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House Natural Resources Subcommittee on Energy and Mineral Resources
Holds Hearing on the Gulf of Mexico Offshore Carbon Storage

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Body

House Natural Resources Energy And Mineral Resources: The Opportunities And Risks Of Offshore Carbon Storage In The Gulf Of Mexico.

April 28, 2022 09:30 A.M.

SPEAKERS:

REP. ALAN LOWENTHAL (D-CALIF.), CHAIRMAN

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REP. MIKE LEVIN (D-CALIF.)

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REP. DIANA DEGETTE (D-COLO.)

REP. BETTY MCCOLLUM (D-MINN.)

REP. JARED HUFFMAN (D-CALIF.)

REP. DEBBIE DINGELL (D-MICH.)

REP. RAUL GRIJALVA (D-ARIZ.), EX-OFFICIO

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REP. DOUG LAMBORN (R-COLO.)

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CENTER FOR INTERNATIONAL ENVIRONMENTAL LAW PRESIDENT CARROLL MUFFETT

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ENVIRONMENTAL DEFENSE FUND DIRECTOR NICHOLE SAUNDERS

NATIONAL OCEAN INDUSTRIES ASSOCIATION PRESIDENT ERIK MILITO

[*]ALAN LOWENTHAL: Good morning, everyone. We--the subcommittee on Energy and Mineral Resources will come to order. We are meeting today to hear testimony on the opportunities and the risks of storing carbon dioxide offshore in the Gulf of Mexico. Under Rule 4F, any oral opening statements or hearings are limited to the Chair and the Ranking Minority Member or the designees.

This will allow us to hear from witnesses sooner and help members keep to their schedules. Therefore, I ask unanimous consent that all other members opening statements be made. Part of the hearing record, if they are submitted to the clerk by 5:00 PM today or at the close of the hearing, whichever comes first.

Hearing no Objection, so ordered. Without objection, the Chair may also declare a recess subject to the call of the Chair. Without objection, we may have other members which we will hear later on today here if they ask questions of witnesses in today's meeting. As described in the notice, statements, documents or motions must be submitted to the electronic repository at HNRCdocks@mail.house.gov

Members physically present should provide a hard copy for staff to distribute by email. Please note that members are responsible for their own microphones. As with our fully in-person meetings, members can be muted by staff only to avoid inadvertent background noise. Finally, members or witnesses experiencing technical problems should inform committee staff immediately.

With that, I will begin my opening statement. This, for me, a very interesting hearing, but I'll start with, the Biden Administration has set goals for the United States to reduce greenhouse gas emissions by at least 50 percent by 2030 and to reach net zero emissions no later than 2050. And according to the international scientific community, if countries worldwide reach net zero emission by mid-century, we can prevent the worst impacts of climate change from occurring.

We have no time to waste and reaching these goals will take a whole of government approach. We need to eliminate greenhouse gas pollution from every sector of the US economy, including heavy industries that are critical to our economy but are very difficult to decarbonize. I'm talking about heavy industries like manufacturing, chemical processing and refining.

One potential tool for these four to decarbonize industries is carbon capture and storage. Excuse me. By capturing the carbon dioxide before it enters the atmosphere is just one side of the equation and a complicated one at that. That carbon must then be stored and Monitored for decades to come. Which brings us to the subject of today's hearing.

The outer continental shelf of the Gulf of Mexico has tremendous potential to permanently store large amounts of carbon dioxide that would otherwise be admitted into the atmosphere. State government, industry and academics have all expressed interest thanks to the Gulf's unique geology and close proximity to heavy industries that emit significant amounts of carbon pollution.

The Gulf region is also home to a highly trained offshore oil and gas workforce whose skills and expertise are directly transferable to this emerging industry, and it makes sense. Instead of pumping oil out of the seabed, they would be pumping carbon dioxide into it. However, offshore carbon storage is most certainly not without risk and it's no silver bullet climate solution.

Carbon capture and storage does not give highly polluting facilities, a license to increase emissions of carbon dioxide or the many other dangerous pollutants that they can spill into the air. The Gulf region is home [Inaudible] industrial facilities that disproportionately impact minority and low-income communities.

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These types of facilities emit enormous amounts of pollution that are harming our planet and hurting human health. We must also gain a better understanding of the impacts of offshore carbon storage on marine environment and the safety hazards posed by carbon dioxide pipelines, which will be essential for moving carbon about from where it is captured into the undersea storage.

In 2020, a ruptured carbon dioxide pipeline in Mississippi led to the evacuation of 200 residents and the hospitalization of 45 people. That's why the bipartisan infrastructure law directed the Department of the Interior to issue new safeguards for development of carbon storage projects on the Outer Continental Shelf, in addition to other provisions to support this industry.

It is critical that these regulations developed by the Department of Interior prioritize the health and safety of Gulf communities, set strong industry standards and provide protections for taxpayers. Before turning over to Ranking Member Stauber, I want to emphasize, the carbon capture and storage could be one piece, albeit a small piece, of our overall efforts to reduce pollution that is destroying our planet and harming the health of Americans.

However, I'd like to say, usually when we have majority witnesses, they all agree generally on the topic, and the minority witnesses are usually in opposition to our majority. But this year, this hearing, our majority witnesses have different takes on this, on carbon capture and storage. One esteemed scientist says that carbon capture and storage in the Gulf, Storage in the Gulf is not a want, but a need.

It has to be done, really. Another one says that, well, carbon storage is not a silver bullet and really, before we do it, we--you know, we really must take into account lots of issues must be solved. And our third witness says carbon capture and storage is a false solution. So I look forward to an exciting hearing and one that I hope will educate me greatly.

I want to hear how realistic some of these carbon capture and storage projects really are in the near time. I personally remain cautiously optimistic. But I still also believe that transitioning away from fossil fuel is still the most effective strategy for saving the planet and for our children, and for our grandchildren, and it's going to remain a focus of this subcommittee.

Although, this is a very fascinating subject also that we need to look at. With that, I look forward to the testimony of our witnesses, and I now recognize Ranking Member Stauber for his opening statement.

PETE STAUBER: Thank you very much, Chairman Lowenthal. I look forward to being with you in person at the next hearing. And as you know, I value our friendship. Today, I'm excited to discuss an exciting new branch of the Energy and Minerals Resources Subcommittee jurisdiction, Carbon Capture, Utilization and Storage. CCUS involves capturing carbon dioxide from emission streams, whether it be right at the point of emission or from the air.

Carbon is then condensed and stored underground or reused in other applications. This technology has the potential to revolutionize the industrial sector. It's a great example of innovation that is already deployed by firms in energy generation, steelmaking and many others. For starters, various forms of carbon capture and storage are already in effect and development in the United States on land.

Meanwhile, the Gulf of Mexico provides opportunities for CCUS development offshore, where the favorable geology under the seafloor offers just the right situation for storage. We will therefore, today explore the potential for offshore carbon capture and sequestration. But first, I would be doing a disservice to the American people if I did not again discuss the damage inflicted on the livelihoods of Americans by Joe Biden's policymaking or lack thereof.

