Young and sustainable: HafenCity

A new neighborhood is emerging in the heart of Hamburg. Following its scheduled completion in early 2030, the ten quarters in Hamburg’s warehouse district and the northern part of the former Elbe island Grasbrook will form HafenCity – a 157-hectare urban center whose development focuses on quality of life and sustainability. Aurubis and enercity are making an important contribution to this with industrial heat for HafenCity East.

Providing heat: Industry as part of the solution

The energy for the heat supply comes from a chemical sub-process of copper production at Aurubis. Water is heated, CO$_2$-free, to 90 °C and transported via pipelines over a distance of one kilometer, through the plant premises to the plant boundary on the Elbe island Peute. The multi-metal producer has called Hamburg home for 150 years. The plant premises of the Aurubis headquarters now cover 100 hectares – about 140 football fields.

Building connections: An adjustable heat supply

From the Aurubis plant boundary, enercity transports the industrial heat further. For this purpose, the energy supplier installed a heat transport pipeline 2.7 km in length, which connects Peute with HafenCity East. There, the heat is fed into the enercity heating grid. The pipeline is designed to transport additional industrial heat up to a capacity of 60 MW, equivalent to Aurubis’ entire industrial heat potential.
Aurubis – Responsibly Transforming Raw Materials into Value

A Hanseatic tradition

Aurubis AG is a leading global provider of non-ferrous metals and the largest copper recycler worldwide. Hamburg is home to the largest Aurubis site, which is also the company’s headquarters. The company was founded there as Norddeutsche Affinerie AG in 1866. Today, it is one of the most modern and environmentally friendly copper smelters in the world.

Its main area of expertise is the processing and optimal recovery of concentrates and recycling raw materials with complex qualities. Aurubis’ customers include companies in the semis industry; the electrical, electronics, and chemical industries; and suppliers of the renewable energies, construction, and automotive sectors.

Vision 2025: Passion for metallurgy.
Metals for progress. Together with you.

When we are asked in 2025 what Aurubis stands for, the answer should be as follows: Aurubis is passion for metallurgy and for metals. Metals that we know make progress possible. Produced by a company that is strongly connected to its employees, customers, and suppliers, as well as to the countries and societies in which we work and operate. Our strategy emphasizes a responsible attitude toward resources and the environment, in addition to an economically sound approach along our supply chain, to our employees, and to society.

Aurubis at a glance

Production: > 1 million t of copper cathodes/year, among other products
Employees: about 6,500 worldwide
Locations: 33 countries on three continents
Operating result: € 298 million (2017)
Environmental protection investments in copper production:
> € 560 million (since 2000)

Photos: Aurubis
enercity – Positive Energy

We are the driving force for the digital energy world of tomorrow!

enercity is one of the ten largest energy service providers in Germany. Our growth strategy is based on the interaction between efficient power plants, decentralized energy supply concepts, and the generation of renewable energies. With the strategy “enercity 4.0,” we have added new business activities such as electric vehicles, smart infrastructure, and digital services.

We purposefully develop energy services as areas of growth with our contracting holdings. Furthermore, enercity offers attractive electricity and gas products for business customers across Germany. The contracting companies’ decentralized, environmentally friendly energy facilities are located all over Germany and in the Baltic region.

enercity at a glance
Employees: about 3,000 (in the entire group of companies)
Revenues: € 2.10 billion (2017)
Operating result: € 76.3 million (2017)
Company holdings: around 30 holdings in other companies in the areas of energy supply systems, energy services, and the expansion of renewable energies

Corporate responsibility

enercity is characterized by economic, ecological, and social responsibility. As a result, enercity is sustainably shifting energy production to renewable sources and is focusing on energy efficiency.

We will invest a considerable amount in regenerative energies such as biomass and wind until 2030. The plan is to produce a total of 1.5 billion kilowatt hours of electricity with renewable energy in the future. This will reduce CO₂ emissions from enercity’s energy production by approximately 25 %.

enercity AG contributes to society through a variety of social, sports, and cultural sponsoring activities. As a municipal company, three-fourths of the company’s profits flow back into the local community and benefit public services.
Behind the Scenes

The climate alliance between Aurubis and enercity is unique in terms of both size and complexity and illustrates the potential for the heat transition. HafenCity East is the first urban neighborhood to be almost fully supplied with CO₂-free industrial heat.

