pace of change in some industries to provide solutions for fastgrowing Chinese players.

As China moves to achieve a level of technological independence, we firmly believe that UK companies will actually find more opportunities from new high-value customers. This is provided that the Government upholds one of the key commitments of the MIC 2025 plan, namely to rely mainly on the market as the key driver of change after an initial stimulus.

This report is just the beginning of CBBC and UKTI's work on MIC 2025 and in the coming period we will continue to share insights and analysis, organise seminars and roadshows to showcase UK strengths in the 10 key sectors, identify links with potential Chinese partners, organise relevant visits to China, and work with government at all levels to track the progress of the initiative and how UK companies are taking advantage.





Background to Made in China 2025

Moving up the value chain

Competition from developing nations with similarly competitive costs, coupled with technology-driven efficiency gains in developed countries, means that China's abundance of cheap labour and the competitive advantage of its infrastructure may no longer be sufficient for it to drive sustainable growth. The consulting firm Alixpartners estimates that the landed cost of outsourcing production to China will be equal to the cost of manufacturing in the United States within a few years.

The strategic question of how to respond to this situation has long been a concern of the Chinese Government, hence the overarching objective of Made in China 2025 to move the country up the value chain. Alternative approaches, such as driving down labour costs or devaluing the renminbi to stimulate exports, would directly conflict with some of China's fundamental development goals and its commitments to achieve a 'moderately prosperous society', an objective which was most recently presented as the Chinese Dream.

In most industries, realising this dream requires a reformed economy driven by domestic consumption rather than exports and higher wages. Since it looks certain that China will continue its reforms to achieve this, we are left with the question of what exactly 'made in China' will mean in future, and therefore what the implications are for UK companies doing business with China.

Long-term vision and plan

A clue to this can be seen in the detail of the MIC 2025 plan. The plan is partly inspired by Germany's Industry 4.0 initiative, but the comparisons do not run deep. Whilst both projects focus in particular on better use of technology, as well as the inclusion of SMEs in the value chain, the Chinese start from a very different base and there are broader issues of quality, consistency of output, safety and environmental protection.

MIC 2025 is certainly comprehensive, covering everything from manufacturing operations and IT use to public and private finance and fiscal incentives. It references intellectual property and the need to adopt

international standards to fit into global manufacturing chains, and it stresses the importance of relying mainly on market forces as the key driver of change.

Eventual outcomes will depend on further government directives for implementing the plan, which often vary considerably from the original blueprints, so staying up to date on the process will be important. Also, China's provinces are surprisingly independent in their implementation of central plans, so local regulations, initiatives, incentives and opportunities will vary across the country (each provincial and city government is developing its own regional plan to implement MIC 2025).

Despite often downbeat coverage of Chinese economic trends, it is important not to lose sight of the overall size, continued absolute growth and regional diversity of the Chinese economy. MIC 2025, whilst encompassing an overt desire for Chinese domestic technological independence, will also provide many new and expanded opportunities for UK companies in working with China to implement the changes it requires.



The overarching objective of Made in China 2025 is to move the country up the value chain.

The objectives of MIC 2025 will also drive Chinese companies to align themselves more closely with global standards and supply chains.





Innovation, productivity and efficiency

MIC 2025 is designed to encourage Chinese manufacturers to be far less dependent on importing highend technology and equipment, and to transform China into a 'manufacturing power' rather than a volume manufacturing base. However, Chinese demand for high-technology solutions, high-end products and ultimately high-end customers is likely to mean more business for UK companies, particularly those that are already world leaders in technology, R&D and innovation. China's industrial reform should broaden the overall base and scale for UK companies to implement and test technology and processes and to compete properly with global giants.

The objectives of MIC 2025 will also drive Chinese companies to align themselves more closely with global standards and supply chains, with a view to influencing those standards in future and also to establish and protect their domestic IP. These upward moves are designed to support ever-increasing productivity and efficiency. If successful they will also bring more willingness on the part of Chinese companies to invest in design-focused consultancy and project management services to drive this new-found productivity, quality and efficiency.

This will play to the strengths of the UK - from managementprocessing optimisation to lean and risk management services, the implementation and monitoring of international industrial and production standards, the management of information and quality control systems, the control and monitoring of safety, emissions and efficiencies, and product testing.

The State Council's Plan

China's State Council announced "Made in China 2025" in May 2015 as a national initiative to improve the manufacturing industry – initially until 2025 and then on to 2035 and 2049. The ultimate goal is to transform China into a world-leading manufacturing power.

Step One: to be achieved by 2025

- Comprehensively upgrade China's manufacturing sectors
- Strengthen China's position as a major manufacturing nation
- Focus on quality manufacturing and smart manufacturing technologies
- Improve the efficiency of energy, labour and material consumption
- Make Chinese companies leaders in the manufacturing value chain
- Master key technologies in key industries (as opposed to importing them)

Step Two: to be achieved by 2035

- Raise China to the level of a midranking manufacturing nation
- Increase innovation
- Increase IP ownership
- Achieve globally innovative breakthroughs in key sectors

Step Three: to be achieved by 2049

- Become a global leader in key highend manufacturing sectors
- · Drive innovation and hold competitive advantages

The implementation of the MIC 2025 initiative is being led by the Ministry of Industry and Information Technology (MIIT), focusing on nine strategic tasks and five nationwide initiatives across 10 priority sectors, as shown below.

The Nine Strategic Tasks

- To encourage innovation
- To promote the use of integrated, digital, technology-focused manufacturing
- To strengthen the overall industrial
- To improve product quality and build global Chinese brand names
- To focus on enforcing green manufacturing methods
- To make innovative technological breakthroughs in the 10 key sectors
- To restructure industries to improve efficiency and output
- To improve service-oriented manufacturing and manufacturingservice industries
- To globalise Chinese manufacturing industries

Ten Priority Sectors

The priority sectors highlighted are:

- · Advanced marine equipment and high-tech vessels
- Advanced rail and equipment
- Agricultural machinery and technology
- Aviation and aerospace equipment
- Biopharmaceuticals and high-end medical equipment
- · Integrated circuits and new generation information technology
- Power equipment and technology
- High-end manufacturing control machinery and robotics
- Low and new-energy vehicles
- New materials

Pilot Projects

In 2015, MIIT supported 46 pilot demonstration projects on various intelligent manufacturing solutions in relation to MIC 2025, and a full list is in the Appendix. Some of the pilot projects are still on-going and others have already finished, and all were led by a Chinese company or institute with support from MIIT. As the MIC 2025 initiative is now being implemented, new pilot projects are likely to listed and supported at both state level and by local provincial and municipal level governments.