Just last week I was able to join my close friend and colleague, House Minority Whip Steve Scalise, to an offshore oil rig off the Louisiana coast, The Appomattox. I saw firsthand how the oil and gas workers value safety and environmental responsibility while developing the resources. We need to keep energy affordable, reliable and clean for American families.

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The issue is clear, The Administration must offer oil and gas lease sales both onshore and offshore. The only offshore lease sale held to 57 was directed by a Louisiana court and was a resounding success. It would have generated record revenues for the United States and would generate even more over the life of the lease, which we would deposit into conservation funding.

However, it was predictably challenged by activists, fundraising and legal organizations who were able to win an unlawful pause. And to make matters worse, we're only 64 days from Boeing's current five-year plan expiring with no replacement in sight. This administration needs to follow the law and complete a replacement plan by the July 1st deadline.

Meanwhile, on shore, the administration was dragged, kicking and screaming into offering one single lease sale. And I'm happy for the roughnecks in the West who may get a little relief, but it does come at a cost, a higher royalty rate and an 80 percent reduction in land offered as the Interior Department bragged in a recent press release.

This is what Joe Biden envisioned when he promised to end fossil fuels as a candidate. Less American resources, more foreign imports, more expensive lives for Americans, especially as a summer driving season is upon us. But don't take my word for it, the White House press secretary recently said that the President's policy is, and I quote, to ban additional leasing, end quote.

This is unacceptable. Joe Biden must get on the side of American energy. With that being said, I can now turn back to the core of the hearing today. There are several federal policy issues in the offshore CCUS space for us to consider. Last November, interior was authorized to lease lands and grant rights of way and easements for carbon storage on the outer continental shelf.

The law requires regulations to be issued within a year of enactment and we're now only seven months away. As the administration develops this framework, we have several issues to consider. For example, we need to ensure lease terms and long-term viability. Carbon has the potential to be stored permanently.

Therefore, what will happen to the leased area? How will we monitor for safety long term? How can we ensure the waters remain viable for multiple use? And just like any industrial application, leasing and regulatory certainty is paramount. We need to ensure operators know their lease terms so they can plan, raise capital and invest.

Unlike other sectors, carbon storage doesn't create a commodity that can be bought and sold on a market. Firms cannot be expected to make these massive investments without having a baseline expectation of liability and certainty. And lastly, we need to have a robust pipeline infrastructure to transport carbon from point source to sequestration.

We therefore need a thoughtful and forward-thinking policy on ocean pipelines. Given the general attitude towards pipelines by this administration and the committee majority, who for example, advanced short-sighted legislation like the Offshore Pipeline Safety Act, it's imperative we build consensus driven bipartisan solutions.

In closing, I look forward to diving into the prospect of capturing, transporting and storing carbon offshore. I look forward to the testimony. Thank you, Mr. Chair, and I yield back.

ALAN LOWENTHAL: Thank you, Ranking Member Stauber. I believe that Ranking Member Westerman will not be making an opening statement.

BRUCE WESTERMAN: That's correct, Mr. Chair.

ALAN LOWENTHAL: Then, I am going to now introduce today's witnesses. Dr. Tip Meckel is a senior research scientist for the **Bureau of Economic Geology** at the University of Texas at Austin. Mr. Carroll Muffett is the President and CEO of the Center for International Environmental Law. And Ms. Nichole Saunders, who is joining us remotely, is the director and senior attorney for Energy Transition at the Environmental Defense Fund.

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And Mr. Erik Milito is the President of the National Ocean Industries Association. Let me remind the witnesses that under our committee rules, they must limit their oral statements to five minutes, but that their entire statement will appear in the hearing record. When you begin, the timer will begin, and it will turn orange when you have one minute remaining.

I recommend that members and witnesses joining remotely pin the timer so that it remains visible. After your testimony is complete, please remember to mute yourself to avoid any inadvertent background noise. I will allow the entire panel to testify before questioning the witnesses. The Chair now recognizes Dr. Meckel for five minutes.

TIP MECKEL: Thank you. Subcommittee Chair Lowenthal, Ranking Member Stauber and subcommittee members, thanks for the invitation today to provide testimony related to the opportunities and risks of offshore carbon storage in the Gulf of Mexico. I serve as a senior research scientist at the Gulf Coast Carbon Center at the Texas **Bureau of Economic Geology** at the University of Texas at Austin.

My expertise is in geology and geophysics with a specialty in carbon dioxide storage. During my 15 years working full time on carbon capture and geologic storage, I've worked closely with the US Department of Energy, National Energy Technology Laboratory under the Office of Fossil Energy and Carbon Management.

My colleagues and I have led a half dozen CCS demonstration projects utilizing over \$70 million in federal funding. Our center has also interacted with many companies that are actively developing CCS projects, including offshore both in the United States and internationally. Beginning in 2010, I initiated a research program to evaluate the offshore Gulf of Mexico for carbon capture and storage.

I've completed three multi-year offshore CCS storage research projects to date with one ongoing for the western Gulf of Mexico. We now have the first example of a successful state lease in Texas for offshore CO2 storage, indicating commercial market interest and viability of IRS Section 45 Tax Credits for Accelerating Project Deployment.

Lastly, my colleagues and I at the Center are currently in regular dialog with the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement on topics related to offshore CCS. In the United States and globally, we are faced with the unprecedented challenge of providing abundant, affordable and reliable energy while simultaneously mitigating the effects of climate change associated with industrial emissions.

Both the International Panel on Climate Change and the International Agency have stated repeatedly over the last decade that trying to address our energy needs and associated industrial emissions will be both more expensive and less effective without carbon capture and geologic storage. Simply put, CCS is not a want, it is a need.

It is important for the subcommittee to recognize that while CCS is a relatively new topic for the offshore in the United States, it has been active internationally for over a decade, and there are over 20 years of experience in developing and deploying CCS technology in the United States, recognized leader in CCS. Multiple examples of successful industrial projects exist.

The primary technology components needed are at a very high technology readiness level and projects can proceed safely and effectively today. With regard to subsurface storage capacity, the offshore continental shelves represent the national endgame for effective CCS deployment at the scale needed to mitigate existing and future emissions.

In particular, the Gulf of Mexico Basin is one of the most studied geologic regions in the world. Currently available subsurface data are sufficient to initiate storage projects today. Multiple technical studies identify hundreds of gigatonnes of storage capable of addressing national emissions for decades.

Considering the opportunities that offshore CCS affords, it is important to recognize that following, an offshore CCS industry would facilitate the mitigation of significant quantities of CO2 emissions from industrial point sources and would increase the nation's ability to reach stated greenhouse gas emissions reduction targets.

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The development of a successful offshore CCS industry will both retain as well as create significant long-term, diverse and high paying jobs. Development of offshore seeks will lead to international competitiveness in a rapidly evolving global energy transition. Offshore CCS can be an important part of addressing environmental justice issues related to the energy transition.

The opportunity exists to repurpose existing infrastructure nearing the end of its production cycle for CCS and avoid decommissioning costs. Considering the risks that CCS presents, the following points are critical to understand. CCS science is mature and subsurface injection of CO₂ for emissions abatement is demonstrably safe and effective.

