



A Continuous Transformation

By David Tawei Lee, Ph.D., Minister of Foreign Affairs

Taiwan remains committed to strengthening economic and trade ties with countries around the world, including the United States, while fostering development in partner nations across the globe.

In the 1950s and 1960s, Taiwan embarked on a program of industrialization so transformative that it would become known, by the 1970s, as the Taiwan Economic Miracle. With the help of international partners such as the United States and through the concerted efforts of Taiwan's government and people, our economy rapidly transitioned over the latter half of the 20th century from labor-intensive sectors to high-tech manufacturing, which set the stage for Taiwan's emergence as a world-leading technology hub.

Today, the country plays an indispensable role in the global supply chains for numerous critical technology products.

Taiwan's competitive edge derives from its vibrant small and medium enterprises. Comprising some 97 percent of the nation's companies, SMEs are the drivers of innovation and powerful vehicles for equitable growth. As such, the development of Taiwan's thriving SME culture is a regular topic of discussion at Asia-Pacific Economic Cooperation (APEC) meetings and other international forums.

Sharing Development Experience

As Taiwan carved out a vital position in the world economy, we moved from a recipient to a donor of international aid, while also eagerly sharing our development expertise. Capitalizing on our strengths in such areas as agriculture,

healthcare and vocational training, Taiwan has launched scores of international cooperation projects in allied and partner nations.

Under these programs, our overseas specialists provide assistance to those most in need, as well as convey our experiences in establishing



David Tawei Lee, Ph.D., Minister of Foreign Affairs of Taiwan

one of the world's leading national healthcare systems.

Taiwan's assistance programs emphasize capacity building in line with the old adage that we do not simply give people fish, but teach them how to fish. Through our diverse vocational training programs, specialists equip young people from recipient countries with practical skills in areas such as carpentry and plumbing.

Over the past year, I have visited many nations to inspect projects implemented by our overseas medical, technical and trade missions. And I am constantly impressed by

the passion and professionalism of our personnel. They deliver real and effective aid in communities across the globe and accelerate economic and social development in partner countries.

Mutually Beneficial Trade with the United States

Taiwan is committed to strengthening economic and investment ties with its trading partners including the United States. Our two countries have long enjoyed robust trade links characterized by high levels of supply chain integration, especially in high-tech manufacturing.

In 2016, the United States was Taiwan's second-largest trading partner, while Taiwan was the 10th-biggest trading partner of the United States. Notably, Taiwan was also the seventh-largest agricultural export market of the United States.

U.S. President Donald Trump has expressed concern about his nation's trade deficits and has signed an executive order to investigate bilateral ties wherein it runs significant imbalances. Taiwan is listed 14th among the 16 countries subject to such scrutiny, with the United States having recorded a trade-in-goods deficit of around \$13.3 billion with Taiwan last year.

But that figure does not reflect the mutually beneficial nature of our trade links. Each year, Taiwanese tech companies pay U.S. firms significant

royalties for patented technologies. In addition, some of our military purchases are not included in U.S. trade statistics. To gain a more accurate picture of our trade relationship, we need to factor in these sales, as well as services related to intellectual property.

In response to President Trump's "Buy American, Hire American" policy, Taiwan has sent its largest ever delegation to the SelectUSA Investment Summit in June. An agricultural mission will also visit major U.S. agricultural states to purchase large quantities of crops like corn, soybeans and wheat.

Many Taiwan companies that have made substantial investments in the United States, including those in Apple Inc.'s supply chain, are seeking to expand their American operations. As a result, Taiwan investments in the country, which reached an accumulated total of \$26 billion by 2016, could increase to \$35 billion in the short to medium term.

Ultimately, our goal is to bolster economic ties with the United States while expanding lines of communication to deepen discussions on issues of mutual concern. Given the complementary nature of our economies, we also believe that a trade agreement is in the best interest of both sides. Such an accord would further boost trade and investment, thus elevating our longstanding and healthy economic partnership to a new level. ■

Taiwan's success takes teamwork

TAIWAN

Like many of its prosperous neighbors, Taiwan has invested a lot into its schools, knowing very well that the foundation of a successful and sustainable society lies in its people and the quality of the education they receive.

