EuLA
European
Lime
Association

**EuLA Feedback on the European Commission's public consultation on the Net Zero Industry Act**

Brussels, 23 June 2023

***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 Commission will publish a Communication to begin the process of establishing a 2040 climate target to help the EU achieve climate neutrality by 2050. The European Lime Association welcomes the opportunity to provide feedback that will inform the forthcoming impact assessment.

EuLA calls on the Commission to take ambitious action to achieve climate neutrality by 2050. To reach this goal, EuLA invites the Commission to propose between -75% and -80% emission reduction by 2040 compared to 1990 levels. This target is in line with the EU's current trajectory to reduce emissions by -55% by 2030 and achieve climate neutrality by 2050. To achieve these reduction targets, the European Commission will have to deploy a number of legislations building on existing climate targets and objectives. EuLA emphasises the need for new targets to work harmoniously with existing legislation.

**Lime: essential to the value-chain**

Lime plays a vital role in the production chain of many critical raw materials, making it an essential component in various net-zero technologies and products. For instance, lime is a crucial component in steel production, as it is used to remove impurities while refining iron ore into iron. Lime is a critical element in the development of net-zero technologies, such as carbon capture and storage (CCS) systems. Therefore, lime's indispensable role in the production chain of critical raw materials and its contribution to net-zero technologies highlight its significance in supporting a sustainable value chain. It is critical that the Commission highlight the importance of energy-intensive industries such as lime by referring to all available technologies that will put the EU on track to climate neutrality.

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**Supporting & scaling up CCUS**

The adoption of the EU Green Deal, the Climate Law and the subsequent proposals to increase energy and climate targets for 2030 have made carbon capture and storage technologies an important part of the EU decarbonisation effort. 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] Including CCUS technologies in the European Union's 2040 climate target can bring several benefits and support the overall decarbonisation efforts.

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 minimising 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 utilisation, where captured $CO_2$ is converted into valuable products. $CO_2$ can be utilised to produce chemicals, fuels, building materials, and other commodities. This approach reduces emissions and promotes resource efficiency and the transition towards a circular economy.

Developing shared infrastructure for the transport (and intermediate storage) of $CO_2$ before sequestration or use (CCUS) should be a priority. EuLA calls on the Commission to explore the current status of CCUS infrastructure networks across the EU in the upcoming impact assessment by identifying existing infrastructure gaps, the potential for repurposing existing facilities, and the development of new infrastructures to support the widespread deployment of CCUS technologies. By assessing the availability of dense CCUS infrastructures, the European Commission can unlock significant opportunities for emissions reduction, industrial decarbonisation, and the growth of low-carbon industries. Furthermore, such an assessment would contribute to the achievement of the EU's climate targets, support the development of innovative technologies, and enhance energy security.

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

**Meeting increasing electricity demands**

The deployment of CCUS technologies will significantly enhance the total electricity consumption of energy-intensive industries. Many low-carbon technological solutions result in large increases in electricity consumption: CCUS, production of hydrogen and e-fuels, electrified industrial thermal processes, electrified transportation, etc. Affordable access to biomass-derived fuels, to hydrogen and e-fuels as energy vectors, as well as to related transportation infrastructure, must be guaranteed.

For the lime sector, due to the progressive deployment of carbon capture technologies and electrified lime kiln technologies, the total electricity consumption is expected to increase by 80% by 2030 and to be multiplied by a factor of 10 by 2050 compared to 2019 levels. A lime kiln operating with biomass-derived fuels, from which $CO_2$ emissions are captured and permanently stored/used, acts as an effective 'carbon removal booster', drawing down $CO_2$ concentrations from the atmosphere. Biomass-derived energy resources should consequently be allocated in priority to the lime sector. The supply of large amounts of low-carbon/carbon-neutral electricity at affordable prices must be secured for European energy-intensive industries. The industry's transformation goes hand in hand with the decarbonisation of the power sector.

**Carbonation & incentivising 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].

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

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 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 the 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 are 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/mineralisation 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 trajectory toward climate neutrality will require ongoing and substantial emission reductions throughout the coming decades. Including CCUS technologies in the EU's 2040 climate target recognises their potential to reduce emissions, support industrial decarbonisation, promote circular economy principles, enable negative emissions, foster innovation, and ensure a smooth transition towards a net-zero future. However, it is also important to implement CCUS as part of a comprehensive strategy that combines other measures such as energy efficiency, renewable energy deployment, carbon removals, and sustainable land use practices for a holistic approach to emissions reduction.

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