TO: EPA Hearing Office, Baton Rouge, LA

From Darryl Malek-Wiley, Senior Field Representative

RE: Louisiana Class VI Primacy Application - Docket ID No. EPA-HQ-OW-2023-0073

Date:23 June 2023

"Hand Delivered"

The Sierra Club has numerous concerns about the Environmental Protection Agency (EPA) granting the Louisiana Department of Natural Resource (LADNR) Class VI Primacy.

Some of our concerns will be raised with these comments while, others will be submitted to the Docket ID No. EPA-HQ-OW-2023-0073 by the comment deadline.

With the passage of Louisiana House Bill 571 signed by Governor Edwards on 14 June 2023 now Act 378 (attachment #1) https://legis.la.gov/legis/ViewDocument.aspx?d=1332572 EPA should re-notice the application and Louisiana's proposed program given the fact that the current application with EPA is now incomplete, it does not contain all the current LA laws governing Class VI wells.

If EPA does not re-notice the Louisiana application we ask for a 60-day extension of the comment period due to the complex nature of the proposed action and the environmental damages to be caused in Louisiana.

Before EPA grants Primacy to Louisiana safeguard and standard of public transparent must be in place:

Public Engagement

1. EPA should require LADNR to open a process to consult landowners, tenants, and other community members on revising rules that determine who receives notice of proposed facilities, when they receive notice, how they receive notice, and how long they have to respond. This should include a clear grievance process for individuals to voice their concerns when state monitoring and enforcement activities are in question.
2. EPA should require States to include all drinking water utilities, and drinking water well owners in the category of "communities" for the purposes of "community engagement
3. EPA should require states conduct community engagement that includes notice, meetings, and comment periods before decisions have been made.

    This public engagement should include:

    - Meetings that are accessible to individuals who work day and night shifts.
    - Meetings in both in-person and online settings to ensure that opportunities for feedback are accessible to individuals who do not have internet access or cannot travel.
    - The provision of free or low-cost transportation, and free childcare during meetings.
    - Information about public meetings in Spanish and language accessibility instructions for people who speak other languages.
    - Language interpreters and translators who are familiar with jargon and key terms relevant to the permitting application and approval process.

4. EPA should require that states include robust public education from trusted, third-party sources on the potential risks, impacts, costs, and benefits of CCS activities in their public engagement processes. 'No impact' must not be an option, and states should be required to review and publish the worst-case scenarios.
5. In compliance with Title VI of the Civil Rights Act of 1964, EPA should require states conduct robust and substantive environmental justice reviews on the impacts of each proposed Class VI well on overburdened environmental justice communities. States should then be required to use knowledge garnered from these reviews to avoid the imposition of additional burdens on overburdened and underserved communities, including by evaluating direct, indirect, and cumulative effects and identifying and implementing appropriate mitigation and avoidance measures.
6. EPA should require that states seriously consider feedback from impacted communities when deciding whether to allow, deny, or modify permits for CCUS infrastructure.
7. EPA should require states to take up broad definitions of 'interested persons' or 'affected persons' to reduce the burden of proof concerned individuals need to provide to have their input on projects considered by state agencies in charge of well permitting.
8. EPA should require that, in the event of new drilling through the Area of Review (AOR) of an existing site, states implement the same rigorous review and public comment processes they do for initial drilling.

Data Monitoring / Oversight

1. EPA should require that liability for wells should stay with the entity drilling the well and not be transferred to any other entity, including the state, for the lifetime of the well.
2. EPA should require that state governments increase staffing and financial security requirements to adequately meet the oversight and monitoring demands of expanded CCS operations.
3. EPA should require that states have comprehensive inspection, monitoring, and enforcement procedures for active, inactive, and plugged

wells before granting primacy or additional authorities to states for CCUS activities and facilities.

4. EPA should require that states carry out post-injection site closure monitoring of 1000 years, and must keep these monitoring records in a clear, publicly accessible, and uniform manner.
5. EPA should require states to maintain up-to-date and publicly available databases with complete and accurate coordinates for all CCS wells, orphaned wells, and inactive plugged wells, to ensure that robust area of review (AOR) assessments for Class VI wells are able to be carried out.
6. EPA should require states to require operators to share real-time data with state regulatory agencies from the required continuous recording devices that will monitor CO2 streams, and require operators to quickly notify community members in the event of an incident.
7. EPA should require that states require operators of Class VI wells to have a certification or license with the state.
8. EPA should require states to enforce the halting of operations at facilities whose permits have been revoked until a new final permit is issued. It is not acceptable to allow facilities to continue to operate while they are in the process of receiving a new permit.

Re-Permitting Wells between Classes

1. EPA should require states to implement compliance and enforcement mechanisms to prevent Class II wells from being improperly operated as Class VI wells and vice versa.

Seismicity

1. EPA should consider not granting Class VI UIC primacy to states that have a history of failing to prevent induced seismicity from oil and gas activities that has affected or may affect a drinking water source.

Environmental Impact

1. EPA should require states to consider the impacts to both quality and quantity of drinking water sources in areas where CCUS infrastructure will be constructed and used.
2. EPA should require states to provide robust details on the baseline geochemical data that applicants are required to submit with Class VI well applications – what mediums must be tested, what chemicals and attributes must be tested for, and other considerations related to seasonality and topography.

A new report **"Carbon Capture & Sequestration in Louisiana: Part 1 Permitting for Rapid Expansion"** (Attachment 2)

The report highlights recent announcements that could open the floodgates to a wave of "Carbon Capture and Storage" developments in Louisiana for the first time.

The report shows at least **20 currently planned sites for underground carbon dioxide storage across Louisiana,** and the number of projects are expected to expand. The report also catalogs the planned construction of thousands of miles of related carbon waste pipelines.

LADNR does not have the staff, budget, or expertise to permit 20 proposed Carbon Capture & Storage (CC&S) facilities and their related pipeline infrastructure.

The Louisiana Department of Environmental Quality (LADEQ) and LADNR have not established a data base of all the proposed CC&S projects proposed in Louisiana and how the two Agencies will coordinate CC&S project that will include greenfield construction, pipeline and injections sites. Thus, concerned Parish Governments, Louisiana Elected Officials, Homeowners,

Businessowners, and Concerned Citizens cannot comment in a timely manner on proposed permits.

Here is the Intro to the report: **CARBON CAPTURE & SEQUESTRATIO IN LOUISIANA Part 1: Permitting for rapid expansion**

carbon capture and sequestration (CCS) refers to a process by which industrial CO2 emissions are captured, transported, and stored underground. There are not any such projects yet operating in Louisiana, though dozens of initiatives are in development following passage of the 2022 Inflation Reduction Act (IRA). The IRA will provide billions of dollars in revenue to project developers in the form of direct tax credits, paired with major grants and low-interest loans established in the 2021 Bipartisan Infrastructure Law.

In April 2023, the U.S. Environmental Protection Agency (EPA) announced its intention to grant permitting jurisdiction ("primacy") over underground sequestration wells, which are known as Class VI injection wells, to the State of Louisiana. This move, which has been supported by CCS project developers, would speed up the permitting process, according to Governor John Bel Edwards, and open the floodgates to dozens of Louisiana projects already in planning stages.

This report, the first installment in a series of three, presents findings from research conducted on the current state of CCS development plans in Louisiana. Detailed maps of planned CCS infrastructure are accompanied by information on federal and state permitting, which has emerged as the decisive factor on which project developers now depend to drill CO2 injection wells.

There are at least 20 planned underground CO2 storage sites across Louisiana, 10 of which have already applied for a Class VI permit, in addition to thousands of miles of related CO2 pipelines and plans for carbon capture equipment at carbon-emitting facilities. Most developers of underground sequestration wells are oil companies, including major multinationals.

Meanwhile, project developers have begun competing for land deals close to clusters of industrial emitters where underground sequestration is geologically

feasible. Any such leases under state land require "pore space agreements" to be signed by the State Mineral and Energy Board, while leases on private land have similar terms but avoid the same degree of public scrutiny. A number of the planned storage reservoirs, which can be viewed in Maps 1-5 (below), are located under freshwater lakes and offshore, where leakages could provoke groundwater contamination and ocean acidification, respectively.

In addition to the backlog of pending Class VI permits, pipeline transportation capacity is emerging as a systemic constraint on the development of CCS projects. Only two companies have well-developed plans for CO2 pipeline networks in the state. One of those companies, Denbury (NYSE:DEN), which is also developing the largest network of permanent sequestration sites in Louisiana, stands out as a key early mover in the space. In April 2023, Denbury arrived at an agreement to pay the second-largest fine ever levied by the Pipeline and Hazardous Materials Safety Administration (PHMSA) for a February 2020 CO2 pipeline explosion in Mississippi that is connected to the same network it plans to expand across Louisiana.

