



Carbon
Leadership
Forum
San Francisco

BAY AREA INNOVATOR PROFILE

Product: Cement

BRIMSTONE

Location: Oakland

[Brimstone Energy](#) team of scientists based in the Bay Area aim to substantially reduce greenhouse gas emissions globally by targeting cement, one of the most ubiquitous and emissions intensive materials on the planet. They have developed a carbon-negative process for making traditional portland cement and a supplementary cementitious material (SCM), the glue that binds concrete together. With their product, they aims to reshape the global cement and concrete industry.

Cement accounts for 8% of global carbon emissions annually, and the vast majority (80-95%) of concrete's carbon footprint. Brimstone's innovative manufacturing process replaces traditional limestone (calcium carbonate)



with calcium silicate. This approach eliminates all process emissions and also removes additional carbon dioxide from the atmosphere. Brimstone creates a product chemically identical to traditional portland cement, thus reducing the need and time of new training required by alternative cement technologies. Their innovation can radically reduce the carbon intensity of today's existing building practices.



In traditional portland cement production, limestone is mined, ground up and then super heated with clay in order to make the finished base cement product. About 40% of the carbon emissions come from the energy used to generate high temperatures and the rest from a chemical reaction. Brimstone's method using calcium silicate does not release carbon dioxide when processed. The SCM produced in the process is also a viable alternative to most common SCM today, fly ash, which is derived from coal plants and poses potential health risks.

Brimstone's process also produces a magnesium waste product, which they divert for use as a carbon dioxide "sorbent" to directly capture carbon dioxide from the ambient air. The result is a process that transforms cement from carbon-intensive to carbon-negative.

Brimstone is currently scaling up their operations, having proven the technology at a lab-scale. In 2022, Brimstone acquired a site outside of Reno, Nevada where it will build its first pilot plant. Brimstone is concurrently identifying sites for the company's first commercial scale manufacturing facility. Brimstone is working with prospective customers to enter advance market commitments to buy Brimstone's cement and SCM when they become available.



Visit their website for more: brimstone.energy