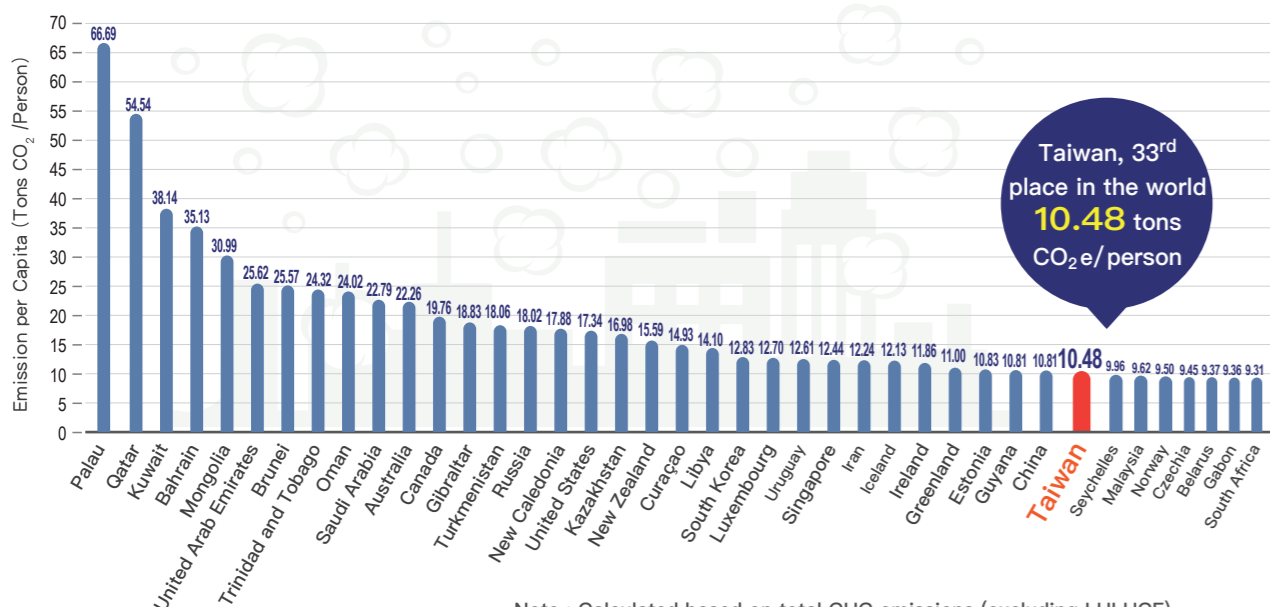
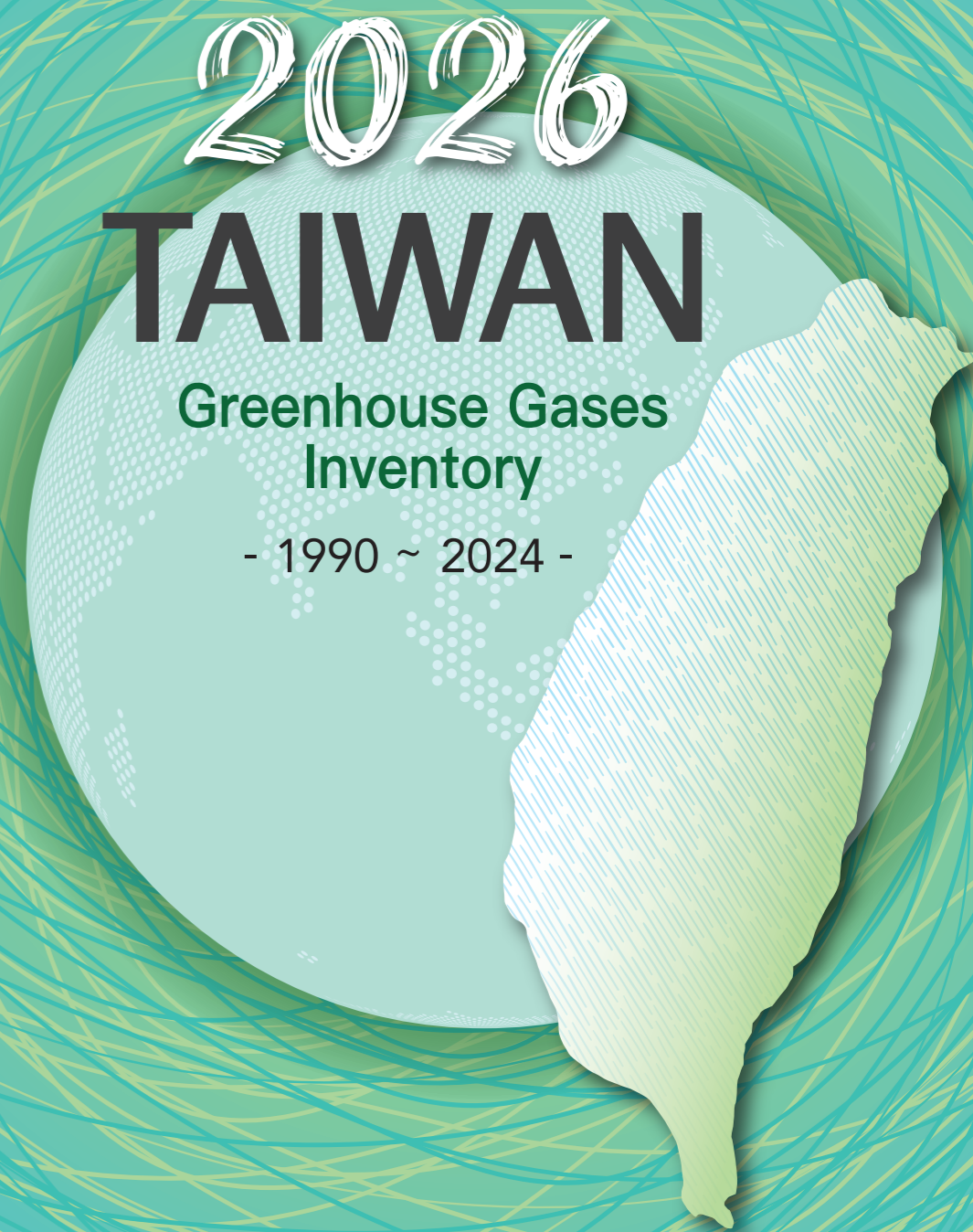
