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Special Issue: Made In China 2025

"Made in China 2025" Plan Unveiled

The "Made in China 2025" plan officially unveiled on May 19 puts forward a three-step approach to the strategic goal of making China a strong manufacturing country. According to the plan which aims at the strategic transformation of China's manufacturing industry from "big" to "strong", China will basically realize industrialization with a further consolidated position as a large manufacturing country and substantially improved application of information technology in manufacturing by 2020, have a number of internationally competitive multinational companies and industry clusters in a manufacturing industry with an significantly improved strength and greatly improved innovation capabilities by 2025, reach a medium level among the world's best

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manufacturers by 2035 and rank near the top of the manufacturing league table by 2049 when the People's Republic of China celebrates its centenary.

The plan's primary focus is the upgrading of the manufacturing industry and its competitiveness so that the industry can play a stronger role in the high end of the industry chain and value chain and achieve the transformation from a large size to great strength, especially the equipment manufacturing industry. Technology innovation is an effective means to improve China's comprehensive competitiveness and is at the core of the equipment manufacturing industry. The plan states that public-private partnership (PPP) will be leveraged to give full scope to social capital in the construction of major projects in the manufacturing industry, the technical upgrading of enterprises, and the construction of key infrastructures. The plan also outlines strategic support and assurance in eight aspects to ensure the accomplishment of the goals: 1) deepen system and mechanism reforms; 2) foster a fair and competitive market environment; 3) improve financing policy; 4) increase fiscal and tax incentives; 5) build a multi-tiered talent development system; 6) improve policy for SMEs; 7) further increase the openness of the manufacturing industry; and 8) optimize organization and implementation mechanisms.

(Source: Science and Technology Daily, May 20, 2015)

The Bottleneck is lack of S&T Innovation

At the 11th meeting of the National Standing Committee of the 12th CPPCC, standing committee members and committee members shared their opinions and suggestions on the "Made in China 2025" plan issued by the State Council. One common concern of the members is the lack of S&T innovation, which has become a bottleneck of "Made in China" in the current stage. Although some large and medium-sized enterprises have their own R&D platforms, due to the lack of strength in R&D, they are weakly positioned to create truly original technologies. With respect to the system and mechanism of sharing of R&D platforms, they suggest that more efforts be made to actively adapt to and meet the needs of enterprises.

To improve innovation capabilities in the manufacturing industry, S&T breakthroughs in three tiers are needed: 1) key science and technology projects at national level; 2) breakthroughs in generic technologies in the industry; and 3) technology innovation at the enterprise level. More investments should be made into innovation in important fields to accelerate breakthroughs in key technologies. During the 13th Five-year Plan period (2016-2020), the government should release relevant policies to join forces and integrate resources nationwide to accelerate breakthroughs in key technologies including core components, engine technology, materials science and technology, and controllable and secure information systems.

All stakeholders should effectively grasp the important opportunity of industry transformation to promote integration of technologies and industries in such fields as Internet, new materials, new energy and advanced manufacturing. Vigorous efforts should be made to strengthen development of manufacturing technologies and building of local brands, promote intelligent manufacturing, networked manufacturing and green manufacturing, and build a new manufacturing system. Meanwhile, efforts should also be made to encourage and support SMEs to adopt and leverage new intelligent manufacturing technologies and become creators and providers of advanced industrial manufacturing technologies.

(Source: Science and Technology Daily, June 17, 2015)

Focus Placed on Intelligent Manufacturing

The "Made in China 2025" plan was first put forward in this year's government work report. At the State Council Executive Meeting presided by Premier Li Keqiang on March 25, the plan was highlighted again to upgrade China's manufacturing industry. As the world's largest manufacturing country, what are China's considerations behind "Made in China 2025"? What changes will China's manufacturing industry take on in the coming ten years? In what ways is "Made in China 2025" similar to and different from Germany's "Industry 4.0"? The new government initiative has garnered a lot of interest from the public.

According to Miao Wei, Minister of Industry and Information Technology, China will roughly take thirty years and three steps to complete the transformation from a large manufacturing country to a strong manufacturing country. "Made in China 2025" is the first action plan, roadmap and timetable of the three-step strategy. China aims to enter the second echelon of the global manufacturing industry through ten years' efforts. Generally speaking, the U.S. is in the first echelon, Germany and Japan in the second echelon, and China, Britain, France and Korea in the third echelon. After the financial crisis in 2008, western developed countries have made plans for the manufacturing industry, including the "Industry 4.0" plan of Germany, all with an eye to strengthen their position and competitive edge in the world by leveraging new technologies, new industries and new models.

