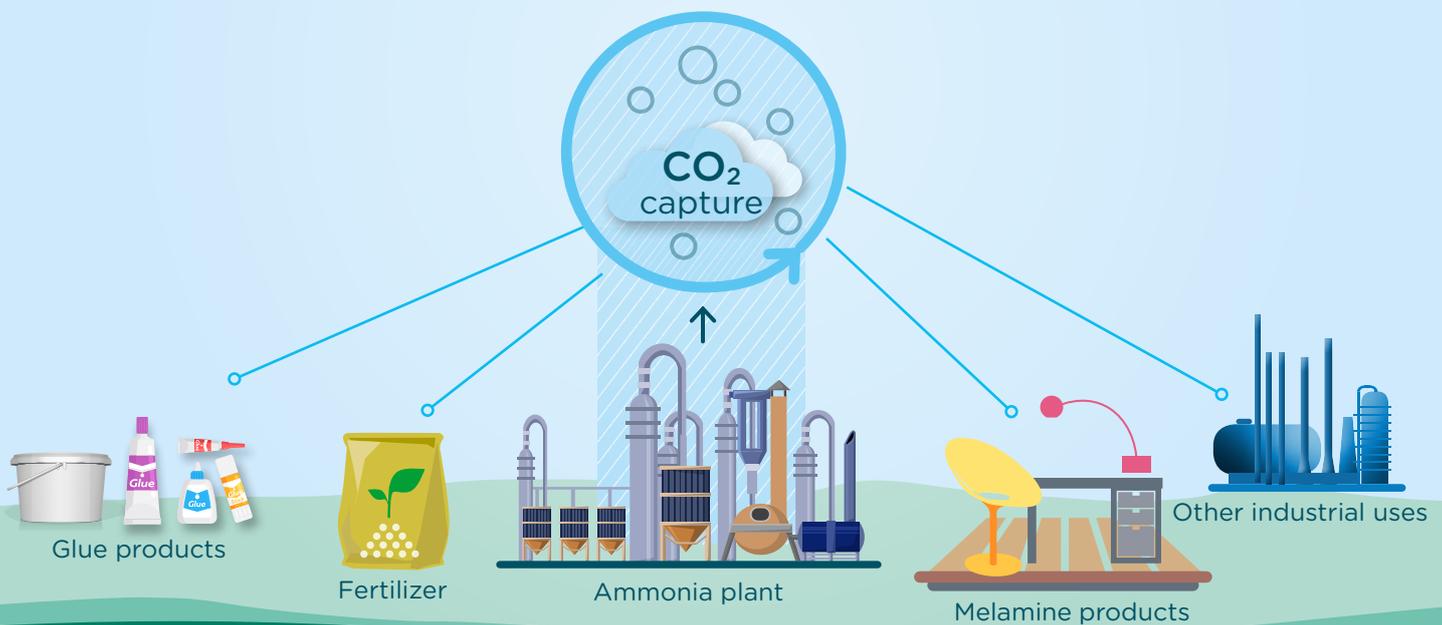


Carbon Capture and Utilization

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 CO₂ 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.

