

Taiwan: Power Industry

<Industry Status> Shift in Power Supply Structure to Achieve Zero Greenhouse Gas Emissions

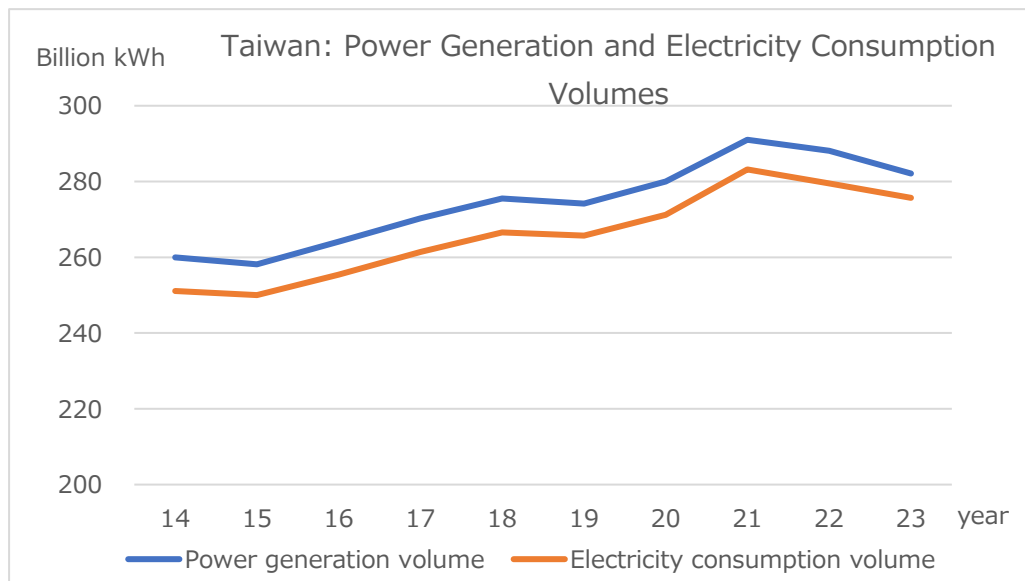
Taiwan has been promoting a shift in its power source composition with a view to achieving zero greenhouse gas emissions by 2050. Since the previous administration of Tsai Ing-wen, the government has been promoting policies aimed at significantly increasing the share of renewable energy, mainly liquefied natural gas (LNG), and eliminating nuclear power generation by 2025. However, the policy of abandoning nuclear power generation has turned a corner, as LNG prices have soared in the wake of the new coronavirus epidemic and the war in Ukraine, and the rising demand for electricity in the wake of the rise of the semiconductor and artificial intelligence (AI) industries has increased the atmosphere of acceptance of nuclear power generation. During this period, it has focused on expanding LNG-fired power generation, reducing coal-fired power generation, and expanding the installation of solar and wind power generation facilities. The goal is to expand the share of renewable energy in the power source composition to 20%, which the Ministry of Economy expects to achieve by the end of 2026. Furthermore, it aims to achieve 60% by 2050.

<Generation and Consumption> Shrinking for 2 consecutive years

The industrial, residential, and service sectors are the main sources of electricity generation and consumption in Taiwan. Although demand is on the rise, electricity generation and consumption contracted for the second consecutive year in 2023 to 282.14 billion kilowatt hours (kWh), down 2.1% from the previous year, and to 275.69 billion kWh, down 1.3% from the previous year. Inflation and rising interest rates due to the war in Ukraine and the economic cycle in the semiconductor industry caused Taiwan's gross regional product (GDP) growth rate to decline to 1.4% that year, the lowest growth since 2009, when the global financial crisis hit, and reduced demand for electricity in the industrial sector.

Electricity consumption in the industrial sector shrank by 2.4% to 153 billion kWh. It accounted for 55.5% of the total, down 0.6 points from the previous year. The manufacturing sector accounted for 86.8%, or 132.7 billion kWh.