Ten Priority Sectors

1. ADVANCED MARINE EQUIPMENT AND HIGH-TECH VESSELS

Over the past five years, China has increased its global share of advanced marine equipment and vessels particularly oil and gas exploration equipment, support vessels and drilling platforms. However, it is still at the low-value end of the market, and the downturn in both shipbuilding and the oil and gas sector is creating substantial volume challenges. It remains reliant on foreign designs and has competitive disadvantages in management and technical capabilities.

China is now focusing on moving up the value chain – enhancing its capability to build high-end LPG and LNG carrying ships and also luxury cruisers, Arctic route vessels, and new energy-saving and intelligent vessels. In oil and gas exploration, it is prioritising deep sea exploration, offshore operation support equipment and testing and inspection equipment. It aims to take steps to become a world shipbuilding powerhouse, with an integrated supply chain incorporating design, construction, equipment supply and technical services.

2. ADVANCED RAIL AND EQUIPMENT

In the past 10 years, China has invested heavily in its new highspeed rail infrastructure and trains through international partnerships with the likes of Alstom, Siemens, Bombardier, Hitachi and Kawasaki, and it now has 18,000km of highspeed railways in operation. Through domestic R&D investment, China now owns IP in core technologies and has some world-leading high-speed train manufacturing technology.

China's two large rail companies, China South Rail Group (CSR) and China North Rail Group (CNR), recently merged to form CRRC, and they are now successfully winning international projects. Domestically, China is now looking at Intelligent Transportation Systems (ITS) to make rail more safe, energy-efficient and environmentally friendly. In 2014, a UK-China rail transport cooperation agreement was signed to foster projects in design, consultancy, engineering construction, equipment and facilities maintenance, and there are opportunities for joint product development and R&D of certain types of advanced intelligent technology.

3. AGRICULTURAL MACHINERY **AND TECHNOLOGY**

China produces more tractors and combine-harvesters than any other country, and its domestic production of agricultural machinery has grown dramatically over the past 10 years. Yet it still lacks many

advanced technologies, is heavily reliant on high-end imports, and the process, speed and scale of farming mechanisation vary significantly across the country. In many areas small-scale farming is still the norm, but China is now focused on consolidating and adopting new technologies – cost efficiencies are being sought through the major industrial-scale integration of cultivation, breeding, processing and waste recycling, which will require advanced farming techniques and the use of high-end and multi-functional agricultural machinery.

The MIC 2025 initiative aims to raise China's capabilities in domestic production and the manufacture of high-end farming equipment, so that home-grown companies can dominate the domestic market and the country can develop its export potential. Although this may be seen as a threat to UK exporters to China, the new opportunities that will emerge and the overall market potential will be greater, for example, in collaborative agricultural research, where the UK is already recognised as a global leader, and in the supply of specialist high-end equipment, new farming technologies and materials, and consultation services and smart solutions on how to integrate and improve farming efficiencies.

The ultimate goal is transform China into a world-leading manufacturing power.

4. AVIATION AND AEROSPACE EQUIPMENT

China's aviation industry has grown rapidly in the past 20 years across the whole supply chain from research to design, testing, manufacturing, repair and maintenance. It has wellestablished manufacturing bases in the cities of Harbin, Shenyang, Xi'an and Chengdu, and new bases in Shanghai, Tianjin and Zhuhai. Many international companies, such as Airbus, Boeing, Rolls-Royce and Bombardier, all have longstanding partnerships in China for subcontracted production.

By 2020, China aims to have a globally competitive and relatively complete aircraft manufacturing industry and to be a leading regional base for aircraft retrofitting and repair. It aims to compete through the delivery of its own C-class large aircraft and engines, and to compete in mediumsized helicopters, high-end business jets, and special-use and emergency aircraft. Opportunities exist in R&D collaboration, design, jointly developing new technologies and the supply of high-end technologies and sub-systems to its production programmes.

5. BIOPHARMACEUTICALS AND HIGH-END MEDICAL EQUIPMENT

China will spend around RMB 6.6 trillion (approx. £660 billion) on healthcare by 2020, and with ongoing reforms to the healthcare system opportunities for UK companies are growing. There are plans to further improve facilities in rural areas by constructing or upgrading 3,700 community hospitals and 11,000

village clinics. Rural and remote healthcare will be especially reliant on technology, including remote diagnosis, medical devices, and biological medicine, and healthcare providers are being encouraged to adopt high-performance diagnostic technology, to manufacture with green technology, and to venture overseas for R&D, manufacturing and market development.

The MIC 2025 initiative aims to develop domestic capability in many areas including imaging equipment and medical robots, wearable devices and telemedicine, and biological 3D printing and stem cell techniques. The UK has a long and proud history in the life sciences sector, with companies commercialising major research innovations from genomics and cell research to MRI, and it enjoys extensive government support and infrastructure for R&D. This makes UK companies very well placed to work with large Chinese partners on global solutions.

6. INTEGRATED CIRCUITS AND **NEW GENERATION INFORMATION TECHNOLOGY**

The ICT industry in China has seen incredible development over recent years, and Chinese domestic giants such as Baidu, Alibaba, Tencent and Huawei have grown into dominant forces in their respective industries. Foreign players have often struggled, due in part to Chinese Government restrictions on many subsectors of ICT, and in part to the difficulty of keeping pace with changes in demand from consumers and companies. Mobile is an area of particularly impressive growth: China now has over 674

million mobile broadband users including 230 million on 4G networks.

Despite the challenges, there are still significant opportunities. UK companies such as ARM, who design integrated circuits but do not directly compete with the manufacturing giants, have been successful. The development of indigenous capability in integrated circuits, 5G and industrial software and operating systems, plus new developments in the Internet of Things, hyperconnectivity and commercial secure communications are all key MIC 2025 objectives and areas of UK expertise.

7. POWER EQUIPMENT **AND TECHNOLOGY**

China now has the largest installed electricity generation capacity in the world (1505 GW generating 5583 TWh in 2014) and the world's largest installed capacity for thermal power, hydropower, wind power, and now, in 2016, also in solar (with an installed capacity of 43GW). Yet despite all the new capacity, the power industry faces a major challenge in distribution. Coal power generation is traditionally in the north, hydropower is in the west and much of the new wind power is in the north and west, whereas the greatest demand is still in the south and east.

MIC 2025 includes objectives aimed at improving capability in power generation equipment, transmission and transformation equipment, and key components including safety valves, circuit breakers and rectifiers. In some areas the intention is that up to 95% of equipment be domestically produced. Nuclear and wind power

are among the UK strengths that will be in demand as China increases its focus on developing domestic capability for export.

