



# Clean technologies by Munters support world's first industrial e-fuel plant

Tomorrow's fuel, today





*Synthetic e-fuel, also called electrofuel, will be produced in the weather-beaten landscape 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, and Clean technologies by Munters will support CO<sub>2</sub> capture. Green hydrogen will be combined with the CO<sub>2</sub> captured from the atmosphere. And the green methanol produced from this process will be converted to carbon-neutral e-fuel. In the pilot phase, 2022 e-methanol production will initially reach around 750,000 liters and 130,000 liters of e-fuel will be produced.

## **Background**

We need carbon-neutral fuel accessible alternatives to fossil fuels on a large scale, to reduce carbon emissions and power a more sustainable future. Electrofuels can help get us there since they are a CO<sub>2</sub>-neutral alternative to conventional fossil energy carriers – shifting the energy demand to the use of renewable sources.

The production of e-fuels requires electricity from renewable sources such as solar or wind, as well as water to produce hydrogen through electrolysis processes and CO<sub>2</sub> from direct air capture or end of pipe. Because e-fuels are produced by synthesizing hydrogen and carbon, they are called synthetic fuels.

e-fuels are climate-friendly, compatible with conventional engines and easy to use. Their usage does not require any conversion and they can be distributed via existing tank and distribution infrastructures.

Existing means of transport and heating can be converted environmentally friendly by using e-fuels. For example, trucks or airplanes, as well as construction machinery and oil-fired heating system can be operated in a climate-neutral manner.



# Process overview

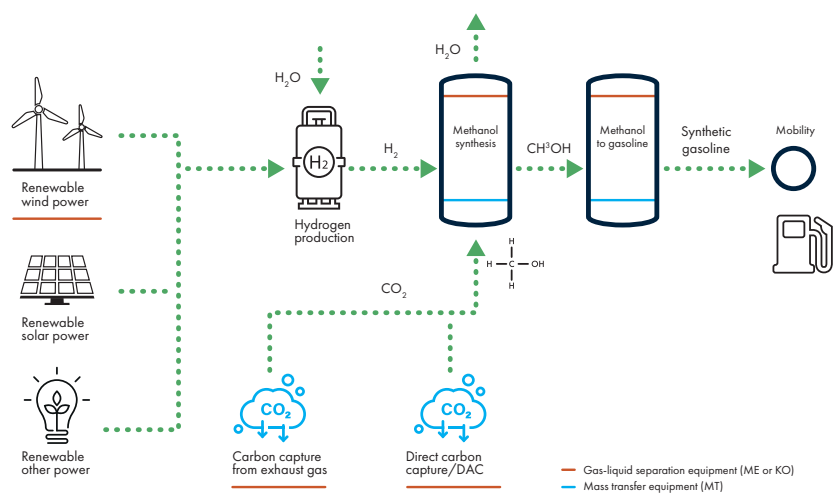
The project's location in Chile was selected for its excellent wind conditions in terms of wind speed and availability. Wind turbines will turn wind energy into electricity using the aerodynamic force from the rotor blades.

Then wind energy will be converted to green hydrogen via water electrolysis. And direct air capture equipment supported by Munters Mist Eliminators will harvest climate-neutral CO<sub>2</sub>.

Instead of using methanol from fossil sources, it will be synthesized from this green hydrogen and CO<sub>2</sub>. These two gases are mixed to form the syngas and react to green methanol when they pass a catalyst.

A MTG (Methanol To Gasoline) plant will be used to convert the green methanol to synthetic e-fuel.

The synthetic e-fuel will be transported to Europe with container ships. One container has a loading capacity of 25,000 – 30,000 liters.







## Munters helps capture CO<sub>2</sub> out of thin air

Carbon capture is the process of removing CO<sub>2</sub> from large emission sources. The purpose of carbon capture is to limit the release of CO<sub>2</sub> emissions into the atmosphere by capturing it and then utilizing it, (CCU) or storing it normally, (CCS).

This project will use Global Thermostats (GT) direct air capture equipment together with Munters Mist elimination equipment to harvest climate-neutral CO<sub>2</sub> as part of the overall e-fuel generation process.

GT uses dry amine-based chemical sorbents that are bonded to porous, honeycomb ceramic monoliths, which act as carbon sponges. These carbon sponges efficiently adsorb CO<sub>2</sub> directly from the atmosphere.

The captured CO<sub>2</sub> is then stripped off and collected using low-temperature steam (85-100°C). The output results in 98% pure CO<sub>2</sub>. Only steam and electricity are consumed during the process, without the creation of emissions or other effluents.



# Clean technologies by Munters in carbon capture

Munters gas-liquid separators help anywhere liquids and gases need to be separated. Power plants, marine, steel and further process industries all benefit from Munters industry-leading expertise. Munters gas-liquid separation enhances process productivity, lowers emissions and helps reduce the environmental footprint of our customers.