This report presents information on CCS permitting and project development plans in Louisiana, including detailed maps of planned infrastructure across the state. A second report will present information on project financing, which is heavily dependent on government grants and tax credits, while a third installment will present research findings on the insurance required for the considerable safety and environmental risks posed by underground CO2 storage and transportation.
https://static1.squarespace.com/static/6422298c9536175973c5173c/t/647fba41fdb96c18bd68e27a/1686092354913/CCS+in+Louisiana_Part+1_7JUN2023.pdf

Additional in this White Paper the ***Carbon Sequestration Loophole: Long-Term Carbon Storage in Poorly Regulated Class II Oil and Gas Underground Injection Control Wells***.

In summary, regarding Louisiana's implementation of the requirement that a Class II oil and gas well used for carbon storage transition to Class VI if warranted by the risks to public safety and the environment, EPA should:

(1) pause the Louisiana primacy proceedings until EPA finalizes a long-promised guidance regarding how states should implement the federal UIC requirement that a Class II well convert to Class VI if warranted by safety and environmental risks (the "Class II-to-Class-VI-transition regulations"),

(2) not approve Louisiana's primacy application without ensuring that Louisiana has effective rules and policies in place to implement the federal Class II-to-Class-VI-transition regulations, including the requirement that within two years of EPA's approval of a state's Class VI program, the state must issue Class VI permits to all injection wells in the state that are required to obtain such permit (see page 17 of the memo for specific details on Louisiana's primacy application), and

(3) not approve Louisiana's primacy application without ensuring that both Louisiana considers environmental justice and complies with Title VI of the Civil Rights Act of 1964 when deciding whether to allow a company to store captured CO_2 in a Class II well rather than in a much more rigorously regulated Class VI well.

A new report "**Carbon Capture & Sequestration in Louisiana: Part 2 Project Financing**" (Attachment 3)

Has the following to say in its conclusion

"Passage of the IRA in August 2022 marked the beginning of financial viability at scale for the CCS industry in Louisiana and elsewhere, as the tax credits created will account for the bulk of initial revenue. Simply put, the industry is heavily dependent on taxpayer subsidies and will remain so for the foreseeable future.

This transfer of taxpayer money was heavily lobbied for by private sector project developers, which received nearly everything they asked for in the IRA. To the extent that CCS will help oil companies and others claim carbon offsets, these will largely be paid for by the public.

The reason so much public money is needed has to do, in large part, with the litany of risks associated with CCS development, which discourages banks from lending money. Those risks, and the insurance policies they require, are the subject of the third and final installment in this research series. The Global CCS Institute notes that, just as there is an inherent "revenue risk" to CCS, which has now been covered by U.S. taxpayers, the long-term environmental risk of CO2 leakage will have to be shouldered by the public:

While a private company might put into place mitigation measures to manage the possibility of leakage throughout the operation of a storage site, post-closure, private investors will be very unlikely to bear that risk, so there needs to be a system of laws and policies whereby the liability is transferred from the private sector investor to government post-closure"
https://static1.squarespace.com/static/6422298c9536175973c5173c/t/64877837aea947538db132ad/1686599735769/Louisiana+CCS+series_Report+2_15JUNE2023.pdf

A new report "Carbon Capture & Sequestration in Louisiana: Part 3 Insuring A New Industry" (Attachment 4)

Has the following to say in its conclusion

For the oil companies and other investors behind CCS projects, risk is a financial matter. The Global CCS Institute characterizes key risks as three-fold:

- *Policy and revenue risk (the industry's primary revenue source is taxpayer money);*
- *Cross-chain risk (projects depend on a complex integration of emissions capture, pipeline transport, and underground storage); and*
- *Storage liability (for underground CO2 leakage).*

These financial risks are the reason that commercial banks have largely avoided CCS projects thus far. To cover the related environmental risks, if only partially, regulatory agencies require private-sector insurance. This report documents that a wide range of companies have begun to provide CCS-related policies in Louisiana, including subsidiaries of some of the world's largest insurers, such as Allianz, Society of Lloyd's, Chubb, and Sompo Holdings.

However, CCS projects present local communities with other, uninsurable risks. The potential health effects of contaminated groundwater or public safety emergencies due to pipeline explosions are not necessarily encapsulated in insurance policies. Financial compensation does not reverse water contamination nor heal potential injuries. Companies may be able to cover such impacts with legal settlements — Denbury will soon be facing a number of lawsuits over the Mississippi disaster,24 in addition to the PHMSA settlement — but they are not mere externalities given the vast and rapid scale of development, currently planned.

By design, CCS requires the public to absorb the bulk of risk associated with this unproven technology, whether through federal taxpayer subsidies or long-term pollution liability transfer to the State of Louisiana*. In areas such as the industrial corridor between Baton Rouge and New Orleans, this new technology will only add one more layer, literally and figuratively, to potential sources of environmental pollution, whether through underground CO2 leaks or new pipeline construction. Taken together, the risks to the public, state and local governments, and investors in the event of disasters warrant additional scrutiny. Denbury, in particular, with its uniquely important position in both CO2 transportation and storage, warrants public scrutiny in light of the company's safety record. The CO2 pipeline explosion in Mississippi that led to evacuations, hospitalizations, ongoing community impacts, and a record-setting PHMSA disciplinary process do not bode well for a massive expansion in pipeline capacity through the Baton Rouge and New Orleans metropolitan areas.*

As a precautionary measure, legislators might reasonably support legislative action to ensure that the State of Louisiana would not assume liability for CO2

accidents after injection ceases, as is currently the case. The adoption of such legislative changes would ensure that project owners and operators — together with their insurers — bear the full financial responsibility in the event of accidents. 23 Global CCS Institute, "Unlocking private finance to support CCS. *https://static1.squarespace.com/static/6422298c9536175973c5173c/t/6491d4e90077990d64f6155c/1687278826291/Louisiana+CCS+series_Report+3_21JUNE2023.pdf*

I will now add to my comments a number of reports raising questions about CC&S and safety, track record around the world, and environmental concerns:

The Carbon Capture Crux; Lessons Learned September 2022 by Institute for Energy Economics and Financial Analysis. (Attachment #5)

Executive Summary

Carbon capture and storage (CCS) is a 50-year-old technology with variable results in capturing and storing carbon dioxide. Project developers have almost always reused the captured carbon for enhanced oil recovery (EOR), producing oil and gas and more emissions.

Carbon capture's role has been rejigged as a climate solution in recent years with its diverse applications being proposed to decarbonise fossil fuel plants and hard-to-abate sectors.

Some widely cited authorities are fuelling the debate on the role of this technology as a climate solution, including the International Energy Agency in both its Energy Technologies Perspectives1 report and Net Zero by 2050 report.

This push has given a platform to polarising views on carbon capture utilisation and storage (CCUS) and carbon capture and storage (CCS): is it a greenwash to extend the life of fossil fuel assets2 or a panacea to avert catastrophic climate change consequences?

This report aims to shed light on the different applications and conceptualisations of CCUS/CCS, demystifying the technology's applications, concepts and categorisations. It explains the dichotomy between enhanced oil recovery and carbon capture within dedicated geological structures, and the difference between carbon capture and utilisation (CCU), CCUS and CCS. It uses a four-tiered structure to provide an overview of all carbon capture applications, which includes gas processing, power generation, industry application/production, and carbon dioxide removal technologies (CDR).

Finally, 13 flagship cases (10 in operation, two that have failed and one that has been suspended) comprising about 55% of the total nominal capture capacity operating worldwide have been reviewed in detail. The projects are flagship in different senses, with each of them having unique aspects of importance.

Our sample is comprehensive, enough to learn lessons about the whole sector. IEEFA estimates that the studied cases have captured more than two-thirds of all anthropogenic carbon dioxide captured in history.

What We Found

- *Failed/underperforming projects considerably outnumbered successful experiences.*
- *Successful CCUS exceptions mainly existed in the natural gas processing sector serving the fossil fuel industry, leading to further emissions.*
- *The elephant in the room of the application of CCS/CCUS in the natural gas processing sector: Scope 3 emissions are still not being accounted for.*
- *Captured carbon has mostly been used for enhanced oil recovery (EOR): enhancing oil production is not a climate solution.*

- *Using carbon capture as a greenlight to extend the life of fossil fuels power plants is a significant financial and technical risk: history confirms this.*
- *Some applications of CCS in industries where emissions are hard to abate (such as cement) could be studied as an interim partial solution with careful consideration.* *https://ieefa.org/resources/carbon-capture-crux-lessons-learned*

Carbon Capture, Utilization, and Storage, and Louisiana's Power Sector Authors: Chirg T.Lala, Joshua R. Castigliego, Schin Peddada, Elizabeth A. Staton, PhD; 4 April 2023 (Attachment #6)

Executive Summary

As a potential decarbonization strategy to aide in the reduction of greenhouse gas emissions within the power and industrial sectors, carbon capture, utilization, and storage (CCUS) must be compared to alternative decarbonization strategies to ensure that surrounding communities are prioritized and not negatively impacted. Louisiana's 2022 State Climate Initiatives Task Force's Climate Action Plan assigns a critical role to CCUS in achieving net-zero greenhouse gas emissions statewide by 2050 while reaching 100 percent carbon-free electricity by 2035. According to the Plan, CCUS could reduce emissions by capturing CO2 to either inject into geologic formations for storage or to use in the extraction of new oil and gas resources. While it may form part of a plan for decarbonization, CCUS emissions reduction potential is limited and does not address the upstream fugitive emissions or environmental and public health impacts from fossil fuel extraction, storage, and transmission.

