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Jurong Island

Singapore: A Leading Manufacturing Hub

Its commitment to innovation makes Singapore globally competitive.

Situated off the southern coast of Singapore is one of the world's leading chemical manufacturing sites. Over 100 global petroleum, petrochemical and specialty chemical companies are housed on 12 square miles of land; most of which was reclaimed from the ocean in the 1990s as part of an ambitious move by the government to make Jurong Island the premier destination in Asia for multinational chemical companies.

It was a bold plan for a country that does not produce a single drop of oil. Today, Singapore is the world's fifth largest refinery export hub¹ and amongst the top ten global chemical hubs by export volume².

Innovating to stay ahead of the pack has always been in Singapore's DNA. That entrepreneurial spirit has fuelled an ecosystem driving some of the most compelling advancements in manufacturing today – from robotics and additive manufacturing, to predictive analytics and artificial intelligence. It has also attracted multinational manufacturing firms to partner Singapore in testing, experimenting and trialling the latest technologies.

One such prominent player is Dyson. Last year, the British manufacturer set up a €360 million research and development center in Singapore to develop and implement new Industry

4.0 technologies in its regional facilities. The center complements its advanced digital motors manufacturing facility in Singapore – Dyson's first and only such plant in the world.

Taking the Next Leap in Manufacturing

Today, Singapore has built a strong and diverse manufacturing base, with leadership positions in sectors such as aerospace, electronics, biomedical sciences and precision engineering.

Manufacturing remains a significant contributor to Singapore's economy, contributing about 20 per cent to its GDP. Singapore is also the fourth largest global exporter of high-tech products³.

With shifting factors of production now favouring technology-intensive economies, Singapore's strengths in innovation, its skilled workforce and well-developed plug-and-play infrastructure position it well to bolster its role as a global manufacturing hub.

To this end, Singapore was ranked second globally in the World Economic Forum's Readiness for the Future of Production Report 2018 and ranked ahead of 120 countries to top the 2017 DII Global Industry 4.0 Readiness Index.

1 BP World Statistical Review 2017

2 World Trade Statistical Review 2017

3 As defined by the World Bank

Anticipating further shifts in the evolution of manufacturing, Singapore has also embarked on a series of initiatives to ensure the economy is prepared for the future.



Firstly, Singapore has established a strong base of leading technology and solutions providers, to provide the necessary technical expertise to sustain Industry 4.0 adoption. Some of the biggest industrial names in the world now operate in Singapore – from ABB’s robotics packaging center to Accenture’s IoT Center of Excellence and Siemens’ first-of-its-kind digitalisation hub. Singapore’s fast-growing start-up scene is also an enabler for manufacturers to co-innovate and customise solutions to meet their needs. For instance, German semi-conductor giant Infineon turned to Hope Technik, a local small and medium enterprise, to develop AGVs to transport materials across its production floor. The partnership was named “Most Disruptive Collaboration between an SME and a Multinational Company” at the 2017 Singapore International Chamber of Commerce Awards.

Singapore has also committed to invest €2 billion in R&D in Advanced Manufacturing and Engineering, to build up the innovation capacity of companies embarking on Industry 4.0. Recently, Singapore’s research institutions opened two model factories that help companies accelerate the adoption of Industry 4.0 technologies, by providing a collaborative environment to research and test-bed solutions before deploying them. Through this initiative, industrial equipment supplier Feinmetall successfully achieved productivity improvements of 10 to 15 per cent.



Furthermore, Singapore also recognises the importance of talent development for Industry 4.0. In consultation with the industry, Singapore has developed a nation-wide series of modular courses to help workers acquire the necessary skills to take on jobs in advanced manufacturing. Spanning across three proficiency levels, courses range from IoT Management, Robotics Coordination, to even Artificial Intelligence for manufacturing. Reception from industry has been positive - Rolls-Royce groomed more than 50 vocational graduates to give them a head-start in their aerospace careers, while Maki-no has enrolled its entire 500-men workforce for training. This rich eco-system enables companies to carry out world-class innovation activities, allowing Singapore to become

an exporter of ideas and solutions. Singapore’s emphasis on partnering the industry has also resulted in a competitive and diverse manufacturing sector, with global companies such as Pepperl+Fuchs and Infineon choosing to locate their best-in-class industrial facilities here.

Continuing to Innovate for Growth and Transformation

The pursuit of advanced manufacturing is not about achieving a one-off boost in productivity, but about equipping companies with the right tools and mind-set to meet future challenges. It is an evolution rather than a revolution, as companies go beyond traditional cost considerations to continually re-orientate, refine and innovate their products and processes.

In this regard, Singapore has developed a world-first diagnostic tool - *The Singapore Smart Industry Readiness Index*® – a step-by-step guide that allows companies to better understand Industry 4.0 concepts, evaluate the current state of their facilities, and architect a comprehensive transformation roadmap.

The Index reflects Singapore’s commitment to fostering a culture of innovation to support the industry’s development. In doing so, it aims to accelerate efforts in creating new businesses and enabling Singapore to become not only an adopter of such technologies but an exporter of innovative solutions.

Beyond helping companies embark on their transformation journey, Singapore also seeks to facilitate partnerships amongst industry players. Come October, Singapore will host Industrial Transformation ASIA PACIFIC – a Hannover Messe Event. This inaugural Asia Pacific edition of Hannover Messe will be an international platform gathering leading manufacturers and technology providers to exchange ideas and best practices, catalyse new partnerships, and identify partners for co-innovation.

All these initiatives reaffirm Singapore’s commitment to partner companies in shaping the future of advanced manufacturing, in Asia and beyond.

- **Germany-Singapore Business Forum 2018**
VIP: Singapore’s Minister for Trade and Industry
S. Iswaran
Hall 2, Room: ROM
24 April 2018, 09:30 - 16:00
- **Singapore Country Booth**
Hall 27, Stand F09