GEA CARBON CAPTURE SOLUTIONS

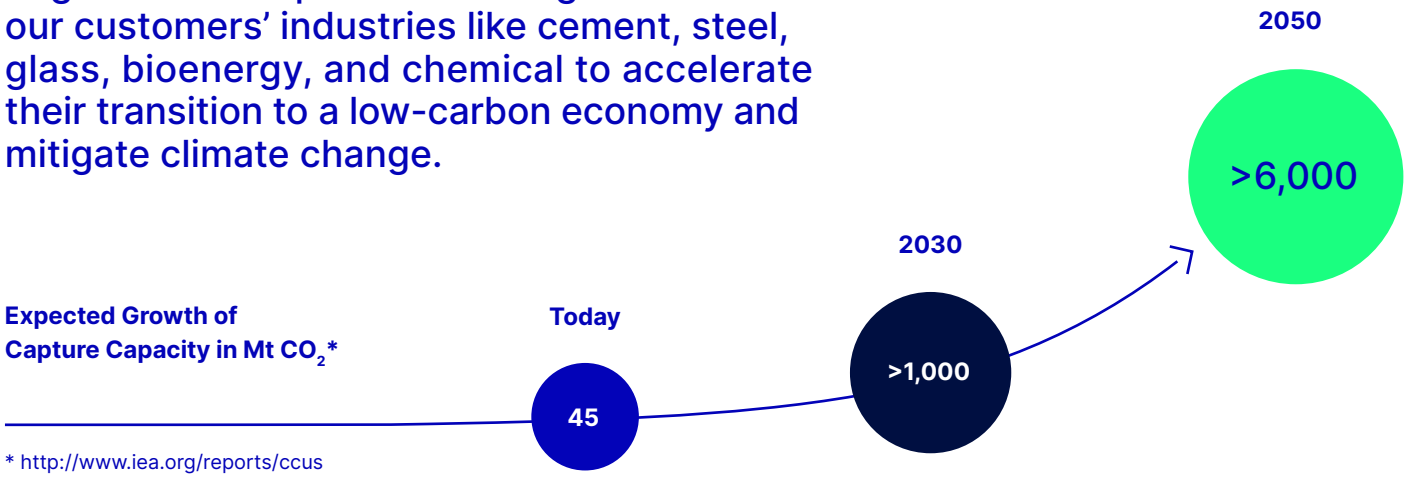
Highly efficient carbon dioxide removal strategies for key industries

GEA Engineering for a better world.

GEA.com

CARBON CAPTURE FOR A BETTER TOMORROW.

At GEA, we are committed to creating cutting-edge Carbon Capture technologies that enable our customers' industries like cement, steel, glass, bioenergy, and chemical to accelerate their transition to a low-carbon economy and mitigate climate change.



* http://www.iea.org/reports/ccus

GEA's Carbon Capture portfolio comes to extend our already well-established gas cleaning and heat recovery offer through technologies for CO_2 capturing as well as options for CO_2 liquefaction and utilization.

Modern CO_2 separation concepts rely on the use of aqueous amine solutions as solvents, as they are proven to deliver a reliable and proper performance. Hence, GEA's Carbon Capturing solution portfolio is based on state-of-the-art amine solvent systems and combines them with GEA's unique scrubbing technologies in a highly standardized design concept, enabling a fast delivery of an economic and cost-efficient CO_2 capturing solution.

Our aim is to make Carbon Capture a viable and practical solution that can be widely adopted and integrated into existing infrastructures. By collaborating with our customers and leveraging our technical expertise we strive for unlocking the decarbonization potential in our targeted industries.