Primary risks include migration of buoyant fluids toward the surface and marine environment via legacy wellbore or geologic pathways. The management of induced pressure in the subsurface associated with CO₂ injection is important for understanding the project location and adjacent proximity while minimizing potential for induced seismicity.

The technologies needed for effective monitoring of subsurface CO₂ injection projects are mature and exist today. The costs of CCS are currently quite high. Current IRS tax credits valued at \$39 a tonne are capable of initiating some projects, but tax credit values closer to \$85 a tonne would generate a significant additional increase in project development.

Public perception of CCS is uneven, although many become more supportive once they are provided additional information on benefits and risks. In conclusion, I believe the Gulf of Mexico represents the single best opportunity for developing a CCS industry in the United States that can effectively address national emissions reduction strategies at the required scale.

The opportunities are economically impactful, can significantly mitigate emissions for reaching our national targets and the risks are manageable and monitoring is mature. We are ready to proceed. I encourage the subcommittee to recognize the ability to simultaneously address future abundant, affordable and reliable energy needs while reducing industrial emissions and addressing climate change by establishing permitting and regulations needed for safe and timely development of an offshore CCS industry in the OCS, specifically in the Gulf of Mexico.

Thank you for the opportunity to provide these perspectives and I'm happy to field any questions as time allows.

ALAN LOWENTHAL: Thank you, Dr. Meckel. The Chair now recognizes Mr. Muffett for five minutes.

CARROLL MUFFETT: Chairman Lowenthal, Ranking Member Stauber, members of the subcommittee, thank you for the opportunity to address you today. Since 1989, the Center for International Environmental Law has used the power of law to protect the environment, promote human rights and ensure a just and sustainable society. Carbon capture and storage advances none of those objectives.

Opposition to CCS is growing rapidly. The White House Environmental Justice Advisory Council says CCS will not benefit communities. Climate Action Network International, the world's largest network of climate organizations, says CCS is not a viable solution to the climate crisis. Last summer, hundreds of organizations urged Congressional leaders to reject CCS as a false and dangerous solution to climate change.

In its latest report, the Intergovernmental Panel on Climate Change recognized the heavy reliance on CCS in many climate plans but warned of its serious risks and limitations and identified CCS as among the highest cost, lowest potential of all climate mitigation options. And communications across the Gulf Coast, the Midwest, the Ohio Valley and beyond are mobilizing and litigating to stop CCS projects.

Why? Because CCS is not a climate solution. Despite decades of industry experience, Existing six projects capture less than one tenth of one percent of CO₂ emissions and have been marked by repeated and conspicuous failures. CCS is energy intensive, making facilities that use it more costly and less effective, less efficient.

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When renewable energy is already the cheapest source of new energy for most people, CCS just makes the bad economics of fossil fuels even worse. The industry's only economical carbon storage solution is using captured carbon to produce even more oil. More than 95 percent of US CCS capacity and development is designed to increase oil production, not reduce emissions, nor can the need to decarbonize industries justify massive new CCS infrastructure.

An analysis of the CCS potential at more than 1500 industrial facilities in the US found CCS technically and economically feasible at only 123 of them, just eight percent of the total. Even if CCS worked, building a massive new infrastructure for CCS would raise profound environmental health and safety work risks for communities across the US, with disproportionate impact on communities of color.

The roughly 5,000 miles of existing CO2 pipelines are heavily concentrated in remote oilfields. CCS proponents call for 65,000 miles or more of new pipelines, including in heavily populated areas putting communities at significant risk. Compressed CO2 is highly corrosive, increasing the risks of leaks and pipeline ruptures.

CO2 is also an intoxicant and asphyxiate. At high concentrations, it can result in unconsciousness, coma and death. A CO2 pipeline rupture near Satartia, Mississippi sent dozens to the hospital, with first responders reporting people frothing at the mouth and wandering around like zombies. The Gulf Coast of Texas and Louisiana are among the few places that combined large scale CO2 storage potential with a dense concentration of high emitting facilities.

As a result, risky CCS infrastructure is being heavily targeted on communities that have already suffered decades of environmental injustice. CCS will only increase the burdens on those communities. When CO2 is injected into saline aquifers, failure to manage reservoir pressures can cause earthquakes, contamination of drinking water and the potential failure of storage sites resulting in CO2 leaks into the environment and atmosphere.

Managing these pressures may require pumping enormous amounts of saline brines from CO2 storage reservoirs, creating a massive and potentially hazardous new waste stream. These risks are compounded when CO2 is injected below the ocean. Experience with natural gas demonstrates that offshore pipelines are at higher risk of failure than those onshore.

80 years of drilling has left the Gulf of Mexico pockmarked with 27,000 abandoned oil and gas wells. The Bureau of Ocean Energy Management acknowledges that it does not know how many of those wells are already leaking, and leakage from oil wells is one of the most likely failure points for offshore CO2 storage.

Keeping global warming below 1.5 degrees requires cutting global CO2 in half by 2030. Publicly subsidized CCS will undermine emission reduction efforts, squander resources, lock in fossil fuel infrastructure and expose communities in the Gulf Coast and beyond potentially catastrophic health, safety and environmental risks, compounding the environmental injustice borne by people of color and low-income communities.

CCS is a false solution, a dangerous distraction and a new but completely avoidable chapter in this country's long history of environmental justice, injustice and systemic racism. Thank you.

ALAN LOWENTHAL: Thank you, Mr. Muffett. The Chair now recognizes Ms. Saunders for five minutes.

NICHOLE SAUNDERS: Chairman Lowenthal, Ranking Member Stauber and members of the subcommittee, thank you for the opportunity today to discuss carbon storage in the Gulf of Mexico with you. My name is Nicole Saunders and I'm a director and senior attorney with Environmental Defense Fund in Austin, Texas. I'm echoing the Chairman now on this point, but carbon capture and storage is not a silver bullet climate solution.

These projects are complex, highly technical, costly and challenging, but most experts and models do agree we will need this tool in our toolbox if we are to meet emission reduction targets. And as much as 75 percent of captured carbon will likely need to be injected for long term storage and deep underground reservoirs like those in the Gulf of Mexico.

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But this process cannot be done successfully by just anyone or take place just anywhere. There are three crucial minimum conditions that must be met to ensure this practice works for both the environment and society. First, these technologies cannot be a substitute for parallel work to lessen our dependence on fossil fuels.

Second and importantly, environmental, justice and equity considerations must be central to decision making on projects, not only through thoughtful consultation and collaboration, but also through affirmative actions and solutions directly aimed at mitigating disproportionate burdens. And policies, incentives and regulatory programs must be designed to ensure the environmental integrity and safety of geologic storage projects, including the associated infrastructure and transport, minimizing the potential for leaks or other harms to both the climate and marine ecosystems.

In the absence of these conditions, the perceived opportunity of carbon storage may fail to overcome the risk that these projects do not live up to their climate promises. The US has an opportunity to showcase global leadership on this complex issue if it can meet these conditions. My testimony today centers on that third condition, ensuring the environmental integrity of carbon storage reservoirs in the Gulf.

