



CASE STUDY

Copenhagen

One of the greenest cities in Europe



København, Denmark, Nyhavn Canal, SD / Pexels.

Copenhagen: One of the Greenest cities in Europe

Since adopting the first City of Copenhagen Climate Plan in 2012, Copenhagen has established itself as one of the world's leading cities in climate action. Thanks to an **emissions reduction strategy** that is both ambitious and realistic, to detailed decarbonisation action plans per sector as well as the implication and therefore the appropriation of citizen in the process, the city has become one of the greenest in the world. This **inspiring example** illustrates how a **public authority can take a leadership role in climate action** and in turn accelerate the climate transition beyond its direct sphere of influence.

RESULTS



As of 2025, Copenhagen has achieved an **80% reduction in CO₂ emissions since 2010**, with **emissions per capita** having been reduced from 4,7 tCO₂e in 2010 to 1,3 tCO₂e in 2022.¹ This represents a remarkable decarbonisation effort, far outpacing most major global cities. In comparison, per capita CO₂ emissions of two cities of similar size, Helsinki and Bristol, amount to 2.4tCO₂ and 3.0tCO₂, respectively.



Over 80% of district heating is now powered mainly by biomass and from burning waste, with only a small fraction from oil and gas during peak demand.²



60% of the people living in Copenhagen ride a bike every day, 500 km of cycle path have been created. As a result, **per capita emissions from road traffic have been reduced by 18%** from 2010 to 2019. Bicycles now account for nearly half of all commutes to work or study.³



Copenhagen has achieved a 31% **reduction in food-related carbon emissions** in its municipal kitchens (e.g.: schools, daycare centres, nursing homes, social service centres, and residential homes).⁴



Since March 2026, all **42 municipal bus lines in Copenhagen run entirely on electricity**. The wider regional bus network has also reached 72% electrification, up from 50% in late 2024.⁵

SUCCESS CONDITIONS

- **An ambitious overarching national legislative framework for climate action:** The Danish Climate Act (June 2020)⁶ commits the country to reducing GHG emission by 70% by 2030 – compared with 1990 baseline– aiming to become the first climate neutral society by 2050.⁷
- **A strong political commitment:** The city's climate objectives have been supported politically for many years, guiding the City Council's financial and operational decisions.
- **A comprehensive understanding of the city's carbon footprint:** A detailed carbon footprint assessment has allowed the city to identify priority areas and design targeted measures.
- **A realistic and transparent approach:** The city of Copenhagen has developed detailed action plans outlining the measures required to achieve its emissions reduction targets in each focus area (energy, construction, mobility, food, travel, procurement, etc.). Annual emissions reporting allows the city to monitor progress and ensure it remains on track with achieving its commitments.⁸
- **Linking adaptation, mitigation and resilience to reinforce its action:** Copenhagen is highly vulnerable to climate change (e.g., increased frequency and intensity of heavy rains, higher temperatures, rising sea levels) and has invested in infrastructures aimed at reinforcing its resilience (e.g., water retention areas, tunnels to evacuate excess water etc.). By strengthening the city's resilience to climate change, the city also reinforces the pertinence and coherence of the city's mitigation efforts.
- **Involvement of all stakeholders:** Engaging citizens, businesses, and municipal staff as active partners has helped build shared ownership and ensure the transition is collectively supported.
- **Capacity building of municipal staff:** Reinforcing the green competencies of municipal staff (i.e.: waste sorting, energy efficiency building management etc..) was an important prerequisite for a successful transition.



WHY THIS CASE STUDY ?

The climate emergency requires that all actors in society take ambitious action and adopt bold measures to reduce emissions and limit global warming. This case study illustrates how a complex organisation composed of a multitude of stakeholders, in this case a city, can successfully drive its environmental transition thanks to a **long-term and structured strategy**.

Similarly to many health and humanitarian organisations, **the city of Copenhagen has an intertwined network of partners, suppliers and stakeholders** which it needs to engage with in order to reduce its overall footprint and demonstrate its commitment to lasting change. This case study provides insights into how it has successfully and strategically engaged with them and managed to reduce its footprint in a large number of domains.

By combining **ambitious mitigation policies** with **long-term adaptation measures**, Copenhagen offers a rare example of an integrated urban climate strategy that addresses both the causes and consequences of climate change. More broadly, it demonstrates that economic development, high living standards, emissions reduction, and climate resilience can be pursued simultaneously through a systemic approach involving both municipal authorities and citizens.

This case study provides valuable lessons for organisations operating in humanitarian and health sectors engaged in reducing their environmental and climate footprint as well as reinforcing the climate resilience of their operations.

WHAT'S THE PROBLEM ?

Significantly reducing emissions poses a major challenge for cities, given the **interdependence of urban activities, the limited direct control policymakers have over certain emissions** (e.g., those from consumers), and the substantial investments required to adapt urban infrastructure (e.g., developing bike lanes, retrofitting buildings, or upgrading waste management plants). All of this must be balanced with the need to maintain a high quality of life and ensure the city remains a pleasant place to live.

