



Copen  
Capture

## *Factsheet*

Welcome to the CopenCapture Factsheet — a comprehensive overview of Copenhagen's pioneering carbon capture and storage (CCS) project.

Inside, you'll find key information about the project, the companies behind it, and the role of CCS in decarbonizing waste-to-energy. Explore details about the site, project milestones, and how CopenCapture is shaping the future of waste management.



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**e-on a/c**



# *Introduction*

**CopenCapture** is a pioneering carbon capture and storage (CCS) project that will take the iconic Waste-to-Energy facility Copenhill to the next level in state-of-the-art waste management. The facility is located in Copenhagen, owned and operated by Amager Ressource Center (ARC).

As one of the world's most advanced waste-to-energy facilities, ARC is now set to become a global leader in decarbonizing waste treatment. Developed in an exclusive partnership between **E.ON Energy Projects GmbH (E.ON)** and **ARC**, the project aims at capturing approximately **400,000 tonnes of CO<sub>2</sub> per year**, reinforcing Copenhagen's leadership in climate action.

As part of Denmark's national CCS strategy, CopenCapture is set to apply for **government funding in 2025**, with a **final investment decision anticipated in 2026** and **operations targeted by 2030**. The realization of the CopenCapture project relies on external funding from the Danish CCS tender and Carbon Dioxide Removals (CDR's).



## **CopenCapture** **Advancing Climate Leadership in Waste-to-Energy**

E.ON and ARC have formed an **exclusive partnership** that brings together the best of both worlds. This collaboration allows E.ON to leverage its **technical expertise** and capacity, while ARC continues to provide **essential waste services and affordable heating** to local communities. Together, we offer a **unique opportunity to tackle emissions**, enabling companies to support innovation without taking on unnecessary risks that could impact local communities.



E.ON is an international investor-owned energy company headquartered in Essen, Germany, which focuses on energy networks, customer solutions and energy sales. As one of Europe's largest energy companies, E.ON plays a leading role in shaping a sustainable, digital, decentralized world of energy. To this end, around 77,000 employees develop and sell products and solutions for private, commercial and industrial customers. More than 47 million customers purchase electricity, gas, digital products or solutions for electric mobility, energy efficiency and climate protection from E.ON.

E.ON in Denmark develops, builds, and operates charging solutions for electric vehicles, district heating for private homes, businesses and municipalities and produces 10% of Denmark's total biomethane production through co-ownership of five biogas plants.

For more information, please visit [www.eon.com](http://www.eon.com).

ARC is here to provide waste services to society. Our job is to help the general public and companies to dispose of their waste in a way that is best for the environment and climate. ARC:

- Operates recycling stations in greater Copenhagen
- Collects the waste in Copenhagen, Dragør and Tårnby
- Operates Amager Bakke where the non-recyclable residual waste is environmentally treated. In return, ARC delivers electricity and district heating for approximately 90.000 households yearly need in the surrounding society.

For more information, please visit [www.a-r-c.dk](http://www.a-r-c.dk).



### **CopenCapture in Numbers**

≈ **400.000t**  
of CO<sub>2</sub> captured per year.

≈ **300-500M€**  
total investment.

≈ **2030**  
date of commercial operation.

≈ **-40%**  
reduction of Copenhagen's fossil emissions.\*



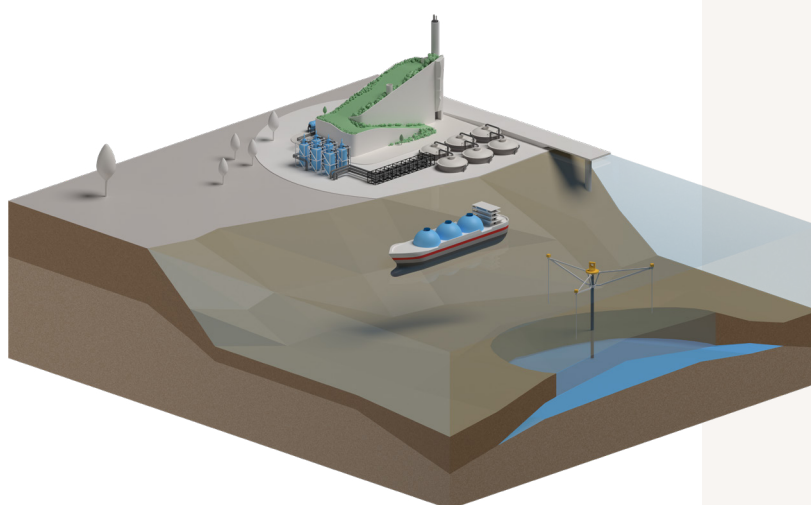
\*compared to 2023 levels.