8. HIGH-END MANUFACTURING CONTROL EQUIPMENT AND ROBOTICS

There are over 5,000 enterprises engaged in China's machine tools industry with a combined production value of RMB 800 billion (approx. £80 billion). China has been the largest machine tools manufacturer in the world since 2002, but it still lacks many advanced manufacturing technologies and advanced computer control systems - only 30% of China's machines tools are numerically controlled, with just 10% being exported. Most of the core components are still imported from developed countries such as Germany, the US, the UK, Italy, Japan or South Korea.

The MIC 2025 initiative outlines some ambitious objectives across the range of control systems in addition to advanced robotics, 3D printing and machine tools to improve the situation. The UK has a strong R&D background in the CNC tools and robotics industry with many of the world's leading related university research departments and so is well placed to take advantage of the opportunities that will develop.

9. LOW AND NEW ENERGY VEHICLES

China domestic sales of new energy vehicles began to grow in the past two years, with consumer subsidies for locally-produced new energy vehicles until 2020, and other incentives such as reduced purchase tax and free license plate registration. Beijing, Shanghai, Shenzhen and Guangzhou are implementing plans to construct related charging and distribution infrastructure. The Government is also leading by example with a minimum of 30% of all Government cars purchased each year must be electric or hybrid vehicles.

MIC 2025 aims to boost the domestic manufacture of electric vehicles, and give objectives to encourage the market for new energy vehicles and associated infrastructure. It highlights plug-in hybrid electric vehicles (PHEV), hydrogen fuel cell electric vehicles (FCEV), public and commercial vehicles, and intelligent and connected vehicles. There will be opportunities for UK-Chinese collaboration and joint investment in a broad range of new energy infrastructure projects, developing charging systems, and R&D projects to improve vehicle efficiency and performance, such as weight reduction, low resistance tyres, battery and energy conversion, gearbox technology and brake-energy recovery.

10. NEW AND ADVANCED MATERIALS

In 2010, the Government prioritised the development of certain newmaterials sectors, such as high-end structural and functional performance metals, artificially synthesised highend polymers, inorganic non-metallic materials and high-performance composites. MIC 2025 seeks to build on this and emphasises advanced international standards, green manufacturing processes, highefficiency and performance, recycling and reuse, fine chemicals, materials for extreme conditions, and ultra-thin materials.

Although there are some export restrictions, there are many opportunities to help Chinese producers move up the value chain, and numerous UK companies and universities are working on joint projects. Currently, China relies heavily on imported new materials, but it is racing to develop more indigenous capability, and there are opportunities across a wide range of industry sectors, such as aerospace, rail, automotive, speciality steel and plastics, and integrated circuits.



Five Nationwide Initiatives

The plan prioritises five nationwide initiatives with clear objectives:

- To establish 15 new innovation centres by 2020 and 40 centres by 2025
- To establish four new national research bases
- To implement projects focusing on smart manufacturing
- To implement projects focusing on green manufacturing
- To prioritise high-end equipment manufacturing in key sectors

	Initiative	Details	Objectives
1	R&D and Innovation Centres	Boost technological breakthroughs and innovation in key fields such as next-generation ICT, smart manufacturing, new materials, additives and pharmaceuticals.	Establish 15 'national manufacturing innovation centres' by 2020; 40 by 2025.
2	Smart Manufacturing Projects	Leading Chinese companies involved in setting up and optimising smart manufacturing projects and techniques, digitisation of factories and customising supply-chains.	Decrease operating costs by 30%, shorten production times by 30%, and lower defect rates by 30% by 2020; and then 50% reduction in costs, time and defect rates by 2025.
3	Industrial Bases	Establish four new research centres known as the 'Four Bases' to accelerate the development of core industrial components, techniques, materials and production technology.	Be self-sufficient for 40% of core components and materials in key sectors – aerospace; telecoms; power production and distribution; transport and household appliances – by 2020; and then 70% by 2025.
4	Green Manufacturing Projects	Undertake projects in energy efficiency, environmental protection, resource usage, re-manufacturing and low-carbon technologies.	Build 1,000 green factories and 100 green industrial parks by 2020. Reduce emissions intensity of primary pollutants by 20%. Align energy consumption per unit with advanced world levels by 2025.
5	High-end Equipment Manufacturing Projects	Develop innovative, high-end industry-focused projects in aerospace, rail, new-energy vehicles, marine, smart grids, highend machine tools, nuclear and medical equipment.	Undertake independent R&D in these sectors to achieve a huge growth in China's market share of IP for high-value equipment by 2025.

Specific MIC 2025 Objectives

	Indicator	2013	2015	2020	2025
Innovation	Expenditure on R&D as % of revenue	0.88%	0.95%	1.26%	1.68%
	Valid invention patents per RMB 100 million in revenue	0.36%	0.44%	0.70%	1.10%
Quality	Manufacturing quality competitiveness index	83.1	83.5	83.5	85.5
	Manufacturing value added ratio	-	-	Up 2% from 2015	Up 4% from 2015
	Labour productivity growth rate in manufacturing (%)	-	-	7.5% (2016-20)	6.5% (2021-25)
Industrialisation & Informatisation	Fixed broadband penetration rate (%)	37	50	70	82
	Penetration rate of digital research tools (%)	52	58	72	84
	Average level of digitisation of key production and work processes (%)	27	33	50	64
Green Manufacturing	Industrial value-added energy consumption	-	-	Down 18% from 2015	Down 34% from 2015
	Carbon dioxide emissions per unit of industrial value added	-	-	Down 22% from 2015	Down 40% from 2015
	Water consumption per unit of industrial value added	-	-	Down 23% from 2015	Down 41% from 2015
	Utilisation rate of industrial solid waste (%)	62%	65%	73%	79%

Source: MIIT

Opportunities by Sector

Part Two of this report looks at each of the 10 priority sectors in detail, and considers China's aims and objectives of MIC 2025. It looks at China's current and future needs and its ambitions, and matches them to UK industry strengths. It considers the opportunities and challenges for UK companies and highlights around 50 sub-sectors where there are likely to be opportunities for UK companies.

Marine equipment & hi-tech ships

High-tech marine equipment Marine materials Ocean/deep-sea exploration Offshore renewable energy Luxury cruisers & yachts

Advanced rail & equipment

Rail infrastructure equipment High-end rolling stock components Signal & operations control & testing

Agricultural machinery & technology

High-end cultivating equipment High-end food production & processing Large-scale farming machinery Smart & integrated farming systems Specialist agricultural R&D & education New farming materials

Aerospace

Commercial passenger aircraft Helicopters & specialist aircraft Aircraft components & equipment Private & luxury jets Specialist airport equipment

Biopharmaceuticals & med-tech

R&D and clinical trials Product testing & compliance Digital health High-end medical devices In vitro diagnostics

Manufacturing control & robotics

Computer numerical control tools (CNC) Robotics 3D printing High-end machine tools

Integrated circuits & new IT

Core hardware & software components New telecoms infrastructure Operating systems & industrial software Cloud computing Data integration & advanced analytics Smart grids

Low & new-energy vehicles

Electric vehicles Hybrid vehicles Fuel cell vehicles Intelligent & interconnected vehicles High-end sports vehicles

New & advanced materials

Special metallic function materials High-end structural metals High performance fibres & composite materials Advanced glass & ceramics Advanced polymers

Power equipment & technology

Coal-fired power Nuclear power Offshore wind power Transmissions & transformation sets High-end safety & monitoring

Opportunities by Location

Most provinces and cities have already published their MIC 2025 action plans, and the table below highlights the major first and second tier Chinese cities and their key sector priorities.