The technical issues surrounding this challenge of a particular and timely relevance given the Department of Interior's active rulemaking on this issue. As directed by Congress through the recent Infrastructure Investment and Jobs Act, Interior's currently developing regulatory programs for the purpose of long-term carbon sequestration on the Outer Continental Shelf.

The agency has until November to do this, and it will be no easy task. In its report released just this month, the Intergovernmental Panel on Climate Change concluded with high confidence that if the geologic storage site is appropriately selected and managed, it's estimated that the carbon dioxide can be permanently isolated from the atmosphere.

And while that concept of site selection and management may seem straightforward, appropriately meeting these objectives is in fact immensely complex. Carbon storage projects can serve their role if and only if they are sighted, designed, managed and regulated in a manner that unequivocally and transparently ensures and demonstrates the long term technical and environmental integrity of sequestration.

So what exactly does that look like? Environmental Defense Fund has a long history of collaborative engagement on well integrity issues. Building on this experience and numerous domestic and international references, we work together with industry, academics, legal and policy experts to build a set of initial principles we believe are core to demonstrating long term secure storage offshore.

They include the need to select and characterize good storage locations including carefully assessing potential leakage pathways, safely construct and operate wells, conduct comprehensive testing and monitoring, develop data, modeling and reports that demonstrate the carbon is securely stored and expected to stay there a thousand years or more.

Ensuring proper plugging and closure processes, require accurate and transparent accounting of sequestration claims and other details that are found more comprehensively in my written testimony. Some may argue for reduced regulatory productions given the remote offshore environment, but this argument simply does not hold water, as there remains much to protect in the Gulf.

These standards are vital not only for the prevention of atmospheric releases but also for the protection of marine ecosystems, water column chemistry and other unique environmental, ecological and biogeochemical features, fisheries and economies. In conclusion, the Gulf may offer a unique geologic opportunity to store large volumes of captured CO₂. Whether it can be done successfully in a way that respects coastal communities, protects marine resources, prevents leaks and releases and earns public trust as a valid solution remains to be seen.

Ensuring that the US is committed to developing oversight programs that address the principles for secure storage included in my testimony would be a good start. Thank you very much.

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ALAN LOWENTHAL: Thank you very much, Ms. Saunders. The Chair now recognizes Mr. Milito for five minutes of testimony.

ERIK MILITO: Chairman Lowenthal, Ranking Member Stauber and members of the subcommittee, thank you for inviting me to testify. My name is Erik Milito and I'm President of the National Ocean Industries Association. At NOIA, we represent all segments of the offshore energy industry. Our members include not just energy developers, but also the businesses large and small that do the work of building, supplying and maintaining these projects.

Hundreds of companies are involved in the construction and operation of offshore energy projects, providing high paying jobs and ensuring reliable supplies of affordable energy for Americans. The same US companies in the supply chain that have built out the US offshore oil and gas sector are already participating in the build out of the US offshore wind sector and will play a significant role in the emerging offshore carbon sequestration sector.

Geophysical companies, engineering design firms, health and safety consultancies, offshore service vessels, marine construction companies, drilling contractors and a myriad of other service and supply companies will be integral to US leadership in offshore CCS. Our industry recognizes the risks of climate change and the need for continued action.

As innovators, our industry is committed to contributing solutions to optimally balance societal and environmental needs. Energy policy must incorporate principles of innovation, efficiency, conservation mitigation, resiliency and adaptation as part of a systematic approach to addressing climate change. To do that, US energy policy should support the development of all forms of abundant, reliable and affordable domestic energy supplies, while continuously driving down emissions.

US energy policy should seek to achieve meaningful GHG reductions across all sectors of the economy and balance energy, environmental, economic, social and national security needs. When it comes to mitigating emissions, which fundamentally must be the focus of climate policy, energy policy should support the advancement of emission mitigation technologies and specifically carbon capture and storage.

The widespread deployment of CCS will be critical for achieving the climate ambitions and goals that have been established by a diverse group of stakeholders around the world. According to the International Energy Agency, reaching net zero emissions will be virtually impossible without CCS. The IEA also says CCS is the only group of technologies that contributes both to directly reducing emissions in critical economic sectors and to removing CO₂ to balance emissions that cannot be avoided, a balance that is at the heart of net zero emissions goals.

According to Secretary of Energy, Jennifer Granholm, some emission sources like cement plants can't be phased out immediately or they don't have non fossil fuel options even available. That is where carbon capture and storage comes into play. US Gulf of Mexico Offshore Region provides tremendous advantages for an emerging US CCS sector.

The Gulf of Mexico is characterized by vast geologic prospects for CO₂ storage, extensive and established energy infrastructure along the Gulf Coast and throughout the Outer Continental Shelf, a proximity to industrial centers for capturing emissions in an accessible engineering and energy knowledge base and workforce.

The Gulf Coast region is distinctly situated to emerge as a global hub for CCS. The Gulf Coast is home to the full supply chain of energy companies with the engineering experience, expertise and vision to deploy projects with the scale and efficiency necessary for success. As with any capital-intensive industry, the US CCS sector requires certainty and predictability in the regulatory system.

Fortunately, Congress has provided interior with authority to regulate the transport and sequestration of carbon dioxide in the US Outer Continental Shelf, and the Department is currently working to develop the regulatory regime to provide for the safe storage of CO₂ in the offshore region. We also urge Congress to expand the 45 Q tax credit as a means of incentivizing and supporting a durable offshore CCS sector in the United States.

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As stated by the National Petroleum Council, CCS is an essential element in the portfolio of solutions needed to change the emissions trajectory of the global energy system. The US Gulf of Mexico stands out as a Premier region for global leadership and success in the emerging CCS sector. One thing I'd like to add, article by Columbia University Climate School makes the point that based on data collected over the last several decades, there is a wide consensus among experts, engineers and geologists alike that it is safe to permanently inject and store carbon dioxide.

Thank you and I'd be happy to take your questions.

ALAN LOWENTHAL: Thank you, Mr. Milito. And I want to thank all the panelists for their testimony. I think we now have a wide range of opinions on both the safety and the effectiveness of carbon capture and storage. Although today, we're talking more about the storage part. I want to remind members that committee ruled 3D imposes a five-minute limit on questions.

The Chair will now recognize members for any questions they may wish to ask witnesses. I'm going to recognize myself for five minutes of questions. My first question is to Dr. Tip Meckel. Dr. Meckel, according to the Interior Department, most Gulf of Mexico storage potential is found in either depleted oil and gas reservoirs or saline aquifers.

What's the difference between these two? And does one formation make a better storage location than the other? And the second part of that question is, should the Interior Department consider slightly different rules and regulations for each type of formation or would a one size fits all approach work in this case?

TIP MECKEL: Thank you for your question. The geology beneath depleted oil and gas reservoirs and the geology that is in a saline formation are one that's filled with salt water, can be very similar. There's--the geology doesn't care if it's full of saline water or oil and gas. I would say that each of those sites requires site specific characterization to allow for safe and effective storage.

In a depleted oil and gas setting, what we're really talking about is an oil field or a gas field that's reached its productive end of life. So that would be injecting CO₂ back into a depleted reservoir. So this isn't injecting CO₂ into currently productive reservoirs, to be clear. Those depleted reservoirs do have a demonstrable geologic seal for retaining buoyant fluids in the subsurface, which is a huge advantage for understanding the ability to retain CO₂. You do also have a lot of production experience which can help you understand how fluids are moving in that subsurface geology in the past, and therefore how they will likely move in the future.

