



Key Innovative Industries in Taiwan

Smart Machinery



Information
Security

Next-Generation
Vehicle

Communications
Industry

Internet
of Things

Semiconductor
Industry

Biopharmacy
Industry

**Smart
Machinery**

Circular
Economy

Green
Energy

Service
Industry

CONTENTS

- 02 Policy Initiatives - Smart machinery industry promotion program
- 04 Overview of Industrial Development
- 09 Potential Investment and Collaboration Opportunities in Taiwan
- 11 Investment Incentive Measures
- 14 Successful Examples of Foreign Companies

Policy Initiatives — Smart machinery industry promotion program

In response to the massive changes brought by the IoT, 3D printing, AI, and robot technologies to life and industries, Taiwan implemented the "Smart Machinery Industry Promotion Program" in July 2016, in hopes of upgrading the precision machinery industry into the smart machinery industry. Taiwan aims to increase the output value of the machinery industry through professional talent cultivation, overall industrial upgrade and transformation, so as to expanding international cooperation and market opportunities.

1 | Smart Machinery Promotion Office |

The Smart Machinery Promotion Office was established in February 2017 to help create a new ecosystem for Taiwan's smart machinery industry. Developing various solutions based on Taiwan's precision machinery and ICT industries such as "digitalization of production management, from Industry 2.0 to Industry 3.0," "establishing the national industrial IoT platform (PaaS)," and "developing service modules for different industry applications (SaaS)," to help key industries applying smart manufacturing. The "Smart Machinery Promotion Office" can help foreign companies participate in testing sites or exchange platforms and establish supply chain and partner networks in Taiwan.

Contact Information

Smart Machinery Promotion Office

Telephone : 04-23598872 02-27046655 (Taipei Office)

Email address : e10015@mail.pmc.org.tw

Address : 2F, No. 27, Gongye 37 Rd., Xitun District, Taichung City

2 | Smart Manufacturing Technology Test Site |

The "Smart Manufacturing Technology Test Site" is a national proofing center that equipped with 100% domestically produced high-end machinery processing equipment. The site links together digital product systems that are domestically developed and produced, develops machinery processing application service modules, and realized 9 mixed-model smart manufacturing production lines for parts and components. It serves as the domestic smart manufacturing planning center, and shows the capability of domestic equipment in Industry 4.0 applications to the industry.

Since the site was opened in September 2018, more than 7,000 visits had been made, and more than 5,500 industry operators had been introduce to the application. Also, international system developers (such as Dassault Systèmes and Mitsubishi) were brought into the site to jointly promote smart processes with domestic teams.

Contact Information

Contact of the Smart Manufacturing Technology Test Site

Telephone : 04-23597116 ext. 843

Address : Taichung City Precision Machinery Innovation Technology Park (No. 2, Jingke E. Rd., Nantun District, Taichung City)

3 | Smart Machinery Park |

In coordination with industry characteristics, requirements, and location of industrial clusters, Taichung City Government has expanded the hinterland of Taichung Fengzhou Technology Science-based Industrial Park to convert Phase 2 of the Industrial Park to a "Smart Machinery Park" that supports the transformation of traditional industries in Taichung City and the development of industries that support the Central Taiwan Science Park. At present, 33.64 hectares of industrial land has been planned, and the Park completed establishment announcements on January 21, 2020. It is expected to invite investors of municipal land before the end of 2020.

Contact Information

Taichung Fengzhou Technology Science-based Industrial Park

Telephone : 04-25151700

Address : No. 801, Fenggong Rd., Shengang District, Taichung City

Overview of Industrial Development

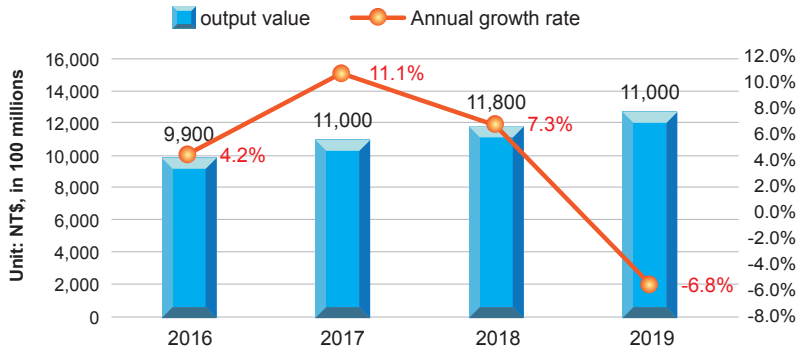
1 | Output Value |

The machinery industry is an important basic industry that had been upgrading Taiwan's industrial behind the scenes. The machinery industry benefited from the rise of smart applications and value-added data services in recent years with a positive outlook on the development of the industry, which became Taiwan's third largest industry in terms of output value in 2017, after the semiconductor and panel industries. Among the variety of machinery products, machine tools, high-tech (semiconductor) production equipment, industrial

robots, and key components of automation have relatively high output value in Taiwan's machinery industry.