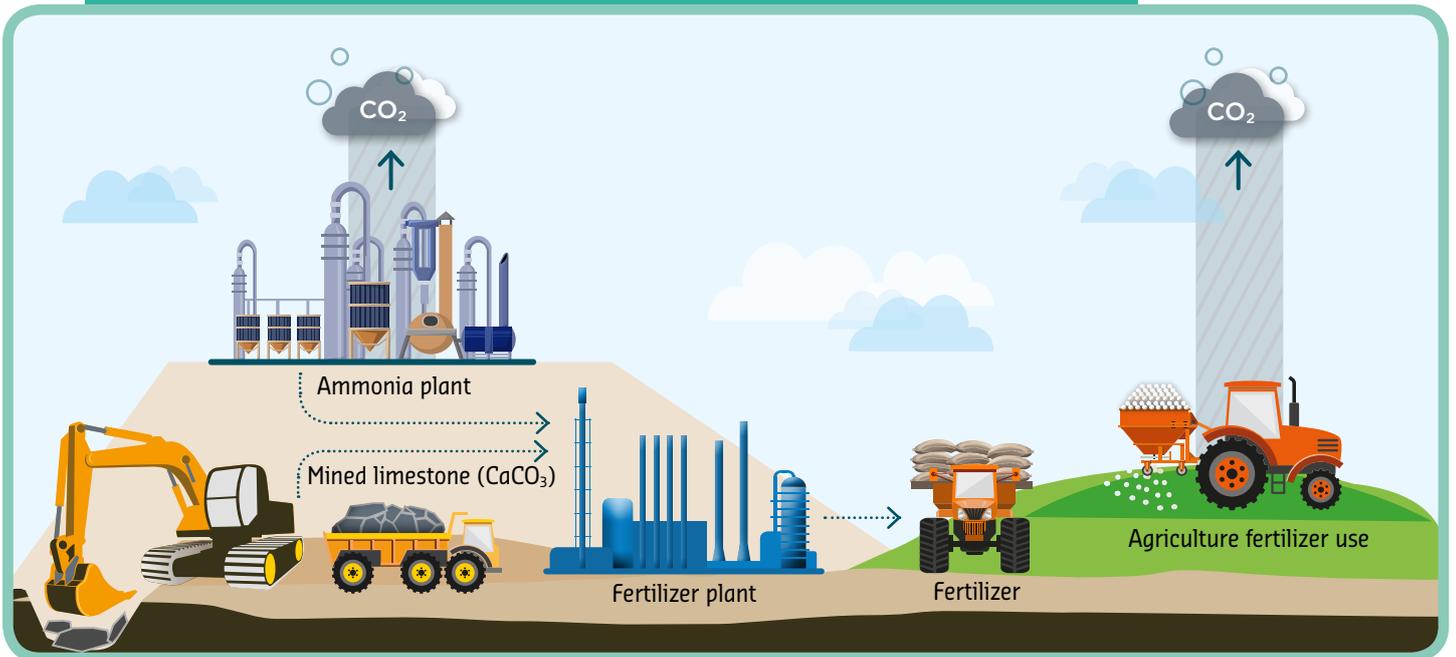
However, the development of these technologies and seizing opportunities that stem from these technologies depends on CCU being recognized as part of the EU's climate policy and given credit for negative emissions.

