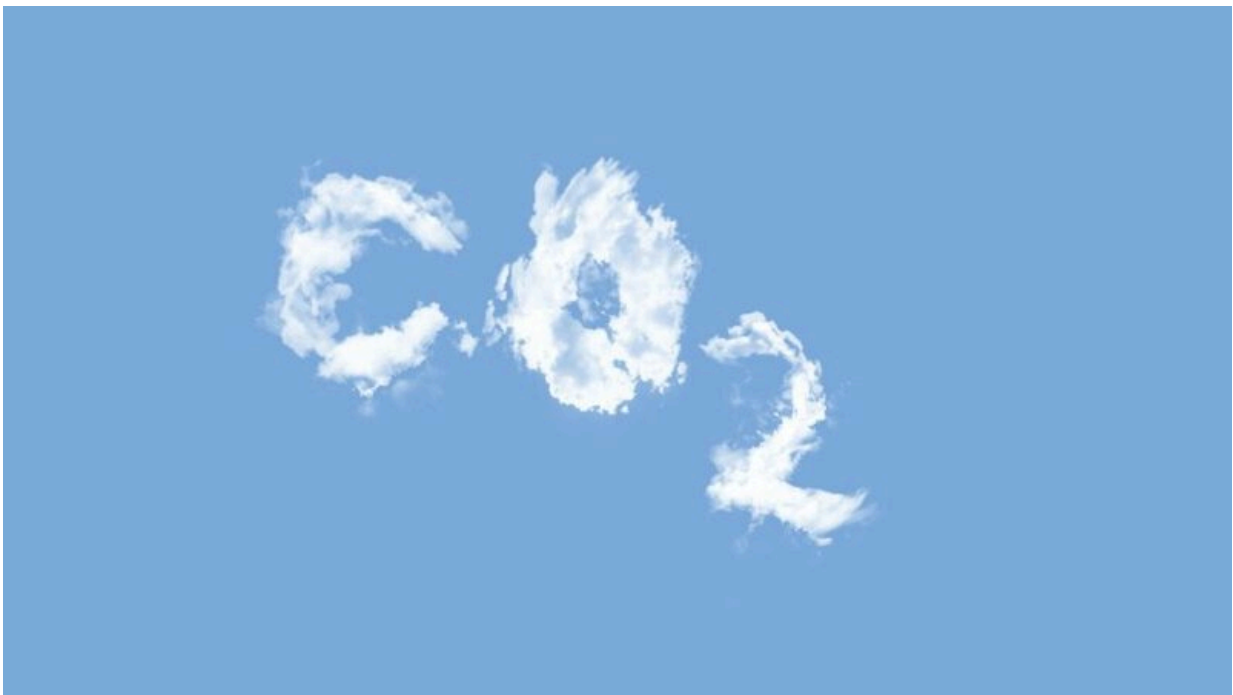


Battle simmers in Illinois over plans to pipe in and store millions of tons of planet-warming carbon dioxide

March 2 2023, by Nara Schoenberg



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On a subfreezing day in January, John Feltham drove his two-seat Kawasaki utility vehicle over neatly furrowed fields glistening with snow. There were deer and coyote tracks, black crows flapping against a powder blue sky, and signs everywhere of Feltham's deep roots in this

fertile land.

The white farmhouse near the road? That was where Feltham's mother grew up. The little cemetery just beyond the cornfield? That was where Feltham's parents, great-grandfather and great-great-grandfather were buried.

Feltham, a farmer in Knox County, 160 miles southwest of Chicago, paused to point out another local sight: his custom sign that reads, "No Trespassing by Navigator CO₂ Surveyors," directed at the Omaha company that wants to send part of a proposed 1,300-mile [carbon dioxide](#) pipeline under land his family has owned for more than 100 years.

"If you post your ground and you catch these people trespassing, you can have them arrested," Feltham said.

The fight over [carbon](#) dioxide—what to do with it and where to store it—is ramping up in Illinois.

The Prairie Research Institute at the University of Illinois at Urbana-Champaign recently released a report showing that Illinois is well-positioned to become a leader in [carbon capture](#), utilization and storage, in which planet-warming carbon dioxide is removed from industrial exhaust or the air and either used or injected into rock deep underground.

Carbon capture has been around for decades in the fossil fuel industry, which uses CO₂ to extract hard-to-reach oil. But recently companies have begun proposing to build major carbon dioxide pipelines in Illinois in the name of decarbonization, or reducing greenhouse gas emissions.