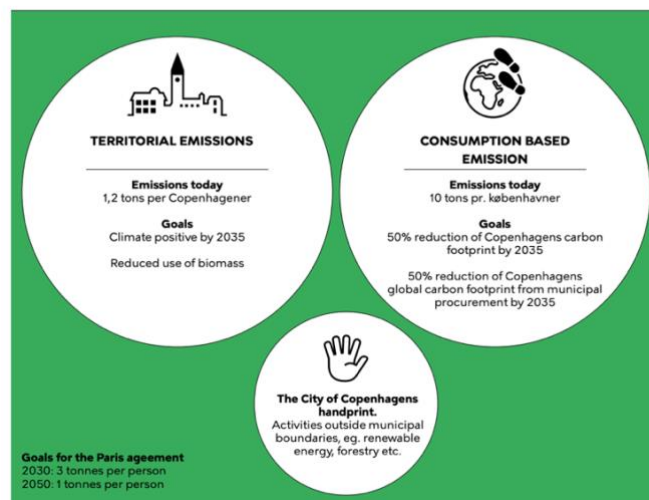
Copenhagen's population has grown by approximately 22% since 2005, reaching 671,714 people in the municipality and 1.4 million in the greater urban area by 2026, increasing overall consumption and energy demand, which makes it challenging for the city to reduce total emissions fast enough to meet climate targets.⁹



Yet, Copenhagen is considered as one of the world's leading cities in efforts to cut greenhouse gas emissions, tackling every major emissions sector. Its **Climate Strategy 2035** sets ambitious targets not only for achieving climate positivity within the city's boundaries, but also for reducing **consumption-based emissions** and emissions linked to **municipal procurement**.¹⁰

Additionally, the city has placed **resilience at the core of its climate strategy**, investing heavily in infrastructure to address increasing risks from extreme rainfall, rising temperatures, and sea-level rise.

Figure 2: Goals for climate strategy 2035



A methodical, pragmatic and sectoral strategy for the city's environmental transition



A 30-years strategy including detailed emission reduction plans and a transparent monitoring framework:

The establishment of an emissions' baseline as early as 2012 (covering scope 1, 2 and 3) provided the basis for the development a **targeted emissions reduction strategy** focused on two main areas: **territorial emissions** (e.g. from transport and energy in the city's facilities) and **consumption-based emissions** (e.g. consumption of the city and its residents) with a focus on various action areas (energy systems, energy consumption, construction, mobility, food and drink, consumer products, travel and leisure, direct procurement of the city)

Bound by the national Climate Act (see above),¹¹ the municipality also has the obligation to report annually on its progress to ensure it is aligned with targets. This reporting ensures that the city is accountable to its citizen and allows for any adjustments to be made.



Ambitious emissions reduction targets for Copenhagen' inhabitants:

Reducing consumption-based emissions of inhabitants is a significant challenge for a municipality. Yet, Copenhagen committed through its Climate Plan 2035 to **halve per**

capita CO₂ emissions linked to consumption by 2035. This objective was supported by the roll out of regular public awareness campaigns as well as financial subsidies to citizen.

An example of this is the city's awareness initiative aimed at encouraging citizen to change their behavioural with regards to heating (i.e.: lowering thermostats, improving ventilation), resulting in a 6–8% reduction in household heating demand in its first year. Subsidies for smart thermostats and financial support for minor building upgrades was also proposed to all residents.¹²



Reducing emissions from municipal procurement

Copenhagen has set an ambitious target to **halve CO₂ emissions from its own procurement by 2035** as part of its Climate Plan 2035. The municipality prioritises sustainable public procurement by selecting products and services with lower environmental impact and collaborating with suppliers that adhere to strict green standards. For example, the procurement of all city vehicles has been transitioned to electric models, significantly reducing CO₂ emissions and improving air quality.¹³



Reducing emissions from municipal buildings

Copenhagen aims to **reduce energy consumption in municipal buildings by 40% by 2030**.¹⁴ Although energy consumption accounts for a small part of the city's overall CO₂ emissions (as the city's energy mix is already highly decarbonised—see below) reducing energy consumption from buildings is strategic from an economical point of view and a way to achieve savings which can help fund other initiatives. The city is using hour-by-hour energy monitoring systems to optimise electricity consumption, reinforcing its commitment to data-driven climate action.¹⁵ The ongoing upgrade of the city's buildings is a key lever to gradually save energy.