To fully understand and mitigate the risks associated with CCUS, decision-makers must assess (1) how and to what extent CCUS could negatively impact surrounding communities, (2) what policies, rules and regulations are required to ensure that CCUS deployment is conducted in a safe and responsible manner, and (3) which applications are most appropriate for CCUS versus other decarbonization alternatives. This Applied Economics Clinic (AEC) report assesses viability of CCUS as a decarbonization strategy in

Louisiana's power sector, while providing an overview of its associated risks and vulnerabilities with the following key takeaways:

- • ***CCUS is vulnerable to damage.*** *CCUS infrastructure is susceptible to land subsidence, damage from water, extreme changes in temperature or pressure, and chemical impurities in the CO2 mixture, which can be further exacerbated by the impacts of climate change such as sea level rise and extreme weather events. Damages to pipelines, injection wells and other types of CCUS infrastructure can impede functionality through leakages, ruptures, embrittlement, and explosions, among other potential hazards.*

- • ***CCUS poses risks to human health, safety, and the environment.*** *The vulnerabilities of CCUS infrastructure can lead to several risks to human health, safety, and the environment, including: explosions from pipeline ruptures, exposure to CO2 plumes from leakages, and compromised drinking water supplies due to CO2 interacting with groundwater.*

- • ***The emissions reduction potential of CCUS is limited.*** *Although CCUS technologies are commonly designed to capture 90 percent (or more) of CO2 emissions released, many examples of CCUS have underperformed and failed to meet this target. Even best-case capture efficiencies of CCUS do not account for upstream fugitive emissions from fossil fuel extraction, storage, and transmission.*

- • ***CCUS is expensive.*** *Retrofitting all of Louisiana's gas-fired combined cycle units with CCUS (without considering IRA tax credits) would cost $1.0 to $1.2 billion per year, which could double the costs associated with operating gas-fired combined cycle power plants in Louisiana.*

- • ***There are excellent, commercially viable alternatives to CCUS.*** *Although CCUS may present opportunities to address recalcitrant greenhouse gas emissions, especially in certain hard-to-decarbonize industries, there are better alternatives to choose that are cheaper, safer, and more effective.*

To identify the most appropriate role that CCUS could play in Louisiana's decarbonization efforts, decision-makers must take into consideration the technical and economic feasibility, emissions reduction potential, and safety of CCUS infrastructure compared to that of alternative decarbonization strategies. https://www.ourenergypolicy.org/resources/carbon-capture-utilization-and-storage-and-louisianas-power-sector/

This article reports that CO2 emission increased 50% at a CC&S operated by Chevron's Gorgon.

Emissions from Western Australia gas project with world's largest industrial carbon capture system rise by more than 50%

Chevron development off Pilbara coast was approved on condition the company store about 4m tonnes of CO2 a year

Adam Morton *Climate and environment editor*
Thu 20 Apr 2023

Emissions from Chevron's Gorgon gas development off Western Australia have increased by more than 50% despite it being home to the world's largest industrial carbon capture and storage system.

There has been a sharp drop in the amount of CO2 stored underground at the liquefied natural gas plant over the last three years, data released by Chevron showed.

The development off the Pilbara coast was approved on the condition the company store about 4m tonnes of CO2 a year that would have otherwise escaped from reservoirs during extraction and been released into the atmosphere.

The company was to pump that CO2 into a natural reservoir 2km beneath Barrow Island. But the CCS development was delayed for more than three years and has failed to reach its promised storage level since it began operating in August 2019.

The Gorgon facility injected 1.6m tonnes into the reservoir last financial year, down from 2.2m tonnes in 2020-21 and 2.7m in 2019-20.

Last year's drop in CO_2 storage coincided with a big jump in onsite emissions from the Gorgon LNG operation, from 5.5m tonnes to 8.3m tonnes.

It made the facility Australia's biggest single major industrial emitter, according to government data. Chevron Australia exported a record 16.7m tonnes of LNG for the year from Gorgon as international gas prices surged after Russia's invasion of Ukraine.

A company spokesperson acknowledged the decline in emissions storage, and said it was working on a project to improve a pressure management system that was preventing more CO_2 being injected under the island. This would "enable carbon dioxide storage rates to increase over time".

Climate campaigners say the failure of the Gorgon CCS project to deliver what was promised illustrates how little progress the technology has made despite decades of promises.

Kim Garratt, an investigator with the Australian Conservation Foundation, said CCS developments were "being slapped on to otherwise unacceptable projects to make them seem like reasonable options".

She said the situation at Gorgon was foreseeable, pointing to a 2006 recommendation by the WA Environment Protection Authority that the development should not be approved as there would be "unacceptable impacts" if the CCS plan did not capture a high percentage of reservoir emissions. "Here we are, almost two decades later, and this unacceptable project is up and running and pumping out as much pollution as 2.5m cars every year," Garratt said.

Big promises but little progress

The problems in getting the Gorgon CCS development fully operational comes as international organisations, governments and particularly the gas industry continue to stress the technology's importance in meeting global climate goals. It is regularly included in modelling to support targets of net zero emissions by 2050.

In Australia the technology has been promised billions of dollars in public funding this century for little result. The Gorgon project, which remains the sole commercial CCS development operating in Australia, received $60m in federal support.

Internationally, according to the Global CCS Institute, there were 30 CCS projects in operation last year, with a combined maximum capacity of 42m tonnes of CO2 a year – about 0.1% of global emissions. It said 11 more were under construction.

Under its terms of approval, the Gorgon development was expected to sequester at least 80% of reservoir gas across a rolling five-year period starting in 2016. The company was not required to capture emissions released during LNG processing. It meant even a fully successful CCS facility would reduce total onsite emissions from Gorgon by only about 40%.

The company missed this target by more than 5m tonnes. It agreed to buy the equivalent amount in carbon offsets and invest $40m in "low carbon energy projects". The forecast cost of the offsets at the time was between $78m and $194m.

Chevron, which operates the Gorgon facility on behalf of partners including Shell and ExxonMobil, said managing emissions was "an integral part" of how it planned and ran its business.

Its spokesperson said the CCS project had stored more than 7.8m tonnes of CO2 since it started operating, demonstrating the "meaningful contribution CCS technology can play in the pursuit of a lower carbon future". The company had also bought more than 7.5m tonnes worth of carbon offsets over the life of the project.

"Emissions increased in 2021/22, primarily as a result of the return to three-train operations and increased reliability at the Gorgon natural gas facility following reduced production in the prior period due to equipment repairs," the spokesperson said.

"Reduced CO2 injection rates at the Gorgon CCS system also contributed to the overall increase in emissions."

Garratt said the latest government data showed the Gorgon plant was a bigger emitter within Australia than any coalmine. She said it led to much higher emissions after its LNG was shipped and burned in Asian countries.

New LNG developments have led to a significant increase in national industrial emissions over the past decade, and wiped out cuts in pollution from electricity generation due to an influx of solar and wind energy.

The Albanese government says a revamp of the climate policy known as the safeguard mechanism, which passed through parliament with support from the Greens and independents, would prevent further combined increases in industrial emissions and lead to cuts over time.

Combined CO2 emissions from the 215 polluting facilities covered by the safeguard mechanism last year were 137.5m tonnes – higher than in 2020-21, but still slightly less than pre-pandemic levels.

Under the changes to the scheme, emitting sites will be set new emissions intensity limits – known as baselines – before 1 July that will be reduced in most cases by 4.9% a year. Companies can meet targets through direct onsite cuts in pollution and by buying contentious carbon offsets.

It is unclear if Gorgon's baseline will be set at a level that assumes the CCS project is working as promised when the project was approved.
https://www.theguardian.com/environment/2023/apr/21/emissions-wa-gas-project-chevron-carbon-capture-system-pilbara-coast

Carbon capture won't fix our climate problem

By June Sekera | Opinion | March 20th 2023

According to the IPCC's Working Group III report, carbon capture is one of the least-effective, most-expensive climate change mitigation options on Earth. Photo by Shutterstock

This week, oil and gas lobbyists are gearing up for a busy few days. Today, the IPCC — the UN experts on climate science — is publishing a new report on the impact of global warming and our best options to slow it down.

Expect lots of spin about carbon capture and storage (CCS): the machinery and chemicals that aim to capture CO2 as it emerges from the smokestacks of factories and power plants burning fossil fuels. Theoretically, the idea is to reduce the amount of CO2 pumped into the atmosphere and store it underground or use it elsewhere. Don't be misled when fossil lobbyists once again push the message that UN scientists say it's a technology we must rely on to limit climate change.

I've spent several years studying carbon capture and my research is cited in the IPCC Working Group III report. I can tell you that when you look at the details of the IPCC's findings, the scientists say something quite different.

According to the IPCC's Working Group III report, carbon capture is one of the least-effective, most-expensive climate change mitigation options on Earth. Scientists rank it close to the bottom of a long list of options, easily outstripped by more affordable solutions like wind and solar energy. And it scores fire-alarm red for cost.

