



Industry 4.0 & the China Market

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“**T**he term “Industry 4.0” is linked to the fourth industrial revolution. The first industrial revolution was driven by the steam engine and mechanisation, the second by Henry Ford’s assembly line and the third in the 1970s, when computers revolutionised the workplace. Now the three have coalesced, putting manufacturing companies at the dawn of Industry 4.0, an age where “smart devices” really are smart enough to assume major control over their machines of manufacturing and distribution.

The Industry 4.0 Project is now part of the German government’s official High-Tech Strategy, which it is actively pursuing in conjunction with private sector partners. Its target is to: “Ensure the Future of German Production”.

How important is Industry 4.0 to Germany?

Manufacturing is still a backbone of the German economy, accounting for 22% of GDP in 2014. This is approximately 30% higher than the European average and 100% more than in France. It also contributes to 17% of total employment. Meanwhile, Germany is ranked third

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globally in terms of exporting goods and services, a status which is primarily supported by the manufacturing industry. So there is a necessity to keep/strengthen the competitiveness of German manufacturing in the increasingly competitive global market.

In the last two decades, for example, the lion's share of manufacturing has switched to emerging economies, from 21% of the manufacturing value added in 1991 to 40% in 2011. Nowadays, competition for Germany's manufacturing industry does not only come from Asia (for example “Made in China 2025”, the “Industrial Value Chain Initiative” in Japan), but also the US. Germany therefore needs to find a solution to keep its manufacturing industry's international competence. Based on a BCG study, in the next 10 years, Industry 4.0 will help Germany gain 5-8% of productivity (considering

the cost of material), and roughly 1% of GDP. Manufacturers need to invest about 1 to 1.5 of their revenue to adapt to Industry 4.0, which has energy efficiency and sustainability among its key characteristics. It is expected that in 2035, 60% of electricity in Germany will be generated from renewable energies. Industry 4.0 could improve the security of the energy supply and solve the industry's threat to the environment.

Industry 4.0 is also a strategic response to deal with the demographic challenges faced. Low birth rates and a declining population size is the main demographic challenge in Germany. The country's population will decline to 65-70 million by 2060, which is approximately 16% less than its population in 2014. Industry 4.0 could release workers from having to perform routine tasks, enabling them to focus on creative, value-added

activities. It will also allow older workers to extend their working lives and remain productive for longer.

In addition, Industry 4.0 caters to the new generation of consumers' demand for individualised products. With highly flexible mass production, manufacturers are able to meet this demand without compromising quality.

How important is Germany's Industry 4.0 to China

From a quantitative perspective, China is the No.1 manufacturing country in terms of value added; its manufacturing industry takes up 31% of GDP, 9% higher than Germany. From a qualitative perspective, China's goal is to transform from “Made in China” to “Created in China” and upgrade its manufacturing industry structure. China is facing challenges



from both developing countries and developed countries in the manufacturing industry. With its aging society it is also facing demographic change. The number of Chinese senior citizens (over 60 years) was already over 200 million in 2014. As they are to Germany, resource efficiency and energy supply security are equally important to China. Meanwhile, China needs to gain productivity to maintain its competence and handle the challenges it faces.

Made in China 2025 echoes the idea of Industry 4.0. Similar to the German concept, China also emphasises applying IT technologies in Industrial Production. China's Premier Li Keqiang proposed the strategy in last year's government work report, meaning to upgrade the industrial and technical standards in China. The country will implement this Made in China 2025 strategy

alongside an Internet Plus plan, based on innovation, smart technology, the mobile Internet, cloud computing, big data and the Internet of Things (IoT). Following this, informatisation and industrialisation will be unified and priority will be given to the development of 10 particular fields, including information technology, new materials and agricultural machinery.

Implications for Sino-German cooperation

Industry 4.0 was conceptualised in Germany to maintain competitiveness of German manufacturing in the increasingly competitive global market and to address demographic changes. China has the world's No.1 manufacturing sector, however it is in need of improvement with regard to quality and competitiveness and faces similar challenges to Germany – such as a rapidly aging society. Made in China 2025 resonates well with international trends such as Industry 4.0. Advanced manufacturing is a strategic area with great potential for cooperation between China & Germany. BMW is keen to exchange our insights in Industry 4.0 and continue our efforts in China to fulfil the Made in China 2025 vision in the auto industry.

Are you ready for Industry 4.0?

Industry 4.0 is currently more of a vision than a reality, but it is one with potentially far-reaching consequences. The concept continues to evolve as

people think of innovative ways to implement it. Most of the techniques and technologies needed to implement Industry 4.0 exist today, such as radios, sensors, and GPS modules that could be used for asset tracking.

Sensors will be involved at every stage of the manufacturing process, providing the raw data as well as the feedback that is required by control systems. Industrial control systems will become far more complex and widely distributed, enabling flexible, fine-grained process control. Programmable logic will become increasingly important since it will be impossible to anticipate all the environmental changes to which control systems will need to dynamically respond. Smart, connected embedded devices will be everywhere, and designing and programming them will become that much more challenging – but also rewarding.

Earlier industrial revolutions did not happen overnight, nor were they recognised as such at the time. For its part, Industry 4.0 may or may not be recognised as revolutionary – rather it may be seen as evolutionary.

Whether revolution or evolution, industrial production is about to become a lot more efficient. It will be important to stay tuned for more innovative developments and of course to get involved in making them happen.