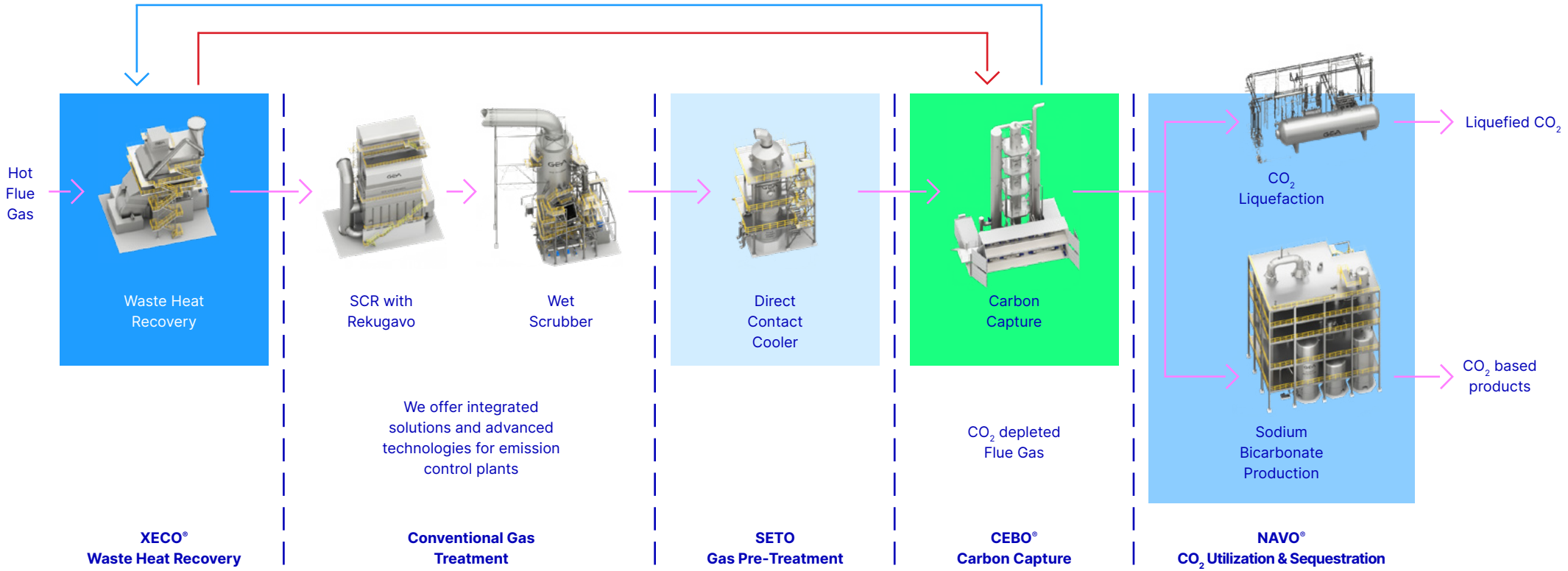
For over a century, GEA has been the global market leader in the development, planning and installation of emissions-reducing systems and technologies for customers in the process industry. This historical expertise provides the basis for our engagement in the development of cutting-edge Carbon Capture technologies.

Read more

GEA CARBON CAPTURE PROCESS CHAIN

For more information, please hover over the colored areas.

GEA's Carbon Capture Solutions involve the following process steps for an optimal and economic CO_2 reduction:



CEBO® CARBON CAPTURE

Once the correct gas pre-treatment is installed, the CEBO® Carbon Capture unit can be added as a modularized unit, meeting your needs in terms of capture capacity and energy integration.

Available sizes in tpd:
CEBO® Pilot
CEBO® individual
CEBO® 50
CEBO® 150
CEBO® 300
CEBO® 600

Pre-Treatment (SETO)
Ready for combining with GEA gas pre-treatment units

Fast Delivery
Containerized design for quick and easy site integration

Energy Integration
Implementation of heat recovery & electrification options to lower the overall energy demand

Modularization
High level of modularization to ensure cost-efficiency and simple scale-up

Performance Guarantee
High & reliable separation efficiency, low energy consumption

Service
Personnel training; GEA operation & maintenance support

Full Remote Assistance
Remote control & optimization ready

Material Selection
Deployment of corrosion-resistant & durable materials like thermoplastics

SUCCESS STORIES

"We are proud of our CCS project with GEA and are taking advantage of the pilot plant at our Beckum site to get started with Carbon Capture. The project has already attracted a great deal of interest from both private and public sectors."

Marcel Gustav Krogbeumker,
Managing Director PHOENIX Zementwerke

Picture: GEA / Tim Luhmann

Phoenix Zementwerke
Contract: CEBO® Pilot Campaign
Status: completed
Industry: Cement
Delivery: 2023
Location: Beckum, Germany
Duration: 10 months
Capture capacity: 25.3 t CO_2
Capture efficiency: 90 – 95 %

Contract: CEBO® Pilot Campaign
Status: in operation
Industry: Cement
Delivery: 2024
Location: Wössingen, Germany
Duration: 6 months

Contract: CEBO® Pilot Campaign
Status: contract signed
Industry: Waste to Energy
Delivery: 2024
Location: Frankfurt, Germany
Duration: 3 months

Contract: Pre-FEED Package
Status: completed
Industry: Refinery
Delivery: 2023
Location: Brunsbüttel, Germany

Contract: Pre-FEED Package
Status: in progress
Industry: Waste to Energy
Delivery: 2024
Location: Frankfurt, Germany

SUSTAINABLITY AS KEY LEVER.