# Carbon Capture & Storage

## What is CCS?

Carbon Capture and Storage (CCS) is a technology that reduces CO<sub>2</sub> emissions by capturing carbon dioxide from industrial processes, power generation, or, as in our case, waste treatment before it enters the atmosphere. Once captured, the CO<sub>2</sub> is compressed, transported, and securely stored deep underground in geological formations, such as depleted oil and gas reservoirs

or saline aquifers, where it remains permanently trapped. This process helps prevent emissions from contributing to climate change and is particularly important for industries where full decarbonization through electrification or alternative technologies is not yet possible.



A simplified look at the CCS process at CopenCapture:

Emissions from Amager Bakke are captured and processed at a dedicated carbon capture facility next to the plant. The CO<sub>2</sub> is then transported to an intermediate storage site at the nearby harbor before being transferred onto ships for safe transport to a permanent storage location.

This streamlined approach minimizes the project's footprint while ensuring efficient and secure CO<sub>2</sub> management.

## Why capturing carbon at a WtE-facility?



Residual waste remains one of the most difficult challenges for reaching net zero. Unlike many other industries, waste treatment cannot be electrified, and no disruptive technologies have yet emerged to eliminate the need for environmentally sound treatment of residual waste. With little change in waste volumes anticipated in the near future, the need for decarbonization remains substantial. A consequence of our modern society that needs to be managed to mitigate climate change.

As a result, Waste-to-Energy (waste incineration) remains the most viable solution for managing residual waste in a controlled and environmentally sound way, as landfills — its primary alternative — emit methane, a greenhouse gas over 25 times more potent than CO<sub>2</sub>.

The integration of carbon capture and storage (CCS) with Waste-to-Energy offers a practical approach to removing CO<sub>2</sub> emissions while managing residual waste responsibly.



# The site

## About CopenHill

CopenHill is a showcase for the green agenda in Europe located close to the center of Copenhagen. It is one of the best waste-to-energy plants in terms of energy efficiency and environmental performance.

The 17.000 m<sup>2</sup> large roof and part of the facade is offering a stunning recreational facility where visitors can ski, hike, run and enjoy themselves. More than 300 trees and 7.000 bushes are planted on the roof, creating a biodiverse and wild landscape that calls for exploration and play.

CopenHill is an ambitious take on how a piece of industry infrastructure can be transformed into a recreational facility providing a joyful and valuable experience; to raise awareness about



both the beneficial and problematic aspect of waste – as a valuable resource if treated well, and as a societal and environmental problem if treated wrongly.

## Energy for CPH

At Amager Bakke, non-recyclable residual waste is converted into electricity and district heating. The waste-to-energy plant is an integrated part of the Danish energy eco-system: the widespread district heating system in large Danish cities makes it possible to harvest the residual heat from the incineration process and turn it into district heating. Amager Bakke provides heating and electricity for roughly 90.000 households yearly consumption.

By utilizing residual waste, the reliance on other more carbon-intensive energy production methods can be decreased.

The flue gas cleaning system is one of the most advanced of its kind. Each furnace line has a separate flue gas cleaning system comprising an electric filter, three scrubbers and a dust filter. During the flue gas cleaning, dust (also known as fly ash), NO<sub>x</sub> particles, hydrochloric acid, mercury, Sulphur dioxide and other undesirable substances are eliminated. The flue gas exiting the stack is nearly only consisting of steam and CO<sub>2</sub>.

The future installation of CO<sub>2</sub> capture will take this advanced facility one step further and turn it into an important climate mitigation tool.



Amager Bakke provides heating and electricity for roughly 90.000 households in Copenhagen



## ***Infrastructure***

The project is **strategically located** near the port, minimizing the footprint needed for transporting CO<sub>2</sub> to offshore storage, optimizing logistics for the entire process. With ARC's modern infrastructure and **long remaining operational life**, CopenCapture is positioned to be a **long-term solution to decarbonizing waste treatment**. Additionally, ARC has already gained experience with CO<sub>2</sub> management through its test unit, which captures CO<sub>2</sub> for industrial use. The captured CO<sub>2</sub> has e.g. been used in greenhouses and in concrete production. This **technical expertise** will be leveraged to ensure the success of the carbon capture process at scale. The project will leverage proven CCS technology and existing

infrastructure to deliver a fully operational solution by 2030. Additionally, excess heat from the capture process could be repurposed, benefiting thousands of district heating customers in the region. This ensures the **proper handling of end-of-life waste and the decarbonization of a hard-to-abate sector**, all while supporting the city's ambitious climate goals as well as the national climate targets of Denmark.

# Project details

## Climate Impact

Once fully operational, CopenCapture will capture approximately 400,000 tonnes of CO<sub>2</sub> annually. Currently, around 50% of the CO<sub>2</sub> in ARC's flue gas comes from fossil-based sources, meaning the project has the potential to cut fossil CO<sub>2</sub> emissions by about 200,000 tonnes per year—equivalent to reducing fossil emissions in the Copenhagen Municipality by nearly 40% (based on 2023 levels).

At the same time, the remaining 200,000 tonnes of captured CO<sub>2</sub> originate from biogenic sources, effectively removing carbon from the natural cycle and creating negative emissions. These carbon removals are essential to offset unavoidable emissions in hard-to-abate sectors. CopenCapture is a cornerstone of Copenhagen's climate strategy, playing a vital role in the city's goal of becoming CO<sub>2</sub>-positive by 2035.