While currently several of Taiwan's top universities are public, the private sector has become more active in shaping Taiwan's next generation.

Only a few years old, CBTC Financial Management College in the southern city of Tainan is focused on preparing the country's next generation for life after graduation.

Believing that life skills plays an important part in education, the school, funded by banking giant CTBC Financial Holding Co., Ltd., uses its extensive network in the business world to instruct its students.

"Our professors are bank presidents, vice presidents in charge of insurance, security

vice presidents and CFOs. The group's many companies send executives down to speak to the students so that after they graduate, they know exactly what they need to do," University Chairman Chi-Tai Feng said.

"We are not trying to build a great academic institution. We are trying to produce international financial experts," added Feng, who pointed out that the school provides scholarships to less fortunate students.

In Kaohsiung, Taiwan's second-largest city, another private institution is committed to raising the quality of education for its future doctors.

"We have thoroughly integrated our affiliated hospital so that all of the efforts are more economical and efficient. This has been a major focus since our 60th anniversary three years ago. Our midterm goals involve putting more emphasis on innovation and entrepreneurship from our faculty and students," Kaohsiung Medical University President Dr. Ching-

Kuan Liu said.

"Before, our university only emphasized its hospital services but were not involved in the economic development," Liu added.

With this "pre-incubator" approach to education, KMU allows new ideas to flourish as it also provides business-related classes that may encourage its students to start their own company involving medicine or a related field. It also uses its close ties to local and national government to create an environment for growth not only within its campus but across Taiwan as well.

Exporting good health around the world

Life-changing discoveries in the fields of medical and biotechnology have put Taiwan in the spotlight the past few decades. With strong IP protection, transparent legal and financial systems, strong pursuits of innovation, as well as cost effective and efficient

manpower, the region continues to flourish.

These factors have created an atmosphere that allows small and medium sized enterprises on the island to thrive, among them TaiwanJ Pharmaceuticals, which has a team of only 30 people.

TaiwanJ Pharmaceutical CEO Dr. Shih Ying-Chu is very proud of their impressive results from its clinical trials of its liver disease drugs. In operation only since 2011, the company has successfully completed two phases of trials and is on their third and fourth phases of testing, all in collaboration with American counterparts.

"We are a group of very honest scientists with a good reputation. We are looking for sustainable growth both in Taiwan and in the international community. We also welcome everyone to participate in our upcoming IPO. Check out our performance. The trials speak for themselves," Shih also said.

Meanwhile, Charsire Biotechnology, based in the Southern Taiwan Science Park in Tainan, has developed health solutions with botanical drugs. With clinical trials underway in various neurodegenerative areas, Charsire has raised funds for additional research through the sales and marketing of their skin care line.

"By selling these products, we not only financially support our research but we also gain valuable market data from our customers. This human experience helps us create better products," said President Chih-Yi Weng.

"Charsire is quite special since we started with plant-based drug R&D. Our skincare products are both botanical and topical, which makes them very safe. The experience we gained from selling these products gave us the confidence to pursue clinical trials," Weng added.

Transforming Technology

Often called the "Island of Innovation," Taiwan is home to some of the technology and

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The Opening Ceremony of Southern Taiwan Interdisciplinary Center for Innovative Technologies

- 2015: Issued number of US patent - World University ranked No. 93
- 2015-2016: The first prize of the Innovation Incubation Center, Ministry of Economic Affairs, Taiwan

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IKB-122	NASH (non-alcoholic steatohepatitis)				
CD	Chronic Disease				
NCE	Autotaxin (NASH)				
	CCB1/CCB5 (NASH)				
	ACC (NASH)				
	IL-4/6, 13 (Autoimmunity/Atopic dermatitis)				

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electronic giants that have transformed our daily lives, such as Foxconn, Taiwan Semiconductor Manufacturing Company, HTC and Acer.

This deeply-ingrained spirit of innovation has since spread across Taiwan's other industries and has made the country a vital link in the global supply chain.

A so-called old world industry, textile manufacturing in Taiwan still remains at the top of the global game because it continually adopts the latest machinery and technology. With its development of functional fibers and yarns, the country has become a hub for textile manufacturing in the region.

