

Made in China 2025: Market Opportunities for EU SMEs



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Table of Contents

1. Executive Summary.....	1
1.1 Overview	1
1.2 New Opportunities.....	2
1.3 Risk and Challenges	2
2. Background to Made in China 2025.....	3
2.1 Moving up the Value Chain	3
2.2 Long-term Vision and Plan.....	3
2.3 Innovation, Productivity and Efficiency.....	3
3. The State Council’s Plan.....	5
3.1 The Nine Strategic Tasks	5
3.2 Ten Priority Sectors	6
4. Ten Priority Sectors	7
4.1 Advanced Marine Equipment and High-tech Vessels.....	7
4.2 Advanced Rail and Equipment	7
4.3 Agricultural Machinery and Technology	8
4.4 Aviation and Aerospace Equipment.....	9
4.5 Biopharmaceuticals and High-end Medical Equipment	10
4.6 Integrated Circuits and New Generation Information Technology.....	11
4.7 Power Equipment and Technology	12
4.8 High-end Manufacturing Control Equipment and Robotics.....	12
4.9 Low and New Energy Vehicles.....	13
4.10 New and Advanced Materials.....	14
5. Five Nationwide Initiatives	15
6. Opportunities by Sector.....	16
7. Specific MIC 2025 Objectives	17
8. Opportunities by Location.....	18
9. Opportunities for SMEs.....	20
10. Challenges for SMEs.....	21
11. Conclusions and Next Steps	22

1. Executive Summary

1.1 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 Small and Medium Sized Enterprises (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 also the proposed answer to China's declining competitive advantages in manufacturing, and oversupply in some industries.

MIC 2025 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 ten 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

1.2 New Opportunities

Despite its overt theme of Chinese technological independence, MIC 2025 is in reality a source of great opportunity for EU SMEs that can help China to implement the changes required. The EU 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. It is also a leader in process innovation, standardisation, efficiency, productivity, and integration all of which will be of great value to Chinese companies during MIC 2025 implementation.

There are many specific opportunities for EU SMEs, 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 EU companies to build early-stage partnerships with new and growing Chinese enterprises;
- Outbound investment to work with Chinese partners on third-country projects and EU-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.

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.

1.3 Risk and Challenges

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

As China moves to achieve a level of technological independence, we firmly believe that EU SMEs may actually find more opportunities from new high-value customers. This is provided that the Chinese 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.

2. Background to Made in China 2025

2.1 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 MIC 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 EU SMEs doing business with China.

2.2 Long-term Vision and Plan

A clue to this can be seen in the detail of the MIC 2025 plan. It 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 EU SMEs in working with China to implement the changes it requires.

2.3 Innovation, Productivity and Efficiency

MIC 2025 is designed to encourage Chinese manufacturers to be far less dependent on importing high-end 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 EU SMEs. China's industrial reform should broaden

the overall base and scale for EU SMEs 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 EU – from management-processing 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.

3. 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 mid-ranking 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 high-end 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.

3.1 The Nine Strategic Tasks

- To encourage innovation
- To promote the use of integrated, digital, technology-focused manufacturing
- To strengthen the overall industrial base
- 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 manufacturing-service industries
- To globalise Chinese manufacturing industries

3.2 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 and advanced materials

4. Ten Priority Sectors

4.1 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.

Key Chinese Players:

China International Marine Containers Group (CIMC)

www.cimc.com

China Merchants Heavy Industry (Shenzhen)

www.cmhicom.com

Dalian Shipbuilding Industry Co Ltd

www.dsic.cn

COSCO Shipyard

www.cosco-shipyard.com

Shanghai Shipyard

www.sh.cssc.net.cn

4.2 Advanced Rail and Equipment

In the past ten years, China has invested heavily in its new high-speed rail infrastructure and trains through international partnerships with the likes of Alstom, Siemens, Bombardier, Hitachi and Kawasaki, and it now has 18,000km of high-speed 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.

Key Chinese Players:

China South Rail Group (CSR)

www.csrgc.com

China North Rail Group (CNR)

www.chinacnr.com

China Railway

www.china-railway.com.cn

China Rail Construction (CRCC)

www.crucg1.com / www.crucg2.com

4.3 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 EU 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 EU's strengths are already recognised, 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.

Key Chinese Players:

Changzhou Dongfeng Agricultural Machinery Group

www.dftractor.com

Foton Lovol International Heavy Industry

en.lovol.com.cn

Kubota Agricultural Machinery

www.kubota.com.cn

Shandong Changlin Machinery Group

en.changlin.net

Shandong Juming Group

www.sdjuming.com

Tianjin Yongmeng Machinery Manufacturing

www.yongmengjixie.com

Wuzheng Group

www.chinawuzheng.com

YTO Group Corporation

www.yto-en.com

Zoomlion

www.zoomlion.com

4.4 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 well-established 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 sub-contracted 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 medium-sized 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.