Many options available now in all sectors are estimated to offer substantial potential to reduce net emissions by 2030. Relative potentials and costs will vary across countries and in the longer term compared to 2030.

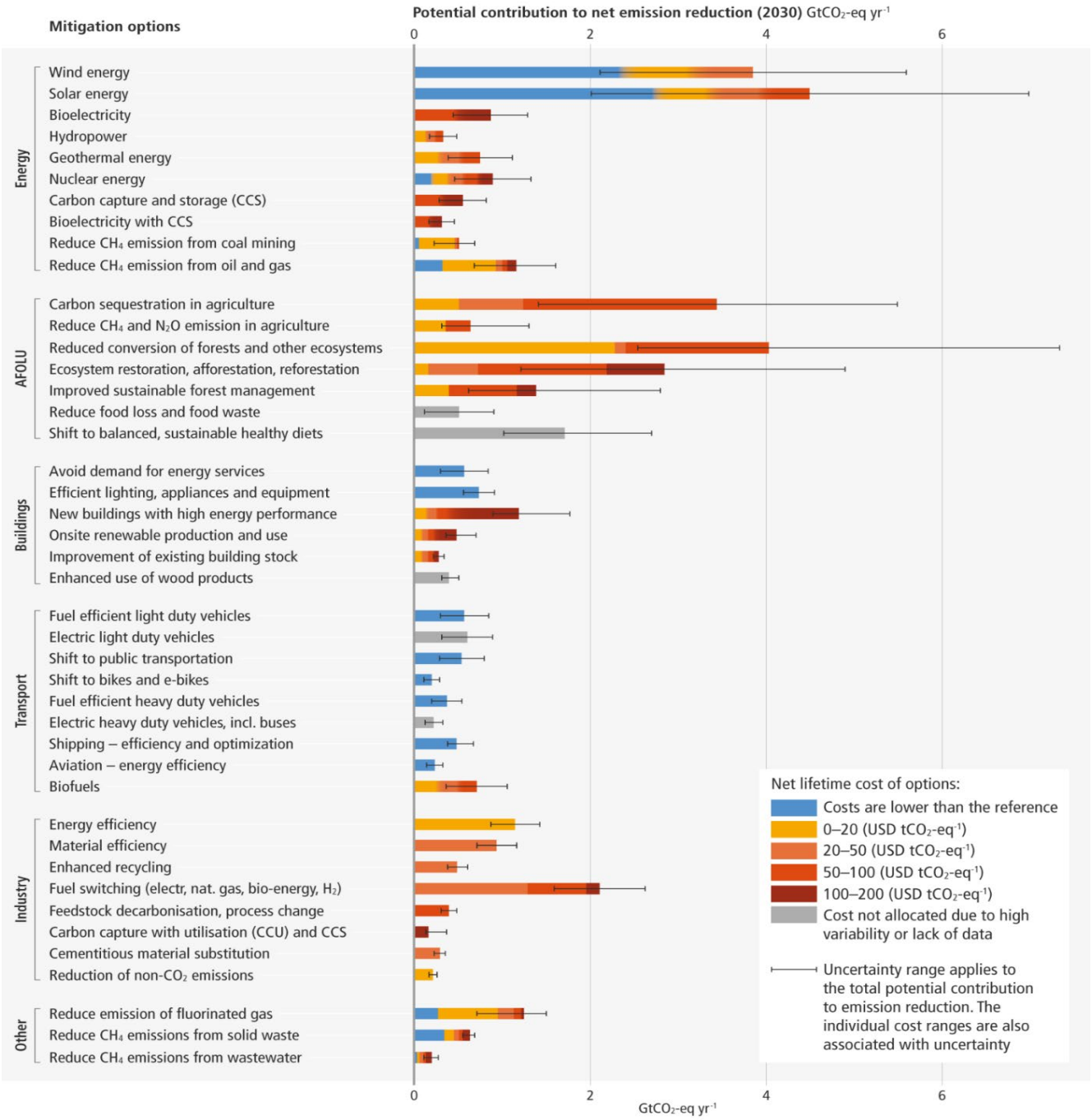

Figure SPM.7: Overview of mitigation options and their estimated ranges of costs and potentials in 2030. Source: IPCC

The IPCC report notes that limiting warming to 2 C will require "rapid and deep and, in most cases, immediate" greenhouse gas emission reductions in all sectors, mainly through cuts to fossil fuel use.

The same IPCC report shows that rather than carbon "capture" or mechanical carbon "removal", the more effective and faster way to remove billions of tons of CO2 from the atmosphere is to restore and expand the carbon sequestration capabilities of plants and soil. My latest research supports this finding. So long as biological sequestration is not connected to carbon "offset" schemes, it can be a powerful tool to address climate change.

Carbon capture, on the other hand, is a placebo. It gives oil and gas companies a story to tell about acting on emissions while they keep extracting, and we keep burning, fossil fuels.

Carbon capture is a placebo. It gives oil and gas companies a story to tell about acting on emissions while they keep extracting, and we keep burning, fossil fuels, writes June Sekera. #cdnpoli #CCUS #cdnpoli #ClimateAction #IPCC #IPPCSynthesis Report

Take the case of the Boundary Dam in Saskatchewan. It captures some of the CO2 pumped out from the coal-fired power station — then pipes it directly to an oilfield where it's injected underground to squeeze even more oil from the Earth.

Factor in emissions from burning that oil, it's clear carbon capture doesn't fix the fossil fuel emissions problem. Research on carbon capture processes, like that of the Boundary Dam, found they can emit three to four times as much CO2 as they inject underground.

Tellingly, the fossil fuel industry isn't prepared to pay the price of this technology. In Canada and the U.S., CCS is enabled by massive public

subsidies. In Canada, ratepayers have paid higher electricity prices triggered by the Boundary Dam carbon capture scheme. Under a proposal announced last year, Canadian taxpayers would be on the hook for a new carbon capture tax credit, despite pleas from over 400 scientists against it.

In the U.S., ExxonMobil wants to build a giant carbon capture "hub" in Texas, but says it needs government subsidies to make it feasible. Oil and gas firms are some of the world's richest companies. If they really believe in this technology, why won't they pay for it?

Carbon capture schemes don't just fail as climate solutions — they harm people. Research shows that carbon capture at scale would require a network of tens of thousands of kilometres of pipelines across the country. Ask the town of Satartia, Miss., what happens when a CO2 pipeline ruptures. In 2020, people collapsed in their homes and trucks, dazed and nauseous when the fast-spreading, odourless, colourless gas displaced oxygen. Car engines died, so people couldn't escape. Nearly 50 people were taken to hospital. As always, disasters like these hit rural communities, poor people, and people of colour first and worst.

With CCS, we are building "a taxpayer-financed sewer system for the fossil fuel industry," says Kert Davies, director of the Climate Investigations Center. It's time to end the era of public subsidy for CCS. It's not taxpayers who should pay for these costly experiments, it's the businesses profiting from pollution. You can't reap record profits from high oil prices and then claim you don't have the funds to deal with your emissions. Legislation should require that carbon capture at emissions sources is only ever done at the producer's expense.

You may hear a lot of news about carbon capture this month. When you do, realize that — even with all this spin and all those subsidies — the great expectations for carbon capture have not been met.

Every dollar we spend on this dangerous and counter-productive technology is a dollar we can't spend on real solutions to climate change — wind, solar, and

energy efficiency. As climate change wrecks more of our homes, that's a path we can't afford to take.

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Guest column: A new geological risk for Louisiana?

- BY ALEX S. KOLKER 24 May 2023

Lake Maurepas is one of the sites for where carbon dioxide would be captured and injected deep underground. Louisiana is poised to become a hub for carbon capture sequestration technology, but some environmentalists and residents question if that's such a good thing.
ADVOCATE STAFF PHOTO BY BILL FEIG

Alexander Kolker

What are the risks of burying carbon dioxide deep underground? This once-obscure topic has gained attention as debates over carbon capture and sequestration roll across our state. As a geologist who has worked in Louisiana for 15 years, I believe these risks have not yet been well communicated to decision-makers and the public, and I want to take a few minutes of your time to share my concerns.

Carbon capture and sequestration is a tool that has been proposed to address climate change. Climate change, which is driven by the increased concentrations of carbon dioxide and other greenhouse gases in the atmosphere, is a concern for Louisiana. It causes hurricanes to strengthen and ocean levels to rise — risks that too many of us know too well. CCS seeks to capture carbon dioxide from the waste stream of an industrial facility, pressurize it, and inject it deep into Earth's crust where it will hopefully stay for thousands of years.

While some CCS technologies are decades old, few projects have done it on the scale that is being proposed in Louisiana. For example, the Decatur, Illinois project — often considered to be one of the largest, most successful CCS projects to date — stored 1 million metric ton of carbon dioxide over a three-year period. In contrast, Louisiana's annual output is nearly 200

times greater. The technology is still relatively new, particularly relative to the scale that is now being proposed, and this relative newness raises risks for Louisianans.

