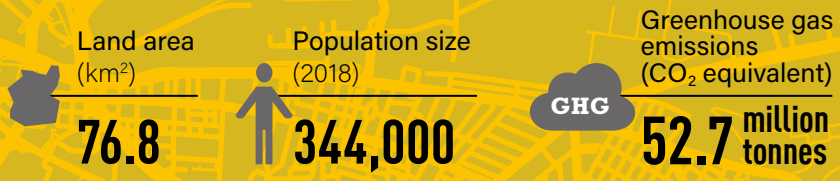


MALMÖ

SWEDEN



The City of Malmö has a track record of urban development initiatives that have led to its recognition as a pioneering sustainable city. The most well-known examples in the city are the Western Harbour district (Västra Hamnen), which has operated on 100% renewables since at least 2012, and Augustenborgin, an industrial area that has 450 square metres of solar thermal panels connected to the central heating system.

Malmö's goal is to make all city government activities climate neutral by 2020 and to ensure that the entire city runs on 100% renewables by 2030. Malmö plans to achieve its 100% renewable energy goal from a mix of renewable sources, waste-to-energy and recycled energy. As of 2020, around 43% of Malmö's energy was from renewable sourcesⁱ, primarily wind energy.

The city has identified two challenging sectors that need to be addressed to stay on track to achieving the 2030 goal: transport and district heating. Sweden's substantial district heating network was built in the 1950s, and many cities in the country have extensive systems. Malmö's district heating system runs on

a combination of biomass and fossil fuels. To help reduce fossil-based energy use, all of the municipalities in southern Sweden send their waste to Malmö, where it is processed and converted to heat that is fed into the district heating network. For example, at the Sysav waste-to-energy facility, the waste is reduced through thermal treatment processes to produce energy in the forms of electricity and heat.

Additionally, Malmö is constructing a 50 MW_{th} geothermal deep-heat plantⁱⁱ, which is expected to start operation in 2022. The city plans to build a total of five geothermal heat plants by 2028, each with an installed capacity of 50 MW_{th}, to replace the use of biofuels and biogas for heat generation. The estimated budget for this pilot project is EUR 5.4 million (USD 6 million), with the Swedish Energy Agency providing EUR 1.2 million (USD 1.34 million). The city's partners include E.ON, a privately owned energy supplier that is investigating the geological conditions, as well as the Swedish Geological Survey and the University of Uppsala.



Malmö is replacing the use of biofuels and fossil fuels in heat generation with **geothermal heat** in order to achieve its energy and climate goals.

Source: See endnote 137 in the *Markets and Infrastructure* chapter.

ⁱ This includes organic waste incineration and industrial waste heat.

ⁱⁱ Boreholes will be in the range of five to seven kilometres deep, and the temperature of around 160°C is expected to be sufficient to directly enter the district heating network. This project will be one of Europe's first geothermal power plants to extract heat from such a depth at the industrial level.

NORTH LOMBOK REGENCY INDONESIA



9

North Lombok is the youngest regency (municipality) in the Indonesian province of West Nusa Tenggara, located on Lombok Island. Energy demand in West Nusa Tenggara totalled more than 1,950 GWh in 2019 and was growing by 5.9% annually. With increased economic development in the region, energy demand is expected to continue to grow rapidly to 2030.

To reduce greenhouse gas emissions in the city and to support the provincial target to generate 35% of electricity from renewable sources by 2025, the local government has set ambitious goals to deploy renewables in a cost-efficient and sustainable manner. North Lombok has rich potential for cheap biomass residues and opportunities to harness wind and solar energy. Out of 8.97 MW of operating power plant capacity in North Lombok, 8.82 MW is derived from renewables, primarily micro-hydropower (the 7 MW Segara and 1 MW Santong plants) and solar energy in Gili Islands.

To support local communities, the North Lombok government developed a Cost-sharing Financing Scheme for Household-scale Biogas to simultaneously reduce dependence on traditional biomass and cut greenhouse gas emissions in the residential sector. Although this scheme was originally an initiative of the provincial government, the North Lombok government has taken measures to adopt it in the city region. The cost is shared between the local government and Hivos / Yayasan Rumah Energi, along with the household users of the biogas, who pay a small amount to ensure citizen participation and ownership.

As of 2020, some 1,152 household-scale biogas units using organic waste had been installed in the North Lombok region through this scheme. The cost of one unit of biogas is IDR 13 million (USD 933), and the local government shares this amount by contributing IDR 4-5 million (roughly USD 290-360) per unit (30-40%). To support the technical portion of the project, Hivos / Yayasan Rumah Energi provide high-quality biogas digesters to the users as well as three years of after-sales service for civil buildings and one year for pipe and stove installations.



Source: See endnote 29 in the *Financing and Investment in Cities* chapter.