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Lime
Association

EuLA Feedback on the European Commission's public consultation on Industrial Carbon Management – carbon capture, utilisation and storage deployment

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EuLA, the European Lime Association, represents European non-captive lime production through its 24 covered Member States (companies & national associations). Lime is one of the essential building blocks of modern industry. It is used in many essential processes, such as making construction buildings, producing iron and steel, treating contaminated land, purifying drinking water, making sugar and even cleaning gases from powers stations. Lime and its derivatives are also important additives for making paper, glass, and agricultural products.

The European Lime Association welcomes the opportunity to contribute to the European Commission's public consultation on industrial carbon management. According to the International Energy Association, a significant scaling-up of CCUS is needed to provide the momentum for further technology development and cost reductions, and to foster progress across a broader range of applications in the longer term.[1] Therefore, it is encouraging to see the Commission recognize the need for an EU strategy on industrial carbon management, establishing a vision for the deployment of carbon capture, utilisation and storage (CCUS) and industrial carbon removals in the EU. The large-scale deployment of these technologies will be critical to achieve Union-wide climate neutrality by 2050.

Carbon Capture, Utilisation & Storage Technologies

CCUS technologies offer an indispensable tool to mitigate CO_2 emissions from hard to abate sectors such as lime, where approximately 70% of emitted CO_2 is unavoidably released by the chemical process (limestone decarbonation). By capturing and storing CO_2 emissions, CCUS will enable the lime industry to continue operations while minimizing emissions. In fact, it is estimated that by 2050, thanks to the deployment of CCUS technologies, the European lime sector will become carbon-negative. CCUS is thus crucial for achieving carbon neutrality targets and offsetting hard-to-abate emissions. Furthermore, CCUS technologies can be used in combination with carbon utilization, where captured CO_2 is converted into valuable products. CO_2 can be utilised in the production of chemicals, fuels, building materials, and other commodities. This approach not only reduces emissions, but also promotes resource efficiency and the transition towards a circular economy.

[1] International Energy Association, *Energy Technology Perspectives*, 2020.

Developing shared infrastructure for the transport (and intermediate storage) of CO_2 before sequestration or use must be a priority. Therefore, it is integral to identify existing infrastructure gaps, the potential for repurposing existing facilities, and the development of new infrastructures to support the widespread deployment of CCUS technologies. Integrated network planning will help to coordinate efforts across member states, ensuring a more harmonized and efficient approach towards emission reduction. Furthermore, it facilitates the establishment of interconnected CCUS systems, enabling energy intensive industries such as lime to work collectively towards achieving ambitious carbon reduction targets. By addressing these infrastructural needs, we can remove barriers to large-scale deployment of CCS and CCU technologies, fostering the growth of a viable market for carbon management.

Permitting across the value-chain

A comprehensive and coordinated approach to permitting, in collaboration with Member States, is important for deploying and scaling up industrial carbon management technologies. With multiple stages involved – from capturing carbon, to transporting and storing it – a coordinated permitting process ensures smooth integration and collaboration between industries. The call for a streamlined process, encompassing a one-stop-shop approach, single permits, simplified appeal proceedings, and shorter assessment and approval times, holds relevance for all project stages. Therefore, these measures should be implemented consistently across the value chain rather than limiting their application solely to the manufacturing sector.

Carbonation & incentivizing the acceleration of carbon removals

While the EU strives to reduce emissions across sectors, there may still be some residual emissions that are challenging to eliminate completely. Carbon removal can help offset these hard-to-abate emissions. By actively removing CO_2 from the atmosphere, carbon removal technologies contribute to long-term climate stability. For instance, lime-based products can contribute to carbon removals. Lime reverts to limestone by capturing ambient CO_2, in a process called carbonation (or mineralisation by carbonation). This process occurs as a result of exposing lime to air, and it is central to many uses of lime. For example, mortar containing lime captures CO_2 from the atmosphere and produces calcium carbonate crystals, which hardens the mortar over time. On average, 33% of the

lime sector's process emissions will be recaptured during the normal lifecycle of its products[2].

This recapturing process mentioned above can be optimised by maximising the exposure of CO_2, or through pressure and time. With these adjustments, studies have shown that there is a combined carbonation potential of approximately 40% of lime's process CO_2 emissions. Most of the carbonation occurs within the first year, which ensures that the benefits stemming from that are achieved before lime is removed. Most importantly, removals via carbonation are permanent, since the only way CO_2 is once again released is if large amounts of heat is applied as used in the lime production process. In other words, without remanufacturing into lime, the CO_2 remains permanently locked-up. Specifically for the lime sector, when CO_2 is stored in a lime-based product, it is never released into the atmosphere. The very essence of carbonation/mineralization is that lime binds with the CO_2 to turn into calcium carbonate crystals that will not release CO_2. Storage in these products is therefore permanent and should be treated as such.

Conclusion

The creation of an industrial carbon management strategy presents an opportunity to establish a regulatory framework that facilitates the transformation of European industries such as lime. As a hard to abate sector where approximately 70% of emitted CO_2 are unavoidable process emissions, CCUS and carbon removal technologies are required for lime to help the sector decarbonize. EuLA calls on the Commission to establish a comprehensive action plan on CCUS and industrial carbon removals with quantifiable and verifiable milestones looking towards 2050. This includes integrated network planning at the EU level for CO2 infrastructure, transport, and storage, as well as guidelines to streamline infrastructure planning and permitting.

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[2] EuLA (2021) Lime, as a natural carbon sink: Examples of mineral carbonation in lime applications.