## Technology & Facility Details

At CopenCapture, carbon capture will rely on proven amine-based technology to separate CO<sub>2</sub> from flue gases. This mature, reliable, and safe technology is provided by an experienced supplier with decades of expertise in CO<sub>2</sub> separation. Once separated, the CO<sub>2</sub> undergoes further purification, followed by compression and cooling to increase pressure and lower its temperature, transforming it into liquid form. The liquefied CO<sub>2</sub> is then stored temporarily before being transported by vessel to its designated storage site.

As a waste-to-energy facility, ARC operates year-round, enabling the carbon capture facility to run continuously, with only brief shutdowns for annual maintenance. This ensures high equipment utilization, minimal downtime, and a cost-effective solution for CO<sub>2</sub> capture.

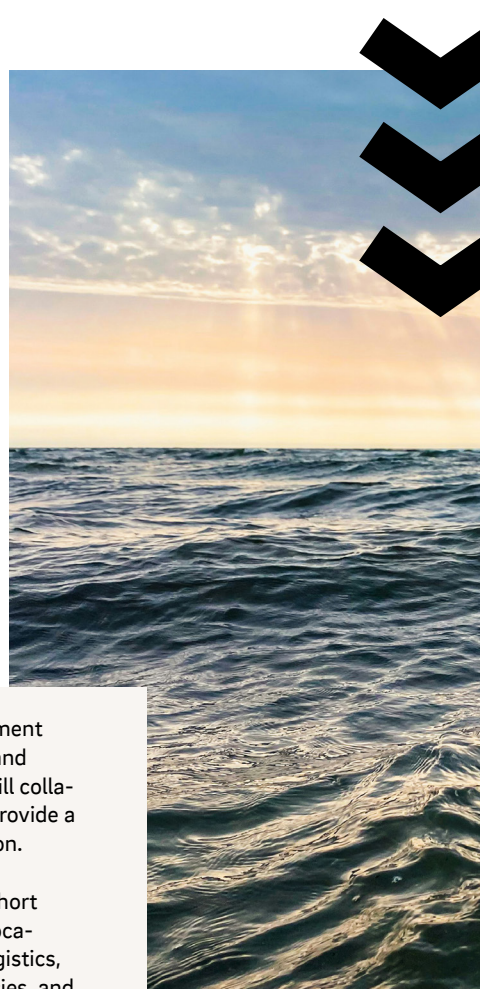
## Storage

The captured CO<sub>2</sub> from CopenCapture will be permanently stored in deep geological formations, at depths of more than 2,000 meters. These formations, similar to those that once held oil and natural gas, consist of porous rock layers sealed by solid caprock. CO<sub>2</sub> is injected into these formations in liquid form through wells, where its movement and pressure are continuously monitored by the storage operator. Over time, depending on the surrounding rock's chemical composition, the CO<sub>2</sub> gradually mineralizes, becoming permanently trapped as solid carbonate rock.



Several storage sites are under development both onshore and offshore in Denmark and neighboring countries. CopenCapture will collaborate with a storage partner that can provide a secure, cost-effective, and timely solution.

The project benefits from its relatively short transport distance to multiple storage locations, which allows for more efficient logistics, reduced need for buffers and redundancies, and ultimately lower costs.







## ***Economics & Financing***

Today, Denmark offers the most fit-for-purpose CCS tender and regulatory framework in Europe. On one hand, there is a clear incentive for emitters to take action in the CCS sector through local CO<sub>2</sub> taxes. On the other hand, the Danish state supports the market's ramp-up phase with – compared to other European countries – an attractive funding tender.

The project's commercial viability is driven by four distinct revenue streams: a base fee from the Emitter Plant to E.ON, which partially

compensates for the project developer's costs in capturing, transporting, and storing CO<sub>2</sub>; carbon removal certificates that assist offtakers on their path to Net-Zero; the supply of climate-neutral heat to the nearby district heating system; and funding to ensure a commercially viable ramp-up during this early market phase.

The realization of the CopenCapture project relies on external funding from the Danish CCS tender and CDR's.

## ***Roles & Responsibilities***

ARC and E.ON are working together to establish a partnership to develop a carbon capture facility at Copenhill. This partnership aims at developing a competitive full value chain project, and will apply for the subsidy from DEA to support the 2030 climate target of Copenhagen.

ARC has great expertise in operation and management of waste-to-energy including supply of district heating. E.ON has a long experience from developing, building, owning and operating energy assets. To this E.ON add expertise in carbon capture, logistics as well as expertise in district heating and utilities from our extensive DH business throughout Europe.

Additionally, ARC has already gained experience with CO<sub>2</sub> management through its test unit, which captures CO<sub>2</sub> for use in concrete production. This technical expertise will be leveraged to ensure the success of the carbon capture process at scale.







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