The residential sector expanded by 0.1% from the previous year to 51.5 billion kWh. It accounted for 18.6% of the total, up 0.4 percentage points from the previous year.



(Source: Bureau of Energy, Ministry of Economic Affairs)

<Power source composition> 80% thermal power

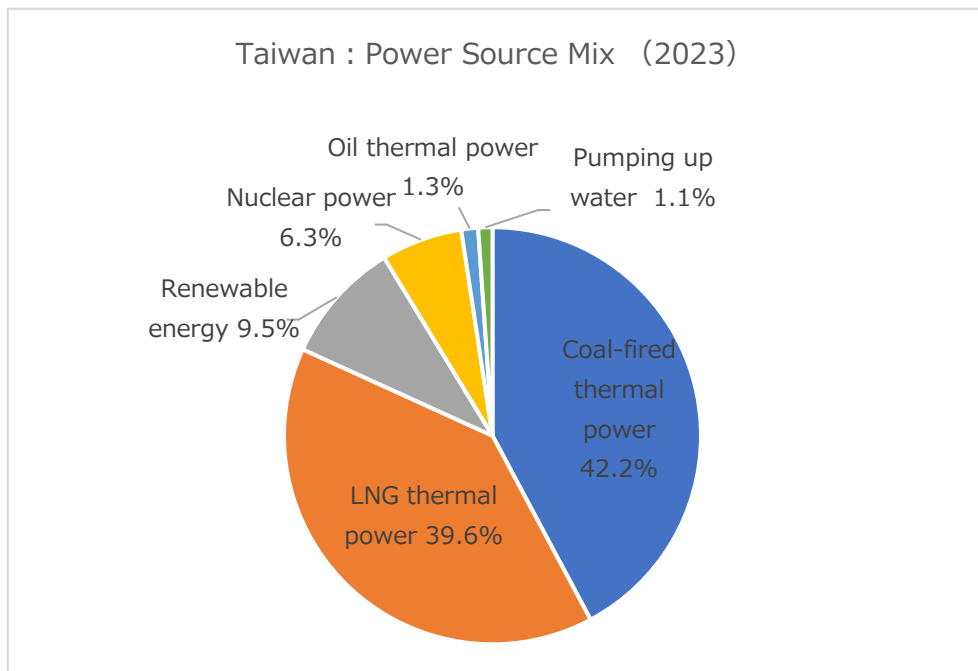
Taiwan's electricity is largely dependent on thermal power generation, of which coal-fired power makes up the majority.

In 2023, the power source composition by type was: ♦ Thermal power, 81.8%; ♦ Renewable energy, 9.5%; ♦ Nuclear power, 6.2%; ♦ Oil-fired thermal power, 1.3%; ♦ Pumped storage hydroelectric power, 1.1%.

Coal-fired thermal power generation is the largest, accounting for 42.2% of the total power supply, followed by LNG-fired thermal power generation at 39.6%. While the share of coal-fired power has declined by 3.9 percentage points over the past four years, that of LNG has expanded by 6.1 percentage points, clearly indicating a move toward a "shift in the leading role.

Renewable energies overtook nuclear power for the first time in 2022 to take second place in the power source mix. Photovoltaic power generation, which accounts for the largest share, expanded by 2.2 billion kWh. Solar power, which accounts for the largest share, increased by 2.2 billion kWh and accounted for 4.6% of the total power source mix, up 0.9 percentage points from the previous year.

Nuclear power, which once accounted for 51.7% of the power supply mix in 1985, fell 2.0 percentage points year over year to 6.2%; it has been shrinking every year since 2019.



(Source: Bureau of Energy, Ministry of Economic Affairs)

<Industry Structure> TPC to account for 87% of power generation

TPC (Taiwan Power Company), under the Ministry of Economic Affairs (MOEA), is the sole provider of generation, transmission, and distribution of electricity in Taiwan. With the opening of the power generation sector, independent power producers (IPPs) entered the market, and TPC's power purchased from IPPs in 2022 reached a record high of 71 billion kWh, up 13.6% from the previous year.