An early adopter of industry 4.0, Everest Textile has transformed its facility into a truly smart factory. Nearly 30-years-old, Everest has been a driving force in Taiwan's textile manufacturing with a profile that includes top apparel brands such as Nike, North Face and Columbia Sportswear.

"Our focus has been on innovation for many years. We invest a lot of money in it. We always have new ideas, new products. This is our way. We are a learning organization. We are hungry to learn and to take action," said Everest President Roger Yeh, who continues to push for more sustainable ways to run his business.

His efforts have paid off. By reducing electricity usage throughout his factory and using an all natural cooling system, Everest has saved \$2 million on energy expenses alone.

With a new operations plant in North Carolina, Yeh has not only added more value to his North American customer base, but he placates the current administration's push for American-made products, while being able to fulfill the needs of the U.S. Department of Defense.

In central Taiwan, LinkWin Technology takes the textile industry in a different innovative direction. Through extensive carbon material research and development, LinkWin makes carbon fibers for various industries.

"Typically, artificial carbon fibers are used in aerospace applications, such as NASA, SpaceX and other special applications. Medical applications of our products are expanding and we look to collaborate with foreign countries and companies to further fund our research," said LinkWin President Arthur Cheng.

While medical applications are LinkWin's main focus at the moment, Cheng is open to working with other industries.

Aviation and Defense Keep Soaring

JYR Aviation, a member of the JY Group, is tasked with adding value to the conglomerate's product line. Taking a small but essential part, JYR Aviation extensively tested its own screws with other industries before it found success in the aerospace industry.

"We are also seeing an increase in our machine parts orders. We have a great relationship with GE Aviation and

that has really helped us connect with Asia and beyond," General Manager Vincent Sun explained. JYR Aviation is GE Aviation's only certified distributor in the Asia Pacific region.

And while industry leaders strive to cut costs without compromising on quality, JYR Aviation fills a gap in the supply chain. "We are very new to aerospace, yet we have many experienced and talented engineers. Because of this we have our own way of thinking and are able to reduce costs and lead times. We are very experienced newcomers to aerospace," Sun also said.

Meanwhile, the National Chungshan Institute of Science and Technology has been responsible for developing Taiwan's defense systems and capabilities for close to 50 years and is now looking to become a major player in the global defense industry.

"We hope to be a part of the international supply chain and work with other major defense companies, even in jointly developing

products. We also want to play a role in establishing a regional maintenance center here in Taiwan," said recently-promoted Army Gen. Chang Guan-chung, who is Deputy Minister of Defense and a former president of NCSIST.

Historically, NCSIST's engineers and scientists have had to be creative and resourceful in compensating for its limited access to foreign technologies and spare parts. This challenging environment has strengthened its capacity to innovate and develop custom-made systems, sub-systems, components and materials for defense and civilian applications.

Because of its strong capabilities in system integration, NCSIST makes home-grown systems that are compatible to many foreign systems, including those used in the United States, an often overlooked advantage.

"We firmly believe that we have the capabilities and necessary experience to work with other international partners," Chang said. ■

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NCKU PLAYS VITAL ROLE IN BUILDING TAIWAN AND THE WORLD

As centers of research and innovation, higher education institutions play a significant role in the development of countries. In Taiwan, over just a few decades, universities have made valuable contributions to the astounding progress made by the entire country.

National Cheng Kung University President Huey-Jen Jenny Su has made it her mission to ensure that her students contribute to the ongoing mission of nation-building.

"This institution will be a fully engaged academy. Through education, we will cultivate top level human capital for society and the country, whether that be in science and technology,



One of the historical buildings at National Cheng Kung University (NCKU) in Tainan

biomedicine or even in culture and heritage," Su said.

"More and more, we are playing a pivotal role not only as an international higher education institution but also as a global citizen," she added.

Established nearly a century ago, NCKU has expanded its influence beyond the main campus in the southern city of Tainan. The university's work has had a tangible impact on the life of the entire country.

