



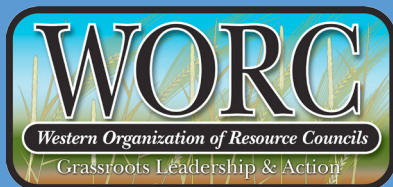
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# TOO GOOD TO BE TRUE: The Risks of Public Investment in Carbon Capture and Sequestration (CCS)

## EXECUTIVE SUMMARY

As the global effects of climate change become undeniable, both market actors and governments around the world are working to reduce greenhouse gas (GHG) emissions. State and federal politicians, the coal industry, and even some environmental organizations support Carbon Capture and Sequestration (CCS) technology as a strategy to continue to generate electricity with coal in a carbon-constrained future.

The industry's hope that coal can provide electricity while decreasing carbon emissions without drastically raising electricity costs and causing environmental damage is simply too good to be true. CCS technology faces both technological and economic obstacles that make public spending on CCS technology a poor investment of taxpayer dollars. From capture to transport to storage, CCS technology has proven itself to be expensive, inefficient, unreliable, and insecure, despite billions in public investment so far.



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# CCS projects have proven the technology's many drawbacks, including the following:

## STORAGE

Storing carbon dioxide (CO<sub>2</sub>) under pressure is a major safety concern. Several CO<sub>2</sub> storage demonstration projects have experienced catastrophic “blowouts” of compressed CO<sub>2</sub> via natural or man-made geologic fissures.<sup>1</sup> Carbon storage sinks that have not yet leaked or exploded have developed fissures or fractures in “cap rock” due to the high pressure of injected compressed CO<sub>2</sub>.<sup>2,3</sup>

## UTILIZATION

Enhanced Oil Recovery (EOR) is not a carbon sequestration technology. EOR is the most common method of CO<sub>2</sub> “utilization,” in which captured waste CO<sub>2</sub> is pumped into oil reservoirs to stimulate production. Pumping CO<sub>2</sub> into oil fields does increase oil production, but it does not permanently capture or sequester CO<sub>2</sub> emissions.<sup>4</sup>

## EFFICIENCY

CCS coal plants are fundamentally inefficient and drive up electricity costs. CCS equipment consumes a significant share of a plant's electricity, decreasing overall thermal efficiency by 10-12 percentage points, according to most studies. Efficiency can be expected to drop from a typical 38% to as low as 16%.<sup>5</sup> This dramatically increases a plant's use of coal without increasing its revenue from selling power, and makes its electrical output even more expensive.<sup>6</sup>

## TRACK RECORD

Public investments in CCS projects have cost billions and have not paid off. There is only one operational coal-with-CCS facility (240 MW) in the United States, despite billions of taxpayer and ratepayer dollars spent on CCS demonstrations (\$4.8 billion during the Obama Administration alone).<sup>7</sup> Even that one project, which was subsidized by hundreds of millions of public dollars, is expected to lose money for its owners.<sup>8</sup>

## COST

Coal-fired power plants with CCS technology make use of coal, a nonrenewable resource that is already running out.<sup>9</sup> The cost of generating electricity by coal with CCS technology will only increase over time as coal becomes more scarce, while the cost of electricity from renewable energy is already lower than the price of electricity from coal plants using CCS and will continue to decline. Renewable energy solutions are cheaper, cleaner, and faster to deploy than CCS generation.<sup>10</sup> Even after decades of CCS research, relatively little private capital has been invested in CCS projects, whereas wind and solar energy will have access to trillions of dollars of financing over the next 20 years.<sup>11</sup>

If no other low-carbon, cost-competitive energy sources were available, public investment in CCS would be required to address rising greenhouse gas (GHG) concentrations. Fortunately, coal-fired power with CCS is not the only low-carbon energy option available – it is just the most expensive. Other technologies are much closer to accomplishing the goal of providing affordable electricity while reducing climate change-causing GHG emissions.<sup>12</sup>

Despite the technological and economic headwinds facing CCS, members of Congress and consecutive Presidents from both major political parties have pressed for increased federal spending in the sector. Public spending on CCS projects has taken the form of Department of Energy grants for demonstration projects that capture or store carbon



Credit: Michael Stravato/The New York Times/Redux.

Carbon capture equipment at the Petra Nova plant near Houston, Texas. Petra Nova is the only operating coal plant that captures carbon dioxide in the United States.

dioxide, as well as tax credits awarded to companies who pump carbon underground for storage or enhanced oil recovery. Under the new Administration, coal companies, fossil fuel trade organizations, and some politicians are proposing dramatic increases in federal spending on CCS tax credits and demonstration projects, ignoring the harsh technological and economic realities of carbon capture and storage facilities.

Every dollar spent on CCS is a dollar spent on already outdated technology, and is a dollar not available for investment in cheaper, cleaner, and simpler energy solutions. Our political leaders should refrain from increasing spending to support the challenged CCS sector and should instead direct public dollars toward cheaper, cleaner, and more efficient renewable energy resources such as wind and solar generation, time-of-use pricing, and grid management technologies. Investing in these clean energy solutions will result in a market-based, low-carbon energy future with cheaper electric bills, cleaner air, and a reduced threat of catastrophic global climate change.

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