Long pipelines
The pipeline connection from the heat source to HafenCity East is about 3.7 km long.

Providing heat
The heat volume of 160 million kWh can supply a total of 8,000 four-person households for about a year.

Protecting the climate
The industrial heat project prevents 20,000 t of CO₂. This is equivalent to the emissions of 10,000 mid-range cars driving 12,000 km per year.

Conserving water
The adjustment to the acid cooling facility saves 12 million m³ of cooling water and Elbe River water annually.

First-rate
... according to others who also find Aurubis’ and enercity’s idea notable:

Supported
... in all project phases by:
In the efficient utilization of industrial heat, Aurubis doesn’t only take advantage of the high temperatures the concentrate melt reaches in the flash smelter. The heat that forms in a sub-process of copper production is extracted for HafenCity as well. The industrial heat is transported in liquid form: as hot water.

**Producing copper. Still Aurubis’ most important product**

In the flash smelter, ore concentrate is heated to temperatures of more than 1,200 °C. This is processed into 99.5 % pure copper and iron silicate in multiple process steps.

- Copper is the smart metal of the energy transition. Whether electric vehicles, wind turbines, or digitalization, copper creates the foundations for these developments.

**Working sustainably. Up to the last process chain**

In a sub-process of copper production, gaseous sulphur dioxide transforms into sulphuric acid – an important raw material used in fertilizer production and in the chemical industry. This transformation in the contact acid plant releases CO₂-free heat that Aurubis extracts for industrial heat.

- The Hamburg plant covers 87 % of its steam needs from its own production processes (2017).
Modular and Decentralized – Heat for HafenCity

To supply heat to HafenCity East, enercity developed a concept that combines the use of renewable energies and CO₂-free industrial heat through a modular set-up of decentralized energy control centers. Producers and consumers are connected to each other via a local heat grid. With temperatures between 70 and 90 °C, the grid provides ideal conditions for the use of industrial heat. Ensuring a secure supply for HafenCity requires that the heat energy volume from Aurubis’ processes, which fluctuates depending on production, be brought to a steady, consistent level.

The most important components:

1. Energy control center in the Oberhafen area
   A combined heat and power plant fueled with biomethane has been in operation to generate heat in the Oberhafen energy control center since 2014. Conventional boilers cover only the peak heat load and serve as a safeguard.

2. Energy control center on Peute (under construction)
   With the energy control center on the island of Peute, enercity ensures that the heat extraction process, which fluctuates strongly, is evened out and safeguarded. This is achieved with a buffer storage facility that stores excess heat and releases it again as needed.

3. Heat transport and distribution
   enercity Contracting Nord GmbH is the installer and operator of the pipeline that transports the heat from the Aurubis plant on Peute to HafenCity East and distributes it there. The steel pipes that are used are insulated to reduce losses.

Photos: HafenCity Hamburg GmbH, enercity
From the Idea to Implementation

The idea of utilizing industrial heat emerged at Aurubis some time ago. However, only with the development of HafenCity and new technologies could it be transferred from head to paper and ultimately implemented in practice.

February 2017  
Setting the course
Aurubis and enercity enter into a contract for an energy-efficient heat supply for HafenCity East.

October 2017  
Preparing
First, Aurubis’ plant premises have to be prepared underground for the new pipelines and structures.

January 2018  
The first few meters
Starting in early 2018, the above-ground pipelines are laid directly on the Aurubis plant premises – in some cases over bridges in order to cross canals.

March 2018  
Diving deep
The pipeline crosses the Peute Canal with a roughly 90 m culvert – an underwater pipe. It was prefabricated in the Baaken Harbor and transported to water with five truck cranes and a ship crane.

April 2018  
The beating heart
The intermediate absorber, the heart of the contact acid plant weighing in at 200 t, is installed in its new location.

