



TAIWAN



Communications Industry

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Policy Initiatives — Digital Nation & Innovative Economic Development Program (DIGI+)

Taiwan launched the Digital Nation & Innovative Economic Development Program (DIGI+) at the end of 2016 to increase the penetration of digital services from 25.8% to 80%, and thereby realize Taiwan as a “smart nation.” DIGI+ places equal emphasis on software and hardware, and builds infrastructure that will benefit digital innovation, lay a solid foundation for a digital nation, and expand the scale of Taiwan's digital economy. The main units implementing the program are introduced as below:

Communications Industry Development Project Office, Industrial Development Bureau, Ministry of Economic Affairs

The Communications Industry Development Project Office, Industrial Development Bureau, Ministry of Economic Affairs is the government think tank for comprehensively developing the network communications industry, and guides industries to invest in the development of integrated solutions. The office integrates resources and links startups and international platforms to develop innovation capabilities and talents in hopes of enhancing the competitiveness of Taiwan's communications industry.

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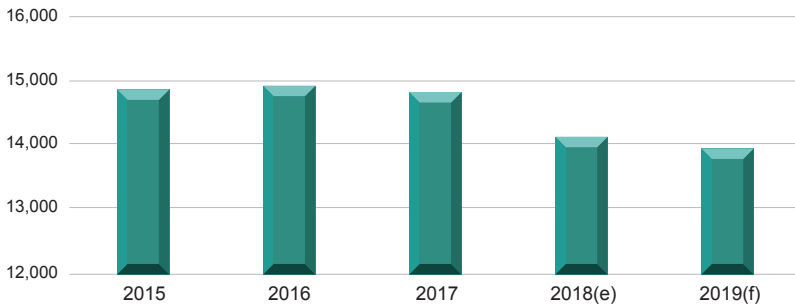


Overview of Industrial Development

1 | Production Value |

Being the home to the manufacturing systems of several communications products, Taiwan is one of the key players in the global communications industry. The output value of Taiwan's communications industry was NT\$1.4 trillion in 2018 (excluding mobile phone OEM services/EMS). Based on the output value of various products, the output value of smartphones and communication services are relatively high, accounting for 29.2% and 28.2% of the overall communications industry's output value, respectively. Other major products include WLAN, Cable CPE, Ethernet Switch, and IP STB. Their output value has steadily grew at between 2.2% and 4.5% in 2018.

5G is a major observation point of the communications industry's development in 2019. Major telecom operators around the world are all implementing plans to build 5G network environments and begin commercial operations. Furthermore, 5G terminals such as mobile routers and home routers have been released starting at the end of 2018, and 5G smartphones are expected to make their appearance in the market in 2019. As the pace of deployment begins to pick up, characteristics of 5G will play a key role in realizing remote controlled driving, telemedicine, and telepresence robots, and also in the vertical integration of industry. This will drive market growth for communications equipment and products and related parts and components.



Source: Compiled by this study (Unit: 100 million NTD).

Figure 1 Production value of Taiwan's communications industry in 2015-2019

2 | Industrial Clusters |

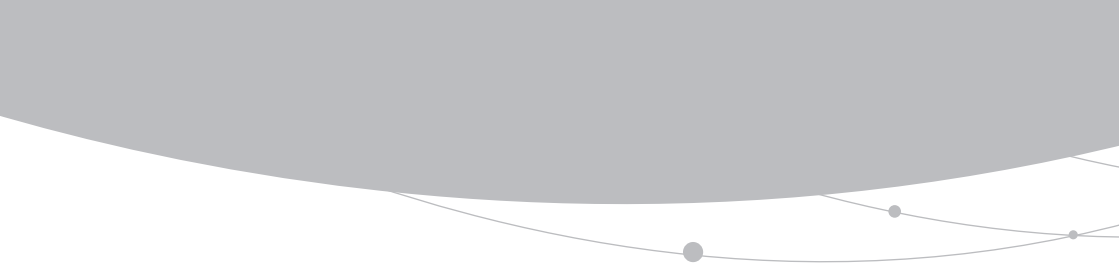
1. Northern Taiwan

Taiwanese companies involved in the communications industry include IC manufacturers, equipment manufacturers, equipment branding companies, and telecom operators. Generally speaking, the communications industry cluster is concentrated in northern Taiwan, especially the mobile phone industry. Mobile phone IC manufacturers, other manufacturers, branding companies, and telecom operators are all headquartered in northern Taiwan. The head offices of these companies are concentrated in the Neihs Technology Park, Hsinchu Science Park, and Taoyuan, such as Accton, Sercomm, Wistron NeWeb, and Chunghwa Telecom.