Furthermore, there's some existing infrastructure there that might be leveraged to develop projects more effectively. And one issue with the depleted oil and gas fields is they tend to have quite a number of legacy wells, and legacy wells can be a weak point in the retention system. On the saline aquifer side, this is a much, much larger proportion of the subsurface.

Consider that oil and gas is only accumulated in a percent or less of the available subsurface. So the vast majority of our storage potential is actually in saline reservoirs. They do have few or no legacy wells in their background and so they present less of a well risk. They do have an untested seal in some regards or retention interval, and so that may be one of the liabilities of developing a saline storage project that would require additional attention.

You asked if the roles should be the same and I would agree that overall there doesn't need to be much of a distinction between these two, but they should perhaps have different emphases on these different risks that each presents, legacy well versus retention in a seal. Thank you.

ALAN LOWENTHAL: Well, thank you, Dr. Meckel. Ms. Saunders, onshore carbon storage who's been happening for years in the United States. How should the Interior Department apply what we've learned from onshore carbon storage to offshore carbon storage in the Gulf of Mexico when writing these new regulations?

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NICHOLE SAUNDERS: Thank you, Chairman. As an initial matter, I think I would say that it's absolutely in Interior's best interest to consult heavily with experts like those at the Department of Energy that have funded and led leading research on carbon storage for many years now through programs like Carbon Safe. And of course, experts at EPA who developed and now have the experience of implementing a fully parallel program through class six onshore.

So there's not necessarily a need to fully reinvent the wheel here. Yes, adaptations are definitely going to be necessary for the unique conditions of the offshore environment. And there have also been important lessons learned in the process with classics. But I would hope and expect to see a role from Interior that really closely parallels the protections that were developed onshore and perhaps expands them in light of the unique circumstances and perhaps the scale of operations in the Gulf.

And I'd also note that Interior can learn from international references on this point as well, particularly those that have been utilized in active offshore projects like the EUs directive on carbon storage and the international standards out of ISO. Both of those are applicable in the offshore context and could provide useful information.

They're also cited in the principles in my testimony. Thank you.

ALAN LOWENTHAL: Thank you. I see I've run out of time, and so I'm hoping that we'll have a second round of maybe even more, since many members are not here. So my I now turn to Representative Stauber five minutes of questions.

PETE STAUBER: Thank you very much. Mr. Chair. Mr. Milito, great to see you and thanks again for agreeing to bear witness. As discussed in my statement, the five-year leasing plan as it is set to expire on June 30th, just 64 days from now and the clock is ticking. What could the impact on future investments in offshore CCUS be without a five-year plan in place?

ERIK MILITO: It could be devastating. We recently put out our own study that shows that if we do not have a leasing program in place, it could result in an average loss of 500,000 barrels a day through 2040. And if you think about the amount we were importing from Russia, was about 500,000 barrels a day. So if we don't produce it here in the US, we have to get it from somewhere else.

We'd be looking at an average loss of 50,000 jobs. And--you know, we've had our member companies in town, service companies who have facilities and operations along the Gulf Coast at several ports. They are now having to talk about whether or not to move those investments to other parts of the world. So what's happening right now.

It's having an impact and it's going to really hurt for everyday Americans because--you know, the price at the pump is related to supplies and supply is not keeping up with demand. And one way to increase supplies is through production of US oil and gas.

PETE STAUBER: Should no offshore lease sales be held, what happens to potential acreage for CCUS operations?

ERIK MILITO: That's a good question. The general understanding is that most of the key opportunities in the outer continental shelf will be on the shelf in a shallow water. And the production in the Gulf of Mexico right now, 92 percent or more is coming from deep water. So either way, you're likely going to have significant opportunities for carbon capture and storage projects in the Gulf of Mexico.

What could be a negative impact though is if we start to lose the talent and expertise and they start to move other parts of the world because we need that work first. We that we need that engineering expertise to be able to move forward, design and implement those projects here in the US, rather than lose that knowledge to other parts of the world.

PETE STAUBER: And by your estimates, what is the potential for American job creation in the Gulf if we were to scale up CCUS?

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ERIK MILITO: We don't have any studies that have modeled the job impacts of that. You know, we do have 370,000 jobs supported by the Gulf of Mexico oil and gas sector today. That's not just along the Gulf Coast. Every state in the country has companies in jobs that are supported by the Gulf of Mexico. As I said, the majority are along the Gulf Coast.

Those are the types of jobs that would feed into the carbon capture and storage sector in the Gulf of Mexico. So it would be additive their high paying jobs or generally paying 30 percent or more than the average wages across the country. A lot of blue-collar jobs. You know, in our membership we have minority owned companies, Native American owned companies, companies led by women, and those are types of companies will play a role in the CCS build out.

PETE STAUBER: And in your testimony, you outlined the vast oil and gas operations and other long standing industrial and commercial activities that occur in the Gulf of Mexico. While the development of CCUS is promising, we need to consider ways to ensure multiple use of submerged lands in the OCS as you--in OCS we want it to continue.

How can we be sure that all uses of submerged lands are equally valued as [Inaudible] considers regulations in the carbon capture sector?

ERIK MILITO: That's a great question and a great point. We have a lot of opportunities to do a lot of different things in the Gulf of Mexico. We had our first approval for alternative use of a offshore facility recently for aquaculture. We know that hydrogen can be used in conjunction with CCS. We want to make sure that we can pursue that.

We have to make sure we're continuing to pursue oil and gas opportunities because it is a transition. We're talking about 2040, 2050. We're not talking about the transition to 2024, o we've got to make sure we're taking advantage of those opportunities. That can be done through the federal agencies, the federal family to make sure that when we're doing environmental impact statements, we're minimalizing conflicts.

But the Gulf of Mexico has a long history of compatible use. We have commercial recreational fishing there. We have rigs to reefs. If you go around these facilities, these are ecosystems that are flourishing and that--you know, are now home to red snapper that wasn't there before. We have tourism, we have Department of Defense and we have oil and gas, and we're hopefully soon going to have wind.

So it all can work together, just a need to manage it from a multiple use perspective and do that through the NEPA process.

PETE STAUBER: I thank you very much. I just have one last question to Dr. Meckel. You had mentioned the pipes that are already on the ocean floor. Is that a viable use or transmission of CCUS?

TIP MECKEL: So if I understand your question correctly, you're thinking about the existing pipeline on the seafloor.

PETE STAUBER: Yes.

TIP MECKEL: Some of those are idle. Many of them are still moving fluids. The ones that are idle are up for consideration for repurposing for CO2 transport. We do have examples of converting natural gas lines onshore into CCS lines. That was done in Mississippi. And so there is some consideration for utilizing that infrastructure.

If it's been abandoned, it's probably unlikely that they'll be realizable, but the ones that are idle currently and there are many, there is a huge opportunity to repurpose those going forward.