Photos: Aurubis AG and enercity AG
“Together, we can achieve more and save up to 140,000 t of CO₂ annually in Hamburg with industrial heat.”

Jürgen Schachler  
Aurubis AG CEO

“The project is unique in its reach and sets new benchmarks for future heat supply approaches in cities.”

Dr. Susanna Zapreva  
enercity AG CEO

2018

July 2018  
Tunneling through
The work to install the pipeline under the middle North Elbe Bridge starts. Openings in the bridge’s crossbeams can be used to lay the pipeline.

August 2018  
Over and under
In the Market Canal, the pipeline initially runs above-ground on the bank of the canal. The 70 m long culvert then connects it to the North Elbe Bridges.

October 10, 2018  
United
The connecting weld seam is placed at the transfer point between Hovestrasse and the Aurubis plant premises. The final weld seams on the entire pipeline follow a few days later north of the Elbe Bridges.

October 2018  
Underway
Kick-off celebration for the industrial heat project: The heat delivery to HafenCity East begins.

Starting late 2018  
Internal use
In the future, the electrolyte from the copper tankhouse, among other things, will be heated with industrial heat, saving about 50 million kWh from natural gas each year.
Hamburg, a Climate Protection City

2020 – 2030 – 2050 – with its climate plan, Hamburg sets an example of the modern city of the future in which climate protection and climate adaptation are basic components of societal cooperation. The climate alliance of Aurubis and enercity makes an important contribution to this. The intelligent generation and distribution of industrial heat for HafenCity East illustrates today how smart cross-sector energy systems for the city of tomorrow can look.

Hamburg climate targets

A comparison of planned CO₂ reductions:

2050 80 % compared to 1990
2030 50 % compared to 1990
2020 about 2 million t compared to 2012

The challenge of climate change

Climate change is already influencing the quality of life in Hamburg. In the future, it will increasingly impact all areas of urban life. Extremes can be expected in different directions: more drought, but also more incidents of heavy rainfall. The objective of the Hamburg Climate Strategy is to make the city more resistant and robust when it comes to climate events.

Key action areas

To achieve these goals, measures are planned for the following areas, among others:

» Urban development
» Coastal flooding protection
» Energy
» Industry
» Buildings
» Mobility
» Research and science

“Hamburg is currentlystarting the heat transition. Decarbonizing the heat supply is a decisive factor for achieving our climate goals. To attain our objectives, we need new ideas, new actors, and new partnerships – the alliance of enercity and Aurubis is exemplary in this regard.”

Jens Kerstan
Hamburg Senator for the Environment and Energy
Using Industrial Heat Means Saving Energy!

Technical equipment and production processes account for a high level of energy consumption in industry. At the same time, they create energy that is usually released into the surrounding area without being used – this is referred to as waste heat, process heat, or industrial heat. The annual energy savings potential from using industrial heat is estimated at 125 terawatt hours (TWh) at a process temperature above 60 °C.

Capturing this energy by recovering and reusing heat reduces the use of energy sources, improves the environmental balance, and helps reduce companies’ day-to-day energy costs. Calculations by the German Energy Agency (dena) show: Throughout Germany, companies could save up to 37 million t of CO₂ and roughly € 5 billion in energy costs if industrial heat were used consistently.

Decentralized heat grids – efficient energy use

Heat grids enable a broad application of renewable energy sources and low-CO₂ power generating systems. A heat supply connected to a grid is efficient and open to different technologies. Heat, and industry heat in particular, can be fed in from various producers. Even energy technologies that aren’t ready for the market yet can be included in this heat supply in the future.

Savings potential in Germany
37 million t of CO₂
€ 5 billion in energy costs

At a glance: benefits and possible uses of industrial heat

Benefits
» Reduced energy consumption
» Reduced emissions of harmful substances and greenhouse gases
» Lower operating costs and possibly lower investment costs for cooling and heating equipment
» Increased local/regional value added

Possible uses
» Process heat in the plant (including pre-heating)
» Room heating in company buildings (including backup heating)
» External use for heat grids (heating and warm water preparation)
» Cooling and electricity generation

Sources: BMWi, dena, KfW; photo: Aurubis AG
#wärmeggeben for Hanseatic Help e.V.