We engineer sustainable solutions to support the sustainability goals of our customers.

GEA on a Carbon Capture mission
We aim to neutralize greenhouse gas emissions that cannot be avoided. As a technology company, we are championing technical carbon removals, focusing primarily on scaling and fine-tuning GEA's Carbon Capture, Storage and Utilization Solutions.

Read more

11 %

By choosing GEA's integrated Waste Heat Recovery and Carbon Capture Solution, you aim to reduce your CO_2 emissions by 11 percent compared to a stand-alone Carbon Capture solution without Waste Heat Recovery.*

ADD BETTER
Resource efficient solution

Numerous industries such as cement, iron and steel, glass, chemicals, bioenergy, waste management and other "hard to abate" industries facing the challenge of making their energy-intensive processes more sustainable. With its "Add Better" label, GEA has launched a pioneering initiative to identify sustainable solutions. The label lets our customers choose advanced products and solutions that offer not only improved performance but also proven resource efficiency. This helps them for example to reduce their greenhouse gas emissions.

As one of GEA's most resource-efficient solutions, our Carbon Capturing incl. Waste Heat Recovery carries the Add Better label.

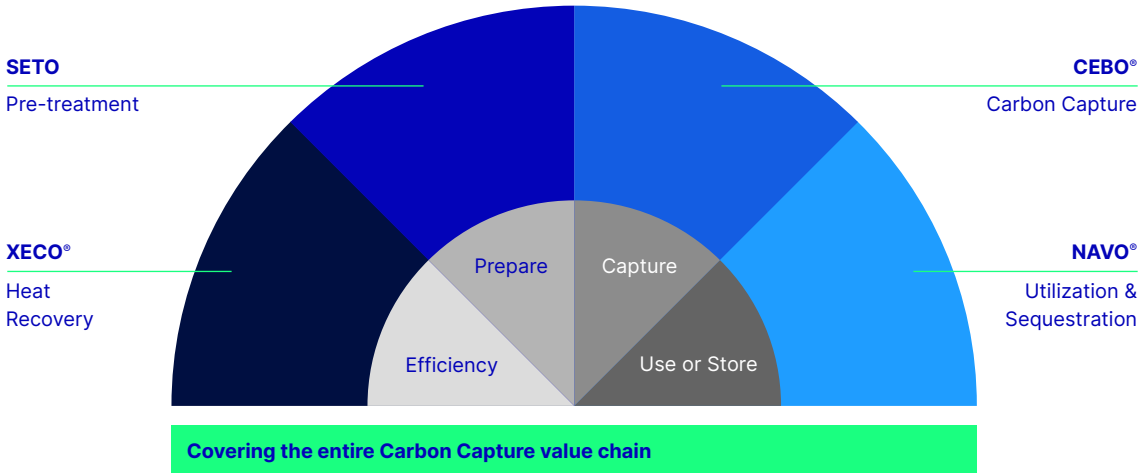
SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Science Based Targets initiative (SBTi)
The SBTi – a globally recognized, independant organization for auditing climate targets – validated in 2023 GEA's upgraded climate targets and the Net Zero target for 2040.

Read more

*Our Capture rate is >/= 90%

WHY CHOOSE GEA CARBON CAPTURE SOLUTIONS?



Capture Expertise
A **high level of process expertise** along the CO_2 value chain together with **operational excellence** as an experienced plant engineering company ensures best processing and low risks for your project all over the world. **GEA reduces battery limits** as we provide solutions from the conventional gas cleaning to the supply of liquified CO_2.

Capture Design
In order **to lower plant costs**, we employ a cost-effective plant design that includes the strategic use of corrosion-resistant materials like thermoplastics or stainless steel to **prolong the plant's lifespan**. Additionally, our standardized GEA CEBO® plants have a **small footprint** and **require minimal installation effort** on site.

Capture Costs
GEA focuses on the **implementation of energy integration options** to reduce operational costs while operating the carbon capture plant. Here utilizing waste heat from the flue gas with GEA's XECO® line **covers a significant thermal energy** demand. Thanks to optimized process control combined with **the integration of our own heat pump and mechanical vapour recompression** equipment, necessary **regeneration energy demand is reduced** to a minimum.

Capture History
GEA relies on **a large portfolio of existing emission control solutions** in a wide range of applications in various industries. The **comprehensive installed base** demonstrates customers' trust in GEA technologies, which can be experienced during reference visits.

ACCELERATE YOUR DECARBONIZATION WITH GEA.

Get in touch with us now for more information or arrange a meeting with our experts.

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Engineering for a better world.

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