This information below is based on published information from the Ministry of Industry and Information Technology (MIIT), National Development and Reform Commission (NDRC) and the various local municipal governments listed.

Ш	Agricultural machinery	Aviation & Aerospace	New-energy vehicles	Medicine & med-tech	ICT	Advanced materials	Robotics & control tools	Marine & high tech ships	Power equipment	Rail	Manufacturing Control Equipment
Beijing	/	/	✓	V	1	✓	✓			✓	
Changchun			✓	/						/	
Changsha	V						✓		✓	✓	
Chengdu		/				/					
Chongqing			✓	V		✓	✓		✓		
Guangzhou			/	/				/			
Nanjing			✓	V	/				✓		
Ningbo								✓			
Shanghai		/	✓	V	/	✓	✓	✓	✓		
Shenyang		/		V		/	✓		✓		ш
Shenzhen			✓	V	/	✓	✓				
Suzhou				V	/	/	✓				
Tianjin		/		/		/		✓			
Qingdao**	✓							✓	✓	✓	
Wuhan			✓	✓			✓	✓	✓		
Xi'an		/		✓					✓		

In addition to the major cities listed above, we can see opportunities in a cluster of smaller cities across various provinces. Some examples include:

Jilin			✓					✓	
Liaoning		/							/
Hunan								✓	V
Shannxi									
Shandong	V					V		✓	
Xinjiang	/						✓		
Guangdong				✓					

Example

Local government implementing plans for industrial upgrading

Shanghai Lingang Industrial Area

Shanghai Lingang Industrial Area is being planned as one of the major smart manufacturing parks under MIC 2025, and is developing policies and incentives to attract advanced manufacturing companies to locate there and to support technological upgrading projects. It is a vast area, including an Equipment Industry Park, Logistics Park, the China (Shanghai) Pilot Free Trade Zone, Lingang Fengxian Industrial Park, Comprehensive Zone and Major Industrial Zone, with good transport connections by air, sea, river, rail and road.

Lingang is supported by the Shanghai Municipal Government, which is aiming to transform and upgrade local manufacturing and establish the city as a major international financial and shipping centre. The local government is focusing on six major sectors: new energy equipment, marine parts and components, offshore engineering equipment, high-end industrial machinery, civil aviation equipment, and auto parts and components.

Specific initiatives being implemented include:

- Building new platforms for smart manufacturing and innovation
- R&D support platform and state-level R&D centre
- Makers' Space, incubator laboratory, technology exchange centre and commercialisation platform
- Shanghai Smart Manufacturing Research Institute

- Smart manufacturing standards and inspection platform
- Yangtze River Delta Smart Manufacturing Innovation Service Platform
- Smart Manufacturing Big Data Centre
- Professional services and cloud computing platform
- A fund of RMB 5 billion (approx. £500 million) and a commitment from commercial banks for a further RMB 20 billion (£2 billion) to support smart manufacturing projects and development of the Lingang Industrial Area - to provide up to 30% of investment for companies intending to transform their factories to smart manufacturing.
- Subsidies of 10-30% for companies in key smart manufacturing projects in industries such as robotics, new energy, marine equipment and aviation.
- Seed funding of up to RMB 500,000 (£50,000) for companies seeking to list/seek public funding.

Major companies investing in the area: Shanghai Electric Group, AVIC Commercial Aircraft Engines, Shanghai Automotive Industry Corporation, SANY, Shanghai Waigaoqiao Shipbuilding Offshore, Siasun Automated Guided Vehicles.



Opportunities for UK Companies

There will be considerable opportunities for UK companies, which we explore in detail in the sector-related sections of this report. The following are the main general areas:



EXPORTING MORE HI-TECH EQUIPMENT

As China strives to move up the manufacturing value chain, Chinese manufacturers will increasingly aspire to international standards of quality, efficiency and productivity. This will provide growing market opportunities for UK companies to export their world leading equipment across most of the sectors identified.



TECHNICAL AND MANAGEMENT CONSULTANCY SERVICES:

MIC 2025 has the clear objective of reducing China's reliance on imported tech solutions, but a considerable part of potential British exports actually consists of supporting services which could contribute greatly to China's objectives. Expertise to improve productivity, quality and efficiency, minimise risks through process design and optimisation, and operation and project management will all be in demand.



STANDARDS, TESTING, COMPLIANCE AND **CERTIFICATION:**

As Chinese companies move up the value chain, they will be more aware of the significance of complying with, and influencing, international standards and achieving international certifications. This will present opportunities for UK companies.



JOINT R&D AND JOINT BIDDING:

MIC 2025 will provide new opportunities for UK companies to work with Chinese partners to develop (in China) the joint IP they require, and to support Chinese companies in bids for related major projects. This is also an important channel for British companies to build early-stage partnerships with new and growing Chinese enterprises.



FINANCING AND INVESTMENT:

With the objective of reducing China's reliance on technology imports will come a sharper focus on technology transfer. In particular many cashrich Chinese enterprises are looking at new ways to facilitate this which offer a better platform for building their own global capability. Private equity, venture capital and listing on public technology exchange markets will be channels for UK companies to realise the value of their intellectual property in the Chinese market, and to win strategic investment from potential partners on the world stage.



OUTBOUND INVESTMENT:

Going global is an integral part of MIC 2025, and we expect to see a growth in development projects related to the initiative (such as SAIC Motor's new R&D centre in the UK). British companies should be looking to partner with growing enterprises in China and the UK and to take joint solutions to third markets.



FINANCIAL & PROFESSIONAL SERVICES:

Banking, securities, insurance and other financial services will be more sought-after by Chinese companies if their projects include an overseas element. Accounting, auditing, consulting and HR are all UK strengths and will be more in demand with the increase in projects worldwide.



Industrial design, building design and architecture, graphic design and virtual reality (modelling, prototyping, testing) will all see more opportunities as Chinese companies seek to use the latest supporting technology to build better infrastructure and to increase output quality and efficiency.



EDUCATION AND SKILLS TRAINING:

Opportunities in education will be generated by Chinese companies looking to quickly build vocational skills and expertise in standards, management and software.

