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Report Name: Taiwan Wood Pellets Market Brief - New Environmental and Energy Priorities Realize Opportunity for 300 Million in US Wood Pellets

Country: Taiwan

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Report Category: Wood Pellets

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Report Highlights:

Taiwan aims to expand use of renewable energy to 20 percent by 2025. Developing renewable energy is the most important implementation component to reach the goal and wood pellets is a green energy resource option being considered by Taiwan. Lacking local forest product supplies, Taiwan is expected to import a significant portion of wood pellet to meet their new green energy production goals. Taiwan authorities' commitment to generate sustainable bioenergy by burning wood pellets should translate into a 300 million USD wood pellet trade opportunity.

Renewable Energy Development and Policy

Following the announcement of a national goal to reach net-zero carbon emission in 2050, Taiwan President Tsai Ing-wen signed the Climate Change Response Act into law in February 2023. To support this goal, the National Development Council published a new program - *Taiwan’s Pathway to Net-Zero Emissions in 2050* to provide the action pathway.

Taiwan aims to increase the share of renewable energy to 20 percent (biomass to three percent) of its total power capacity by 2025, as part of the nuclear-free homeland vision and to support the island’s national goal to reach net-zero carbon emission in 2050. Currently, renewable energy only accounts for less than 10 percent of total energy output in Taiwan. Among all the renewable energy types, biomass’s contribution to Taiwan’s energy mix was significantly less than other sources such as solar and wind.

Table 1. Taiwan Energy Output by Generation Type

Total Amount and Composition of Power Generation from 2019 - 2021








	2019		2020		2021	
	Billion kWh	Percentage	Billion kWh	Percentage	Billion kWh	Percentage
Net amount of power generated and purchased	232.5	100.0%	238.9	100.0%	248.8	100.0%
Amount of power generated	180.4	77.6%	183.9	77.0%	189.1	76.0%
 Pumped storage hydro	3.2	1.4%	3.1	1.3%	3.2	1.3%
 Thermal	140.6	60.5%	147.0	61.5%	155.2	62.4%
 Nuclear	31.1	13.4%	30.3	12.7%	26.8	10.8%
 Renewable energy	5.5	2.4%	3.4	1.4%	3.9	1.6%
Amount of purchased power	52	22.4%	55.1	23.0%	59.7	24.0%
 Privately-owned thermal	39.4	16.9%	40.6	17.0%	42.7	17.1%
 Renewable energy	8.5	3.7%	10.4	4.3%	11.9	4.8%
 Cogeneration	4.1	1.8%	4.1	1.7%	5.1	2.1%

Table 2. Taiwan Renewable Development Targets**Government and Taipower Renewable Development Targets**

Development Timeline	Government's Target		Taipower's Target	
	2025		2025	
Item of Promotion	Capacity (MW)	Power Generation (billion kWh)	Capacity (MW)	Power Generation (billion kWh)
Hydropower	2,122	5	1,825	3.52~4.8
Onshore Wind Power	886	2.2	408.2	1.08~1.15
Offshore Wind Power	5,617	12.3	403.7	1.38~1.59
Solar Photovoltaics	20,000	22.8	469.1	0.58~0.66
Geothermal Power Generation	20	0.102	1.4	0.009~0.01
Fuel Cells	0.7	0.0009	-	-
Biomass Energy	778	4.1	-	-
Total	29,423.7	46.5029	3,107.4	7.2

Note: The government targets are based on the "Overall Strategy of Green Energy Implementation" briefing by the Bureau of Energy, Ministry of Economic Affairs on July. 11, 2021.

Source: Taiwan Power Company, 2021 Sustainability Report

In line with these green energy goals, Taiwan has been focusing on transitioning from coal and other fossil fuels to renewable energy sources, including biomass, solar, and wind. Consequently, the state-owned power enterprise Taiwan Power Company (Taipower) decided to convert the 500 megawatt (MW) Number 1 coal-fired boiler in its Kaohsiung Hsinta Power Plant into a low-carbon biomass energy generation system specialized in burning wood pellets in 2022. This marks the first domestic case of transforming a decommissioned coal-fired unit into a biomass energy generation facility, serving as a technology demonstration for the transition of large-scale coal systems to clean energy in Taiwan.

The new wood pellet heat boiler is set to operate in 2025/2026. According to Taipower, the converted biomass facility will consume 1.7 million metric tons of industrial grade wood pellets annually.