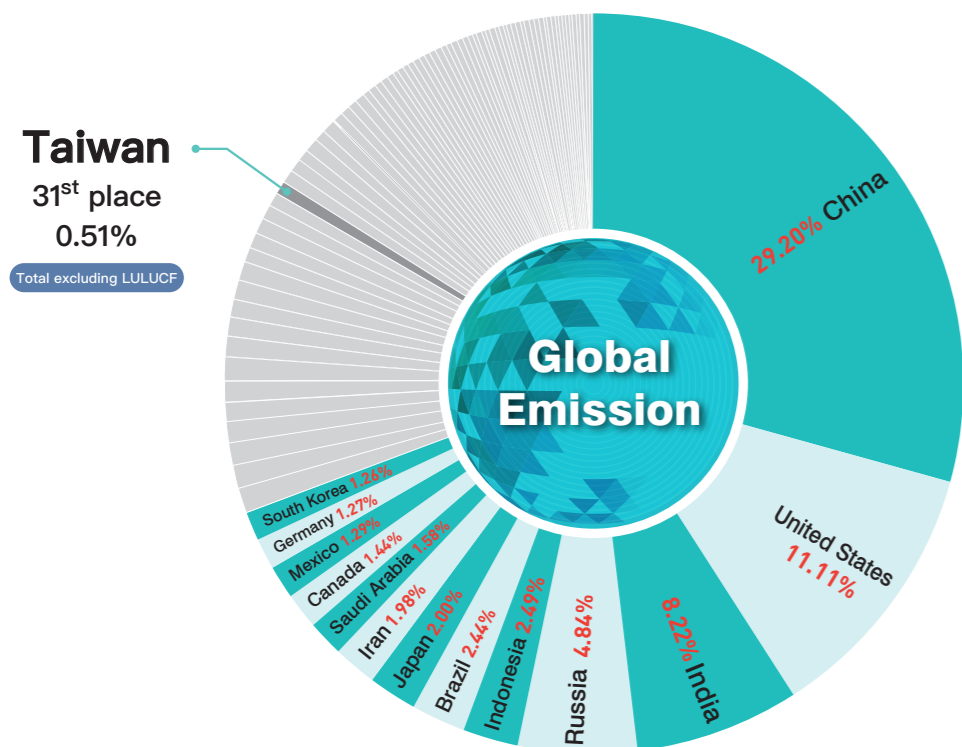