Challenges for UK Companies

There will inevitably be challenges for UK companies looking to take advantage of such an ambitious initiative, which spans the whole of the Chinese manufacturing industry. They include:



IP PROTECTION:

A renewed push for technological development will drive demand for foreign intellectual property and this may result in cases of infringement or theft. However, China's intellectual property rights (IPR) environment is improving with changes to the laws and better enforcement. CBBC and the British Embassy in Beijing works with Chinese counterparts to encourage mutual understanding and the adoption of international processes and standards for IP protection. MIC 2025 itself also contains provisions for improving IPR enforcement, and if Chinese companies successfully move up the value chain, their interest in creating and protecting global IPR will increase. In any case our advice remains the same: companies need to take steps to protect their trademarks, patents and other IP at the earliest opportunity, and not wait for the decision to export or license technology to China.



OVER-SUPPLY:

Government policies have a very strong influence on industrial structure and business behaviour in China, and the Government is keen not to repeat the mistakes made in the steel and cement sectors which led to dramatic over-supply. We have identified robotics (RAS including drones and CNC) and Internet Plus (IoT) technologies as potential areas to watch in this respect, where government support has dramatically increased and companies have proliferated but commercial applications are still being established and Chinese technology still lags behind that of global leaders.



PACE OF CHANGE:

MIC 2025 contains ambitious, time-specific objectives that will drive short to medium-term investment. British companies may need to review their ability to react to the fast-moving opportunities and provide solutions to fastgrowing Chinese players looking for global expansion and cooperation.



DUE DILIGENCE:

In China, a new injection of government funds often prompts companies to flock to the opportunity without due consideration of longterm strategy. British companies should look carefully at potential partners' existing business interests and their strategic intentions for the adoption of technology and development of new joint IP in China.



INDIGENOUS INNOVATION:

It cannot be overlooked that the clearly stated objective of MIC 2025 is to increase China's technological independence. Nevertheless, having considered the policies, the industrial impact of similar initiatives in the past and the fast pace of technological change, we believe that British companies will actually find more opportunities, even as China improves its capabilities, provided they maintain or extend their technological lead. We will however be keeping an eye on how things progress, in particular the Government's commitment to rely mainly on market forces as the key driver of change after the initial stimulus of the MIC 2025 plan.



China's IP environment is improving with changes to the laws and better enforcement.

Example

UK company investing in R&D and innovation in China



GKN is a global engineering group which designs, manufactures and services systems and components for the world's manufacturers. It has four divisions including GKN Aerospace, GKN Driveline, GKN Powder Metallurgy and GKN Land Systems. GKN's business units fit closely with the 10 key sectors listed in the MIC 2025 plan, so they are paying close attention to the development in their own 10-year plans.

GKN was the first Western company to invest in the automotive component industry in China, and now employs around 8,000 people across multiple locations. Shanghai GKN Huayu Driveline Systems (SDS) was established as a joint venture with SAIC in 1988 and is the market leader in driveline products in China. In 2015, GKN Driveline announced it would invest around £500 million over the next five years to meet growing demand for the company's driveline systems, all-wheel drive (AWD) and hybrid technologies.

Whilst the automotive sector has seen a challenging year in 2015, affecting investments by all the major players, GKN remains confident. Arnaud Lesschaeve, GKN Driveline Asia Pacific President, said: "GKN is the only driveline supplier that can design, develop and produce intelligent AWD and hybrid AWD systems completely in-house, with capability to deliver globally."

For GKN, the answer to the increasing challenge from Chinese competitors is to stay ahead, growing with them, while continuing to invest in global R&D and innovation to maintain its lead. In other high-end sectors it is investing to leverage opportunities higher up the value chain. GKN Aerospace acquired Fokker Technology in 2015 to enhance its position as a leading supplier to the aerospace sector. Fokker has an aircraft electric-wiring business in Langfang, Hebei Province, and a contract with the Commercial Aircraft Corporation of China (COMAC) to convert a range of its small jets for high-end business use. Additionally, GKN Powder Metallurgy will expand its production capacity in China with new plants due to open in 2016.

MIC 2025 includes a specific goal to manage developments in the aerospace sector to avoid the challenges that China has faced in the automotive industry, where foreign brands still dominate the market and domestic companies have struggled to compete fully. GKN is responding by both working more closely with Chinese partners who want to move up the value chain, and also making sure that it stays ahead of the fastmoving developments in the global industry.



Conclusions & Next Steps



The Made in China 2025 initiative is far-sighted and wide-ranging. While there are short-term goals which will prompt Chinese companies and local governments into rapid action and many have already begun - it is important also to bear in mind the objectives beyond 2025 and towards the second half of this century.

In this respect the initiative can be considered in the same context as the concurrent Belt and Road initiative, as a long-term and comprehensive blueprint for Chinese growth on the world stage.

Geographically, the opportunities will be widespread and diverse. Companies will be well advised to take a granular, local view. Openings will vary between different cities and regions of China, as will the way in which provincial governments implement the central plan. Turning this to UK companies' advantage will require a close understanding of the local business environment in the relevant sector of industry. CBBC and our partners can help in this respect.

There are certainly risks and challenges to be aware of, but businesses with an eye on the wider picture should recognise significant opportunities too. Above all else, UK companies must stay ahead of the game in terms of technological development – it is this technology gap which China seeks to close, and therefore it is here where British players hold the aces.

But there is potential for mutually beneficial cooperation. Ultimately the goal of MIC 2025 is to enable Chinese manufacturers to stand on their own feet in the global market through the development of independent strengths. This does not mean isolation from overseas players, but rather closer ties, which can help raise the game of both sides, whether it be through innovation in third countries or closer adherence to international quality and environmental standards. And what China lacks in this process, the UK can, in many cases, provide as we hope this report demonstrates.

Follow-Up

Advice and support are available to both established UK operators and new entrants, from CBBC, UKTI and other partners across both countries. Furthermore, this report is just the beginning of CBBC and UKTI's work to help British companies meet the challenges and take advantage of the opportunities presented by MIC 2025.

In the coming period we will:

- Continue to share insights into, and analysis of, the implementation of MIC 2025
- Organise seminars and roadshows to showcase UK strengths in the 10 key sectors
- Identify links with potential Chinese partners for UK companies in these sectors
- Organise visits to Chinese industrial parks and institutions tasked with MIC 2025 projects
- Work at a provincial and municipal level to understand local initiatives, opportunities and incentive policies for MIC 2025, and how UK companies can take advantage
- Provide individual support to UK companies wishing to explore specific opportunities

And what China lacks in this process, the UK can, And what China lacks in this in many cases, provide - as we hope this report demonstrates.