The output value of Taiwan's machinery industry was NT\$1.18 trillion in 2018. However, the intensification of the trade disputes between the United States and China and the significant decrease the demand for industrial machinery caused the output value in 2019 to decline by 6.8% from 2018 to NT\$1.1 trillion (Figure 1).

According to information announced by the Taiwan Association of Machinery Industry, the export value of machinery equipment in Taiwan was US\$860.1 billion in 2019, dropping 5.7% compared to 2018. The main exporters of machinery in 2019 were Germany, Japan, China, Italy, Taiwan, the United States, and South Korea, with a combined export value of approximately US\$33 billion, accounting for more than 70% of global exports.¹



Source: Taiwan Machinery Monthly, Issue 755, (January 2020), http://www.tami-ebook.com.tw/TaiwanMachineryMonthly_2020_01/index.asp.

Figure 1 Output value of Taiwan's machinery industry in 2016-2019

1 Taiwan Association of Machinery Industry, http://www.tami.org.tw/statistics/2019_global_mt.pdf.

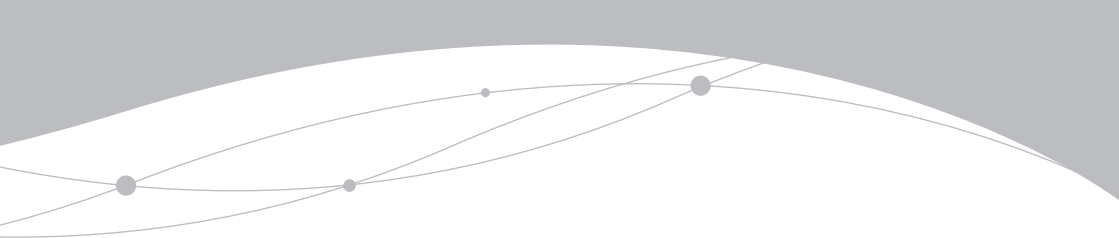


2 | Industrial Clusters |

Taiwan's machinery industry mainly consists of SMEs. According to statistics of the Statistics Department, Ministry of Economic Affairs (MOEA), Taiwan currently has approx. 18,000 machinery companies with over 300,000 employees. Industrial clusters have formed in northern, central, and southern Taiwan, which led to the establishment of many important companies.

1. Northern Taiwan

The northern Taiwan industrial cluster formed in New Taipei City, Taoyuan, and Hsinchu, consists of precision sensing equipment, electronics and semiconductor production equipment, automated components and system integration, industrial computers, and controllers. For instance, the "Fair Friend Group" (FFG), headquartered in Taipei, has three business groups – machine tools, industrial equipment, and green energy. The company has 37 brands and 50 production bases in total and has become a global leader in the machine tool industry. "Delta Electronics (DELTA)" has the capacity for the production, research, and development of smart machinery applications, including inverters, servo drive systems, power management, sensors, logic and motion control, industrial robots, SCADA software, and industrial information management systems. "Advantech" is a leader in comprehensive system integration and design services in Taiwan. It offers products and solutions such as remote I/O modules, industrial communication equipment, automation controllers and I/O, embedded automated industrial computers, industrial tablet PC, smart factory cloud integration, and smart equipment automation. "Marketch International Corp." is a major manufacturer of electronics and semiconductor production equipment. It produces system modules for major international semiconductor equipment manufacturers. In addition to IC plant engineering purchase orders, it recently developed the "Prognostic and Health Management" (PHM) system that uses AI technologies to analyze past failure records of machinery and equipment, predict the timing for repairs of equipment in advance, and reduce the risks and costs of sudden failure of machinery. "BizLink", a machinery connection solution provider located in New Taipei City, provides products and services including key components, cable harnesses, and cables, which can be used in consumer electronics, automobiles, electrical appliances, medical applications, industrial



manufacturing, optical communications, and solar energy. "Chroma" is a leader in turnkey solutions for precision electronic measurement devices, automatic test systems, smart manufacturing systems, and comprehensive measurement and automation. Its main market applications include electric vehicles, renewable energy batteries, solar energy, passive components, electrical safety regulations, smart manufacturing systems, and smart factories.

