

Development Strategies for The Green Industry in Pingtung County

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ABSTRACT

The ample sunlight in Pingtung County is advantageous for the development of its photovoltaic industry. Pingtung County Government, in recent years, has proactively developed green energy, including efforts to promote the Aqua Solar Farm program, the installation of photovoltaic systems on rooftops of public buildings and schools, green architecture, etc. What's more, the government established Taiwan's first and only floating solar power station on a detention pond in early 2016. As of the present time, a total renewable energy generating capacity of 125 MW has been installed in Pingtung County, and an annual growth of 50 MW is expected.

In addition, an intelligent green and energy efficiency industry cluster is forming in the Pingtung Export Processing Zone, which coupled with the Liukuaicuo Industrial Park to be established in the near future, will position Pingtung as Southern Taiwan's stronghold for the development of this industry. In light of this, the "Intelligent Green and Energy Efficiency Industry Guidance Project" was initiated to further strengthen the soft power of local industries. To assist Pingtung-based businesses with industrial transformation and development, this Project focuses on four approaches: 1. value-added application and promotion of green and energy efficiency technologies; 2. joint development and promotion of technologies and services; 3. establishing an innovative system for the application of intelligent green and energy efficiency technologies, and providing guidance on the system; and 4. designing intelligent green and energy efficient products and providing guidance for innovative services, in the hope of boosting the development of local green and energy efficiency industry, and in turn facilitating the formation of local industry clusters and R&D alliances.

Keywords: *energy use, energy saving, green industry*

1. INTRODUCTION

In recent years, global warming has had a significant impact on climate patterns. In light of this problem, countries around the world have actively invested in the expansion and promotion of the green energy industry, bringing huge business opportunities for its respective sectors. Due to its limited natural resources, a significant portion of Taiwan's energy supply is reliant on imports from other countries. In addition, faced with the decommissioning of its Maanshan Nuclear Power Plant in 2025, the possibility of a gap in Taiwan's energy supply chain has become a challenge which is confronting both the central and local governments. In 2009, Typhoon Morakot inflicted severe damage upon Pingtung by flooding nearly 1,075 hectares of aquaculture facilities and leaving several townships and villages without electricity for as long as two months. Pingtung County Government implemented the "Aqua Solar Farm Program" (Figure 1) to provide guidance for the upgrading and transformation of the fish farming industry, which has been relying on groundwater for lengthy periods. Pingtung County Government also established the "Guangtsai Wetland" green energy demonstration zone in Pingtung's Linbian Township, hoping to nurture the development of green energy-related industries such as photovoltaic power, marsh gas, wind power, biomass energy, and fuel cells. In addition to the Guangtsai Wetland green energy demonstration zone, the government also established Taiwan's first floating solar power station on a detention pond in 2016 at Jiadong Township's Dawuding Pumping Station (Figure 2). The government continues to push for the establishment of related facilities.



Figure 1: Aqua solar farm program facilities



Figure 2: Taiwan's first floating solar power station

Furthermore, Pingtung County Government plans to establish the “Pingtung County Liukuaicuo Industrial Park”, and has selected a property consisting of 19.75 hectares located to the south side of the Pingtung Export Processing Zone founded by the Ministry of Economic Affairs. Through the development of this industrial park, it is hoped that companies related to renewable energy will be attracted to set up offices in the park. By collaborating with the Pingtung Export Processing Zone, a green energy supply chain is expected to be built, thereby forming a cluster effect for the industry.

2. PINGTUNG'S STRATEGY FOR DEVELOPING ITS GREEN ENERGY INDUSTRY

Pingtung possesses many natural advantages for developing its green energy industry. The county is exposed to abundant sunlight throughout the year, reaching as many as 2,400 hours in terms of sunshine duration – ranking it second in Taiwan in 2015. The powerful katabatic winds which blow from October to April provide a source for generating wind power. Pingtung County also boasts the second longest coastline among all the counties in Taiwan, being adjacent to major bodies of water such as the Pacific Ocean, the Bashi Channel, and the Taiwan Strait. The strong Kuroshio Current is also a possible source for ocean current energy. In addition to the aforementioned natural resources available within its environment, one of the biggest advantages Pingtung County has for developing a renewable energy industry is its solid foundation in agriculture – the abundance of kitchen waste and manure from farm animals facilitates the development of marsh gas power and biomass energy utilization.



Figure 3: Pingtung county government establishes the green energy project office

Actively complying with the central government's green energy policies, the Pingtung County Government established the Green Energy Project Office (Figure 3) to manage the achievements and results obtained from the implementation of green energy projects by county government agencies. It establishes a platform for communication and coordination, creating a single-window system to accept inquiries, provide investment for green energy industries, offer services for the installation of green energy facilities, and assist in overcoming administrative obstacles. The project office has set a goal of installing 58.5 megawatts (MW) of renewable energy facilities in 2016-2017, as well as creating 234 employment opportunities, and 300 millions output value per year. We seek to promote renewable energy diversity.