Wood Pellet Supplies

As Taiwan has essentially zero domestic wood pellet production, Taipower will be forced to import the vast majority wood pellets to meet the demand.

Taiwan does not have extensive forests or wood resources to support large-scale wood pellet production. Importing wood pellets can be more cost-effective and logistically feasible than attempting to produce them domestically. According to industry estimates, Taiwan produces approximately 300,000~400,000 metric tons of non-industrial grade wood pellets annually.

North American, European, and Southeast Asian countries are major wood pellet producers and suppliers. In the EU specifically, demand for pellets has significantly outpaced domestic production for the past ten years. Given the need for a stable supply of wood pellets and considerations of pricing feasibility, Taipower is aiming to import wood pellets from Southeast Asia and North America.



Source: FAO

World's Leading Wood Pellet Suppliers

	Enviva	Drax	CM Biomass	Fram	Hanwa	JFE	Mihaud	Indika
Region	U.S. Southeast	U.S. Southeast and Canada West Coast	U.S. Southeast	U.S. Southeast	Canada and Southeast Asia	Southeast Asia	Vietnam	Indonesia
Annual Supplies (1,000 mt)	6,000	400	400	180	140	20~30	20~30	20~30

Source: Survey of Taiwan Power Company

2022 Wood Pellet Prices

Sources	USD/ton	NTD/ton	Unit Price in terms of Calorific Value ¹ (NTD/Mcal)
fob southwest Canada ²	\$266.00/t	7,980	1.77
fob southeast US ²	\$263.75/t	7,890	1.75
fob Vietnam ²	\$146.50/t	4,380	0.97
fob Portugal ³	€308.34	10,704	2.38

Note 1. Calorific Value of wood pellet is 4500 kcal/kg; Mcal: 1,000 kcal.

Note 2. April 2022

Note 3. January 2023

Source: Argus Biomass Markets

Taiwan Wood Pellets Requirements

Taipower intends to procure the annual 1.7 million metric tons of wood pellets through open tender, with a contract duration of 10 years. It's expected the tender will be published in the first quarter of 2024. Fifty percent of the products will be supplied by North American suppliers, while the other half being supplied by Southeast Asian countries. Taipower estimates that the annual wood pellet procurement amount will reach three hundred million US dollars.

The principles governing Taipower's wood pellet imports include supply stability, quality standards based on Taiwan's Chinese National Standards (CNS) 17225-2 and alignment with the Taiwan Ministry of Environment's

primary solid biomass fuel standards, as well as considerations of pricing feasibility from sources in Southeast Asia and North America. (Note: CNS17225-2 for wood pellets is based on ISO standards, which specifies requirements for solid biofuels.)

Taiwan does not have specific wood pellet regulations. However, Taiwan's CNS [17225-2](#) (Chinese version only and can be locate in the search engine) specifies the requirements and classifications for wood pellets used as solid biofuels, including specifications for dimensions, quality requirements, calorific values, additives and binders, sampling and testing, packaging and labeling, quality assurance, and transportation and storage.

Taiwan's Ministry of Environment have specific requirements for emission levels of wood pellet broiler to ensure they meet environmental and quality standards. The table below listed chemical content and heat value allowed for primary solid biomass fuel, which includes wood pellets.

Chlorine content	≤ 0.1 Wt%
Sulfur content	≤ 0.05 Wt%
Lead content	≤ 20 $\mu\text{g/g}$
Cadmium content	≤ 1 $\mu\text{g/g}$
Mercury content	≤ 0.1 $\mu\text{g/g}$
Lower heating value	$\geq 3,000$ kcal/kg

Source: Ministry of Environment

Future Prospects

Taiwan's Bureau of Energy supports and assists Taipower, as well as other private sectors, in the transformation of coal-fired power generators into biomass (100 percent wood pellets) energy power generation systems. Taipower's experience in biomass energy power generation transformation can serve as a reference for future domestic biomass energy development practices.

Some domestic business, such as paper and petrochemical industries with fluidized bed systems, are also required to adopt carbon reduction target to cut their emissions. The Bureau of Energy encourages these industries to establish new biomass energy power generation units by providing feed-in tariff (FIT) incentives, which are reviewed annually by the Bureau.

The U.S. Industrial Pellet Association (USIPA) estimated that Taiwan's wood pellet import volume could reach ten million metric tons if a supportive policy framework is in place. Post will continue collaborating with USIPA, U.S. wood pellet producers, USDA Cooperators, and Taiwan counterparts to identify trade opportunities and support promotional and trade events.

Attachments:

No Attachments.