CCU and fertilizers industry

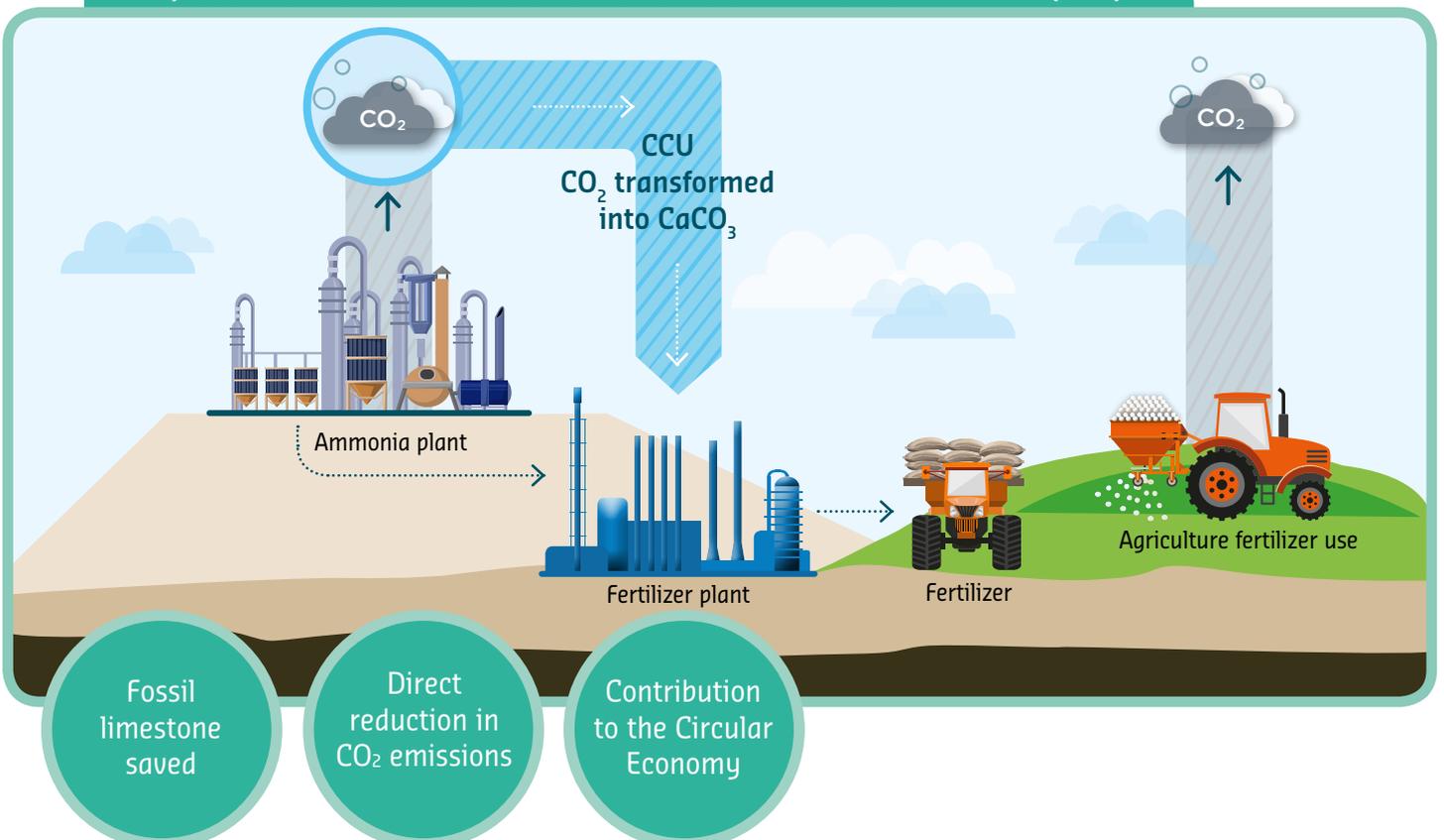
In the manufacturing of ammonia, carbon dioxide is produced as a co-product. The fertilizer industry uses this carbon dioxide for the production of calcium ammonium nitrate (CAN).

1 Production of calcium ammonium nitrate (CAN)

A) CLASSICAL PRODUCTION OF CALCIUM AMMONIUM NITRATE (CAN)