In addition to establishing the Green Energy Project Office to actively promote renewable energy policies, the Pingtung County Government drafted the "Pingtung County Self-governing Ordinance on Green Buildings" in 2016, seeking to promote the installation of solar panels on townhouse communities and apartment buildings. Apart from publicly-owned buildings and schools, the ordinance requires that publicly-owned factories and new buildings intended for public use must abide by green building regulations. Furthermore, the number of pig farmers in Pingtung County comprise one-fourth of Taiwan's total population. To avoid the pollution of water bodies and air by the large volume of animal waste created daily, Pingtung County Government has recently been working on utilizing the marsh gas produced from the wastewater discharged from pig farms to generate power.

Based on the above, the types of renewable energy promoted by Pingtung County Government include solar power, marsh gas power, and ocean current power. The location for the placement of solar panels includes poultry houses, farm facilities, green buildings, publicly-owned buildings, and schools; the primary location of marsh gas production are livestock farms; and for ocean current power generation, the electricity-generating equipment will be placed in the sea in the vicinity of Eluanbi Lighthouse – along the path of the Kuroshio Current. The following table contains information on the types of renewal energy generators, locations for deployment, and objectives regarding Pingtung's green energy policies:

Type of Renewable Energy	Location	Installation Objective for 2016 (MW)	Completed as of Sept. 19, 2016	
			MW	(%)
Solar Power	Poultry Houses	30	8.7	29%
	Other Farm Facilities	20	6.85	34.25%
	Green Buildings, Publicly-owned Buildings, Schools	5	8.234	164.68%
	Detention Ponds,	1	0.5	50%
Marsh Gas Power	Livestock Farms	1	0.015	1.5%
Ocean Current Power	Sea near Eluanbi Lighthouse	1.5	0	0%
Total		58.5	24.389	41.69%

Table 1: Green energy project office renewal energy equipment type, deployment location, and objective

3. GREEN ENERGY PROMOTIONAL PLAN AND CONTENTS

Through a short-term 4-year plan running from 2016 to 2020, Pingtung County Government is investing effort in the promotion of solar power, marsh gas power, and ocean current power. Each year, it sets the objective of installing renewable energy generation equipment with a combined capacity of 50 MW. Some of the proactive measures include: (1) Coordinating with the green energy policies of central government agencies by establishing the Green Energy Project Office to determine the county's vision, goals, and strategies for relevant green energy projects; (2) Drafting the division of duties and responsibilities regarding affairs related to the promotion of green energy policies for agencies and institutions affiliated with Pingtung County Government in order to duly supervise the promotion carried out by the affiliates; (3) Constructing a platform for communication and coordination, as well as the management and tracking of annual objective achievement rates; (4) Establishing a single-window system to accept inquiries, provide investment services for green energy industries, offer services for the installation of green energy facilities, and assist in overcoming administrative obstacles; (5) Handling affairs such as researching

and providing suggestions on regulations related to green energy, industry technology, along with market surveys, assessment, and analysis; (6) Formulating regulations governing subsidies and incentives for promotions related to green energy projects; (7) Drafting memorandums and proposals for promoting green energy policies to secure funds and subsidies from the central government; (8) Organizing promotional campaigns and investment seminars related to green energy projects.

In the long run, Pingtung County Government seeks not only to develop new energy sources, but also to promote energy conservation. In the future, it will continue to implement policies such as solar power, ocean current power, stream current power, marsh gas power, and wind power. It will also assist in the development of different kinds of green energy technology, integrating different fields to achieve the most effective results through synergy. The promotion of energy conservation policies will also start with Pingtung County Government. This involves the planning of energy measures in line with local characteristics, seeking to gradually change the electricity-use habits of county residents, thereby establishing a trend for energy conservation. The government also encourages the decommissioning and replacement of high energy-consumption equipment to reduce the load on Pingtung County in the coming years. Hopefully, by working in coordination with measures on both the supply and demand side, the county is expected to achieve its vision of a 2025 carbon-emission-free Pingtung.

4. CONCLUSION

In recent years, through approaches such as strengthening microgrids, generating electricity using marsh gas, and the Aqua Solar Farm Program, Pingtung County Government is gradually implementing its objective of promoting green energy. In the future, it will continue to boost the volume of green electricity by continuing to develop diversified renewable energy sources such as aqua solar farms and marsh gas power generation. By introducing the development of composite energy-generation – ocean current power and stream current power generation – which coexists with agriculture and aquaculture, Pingtung County Government seeks to become home to sustainable green energy development in the future.

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