

Carbon capture: Solved by software?

January 23, 2020

[Carbon capture: Solved by software?](#)

by Richard Middleton

Most scenarios for a clean-energy future rely on carbon capture—taking CO₂ emissions from their sources, such as power plants, then sequestering them underground or converting the carbon into a usable product like smart concrete. While making carbon capture economically viable has long faced significant challenges, this environmentally friendly technology may finally be on the threshold of success.

By 2025 the Department of Energy plans to create vast, regional carbon sequestration programs across the country by partnering with private utilities. But while researchers developed the science behind removing and storing carbon emissions decades ago, connecting an emitter to a storage center has always posed problems.

For example, at the National Carbon Capture Center in Alabama, where the DOE has tested the technology since 2009, equipment on the coal power plant's smokestacks separates the carbon from other emissions. The byproduct is then transported in the form of liquid to a storage sink, a subterranean reservoir full of the same porous, sedimentary rock found in Zion National Park—except that the rock exists thousands of feet below the earth's surface.

At this depth, carbon can be stored below a caprock layer, a virtually impenetrable stratum of rock, most often shale. Sometimes these carbon capture sinks already exist in the form of prior oil extraction projects. Most importantly, transportation costs between emitter and sink must be kept lower than the tax credit so companies can profit, a condition without which they're not likely to invest in the technology.

SimCCS is a software program developed at Los Alamos National Laboratory to solve that problem. The open-source software, which is also being developed and expanded on by universities across the country, finds the most efficient route between a carbon-emitting plant and a sink.

This story first appeared in [Scientific American](#).

Managed by Triad National Security, LLC for the U.S Department of Energy's NNSA