When a dengue fever epidemic struck Tainan in 2015, NCKU organized students and faculty to assist the city in containing the outbreak. Following this successful effort, Su and NCKU realized that the city, as well as the entire country, would benefit from the school's science-based medicine and various innovations, including many in computer applications, robotics systems and IoT systems and design.

"Our role not only lies in our academic reputation but also in our service to the people around the city and the country which is rooted to our noble calling of being a responsible global citizen," Su also said.

Outside of its social contributions,

NCKU is also a leader in academia-industry collaboration. It has the highest percentage of commercialized intellectual properties and made history with its involvement in the single highest licensing fee of \$40 million.

"The strength of the university is not only that we continuously strive to raise the quality of our research. We also ensure through IP licensing, that every discovery will deliver an impact," Su said.

Focused on improving interdisciplinary collaboration between its departments, NCKU forecasts a very exciting future as a model for other academic institutions in terms of innovation and international collaboration.

"We would like to see a platform that will better connect us to global centers. One of our strengths is connecting academic experiences with real life challenges. Our goal is to realize and deliver on this connection. I see that as the value of the university," Su said. ■

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NCKU
National Cheng Kung University

TWSE: Cultivating Growth

When gauging a country's economic prospects, analysts first study the historical performance of its financial market and activity that characterize its investment environment. For more than 50 years, the Taiwan Stock Exchange (TWSE) has served as the island nation's definitive economic benchmark.

With strict attention paid to corporate governance reporting standards and strong economic upturn, Taiwan has a well-earned reputation as a preferred investment destination both at home and abroad. This is evidenced in the growth of TWSE's main index, which hit the 10,000 ceiling on May 11.

TWSE Chairman Jun-ji Shih knows what it takes not only to realize this record high but also to sustain that growth.

"One factor is economic performance, and we think that performance should be able to support the growth of the stock market. Other factors include the inflow of foreign funds and the contribution of

individual domestic investors to enhance capital market surplus. The last decade has seen a steady climb in institutional investors, with this group having 40% of the overall holdings of the Taiwan market."

At the end of June 2017, the TWSE reported 837 domestic listed companies and 64 foreign primary listed companies. Taiwan's well-known strength in high tech has also contributed to the stock market progress with globally-recognized giants Taiwan Semiconductor Manufacturing Company and Hon Hai Precision (Foxconn) being listed on TWSE. Biotech is also active, and the bourse has the highest number of listed biotech companies in Asia.

"Taiwan's position as a leading global supply chain gives our market many advantages with international linkage through Asia and worldwide. Our advanced ICT ecosystem enterprises are an integral part of our success. Investors in these companies enjoy the benefits of Taiwan's transparency and shareholder protection, while easily accessing other markets in the region and beyond," noted Shih.

External recognition of Taiwan's advances in corporate governance by global reporting bodies shows yet another side of Taiwan's market strength. It is well worth mentioning that 2016 was the first year

Taiwan made the Robeco SAM Country Sustainability Ranking. This is significant because when we were ranked, we were in the top third. Taiwan also placed first in APAC in Bloomberg's ESG category as well as rising to the 4th place position in ACGA's most recent survey.

"The ultimate goal of the TWSE is to provide trading value growth and consistently high dividend yields in the 4 percent range. Our listed companies also have reasonable P/E ratios; both of these are factors that continue to draw foreign investors to our market," Shih added.

Looking to the future, Shih is active in building greater collaboration with the international community to further strengthen Taiwan's investment environment. This involves working closely with other exchanges like Japan, Korea, Malaysia and NASDAQ with whom strong ties are held. Promoting the advantages of investing in Taiwan is also a key strategy which entails roadshows in all regions of the world that include New York, London, Hong Kong and Singapore. With all this momentum in place, the TWSE is poised to deliver.



TAIWAN
STOCK EXCHANGE





NCSIST: Always adapting to an ever-changing world

The island-nation of Taiwan has long prided itself on maintaining stable social order, low crime rates, and a prosperous economy. Its dynamic semiconductor industry has driven the worldwide boom of information and communication technology. Moreover, Taiwan's vibrant democratic system recently elected its first-ever female president.

