China’s 13th Five-Year Plan: The Challenges and Opportunities of Made in China 2025

Under China’s 13th Five-Year Plan, efforts will be made to implement the Made in China 2025 initiative in greater depth, with a view to achieving the country’s objectives of becoming a manufacturing powerhouse, creating a favourable environment for the growth of new strategic industries, and optimising modern industrial systems. These developments are bound to stimulate demand for all kinds of advanced technologies and services. While China has already reached international advanced levels in certain technology sectors, its overall technological development still lags behind that of advanced countries. The absence of standard total solutions in certain industrial sectors has also restrained the development of these industries. In light of this, apart from increasing research and development (R&D) activities at home, China still has to import a wide range of advanced technologies in order to promote industrial upgrading and develop emerging industries.

Hong Kong’s technological personnel, well-versed in foreign advanced technologies and proficient in using technologies developed to international standards, can provide technological and management systems applications and solutions, and help promote commercialisation of the projects concerned to meet the demand for technologies arising from the 13th Five-Year Plan. Moreover, Hong Kong, as mainland enterprises’ first port of call for services in their “going out” strategy, can support them in their ventures of undertaking technological investment projects and seeking cooperation partners abroad. The extensive range of professional services and sound protection of intellectual property rights offered by Hong Kong also provide an ideal business environment for industry players and help to promote cooperation and technology transfer projects between mainland and foreign enterprises. As an international financial centre in the region, Hong Kong can also provide the necessary project financing services. Hence, the in-depth implementation of Made in China 2025 under the 13th Five-Year Plan is set to generate a host of opportunities for Hong Kong’s technology sector and service suppliers.
**Striding Towards a Manufacturing Powerhouse**

The *Outline of the 13th Five-Year Plan for National Economic and Social Development of the People’s Republic of China* (the 13th Five-Year Plan) issued in March 2016 stated that in the next five years (2016-2020), the quality and benefit of development will be enhanced in order to establish a moderately prosperous society across the board. One of the major development objectives is to propel industry to move towards medium- and high-end manufacturing.

(Remark: For details on the 13th Five-Year Plan, please see [Opportunities Arising from China’s 13th Five-Year Plan: An Overview](#))

The 13th Five-Year Plan states clearly that efforts will be made to optimise development of the modern industry system, whereby structural reform will be implemented on the supply side. In particular, the development strategy of building China into a manufacturing powerhouse under the *Made in China 2025* initiative will be implemented in greater depth in order to enhance the innovation capability of the manufacturing industry and strengthen the industrial base. This includes manufacturing key basic materials and core parts and components, developing new-type manufacturing such as smart production, enhancing quality and brand building, as well as advancing traditional industry upgrading and eliminating outdated production capacity in order to add a new competitive edge to the manufacturing industry.

Indeed, in the past decade or more, following the massive shift in global production activities, China’s industrial sector has undergone rapid expansion. Revenues generated by industrial enterprises soared to RMB110.3 trillion in 2015, from RMB8.4 trillion in 2000. As the ”world’s factory”, China’s production of a wide range of consumer and industrial goods, such as garments, toys, home appliances and consumer electronics, accounts for the lion’s share of the global market. However, most industrial activity is still concentrated on the production of low-technology products through labour-intensive processes generating relatively slim profit margins.
The 13th Five-Year Plan encourages enterprises to shift to medium- and high-end manufacturing. Many mainland enterprises still rely on imported key parts and components.

While China is a leading producer of a number of high-tech products, such as computers and smartphones, high-tech production only accounts for about 12% of the country’s industrial production activities. This, coupled with the fact that China still has to rely on imported key parts, components and production equipment, has resulted in small profit margins for high-tech manufacturing. Therefore, accelerating industrial upgrading and encouraging enterprises to shift from low value-added business to medium- and high-end manufacturing in order to achieve the objective of turning China into a manufacturing powerhouse is one of the major objectives of the 13th Five-Year Plan.
Remark:
(1) The gross profit margin of an enterprise is calculated based on the share of business profits in revenue from its principal business.
(2) Industrial enterprise above a designated scale refers to an industrial enterprise with annual revenue from its principal business equal to or greater than Rmb 20 million.
Source: National Bureau of Statistics of China; Statistical Communiqué on 2015 National Economic and Social Development; Ministry of Science and Technology.
Roadmap for Industrial Upgrading