Accton was established in 1988 and focuses on the R&D, design, and manufacturing of Ethernet and wireless equipment. It is the leader of the open platform for hardware design, such as data centers, metro access/telecom operator-level networks, and campus/corporate networks. Accton has R&D and sales centers in Taiwan, the U.S., and China with over 4,000 employees worldwide¹. Accton achieved revenue of NT\$43.092 billion in 2018.

¹ Official website of Wistron NeWeb Corporation, <http://www.wnc.com.tw/index.php?action=about&cid=1>.



Sercomm was established in 1992 with broadband network software and firmware R&D as its core business. Its head office is in Taipei and it has sales locations throughout North America, Europe, China, and the Asia-Pacific with several thousand employees worldwide. Its products span home-use, commercial-use, telecommunications, security surveillance, and cloud applications, and main products include: integrated access devices (IAD), commercial network communications equipment, FTTx fiber optic products, Cable DOCSIS equipment, Small Cell, and smart IoT solutions. Its 2018 revenue was NT\$33.441 billion.

Wistron NeWeb Corporation was established in 1996 and specializes in communications product design, R&D, and manufacturing. It has RF antenna, software/hardware, mechanism design, system integration, interface development, product testing/certification, and manufacturing technologies. Its global headquarters is located in the Hsinchu Science Park in Taiwan, and it has service or manufacturing locations in the U.S., the U.K., Japan, China, and Vietnam. Wistron NeWeb Corporation is the global leader in notebook built-in antennas with 35% market share. The company has delivered over 300 million satellite communications and digital home appliances, and its 2018 revenue was NT\$56.049 billion.

Chunghwa Telecom was established in 1996, and was restructured from the business department of the Directorate General of Telecommunications, Ministry of Transportation and Communications at the time. It is the largest general telecom operator in Taiwan, and its scope of business covers fixed network communications, mobile communications, and broadband access and Internet. It also provides corporate customers with ICT services using its big data, information security, cloud, and network data center technologies. Chunghwa Telecom is also developing emerging technology services, such as IoT and AI. The company's 2018 revenue was NT\$215.458 billion.



2. Central and Southern Taiwan

Communications companies in central Taiwan are mainly automobile communications electronics and consumer electronics manufacturers. Even though southern Taiwan has the Kaohsiung Software Technological Park and Southern Taiwan Science Park, the number of communications companies is still unable to match those in northern Taiwan. For services, the three major telecom operators mainly start from the north and then extend southward.

Potential Investment and Collaboration Opportunities in Taiwan

1

Accessing the ICT industrial cluster in Taiwan

Taiwan's communications companies have manufacturing and global logistics abilities, and have an advantage in network chips, parts and components, touch panel, and system integration. The industrial chain is complete and has high control over key parts and components. Therefore, Taiwan's complete communications industrial cluster can improve the performance of R&D centers and manufacturing bases established by foreign companies in Taiwan.

In the future, foreign companies can participate in the development of Taiwan's ICT industry through collaborative R&D and technology transfer, as they expand into the global smart manufacturing applications market. At present, several major IC manufacturers, such as Broadcom and Qualcomm, have established offices or R&D and design centers in Taiwan, creating new business opportunities for the communications industry through technology exchanges and IC OEM.





2

Utilizing Taiwan's advantages to develop 5G business models

Due to the rapid development of mobile communications technologies worldwide, 5G services will become a key point in observing the global communications industry's development in 2019. As countries around the world develop 5G, Taiwan already has an advantage in the development of key IC, modules, and terminal products. Taiwan's network communications companies already play a decisive role in the global market. Taiwanese companies will have an opportunity to connect central offices and terminal locations, then gradually complete the industrial value chain as they integrate 5G, cloud computing, IoT, and AI technologies, thereby becoming system solution suppliers.

Foreign companies can utilize Taiwan's advantages and jointly develop 5G business models with Taiwanese companies, especially in the integration of AI, IoT, and AR/VR technologies, which will further develop business opportunities in vertical fields of application.