The Navigator CO₂ project would transport liquid carbon dioxide from

ethanol and fertilizer plants in South Dakota, Minnesota, Nebraska, Iowa and Illinois to underground storage sites in central Illinois.

Another project, proposed by Chicago-based Archer Daniels Midland Co. in partnership with a Denver company, would take carbon captured at ADM's facilities in Clinton and Cedar Rapids, Iowa, and transport it to an existing storage site in Decatur.

The opportunity to compete for billions of dollars in federal funding is on the line as Illinois considers the future of carbon capture, according to the Prairie Research Institute report, as well as the chance to create jobs and boost local economies.

And at a time when the state and federal government and nations worldwide are trying to drastically reduce greenhouse gas emissions and stave off the worst effects of global warming—including catastrophic floods and droughts—carbon capture also holds out the promise of making the job easier.

Carbon capture and storage "could play an important role in achieving the state's decarbonization goals," according to the report, which was commissioned by the state legislature.

According to Navigator CO₂, the Heartland Greenway pipeline would have the ability to reduce annual carbon dioxide emissions by 15 million metric tons, the equivalent of taking 3.2 million cars off the road.

But as the fight over Navigator CO₂'s pipeline illustrates, battle lines are being drawn, with opponents questioning carbon capture's very reason for being—its real-world effectiveness in reducing greenhouse gases.

There are also safety concerns. Landowners fear a pipeline could rupture, releasing a potentially suffocating gas not far from bedroom

windows.

"Right now, to move forward with a carbon dioxide pipeline is unconscionable," said Pam Richart, lead organizer of the Coalition to Stop CO₂ Pipelines, which includes citizens and environmental groups. "It just brings too much risk."

In response to questions about the possibility of a pipeline rupture, Navigator CO₂ Vice President of Government and Public Affairs Elizabeth Burns-Thompson said that Navigator has learned from previous failures and successes in the industry.

"We are using the best available information and technology to date to assure that we're building out the most state-of-the-art and safest asset that can be possible," Burns-Thompson said.

Farmers band together

Feltham is afraid the Navigator pipeline would cause permanent damage to the complex system of terraces and underground drainage tile that allows him to farm the hill that descends from his brick ranch home toward the Spoon River.

He's concerned about the flooding and erosion that could occur if Navigator dug a 7-foot trench across his 220-acre property. And he's not much impressed by Navigator's \$110,000 financial offer.

But this goes beyond that, said Feltham, 66.

"Attachment to farmland out here, for families like mine, is almost spiritual, and when a company says it wants to get eminent domain authority to run a pipeline across the farm, I view that with about the same attitude I would view an attempt at home invasion," he said.

Navigator has applied for the authority to take easements and interests in property via eminent domain, in which private property can be taken for [public use](#) against the owner's wishes but with proper compensation.

Feltham, a retired U.S. Marine Corps judge advocate, was suspicious when Navigator first contacted him in December 2021. He did some online research and called the Sierra Club in Chicago, which referred him to a Sierra Club member in Peoria, who got him in touch with the nonprofit Eco-Justice Collaborative in Champaign, which took up the cause and helped organize the opposition.

Now president of Citizens Against Heartland Greenway Pipeline, a group representing opponents, Feltham noted with satisfaction that Navigator isn't making much headway with landowners.

Despite over 8,500 contacts with Illinois landowners since August, Navigator has managed to get only 6% of those along the proposed path of the pipeline to sign easements or options, according to a Navigator document the Tribune obtained from a lawyer representing opponents of the pipeline project in proceedings before the Illinois Commerce Commission.

In Christian County, farmer Karen Brockelsby, 67, said she was concerned about damage to prime farmland as well as pipeline ruptures and the potential that carbon dioxide could leak from underground storage areas, contaminating drinking water with harmful metals. Such leaks could happen decades down the road, she said, and she fears landowners will be left to bear the financial and health burdens.

"Farm owners here started talking to one another and really came together as a solid group that said no," she said.

Now opponents say Navigator's agents appear to have moved on, to

neighboring Montgomery County.

"Things have gotten pretty quiet," Brockelsby said.

Asked about the reception Heartland Greenway has received in Illinois, Burns-Thompson said "these things take time, and especially here in the Midwest."

"I've worked with farmers for all of my professional career," she said. "Most of them want to get to know who you are, and why you're doing what you're proposing, long before they want to get into dollars and cents."

'A world leader'

The interest in carbon capture and storage in Illinois rests, in part, on the unique geology of the Illinois Basin, an expanse of sedimentary rock that underlies most of the state and extends into Indiana and Kentucky.

