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# Carbon-Reduction Plans Rely on Tech That Doesn't Exist

Instead of scaling up renewable energy, researchers promote unproved ideas

By Naomi Oreskes on August 1, 2022

**A**t last year's Glasgow COP26 meetings on the climate crisis, U.S. envoy and former U.S. secretary of state John Kerry stated that solutions to the climate crisis will involve “technologies that we don't yet have” but are supposedly on the way. Kerry's optimism comes directly from scientists. You can read about these beliefs in the influential Intergovernmental Panel on Climate Change (IPCC) Integrated Assessment Models, created by researchers. These models present pathways to carbon reductions that may permit us to keep climate change below two degrees Celsius. They rely heavily on technologies that

don't yet exist, such as ways to store carbon in the ground safely, permanently and affordably.

Stop and think about this for a moment. Science—that is to say, Euro-American science—has long been held as our model for rationality. Scientists frequently accuse those who reject their findings of being irrational. Yet depending on technologies that do not yet exist is irrational, a kind of magical thinking. That is a developmental stage kids are expected to outgrow. Imagine if I said I planned to build a home with materials that had not yet been invented or build a civilization on Mars without first figuring out how to get even one human being there. You'd likely consider me irrational, perhaps delusional. Yet this kind of thinking pervades plans for future decarbonization.

The IPCC models, for instance, depend heavily on carbon capture and storage, also called carbon capture and sequestration (either way, CCS). Some advocates, including companies such as ExxonMobil, say CCS is a proven, mature technology because for years industry has pumped carbon dioxide or other substances into oil fields to flush more fossil fuel out of the ground. But carbon dioxide doesn't necessarily stay in the rocks and soil. It may migrate along cracks, faults and fissures before finding its way back to the atmosphere. Keeping pumped carbon in the ground—in other words, achieving net negative emissions—is much harder. Globally there are only handful of places where this is done. None of them is commercially viable.

One site is the Orca plant in Iceland, touted as the world's biggest carbon-removal plant. Air-captured carbon dioxide is mixed with water and pumped into the ground, where it reacts with the basaltic rock to form stable carbonate minerals. That's great. But the cost is astronomical—\$600 to \$1,000 per ton—and the scale is tiny: about 4,000 tons a year. By comparison, just one company, tech giant Microsoft (which has pledged to offset all its emissions), produced nearly 14 million tons of carbon in 2021. Or look at carbon capture at the Archer Daniels Midland ethanol plant in Illinois, which, since 2017, has been containing carbon at a cost to the American taxpayer of \$281 million (more than half the total project cost); at the same time, overall emissions from the plant have increased. And the total number of people employed in the project? Eleven. Meanwhile numerous CCS plants have failed. In 2016 the Massachusetts Institute of Technology closed its Carbon Capture and Sequestration Technologies program because the 43 projects it was involved with had all been cancelled, put on hold or converted to other things.

It's obvious why ExxonMobil and Archer Daniels Midland are pushing CCS. It makes them look good, and they can get the taxpayer to foot the bill. The Infrastructure Investment and Jobs Act, passed last year, contained more than \$10 billion for efforts to develop carbon-capture technologies. In contrast, the act contained merely \$420 million for renewable energy—water, wind, geothermal and solar.

Scaling up solar and wind is going to cost money and will need to be supported by effective public policies. The big question is, Why can't we get those programs? One reason is the continued obstructive activities of the fossil-fuel industry. But why do scientists accept this hand-waving? My guess is that, frustrated by the inability of elected officials to overcome the political obstacles, researchers think that getting around the technological obstacles will be less difficult. They may be right. But by the time we know if they are, it may be too late.

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