Tsung-Tsong Wu – Minister Without Portfolio, Executive Yuan, Taiwan



The most important factor in Taiwan's biotech environment is talent

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Tsung-Tsong Wu, minister without portfolio, offers insights into the current state of Taiwan's biomedical landscape three years after the administration's Biomedical Industry Innovation Program was put into place to bolster the industry. Minister Wu also shares his vision on Taiwan's future as a leader in the emerging digital era.

As Minister Without Portfolio, you were entrusted with the strategic mission of handling the overall supervision and coordination of the "Biomedical Industry Innovation Program". How has the policy impacted Taiwan since it was first implemented in 2016, starting with the cultivation of talent from academia to industry?

The most important factor in Taiwan's biotech environment is talent. We have many researchers in the biomedical area, in fact, Taiwan has the second highest number of biomedical researchers and third highest for life science related graduates in the world. Over the past three years, we have been trying to link the researchers to the industry. Our aim is to encourage the movement of researchers across the historical gap to the industry.

Programs like the Ministry of Science and Technology's Global Research & Industry Alliance (GLORIA) are aiming to help university professors and their students to translate their work and create new biotech startups. For example, 12 academic centres have joined the Taiwan delegation

to attend Bio Convention at Philadelphia this year. Furthermore, for 2 years, over 600 students have been trained in the Rebuild After PhDs' Industrial Skill and Expertise" (RAISE) program which sponsors PhD students to participate in a one year internship with a business that will help them build their professional skills for a career in the biomedical field after their education.

How has Taiwan's biomedical environment been able to attract international attention?

We have also been focused on creating an investment-friendly environment in Taiwan. The base infrastructure of the biomedical industry is strong, with over 130 well-trained hospitals in Taiwan which are approved by the TFDA to conduct clinical trials. We have a comparative level of quality to the US at a more reasonable price point. Moreover, Taiwan offers advantages such as quick processing, accelerated IRB review, a large health care database, and strong IT industry to support biotechnology R&D and data management. In addition, Taiwan Clinical Trial Consortium (TCTC) brings together 13 specific diseases that are highly prevalent in Asia that facilitate the development and commercialization of international and domestic biomedical products.

Building a link between the different ministries is a key activity in cultivation Taiwan's environment to attract international companies to the country. Bolstering inter-ministerial cooperation helps foreign companies to invest in Taiwan by creating advantages such as spaces in science parks, R&D encouragement from MOEA, biomedical talents from MOE, etc. This can be challenging because like all governments, each agency has its own focus areas and agendas. Therefore, it is my job as Minister Without Portfolio to coordinate these efforts and we have been quite successful in creating synergies between the Ministries of Health and Welfare (MOHW), Science and Technology (MOST), and Economic Affairs (MOEA) in building Taiwan's biomedical and business attractiveness from all angles.

What is the government's strategy to accelerate the integration of Taiwan's bio-clusters to bolster the improvement of the industry's value chain?

Our aim is to create a cluster effect by bringing together all core agencies related to the biotech industry in order to create a favorable environment to develop biotechnology, provide speedy service channels for the biomedical industry, and support translational research. By 2025, the goal is to develop 20 new drugs and have 80 different high-value medical devices on the international market, creating an NT$ one trillion industry offering a wide range of quality products.

In 2017, the Drug and Medical Device Commercialization Center was launched to facilitate technology transfer, licensing-out, co-development, and spin-off companies and assist in the commercialization of the biomedical products and technologies to boost the economy and create job opportunities. Taiwan has four science parks – Hsinchu, Taichung, Kaohsiung, and the recently inaugurated National Biotechnology Research Park in Nangang.

As Hsinchu already stands as the heart of Taiwan's ICT industry, the further development of this cluster could foster an extremely promising interplay between these two pioneering industries, and cross-sector investments, research projects, and other partnerships could truly propel the development of Taiwan's "bio-ICT" sector. In addition to Hsinchu Science Park, the Central Taiwan Science Park located in Taichung and the Southern Taiwan Science Park located in both Tainan and Kaohsiung each have a specific task development –precision machinery with focus on minimally invasive surgery and Smart assistive technology at Central Taiwan Science Park and dental, orthopedic and Smart Health in the Southern Taiwan Science Park. The NBRP in Nangang serves as a hub for local biomedical companies as well as encourage leading foreign companies and research team to set up bases in Taiwan.