2. Central Taiwan

An industrial cluster of machine tools and parts and components, integrated ball screw, linear guide, industrial machinery (carpentry, textiles, rubber and plastics machinery), smart robots, automation components and system integration are located in Taichung and Changhua. As "Industry 4.0" becomes an important development trend in the global industry, this wave of unstoppable revolution in the machinery industry has also powered the active transformation of industries. For instance, "HIWIN" specializes in the research, development, and production of precision integrated ball screws, linear transmission components, and industrial robots. In coordination with industrial development trends, HIWIN is gradually transitioning from individual parts and components to system development, and is actively investing in medical devices, solar power, wind power, semiconductors, ICT, and precision machine tools to aid the development of Taiwan's industries towards smart manufacturing. "Precision Motion Industries" focuses on the R&D and production of precision ball screw spline and linear guideway. Products are used for the mechanical modules, guideways, guide screws, controllers, and driver modules of smart robots. "Chumpower Machinery Corporation" is committed to the development and applications of chucks and is a main global supplier of PET blow molding machines. It has created the "SCP Meltblown Alliance" in response to recent demand for disease prevention for the development of N95 medical grade melt-blown fabric production line equipment. "Gallant Precision Machining Co., Ltd." integrated its years of experience in promoting automation system and uses technology to connect equipment and processes to create an Industry 4.0 demonstration site in Central Taiwan Science Park.

3. Southern Taiwan

As for Chiayi, Tainan, and Kaohsiung, there are industrial clusters for machine tools and parts and components, industrial machinery (screw forming and processing and rubber and plastic machinery), semiconductor equipment, smart robots, controllers, and precision molds, in which "Tongtai Machine & Tool", "CCM", and "E&R Engineering Corp." are the most representative. Besides developing cutting machine tools and conducting application research, "Tongtai Machine & Tool" expanded to advanced processes for ultrasound assisted processing, laser processing, and metal 3D printing to provide customers with one-stop services for smart machinery. "Ching Chan Optical Technology" is a leader in optical sorting machines and it also develops high-speed bolt former and intelligent automated production lines to help customers establish comprehensive and automated connections with online inspection processes so that customers can monitor the quality of bolts from the source. "E&R Engineering" specializes in plasma, laser, automated optical inspection (AOI), and precision dispensing technologies. It had already supplied core technologies and products for IC packaging, LED packaging, FPC manufacturing, and touch panel production sectors, particularly in laser and roll-to-roll processes of soft electronic materials.

Taiwan's Precision Machinery Industrial Cluster is summarized in the figure below:

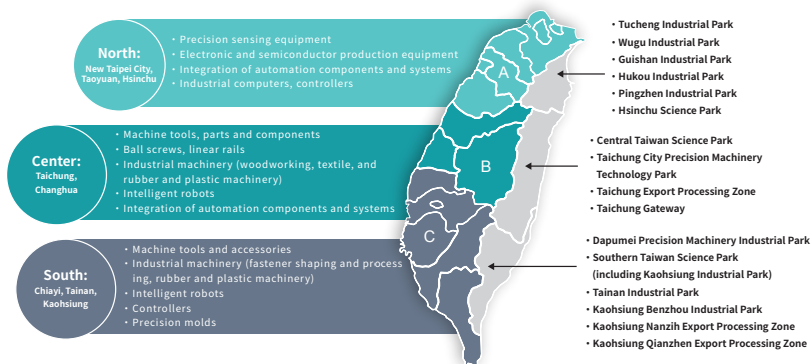


Figure 2 Taiwan's Precision Machinery Industrial Cluster



Potential Investment and Collaboration Opportunities in Taiwan

1

Joint development of smart manufacturing applications

Taiwan has developed complete industrial clusters for semiconductor, ICT, metal processing, auto parts and components, and petrochemical products. Diverse industries along with the tightly knit machinery industry supply chain, as well as the government's active promotion of industrial parks and preferential taxes, foreign companies will have the optimal site for developing and verifying innovative smart manufacturing application projects. Taiwan has already accumulated R&D capabilities in digital simulation and analysis, product life cycle management, big data analysis, machine learning, and AI, which makes Taiwan the best partner for foreign companies to seize business opportunities in the development of smart machinery.



