

Carbon Dioxide Capture in Cement Manufacturing

Description:

The US cement industry produces over 41million metric tons (MMT) of process-related CO₂ per year¹. That total excludes the CO₂ released from the burning of fossil fuel to heat the process. This invention provides a method of capturing much of that CO₂ for sale or storage.

Using several possible methods, the CO₂ may be captured and reintroduced into the system before being captured again and extracted from the system. The initial reuse of the gas influences the production of alite and belite. The alite to belite ratio influences the curing and strength properties of the concrete. Using the CO₂ in this way allows the cement manufacturer to provide customization and value to customers while significantly reducing greenhouse gas emissions.

Applications:

- Cement production
- Carbon-neutral buildings, residences, and municipal structures
- Industrial CO₂ production

Benefits:

- Reduces waste CO₂
- Creates hydrating belite and alite, which control early and late cure strengths of concrete
- CO₂ is clean and sufficient for sale or storage

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¹ (2010) US Greenhouse Gas Inventory Report: 1990-2009. US Environmental Protection Agency. 2010.