Japanese companies are taking equity stakes in six LNG-fired IPPs. Marubeni has a 50% stake in Hsin Tao Power Company, which operates the Hsin Tao Thermal Power Plant (Hsinchu County), and 40% in Chang Sheng Power Company, which operates the Haihu Thermal Power Plant (Taoyuan City). Kyushu Electric Power also has a 33.2% stake in Hsin Tao Power Company.

JERA will take a 19.5% stake in Xingneng Power Company, which operates thermal power plants in Changbin (Changhua County), Fengde (Tainan City), and Xingyuan (Changhua County), a 19.5% stake in Moriha Power Company, and 22.7% in Xingyuan Power Company.

KEPCO will take a 20% stake in Kuokuang Power Company, which operates the Kuokuang Power Plant. The company is an IPP, mainly owned by Taiwan's largest government-affiliated oil company, Taiwan Petroleum Corporation (CPC).

Japanese companies' participation in IPP				
Power generation companies	Power plant	Generation capacity (1000 kWh)	Investing Japanese companies	Capital contribution ratio
Hsin Tao Power Corporation	Hsin Tao Thermal Power Plant	600	Marubeni, Kyushu Electric Power	50%, 33.2%
Ever Power IPP	Hai-Fu Thermal Power Plant	900	Marubeni	40%
Star Energy Power Corporation	Chang Bin power plant	490	JERA	19.5%
Sun Ba Power Corporation	Fong Der Power plant	980	JERA	19.5%
Star Buck Power Corporation	Star Buck power plant	490	JERA	22.7%
Kuo Kuang Power	Kuo Kuang Thermal Power Plant	480	Kansai Electric Power	20%

(Source: Bureau of Energy, Ministry of Economic Affairs)

<Renewable Energy> Double-digit growth for three consecutive years

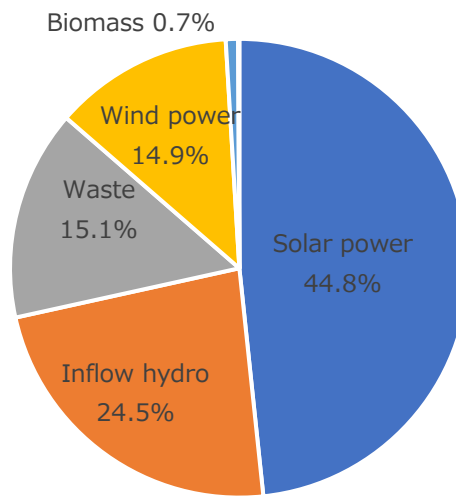
In 2023, renewable energy recorded double-digit growth for the third consecutive year, with electricity generation increasing 12.5% year-on-year to 26,871 million kWh.

Photovoltaic power generation, the main source of power, increased 20.9% from the previous year to 12,909 million kWh. The share of renewable energy in total power generation also expanded by 3.2 percentage points from the previous year to 48.0%, and has maintained a two to three digit growth rate every year since it was first introduced in Taiwan in 2001.

In 2023, wind power, where installation of equipment is proceeding at a rapid pace, grew 74.4% to 6.238 billion kWh. It ranked second for the first time in the renewable energy sector. On the other hand, flow-in hydropower shrank by 32.1% to 3.963 billion kWh.

As of the end of 2023, the total capacity of PV installations across Taiwan increased 27.1% year-on-year to 17,900 MW. The capacity has expanded 4.7 times over the past decade, with the goal of achieving 20,000 MW by 2025 and 30,000 MW by 2030. In addition, the installed capacity of wind power generation at the end of 2023 expanded to 2,678 MW, up 69.4% from the previous year.

Taiwan: Renewable Energy Composition Ratio (2023)



(Source: Bureau of Energy, Ministry of Economic Affairs)

(Ashu Research: January 2025)