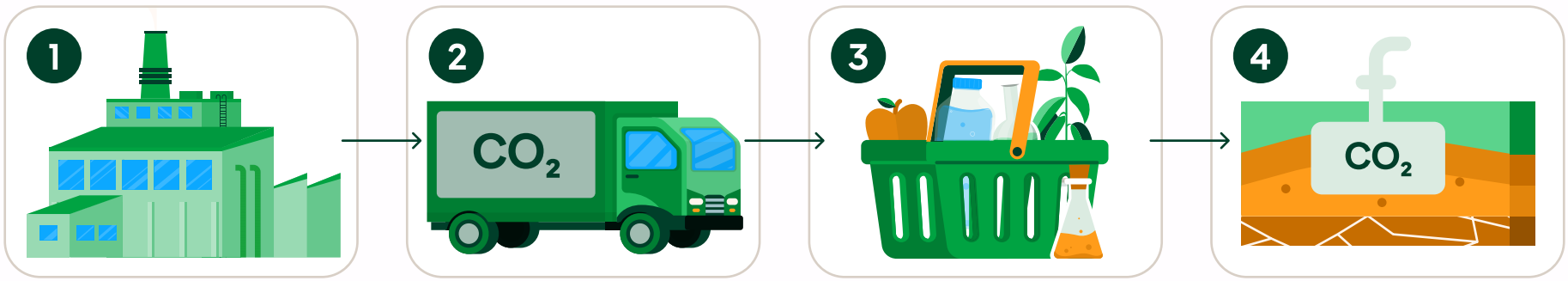
CCUS technology consists of three main stages



1 Capture

In the first stage of the process, carbon dioxide is separated from other gases emitted by industrial facilities, such as cement plants or industrial boilers that use coal and gas.

2 Transport

Once separated, CO_2 can be cooled to -80°C to convert it to liquid form and allow for transport by truck or ship. However, the most common method is to transport it at ambient temperature under high pressure through pipelines, especially when dealing with large volumes.

3 Use

The next step in **recovering captured carbon dioxide involves its use in various industries, such as the food and beverage sector for carbonation and preservation; in medicine for anaesthetic procedures; in agriculture to support greenhouse plant growth; and in supercritical extraction to obtain compounds from plants and chemicals.** It is also used in steel welding, fire extinguisher production and as dry ice for shipping frozen goods and cleaning industrial surfaces.

In addition, new and innovative applications of CO_2 are being explored, such as its conversion into plastics, concrete, synthetic fuels and algae-based biofuels, as well as fertilisers to promote plant growth.

4 Storage

Carbon dioxide can also be injected into deep underground geological formations, such as depleted oil fields or saline caverns, where it is stored safely. According to the Global CCS Institute, around 300 million tonnes of CO_2 have been injected underground worldwide as part of carbon capture projects (as a reference, Spain emits around 250 million tonnes of CO_2 each year).

Most of the projects currently in operation belong to the oil industry, where CO_2 is injected into active reservoirs to increase underground pressure and help extract more oil. From a climate perspective, this process is not considered sustainable, as although CO_2 is removed from the atmosphere, it is used to produce more oil and ultimately results in more CO_2 being emitted when the oil is burned.