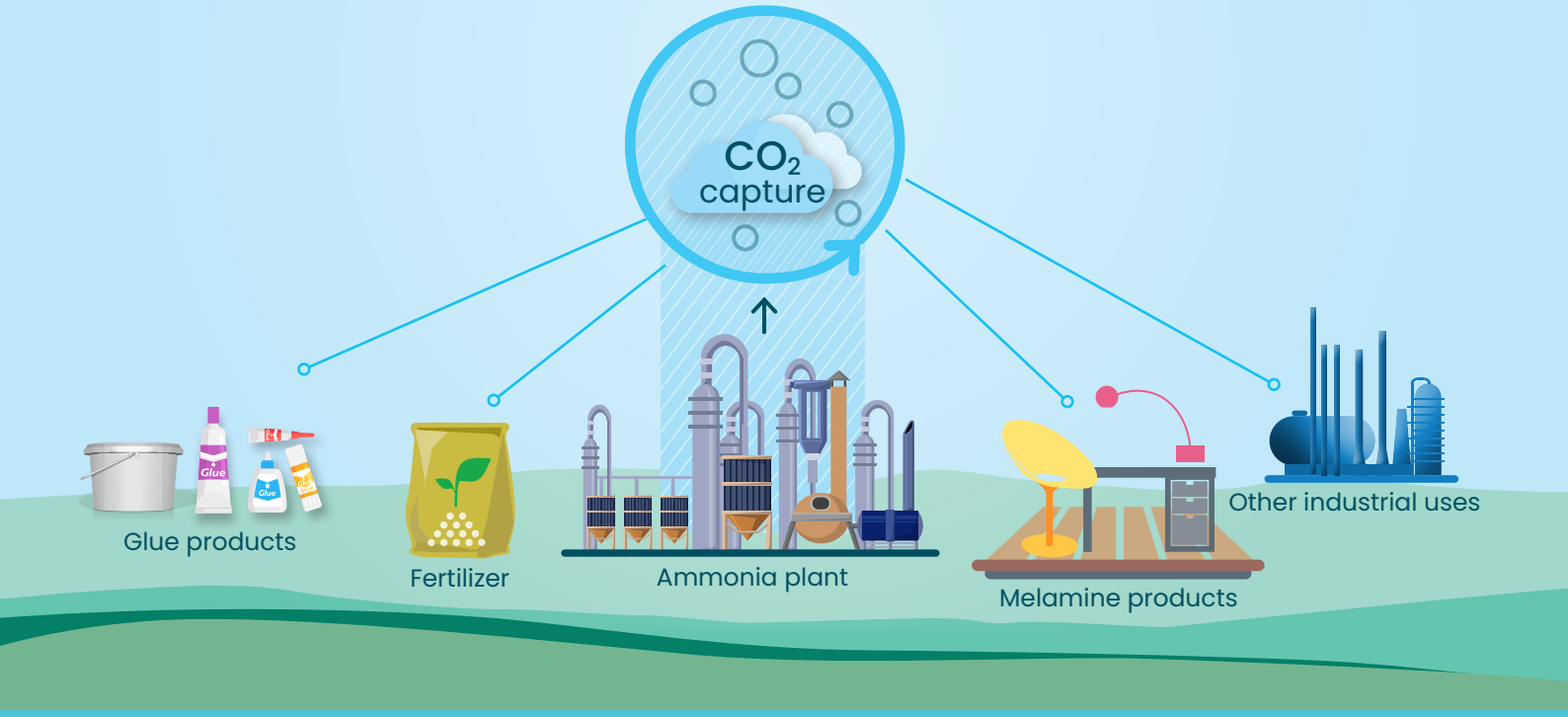
Fertilizers Europe

Carbon Capture and Utilization

in the European Fertilizer Industry



What is CCU and why do we need it?

Europe has the ambition to become a carbon-neutral economy by 2050. Making use of, as well as binding CO_2 will be key for achieving net-zero greenhouse gas emissions (GHG).

The fertilizer industry offers several opportunities for Carbon Capture and Utilization (CCU), and further innovation will lead to more uses in the future.

