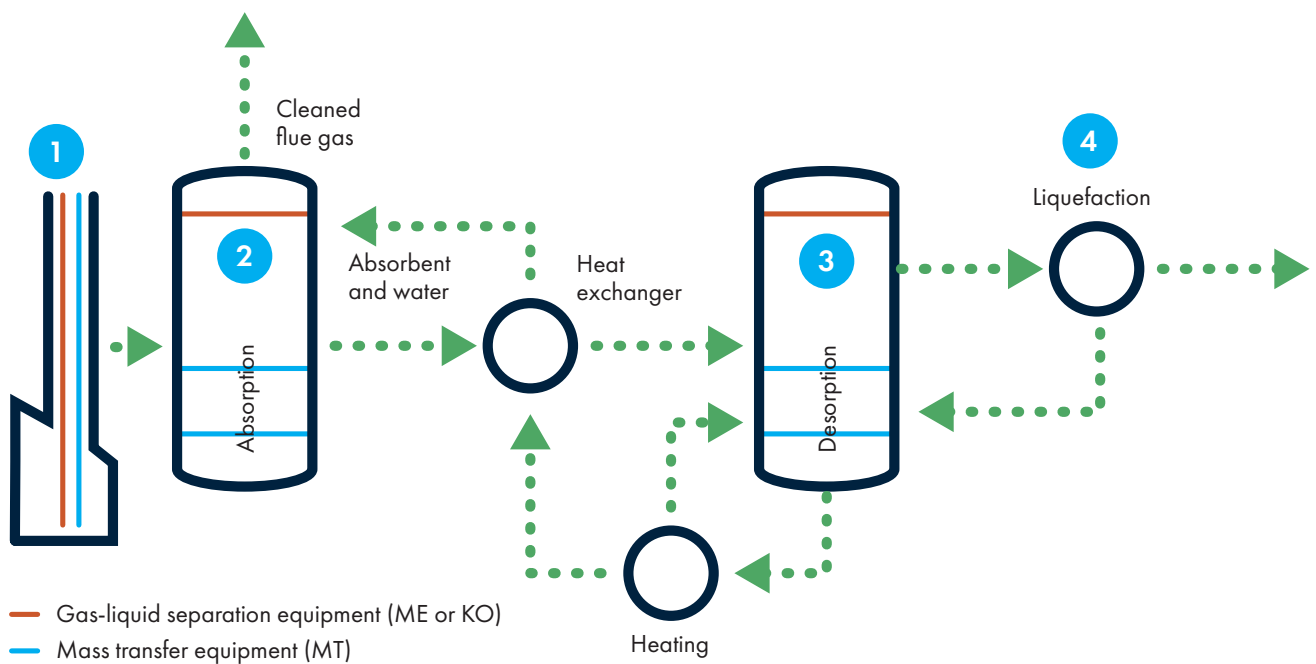


# Clean technologies in carbon capture

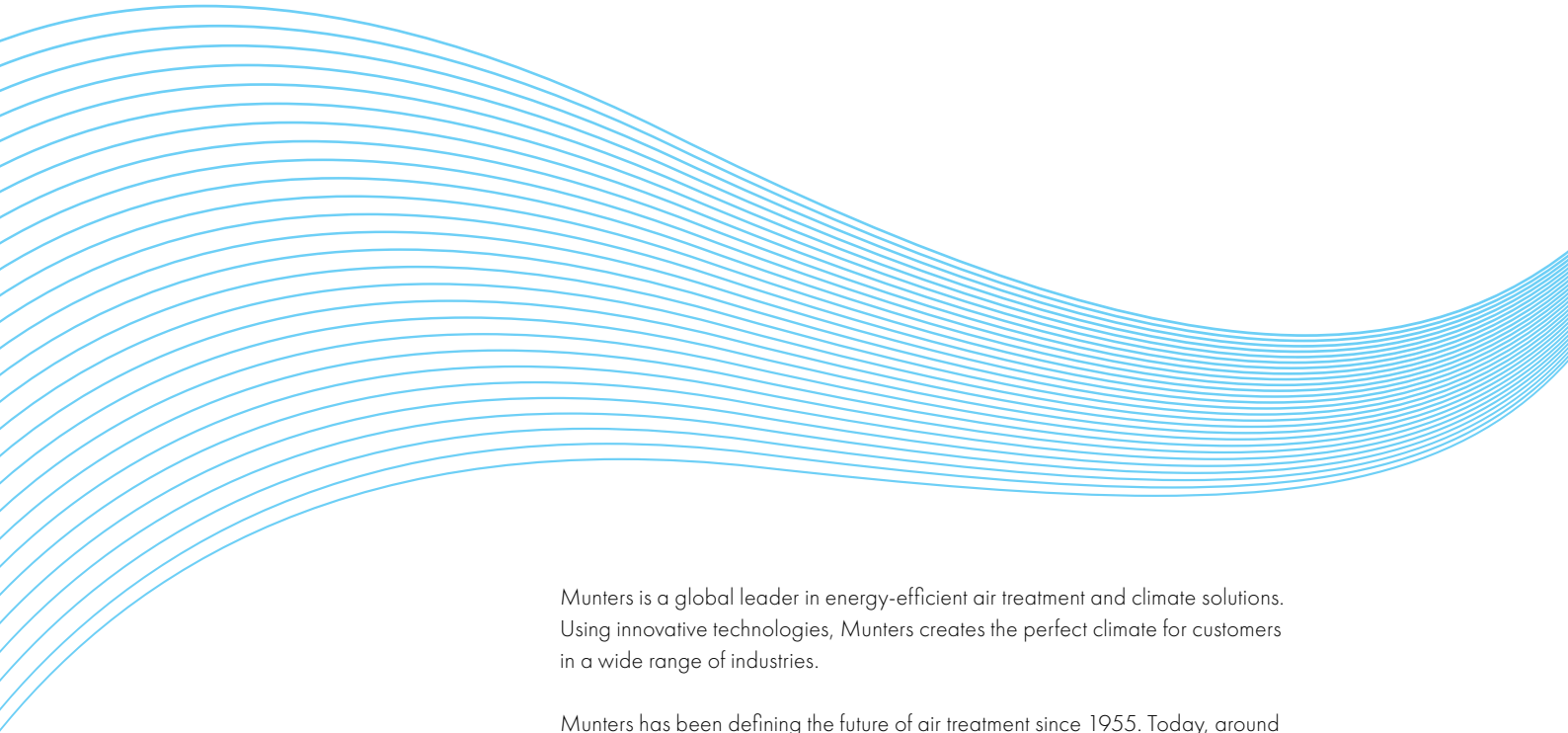
Munters gas-liquid separators are virtually everywhere there are liquids and gases that need to be separated. But gas-liquid separation is just one solution of Clean technologies from Munters. Additionally, Munters can also offer Mass Transfer technology for different unit operation processes in CCS applications, and VOC abatement removes polluting solvents from the air.

Clean technologies from Munters enhance process productivity while lowering emissions and reducing carbon footprint. Technologies that deliver clean air to the world.



- 1. Pre-conditioning depending on the composition of the CO<sub>2</sub> loaded flue gas and the used absorbent**
  - Scrubber use will mean need of ME and MT equipment
- 2. Reaction of the absorbent and CO<sub>2</sub>**
  - MT to let the absorbent and the CO<sub>2</sub> react
  - ME to prevent that absorbent as droplets will go out with the cleaned flue gas

- 3. Extracting CO<sub>2</sub> from the absorbent**
  - ME to prevent that absorbent will go out with the pure CO<sub>2</sub>
- 4. Liquefaction of the CO<sub>2</sub> gas for transportation**
  - MT as column internals for desorption
  - ME is used in the heating and compressing stages for liquid recovery and to prevent liquid carry over



Munters is a global leader in energy-efficient air treatment and climate solutions. Using innovative technologies, Munters creates the perfect climate for customers in a wide range of industries.

Munters has been defining the future of air treatment since 1955. Today, around 3,350 employees carry out manufacturing and sales in more than 30 countries.

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



Clean technologies by Munters  
Proven solutions  
for carbon capture

# Proven solutions based on technology expertise

*Carbon capture limits the release of CO<sub>2</sub> emissions into the atmosphere by capturing and utilizing it, and then storing it safely.*

*Clean technologies from Munters enhance process productivity while lowering emissions and reducing carbon footprint. We have vast knowledge in Mist Elimination and Mass Transfer, Clean technologies that are essential parts of any carbon capture process.*

*With decades of experience, skilled design and support staff, and satisfied customers throughout the world, you can count on Munters as a partner to support your carbon capture project.*



# Solution partners for a carbon-neutral future

With Munters, your process partner, you will have access to our know-how and proven technologies. We'll make sure your equipment is set up and functioning correctly, right from the start. And over the years, your Clean technologies equipment will receive the attention needed to reach its maximum life expectancy.