Gas-liquid separation is just one of the Clean technologies by 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 by Munters enhance process productivity while lowering emissions and reducing carbon footprint. Technologies that deliver clean air to the world.



### **Case study**

- Making e-fuel in Chile with Clean technologies by Munters

### **Benefits**

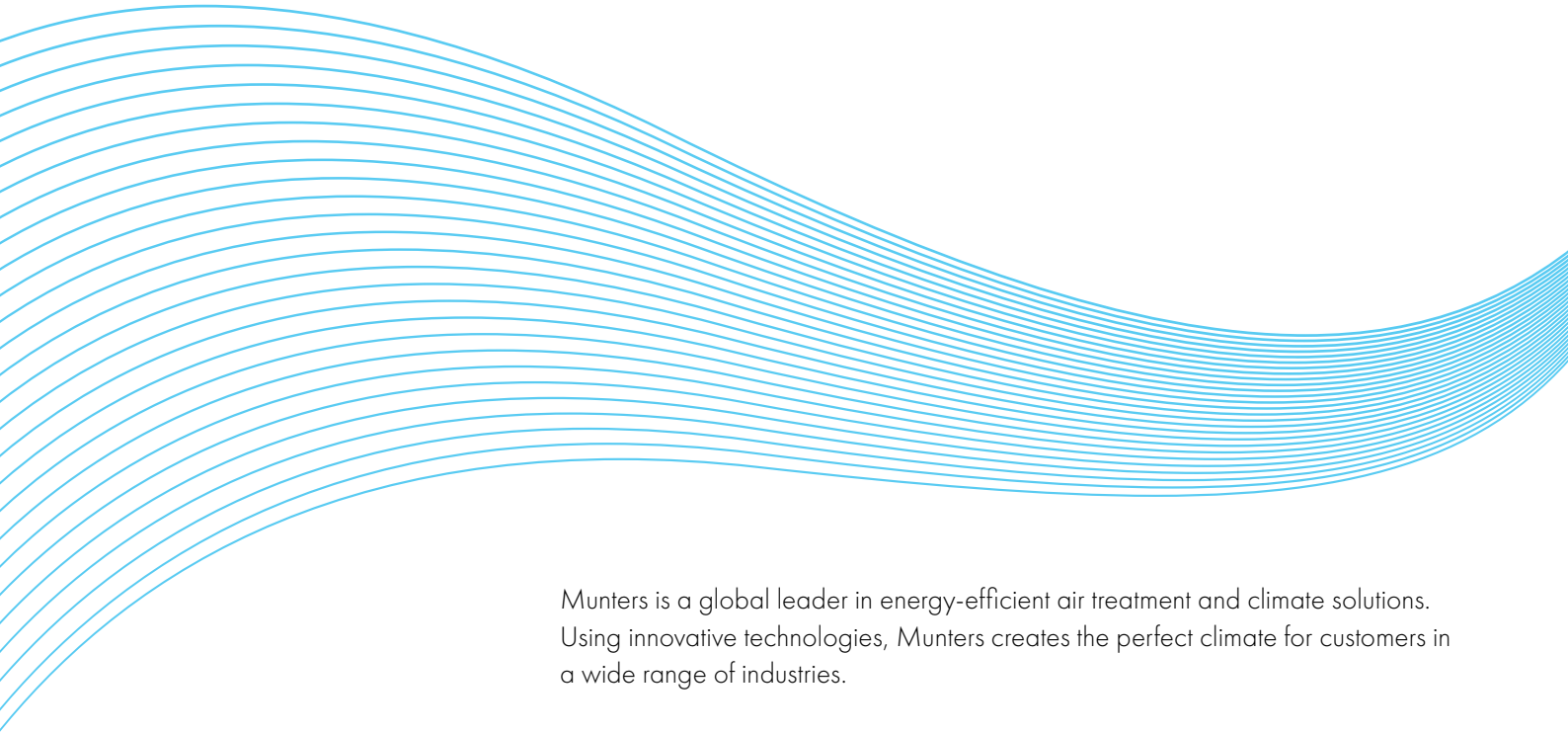
- Initial yearly e-methanol production of around 750,000 liters
- Yearly production of e-methanol could reach 1,000,000 tons by 2026
- In 2022 130,000 liters of e-fuel will be produced
- By 2024 yearly e-fuel capacity is planned to be increased to 55 million liters
- By 2026 e-fuel capacity could be over 550 million liters per year
- Ships could transport e-fuel with green methanol in the future

### **Clean technologies equipment from Munters can also be used in:**

- Wind generators
- Methanol synthesis. Carbon capture equipment for end of pipe capture
- Methanol-To-Gasoline plants

### **Product/Products featured**

- Munters Mist elimination equipment
- Munters Mass Transfer products



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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)

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