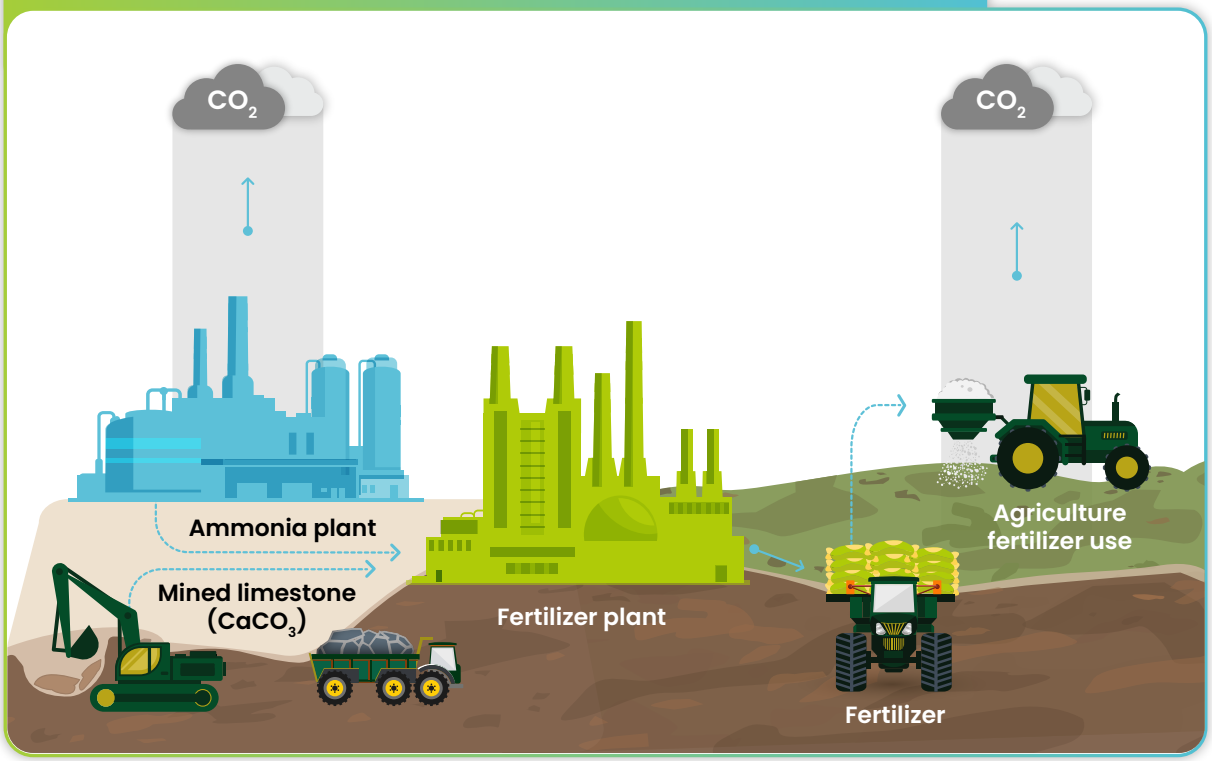
However, the development of these technologies and seizing opportunities that stem from these technologies depends on CCU being recognized as part of the EU's climate policy and given credit for negative emissions.