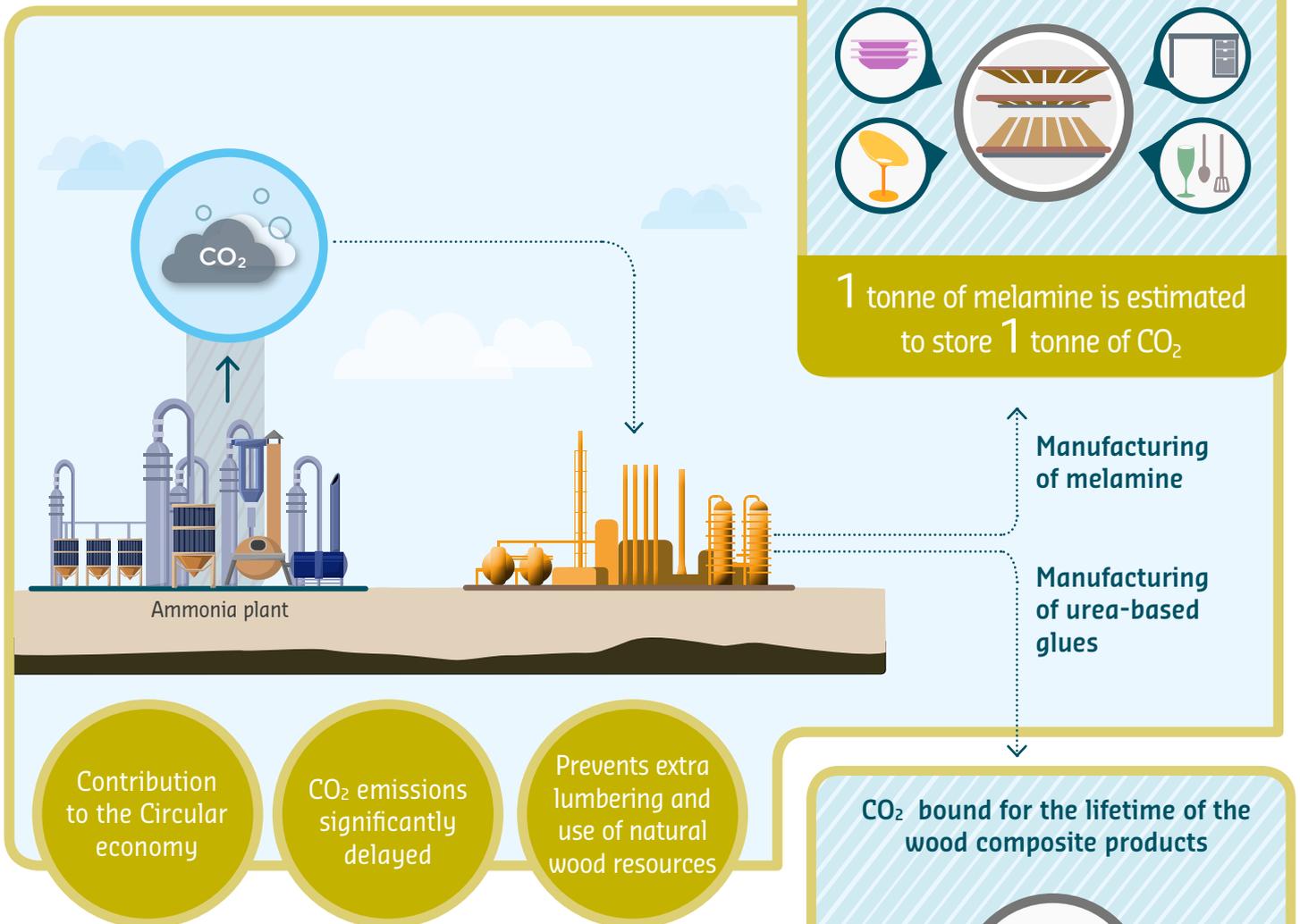


B) CCU TECHNOLOGY PRODUCTION OF CALCIUM AMMONIUM NITRATE (CAN)



CO₂ 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



? DID YOU KNOW?

In the ammonia production process, a highly concentrated CO₂ 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) require 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 CO₂ equivalent "emitted" during the production of ammonia.

All CO₂ formed during the production of ammonia is considered as emitted under the current ETS legislation. Part of the CO₂ produced, however, is used in the production of downstream products like melamine and calcium carbonate and bound in these products.

The use of carbon dioxide reduces the emissions from the ammonia plants to the atmosphere. This reduction needs to be recognized in



the emission reporting of ammonia plants; the carbon dioxide bound should not be reported as emissions.

Consequently, no emission allowances ought to be surrendered for carbon dioxide that is captured and used.

The industry proposal is in line with the European Court of Justice ruling in the Schaefer Kalk² case. The Court ruled that carbon dioxide, which is subsequent to its production, chemically bound in other products and thus not emitted into the atmosphere, is not to be included in the emissions of the carbon dioxide producing plant of first instance.

2 - Schaefer Kalk GmbH & CO, KG v Bundesrepublik Deutschland [2017] EU ECJ C-460/15, on 19 January 2017.



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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Infinite fertilizers guides the European fertilizer industry's initiatives to ensure that Europe's farmers have access to a variety of safe, high quality, locally produced products, as well as information on their use, environmental impact and nutrient recycling opportunities.