HeidelbergCement Driving Carbon Capture & Storage/Utilization

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As one of the leading global players in the cement industry, HeidelbergCement (HC) is highly engaged in mitigating climate impacts. By increasing the energy-efficiency, the use of biomass fuels and replacing clinker in cement, HC has reduced the net CO_2-emissions per ton of cement in 2015 by 23% compared to 1990. As founding member of the Cement Sustainability Initiative (CSI, part of WBCSD) a CSI Roadmap has been developed which emphasizes the importance of applying carbon capture and storage or utilization to further reduce the CO_2 footprint of the industry. As we consider Carbon Capture and Utilization (CCU) applications complementary to CCS, we are monitoring this sector for transformative solutions to the climate problem.

Technologies for CCU are at different stages of maturity and with a wide variety of potential applicability and hurdles to overcome. HeidelbergCement's strategy is to implement quick-wins, even when they are now small in terms of CO_2-abatement, and to systematically develop the larger scale potentials in collaboration with technology developers and downstream value chain partners.

The communication will highlight some examples of CCU initiatives carried out by HC. For example, after finalizing our R&D-programs in Degerhamn-Sweden, Canakkale-Turkey and Gargenville-France, we consider the growth of micro-algae using flue gas from cement kilns without purification, and generating dry biomass for animal feed, as TRL 6. In next steps we are initiating CCU-micro-algae demonstration programs to reach TRL7 to TRL8.

Another strategic development of HC which is able to be connected to a large market is the use of CO_2 and green H_2 for the generation of methane suitable as low-carbon fuel for the transport sector. In case this is done in oversupply situations, it serves as a power-to-gas approach.

Finally, CCU-technologies fitting best to the cement and aggregate industry are those that use CO_2 from flue gas to carbonate (waste) minerals into building materials. These processes use exhaust gases to carbonate for example olivine or other products that consist of a considerable amount of free lime, such as incineration ashes or oil shale ashes. Such technologies are different from classical capture technologies, as they bind the CO_2 in a long lasting construction material that has an improved environmental footprint compared to classical binder materials.