To enhance industrial efficiency and attain the objective of building China into a manufacturing powerhouse, a “three-step” roadmap and nine strategic tasks are set out in Made in China 2025 in the hope of elevating the country to the upper echelons of the world’s manufacturing powerhouses by 2049[1]. The 13th Five-Year Plan further puts forward that action will be taken to develop a new system aimed at streamlining the industrial- and business-management system, raising administrative efficiency, expediting financial-system reform, further promoting development of the capital market, and enhancing the efficiency of the financial services sector in serving the real economy and promoting industrial upgrading. Efforts will also be made to lower the “five social insurances and one fund”[2] fees and abolish unreasonable charges in a bid to reduce the tax burden on enterprises, which will in turn facilitate industrial upgrading and transformation[3].

Made in China 2025 Roadmap for Building China into a Manufacturing Powerhouse

- **2025**: Enhancing the manufacturing industry’s innovation capability, advancing industrialisation and informatisation integration to a new level, and elevating China’s position in the global industrial division of labour and value chain.
- **2035**: Reaching the medium level of the world’s manufacturing powerhouses, raising innovation capability significantly, and enhancing overall competitiveness considerably.
- **About 2049**: Comprehensive strength to rank among the upper echelons of the world’s manufacturing powerhouses, a leading technological and industrial system will be built.
### Nine Strategic Tasks

- **Enhancing innovative capability of the manufacturing industry**
  This includes encouraging OEM enterprises to shift to designing and exporting own brand products

- **Advancing closer integration of informatisation and industrialisation**
  Devote great efforts to developing smart equipment and smart products, as well as advancing smart production

- **Strengthening fundamental industrial capabilities**
  Strengthen development of basic core parts and components, advanced basic processes, basic key materials and basic industrial techniques

- **Enhancing quality and brand building**
  Encourage enterprises to develop brand products with proprietary intellectual-property rights, and implement action plans to enhance the quality of industrial products

- **Proactively developing service-oriented manufacturing and producer services**
  Advance innovative business models and innovative business formats, and accelerate the development of producer services

- **Fully promoting green manufacturing**
  Strengthen R&D of advanced energy conservation and environmental protection technologies, and quicken the pace of transforming and upgrading the manufacturing industry to green production

- **Actively achieving development breakthroughs in key areas**
  Focus is put on 10 key areas: new-generation information-technology industry, high-end numerical control lathes and robots, aviation and aerospace equipment, ocean engineering equipment and high-tech vessels, advanced rail transport equipment, energy saving and new-energy vehicles, electrical equipment, agricultural machinery and equipment, new materials, biomedicines and high-performance medical devices

- **Deepening restructuring of the manufacturing industry**
  Promote traditional industries to move towards medium- and high-end manufacturing to gradually solve the problem of excessive production capacity

- **Elevating development of the manufacturing industry to international level**
  Devote greater efforts to integrating the “bringing in” and “going out” development strategies, and raise the level of international cooperation

Remark: For details, please see *Made in China 2025*

Source: *Made in China 2025*

The *Made in China 2025* initiative also mentions that under the premise of enhancing the innovation capability of the manufacturing industry, innovative design demonstration projects will be unfolded in key sectors including traditional manufacturing industries and new strategic industries, where advanced designs and technologies featuring green and smart concepts will be popularised and applied. The 13th Five-Year Plan clearly sets out that the development of new strategic industries will be vigorously promoted and it is hoped that, through such measures as industrial policy guidelines and the national strategic industries development fund, the role of emerging industries in supporting the
development of the manufacturing industry and the overall economy will be enhanced. Development objectives and actions include:

- The value-added of new strategic industries to account for 15% of GDP
  (In 2015 the value-added of all industries accounted for about 33.8% of GDP)

- New-generation information technology industry innovation
  Develop artificial intelligence, smart hardware, new displays, mobile-smart terminals, 5G mobile communications, advanced sensors, wearable devices, etc.

- Bio-industry to expand
  Accelerate the application of bio-technology such as genomics; advance the development of new medicines, biological breeding, new-generation bio-technology products and services.

- Spatial smart sensing
  Accelerate the building of spatial infrastructure facilities, such as multi-modal remote sensing, broadband mobile communications, Beidou global navigation satellite, and advance related commercialisation and application.

- Storage and distributed energy resources
  Achieve breakthroughs in key technologies including new-generation photovoltaics, large-power efficiency wind energy, biomass, smart grids, new-energy storage devices; accelerate the application, large-scale production and industrialisation of related products.