Formed over the course of hundreds of millions of years, the Illinois Basin includes deep deposits of sandstone, an ideal medium for storing liquid carbon dioxide, according to the report. Sandstone has both porosity, or spaces to hold the CO₂, and permeability, or channels between the spaces that allow the CO₂ to spread.

"Imagine a crate of oranges: the spheres touch in many places, but there are also gaps between the spheres," the Prairie Research Institute report says. "These gaps are similar to the pore space found between grains of rock deep underground."

Once the carbon dioxide is injected into the sandstone, it needs to be contained, and here again, Illinois geology offers help. The porous sandstone of the Illinois Basin is topped with layers of shale, a dense

rock that acts as a barrier to the upward movement of CO₂.

Already, over 4 million metric tons of carbon dioxide have been injected deep underground at the Archer Daniels Midland ethanol facility in Decatur, the report says.

And the naturally occurring Mount Simon sandstone and shale used for storage in Decatur—and widely distributed in portions of the Illinois Basin—has an estimated storage capacity of 11 to 150 billion metric tons of carbon dioxide.

That's the equivalent of at least 2 billion gas-powered cars driven for a year, according to the report.

Mount Simon sandstone is just one of the rocks in Illinois with the potential for carbon storage.

The report also highlights a series of research projects in the state, many involving the Prairie Research Institute, that have "enabled Illinois to be a world leader in carbon capture research and development."

The projects include the Prairie State Generating Co. coal plant in Marissa, where the institute recently completed a major engineering study on a plan to use carbon capture technology to reduce [greenhouse gas emissions](#). The proposed carbon capture system is expected to be capable of removing 8.5 million tons of CO₂ each year.

Carbon utilization, or using captured CO₂ to make economically valuable products, is still in the early stages, both in Illinois and worldwide. The institute's report notes Illinois projects such as an attempt to grow algae from flue gas generated by a Springfield power plant.

"Illinois is well placed to be a leader in carbon capture, utilization, and

storage. We have the research framework, industrial capacity, and the geologic resources for this role," Illinois carbon capture report co-author Sallie Greenberg, a principal research scientist at the Prairie Research Institute, said via email.

Illinois carbon capture businesses would stand to gain from federal incentives, including a tax credit of up to \$85 per metric ton of permanently stored carbon dioxide. Under a hypothetical scenario with five Illinois carbon capture facilities, carbon transport and a shared storage site, 480 people would be employed, on average, in a given year, according to an analysis by the consulting firm Industrial Economics, Inc., that was quoted in the report.

The total gross regional product, or value added, over the 30-year life of the project would be \$1.7 billion, according to the analysis.

'A boondoggle'

Carbon dioxide, which traps heat close to the earth, plays a vital role in maintaining the planet's temperature.

But now, scientists say, we have too much of a good thing. Due largely to carbon emissions from fossil fuels such as oil, gas and coal, global temperatures have risen in the last century. As a result, there's been an increase in extreme weather events such as droughts, heat waves and floods; trees and corals have died off in large numbers; and millions of people have been exposed to acute food and water insecurity, according to the Intergovernmental Panel on Climate Change.

Scientists say urgent action is needed and effective solutions are available, including replacing fossil fuels with wind and solar energy, switching homes and businesses from gas to electricity, and turning to electric cars.

Carbon capture is more controversial, especially when it comes to keeping coal or gas-burning power plants open for business.

Among the critics is climate scientist Mark Jacobson, a professor of civil and environmental engineering at Stanford University.

"If you don't care about climate or air pollution or energy security, go for it," he said when asked whether Illinois should pursue leadership in carbon capture. "You can pump a lot of money into carbon capture and create some jobs, but it's not going to help the climate."

Jacobson, author of a 2019 study in the journal *Energy & Environmental Science* that raised doubts about the real-world effectiveness of carbon capture, said that the widely quoted figure that the technology can capture 90% of carbon dioxide emissions is actually an assumption based on idealized measurements.

When Jacobson looked at the real-world performance of the \$1 billion Petra Nova project in Texas, at the time the biggest coal-plant carbon capture project in the United States, only about 55% of carbon dioxide emissions were being captured.

And that figure didn't take into account emissions from the natural gas turbine that had to be built to power carbon capture. Also excluded: emissions from mining and processing the coal and natural gas used at the Petra Nova.

When those factors were taken into account, Jacobson found that carbon capture only reduced average annual emissions by 11% to 20%.

