Carbon dioxide (CO_2). A valuable product with unique properties.

Essential part of life

Life on earth would not be possible without carbon dioxide (CO_2). It is released into the atmosphere and absorbed by the earth in a constant carbon cycle – driven by processes such as photosynthesis, fermentation and decomposition, which do not accelerate the greenhouse effect. It is the burning of fossil fuels that releases higher levels of carbon dioxide into the atmosphere, upsetting the balance of the cycle. Because of this, many people associate carbon dioxide with global warming and tend to regard it in a negative light. But in doing so, they disregard its many important applications and benefits.

Does the use of CO_2 contribute to global warming?

The answer is NO.

Carbon dioxide is obtained as a by-product of combustion and chemical processes. If it were not captured by Linde and transformed into a valuable commodity, it would be released directly into the atmosphere. You could say that we "borrow" the carbon dioxide and put it to beneficial use, for example as a substitute for harmful substances, before discharging it into the atmosphere. The carbon dioxide released by various fermentation processes is also part of the natural carbon cycle and has no negative impact on the greenhouse effect.

In addition, carbon dioxide is also found in natural deposits, such as mineral water wells. Linde extracts natural CO_2 from its own mineral water sources.

An environmentally efficient gas

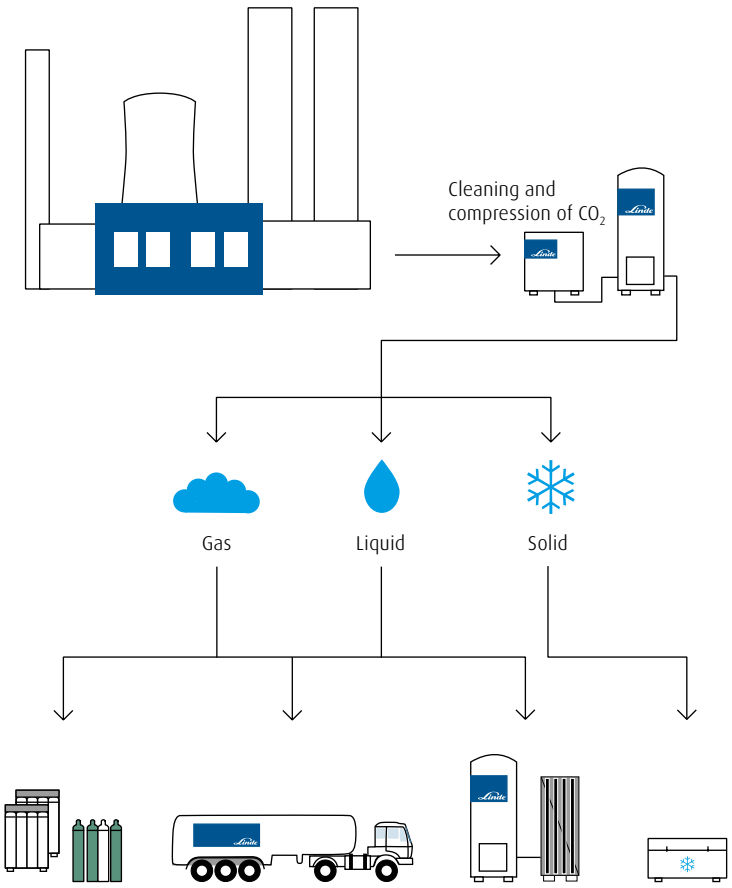
Many of our application technologies replace substances that are harmful to the environment with carbon dioxide. For example, it is used to replace halons in fire extinguishers, or Freons (CFCs) in the manufacture of polystyrene and polyurethane foams. These substances destroy the stratospheric ozone layer, which is why they have been banned. Carbon dioxide is the ideal substitute because it is fast-acting and effective.

In swimming pools, for instance, carbon dioxide can be used instead of hydrochloric acid to neutralise the pH of the water. This reduces the risk of harmful chlorine gas fumes, making the pool safer for swimmers and the working environment more healthy for staff. In dry ice (solid) form, carbon dioxide can also be used for cleaning. It eliminates the need for harmful solvents, which can damage or attack the surfaces to be cleaned. In addition, cars that replace haloalkanes with CO_2 as the cooling agent in their refrigerant system are not only kinder to the environment, but also more economical to run (lower fuel consumption) than systems using fluorinated greenhouse gases. Even diesel-powered refrigerated trucking units that switch to cryogenic CO_2 systems can reduce the environmental impact of food transport.

Production, storage and transport

Carbon dioxide is obtained as a by-product during the industrial manufacture of ammonia, alcohol and fertilizers. The gas is captured, purified and compressed in a multi-step process, and finally liquefied. Liquid carbon dioxide is stored and transported in pressurised tanks at a low temperature. Smaller volumes of liquid CO_2 are stored in gas cylinders.

Carbon dioxide can also be supplied in the form of dry ice. The production of dry ice starts with liquefied carbon dioxide, which is expanded to produce carbon dioxide snow, which is in turn compressed to create ice. Dry ice is supplied in the form of pellets or blocks in insulated containers.



A versatile gas

The special properties of carbon dioxide make it ideal for a vast spectrum of applications that have no negative impact on the carbon cycle. That is why you will find carbon dioxide in many everyday products and processes:

- → It prolongs the shelf life of carbonated beverages and ensures a refreshing taste
- → It is used in food refrigeration and freezing
- → It is a low-corrosion agent for purifying drinking water
- → It promotes healthy growth of vegetables in greenhouses
- → It is used to neutralise the pH of wastewater before it is discharged into the environment
- → ICEBITZZZ® dry ice pellets and blocks are a highly effective and versatile cooling agent, eliminating the need for a source of electricity to keep food cool and fresh
- → It acts as a shielding gas in steel welding and laser cutting
- → It is used in industrial cooling processes
- → CRYOCLEAN® dry ice blasting processes are extremely effective at cleaning

Linde GmbH
Gases Division, Dr.-Carl-von-Linde-Strasse 6–14, 82049 Pullach, Germany
Phone: +49 89 7446 0, www.linde-gas.com

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