The most widely discussed part of 'Made in China 2025" is undoubtedly intelligent manufacturing which is also an important part of the initiative. Promoting intelligent manufacturing is a fundamental means to transform China's manufacturing industry from "large" to "strong". In the new round of technological and industrial revolution, all countries are trying to secure an advantageous position of development. The integration of the Internet with traditional industries is meant to capture a commanding height in the competition, and its main focus is on intelligent manufacturing, which involves the upgrade of production from "automated" to "intelligent" in the entire production cycle by replacing manual control with "factory + information systems", replacing human supervision with "production line + sensors", and replacing worker skills with "precision machining equipment + algorithms", eventually leading to "intelligent factories" and "fully automatic factories". Numeric control systems and industrial robots so far have basically operated according to manually set parameters and lacked artificial intelligence. China needs to increase artificial intelligence applications in high-end sensors, important operating systems, and numeric control equipment to meet the requirements of intelligent manufacturing.

(Source: Science and Technology Daily, April 1, 2015)

Prominence Given to Green Development

"Made in China 2025" outlines China's efforts to 1) comprehensively promote green manufacturing, strengthen R&D intensity in advanced environmental technologies, processes and equipment, and accelerate green-oriented upgrade of the manufacturing industry; 2) actively promote low-carbon, circular and intensive production and improve efficiency of resource utilization in the manufacturing industry; and 3) strengthen life-cycle green management of products and build an efficient, clean, low-carbon and circular green manufacturing system.

Currently, industrial production contributes 89% of sulfur dioxide emissions, 69% of nitrogen oxide emissions and roughly 85% flue dust emissions in China. Therefore, the industrial sector has a huge impact on the environment. To solve the constraint of resources and

environment in economic development, the only solution is green development. China's current industrial structure is still dominated by traditional industries - especially the manufacturing industry – based on the consumption of energy and resources, and therefore the top priority of green restructuring of traditional industries is the green restructuring of such industries as steel, nonferrous metals, building material, chemicals, papermaking, textile, and printing and dyeing. For this purpose, efforts must be made to promote advanced appropriate energy-saving and emissions-reducing technologies, equipment and processes in Chinese enterprises to reduce energy consumption and pollution in the traditional manufacturing industry, which is an urgent task on hand.

In addition to restructuring traditional industries, clean production needs to be promoted in key regions, key industries and key river basins, because clean production can solve pollution and emissions from their very sources. In this respect, the main measure is the application of clean production technologies and processes by replacing traditional processes that produce toxic substances with environmentally friendly ones. Moreover, it is also necessary to promote the high-level and green development of advanced manufacturing and strategic emerging industries, i.e. products and industries with a high added value and technology content, because these industries are crucial to China's industrial restructuring and transformation.

Source: Science and Technology Daily, June 16, 2015)

Outlook for Robotics Industry

The 2015 China National Robotics Development Forum was jointly organized by the Chinese Association of Automation and the China Association for Mechatronics Technology and Application in Beijing on April 13. According to data released at the forum, China has become the world's largest industrial robot producer, posting 56,000 newly added industrial robots in 2014, much higher than 37,000 in 2013. In spite of a weak global economy, the robotics industry has seen a rapid development, growing 12% globally and 58% in China in 2013 and 27% globally and 54% in China in 2014, with China consistently taking the lead in growth speed.

The rapid development of China's robotics industry has presented both opportunities and challenges to enterprises. The robotics industry is a typical industry characterized by high intensity of talent, high technology and capital. In this industry, China faces the challenge of lacking core robotics technologies, core parts and components, and core enterprises. Chinese and foreign enterprises compete on an equal footing in the Chinese market, but as Chinese robotics enterprises are still in the growth phase, they face a tough situation in the competition with foreign enterprises. As of the end of last year, China had approximately 500 robotics enterprises, and they will face daunting challenges ahead. The robotics industry has a window period of five to eight years, with enterprises entering head-to-head competition in 2015. It is expected that the overheated robotics industry will be reshuffled in the coming five years.

(Source: Science and Technology Daily, April 14, 2015)

Implementation and Advancement

Vice Minister of Industry and Information Technology Su Bo said on March 27 that "Made in China 2025" is an action plan to advance China's goal of becoming a strong manufacturing country in the coming ten years. To implement the strategic plan, the Ministry of Industry and Information Technology will promote five major projects, including 1) construction of national manufacturing innovation centers; 2) intelligent manufacturing; 3)

industrial base capacity and quality enhancement; 4) green manufacturing; and 5) high-end equipment innovation.

With innovation-driven development of the manufacturing industry as the main theme, acceleration of integration of new-generation information technologies and the manufacturing industry as the main thread, promotion of intelligent manufacturing as the main direction, and meeting the demand of economic and social development and national defense capacity building for key technology equipment as the goal, "Made in China 2025" proposes nine major tasks, ten major fields and five major projects.