- Advanced materials
  Actively develop shape memory alloys, self-healing smart materials, graphene, functional nanomaterials, next-generation semiconductor materials, etc.

- New-energy cars
  Develop pure electric cars and plug-in hybrid electric vehicles to boost output and sale of new-energy vehicles across the country to five million units, and strengthen recovery and treatment of old and waste batteries of new-energy cars.

Remark: For details, please see the 13th Five-Year Plan
Source: The 13th Five-Year Plan
New-generation photovoltaics: a new strategic industry to receive a boost under the 13th Five-Year Plan

New-energy cars: a new strategic industry to receive a boost under the 13th Five-Year Plan

**Strong Demand for Advanced Technology**

The *Made in China 2025* initiative and promotion of new strategic industries under the 13th Five-Year Plan are bound to stimulate China’s demand for various kinds of specialised technology, equipment and technical services. Indeed, China’s technological development in the past 20 years has been brisk. For instance, in 1995 the number of domestic patent applications processed in China was less than 70,000, but by 2015 this number had rocketed to 2.64 million[4]. According to the World Intellectual Property Organization’s (WIPO) 2015 report, China topped the global league table for the numbers of patent applications submitted in all three categories, namely invention, utility model and industrial design, surpassing developed countries such as the United States, Germany and Japan[5]. Moreover, China’s R&D expenses jumped to RMB1.4 trillion (accounting for 2.1% of GDP) in 2015[6] from RMB34.9 billion (accounting for 0.57% of GDP) in 1995. Meanwhile, China’s development level in certain technology sectors, such as aviation and aerospace, navigation, electronic computing engineering and biotechnology, has reached the international advanced standard.
In spite of this, China still relies on the support of a wide range of advanced technologies to promote its industrial upgrading and new strategic industries development. Although the absolute value of China’s technological R&D expenses has surpassed that of many countries, in terms of the share of R&D expenses in GDP, the strength of China’s technological R&D still lags behind that of advanced countries in Europe and the Americas and falls short of fully supporting this “world’s factory” development into a manufacturing powerhouse. Moreover, although China has been attaching great importance to technological R&D in recent years, the large gap formed in the past decades means that in the short term its technological development still trails that of advanced countries.

Take patents for example. Despite the rapid rise in the number of patent applications filed in China, they are mainly for utility models and industrial designs with most of them merely involving production technique and product design. Inventions involving advanced technology, however, currently only account for about 37% of the total number of applications. Also, in terms of valid invention patents, the number of such domestic patents in China was only 870,000 at the end of 2014, lower than the number of 970,000 applications filed in the same year and also lower than the number of valid invention patents in the US and Japan.
In both the industrial upgrading mentioned in *Made in China 2025* and the new strategic
industries mentioned in the 13th Five-Year Plan, the development focus lies in utilising advanced technologies to enhance the value-added and competitiveness of the manufacturing industry. Therefore, the 13th Five-Year Plan further encourages technological R&D activities and has also set development targets in the hope of raising the share of R&D expenses in GDP to 2.5% in 2020, from 2.1% in 2015.

Although China’s technological R&D activities have been expanding rapidly, a report recently released by UNESCO pointed out that Chinese enterprises are facing problems in mismatching R&D input and actual application output. Specifically, enterprises cannot effectively commercialise their R&D achievements. Also, due to system constraints, the personnel of public R&D institutions lack the incentive to transfer technology to enterprises. Against this backdrop, with a small number of exceptions, Chinese enterprises still have to rely on imported foreign technology to support industrial development and upgrading[7].

In light of this, both Made in China 2025 and the 13th Five-Year Plan put forward that efforts will be made to better integrate the “bringing in” and “going out” development strategies in a bid to enhance the level of international cooperation. Made in China 2025 specifically sets out that steps will be taken to coordinate the utilisation of domestic and international market resources, implement more positive opening-up strategies, further liberalise the general manufacturing industry, and guide foreign investment towards advanced manufacturing such as new-generation information technology, advanced equipment, new materials and biomedicines. It will also encourage foreign companies and technological institutions to set up global R&D institutions in the Chinese mainland in a bid to elevate the development of the country’s manufacturing industry to an international level. The above-mentioned UNESCO report also pointed out that China must continue to introduce different measures to attract foreign technology. It estimated that in 2015, China’s dependence on foreign technology was about 35%.