UK Trade & Investment

UKTI has invested in resources to support UK business across all areas of MIC 2025. Our key sector targets are aerospace and commercial aviation, space, airports, automotive, advanced manufacturing (including new and advanced materials), innovation, marine and rail. We are supported by key sector specialists in the UK and China and by teams throughout China and the UK. In particular we offer help and guidance on all elements of intellectual property law, protection and advice on defending IP in China.

We run regular missions in all sectors, arranging meetings and hosting dialogues between Chinese and British companies to improve understanding of the markets and ensure that realistic, commercial partnerships are formed to the mutual benefit of all parties. We also run series of bilateral working groups that engage the highest levels of government to open up access to markets.

The Embassy more widely works to shape policy across China and sets out the frameworks where the Golden Era of Sino-British collaboration will lead to a greater engagement in the commercial sphere, bringing together the rich expertise and capabilities of the UK business world with the ambitious and diverse Chinese market.

CBBC: Advanced Manufacturing Sector

CBBC has sector specialists in Advanced Manufacturing and Transport, Energy, ICT and other related industries both in China and the UK, and a membership that includes global leaders like Rolls Royce, Jaguar, and GKN. We also have a highly experienced team of project managers across all sub-sectors of the MIC 2025 initiative who over the past two years have helped over 60 UK companies to understand market opportunities, identify customers and partners, establish a presence in China, and address specific industry challenges around regulation and market access.

In 2015, CBBC organised more than 30 events and activities in the advanced manufacturing and technology sectors and we work closely with UK and Chinese government departments to identify opportunities for British companies, and help Chinese investors to understand more about the UK. Our activity includes market briefings, policy dialogues, networking activities, roadshows and seminars across China, and bespoke projects to support UK Government lobbying on trade issues like import taxation, and protection of intellectual property.

We have also undertaken a number of large high profile industry research projects, and produce regular sector insights across many industries including automotive, aerospace, transport, and technology working with trade associations and sector working groups across the UK and China.



Appendix: MIIT List of Pilot Demonstration Projects (2015)