PETE STAUBER: And then one last question. I know I'm over time, Mr. Chair, just indulge me for a moment. When we--one of the questions that I have is, I talked about multiple use. Could you envision where there would be a carbon capture? Let's say it's in an abandoned well, for example, on the ocean floor. You're putting the carbon in. Can you envision a law or rule that would then say you couldn't drill for oil within a certain distance from that?

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In your professional conversations, is that part of it?

TIP MECKEL: It is part of the conversation, but actually what we're seeing in some of the state level considerations is that CCS is not developed at the expense of traditional oil and gas exploration. So there are some considerations about the ability to drill through an existing CCS project to reach deeper hydrocarbons that may yet be undiscovered, but in most cases, there are compatible activities.

Again, they just need to be managed correctly in terms of their proximity.

PETE STAUBER: Thank you very much. Mr. Chair, I yield back.

ALAN LOWENTHAL: Thank you. I now recognize Representative Herrell for five minutes of questions.

YVETTE HERRELL: Great. Thank you, Mr. Chairman and thank you for having this hearing and for all of our witnesses being here in person. I really appreciate that. And the timeliness of this hearing is amazing. I mean, the carbon storage, it's important. It's an important issue, certainly important in southern New Mexico where I'm from.

Obviously, we don't have any of the offshore drilling where I come from, but the companies that I represent are obviously looking at new technologies. Not only to store carbon but to use it in such things as enhanced oil recovery. But the biggest issue and hurdle that we have is the cumbersome permitting process by the federal agencies.

This is the biggest impediment we have because now we're seeing wait times of up to 450 days to receive our federal permits. And obviously, we can all understand how that would prohibit business as usual, if you will. I do have a question for Mr. Milito, and I hope I'm saying that right. Can you give the Committee a glimpse at what your members are experiencing?

I mean, what are some of the wait times for offshore operators and the experiences that they're having in terms of getting their permits approved? And how do you think that will translate to permitting practices for offshore carbon storage?

ERIK MILITO: Yeah. Generally, applications for permits to drill have continued to get processed and approved. One area where there's been a huge backlog is in geophysical permitting and that's kind of driven by the approvals that come out of the Department of Commerce through National Marine Fisheries Service. So for companies to be able to--you know, pursue offshore oil and gas projects, they need to run the geophysical surveys to really understand the geology and the rock to make that happen.

And that allows them to actually shrink the environmental footprint because they're better to target the prospects because these technologies are highly advanced. I mean, you can really pinpoint where you want to target for producing oil and gas. Those same technologies will generally be required to be used for carbon capture and storage.

So we need to make sure that we're streamlining the ability to get permits to run geophysical surveys. The other areas in leasing--you know, there hasn't been at least see that's gone through finalization and issuance of the leases since late 2020. And as we recognize and understand, that in order to produce any kind of energy and to move forward with any type of energy project like CCS, you need acreage.

To get acreage, you need leases. If you don't have lease sales, you can't do the activity. You can't produce energy, or you can't store carbon capture and storage. So they do have some parallels, and we're--you know, highly concerned about the inability to get leases in the offshore. Some of that production can come online rather quickly.

If you have a lease that you'd like to secure and it's close to an existing facility, you can bring that production online sometimes within 12 months, which would help us in a situation like we're in today, with high prices and the geopolitics of the Russian invasion Of Ukraine. So there are concerns. I'm confident that Interior is going to move forward and put together key regulations.

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They're working on it. We've had some engagement with them to let them have the opportunity to hear from our experts. But--you know, there are federal laws and regulations in place that could hold things up.

YVETTE HERRELL: Okay. And that's great. And you actually--you already answered the next question I was going to--it's kind of like, did you have my notes? Because actually I was going to ask, the lack of federal lease sales also plays such an important role. And just touched on that. You know, in New Mexico, obviously again, not any of the offshore.

But just to give an example of just the slowdown or the kind of the process, in New Mexico, we have 95 rig count. In Texas where the land is largely private versus federal lands, there's 249. So again, I just think the technologies could revolutionize the energy industry as a whole and benefit the environment.

And so again, I just think it's timely because many of our committee hearings stem from environmental justice and what we can do to protect the environment. And certainly, this is proof technologies are moving forward to protect not only the industry but the people that live in and around those industries and the company assets.

So with that, that's all of my questions, and Mr. Chairman, I yield back. Thank you for this hearing.

ALAN LOWENTHAL: Thank you. Are there any members who have not had their five minutes or who seek recognition to ask questions? Well, not hearing any, I would like to have a second round to give us some more time if that's okay with the other members. Well, I'm going to do it anyway. So I'm going to begin and recognize myself.

I didn't--Mr. Muffett. First question is, Mr. Muffett, you know, it's critical to monitor the carbon dioxide injected into the earth to verify it doesn't leak back into the atmosphere or migrate into areas where it might cause damage. Tell me what you think about the Gulf of Mexico. What about the unique challenges that we're going to find there to monitoring and verifying that carbon dioxide injected into the deep--that's injected into--that monitoring, we'll be able to successfully understand what is happening to the carbon dioxide?

And how should the interior plan for challenges, such challenges about the damage that carbon dioxide might cause in their regulations?

CARROLL MUFFETT: I think that there are a number of challenges to consider. Analysis of experience with offshore natural gas pipelines has demonstrated that offshore pipelines pose a higher risk of failure than onshore pipelines. And the increased corrosion risks from CO2 increase those risks of failure, even beyond the challenges Of managing pressure in subsea storage.

With respect to managing and monitoring pressure and monitoring leakage in subsea storage facilities in subsea reservoirs, I think the challenge is that the technologies are not yet developed. There are experimental measures. You read the scientific papers and there are pilot projects that are in testing, but the means of doing this are not well understood.

And it is important to recognize that our experience with abandoned oil and gas wells proves that point. A document released by the Bureau of Oceans and Energy Management, just in 2021 covering the 2022 to 2023 research year, focuses on the Bureau's need to develop methodologies to determine whether existing abandoned oil and gas wells are leaking, because the Bureau does not know.

And if the Bureau cannot tell you whether existing abandoned oil and gas wells are leaking, given the existing experience with those wells, I think the potential for monitoring leakage, monitoring pressure from CO2 storage is even more complex and even more limited.

ALAN LOWENTHAL: Thank you. Ms. Saunders, can you speak on the importance of involving the public, especially that live in the Gulf Coast region, in the Interior Department's carbon storage rulemaking and any future CCS activities and projects in the Gulf of Mexico?

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NICHOLE SAUNDERS: Thank you, Chairman. I'd be happy to. I don't think that the importance of public involvement can really be overstated here. Our normal kind of rulemaking notice and comment processes just simply aren't going to be enough in this instance, given the weight of the decision at hand. So proactive outreach is going to be very important.

EDF recently participated in a dialog involving numerous interested environmental, NGO stakeholders with Interior. And I also understand from that conversation, that they are actively working to conduct similar outreach to environmental justice leaders and organizations and particularly those that are representing communities on the Gulf Coast.

You know, from source to sink, we're talking about a lot of infrastructure, a lot of lives, a lot of land, a lot of ecosystems that might be touched and otherwise impacted by these operations. So everyone in that chain, and in particular the communities that have already been disproportionately impacted and burdened by industrial development, really need a chance not only to be heard but to be proactively involved in decisions that will impact them down the line.