Several risks associated with CCS were presented in a 2019 report by the National Petroleum Council, a panel of academics, professionals and technical experts who have been advising the federal government on energy issues since the Truman administration. This report developed a road map to implementing CCS, and pointed out some of risks that could appear along the way.

According to this report, some of the biggest risks come from old oil and gas fields. Old wells act something like straws in the earth — they are easy pathways that carbon dioxide can take to reach the surface. Oil and gas extraction, the report points out, can also alter rocks, cracking them or making them less conducive to CCS. Hydraulic fracturing (fracking) can further damage rocks, making them more susceptible to leaking carbon dioxide.

Here in Louisiana, we should take note of these risks. There has been oil and gas drilling in this state for over a century, and there have been hundreds of thousands of wells drilled. Today, there are thousands of orphan wells in Louisiana and the nearshore regions of the Gulf of Mexico, some of which are not capped. Risks associated with oil and gas fields, wells, active and abandoned, need to be addressed to minimize the chances of accidents or blowouts.

If carbon dioxide does disperse underground, it could be problematic for our groundwater resources. When dissolved in water, carbon dioxide is a

corrosive acid that could cause toxic elements like copper, chromium, arsenic or radium to leach out of the aquifer rocks and into groundwater. These contaminants could be harmful to people who drink well water, or industries that use groundwater in their processes.

Louisiana also needs to consider whether injecting high-pressure carbon dioxide could cause the ground to shift. In Oklahoma, wastewater injection caused a sharp increase in the rate and size of earthquakes — most in places where earthquakes seldom occurred before. While Louisiana's rocks are less susceptible to earthquakes, the state has many geological faults that could become active and move if injected with fluids like high-pressure carbon dioxide. This could be problematic in Louisiana, where shifting lands contribute to the fragility of our landscape. For reasons that should be obvious, we do not want the ground shifting underneath a levee, road, bridge or home.

There are also risks to Louisiana's landscape. The build-out of CCS will require an expansion of Louisiana's pipeline network, and we know that pipeline canals are one cause of land loss in Louisiana. A CCS expansion will also lead to the construction of large facilities in Louisiana's coastal zone, and our coast is becoming a difficult place to work, as ever-more-intense storms strike this increasingly fragile landscape.

In my professional view, there are risks associated with CCS that we need to take seriously. I call upon my friends and colleagues in Louisiana's science community to start investigating the challenges associated with CCS, so that we can have a more informed conversation about the potential trade-offs associated with this new activity slated to occur on our landscape.

Alexander S. Kolker is an associate professor at the Louisiana Universities Marine Consortium. https://www.nola.com/opinions/guest-column-carbon-capture-geological-risk-for-louisiana/article_c6c6c5c8-fa09-11ed-a20c-83df8fcf35b5.html?utm_medium=email

The Great Carbon Capture Scam

Rex Weyler
1 June 2022 • 10 min read

We know that oil companies hid knowledge of global heating for decades, but the captains of petroleum also schemed to turn the ecological crisis into a profit centre. The industry devised a plan to swindle money from the public purse by pretending to address the climate issue while using subsidies to increase oil production. If one had no moral compass, one might say their scam was a stroke of genius.

Since the oil industry — Shell, Chevron, and others — were not prepared to actually slow oil production to halt global heating, and since they had no intention of aiming for zero carbon emissions, they invented "net zero." The "net" requires that we subtract some carbon from total emissions to create the illusion of "zero" emissions. Thus, the patriarchs of petroleum profiteering came up with "carbon capture," a deception that has netted them billions of dollars and euros in public money.

Even the Intergovernmental Panel on Climate Change (IPCC) has enabled the scam, since most IPCC climate models require carbon capture and storage (CCS) to balance the carbon books, always of course, at some time in the distant future.

A thick layer of smog hovers above the ground while smoke continues to pour out of the smoke stacks at the oil refinery. © Greenpeace / Colin O'Connor

How the scam works

Oil industry geologists knew in the 1950s that all oil fields would deplete over time, as pressure dropped in rock formations and the oil would no longer flow. They developed certain "enhanced oil recovery" technologies to extend the life of depleted oil fields, by fracking and by pumping carbon dioxide (CO_2) into old wells. However, these technologies were expensive and reduced their gargantuan profit margins. Furthermore, by 1965, even the American Petroleum Institute had anticipated the "catastrophic consequences" of carbon dioxide emissions. Thus the Great Carbon Capture Scam was born.

Industry insiders publicly claimed that they could capture and store the dangerous CO_2, using public money of course, while secretly planning to use

this captured CO_2 for enhanced oil recovery, which would create more carbon emissions. It might take decades for the public to figure out that they had been filched.

In 1948, Chevron discovered a promising field in Scurry County, Texas, which showed signs of depletion by 1951. In 1972, they began the world's first CCS project, using waste carbon dioxide from a gas field 400 kilometers away, near the Mexican border, shipping it north through a pipeline, and using the gas to extend the life of their Scurry field. After using the CO_2, they vented the gas, so there was no real climate advantage. However, the technology worked to produce more oil.

Since the companies intended to use captured CO_2 for enhanced oil recovery, the technology was then called "Carbon Capture, Use, and Storage," (CCUS). In 1992, international oil companies held the first CCUS conference in the Netherlands.

In 1998 Chevron, Exxon-Mobil, Shell, and the Australian government began promoting carbon capture and use for the huge Gorgon gas field in Australia that had two public relations problems: It was in a nature reserve and it produced a relatively dirty, climate-wrecking gas with 14% carbon dioxide waste. Since the carbon had to be captured anyway, to meet export regulations, the oil companies lobbied to have Australian citizens pay for it.

Chevron and their partners received a $60-million grant from the Australian government, and in 2003 Chevron claimed that CCUS was "a vital technology to ensure a safe, reliable supply of energy to meet the world's needs." Meanwhile, an API promotional campaign confirmed that CCS was primarily used to "enhance oil production."

In Australia, the companies promised to capture millions of tonnes of carbon, beginning in 2016, but for the first four years they captured none, and in 2019

the Gorgon CCUS project clogged up with sand and had to shut down for repairs.

To date, Gorgon has captured about 30% of its target for "processing emissions," but this term hides the fact that the companies have only captured about 2% of the target for total emissions. However, the one thing that Chevron did capture and store was 100% of the $60 million in public hand-outs. "Managing greenhouse gas emissions," Chevron declared, "is an integral part of how Chevron plans and executes its business."

The corporate strategy appears to be: Socialize costs and privatize profits. However, carbon capture added an additional strategy: Socialize risk. Since carbon emissions would accelerate global heating, and since the hydrogen produced is highly explosive, the companies faced severe liability risks. No problem: In Australia, Chevron and Shell convinced the government, the taxpayers, to accept liability for the hazardous Gorgon project.

The swindle appears simple: Pretend to help solve a problem, while making the problem worse, socialize the costs and liabilities, and privatize the profits. Clever. However, the unscrupulous scheme began to show signs of unravelling.

Flare stack at oil refinery in Immingham, UK © Les Gibbon / Greenpeace

Red herrings and red flags

In 2006, the German Federal Ministry of the Environment determined that there was "no direct cost advantage for technologies using fossil fuels [i.e. carbon capture] … compared to advanced renewable energy technologies," and a year later, the Australian Environmental Protection Agency recommended that the Gorgon project should not proceed due to environmental risks.

EnergyWashington Week revealed, as reported by Oil Change International and the US Environmental Protection Agency, that "A power plant equipped with a CCS system … would need roughly 10 to 40% more energy than a plant of equivalent output without CCS." More energy consumption yields more CO_2 emissions, not less. These warnings and recommendations were ignored.

The American Petroleum Institute continued to promote carbon capture, although their own consultant report on "Carbon Dioxide Enhanced Oil Recovery" warned that "the amount of infrastructure necessary to perform geologic storage on a meaningful level is equivalent to the existing worldwide infrastructure associated with current oil and gas production." To reverse global heating, CCUS would require doubling the world's petroleum infrastructure, built up over the previous century, a near impossibility with costs running into the trillions. Furthermore, that infrastructure would require massive mining, transport of materials, cement, steel, and carbon-intensive fabrication, yielding more emissions.

In 2007, as these nagging problems surfaced, BP scrapped a £500-million carbon capture scheme in Scotland. In the US, a "clean coal" CCS project in Mississippi, behind schedule and billions over budget, closed, and the Petra Nova CCS plant in Texas—promising to capture 1.6 million tonnes of CO2 annually—missed its targets over three years of operation and shut down in 2020. The Carbon Capture and Sequestration Technologies program at MIT closed due to the technology's ecological damage and unviable economics in 2016. By the end of 2020, more than 80% of US CCUS projects had failed.

Meanwhile, Western Australia's Environmental Protection Authority concluded in 2019 that Chevron should be held accountable for venting gas from the Gorgon project and for failing to capture and store the project's emissions as promised and required.

Quest for dollars

According to a January 2022 study by Global Witness, Shell's Quest plant in Canada's tar sands, is emitting more carbon than it is capturing, with the same annual carbon footprint as 1.2 million gas-powered vehicles. Shell's scheme, one of the biggest boondoggles of carbon capture chicanery, uses the hydrogen produced to refine thick, toxic bitumen into synthetic crude, creating

more carbon emissions. The project also emits methane, a much more potent greenhouse gas.