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Electronic glass intelligent manufacturing Rainbow Hefei Company Anhui Smart petrochemical plant China Petroleum & Chemical Corporation Jiangxi Changhe Aircraft Industry Group Jiangxi Tyres smart pilot demonstration plant Racewheel Jinyu Group Shandong Smart cement manufacturing China United Cement Group Co., Ltd. Shandong Taishan Glass Fiber Co., Ltd. Shandong Meichai Power Co., Ltd. Shandong Appliances intelligent manufacturing Haier Group Company Shandong Cheese dyeing intelligent plant pilot demonstration Qingdao Red Link Group Shandong Intelligent manufacturing Industrial 3D printing system pilot demonstration Joston Street Copensy Hunan Industrial 3D printing system pilot demonstration Joston Mobile phone accessories intelligent palnet demonstration Shandong Sang Group Hunan Mobile phone accessories intelligent manufacturing Shandong Mobile phone accessories intelligent manufacturing Shandong Hans Hunan Hunan Hunan Pharmaceutical Company Mobile phone accessories intelligent manufacturing Shandong CHALCO Guangxi Guosheng Rare Earth Development Company Hainan Pharmaceutical preparations intelligent manufacturing Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan Chongging Changan Automobile Chongging Smart car manufacturing integrated demonstration Chongging Changan Automobile	16	Food & beverage production intelligent pilot	Hangzhou Wahaha Group	Zhejiang
19 Smart petrochemical plant 20 Helicopter systems Changhe Aircraft Industry Group Jiangxi 21 Tyres smart pilot demonstration plant Racewheel Jinyu Group Shandong 22 Smart cement manufacturing China United Cement Group Co., Ltd. Shandong 23 Smart glass fiber factory Taishan Glass Fiber Co., Ltd. Shandong 24 Diesel intelligent manufacturing pilot demonstration Weichai Power Co., Ltd. Shandong 25 Appliances intelligent manufacturing Haier Group Company Shandong 26 Cheese dyeing intelligent plant pilot demonstration Clothing customisation pilot demonstration Dingdao Red Link Group Shandong 27 Clothing customisation pilot demonstration Dingdao Red Link Group Shandong 28 Industrial innovation service cloud platform Application of Science & Technology Company Shandong 29 Intelligent manufacturing fiber pilot demonstration Optical Fiber & Cable Company Hubei 30 Construction machinery Intelligent manufacturing Sany Group Hunan 11 Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan 12 Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong Mobile phone accessories intelligent manufacturing Shenzhen Skyworth - RGB Electronics Guangdong Mobile phone accessories intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Skeyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Hainan Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	17	Intelligent communications equipment manufacturing	Eastern Communications Company	Zhejiang
Helicopter systems Changhe Aircraft Industry Group Jiangxi Tyres smart pilot demonstration plant Racewheel Jinyu Group Shandong Smart cement manufacturing China United Cement Group Co., Ltd. Shandong Smart glass fiber factory Taishan Glass Fiber Co., Ltd. Shandong Appliances intelligent manufacturing pilot demonstration Weichai Power Co., Ltd. Shandong Appliances intelligent manufacturing Haier Group Company Shandong Cheese dyeing intelligent plant pilot demonstration Shandong Kangping Group Shandong Clothing customisation pilot demonstration Qingdao Red Link Group Industrial innovation service cloud platform Application of Science & Technology Company Shandong Industrial Sprinting system pilot demonstration Qptical Fiber & Cable Company Hunan Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong Mobile phone accessories intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Mobile phone accessories intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Shenzhen Pennefather Science and Technology Guangdong Shandong Plymouth Hainan Pharmaceutical Company Hainan Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Flainan	18	Electronic glass intelligent manufacturing	Rainbow Hefei Company	Anhui
Tyres smart pilot demonstration plant Racewheel Jinyu Group Shandong China United Cement Group Co., Ltd. Shandong Smart glass fiber factory Taishan Glass Fiber Co., Ltd. Shandong Diesel intelligent manufacturing pilot demonstration Weichai Power Co., Ltd. Shandong Cheese dyeing intelligent plant pilot demonstration Weichai Power Co., Ltd. Shandong Cheese dyeing intelligent plant pilot demonstration Clothing customisation pilot demonstration Clothing customisation pilot demonstration Clothing customisation pilot demonstration Clingdao Red Link Group Shandong Intelligent manufacturing fiber pilot demonstration Construction machinery Intelligent manufacturing Sany Group Hunan Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan Lindustrial 3D printing system pilot demonstration Borch Machinery Company Guangdong Mobile phone accessories intelligent manufacturing Shenzhen Skyworth - RGB Electronics Guangdong Mobile phone accessories intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Smart are earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Hainan Smart car manufacturing integrated demonstration Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	19	Smart petrochemical plant	China Petroleum & Chemical Corporation	Jiangxi
22 Smart cement manufacturing China United Cement Group Co., Ltd. Shandong 23 Smart glass fiber factory Taishan Glass Fiber Co., Ltd. Shandong 24 Diesel intelligent manufacturing pilot demonstration Weichai Power Co., Ltd. Shandong 25 Appliances intelligent manufacturing Haier Group Company Shandong 26 Cheese dyeing intelligent plant pilot demonstration Shandong Kangping Group Shandong 27 Clothing customisation pilot demonstration Qingdao Red Link Group Shandong 28 Industrial innovation service cloud platform Application of Science & Technology Company Shandong 29 Intelligent manufacturing fiber pilot demonstration Optical Fiber & Cable Company Hubai 30 Construction machinery Intelligent manufacturing Sany Group Hunan 31 Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan 32 Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong 33 Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong 34 Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong 35 Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong 36 Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong 37 Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company 38 Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan 39 Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	20	Helicopter systems	Changhe Aircraft Industry Group	Jiangxi
23 Smart glass fiber factory 24 Diesel intelligent manufacturing pilot demonstration 25 Appliances intelligent manufacturing 26 Cheese dyeing intelligent plant pilot demonstration 27 Clothing customisation pilot demonstration 28 Industrial innovation service cloud platform 29 Intelligent manufacturing fiber pilot demonstration 30 Construction machinery Intelligent manufacturing 31 Industrial 3D printing system pilot demonstration 32 Injection molding equipment & services intelligent pilot demonstration 33 Intelligent manufacturing of TV equipment 34 Mobile phone accessories intelligent manufacturing 35 Keyboard integration intelligent manufacturing 36 Laser cutting machiner intelligent manufacturing 37 Smart rare earth smelting plant 38 Pharmaceutical preparations intelligent production 39 Smart car manufacturing integrated demonstration 4 Weichai Power Co., Ltd. 5 Shandong 4 Weichai Power Co., Ltd. 5 Shandong 4 Haier Group Company 5 Shandong 5 Shandong 6 Veing Group 6 Shandong 7 Shandong 7 Smart car manufacturing pilot demonstration 8 Shandong Kapiong Shandong 8 Pharmaceutical preparations intelligent production 9 Plymouth Hainan Pharmaceutical Company 9 Smart car manufacturing integrated demonstration 9 Smart car manufacturing integrated demonstration 10 Shandong 11 Shandong 12 Shandong 13 Smart car manufacturing integrated demonstration 12 Shandong 13 Smart car manufacturing integrated demonstration 13 Smart car manufacturing integrated demonstration 14 Chongqing Changan Automobile 15 Chongqing 16 Chongqing 17 Smart car manufacturing integrated demonstration 18 Shandong 18 Smart car manufacturing integrated demonstration 19 Smart car manufacturing integrated demonstration 19 Smart car manufacturing integrated demonstration 19 Smart car manufacturing integrated demonstration 10 Chongqing Changan Automobile 10 Chongqing 11 Chalco Guangan Automobile 11 Chongqing	21	Tyres smart pilot demonstration plant	Racewheel Jinyu Group	Shandong
24 Diesel intelligent manufacturing pilot demonstration 25 Appliances intelligent manufacturing 26 Cheese dyeing intelligent plant pilot demonstration 27 Clothing customisation pilot demonstration 28 Industrial innovation service cloud platform 29 Intelligent manufacturing fiber pilot demonstration 30 Construction machinery Intelligent manufacturing 31 Industrial 3D printing system pilot demonstration 32 Injection molding equipment & services intelligent pilot demonstration 33 Intelligent manufacturing of TV equipment 34 Mobile phone accessories intelligent manufacturing 35 Mobile phone accessories intelligent manufacturing 36 Keyboard integration intelligent manufacturing 37 Smart rare earth smelting plant 38 Pharmaceutical preparations intelligent production 39 Smart car manufacturing integrated demonstration 4 Haier Group Company 5 Shandong 5 Shandong Kangping Group 5 Shandong Kangping Group 6 Application of Science & Technology Company 7 Shandong 7 Shandong 8 Hubei 8 Chongqing 8 Sany Group 8 Hunan 9 Shandong Kangping Group 9 Shandong 9 Smart car manufacturing pilot demonstration 9 Smart car manufacturing integrated demonstration 9 Chongqing Changan Automobile 9 Chongqing	22	Smart cement manufacturing	China United Cement Group Co., Ltd.	Shandong
