

Indian firm makes carbon capture breakthrough

Carbonclean is turning planet-heating emissions into profit by converting CO₂ into baking soda – and could lock up 60,000 tonnes of CO₂ a year



A breakthrough in the race to make useful products out of planet-heating CO₂ emissions has been made in southern [India](#).

A plant at the industrial port of Tuticorin is capturing CO₂ from its own coal-powered boiler and using it to make baking soda.

Crucially, the technology is running without subsidy, which is a major advance for carbon capture technology as for decades it has languished under high costs and lukewarm government support.

The firm behind the Tuticorin process says its chemicals will lock up 60,000 tonnes of CO₂ a year and the technology is attracting interest from around the world.

Debate over carbon capture has mostly focused until now on [carbon capture and storage](#) (CCS), in which emissions are [forced into underground rocks](#) at great cost and no economic benefit. The Tuticorin plant is said to be the first unsubsidised industrial scale example of carbon capture and utilisation (CCU).

There is already a global market for CO₂ as a chemical raw material. It comes mainly from industries such as brewing where it is cheap and easy to capture.



Until now it has been too expensive without subsidy to strip out CO₂ from the relatively low concentrations in which it appears in flue gas. The Indian plant has overcome the problem by using a new CO₂-stripping chemical.

It is just slightly more efficient than the current CCS chemical amine, but its inventors, Carbonclean, say it also needs less energy, is less corrosive, and requires much smaller equipment meaning the build cost is much lower than for conventional carbon capture. The new kit has been installed at Tuticorin Alkali Chemicals. The firm is now using the CO₂ from its own boiler to make baking soda – a base chemical with a wide range of uses including glass manufacture, sweeteners, detergents and paper products. The firm's managing director, Ramachandran Gopalan, told BBC Radio 4: "I am a businessman. I never thought about saving the planet. I needed a reliable stream of CO₂, and this was the best way of getting it." He says the plant now has virtually zero emissions to air or water.

Carbonclean believes capturing usable CO₂ can deal with perhaps 5-10% of the world's emissions from coal. It's no panacea, but it would be a valuable contribution because industrial steam-making boilers are hard to run on renewable energy.

The inventors of the new process are two young chemists at the Indian Institute of Technology in Kharagpur. They failed to find Indian finance and were welcomed instead by the UK government, which offered grants and the special entrepreneur status that whisks them through the British border.

The firm's headquarters are now based in London's Paddington district. Its CEO, Aniruddha Sharma, said: "So far the ideas for carbon capture have mostly looked at big projects, and the risk is so high they are very expensive to finance. We want to set up small-scale plants that de-risk the technology by making it a completely normal commercial option."

By producing a subsidy-free carbon utilisation project, Carbonclean appears to have something of a global lead. But it is by no means alone. Carbon8 near Bristol is buying in CO₂ to make aggregates, and other researchers are working on making plastics and fuels from waste CO₂.