

Why electric cement is bad

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Founded by two MIT battery scientists, the startup is developing an entirely new way to make cement. Instead of heating crushed-up rocks in lava-hot kilns, Sublime's technology zaps them in ...

Researchers have come up with a new way to store electricity in cement, using cheap and abundant materials. If scaled up, the cement could hold enough energy in a home's concrete foundation to fulfill its daily power needs. Scaled up further, electrified roadways could power electric cars as they drive.

Cement production emits large amounts of toxic substances into the air, which can worsen air quality and lead to respiratory diseases. For example, cement factories have been known to release Sulphur dioxide and Carbon monoxide, which can cause or aggravate respiratory issues, like asthma, or cause damage to central nervous systems.

If cement was a country, it would be the third biggest source of emissions after China and the US, responsible for 7.5% of human-made CO₂. The problem is the material's uniquely polluting...

Making one kilogram of cement sends one kilogram of CO₂ into the atmosphere. Worldwide every year cement and concrete production generates as much as 9 percent of all human CO₂ emissions ...

Most people are so used to being surrounded by concrete that we do not even notice its ubiquity and are unaware of the ecological damage that this tool for modernisation has caused.

Climate experts at COP27 called for a reduction of greenhouse gas (GHG) emissions from the construction sector, comprising the concrete, iron and steel industries, which collectively generate 27 percent of the world's industrial carbon emissions. Of these, concrete is responsible for over 7 percent of the world's carbon emissions.

Concrete is created by mixing a binding mass, either cement or lime, with fine or coarse aggregates (like stone, gravel or sand) and water.

The cement is a manufactured mixture of materials that includes calcium, silicon, aluminium and iron, among other ingredients. While concrete has been used since ancient civilisations, like the Mayans, the Ancient Egyptians and the Romans, who used different ingredients like limestone and volcanic stone, modern concrete mainly relies on Portland cement.

The creation of cement is the most carbon-intensive portion of the concrete process. This comes down to two main activities: the calcination of limestone and the heating of cement kilns.

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To create Portland cement, limestone undergoes a calcination process, which releases large amounts of CO₂ from the chemical reaction. This is the concrete industry's most-pollutive activity, releasing up to 50 percent of the cement industry's carbon emissions.

Additionally, to create cement from raw materials into clinker (an intermediate product), large amounts of energy are required to heat, mix and cool the ingredients in giant kilns.

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