Global Witness found that although Shell's Quest plant was capturing 4.81-million tonnes of carbon annually (Mt/yr), it was emitting 12.47 Mt/yr in greenhouse gases from on-site and supply chain emissions and from the power required to operate the CCS system. The plant therefore annually is responsible for some 7.66-million tonnes of greenhouse gases, even after the CCUS bookkeeping tricks.

Shell originally promised to capture 90% of emissions, had to admit failure, and changed their target to 65%, but according to the Institute for Energy Economics and Financial Analysis, the Quest plant failed to reach its target every year from 2015 to 2020.

Upon awarding the Quest project a Canadian-dollar $834-million subsidy (US$654-million, €571-million) Canada's Ministry of Natural Resources Joanna Sivasankaran claimed that CCS was "an important tool on the pathway to reaching Canada's ambitious climate goals," to reach "net-zero by 2050." However, since the Quest project emits more than it captures and increases tar sands production, the dirtiest, most carbon-intensive petroleum product on Earth, these "ambitious climate goals," remain unattainable and appear preposterous.

Four hundred international scientists, academics, and energy analysts signed a letter to the Canadian government asking that they halt the subsidy scam. "Deploying CCUS at any climate-relevant scale," they wrote, "carried out within the short timeframe we have to avert climate catastrophe without posing substantial risks to communities on the front lines of the buildout, is a pipe dream."

The letter warned that CCUS is "not a negative emissions technology," with billions of taxpayer dollars used to boost oil production. The scientists and scholars warned of the health impacts to local communities, that the tax subsidies would tie Canada to "dependence on dirty tar sands," and that the project would add some 50 million metric tons CO_2 emissions annually by 2035.

According to Lubicon Cree citizen Melina Laboucan-Massimo, the tar sands project yields "elevated rates of cancers, as well as elevated rates of respiratory illnesses … contamination to the water, destruction and complete fragmentation of the Boreal forest."

According to Reuters, 26 commercial CCS facilities around the world capture about 40 million tonnes of CO_2 each year. To put that in perspective, the world emits about 36.4-billion tonnes of CO2 each year.

That means that after 50 years of CCS development; after billions of dollars in subsidies; after all the hype, deceits, tax breaks, and guarantees; the oil industry captures about 0.1% of annual CO_2 emissions. The other 99.9 % pollutes the atmosphere and heats Earth. Meanwhile, most of this captured CO_2 is used to produce more oil. Since that first CCS project began in 1972, world CO_2 emissions have almost tripled from 14.68 to 36.4 billion tonnes per year, not exactly the "net zero" we were promised.

Carbon capture was a scam from the beginning, and remains so today.

Greenpeace Italy activists have shown leaders of the world's largest economies that compensatory scams are the new climate denial and have dangerous consequences. A large screen shows some videos explaining how the practice of greenwashing hides reality. The key message is: "we need REAL climate action NOW". © Greenpeace / Lorenzo Moscia

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Resources and links:

Carbon Capture: Five Decades of False Hope, Hype, and Hot Air," Andy Rowell and Lorne Stockman, Oil Change International, June 2021.

Shell's fossil hydrogen plant in Canada emitting more greenhouse gasses than it is capturing: GlobalWitness report: "Hydrogen's Hidden Emissions," January 2022; sourcesand methodology: Pembina "Carbon Intensity of Blue Hydrogen;" Shell, Alberta data set; UK Dept. Transport; and Nimblefins Insurance; calculations shown in annex.

"The Western Australian government rules against the oil and gas company over emissions at the Gorgon LNG project, Guardian, 2020.

"Between a rock and a hard place: The science of geosequestration," Standing Committee on Science and Innovation, House of Representatives, The Parliament of the Commonwealth of Australia, 2007, PDF.

"Chevron's Gorgon emissions rise after sand clogs $3.1B C02 injection system," Peter Milne, Boiling Cold, Jan 12, 2021.

American Petroleum Institute: CCS used to "enhance oil production," Platts Energy Economist, "Carbon Capture and Storage: panacea or an expensive red herring?" November 1, 2006, reported in Oil Change International, June 2021.

"Summary of Carbon Dioxide Enhanced Oil Recovery (CO2EOR) Injection Well Technology," James P. Meyer PhD, Contek Solutions, Plano, Texas, for the American Petroleum Institute, web archive

Western Australia's Environmental Protection Authority concluded that Chevron should be held accountable for venting gas from the Gorgon project:

"Chevron Faulted for Gorgon Emissions," September 30, 2019; cited in "Carbon Capture: Five Decades of False Hope, Hype, and Hot Air," A. Rowell and L. Stockman, Oil Change International, June 2021.

Over 80% of U.S. CCUS projects have failed: "Explaining successful and failed investments in U.S. carbon capture and storage," Abdulla et al., Environmental Research Letters, 2021; Science IPO.

"Honest Government Ad, Carbon Capture & Storage," The Juice Media; "Australien Government" Sept 1, 2021:

"A power plant equipped with a CCS system .. would need roughly 10 to 40 % more energy than a plant of equivalent output without CCS." EnergyWashington Week, "International Panel Finds Carbon Sequestration Has High Price Tag", October 12, 2005; JSTOR.

"IEEFA: Carbon capture goals miss the mark at SaskPower's Boundary Dam coal plant," IEEFA. "The World's Only Coal Carbon Capture Plant Is Regularly Breaking," Audrey Carleton, Vice, 2022. SaskPower; has never met this goal (spglobal), as of the end of 2021.

"Are Canada's carbon capture plans a 'pipe dream?" John Woodside, National Observer, Canada, January 20, 2022

400 Canadian scientists'letter urges Canadian government to avoid rewarding companies who use carbon capture technology.

"Shell's Massive Carbon Capture Plant Is Emitting More Than It's Capturing," Anya Zoledziowski, Vice, January 2022.

"Comparison of carbon capture and storage with renewable energy technologies regarding structural, economic, and ecological aspects in

Germany," Peter Viebahn, et al., International Journal of Greenhouse Gas Control, April 2007, p.121-133.

"Fossil Fuel Racism: How phasing out oil, gas and coal can protect communities," Donaghy, T. & Jiang, C., 2021, Greenpeace.

26 commercial CCS facilities globally, capture about 40 million tonnesCO2/year: "Global CCS capacity grew by a third," Reuters, Dec. 2020.

2021 global CO2 emissions, 36.4-billion tonnes/year: "Global carbon emissions rebound to near pre-pandemic levels," Andrea Januta, Reuters, Nov. 2021; from University of Exeter study.

Using carbon dioxide for enhanced recovery: "The Scurry Area Canyon Reef Operating Committee (SACROC) unit, Scurry County, Texas," over a billion barrels of oil produced, Global CCS Institute, 2016. Carbon Capture, Centre for Climate and Energy Solutions, C2ES.

Exxon predicts Greenhouse Effect, CO_2 build-up, and global heating: Exxon internal Engineering Report, 1982.

"Peak oil and the low-carbon energy transition: a net-energy perspective," Delannoya, Murphy, ASPO France, 2021.

"Grand Transitions: How the Modern World Was Made," Vaclav Smil, amazon.

"Hydrogen: The dumbest & most impossible renewable," Alice Friedmann, Energy Skeptic, 2019

Energy Mix over time: Our world in Data

Energy Timeline, Alternative Energy

"COP-26: Stopping Climate Change and Other Illusions," William E. Rees (Professor Emeritus, University of British Columbia), Buildings and Cities, October 2021.

Leaks Show Attempts to Weaken UN Climate Report, Greenpeace Says, Deutsche Welle, Eco Watch, Oct. 21, 2021.

Anderson, K. & Peters, G. (2016) The trouble with negative emissions: science.org

"A Review of the Role of Fossil Fuel Based Carbon Capture and Storage in the Energy System," Garcia Freites, S. & Jones, C.; Friends of the Earth Scotland, 2020. https://www.greenpeace.org/international/story/54079/great-carbon-capture-scam/

Bob Marshall: Carbon capture is a taxpayer-funded gusher for oil, gas

BY BOB MARSHALL | Contributing Columnist

1 May 2023

 ***The Marathon Petroleum Refinery is seen in Reserve, La., Thursday, Dec. 2, 2021. Last year, Congress pledged $3.5 billion to carbon capture and sequestration projects around the United States, which has been called the largest federal investment ever by advocates for the technology. But environmental justice advocates and residents of legacy pollution communities are wary of the technology, with many calling it a "false solution." (AP Photo/Gerald Herbert) Gerald Herbert***

Watching Louisiana's oil-soaked politicians madly embracing carbon capture to reduce greenhouse gas emissions recalls a famous saying from the 1960s: Long hair can cover a red neck.

Yes, the world desperately needs to reduce emissions any way it can if Louisiana's coastal zone is to survive climate change. But are Steve Scalise, Garret Graves and the rest of our GOP gang in Congress suddenly turning greener than Rachel Carson?