Taiwan's government has been investing in the biotech sector long before the 5+2 Plan. What are the synergies between past and present biotech policies and how has the government improved in its policymaking?

Regulation reform has been a large aspect of transforming Taiwan's biomedical ecosystem, which the MOHW and MOEA has played an important role in. One of the first key enhancements made to our regulatory landscape was the amendments made to the Biotech and New Pharmaceutical Development Act. The amendments extended tax benefits on R&D activities to high-risk medical device companies, new drugs, and emerging areas such as cell therapy and precision medicine. The incentive provides a reduction in its corporate income tax payable for up to 35 percent of the total funds invested in R&D and personnel training each year for up to five years.

Next, an amendment made to the "Regulations Governing the Use of Specific Medical Technology and Medical Equipment for Examination and Test" last September has authorized the use of six cell therapies to treat medical issues including degenerative joint disease, hematological malignancies, spine injuries, solid tumors, strokes, and burns. Three medical centers in northern, central and southern Taiwan have reached the final assessment stage and more than 100,000 patients a year are expected to benefit from the therapies. Our goal is to position Taiwan as a hub for regenerative

medicine in Asia and market investors into this emerging biomedical technology.

Finally, I would also like to mention the Guidance on Laboratory Developed Tests and Services (LDTS) program for precision medicine molecular testing. Precision medicine comprises of screening, diagnosis, treatment, and monitoring. Each one of these areas has the business potential to develop into a major sector.

How are these policies transforming Taiwan from an OEM economy to an IT application superpower and paving the way for Taiwan to welcome industry 4.0 and fulfill the digital dream?

The 5+2 Industry Innovation Projects launched by President Tsai were integrated with the digital nation project called DIGI + which aims to build up an innovative ecosystem for the coming digital world and network society. If innovation is neglected, the 5+2 industries are in fact just traditional industries. AI, IOT, Big Data, etc. are among the important elements. Of course, the biomedical industry is also facing the challenge of how to transform based on emerging ICT technologies.

To make the 5+2 Major Innovative Industries policy a success, these areas need to meet with the digitalization wave. AI and 5G cannot stand alone but need to combine with the traditional industries for Taiwan to become “a Digital Nation, Smart Island”. This is a crucial factor to achieve and is also the most difficult.

What is your assessment of Taiwan’s biopharma sector? How are more traditional players able to find a space in the biotech boom?

Taiwan’s biotech companies can be divided into several categories, of course, one being biopharma, which includes new drugs and generics. There are over 130 small scale generics companies in Taiwan, and we are trying to help them evolve into the next stage. The government communicates openly with the industry to try and understand the key trends and demands that are shaping their sector. Interestingly enough, many generic players are exploring how they can benefit from AI. Taiwan has set up an AI academy which we use to train different industries in the technology and explore what AI can and cannot do. In addition, we are also working with generic players on IP solutions to try and encourage them to work upgrade themselves operations.

Taiwan has been investing in new drug development for more than fifteen years and we are now starting to see the rewards. For last 5 years, six new drugs created here have been granted FDA approval. We have also seen growth in the medical device sector which had revenues increased by over eight percent in 2018. We expect this growth to be even higher this year as we encourage physicians to work with the ICT industry to conceive next generation smart health technologies.

Looking forward, what is your vision for Taiwan in the future of innovation?

In the next few years, there will be a massive paradigm shift caused by emerging technologies. So far, no country has taken a lead yet, but Taiwan is a very good place in linking the “hardware” of resources and infrastructures with the “software” of information and policies to meet the needs of society. Major IT companies have invested in building key R&D centers in Taiwan because all the necessary resources are here for the development of future industries. We may be a small country, but we are very adaptable and can adopt new technologies quickly. In the future, I expect Taiwan to have a very significant role in leading the next generation solutions of the world.

We are focused on the construction of Human Biobank and human genome-related databank available for all public use. There are 30 hospitals across Taiwan with independent biobanks and our aim is to link them together and have the same quality and structure data.

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