Aurubis and enercity are using the inauguration of the industrial heat pipeline to draw attention to the campaign “Hoping for Warmth” by the organization Hanseatic Help e.V.

More than just a clothing warehouse

Since fall 2015, Hanseatic Help e.V. has supported refugees, homeless people, women’s shelters, and children’s homes with free clothing and other items for daily use. The volunteer organization doesn’t just regularly supply 150 Hamburg institutions for those in need of help, but also delivers relief supplies to crisis regions. Thousands of people receive crucial items such as clothing and hygiene products in this way.

What was once a clothing warehouse is now a meeting place for dialogue and social involvement. Thanks to support from all of Hamburg: the government, businesses, and civil society.

Additional information: [www.hanseatic-help.org](http://www.hanseatic-help.org)

How to help

**By donating money**
Hanseatic Help e.V.
IBAN: DE61 2005 0550 1241 1552 56
BIC: HASPDEHHXXX

... or at Aurubis!

**By donating items**
Please donate only clean, intact, everyday items. The location at Grosse Elbstrasse 264 is open six days a week.

**By donating time and knowledge**
Those who give their time in addition to donations are welcomed with open arms.
For Aurubis, responsible corporate governance is a contribution to securing the company’s future. The Sustainability Strategy for 2018 to 2023 creates the framework for this. It directly picks up on the Aurubis mission: “Responsibly transforming raw materials into value to provide metals for an innovative world.” Aurubis views the topic of sustainability holistically: from the recovery of the raw materials, to metallurgical processes and the manufacture of metal and by-products, to further processing and utilization, as well as the return of these materials to the economic cycle.

Sustainability is part of all of these steps in the chain and therefore contributes to the balance between the economy, the environment, and people. The heart of the strategy is the classic sustainability triad “economy, environment, and people,” which categorizes the nine topics that will significantly influence the Aurubis business model in the coming years.

The Sustainability Strategy at a glance:

- Balance between economy, environment, and people
- 9 key action areas
- 9 targets
- 27 measures
- Released in September 2018
- Runtime from 2018 to 2023

Sustainability at Aurubis means:

- Treating the environment and limited natural resources with care
- Exhibiting responsibility towards our employees, suppliers, customers, and neighbors
- Securing long-term company success with responsible business practices and stable growth
Aurubis Sustainability Strategy 2018 - 2023

The Sustainability Strategy outlines targets and describes planned measures and KPIs. These include the fact that Aurubis would like to see its own high standards in social and environmental issues, as well as anti-corruption, fulfilled beyond the plant boundaries as well.

As a multi-metal group, Aurubis assumes responsibility for protecting the environment and the climate. The efficient use of energy and the reduction of CO₂ emissions are an important part of the company’s ecological and economic responsibility. We have set the target of further increasing our energy efficiency and reducing CO₂ emissions wherever possible.

Significant measures include energy efficiency projects such as increased heat extraction and internal company electricity projects. In this way, we hope to avoid more than 100,000 t of CO₂* – and the industrial heat project contributes to this goal.

Furthermore, Aurubis would like to see its own high standards in social and environmental issues, as well as anti-corruption, fulfilled beyond the plant boundaries as well; is strengthening its good, close cooperation among its employees in order to be equipped for the future; and is expanding multi-metal recycling further to make an even greater contribution to the circular economy. With the new Sustainability Strategy, Aurubis is assuming even more responsibility beyond its plant boundaries, as a neighbor and reliable partner, and thus as part of society.

* until FY 2022/23 (baseline: FY 2012/13)

"With its measures and targets, the new Strategy helps to enshrine the topic of sustainability more deeply in the company and encourages employees to live its principles and develop it steadily – both internally and externally. Every site in the Group contributes to the Aurubis Sustainability Strategy and helps shape it."

Kirsten Kück

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Additional information: aurubis.com/sustainabilitystrategy