Going Out to Seek Technology Support

For many years, China has been importing all kinds of technology from its foreign partners. According to mainland statistics, in terms of contracted amount, Hong Kong was the mainland’s sixth-largest source of imported technology, accounting for 2.6% of the total, after the US (30.5%), Japan (17.2%), Germany (14%), South Korea (11.6%)
and Sweden (3.5%). Manufacturing enterprises in China producing electronics, transport equipment, chemical products, etc., are the major importers of foreign technologies, accounting for more than 84% of such imports in 2014. Evidently, China’s imported technology is closely related to its manufacturing activities. Mainland manufacturers are eager to import foreign technologies to enhance their competitiveness to combat intense competition in the global market.

China’s Import of Foreign Technology

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<tr>
<th>Year</th>
<th>Import (US$ billion)</th>
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<tr>
<td>2005</td>
<td>19.0</td>
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<td>2006</td>
<td>22.0</td>
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<td>2007</td>
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<td>2008</td>
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<td>2009</td>
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<td>2010</td>
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<td>2011</td>
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<td>2012</td>
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<td>2013</td>
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<td>2014</td>
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2014

- Manufacturing: 84.4%
- Information transfer and software: 5.9%
- Real estate: 2.1%
- Mining: 1.2%
- Scientific research & technical service: 1.1%
- Consumer and other services: 1.0%
- Others: 4.3%

Remark: The above figures are calculated based on the contracted amount of imported technology.
Although the amount of technology China has imported in the past 10 years has generally increased, it is still failing to cope with the robust growth of industrial activity and even showed signs of a downturn in 2013 and 2014. After years of growth, China needs to import technology that is increasingly advanced. However, due to political considerations and other factors, some developed countries are not willing to supply China with certain state-of-the-art technologies and equipment. Some foreign technology-industry players are also worried that certain commercial secrets could fall into the hands of their Chinese counterparts, with the risk of undermining their long-term competitiveness.

### Made in China 2025 versus Germany’s Industrie 4.0: Implications

As China’s 13th Five-Year Plan put forward that the Made in China 2025 initiative will be implemented in greater depth, many industry players associate China’s industrial upgrading with Germany’s Industrie 4.0 strategy. Some even believe this could intensify industrial competition between the two countries. However, China and Germany occupy different positions in the global industry chain. Moreover, the objective of Germany’s Industrie 4.0 is to integrate advanced network and information technology with its industrial-production system, which already commands a leading position globally, in order to further enhance the country’s industrial efficiency. Meanwhile, the tasks of Made in China 2025 include solving such problems as inefficient and outdated production capacity as well as encouraging domestic enterprises to shift from low value-added business to medium- and high-end manufacturing in the hope that China can reach the medium level of the world’s manufacturing powerhouses. Considering the different stages of industrial development of the two countries, China will have to rely on more advanced technologies and services to promote industrial transformation and upgrading. In light of this, both the 13th Five-Year Plan and Made in China 2025 are bound to generate more opportunities for the suppliers of a wide range of technologies and services.

On the other hand, as Chinese enterprises move towards medium- and high-end manufacturing, the technology required has gradually shifted from production-based to that which focuses on high-tech product design, system solutions, advanced materials, application of new technology and standards, networks, and big data analysis. As such, it has become increasingly difficult for them to rely solely on imported equipment. Therefore, many enterprises have taken advantage of the “going out” strategy to invest directly in foreign countries or conduct technological cooperation with foreign partners as the means to acquire the technologies needed.

China is currently the world’s third-largest source of outward direct investment, which reached US$123.1 billion in 2014. Both state-owned enterprises and private enterprises pursuing the “going out” strategy aim to enhance competitiveness and undertake...
transformation and upgrading through such commercial activities as merger and acquisition, sourcing foreign raw materials/key parts and components, and technological project cooperation with foreign organisations.[8]

For instance, according to a report[9] by the Asia Society in New York, China’s direct investment in the US has undergone enormous changes in the past 20 years. The latest investment wave, which started in 2010, was mainly concentrated in the high-technology sector. And while China’s share of the total direct investment in the US high-technology sector is not large, it has been rising in recent years.