Or is there another reason behind their sudden change?

Well, there is. And, as always with this group, it's about getting the public to pay fossil fuel companies to do the right thing.

Here's the deal.

For decades, these petrol-patriots said efforts to reduce emissions at their refineries was bad for America. It would cost them money and hurt consumers, and was unnecessary because climate change was a hoax — and they were not the problem, anyway.

But last year President Joe Biden got his Inflation Reduction Act passed, providing roughly $374 billion dollars in grants and tax incentives to encourage American industry to reduce emissions. A large chunk of that will be available to the energy industry to capture and store their refinery emissions underground. The credits start at $45 a ton and could reach a whopping $180 a ton.

Such a deal! You and I will be paying them to stop adding to the emissions responsible for larger hurricanes already wreaking greater economic disasters on us, ruinous rises in insurance rates and surging sea levels that could swallow our bottom third in the next 40 years.

Best of all (for them), they can still make the fossil fuels that will produce even more carbon than will be captured at their refineries. All while continuing their fight against taxpayer grants to increase green energy.

It's like paying a thief to stop stealing just some of your money.

Meanwhile, oil giants like Chevron and Exxon-Mobile see the potential of trillions in profits by providing the pipelines to remove the crisis-causing carbon their refineries and products produce. They made untold billions pumping the poisons into our air, causing this crisis, now they see even more profits taking it out.

This obviously goes against the ideas of justice and responsibility our parents taught us. But every politician, lobbyist and environmentalist I talked to said there was no chance of passing a regulation forcing them to clean up their mess.

That's because corporate citizens have more rights and far fewer responsibilities in our democracy than human citizens.

I'm not saying not to do this; quickly reducing all sources of emissions is essential to our survival. But if we must acquiesce to the grift, let's make sure we get what we're paying for, and it doesn't lead to other environmental degradation.

And that might not happen.

Graves and others are pushing to have the Environmental Protection Agency give the state permitting responsibilities for capture-and-bury projects. But last year, Louisiana was ranked the most polluted state in the nation, a position it annually hovers around.

Does that give anyone confidence these agencies will protect the land, water and wetlands these pipelines might be cut through, stop the pollution that might be spewed into the air or keep close watch on the carbon pumped below?

The politicians urging us to rush into this new industry say giving the state authority will reduce permit review times from several years to a few months. And that, they say, could speed up the time frame for reducing emissions, helping slow the pace of global warming.

But this is the same congressional delegation that voted against Biden's bill and continues to oppose funding for green energy.

It makes you want to see just what might be hiding under their mullets.

Bob Marshall, a Pulitzer Prize-winning Louisiana environmental journalist, can be reached at bmarshallenviro@gmail.com, and followed on Twitter @BMarshallEnviro.
https://www.nola.com/opinions/bob-marshall-carbon-capture-a-taxpayer-funded-gusher/article_3b78c5fe-e521-11ed-be90-7795e970f680.html

Why carbon capture and storage technologies represent a new form of greenwashing

Published: 10 January 2023 10:38

Polluters' reliance on carbon capture and storage (CCS) technologies, in-place of holistic action and expansion of renewables, is a greenwashed recipe for disaster, argues Aidan McClean, CEO and co-founder of online electric vehicle hire firm UFODRIVE.

Modern civilisation is founded on technology. It has made our lives immeasurably better, and we seem to be on the constant verge of something greater than ever before. However, when it comes to climate action, too many governments, companies and organisations are using technological potential and the alure of the next big breakthrough to defer meaningful, radical, climate action.

Nothing exemplifies this better than carbon capture and storage (CCS) technologies. It is an expensive, unscalable, and inefficient solution that often creates more pollution than it saves due to how energy intensive it is. This is, of course, worsened by how it is used to greenwash the environmental impact of fossil-fuel energy production, with energy companies and petrostates using its potential success at removing carbon as an excuse to just produce more.

There is some positive news, though. Clean, renewable energy production is commonplace throughout much of the world, and has been steadily, but consistently, rising. Clean energy production met up to 7% of global demand in the first six months of 2021, according to the ***World Economic Forum****, and accounts for more than half of all jobs in the energy sector.*

Furthermore, investment into renewable sources now accounts for almost three-quarters of the growth in total energy investment and has been growing at an average annual rate of 12% since 2020.

*To keep global warming to between 1.5 and 2 degrees Celsius, which is what the Intergovernmental Panel on Climate Change (**IPCC**) brand a "liveable future", greenhouse gas emissions need to peak by 2025. And we are on course to meet this target, but only by the skin of our teeth, according to the International Energy Agency (**IEA**).*

Energy companies must ramp up renewable investments

*A hospitable planet and functioning ecosystems, however, do not seem to be priorities for many energy companies. The four largest oil and gas companies in Europe (BP, Shell, TotalEnergies and Equinor) are allegedly investing just 5% of their profits in renewables, according to a recent investigation by **Channel 4 News**.*

*The results across the Atlantic are even grimmer. The two major American energy companies – Chevron and ExxonMobil – trail their European counterparts significantly, with scientists questioning the clean energy claims of all of the big four energy providers globally, according to a study from February 2022 in the journal **PLOS One.***

Understanding how far short both US and European energy producers fall from sound climate action is easier said than done due to a general lack of transparency around existing investments in renewables.

However, estimates are below 1% of profit, and in fact, "only in 2018 did ExxonMobil recognise, indirectly and weakly, the link between fossil fuels and climate change in its annual report".

Misplaced priorities and new forms of greenwashing

*Instead, energy companies and petrostates have other (misplaced) priorities. Carbon capture technologies are colossally expensive, taxpayer-subsidised failures – which in practice just give energy producers the excuse to pollute further. Their lack of viability, and the enthusiasm for them amongst those that profit the most from fossil fuels (**such as Saudi Arabia**), reveals the truth: it is just a new form of greenwashing.*

*CCS technologies actually increase the amount of carbon going into the atmosphere due to how energy intensive the process is. In fact, the US emits roughly five billion tons of carbon into the atmosphere every year, and removing one billion tons of that through direct air capture would require almost the entire electricity output of the entire country, according to some of the recent studies in the **Biophysical Economics and Sustainability journal**.*

*Worryingly, state subsidies, particularly in the west, are often the driving force behind carbon capture. For example, the Quest CCS facility, a joint venture between Shell, Chevron, and Marathon Oil, cost $1 billion overall, with $654 million coming from Canadian government subsidies. The companies involved in this project claim that it has captured five million tonnes of CO2 in less than five years. Yet some reports claim that it also emitted a further 7.5 million tonnes during the same time period and that only 48% of the plant's emissions were captured, far short of the 90% claimed, according to **NGO Global Witness.***

*To make matters worse, CCS isn't just being used as a distraction, vanity project, or projected virtue, but rather a way to mask true action, or lack thereof. CCS "makes up a large part of low carbon investment for Chevron and Shell", according to the **PLOS One** study, and we still aren't clear whether this depicts R&D, project development or actual energy production.*

Business as usual

Despite what's at stake, business as usual prevails. Channel 4 alleged that BP invested £300m into renewables in the first half of 2022, but £3.8bn in new oil and gas projects, which is more than 10 times its low carbon investments. Similarly, Shell invested the equivalent of 6.3% of its £17.1bn profits into low carbon energy, and nearly three times that amount in more oil and gas.

The most frustrating aspect of this, perhaps, is the fact that renewables work. They are profitable, sustainable, and have consistently grown to meet demand; their value has been even more graphically illustrated as Russia's war in Ukraine made gas expensive and unreliable.
https://www.computerweekly.com/blog/Green-Tech/Why-carbon-capture-and-storage-technologies-represent-a-new-form-of-greenwashing

U.N. slams carbon removal as unproven and risky

By **Corbin Hiar** | 05/24/2023

Workers watch a bucket excavator remove earth from the top of coal deposits near Großräschen, Germany. The United Nations is questioning the use of carbon removal technologies to reduce greenhouse gas emissions. Sean Gallup/Getty Images

A United Nations panel is casting doubt on the promise of using machines to remove vast amounts of carbon dioxide from the air and sea in order to fight climate change.

The skepticism from the high-profile organization sent shock waves through the emerging industry of carbon removal companies that many scientists say will be essential for the world to stabilize, or one day reduce, global average temperatures. It comes as the Biden administration is preparing to pour billions of dollars into the industry.

The panel questioned the technical and economic viability of startups seeking to clean up carbon that's already been dumped into the sky, igniting pushback

from an industry that is gaining popularity but so far has not captured sizable amounts of warming gases.

The U.N. panel called the sector "unproven," with "unknown" risks.

At issue is a provision of the Paris Agreement on climate change that calls for establishing an international carbon trading program. Officially known as Article 6.4, the provision is the cornerstone of an envisioned worldwide system in which companies could offset some of their emissions by funding, for example, a new wind farm and then trading the offsets the project generates with foreign firms. Other businesses might try to meet their climate commitments by paying a company for carbon dioxide removal, or CDR.

The U.N. panel is charged with standing up that trading system. And the positions it takes on carbon removal systems could affect the trajectory of the industry.