"There's just no evidence this stuff is useful," Jacobson said of carbon capture. "And all the evidence suggests it's just a boondoggle and we could have spent all that money on actual emissions reduction."

Asked for studies that show carbon capture's effectiveness in reducing emissions, the authors of the Prairie Research Institute study responded via a spokesperson, who offered a written list of studies, none of which appeared to look at real-world emissions before and after carbon capture.

One of the studies on the list—published in 2022 in the *Journal of Cleaner Production*—explicitly stated that it was assuming 90% effectiveness for carbon capture.

The highly respected Intergovernmental Panel on Climate Change does include carbon capture among the strategies for meeting global climate goals but with caveats and qualifications.

For instance, the panel's 2022 Mitigation of Climate Change report says the use of carbon dioxide removal to counterbalance some emissions is "unavoidable" if climate goals are to be achieved. But expanding the use of carbon removal—a category that includes carbon capture—would depend on "developing effective approaches to address feasibility and sustainability constraints, especially at large scales."

Unanswered questions

Among the questions that Illinois still hasn't answered clearly: Who will bear the long-term responsibility for underground carbon storage sites? Who owns the potentially valuable underground space where carbon dioxide can be stored?

And what will happen if some landowners want to offer up their property for carbon dioxide storage, and other, adjacent, owners do not?

The Prairie Research Institute report includes a range of recommendations addressing such issues, including that the state should

create legal and regulatory frameworks for the long-term stewardship and oversight of carbon dioxide storage sites. The report also recommends the establishment of an interagency planning and oversight committee to consider carbon capture and storage activities in Illinois.

Carbon capture, utilization and storage "should be both enabled and appropriately regulated to ensure long-term storage of CO₂ in full consultation with impacted communities," the report says.

In the wake of a 2020 carbon dioxide pipeline rupture near Satartia, Mississippi, the federal government is also considering more regulation.

At the Satartia pipeline rupture, which followed heavy rains and a landslide, the escaping carbon dioxide roared like a jet engine and carved a crater an estimated 40 feet deep in the ground. A potentially suffocating green fog rose from the pipeline and started moving downhill toward Satartia, according to rescue workers who testified before the Illinois Commerce Commission.

Gas-powered vehicles stalled out on the road due to lack of oxygen, according to testimony. People passed out. In one car, rescue workers found three people unconscious, two with froth coming out of their mouths.

"It looked like the Zombie apocalypse," testified Yazoo County Emergency Management Agency Director Jack Willingham, who arrived in Satartia about five hours after the rupture. "It was hazy. ... There were abandoned vehicles everywhere, many with doors ajar, many with their windows smashed from the rescue efforts."

No deaths were reported, but 45 people sought medical attention at local hospitals, according to a government report, and federal regulators took notice.

In May, the U.S. Pipeline and Hazardous Materials Safety Administration announced that it would start a new rule-making process to update standards for carbon dioxide pipelines, including new requirements related to emergency preparedness and response.

Meanwhile, some counties in Illinois have taken matters into their own hands, declaring moratoriums on permits for pipeline construction. McDonough, Fulton and Sangamon counties have passed moratoriums, and Christian County had a moratorium while Navigator was actively pursuing carbon storage there, according to the Coalition to Stop CO₂ Pipelines website.

The next step in Illinois is a review of the Prairie Research Institute report by legislators, who are working out the details of how to reach the ambitious climate goals of the state's 2021 Climate and Equitable Jobs Act. The act sets the state on a path to 100% carbon-free energy by 2045.

'Just the first wave'

Navigator, which temporarily withdrew its Illinois pipeline application in January, announced on Feb. 24 that it had refiled with an expanded plan.

"I think it will happen. I think it needs to happen," Burns-Thompson said of the pipeline.

Feltham, too, was resolute. He half-jokingly referred to his comfortable home office—complete with family photos and mallard-trim wallpaper—as his war room, and the translucent plastic box holding neat stacks of binder-clipped documents as his war chest.

He said he hopes the Navigator pipeline application fails in its bid for state commerce commission approval, but if it succeeds, he would

support a lawsuit challenging the constitutionality of the Illinois law that declares carbon dioxide pipelines to be in the public interest.

"We might be able to hamstring Navigator for years," he said.

In Christian County, where Navigator agents appear to have moved on, at least temporarily, Brockelsby was still wary. She noted that two neighboring states, Kentucky and Indiana, also have the underground rock prized by carbon storage companies. She quoted projections that the United States could have 65,000 miles of carbon dioxide pipeline by 2050.

"This is only the very beginning," she said of the current fight. "This is just the first wave."

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