Global Share of Taiwan's Greenhouse Gases Emission

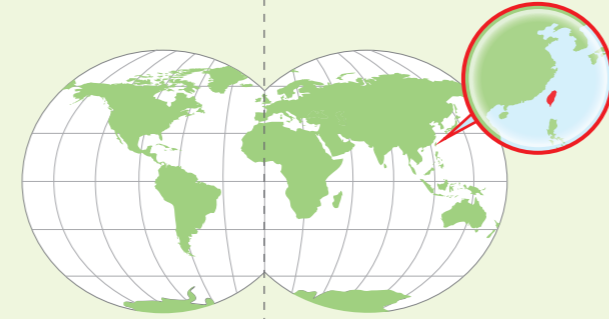
Taiwan belongs to the island-type independent energy system. More than 96% of energy is imported. The economy is guided by export trade. In 2024, Taiwan's semiconductor industry output value reached approximately NT\$5.3 trillion, maintaining its global leadership in semiconductor foundry and IC packaging and testing industries, while ranking second worldwide in IC design. But Taiwan's greenhouse gases emission only makes up 0.51% of the global amount. Major industries continue to promote energy conservation, carbon reduction, and low-carbon transformation in response to international supply chain decarbonization requirements. However, Taiwan still faces considerable challenges in further deepening greenhouse gas emission reductions due to its high dependence on imported energy and the ongoing energy transition process.



Note : Calculated based on total GHG emissions (excluding LULUCF)
Ref. : Joint Research Centre (JRC), Emissions Database for Global Atmospheric Research (EDGAR), GHG emissions of all world countries, 2025

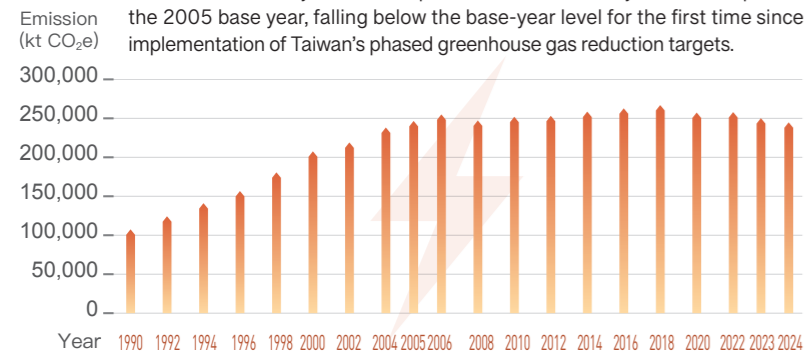
Trends of Various Emission Sources

The emission sources in Taiwan come from five major sectors: energy, industrial processes and product use, agriculture, land use change and forestry and waste.



