



KAOHSIUNG

POPULATION: 2 775 318 (2018)

GHG OBJECTIVES: 20% BY 2030; -50% BY 2030; -80% BY 2050 (BASELINE: 2005)

SCOPE 3 AVAILABLE

Enhancing energy autonomy in industry

Climate policy governance and integration

The Municipal Government of the city of Kaohsiung shaped its first [Adaptation to Climate Change and Sustainable Development Plan](#) in 2015, split between mitigation and adaptation. The implementation of necessary measures to achieve the objectives of each theme is allocated to different municipal secretariats including: the office in charge of economic development, environmental protection, agriculture and public works. For each of these 6 themes, short, medium, and long-term goals were set.

The government of Taiwan does not directly intervene in the implementation of the plan, but it does help shape it by providing [guidelines for local authorities](#), as well as the necessary data. Finally, the State intervenes beforehand by co-funding certain green energy development projects or water outlets. The adaptation section in the plan is subdivided into 'issues' the city faces: disaster resilience, infrastructure, health, coastal zones, water resources, energy, land use, agriculture, and biodiversity protection.

Climate policy tracking

Since 2005, Kaohsiung began annually tracking its greenhouse gas (GHG) emissions. The 30% reduction target by 2020 compared to 2005 remained in force [until 2016](#), before being reduced to 20%. Between 2005 and 2018, the municipality managed to reduce its emissions by 13.23%.

Between 2005 and 2017, Kaohsiung's carbon footprint was lowered by 13.07%, going from 67 to 58 million tonnes of CO₂eq (MtCO₂eq). In 2017, GHG emissions in the city were mainly due to its industry sector (45%), then transport (13%), commercial buildings and housing (8% each). The remaining emissions are caused by agriculture and land use.

Mobility – A shy modal share of public transport

In Kaohsiung, the most popular means of transport of inhabitants is the motorcycle (61.3% of trips), followed by the private car (20.5%). Public transport, walking and cycling represent 7%, 4.5% and 5.4%. In 2016, 172,400 daily commutes were by metro, representing a 4.5% increase compared to the previous year. The rise

in the modal share of public transport is a result of programmes such as "[Live your best life in Kaohsiung](#)", that contains fare integration measures for all means of transport or even educational measures that should enhance a modal shift.

Low-impact mobility is supported by a general improvement in the condition of pavements, making it easier for pedestrians to use them and restricting motorcyclists from parking on them. In 2015, a 755 km network of cycle lanes was built, and the city aimed for a total of 1,000 km by 2018. A bicycle rental scheme called [C-bike](#) was also set up.

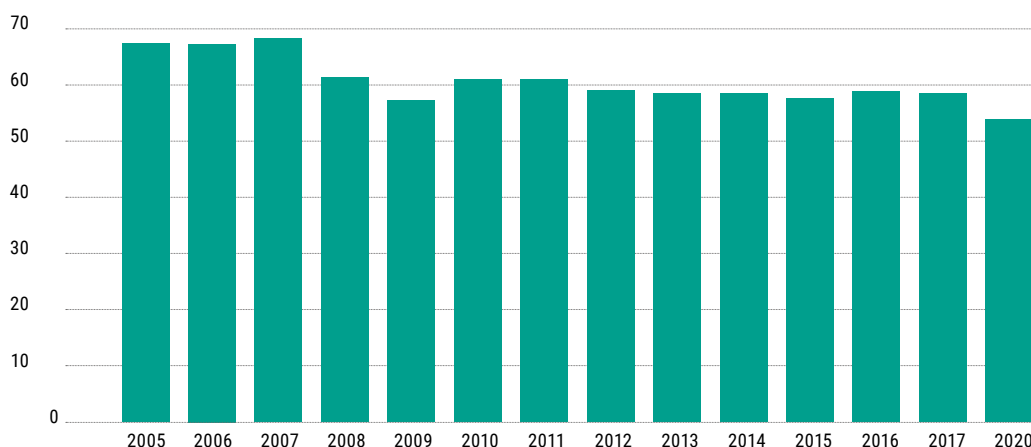
The municipality of Kaohsiung works to increase the number of electric vehicles, as much for the bus fleet as for cars and motor scooters. In 2018, 9.7% of the fleet was electric. To achieve 100% by 2030, in addition to subsidies for the purchase of electric motor scooters and bicycles, there are fuel tax reductions for electric vehicle owners. Therefore, between 2016 and 2017, 150,000 two-wheel vehicles were removed from circulation whereas 6,020 new electric motor scooters were purchased.

In 2017, during the EcoMobility Congress organised in Kaohsiung by the network of cities, ICLEI, the participating cities adopted the "[Kaohsiung Strategies for the Future of Urban Mobility](#)", focused on 3 main axes: public transport, electric vehicle and citizen awareness-raising to enhance the modal shift. The historic district of Hamasen was closed off to traffic during the entire congress.

Energy – Taiwan's pioneer city for the development of "green" energies

To limit the capital share of CO₂ emissions caused by industry, the municipality of Kaohsiung has developed green sources of energy and self-sufficiency. With a high sunlight rate in the area, this policy transformed the city into a pioneer in the Asian solar sector. In 2010, the municipality inaugurated "[Kaohsiung Science Park](#)" cluster, a place of innovation for LED and solar technologies as well as biotechnologies. It is also the largest solar photovoltaic plant in Asia, with a capacity of 1 to 10 MMW. One year earlier, in 2009, the municipality inaugurated its [solar stadium](#), covered in a total of 8,844 solar panels making it 100%

KAOSHIUNG - GHG EMISSIONS (MTCO₂)



self-sufficient in energy. The “left-over” energy from the stadium can supply up to 80% of the district’s energy needs, therefore preventing 660 tonnes of CO₂ emissions every year. In 2012, the municipality defined its [law on photovoltaic buildings](#) with the aim of encouraging solar panel installations on roofs across the city, as well as a yearly production of 19.92 million kWh, or 12,400 tonnes of CO₂ (tCO₂) per year completely avoided.

Kaoshiung also pioneered the development of biogas technology, with the construction in 2000 of the [Hsichingpu methane power plant](#). The plant powers 4,600 households and enables the reduction of the 5,000 tCO₂ per year.

Housing: a rigorous local regulation

The 2012 “[Kaoshiung City Green Building Autonomy Act](#)” regulates the construction of all new buildings in a more binding way than national law. All public use buildings (owned either by public or private actors), in the process of being built or renovated, are concerned by the regulation. The requirements differ according to the size of the buildings, but this includes: installation of solar panels, green roofs, improvement of thermal insulation, rainwater harvesting systems, use of ecological building materials and installation of bicycle garages.

The city encourages more environmentally friendly buildings for which it is easier to obtain a licence. In 2013, 230 building permits were issued enabling the installation of over 31,788 m² of green roofs, an increase in solar energy production of 4,616 kWp, the creation of 1,657 new parking spots for bicycles and the equivalent of 16,200 m³ of rainwater harvesting tanks. Between 2011 and 2013, the greening of roofs led to a reduction of 1,402.64 tonnes of CO₂.

ADAPTATION

GIVING LIFE TO VERTICAL FORESTS

To combat the heat that highly affects the city of Kaoshiung during the summer, due to its tropical climate, the municipality has decided to encourage all residents with balconies to start planting flowers, shrubs and other plants to refresh the structures and create “vertical forests”. In 2018, some 400 households had requested this installation over a total of 180,000 m².

To cope with the high risk of flooding, 15 urban water retention basins have been built. These basins reduce peak flooding, hold groundwater, preserve housing and provide leisure areas. They have said to have [reduced flooded areas by nearly 80%](#).