2

Transformation of R&D results through supply chain collaboration

Taiwan is the world's seventh largest producer and fifth largest exporter of machine tools. Taiwan has complete industrial clusters and supply chains, and has all of the equipment or systems for machine tools, robotic arms/robots, smart factories, and industrial IoT. Taiwan's advantages in its machinery industry is also exemplified in the rapid response provided by machinery companies for assisting the establishment of the "national face mask team" which effectively controlled the spread of the COVID-19 epidemic. Furthermore, Taiwan's machinery industry has detailed division of labor with the flexibility to meet customers' requirements. The abovementioned industrial foundation will benefit foreign companies in establishing R&D or production sites in Taiwan, rapidly transforming R&D results into products.

3

Exploration of the continuously growing smart machinery market

Industry 4.0 has become a global trend. The trade war between the United States and China has also compelled companies to readjust production capacity plans and the supply chains that were previously concentrated in a handful of production sites have gradually become more regional and dispersed. This trend is expected to encourage manufacturers in all areas to increase vertical integration, automation, and demand for smart machinery applications such as robotics. The COVID-19 epidemic has also increased the demand for service robots in the cleaning and healthcare sectors. Foreign companies can seize business opportunities of Taiwan's smart machinery industry through investment in Taiwan, and further expand into the future regional/global market.

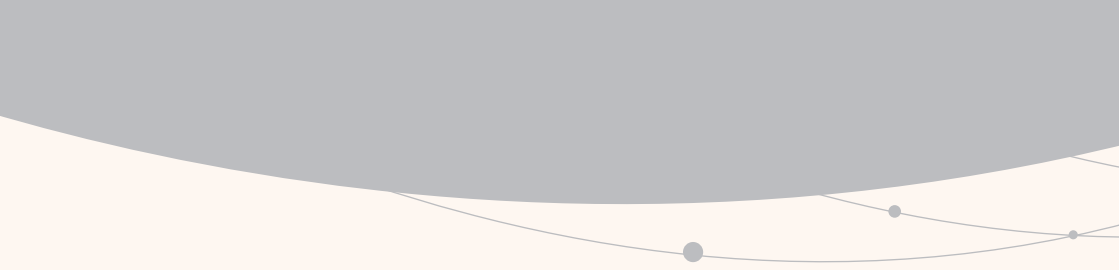
Investment Incentive Measures

1 | Tax incentives |

Taiwan's profit-seeking enterprise income tax rate is 20%. To encourage foreign companies to invest in Taiwan, support industrial innovation, and promote industry-academia collaboration, foreign companies are eligible for the following preferential taxes (Table 1):

Table 1 Preferential taxes

Item	Incentives
R&D and introduction of technology or mechanical equipment	<ul style="list-style-type: none">• Up to 15% of the company's R&D expenditures may be deducted from its profit-seeking enterprise income tax for current year.• Royalty payments to foreign companies for imported new production technologies or products that use patents, copyrights, or other special rights owned by foreign companies is, with the approval of the Industrial Development Bureau, MOEA, exempt from the corporate income tax.• Imported machinery which local manufacturers cannot produce are eligible for duty-free treatment.
Technology investment / Stock-based employee compensation	<ul style="list-style-type: none">• The worth of shares acquired through technology investment/stock-based employee compensation can be excluded from the taxable income for that year (up to NT\$5 million). In addition, those that meet related criteria are eligible for reduced taxes based on "acquisition price" or "transfer price," whichever is lower.



Item	Incentives
Investment in smart machinery / 5G	<ul style="list-style-type: none"> ● Smart machinery: Automatically scheduled, flexible, or mixed-model production lines that utilize big data, AI, and IoT. ● 5G: Related investment projects include 5G communication systems, and new hardware, software, technology, or technical services. ● For investments of no less than NT\$1 million and no more than NT\$1 billion, either "5% of investment spending deducted from profit-seeking enterprise income tax (current FY)" or "3% of investment spending deducted from profit-seeking enterprise income tax, if total spending spread over three years" may be selected, but the total amount deducted may not exceed 30% of corporate income tax that year. ● The applicable periods are January 1, 2019 through December 31, 2021 (smart machinery) and January 1, 2019 through December 31, 2022 (5G).
Foreign Special Professionals	<ul style="list-style-type: none"> ● Foreign special professionals who meet criteria are eligible for a 50% deduction of total income tax for amounts exceeding NT\$3 million.
Setting up operations in industry parks	<ul style="list-style-type: none"> ● Companies that set up operations in export processing zones, science industrial parks, or free trade ports are eligible for exemptions on import duties, commodity tax, and business tax for the import of machinery and equipment, ingredients, fuel, materials, and semi-finished products for their own use.
Others	<ul style="list-style-type: none"> ● Companies that use undistributed earnings to engage in substantive investments may exclude the amount when calculating their profit-seeking enterprise income tax.