Energy Sector

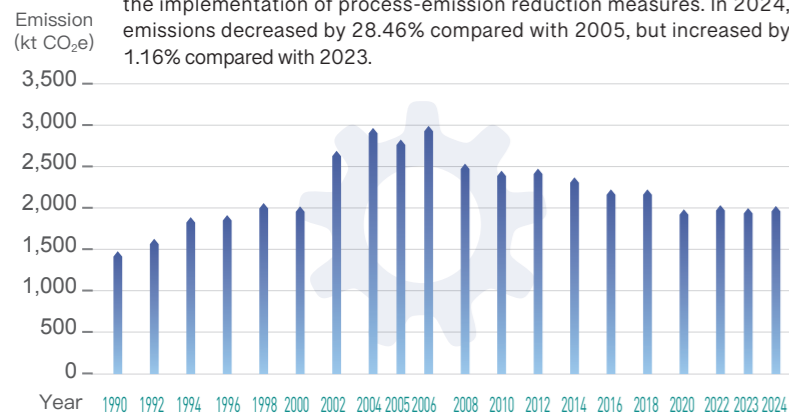
The energy sector remained the largest source of greenhouse gas emissions in Taiwan, accounting for 90.50% of total national emissions in 2024. Its emissions had generally shown an upward trend over the years, before declining for the first time in 2008 and stabilizing in recent years. In 2024, emissions from the energy sector decreased by 2.07% compared with 2023 and by 1.07% compared with the 2005 base year, falling below the base-year level for the first time since the implementation of Taiwan's phased greenhouse gas reduction targets.



Energy industry 70.24%, Manufacturing and Construction Industries 11.80%, Transportation 14.00%, Service 1.60%, Residential 1.55%, Agriculture, fishery, and husbandry 0.66%, Fugitive emissions from fuels 0.14%.

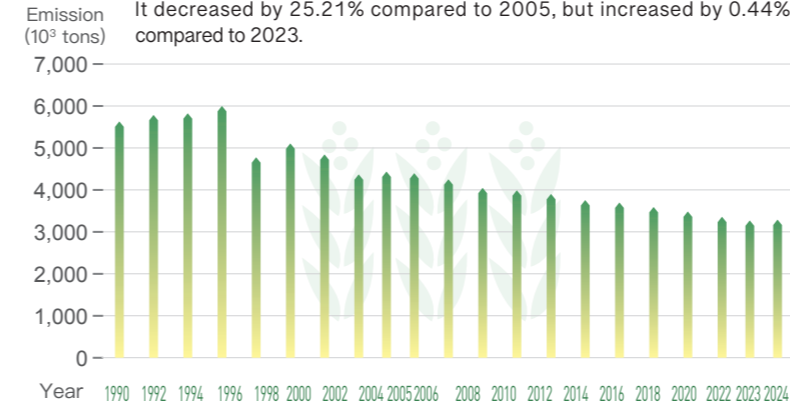
Industrial Processes and Product Use Sector

The year with the highest emission for this sector was 2006, which made up 9.97% of national emission. Since then, emissions have generally shown a fluctuating downward trend, affected by changes in industrial structure and the implementation of process-emission reduction measures. In 2024, emissions decreased by 28.46% compared with 2005, but increased by 1.16% compared with 2023.



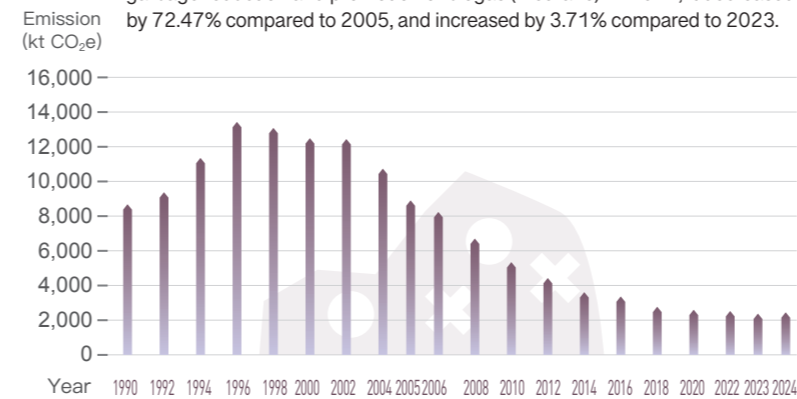
Agriculture Sector

The emission of the agriculture sector has been decreasing yearly. In 2024, it decreased by 25.21% compared to 2005, but increased by 0.44% compared to 2023.