So I also believe, actually, that in guidance with EPA's Classics program, there's numerous instances where public engagement and communication should occur both formally and informally in the actual individual project and permit process. And so I would hope that Interior would also look at those procedures and adopt something similar as well.

ALAN LOWENTHAL: All right. I have one more question and I'm going to ask Mr. Muffett. Does the track record of carbon capture projects in the United States make you optimistic or pessimistic that capturing carbon and storing it in the Gulf of Mexico will be an economical way to reduce carbon emissions?

CARROLL MUFFETT: It's important to recognize that this is not a new technology. The oil industry invented and patented technologies to remove carbon from waste streams in the early in the 1950s and 1960s. By 1980, Exxon Mobil was acknowledging that it had the technology to remove carbon from waste streams, but then it was simply too expensive, and the industry didn't want to do it. Exxon said in an internal document, we could remove 50 percent of the emissions from waste streams but doing so would double the cost of the underlying industry.

So the challenge for CCS is not one of technology on the capture side, the challenge has always been one of economics. And this has been demonstrated over and over again with CCS projects. The history of CCS projects in the US and worldwide is history where industry and proponents overpromise emission reductions and systematically under-deliver.

Chevron's Gorgon project in Australia is a case in point. It is one of the largest CCS projects in the world. And Chevron is currently having to repay massive fines to the Australian Government because it failed to capture remotely what it had committed to capture. And we've seen this happen again and again, and I think this is really important.

When rules were proposed--

ALAN LOWENTHAL: --make it brief. We're over. We've been over.

CARROLL MUFFETT: I'm sorry?

ALAN LOWENTHAL: We're quite a bit over in time. Just close that. Well, thank you. I now recognize the Ranking Member for another five minutes of questions.

PETE STAUBER: Thank you, Mr. Chair. So Mr. Milito. Can you briefly explain the purpose of seismic surveying and why it is needed to properly cite locations for CCUS operations and what would happen if seismic permits weren't granted in a timely fashion?

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ERIK MILITO: Yeah. Well, seismic surveys are fundamentally scientific research. They're used to understand the geology both onshore and offshore. They're used for a multitude of purposes for understanding faults--you know, potential for--you know, earthquakes, the potential for any kind of activity within the geology itself.

The seismic surveys are used for--you know, locating sand for beach renourishment. They're used for siting--you know, wind turbines, It is fundamentally a scientific research activity. But what it does, is it allows you to obtain a very vivid image of the geology underneath the seafloor so you can understand where and how best to either develop energy resources or to find the best sites for injecting carbon dioxide into a reservoir.

So it's really about delineating the reservoir and understanding which are the best locations for storing carbon dioxide when it comes to CCS.

PETE STAUBER: Currently is the Biden Administration, processing seismic permits in a timely and predictable fashion?

ERIK MILITO: No, no. And this has gone back several years. We've been looking for regulations to be in place. The regulations are finally put into place and they're working contrary to the needs of Americans and for--you know, offshore energy development because the permits are piling up. It relates to the incidental take authorizations and companies are finding themselves in a real bind to be able to get these seismic permits, these geophysical permits so they can do the geological work to best move forward with projects.

PETE STAUBER: And then one of the long-term question is about liability. Who is responsible for monitoring if carbon is stored forever?

ERIK MILITO: Well, the operator of the project is going to be with the responsible--they're going to have the responsibility to monitor during the life of the project. The question becomes about when you have a lease, whether it's wind or oil and gas or carbon capture and storage, at some point, you're done using and it goes back to the government.

Leases have a fixed term, they go back. Production ends, the lease goes back. So when it comes to carbon capture and storage, this is still an open question. The National Petroleum Council recommended that the government, through DOE, we put together a forum to really have a discussion to consider all the issues around liability.

And that's one approach we think should need to be taken because companies aren't going to want to invest when they don't have the certainty around what the liability will be. In Europe--you know, at some point the liability transfers back to the government. That's one model. It's after a certain number of years after you're able to demonstrate after a certain number of years that you have secured geologic storage permanently in place.

So different ways of looking at it, but it's something that must be sorted out.

PETE STAUBER: Do any panelist have any ideas or recommendations to that question on how long could carbon storage--should carbon storage lease terms be? Dr.?

TIP MECKEL: Yeah. I have some opinions on that. So typically, if you're going to invest in a project of this scale, you're going to want the project to be active for anywhere from 15 to 30 years. So a lease agreement needs to have that much flexibility.

PETE STAUBER: And who should be responsible for the carbon storage after a certain period of time, in your opinion?

TIP MECKEL: Well, so under the current regulation in the United States, onshore. It's under UIC Class six well regulations, and you are required to monitor to demonstrate containment in order to be in compliance with your well permit. That in turn, allows you to apply for a 45 Q tax credit. So the operator will always have the incentive to monitor the project because it is tied directly to the economics of the project.

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I agree with the former statement that understanding when that project ends and the timeline into transferring the liability back to a state or federal government is yet to be defined. But at least in the state, in the case of the state of Texas, in the state offshore, they're considering taking back over the CO2 ownership at a given time.

It's just not yet defined.

PETE STAUBER: Okay. Go ahead.

NICHOLE SAUNDERS: Could--I also could also make some contributions as well, Representative. I apologize. It's hard to jump in virtually.

PETE STAUBER: Go ahead, ma'am.

NICHOLE SAUNDERS: I did want to kind of engage on that. This is an issue that EDF has been actively thinking about. And so--you know, the traditional regulatory legal principles around liability like those that apply in oil field operations, EPA has also indicated applying the classics context. And they're designed to hold operators accountable when they fail to live up to their responsibilities, encouraging them to do as good of a job as possible.

And what we're concerned about is the potential for liability transfer. So done so too early in the process or without the right characteristics to reopen it, that might create a moral hazard or create a situation where operators lack an incentive to decrease their exposure risk because they're not going to face significant consequences if projects eventually fail or have negative effects.

So for example in the EU, there is a transfer of liability provision, but that framework also gives the authorities ability to reopen liability in the case of deficient data, negligence, failure to exercise diligence and more. And so--you know, I think an operator in class six EPA has also said--you know, even though a transfer might occur, the operator might still be liable for regulatory noncompliance under certain circumstances even after site closures approved.

For example, if they provided erroneous data to support approval or is necessary to protect health if a leak threatens US DWs water. So I think there's some specificity here in terms of not wanting to create liability relief that lessens the motivation of operators to really do their due diligence in the name of helping for investment.

Because as we've seen in Texas where the statute actually expressly provides that storage operators keep their liability for their mistakes offshore, we're still seeing projects and investment there as well. So I think we have to be committed to the long game here and--you know, seeking early liability relief and speaking at the same time to the safety and demonstrated safety of operations doesn't help public trust here.

So I think there's a solution that we need to find somewhere in the middle.

PETE STAUBER: Thank you, ma'am. My time's up. I yield back, Mr. Chair.