Investment Incentives

1 | Tax incentives |

The corporate income tax rate of Taiwan 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

Encouraged operational activities	Incentives
Establishing operational, R&D, or manufacturing sites in Taiwan	<ul style="list-style-type: none">• Up to 15% of the company's R&D expenditures may be deducted from its corporate income tax that year.• Imported machinery that local-manufacturers cannot produce is eligible for duty-free treatment.• Royalties paid to foreign companies for new production technologies or products imported from overseas that have patent rights, trademarks, or various concessions are exempted from income tax after gaining approval from the Industrial Development Bureau, MOEA.• 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.

Encouraged operational activities	Incentives
Investment in smart machinery/5G	<ul style="list-style-type: none"> • Smart machinery: Automatic, flexible, or mixed-model production that utilizes big data, AI, and IoT. • 5G: Related investment projects include 5G communication systems, 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 corporate income tax (current FY)” or “3% of investment spending deducted from corporate 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 period is from January 1, 2019 to December 31,2021 (smart machinery)/January 1,2019 to December 31,2022 (5G).
Promoting industrial innovation and industry-academia collaboration	<ul style="list-style-type: none"> • Individuals and creators who receive shares via technology investment, hold the shares for 2 years, and meet conditions for serving in Taiwan may choose to pay taxes based on the price of shares when they were acquired or transferred, whichever is lower. • Limited partnership venture capital that makes a larger lump sum investment may be taxed using the transparent entity concept. • Parent company employees that obtain shares of subsidiaries and vice versa are also eligible to be taxed based on the lower share price. • Companies or limited partnerships that use undistributed earnings to make real investments may deduct it from their undistributed earnings.
Moving into industrial parks	<ul style="list-style-type: none"> • Companies that move into export processing zones, science-based industrial parks, and free trade zones are exempted from import tariffs on machinery and equipment, raw materials, fuel, supplies, and semi-finished products. • The business tax rate is zero for exporters of goods and labor services.

2 | Subsidies |

1. Global Innovation Partnership Initiatives

To encourage foreign companies that complement and mutually benefit Taiwan's industries to engage in R&D and innovation activities in Taiwan, those that: (1) have technologies not yet mature in Taiwan and overseas and will produce strategic products, services, or industries in future industrial development; (2) have potential to let 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; will be eligible for subsidies of up to 5% of total R&D expenditures after gaining approval from the MOEA.





2. Integrated R&D Program

Companies that (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 the industry's added value; will be eligible for subsidies of no less than 40% but no more than 50% of total project funding after gaining approval from the MOEA.

3. Industrial Upgrade & Innovation Platform Program

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

Successful Examples of Foreign Companies

1 | Collaboration in emerging fields of application

HPE is working together with the Taoyuan City Government in deploying the new HPE Edgeline IoT smart street light solution, which uses an IoT real-time street light monitoring platform to increase energy efficiency and reduce energy consumption. Wistron NeWeb Corporation and Qualcomm are working together to develop 5G Internet of Vehicles applications. MediaTek has accelerated its R&D and completed 5G testing with Nokia. Europe's multinational telecom operator Vodafone selected Accton's subsidiary Edgecore Networks, Alpha Networks, and Delta Electronics' subsidiary Delta Networks to develop the disaggregated cell site gateway (DCSG). FarEasTone and Ericsson are working together and displayed a 5G system prototype in Taiwan, which will give self-driving cars, smart transportation, and healthcare applications greater room for development. Furthermore, Verizon partnered with Wistron NeWeb Corporation and Alpha Networks in implementing a 5G home router project in 2018.



2 | Collaboration in R&D |

Taiwan has a complete communications industry value chain, and major IC manufacturer Broadcom established an IPO office, R&D and design center, and head office in Taiwan, creating collaboration opportunities through technology exchanges and IC OEM.

Nokia has established an experimental site and verification platform in Taiwan for emerging communications technology applications, and is conducting trials of vertical application solutions (such as Internet of Vehicles, smart meters, and industrial network) together with domestic companies.

3 | Cooperation in talent development |

To help industries discover local talent with creativity and design application abilities, the Industrial Development Bureau, MOEA established a competition mechanism with themes based on development trends and needs of the communications industry. Since 2002, themes have included wireless software, antenna design, smart handheld device user interface design, wearable and IoT device development, and smart IoT applications. Over 8,000 students and members of society have participated in the competitions, which have attracted Google, Qualcomm, Microsoft, AWS, and Sigfox. For example, Sigfox provided development modules for free to encourage contestants to develop innovative IoT applications using Sigfox technology. It also organized Hacking House to guide excellent startup teams in Taiwan to participate in its global IoT product development project.



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