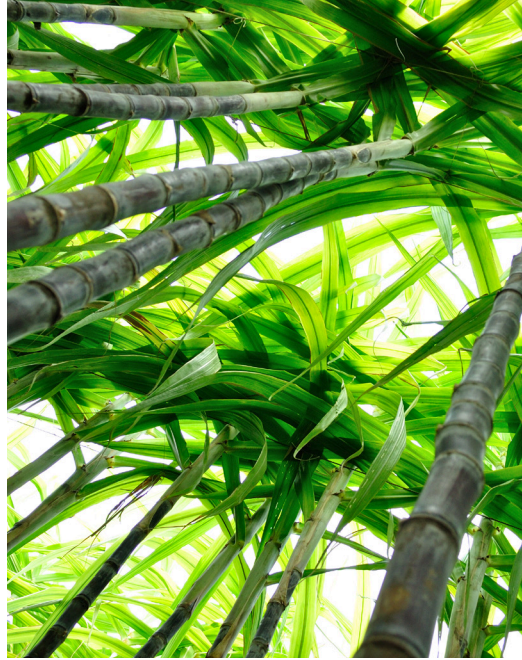
We're with you all the way throughout each phase of your equipment's life cycle, Munters knowledge and expertise will insure optimal operation, minimum energy consumption, and extension of the life of your investment.

"We are a leader in our field. Munters can tailor solutions to meet the needs of our customers and we are good at collaborating and co-developing with our partners," says Jing Jin, Vice President of Clean technologies at Munters.

*"Munters is a trusted solution provider with proven solutions and decades of expertise in key process technologies."*

Markus Karbach, Head of Business Development EU & SEA, Clean Technologies at Munters.





# Munters success stories

## Carbon capture at cement plant

A new, ground-breaking project is underway that will bring carbon capture to cement manufacturing for the first time ever at a Northern Europe cement factory, which produces 1.2 million tons of cement every year.

It is estimated that 400,000 tons of CO<sub>2</sub> will be captured per year, which gives a 50% reduction in the plant's emissions once the carbon capture and storage operations are fully running in 2024.

- World-first carbon capture solution for cement manufacturing
- 400,000 tons of CO<sub>2</sub> will be captured every year
- Will help customer reach goal of being carbon-neutral by 2050
- Munters proven gas-liquid separation solutions support this carbon capture process

## World's first bamboo ethanol refinery

To support India's ambition to reduce carbon emissions from its transportation sector a pioneering project is underway to build the world's first full-scale ethanol refinery using bamboo, which grows in massive quantities in northeastern India.

The refinery will process 300,000 tons of bamboo each year. This will generate 60 million tons of bioethanol and 30,000 tons of biochemicals that will be used to make paints, adhesives and plastics, and green power for local use.

- Bamboo grows in massive quantities in northeastern India
- Refinery will process 300,000 tons of bamboo each year
- 60 million tons of bioethanol and 30,000 tons of biochemicals will be generated annually
- Munters is working with the customer to develop an efficient and sustainable solution

## World's first integrated, industrial-scale plant to produce climate-neutral e-fuel

Tomorrow's fuel will be produced in the weather-beaten landscape of the Magallanes region of Chile. A combination of wind energy and CO<sub>2</sub> captured from the atmosphere will be used to create a gasoline substitute that can work in existing engines and infrastructure.

Via a filtration process, CO<sub>2</sub> will be directly captured and condensed in the atmosphere, and Clean technologies by Munters will be used in the carbon capture process. Green hydrogen will be combined with CO<sub>2</sub> captured from the atmosphere. And the methanol produced from this process will be converted to carbon-neutral e-fuel. In the pilot phase, 130,000 liters of e-fuel will be produced in 2022.

- Chile's windy Magallanes region is the perfect location for wind turbines
- Munters Mist Eliminators will be used to help capture climate-neutral CO<sub>2</sub>
- Wind energy will be used to produce hydrogen out of water with an electrolyzer
- Methanol will be produced from green hydrogen and captured CO<sub>2</sub>
- A MTG (Methanol To Gasoline) plant will convert the green methanol e-fuel