ALAN LOWENTHAL: Thank you. Thank you, Ranking Member. Before we conclude, I'd like to ask each witness if there was one question that you were not asked today but would have liked to have been asked by this subcommittee. What is that question and what would your answer have been? And let's start with Dr. Meckel. Is there any question we should have asked, or you would have liked us to have asked you?

TIP MECKEL: A question I'm often asked by industrial entities considering pursuing these projects is, how do I know that I can actually inject the CO2? And the answer is, we have existing examples of injecting billions of barrels of waste fluid into these similar geology for decades and it's led to almost no incidents.

So we know today there are 1,500 wastewater injection wells in the Gulf Coast that are injecting the equivalent of a gigaton of CO2. If you were to convert that water into a CO2 equivalent, a gigaton, 1500 wells. We know that those wells are capable of injecting a million tonnes a year equivalent. Today, we expect wells to be able to do even more of that.

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So we expect that the development of CCS to effectively address emissions will develop on the order of thousands of wells in the OCS that will be injecting gigatons of CO₂ by 2050. That's a significant reduction in the US emissions profile.

ALAN LOWENTHAL: Thank you. Ms. Sanders, I ask you the same question. What question were you not asked today but would have liked to have been asked by this subcommittee, and what would your answer have been?

NICHOLE SAUNDERS: Well, I think--I've been fascinated and grateful to participate in this hearing because it represents a wide swath of perspectives on both the benefits and the most challenging risks and potential downsides of CCS in the Gulf. And I kind of--the nuance here is exceptionally challenging. And so at the moment I want to share that the risk I'm most focused on is that Interior has maybe six, seven more months left to draft, propose take comment and finalize and complete a regulatory framework for offshore carbon storage on the OCS. It is absolutely imperative that those roles cut zero corners for the sake of expediency, not only on principles to demonstrate and secure storage of carbon, but also for many, many other aspects of a regulatory program such as consulting and working with environmental justice communities and leaders on the Gulf Coast.

So I'm just really pleased that you've chosen to focus a hearing on this subject right now, because our current reality is that American companies are rapidly lining up to meet decarbonization and net zero commitments. Just this past week, we saw companies like Google and MEDC committing massive sums of money to support ventures for carbon removal.

All of this carbon, whether it's industrial capture, carbon removal or otherwise has to go somewhere essentially permanently. And many experts direct much of those volumes to geologic storage. And so it's likely that carbon storage in geologic formations like those in the Gulf Coast may be part of meeting those targets.

But before we roll out the red carpet and allow this practice at scale, we have to come to agreement on the conditions that need to be met to ensure that it will be done in a way that's not only safe, but can clearly demonstrate the permanence of storage. So that's why I'm here. That's what I wanted to share my testimony about.

And we desperately need more voices like all of yours here today, focusing on how important that sequestration part is of this equation and that we comprehensively monitor, report, verify, that we ensure our regulatory system holds carbon storage operations accountable for not just the safety of their operations, but the validity of their claims for sequestration.

Otherwise, this whole process really fails to provide that benefit.

ALAN LOWENTHAL: Okay. Thank you. Mr. Muffett, can you answer, what question were you not asked today that you would have liked to have been asked, and what would your answer have been?

CARROLL MUFFETT: I think the question we should all be asking, is what conceivable rationale is there for investing untold billions of dollars of public money in a technology that will capture only a tiny fraction of emissions even from industrial sources when the most direct route to addressing the climate crisis is to accelerate the transition from fossil fuels.

And we have the tools and technologies to do that right now. And increasingly, those tools and technologies are cheaper than fossil fuels. And I would like to highlight that the fundamental lack of economics is demonstrated by the fact that the industry says they cannot do this without those massive public subsidies that they are asking again here today for the government to increase.

And they're asking for further subsidies by asking the government and the American public to waive the liabilities that would result from potential accidents far into the future, which is what matters when we're talking about injecting CO₂ into the ground and keeping there for decades to Centuries to millennia.

Thank you.

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ERIK MILITO: Sir, I think you are on mute. I guess it's my turn. Okay. Thank you. No, I think one of the leading questions here is how do we put together a framework of regulation for the safe and secure and permanent geologic storage. I look at the EDF testimony from Ms. Saunders. I think it really lines up in a very excellent way, the components of regulations that need to be put in place.

We need to have a risk-based approach for the full lifecycle design of these systems that looks at things like site characterization, characterization of reservoirs, assessing leakage pathways, constructing and operating wells, testing and monitoring response, post injection site care and demonstrating verifying security.

These are all elements that this industry has great experience doing and we want to have regulations that put certainty around that to make sure it's done in that way. One other thing I would add is when it comes to monitoring, we have a long history of being able to monitor. If you look at the Sleipner project, offshore Norway, it's been around since '96, over 25 years.

It's captured over 20 million tonnes of carbon dioxide and they have monitoring in place there. The monitoring is off the shelf. These are downhole instruments, gauges that allow companies to monitor pressures and temperatures to know if there's an abnormality. So our industry can do it. We're ready to do it And we as NOIA are here to help and be a resource to Congress to this committee.

We thank you for allowing us to appear and we look forward to further conversation on this key topic for addressing the climate challenge.

ALAN LOWENTHAL: Thank you. And I want to thank the witnesses for their valuable testimony, Members for their questions. This concludes our hearing. The members of the committee though, may have some additional questions for the witnesses and we'll ask you to respond to these in writing under Committee Rule 30. Members of the committee must submit witness questions within three business days following the hearing and the hearing record will be held open for ten business days for these responses.

If there are no further business, without objection, this subcommittee stands adjourned.

Classification

Language: ENGLISH

Subject: NATURAL RESOURCES (90%); US DEMOCRATIC PARTY (90%); US REPUBLICAN PARTY (90%); EMISSIONS (89%); TALKS & MEETINGS (88%); ENVIRONMENTAL & WILDLIFE ORGANIZATIONS (78%); ENVIRONMENTAL REGULATION & POLICY (78%); GEOLOGY & GEOPHYSICS (78%); INTERNATIONAL LAW (78%); MINING & ENVIRONMENT (78%); OCEAN ECONOMY (78%); OCEANS (78%); ASSOCIATIONS & ORGANIZATIONS (77%); TESTIMONY (77%); ENVIRONMENTAL LAW (72%); SCIENCE & TECHNOLOGY (72%); US ENVIRONMENTAL LAW (72%); GREENHOUSE GASES (70%); EXPERIMENTATION & RESEARCH (67%); BUSINESS & PROFESSIONAL ASSOCIATIONS (66%)

Industry: ENERGY & UTILITIES (90%); EMISSIONS (89%); MINING & ENVIRONMENT (78%)

Person: ALAN LOWENTHAL (92%); DEBBIE DINGELL (79%); GARRET GRAVES (79%); JOE BIDEN (79%); PETE STAUBER (79%); TOM TIFFANY (79%); YVETTE HERRELL (79%); KATIE PORTER (78%); DONALD MCEACHIN (73%); MIKE LEVIN (73%); RAUL M GRIJALVA (59%); BETTY MCCOLLUM (57%); DIANA DEGETTE (57%); DOUG LAMBORN (57%); JARED HUFFMAN (57%); BRUCE WESTERMAN (56%)

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