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Holcim's Vision for Carbon Capture Utilization and Storage (CCUS) in the EU

An essential technology to achieve carbon neutrality

By being the first global building materials company to sign in September 2020 the UNGC's "Business Ambition for 1.5°C" initiative, with a 2030 SBTi-verified action plan, **Holcim has embarked on a net-zero journey**. Over the next decade, the company will maximize the deployment of existing technologies to reach a 38% intensity reduction in its cementitious materials (vs. 1990). To lay the groundwork for the net-zero journey beyond 2030, Holcim is working to develop and deploy new and advanced technologies. This includes novel binders, low clinker cements, an increased use of recycled materials in processes and products, and piloting Carbon Capture Utilization and Storage (CCUS) projects.

Given the nature of cement manufacturing (since most of the CO₂ is inevitably emitted from the decarbonation of the limestone, inherent to the clinker production process and regardless of the burning technology employed), **reaching net zero in cement manufacturing will require the deployment of CCUS technologies at scale**. International experts, such as the IEA in its cement roadmap, have identified the need for CCUS projects to begin at scale from 2030 onwards.

Holcim is piloting over 20 CCUS projects worldwide including several in the EU:

- **Westküste100 in Germany**: In this project, which received the go-ahead and funding approval from the German Federal Ministry of Economic Affairs and Energy in August 2020, CO₂ from the Holcim Lägerdorf plant will be transformed with green hydrogen into a synthetic fuel to serve the Hamburg airport. Westküste 100 is a ten-company consortium.
- **ECCO2-LH in Spain**: Holcim is developing a pilot in collaboration with Carbon Clean and Sistemas de Calor, to capture CO₂ from flue gas at its Carboneras plant and turn it to agricultural use for accelerated crop production. This will increase farm efficiency by reducing water and soil consumption ratio per kg of vegetable production.
- **Carbon2ProductAustria (C2PAT)**: Holcim, OMV, Verbund and Borealis are planning to build a Carbon Capture and Utilization (CCU) plant, with the aim of capturing CO₂ during the production of cement and using it for the manufacture of high-quality plastics, olefins and green fuels. To this end, the parties plan to build a plant on an industrial scale at the Lafarge Mannersdorf cement plant site in Austria, starting with a demonstration plant by 2025 and full industrial scale by 2030. Such projects are deemed strategic and have received the support from Austrian authorities.

We are convinced that CCUS technologies will be deployed only with industrial partners and via the creation of an entire ecosystem to develop capture technologies and to identify transportation and transformation systems, all the way to end-users and storage facilities.

This is why all these projects are developed with local and global partners. At global scale for instance, Holcim has recently partnered with Schlumberger New Energy to explore the development of Carbon

Capture and Storage (CCS) solutions, with a feasibility study of capturing carbon from two Holcim cement plants, including one in Europe, using Schlumberger's carbon sequestration technologies.

However, **despite our conviction and commitments, making it an investable proposition with sound business cases remains a major cause for concern and obstacle.** Indeed CCUS projects typically lead to a production cost to carbon cost ratio of 1:3, for which there are few sound financial answers today. Overcoming this challenge requires unprecedented collaboration across industry and with policy makers to create the necessary infrastructure and regulatory conditions that will enable us to build sound business cases and give us the needed competitive edge.

The necessity of an unprecedented collaboration to bring CCUS to scale in the EU

Building on our experience and our pilot projects, we are convinced that the large-scale deployment of CCUS technologies is broader than the technical challenges faced by individual industrial sectors. It forms an economy-wide endeavor that **requires large-scale investment in CO₂ transportation and storage networks, social acceptance of permanent storage technologies and the creation of a large-scale demand for captured CO₂ as an industrial feedstock.**

No single industry or actor can achieve large-scale deployment of CCUS on its own. **This is why we are convinced that the development and deployment of CCUS technologies should be approached as an industrial alliance by the EU, in support of the Green Deal's ambition, on the model of batteries, hydrogen, etc.** Such approach will enable to bring all actors around the table with the aim to:

- Foster collaboration between small innovative start-ups and large industries
- Develop pan-EU CO₂ transportation and storage networks
- Support funding to accelerate deployment of such technologies
- Identify regulatory hurdles including the lack of harmonization of the regulatory framework between Member States and the gaps in carbon accounting and verification mechanisms for CCU and CCS technologies
- Ensure social acceptance of permanent storage technologies

Such alliance would enable to develop competitive decarbonization solutions for hard-to-abate sectors like ours and ensure that the EU industry becomes carbon-neutral while avoiding any carbon leakage risk. With a long-term vision, we can lay together the groundwork for such technologies as part of the portfolio of solutions needed to achieve the EU's climate neutrality ambitions.

An adequate regulatory framework

Deploying CCUS technologies, at scale, requires a business case underpinned by an enabling regulatory framework that covers all technologies. **The decarbonisation business case for large-scale CCUS projects relies on the ability of the plant that captures the CO₂ and does not emit it to the atmosphere to discount it as such in carbon accounts** (i.e. as CO₂ that is not emitted to the atmosphere must not be accounted for), regardless of the downstream use of the carbon (incl. for permanent geological storage, for the production of precipitated calcium carbonate as well as other uses such as e-fuels). The investments and operational costs of such capture technology

are born at the industrial site capturing the CO₂, which in turn must be able to deduct the captured CO₂ from its emissions as it is not emitted to the atmosphere and account it as such in carbon reports.

A central piece of this regulatory framework is the carbon accounting framework, or the so-called MRR (Monitoring and Reporting Regulation¹ for the monitoring and reporting of greenhouse gas (GHG) emissions and activity data pursuant to the EU ETS Directive 2003/87/EC. **Currently, the MRR does not include any provisions for the CO₂ that is captured and transferred out of the installation for use as an industrial feedstock and / or in products substituting more carbon intensive ones (e.g. to produce synthetic fuels and materials).** This creates a significant disincentive for any such large scale projects that require unprecedented investments.

The “fit for 55” package under preparation provides a unique opportunity to create the necessary regulatory conditions for large scale innovation to become a reality across Europe.

¹ COMMISSION IMPLEMENTING REGULATION (EU) 2018/2066 of 19 December 2018