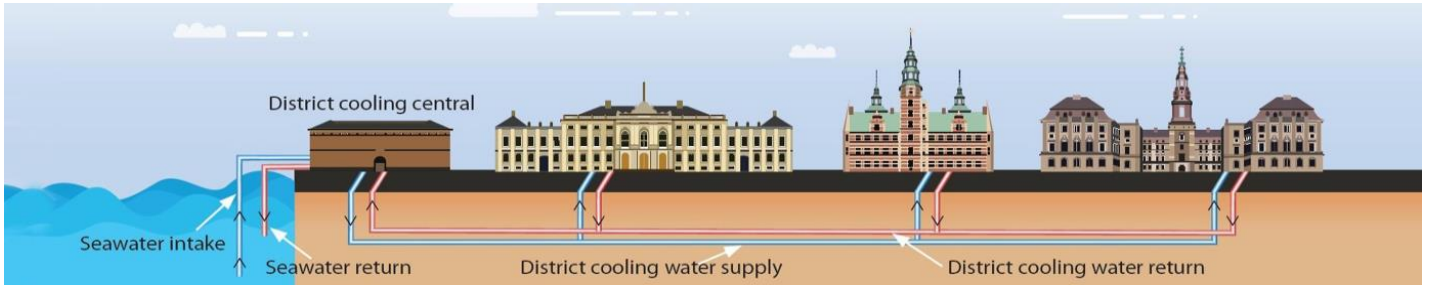
A strategy grounded in technical solutions from the most carbon-intensive sectors



The use of sea water as a cooling solution for facilities and equipment

Copenhagen has a centralised cooling network that draws cold seawater from the harbour to cool buildings such as individual households, hotel rooms in the summer

months and data centres and hospital equipment all year round. This approach **cuts cooling-related CO₂ emissions by up to 70%** compared with conventional air conditioning running on fossil fuels.⁹



The Copenhagen cooling system using seawater.



The decarbonisation of energy supply through wind energy

Most of the city's energy is derived from renewable sources mostly onshore and offshore wind power.¹⁶ During periods of strong wind, surplus power is fed into the national grid. Today, Denmark holds the **world record for the most wind power capacity per person**.¹⁷ Additional sources of energy come from solar plants, as well as waste to energy plants.

Middelgrunden offshore wind farm located off the coast of Copenhagen supplies 3% of the city's energy needs.





A strategy supporting cycling infrastructure and public transport

Copenhagen's **transport strategy** focuses on **cutting car use** by strengthening public transport and making cycling the fastest, most convenient option for many journeys. The city has built an extensive cycling network featuring 500 km of dedicated bike paths, including high-speed 'cycle superhighways' that allow commuters from outlying areas to reach the city centre quickly.¹⁸ Over the past decade, **the municipality has invested an average of 11 million euros per year into cycling infrastructure.**



Copenhagen has around 500km of cycles

Cyclists benefit from features such as "green wave" traffic lights that synchronise to maintain flow, digital countdowns at junctions, and footrests for comfort while waiting. Even in the city's icy winters, cycling accounts for 40% of all trips in Copenhagen, and six out of ten residents own a bicycle.¹⁹ City **buses are gradually transitioning to electric models**, and all five harbour ferries have become fully electric in 2020—the first public water transport system in the world to achieve 100% electrification.²⁰ Together, these measures make sustainable mobility both practical and attractive, helping to drive down the city's transport emissions.



A Waste-to-Energy power solution

Amager Bakke, also known as Copen Hill, is a pioneering waste-to-energy plant in Copenhagen that converts 400,000 tons of municipal waste annually into clean energy, supplying district heating to 160,000 households and electricity to 62,500 residences. The place is recognized as **one of the cleanest waste-to-energy facilities** globally, reducing sulphur emissions by 99.5% and NOx by 95%,¹



The Copen Hill, Amager Bakke

¹ **Sulphur** refers to sulphur compounds, like sulphur dioxide, also pollutants from burning fossil fuels. **NOx** are nitrogen oxides, harmful pollutants from combustion.



CO₂ capture and storage projects

Copenhagen's target to become climate positive by 2035 means that more CO₂ must be removed from the atmosphere than released. The city is investing in **carbon capture and storage (CCS)** as a key tool for cutting emissions. Several large underground storage projects (such as Bifrost and Greensand) are already under way in the North Sea.²¹



GreenSand CCS Project : ccs-europe.eu



A strategy that embeds resilience as a core pillar of the climate roadmap

A devastating cloudburst in July 2011 flooding basements, metro stations and major roads pushed Copenhagen to reinforce its resilience to climate shocks. The city's response was to fund the implementation of **300 projects throughout the city over 20 years** at an estimated cost of €1.3 billion.²² The core of this approach is a "*blue-green*" solution that evolves and strengthens resilience of conventional underground sewers allowing them to absorb large quantities of water.²³ Streets, squares and parks have also been redesigned to absorbing and channelling excess rainwater during extreme weather while continuing to function as ordinary public spaces the rest of the time.

By **designing resilience and mitigation together**, Copenhagen has built climate infrastructure that protects residents now and supports its long-term decarbonisation goals.

CONCLUSIONS

Copenhagen's climate transition success stems from a combination of strong political commitment, cross-sector partnerships, integrated urban planning, and active engagement of stakeholders. Most of all, the municipality is ensuring that the city's climate transition is compatible with high living standards and is seen as way to improve the quality of life of citizens and visitors.

In addition to aiming to significantly reduce the cities direct and indirect emissions, Copenhagen aims to contribute to the **wider climate transition in society** including working to increase the share of green and sustainable investments and to increase CO₂ absorption through nature-based solutions.



RESSOURCES

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