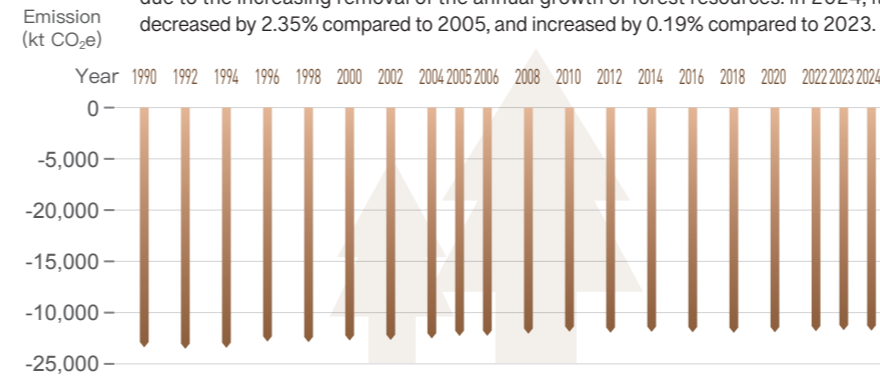
Waste Sector

The emission of the waste sector decreased greatly after 2000, because of garbage reduction and promotion of biogas (methane). In 2024, it decreased by 72.47% compared to 2005, and increased by 3.71% compared to 2023.



Land Use Change and Forestry Sector

The carbon removal of the sector has been fluctuating slightly over the years, mainly due to the increasing removal of the annual growth of forest resources. In 2024, it decreased by 2.35% compared to 2005, and increased by 0.19% compared to 2023.



Emission Trends of Greenhouse Gases

2024

Emission share of each greenhouse gas

CO₂
95.73%

CH₄
1.59%

Total fluoride gases
1.44%

N₂O
1.24%

1st CO₂
95.73%

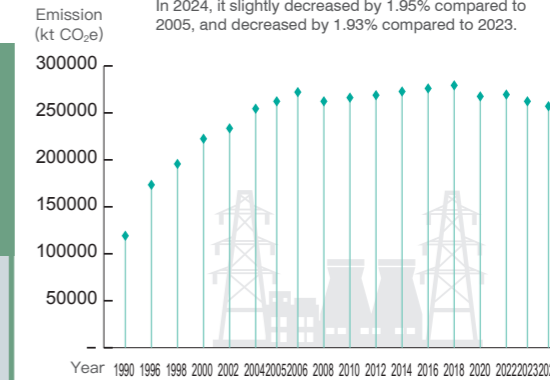
2nd CH₄
1.59%

3rd Total fluoride gases
1.44%

4th N₂O
1.24%

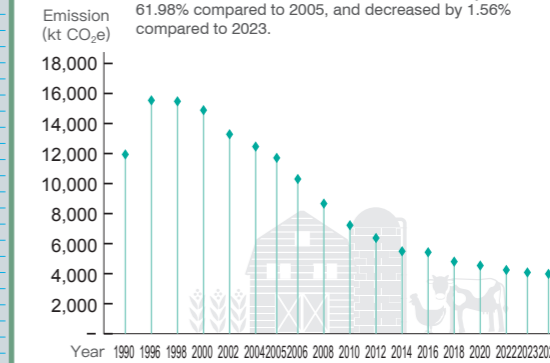
CO₂ Carbon dioxide

The primary emission sources are Energy Sector and Industrial Processes and Product Use Sector. In 2024, it slightly decreased by 1.95% compared to 2005, and decreased by 1.93% compared to 2023.