The construction of national manufacturing innovation centers, one of the five major projects, involves the formation of an industry alliance based on the existing research institutes, universities and enterprises without changing their affiliations to undertake the task of building a strong manufacturing country. Intelligent manufacturing is at the core of the new round of technological revolution and also the main direction of the digital, networked and intelligent manufacturing industry. The intelligent manufacturing will promote digital and intelligent applications in various industries.

(Source: Science and Technology Daily, March 29, 2015)

Research Report on China's Manufacturing Industry 2014 Comes Out

Foreign direct investment (FDI) has for a long period of time been one of the primary drivers of China's manufacturing industry, but the percentage of actual FDI devoted to the manufacturing industry has been declining since 2006, and the total FDI in the manufacturing industry has also been declining since 2012, according to the Research Report on China's Manufacturing Industry 2014 recently released by Nanjing University of Information Science & Technology. During the period, western developed countries such as Germany and the U.S. introduced new development strategies such as "Industry 4.0" and "Reindustrialization" in a bid to win back and maintain their position at the commanding height of the manufacturing industry, accompanied by pessimistic predictions about China's manufacturing industry. According to experts, the decline of FDI in China is actually an indication of China's economic transformation and the in-depth restructuring of its manufacturing industry. It will not undermine the development of China's manufacturing industry, rather it will herald the industry's increasing reliance on domestic capital.

Data show that the actual use of FDI in China has always been on an upward trajectory. In 2014, global foreign investment decreased by 8% to USD 1.16 trillion from USD 1.26 trillion in 2013, hitting the lowest level since 2009. In the same year, China attracted USD 119.56 billion in FDI, up by 1.68% year on year in a consistently upward trend, outstripping the U.S. to become the largest FDI recipient in the world. It merits noting that China's service sector received USD 66.24 billion in foreign investment in 2014, up by 7.8% year on year, accounting for 55.4% of the total foreign investment nationwide. It can be seen that the decline of actual FDI in China's manufacturing industry doesn't mean the decline of the industry but reflects China's economic transformation and the in-depth restructuring of China's manufacturing industry. In the same period, the percentage of foreign capital (excluding capital from Hong Kong, Macau and Taiwan) in the paid-in capital in the manufacturing industry steadily decreased from 22.47% in 2007 to 15.97% in 2012, indicating that China's manufacturing industry has become increasingly reliant on domestic capital and less driven by foreign capital, with a significantly improved strength of independent development.

The "Made in China 2025" plan unveiled by the Chinese government in May outlines China's three-step approach to becoming a strong manufacturing

country, plotting a blueprint of China's manufacturing industry transformation from "large" to "strong". Geared to solve problems and challenges confronting China's manufacturing industry, "Made in China 2025" puts forward a five-phrase guideline of China's manufacturing industry development in the coming ten to thirty years, i.e. "Innovation-driven, quality first, green development, structural optimization, and people-oriented". According to experts, China is currently in the mid to late stage of industrialization and the manufacturing industry, which contributes one third of China's GDP and 90% of its overall domestic export, has been an important engine of the country's high-speed growth and will remain at the very foundation of the Chinese economy. "Made in China 2025" explicitly puts forward the acceleration of the in-depth integration of information technology and the manufacturing industry and the upgrade of traditional industries to medium and high levels, with the emphasis on a new intelligent, networked and energy-efficient manufacturing model.

After the financial crisis in 2008, the U.S. explicitly expressed its determination to promote U.S.-made products in global market, enable 95% consumers to buy American products, implement recall of traditional manufacturing, and provide incentives for local manufacturers. In order to increase export, the U.S. introduced a series of measures including the National Export Initiative and the Trans-Pacific Partnership (TPP), which have increased pressure on the export of China's medium and low-end products. According to experts, China's exports to developed countries concentrate on low-end manufacturing such as machinery, textile, leather, metals and minerals. In order to increase the added value of Chinese products and reach the medium and high end of the value chain, Chinese manufacturers have been gradually upgrading their production lines and product positioning. This will inevitably have an impact on the existing international system of specialized division of labor and lead to protectionism of local products in other countries, directly resulting in the increase in trade frictions between China and western countries.

In 2012, for example, 21 countries initiated 77 trade remedy probes targeting Chinese products, involving a total value of as high as USD 27.7 billion, up 369% from the previous year. China has also been the target of the greatest number of the 377 trade probes launched by the U.S., the largest buyer of Chinese exports, in the past decade. In recent years, the EU has also increased trade remedy measures against Chinese products, especially the action against Chinese PV products in 2013 which has had the greatest impact so far. In response, experts suggest that China should actively leverage multilateral mechanisms to promote free trade, curtain trade protection, and improve the trade environment. Meanwhile, China can take tit-for-tat actions where necessary. Experts also advise Chinese enterprises to grasp the historical opportunity of intelligent manufacturing by building innovation capacity, increasing the added value of products, and strengthening protection of intellectual property rights.

(Source: Science and Technology Daily,
June 17, 2015)