2 | Subsidies |

1.The Global R&D Innovation Partner Program

Some foreign companies have a high degree of complementarity with Taiwan's industries. To encourage them to engage in R&D and innovation activities in Taiwan, such companies, after gaining approval from the MOEA, will be eligible for subsidies of up to 50% of total R&D expenditures if they: (1) have technologies that are not yet mature in Taiwan or overseas, and could create strategic products, services, or industries over the course of future industrial development; (2) have potential to help Taiwan produce leading technologies or significantly enhance the competitiveness and increase the added value of important industries; or (3) engage in key and common technology R&D, vertical or horizontal technology integration, and can create an industrial value chain.

2.Integrated R&D Program

Companies, once approved by the MOEA, will be eligible for subsidies of no less than 40% but no more than 50% of total project funding if they: (1) engage in key and common technology R&D, vertical or horizontal technology integration, and can create an industrial value chain; (2) establish industry standards, protocols, or platforms; or (3) establish applications, services, and innovative business and marketing models with technological content, and increase industry's added value.

3.Taiwan Industry Innovation Platform Program

The MOEA Industrial Development Bureau and the Ministry of Science and Technology are jointly implementing the "Taiwan Industry Innovation Platform Program" to guide industries to develop towards greater value, and to encourage companies to enter high-end product application markets to increase industry's overall added value. For companies owning R&D teams in Taiwan, the program provides 40-50% of the funding required for theme-based R&D projects, and up to 40% of funding for R&D projects proposed by the companies themselves.



Successful Examples of Foreign Companies

1 | Collaboration in machinery and equipment manufacturing

Energid and Taiwan's NEXCOM International Co., Ltd. jointly developed a 7-axis industrial robot. NEXCOM's subsidiary NexCOBOT Taiwan will continue to develop and expand the sales market. Applied Materials invested in a manufacturing center of the equipment for producing display in Taiwan. Yaskawa Electric Corporation invested in a robot R&D and exhibition center in Taiwan.

2 | Cross-industry collaboration

Keysight Technologies, a leading test and measurement equipment provider from the United States, and MediaTek, a semiconductor plant in Taiwan, announced their technology cooperation partnership for business opportunities in the future 5G market in January 2020. With Keysight Technologies' 5G simulator solution and mmWave technologies, MediaTek can establish appropriate network connection formats for various innovation and R&D requirements. It is expected to effectively increase the R&D testing capacity and provide access to business opportunities in 5G applications.

3 | Cooperation on testing facility

Dassault Systèmes established an R&D center in Taiwan and formed an alliance with the Fair Friend Group to seize business opportunities of smart factories. It also signed a MOU with Taoyuan and Taichung City Government to collaborate in projects relating to IoT, startup ecosystem, and innovation and R&D hubs under the "Asia Silicon Valley" program.

4 | Cooperation on talent development |

Bosch and National Cheng Kung University jointly established a smart manufacturing innovation to cultivate Industry 4.0 talent. Rockwell Automation and Feng Chia University signed a MOU on forming an industry-academia alliance. Besides introducing smart equipment and offering courses on smart machinery, it also established a "corporate IoT application laboratory" which serves as a training classroom, and a "smart manufacturing laboratory" which serves as a demonstration venue to assist in the cultivation of middle to high level talent for smart machinery in Taiwan.





Department of Investment Services,
Ministry of Economic Affairs

Add : 8F, No.71, Guanqian Rd., Taipei City, Taiwan

Tel : +886-2-2389-2111

All rights reserved, reprints only with approval.



TAIWAN



InvesTaiwan

Add : 8F., No.1, Xiangyang Rd.,
Zhongzheng Dist., Taipei City, Taiwan
Tel : +886-2-2311-2031
Fax : +886-2-2311-1949
Website : <https://investtaiwan.nat.gov.tw>
E-mail : service@invest.org.tw

**Department of Investment Services,
Ministry of Economic Affairs**

Add : 8F, No.71, Guanqian Rd., Taipei City, Taiwan
Tel : +886-2-2389-2111
Fax : +886-2-2382-0497
Website : <https://investtaiwan.nat.gov.tw>
E-mail : dois@moea.gov.tw