Key Chinese Players:

Aviation Industry Corporation of China (AVIC)

www.avic.com/en/

AviChina Industry & Technology Co Ltd (AviChina)

<http://techniques.avic.com/>

AVIC Aircraft Corporation Ltd (AVIC Aircraft)

www.aircraft_co.avic.com/

AVIC Engine

<http://engine.avic.com/>

China Aviation Industrial Helicopter Co Ltd (AVIC Helicopter)

<http://avicopter.avic.com/>

AVIC Avionics Systems Co Ltd (AVIC Avionics)

www.avicem.cn/

China Aviation Industry General Aircraft Co Ltd (CAIGA)

www.caiga.cn/

AVIC Commercial Aircraft Engine Co Ltd (ACAE)

<http://www.acae.com.cn/>

AVIC International

<http://www.intl.avic.com/>

Commercial Aircraft Corporation of China (COMAC)

<http://english.comac.cc/>

Shanghai Aircraft Design and Research Institute (SADRI)

<http://sadri.comac.cc/>

Shanghai Aircraft Manufacturing Company (SAMC)

<http://samc.comac.cc/>

Shanghai Aircraft Customer Service Company (SACSC)

<http://sc.comac.cc/>

Beijing Civil Aircraft Technology Research Centre (BCATRC)

<http://bj.comac.cc/>

Shanghai Aviation Industrial Group Company (SAIGC)

<http://saic.comac.cc/>

Civil Aircraft Flight Test Centre

Zhejiang Xizi Aviation Industry

<http://en.xiziac.com/>

4.5 Biopharmaceuticals and High-end Medical Equipment

China will spend around CNY 6.6 trillion (approx. EUR 748 billion) on healthcare by 2020, and with ongoing reforms to the healthcare system opportunities for EU SMEs 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 EU 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 EU companies very well placed to work with large Chinese partners on global solutions.

Key Chinese Players:

Mindray Medical

www.mindray.com

Fosun Group

www.fosunpharma.com

Neusoft Medical Systems

www.medical.neusoft.com

Kanion Pharmaceutical

www.kanion.com

Hainan Poly Pharm

<http://english.hnpoly.com>

Shanghai Hengyi Group

www.hengyi-sh.com/en

Shanghai Waton Pharmaceutical Machinery

www.eastchinagroup.com

Leading Chinese enterprises producing pharmaceutical products include:

China Resources Medications Group, Beijing - www.crpharm.com

Guangzhou Pharm, Guangzhou - www.gzmpc.com

Harbin Pharm, Harbin - www.hayao.com

NorthChina, Shijiazhuang - www.ncpc.com

Qilu Pharm, Jinan - www.qilu-pharma.com

Sichuan Kelun Pharm, Chengdu - www.kelun.com

Fosun Pharma, Shanghai - www.fosunpharma.com

SinoPharm, Beijing - www.sinopharm.com

Tianjin Pharm, Tianjin - www.pharm.com.cn

Yangtze River Pharm, Taizhou - www.yangzijiang.com

4.6 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. 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 EU expertise.

Key Chinese Players:

(Group) Corporation (CETC)

www.cetc.com.cn

Eastern Communications (Eastcom)

www.eastcom.com

Huawei Technologies

www.huawei.com

4.7 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 EU strengths that will be in demand as China increases its focus on developing domestic capability for export.

Key Chinese Players:

Dongfang Electric

www.dongfang.com.cn

Harbin Electric

www.hpec.com

NARI Group

www.narigroup.com

Shandong Electric Power Equipment Corporation (State Grid)

www.speco.com.cn

Shanghai Electric

www.shanghai-electric.com

XJ Group (State Grid)

www.xjgc.com

4.8 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 CNY 800 billion (approx. EUR 90 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.

Key Chinese Players:

Shenyang Machine Tools Co Ltd

www.smtcl.com

Dalian Machine Tools Group

www.dmtg.com

Siasun Robot & Automation Co Ltd

www.shsiasun.com/en

Beijing Tiertime Technology Co Ltd

www.tiertime.com

Hunan Farsoon Technology

www.farsoon.net

GSK

www.gsk.com.cn

Guangzhou ST Sail Industrial Robot Co Ltd (STS)

www.stsrobot.robot-china.com

Effort Triowin

www.triowinrobot.com

4.9 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: 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 EU-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.

Key Chinese Players:

BYD

www.byd.com

BAIC

www.baicmotor.com

Chery

www.cheryinternational.com

4.10 New and Advanced Materials

In 2010, the government prioritised the development of certain new-materials sectors, such as high-end structural and functional performance metals, artificially synthesised high-end polymers, inorganic non-metallic materials and high-performance composites. MIC 2025 seeks to build on this and emphasises advanced international standards, green manufacturing processes, high-efficiency 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. 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.

Key Chinese Players:

Xiamen Tungsten

www.xiamentungsten.com

Advanced Technology & Materials Company

www.atmcn.com

Northern Rare-Earth High-Tech

www.reht.com

BaoTi

www.baoti.com/en

Beijing Zhong Ke San Huan Hi-Tech

www.san-huan.com.cn

5. 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 focused on smart manufacturing
- To implement projects focused on green manufacturing
- To prioritise high-end equipment manufacturing in key sectors

	Initiative	Details	Objectives
1	R&D 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, high-end 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.