25 Appliances intelligent manufacturing 26 Cheese dyeing intelligent plant pilot demonstration 27 Clothing customisation pilot demonstration 28 Industrial innovation service cloud platform 29 Intelligent manufacturing fiber pilot demonstration 30 Construction machinery Intelligent manufacturing 31 Industrial 3D printing system pilot demonstration 32 Injection molding equipment & services intelligent pilot demonstration 33 Intelligent manufacturing of TV equipment 34 Mobile phone accessories intelligent manufacturing 35 Keyboard integration intelligent manufacturing 36 Laser cutting machine intelligent manufacturing 37 Smart rare earth smelting plant 38 Pharmaceutical preparations intelligent production 39 Smart car manufacturing integrated demonstration 4 Haier Group Company 4 Alaier Group Company 5 Shandong 5 Shandong 6 Application of Science & Technology Company 7 Shandong 7 Shandong 7 Shandong 8 Hunan 8 Hunan Huasheng Shu-Tech Company 8 Hunan 8 Borch Machinery Company 9 Guangdong 9 Guangdong 9 Shenzhen Skyworth - RGB Electronics 9 Guangdong 9 Shenzhen Pennefather Science and Technology 9 Guangdong 9 Guangdong 9 Shenzhen Pennefather Science and Technology 9 Guangdong 9 Shenzhen Pennefather Science and Technology 9 Guangdong 9 Smart rare earth smelting plant 9 CHALCO Guangxi Guosheng Rare Earth Development Company 9 Smart car manufacturing integrated demonstration 9 Plymouth Hainan Pharmaceutical Company 9 Smart car manufacturing integrated demonstration 9 Chongqing Changan Automobile 9 Chongqing	23	Smart glass fiber factory	Taishan Glass Fiber Co., Ltd.	Shandong
26 Cheese dyeing intelligent plant pilot demonstration 27 Clothing customisation pilot demonstration 28 Industrial innovation service cloud platform 29 Intelligent manufacturing fiber pilot demonstration 30 Construction machinery Intelligent manufacturing 31 Industrial 3D printing system pilot demonstration 32 Injection molding equipment & services intelligent pilot demonstration 33 Intelligent manufacturing of TV equipment 34 Mobile phone accessories intelligent manufacturing 35 Shenzhen Skyworth - RGB Electronics 36 Guangdong 37 Keyboard integration intelligent manufacturing 38 Shenzhen Pennefather Science and Technology 39 Guangdong 30 Laser cutting machine intelligent manufacturing 30 ChALCO Guangxi Guosheng Rare Earth Development Company 31 Alman 32 Intelligent manufacturing plant 33 Changdong 34 Mobile phone accessories intelligent manufacturing 35 Smart rare earth smelting plant 36 ChALCO Guangxi Guosheng Rare Earth Development Company 37 Smart rare manufacturing integrated demonstration 38 Pharmaceutical preparations intelligent production 39 Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	24	Diesel intelligent manufacturing pilot demonstration	Weichai Power Co., Ltd.	Shandong
27 Clothing customisation pilot demonstration Qingdao Red Link Group Shandong 28 Industrial innovation service cloud platform Application of Science & Technology Company Shandong 29 Intelligent manufacturing fiber pilot demonstration Optical Fiber & Cable Company Hubei 30 Construction machinery Intelligent manufacturing Sany Group Hunan 31 Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan 32 Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong 33 Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong 34 Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong 35 Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong 36 Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong 37 Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi 38 Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan 39 Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	25	Appliances intelligent manufacturing	Haier Group Company	Shandong
Industrial innovation service cloud platform Application of Science & Technology Company Application of Science & Technology Company Britisher & Cable Company Hubei Construction machinery Intelligent manufacturing Sany Group Hunan Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Hainan Plymouth Hainan Pharmaceutical Company Hainan Chongqing Changan Automobile Chongqing Chongqing	26	Cheese dyeing intelligent plant pilot demonstration	Shandong Kangping Group	Shandong
19 Intelligent manufacturing fiber pilot demonstration Optical Fiber & Cable Company Hubei 30 Construction machinery Intelligent manufacturing Sany Group Hunan 31 Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan 32 Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong 33 Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong 34 Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong 35 Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong 36 Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong 37 Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi 38 Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan 39 Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	27	Clothing customisation pilot demonstration	Qingdao Red Link Group	Shandong
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Industrial 3D printing system pilot demonstration Hunan Huasheng Shu-Tech Company Hunan Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	29	Intelligent manufacturing fiber pilot demonstration	Optical Fiber & Cable Company	Hubei
Injection molding equipment & services intelligent pilot demonstration Borch Machinery Company Guangdong Intelligent manufacturing of TV equipment Shenzhen Skyworth - RGB Electronics Guangdong Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	30	Construction machinery Intelligent manufacturing	Sany Group	Hunan
33 Intelligent manufacturing of TV equipment 34 Mobile phone accessories intelligent manufacturing 35 Keyboard integration intelligent manufacturing 36 Laser cutting machine intelligent manufacturing 37 Smart rare earth smelting plant 38 Pharmaceutical preparations intelligent production 39 Smart car manufacturing integrated demonstration 39 Smart car manufacturing integrated demonstration 39 Smart car manufacturing integrated demonstration 30 Shenzhen Pennefather Science and Technology 30 Guangdong 31 Guangdong 32 Guangdong 33 CHALCO Guangxi Guosheng Rare Earth Development Company 34 Plannan 35 Chongqing Changan Automobile 36 Chongqing	31	Industrial 3D printing system pilot demonstration	Hunan Huasheng Shu-Tech Company	Hunan
Mobile phone accessories intelligent manufacturing Dongguan Jin Sheng Precision Components Guangdong Keyboard integration intelligent manufacturing Shenzhen Pennefather Science and Technology Guangdong Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong That Company Guangdong CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	32	Injection molding equipment & services intelligent pilot demonstration	Borch Machinery Company	Guangdong
Shenzhen Pennefather Science and Technology Guangdong Laser cutting machine intelligent manufacturing Hans Laser Technology Industry Group Guangdong Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	33	Intelligent manufacturing of TV equipment	Shenzhen Skyworth - RGB Electronics	Guangdong
36Laser cutting machine intelligent manufacturingHans Laser Technology Industry GroupGuangdong37Smart rare earth smelting plantCHALCO Guangxi Guosheng Rare Earth Development CompanyGuangxi38Pharmaceutical preparations intelligent productionPlymouth Hainan Pharmaceutical CompanyHainan39Smart car manufacturing integrated demonstrationChongqing Changan AutomobileChongqing	34	Mobile phone accessories intelligent manufacturing	Dongguan Jin Sheng Precision Components	Guangdong
Smart rare earth smelting plant CHALCO Guangxi Guosheng Rare Earth Development Company Guangxi Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	35	Keyboard integration intelligent manufacturing	Shenzhen Pennefather Science and Technology	Guangdong
Pharmaceutical preparations intelligent production Plymouth Hainan Pharmaceutical Company Hainan Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	36	Laser cutting machine intelligent manufacturing	Hans Laser Technology Industry Group	Guangdong
39 Smart car manufacturing integrated demonstration Chongqing Changan Automobile Chongqing	37	Smart rare earth smelting plant	CHALCO Guangxi Guosheng Rare Earth Development Company	Guangxi
	38	Pharmaceutical preparations intelligent production	Plymouth Hainan Pharmaceutical Company	Hainan
40 Intelligent manufacturing TV pilot demonstration Sichuan Changhong Electric Sichuan	39	Smart car manufacturing integrated demonstration	Chongqing Changan Automobile	Chongqing
	40	Intelligent manufacturing TV pilot demonstration	Sichuan Changhong Electric	Sichuan
41 Hydraulic parts smart manufacturing demonstration AVIC Liyuan Hydraulic Guizhou	41	Hydraulic parts smart manufacturing demonstration	AVIC Liyuan Hydraulic	Guizhou
42 Intelligent power equipment service cloud platform Xi'an, Shaanxi Drum Power Company Shaanxi	42	Intelligent power equipment service cloud platform	Xi'an, Shaanxi Drum Power Company	Shaanxi
43 Collaborative development & regional aircraft manufacturing pilot demonstration Xi'an Aircraft Industry Group Shaanxi	43	Collaborative development & regional aircraft manufacturing pilot demonstration	Xi'an Aircraft Industry Group	Shaanxi
44 Smart foundry pilot demonstration Sharing Group Company Ningxia	44	Smart foundry pilot demonstration	Sharing Group Company	Ningxia
Transformer intelligent manufacturing demonstration TBEA Company Xinjiang	45	Transformer intelligent manufacturing demonstration	TBEA Company	Xinjiang
46 Household products smart manufacturing pilot Meike International Houseware Company Jiangsu	46	Household products smart manufacturing pilot	Meike International Houseware Company	Jiangsu

Source: MIIT (http://www.miit.gov.cn/n11293472/n11293832/n12845605/n13916928/16746307.html)

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