In conjunction with these achievements, Taiwan has also faced urgent geopolitical and diplomatic obstacles. Surmounting these challenges will require the contribution of Taiwanese institutions dedicated to the country's long-term development. Among these is the National Chung Shan Institute of Science and Technology

(NCSIST), a research facility comprising talented, technologically innovative experts who work tirelessly behind the scenes to ensure Taiwan's long-term defense and national security.

Age of growth

NCSIST was formally established in 1969, following the ambitious expansion of the ballistic missile and nuclear bomb strength by the People's Republic of China's, as well as a series of diplomatic setbacks for the Republic of China, which included withdrawal from the United Nations, the loss of key political alliances, and the overall disruption of the country's international relations.

At the time, Taiwan had a poorly developed national defense program. Moreover, limited diplomatic resources precluded the feasibility of obtaining weapons from overseas. Against an increasingly grim military threat, Taiwan initiated its own weapon system programs.

In this initial period, progress was hindered by a severe shortage of the hardware, instruments, laboratories, and test sites required to support an adequate defense program. Taiwan also did not have many experts in defense technology. With little in terms of guidance, NCSIST broke new ground with the development of short-range missiles and self-propelled rockets, fully aware that the accumulated experience – and failures notwithstanding – would slowly but surely lead to success.

Finally, in the 1980s, NCSIST found commendable success with the development of its first three missiles and one fighter jet: the Tien Kung surface-to-air missile, the Tien Chien air-to-air missile, the Hsiung Feng anti-ship missile, and the indigenous defense fighter (IDF) jet. These milestones allowed Taiwan to indirectly purchase weapons and equipment from the international community, thereby strengthening its defense capabilities.

Vertical integration, horizontal expansion

In the 1990s, the international community tightened regulations on Taiwan's arms industry in response to the changing geopolitical landscape. Amid these challenges, NCSIST implemented a system of vertical integration in order to make the key modules, components and materials required by its weapon systems, which could no longer be obtained from foreign providers. NCSIST also widened the scope of its R&D program to meet military demands, which included radars, communication systems, command and control systems and missile systems. This transition made NCSIST

one of the few R&D institutions worldwide to implement both deep systems integration and product diversification.

With these systems in place, NCSIST has spent recent years developing the new generation of its homegrown missile technology: the Tien Kung III anti-tactical ballistic missile area defense system, the Hsiung Feng III supersonic anti-ship missile and the air-launched Wan Chien remote attack missile, which together bolster Taiwan's combat readiness.

Superior performance

During annual military exercises, Taiwan tests the performance and effectiveness of its own weapons against those purchased from abroad. In these field tests, NCSIST's weapon systems have outperformed equipment bought from overseas, while also proving more reliable and more affordable to maintain.

Bridging defense to industry

Taiwan is home to prominent manufacturers of the world's high-tech products, as well as birthplace to several giants of the global supply chain in a

wide range of industries. In the local defense industry, NCSIST plays a vital role in converging these civilian technological capabilities into the manufacturing, maintenance and upgrade of self-made weapon systems and foreign equipment, including missile parts, wireless communication devices, bulletproof armor plate, and composite armors.

In line with the institute's mission to ultimately employ its defense technology for military and civilian benefit, the core technologies offered by



Deputy Minister of Defense and former NCSIST President Gen. Chang Guan-chung

NCSIST are adapted by private enterprises to develop innovative industrial and consumer products that strengthen these companies' market value. These include target materials, titanium golf club heads, advanced bearings, electronic devices for the AMS space magnetic spectrometer multinational project, community-type green power systems, and high-speed railway components.

Mapping out the future

In order to bolster the national defense industry and spur NCSIST's momentum, the Taiwanese government re-branded the organization from a research institute under the Ministry of Defense into an administrative corporation in 2014.

The change allows NCSIST greater flexibility and more freedom to cooperate with foreign entities and participate in forming government policy. Since then, NCSIST has joined large-scale national projects, such as the

Homemade High-level Training Aircraft, Homemade Warship and Homemade Submarine.

In the future, NCSIST anticipates more successes, as it tackles the enormous responsibility of developing the national defense industry, expands participation in the international market, and faces geopolitical challenges on the global stage. ■

www.ncsist.org.tw



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