6. Opportunities by Sector

<p>Advanced marine equipment & hi-tech vessels High-tech marine equipment Marine materials Ocean/deep-sea exploration Offshore renewable energy Luxury cruisers & yachts</p>	<p>Advanced rail & equipment Rail infrastructure equipment High-end rolling stock components Signal & operations control & testing</p>
<p>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</p>	<p>Aerospace Commercial passenger aircraft Helicopters & specialist aircraft Aircraft components & equipment Private & luxury jets Specialist airport equipment</p>
<p>Biopharmaceuticals & med-tech R&D and clinical trials Product testing & compliance Digital health High-end medical devices In vitro diagnostics</p>	<p>Manufacturing control & robotics Computer numerical control tools (CNC) Robotics 3D printing High-end machine tools</p>
<p>Integrated circuits & new IT Core hardware & software components New telecoms infrastructure Operating systems & industrial software Cloud computing Data integration & advanced analytics Smart Grids</p>	<p>Low & new-energy vehicles Electric vehicles Hybrid vehicles Fuel cell vehicles Intelligent & interconnected vehicles High-end sports vehicles</p>
<p>New & advanced materials Special metallic function materials High-end structural metals High-performance fibres & composite materials Advanced glass & ceramics Advanced polymers</p>	<p>Power equipment & technology Coal-fired power Nuclear power Offshore wind power Transmissions & transformation sets High-end safety & monitoring</p>

7. 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, 2017

8. 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.

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

*Qingdao and other major manufacturing cities in Shandong

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										✓	✓
Shannxi		✓									
Shandong	✓							✓		✓	
Xinjiang	✓								✓		
Guangdong					✓						

9. Opportunities for SMEs

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 EU SMEs to export their hi-tech 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 European exports actually consists of support 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 EU SMEs who can provide relevant services.

JOINT R&D AND JOINT BIDDING

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

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. EU SMEs should be looking to partner with growing enterprises in China and Europe 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 EU strengths and will be more in demand with the increase in projects worldwide.

DESIGN

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. Technical & Vocational Education & Training (TVET) is just one area that's currently experiencing several extensive reforms and is increasingly seen as the key to solving future problems, such as sustainable workforce development. Chinese central and provincial governments are investigating new approaches and initiatives to address the current challenges, and this is an area where experienced EU SMEs can offer their expertise.

10. Challenges for SMEs

There will inevitably be challenges for EU SMEs 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 IP rights environment is improving with changes to the laws and better enforcement. Various European Chambers and Embassies (including the EU SME centre) in Beijing work 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 IP enforcement, and if Chinese companies successfully move up the value chain, their interest in creating and protecting global IP 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 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. EU SMEs may need to review their ability to react to the fast-moving opportunities and provide solutions to fast-growing 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 long-term strategy. EU SMEs 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 EU SMEs will actually find more opportunities, even as China improves its capabilities, provided they maintain or extend their technological lead.

All in all, EU SMEs must stay ahead of the game in terms of technological development as it is this technology gap which China seeks to close, and therefore it is here where it presents the greatest opportunities. 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, EU SMEs can, in many cases, provide.

The MIC 2025 strategy was highlighted during the 19th Party Congress, which took place in October 2017. It was expressed by the government that MIC 2025 is a market-led and government-guided strategy, whose policies will be applicable to all enterprises in China, no matter if they are domestic or foreign-owned.

The government has also pointed to the next phase of its MIC 2025 strategy, which is to combine manufacturing with use of the internet, thus aiming to do away with the old “Made in China” label and replace it with for “Made on the Internet”. This is reflected in the promotion of concepts such as intelligent manufacturing, big-data and Internet of Things which look to change the idea that manufacturing is simply a tool or process, and rather present it as a driver of innovation and new technologies.

11. Conclusions and 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 would 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 the advantage of EU SMEs will require a close understanding of the local business environment in their industry.

As with any government led strategy, there are certainly risks and challenges to be aware of, but businesses with an eye on the wider picture should recognise significant opportunities too.

About the Centre

The EU SME Centre helps EU SMEs prepare to do business in China, by providing them with a range of information, advice, training and support services. Established in October 2010 and funded by the European Union, the Centre has entered its second phase which will run until July 2018.

The Centre is implemented by a consortium of six partners – the China-Britain Business Council, the Benelux Chamber of Commerce, the China-Italy Chamber of Commerce, the French Chamber of Commerce in China, the Eurochambres, and the European Union Chamber of Commerce in China. All services are available on the Centre's website after registration, please visit: www.eusmecentre.org.cn.

About CBBC

This report is compiled in partnership with the China-Britain Business Council (CBBC) and is an introduction to e-commerce in China. It aims to help EU SMEs gain an understanding of the different e-commerce channels in China and how EU SMEs can use these channels in a cost-efficient way.

CBBC is the leading organisation helping UK companies grow and develop their business in China. CBBC delivers a range of practical services, including: advice and consultancy, market research, event management, an overseas market introduction service, trade missions and exhibitions, and setting up rep offices. For more information about what CBBC can do to help your business develop in China, please visit: www.cbcc.org.

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