Oppportunities for Hong Kong Companies

In its 13th Five-Year Plan, China hopes to develop into a manufacturing powerhouse and strengthen the role of new strategic industries in supporting its overall economic growth by implementing the Made in China 2025 initiative. This is likely to bolster the mainland’s demand for various kinds of advance technology. At present, China lacks standard total solutions in certain high-tech sectors, such as IoT (Internet of Things) application and next-generation internet development, and also lacks user experience in other sectors. This inadequacy has constrained the R&D and application of related technologies. Hong Kong’s technological personnel, well-versed in foreign advanced technologies and proficient in using technologies developed to international standards, can provide mainland players with the necessary support in technological and management systems applications and solutions, and help promote commercialisation of the projects concerned to meet the demand for technologies arising from the 13th Five-Year Plan.

Hong Kong not only possesses advantages in technological application but also with marketing and application personnel. As such, Hong Kong can serve as an ideal platform for mainland enterprises to conduct technological cooperation with foreign companies. This is why a large number of mainland enterprises use Hong Kong as a means to cooperate with foreign partners. Mainland enterprises are eager to “go out” and make outward investment, including seeking technological and technical cooperation partners. According to a recent survey conducted by the HKTDC, the majority of enterprises located in the Pearl River Delta, Yangtze River Delta and Bohai Rim indicated that the Hong Kong service platform is their first port of call in “going out”[10].
When foreign technologies enter the mainland market, they must undergo modifications in order to adapt to China’s industrial and business environment. Moreover, foreign companies not only have to find the right mainland partners and clients, but also face challenges of intellectual-property-right protection. Hong Kong, with a sound legal system and the availability of an extensive range of professional services, can provide an ideal business environment for industry players, help promote technology transfer, and offer good protection to intellectual-property rights.

*Made in China 2025* also points out that enterprises will be encouraged to pursue innovation to promote industrial upgrading and to enhance product-design capability and brand building. It is also hoped that more production activities will evolve from OEM to ODM and that efforts will be made to develop brands. This should create opportunities for Hong Kong’s design and branding service suppliers. According to a recent survey conducted by the HKTDC, mainland enterprises wish to obtain the relevant service support from Hong Kong and foreign countries in the areas of product development and design, brand design and marketing strategy.[11]

Moreover, Hong Kong, as an international financial centre in the region, can provide mainland enterprises and foreign technology companies with the necessary lending and financing services, including providing cost-effective funds for relevant technological and industrial projects, which can help mainland enterprises lower the cost of financing. At the same time, Hong Kong, as one of the largest venture-capital-investment-management centres in Asia and home to a great number of top-notch international funds hoping to capture business opportunities in China, can offer additional financing channels to mainland enterprises. Therefore, it can be expected that during the 13th Five-Year Plan period, as the mainland further opens up its financial-services market, there will be more opportunities for Hong Kong financial-service suppliers to enter the mainland market.

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[1] In the *Made in China 2025* document, it states: “On the 100th anniversary of new China, its position as a strong manufacturing country will be consolidated and its comprehensive strength will rank among the upper echelons of the world’s manufacturing powerhouses.”

[2] "Five social insurances and one fund" refers to the social benefits that the government requires enterprises to provide to their employees. They include old-age insurance, medical insurance, unemployment insurance, work injury insurance and maternity insurance, as well as access to the housing provident fund.

[3] In the government work report issued in March 2016, Premier Li Keqiang remarked that action would be taken to further reduce the burden on enterprises. VAT would fully replace business tax from 1 May 2016, and the scope of the pilot policy would be extended to cover the construction, real estate, financial and consumer-services sectors. Further, the immovable property newly acquired by enterprises would be entitled to VAT deduction to ensure that the tax burden on all industries is lightened. In addition, government funds set up illegally would be revoked, contributions to a number of government funds would be suspended and consolidated, and the scope of waiving contributions to funds such as water conservancy and construction fund would be
expanded. The exemption of 18 items of administrative fees would be extended from small and micro enterprises to all enterprises and individuals. For more details, please see the HKTDC Business Alert-China: China to Pilot Full-Scale Replacement of Business Tax with VAT


[6] Source: Ministry of Science and Technology; Statistical Communiqué on 2015 National Economic and Social Development


[8] For details, please see HKTDC Research report Outbound Investment of Chinese Enterprises: Hong Kong the First Port of Call for Professional Services


[10] For details of the survey, please see HKTDC Research report Outbound Investment of Chinese Enterprises: Hong Kong the First Port of Call for Professional Services

[11] For details of the survey, please see the HKTDC Research report Outbound Investment of Chinese Enterprises: Hong Kong the First Port of Call for Professional Services


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