CCU and fertilizers industry

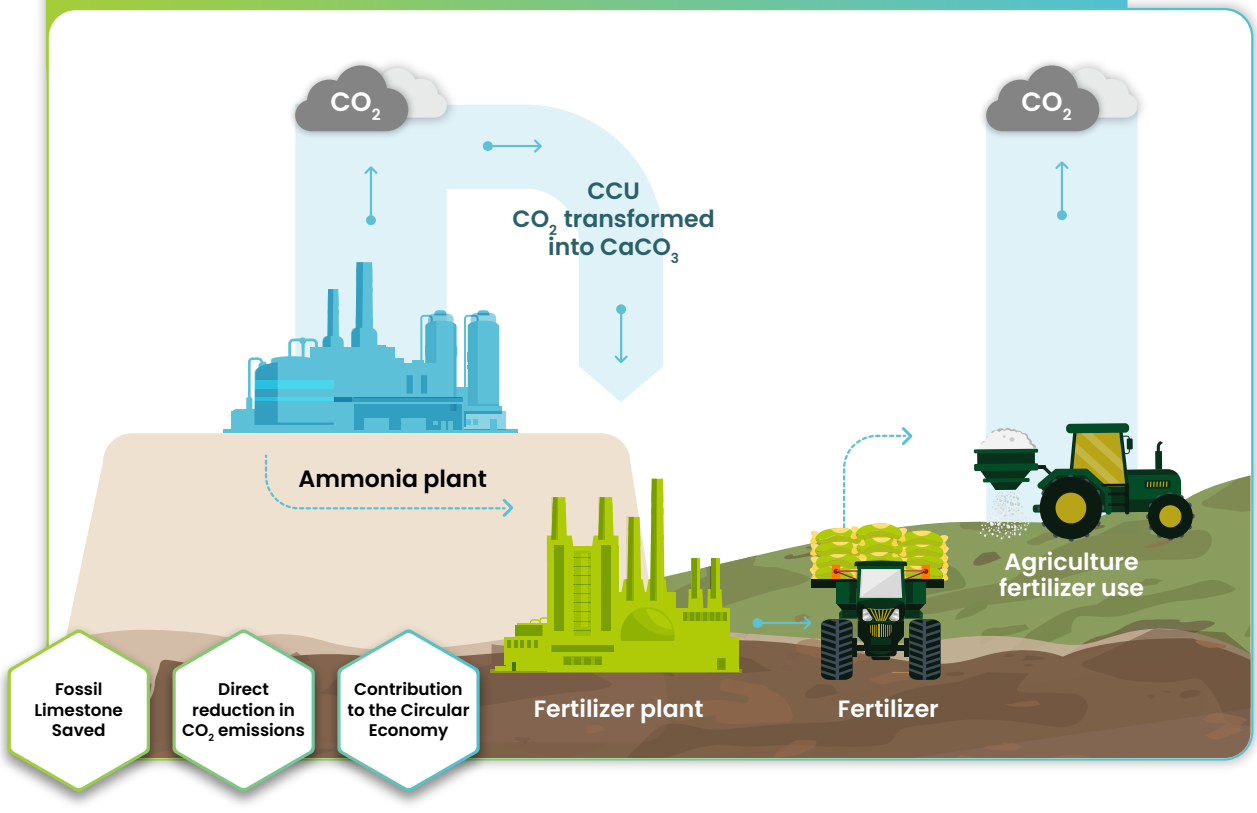
In the manufacturing of ammonia, carbon dioxide is produced as a co-product. The fertilizer industry uses this carbon dioxide for the production of calcium ammonium nitrate (CAN).

1 Production of calcium ammonium nitrate (CAN)

A) CLASSICAL PRODUCTION OF CALCIUM AMMONIUM NITRATE (CAN)