"It's a big deal," said Wil Burns, co-director of American University's Institute for Carbon Removal Law and Policy, referring to the trading system.

"Paris can help us, if done well, to rigorously set up uniform rules that I think will create more integrity in the carbon removal marketplace than we've had before," he said. "The devil is in how we operationalize this."

There are two main ways to remove carbon from the atmosphere and oceans. One is to cultivate or protect CO2-hungry plants like trees and seagrasses. The other is to deploy carbon removal technology such as direct air capture, which uses fans, filters, piping and energy to pull CO2 from the atmosphere and pump it permanently underground.

In recent years, Congress has provided billions of dollars in subsidies to help establish the direct air capture industry in the U.S.

But the U.N. panel appears to favor so-called natural approaches.

"Engineering-based removal activities are technologically and economically unproven, especially at scale, and pose unknown environmental and social risks," the panel wrote in a lengthy note released last week. "These activities do not contribute to sustainable development, are not suitable for implementation in the developing countries and do not contribute to reducing the global mitigation costs, and therefore do not serve any of the objectives of the Article 6.4 mechanism."

The panel based its conclusions in part on input it received from several groups that are critical of carbon removal such as the Center for International Environmental Law and Friends of the Earth. Only a few carbon removal companies provided information to the panel while it was developing its note.

The fledgling industry is now scrambling to provide feedback to the United Nations before it makes any final decisions on the Paris Agreement's emissions trading system.

"CDR is a new commercial sector, and the range of potential pathways are at varying stages of discovery, development, and deployment," Ben Rubin, the executive director of the Carbon Business Council, a trade association, said Wednesday in a letter to the panel. "The sector is advancing quickly, and there are a number of approaches ready for eligibility under Article 6.4 now, with more expected to reach that stage of maturity in coming years."

Rubin also took issue with the United Nations' conclusion that CDR projects don't help economies or ecosystems.

"We would be pleased to connect you with carbon removal leaders advancing projects in Kenya, Kiribati, India, Brazil, and other locations around the world where CDR is contributing directly to local and regional economic development," he said in the letter, which was co-signed by more than 100 carbon removal executives and experts.

The industry's delayed response indicated that it was unprepared to participate in a process that was important in its evolution, said Burns of American University.

"It seems the carbon removal industry really shot themselves in the foot," said Burns, who also signed the letter. "They were not well-organized in sending in comments. So part of it is their fault because what ended up at the end of the day was the narrative advanced by a very narrow faction of groups, most of whom are extremely hostile to any quote-unquote industrial CDR approaches and in my mind fetishize nature-based solutions.

"I'm not totally in the bag on CDR," he added. "But I do know that this was a bit of a hatchet job."

The U.N. Framework Convention on Climate Change, which includes the panel, did not respond to a request for comment.

The panel is accepting comments on the note through Thursday. It hasn't set a deadline for establishing the emissions trading system but is likely aiming to make an announcement by the end of November, when the next U.N. climate conference is set to take place in the United Arab Emirates.
https://www.eenews.net/articles/u-n-slams-carbon-removal-as-unproven-and-risky/

A recent report once again call into question industries claims about CC&S as a "proven technology". As note above "the Emissions from Chevron's Gorgon gas development off Western Australia have increased by more than 50% despite it being home to the world's largest industrial carbon capture and storage system.

There has been a sharp drop in the amount of CO2 stored underground at the liquefied natural gas plant over the last three years, data released by Chevron showed". https://www.theguardian.com/environment/2023/apr/21/emissions-wa-gas-project-chevron-carbon-capture-system-pilbara-coast

Norway's Sleipner and Snøhvit CCS: Industry models or cautionary tales?

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Grant Hauber (Attachment #7)

Executive Summary

The oil and gas industry, along with a host of high carbon-emitting companies and hopeful governments, are looking at offshore carbon capture and storage (CCS) as a panacea to reducing anthropogenic carbon dioxide (CO_2) emissions. Leading CCS proponents consistently cite two projects in Norway as proof of the technology's viability: Sleipner and Snøhvit. These offshore fields have been operating since 1996 and 2008 respectively. The facilities separate CO_2 from their respective produced gas, then compress and pipe the CO_2 and reinject it underground. Between Sleipner and Snøhvit, an average of 1.8 million metric tonnes per year of CO2 are disposed of in this manner, accumulating 22 million tonnes in storage so far.

Following from Sleipner's and Snøhvit's purported success, there are now nearly 200 proposed offshore CCS projects worldwide seeking to sequester hundreds of millions of tonnes of CO_2 annually – potentially billions over their operating lives. These proposals represent hundreds of billions of dollars in capital investment and billions of dollars in ongoing operating costs. More importantly, they are said to be the key to making a material dent in the over 37 billion tonnes of CO_2 emitted globally each year.

Can these two Norwegian projects be relied upon as fully successful models for global decarbonization?

Research conducted by the Institute for Energy Economics and Financial Analysis (IEEFA) has revealed that storing carbon dioxide underground is not an exact science. It may carry even more risk and uncertainty than drilling for oil or gas, given the very limited practical, long-term experience of permanently keeping CO_2 in the ground.

Oil and gas exploration companies rely on their geophysical survey prowess and analytic capabilities in identifying and updating reserves. However, even in what are thought to be reserve-rich areas, drilling sometimes comes up with dry holes. This is because exploration is an inexact science. There can be no clairvoyance as to what lies below the ground, but rather indications. While exploration is increasingly based on data derived from the most advanced technologies, its outcomes necessarily remain estimates drawn from interpretations and interpolations of subsurface data.

The subsurface areas of Sleipner and Snøhvit are among the most studied geological fields in both oil and gas and CO_2 storage globally. More seismic and other forms of subsurface study and monitoring of these two fields have been conducted than nearly any other place on the planet. Over 150 academic papers have been published. Their seismic datasets have been downloaded more than a thousand times.

Despite the studies, experience and passage of time, the security and stability of the two fields have proven difficult to predict. In 1999, three years into Sleipner's storage operations, CO_2 had already risen from its lower-level injection point to the top extent of the storage formation and into a previously unidentified shallow layer. Injected CO_2 began to accumulate in this top layer in unexpectedly large quantities. Had this unknown layer not been fortunate enough to be geologically bounded, stored CO_2 might have escaped.

At Snøhvit, problems surfaced merely 18 months into injection operations despite detailed pre-operational field assessment and engineering. The targeted storage site demonstrated acute signs of rejecting the CO_2. A

geological structure thought to have 18 years' worth of CO_2 storage capacity was indicating less than six months of further usage potential. This unexpected turn of events baffled scientists and engineers while at the same time jeopardizing the viability of more than US$7 billion of investment in field development and natural gas liquefaction infrastructure. Emergency remedial actions and permanent long-term alternatives needed to be, and were, identified on short notice and at great cost.

In the context of CCS projects and proposals worldwide, Sleipner and Snøhvit account for only a tiny fraction of the intended carbon capture capacity.

The hub proposals – from Malaysia to the North Sea to the Gulf of Mexico – are larger by factors of 10 or more, and potentially entail CO_2 storage fields measuring in the thousands of square kilometers. Applying a similarly intense level of technical study, monitoring and resources as allocated to the CO_2 storage operations of Sleipner and Snøhvit may prove to be a cost and resource challenge for larger, more complex CCS projects.

Yet unpredicted deviations in how Sleipner's and Snøhvit's injected CO_2 was interacting with targeted strata underground, including unexpected behaviors that evolved years into operations, indicate that such monitoring is indeed required. What the Norwegian projects demonstrate is that each CCS project has unique geology; that geologic storage performance for each site can change over time; and that a high-quality monitoring and engineering response is a constant, ongoing requirement. Every proposed project needs to budget and equip itself for contingencies both during and long after operations have ceased.

Globally, regulation of CCS projects is both nascent and uneven. Australia, the European Union and Norway have perhaps the most advanced rules

governing CO_2 injections, but their efficacy of scope and level of detail remains untested. The common features are requirements for pre-implementation plans; collection and disclosure of operational data; and post-closure containment monitoring and mitigation plans spanning decades. CCS field operators must post financial bonds and have emergency remediation plans to address contingencies if the CO_2 leaks. However, bonding requirements vary considerably among jurisdictions, from 10 years in Australia to potentially 50 years in the United States. Including long post-closure bonding periods appears to acknowledge that storage sites may not have the permanence proponents assume. Yet, at the regulator's discretion, those periods can be shortened, potentially transferring uncapped risk to the public.

While these regulations are imperfect, most of the rest of the world lacks any CCS regulation. This exposes people and the planet to considerable long-term risk.

Sleipner and Snøhvit, rather than serving as entirely successful models for CCS that should be emulated and expanded, instead call into question the long-term technical and financial viability of the concept of reliable underground carbon storage. They cast doubt on whether the world has the technical prowess, strength of regulatory oversight, and unwavering multi-decade commitment of capital and resources needed to keep CO_2 sequestered below the sea – as the Earth needs – permanently. https://ieefa.org/resources/norways-sleipner-and-snohvit-ccs-industry-models-or-cautionary-tales