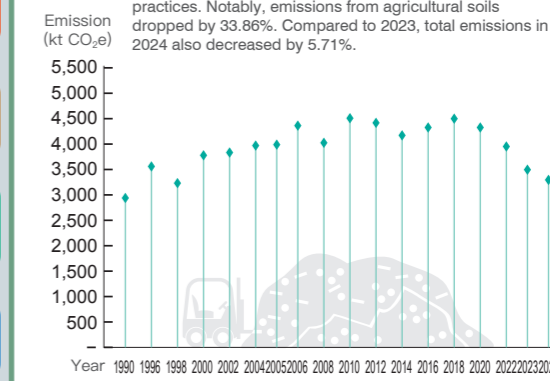
CH₄ Methane

The primary emission sources are Agriculture Sector and Waste Sector. The annual emission of methane has been decreasing since 2000, mainly due to promotion of garbage reduction, zero landfill of waste, biogas recovery for power generation, rising connection rate of sewage, three-stage treatment of livestock excrements, and farmland reduction. In 2024, it decreased by 61.98% compared to 2005, and decreased by 1.56% compared to 2023.



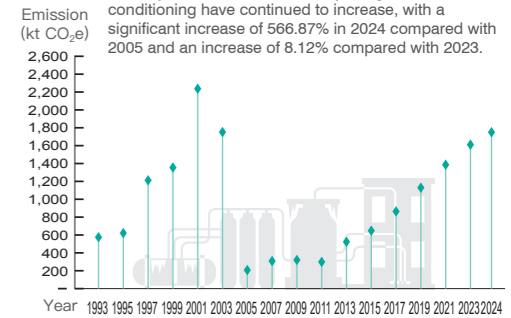
N₂O Nitrous oxide

The primary emission sources are Industrial Processes and Product Use Sector, Agriculture Sector, and Energy Sector. In 2024, emissions decreased by 17.00% compared to 2005, mainly due to the Ministry of Agriculture's promotion of rational fertilization and the implementation of fallow practices. Notably, emissions from agricultural soils dropped by 33.86%. Compared to 2023, total emissions in 2024 also decreased by 5.71%.



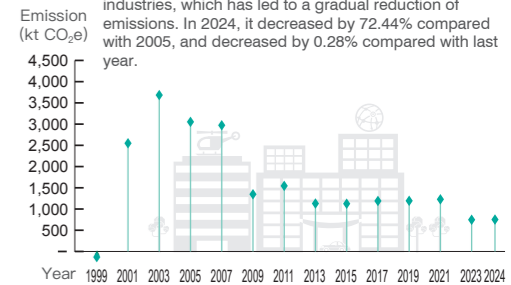
HFCs Hydrofluorocarbons

After the closing of the only HFCs producing plant in 2004, the emission has been decreasing every year. In recent years, HFCs emissions by refrigeration and air conditioning have continued to increase, with a significant increase of 566.87% in 2024 compared with 2005 and an increase of 8.12% compared with 2023.



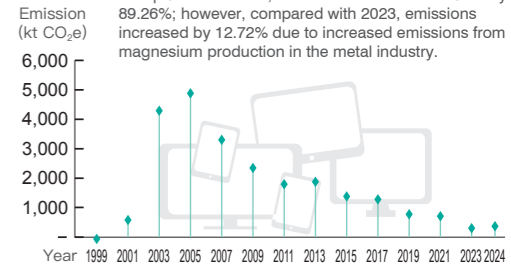
PFCs Perfluorocarbons

Since 2004, Taiwan Semiconductor Industry Association has cooperated with the government to promote the voluntary reduction scheme, including the introduction of waste gas disposal and the improvement for the manufacturing process by semiconductor and optronic industries, which has led to a gradual reduction of emissions. In 2024, it decreased by 72.44% compared with 2005, and decreased by 0.28% compared with last year.



SF₆ Sulfur hexafluoride

The emission of SF₆ has been decreasing since 2005, mainly due to the lower usage amount in TFT flat screen display, power equipment, and magnesium production. Compared with 2005, emissions in 2024 decreased by 89.26%; however, compared with 2023, emissions increased by 12.72% due to increased emissions from magnesium production in the metal industry.



NF₃ Nitrogen trifluoride

The emission of NF₃ has been fluctuating due to the variance for the production of semiconductor and TFT flat screen display. Compared with 2023, emissions in 2024 increased by 99.49%, mainly due to the advancement of artificial intelligence technologies, the expansion of semiconductor production capacity, and the commencement of mass production at several key wafer fabrication plants.