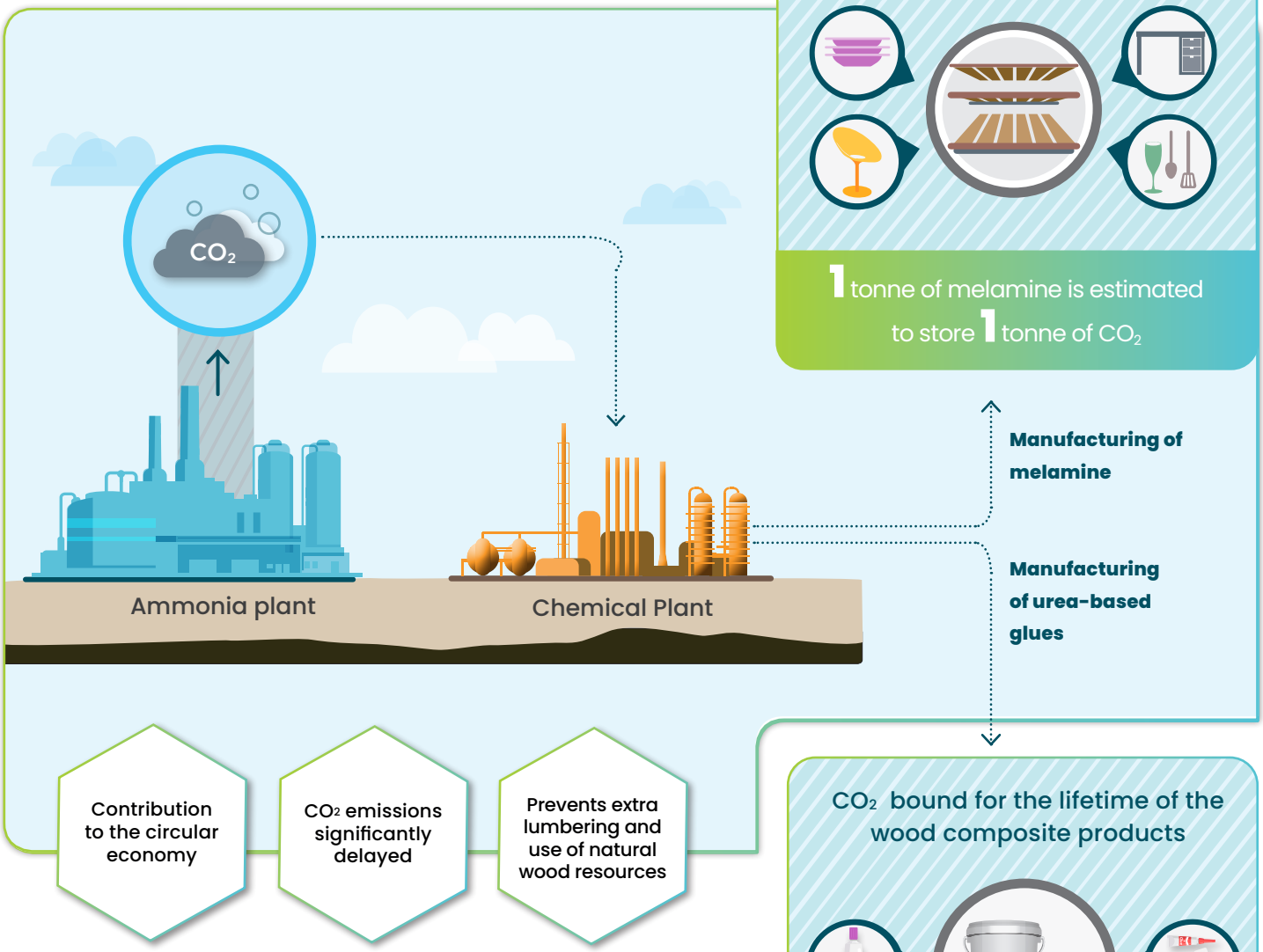


B) CCU TECHNOLOGY PRODUCTION OF CALCIUM AMMONIUM NITRATE (CAN)



CO_2 from ammonia plants is used in various downstream industrial processes which capture the carbon in products with a high longevity, such as in melamine and in glues and resins.

2 Production of melamine and urea-based glues



Contribution to the circular economy

CO_2 emissions significantly delayed

Prevents extra lumbering and use of natural wood resources

DID YOU KNOW?

In the ammonia production process, a highly concentrated CO_2 stream is already produced, making it a low hanging fruit for CCS (carbon capture and storage) when such facilities will become available. This so-called "blue" ammonias (with CCS) is another way of decarbonising the fertilizer production sector. Other long-term solutions to decarbonise ammonia production (such as electrolysis) are being developed, requiring further technological advancement.

[1] The lifetime of the melamine products is estimated at 20-50 years

Role of legislation in promoting good environmental practices

The EU Emission Trading System (EU-ETS) is a cornerstone of the European Union's policy to combat climate change and reduce greenhouse gases cost-effectively.

The production of ammonia and of its downstream products is affected by the EU ETS regulation.

Manufacturing companies need to hand over an emission allowance for each ton of CO_2 equivalent "emitted" during the production of ammonia.

The use of carbon dioxide in downstream products like melamine and calcium carbonate, where CO_2 is bound in those products, reduces the emissions from the ammonia plants to the atmosphere. This reduction needs is recognized in the emission reporting of ammonia plants. The carbon dioxide bound in stable products during their use phase is not reported as emissions.

The uptake of CCUs activities will be further developed in the years to come. To this end, European Commission recently published a proposal for a voluntary EU Certification of Carbon Removals which aims to increase the EU's capacity to quantify, monitor and verify carbon removals such as CCS, CCU and Carbon Farming practices.

Fertilizers Europe

Fertilizers Europe represents the majority of fertilizer producers in Europe and is recognised as the dedicated industry source of information on mineral fertilizers. The association communicates with a wide variety of institutions, legislators, stakeholders and members of the public who seek information on fertilizer technology and topics relating to today's agricultural, environmental and economic challenges. The Fertilizers Europe website provides information on subjects of relevance to all those interested in fertilizers contribution to global food security.

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