



NOIA ESG NETWORK **2024 REPORT** OF THE OFFSHORE ENERGY INDUSTRY

MANAGING EMISSIONS AND DEVELOPING THE WORKFORCE OF TOMORROW



The background of the entire page is a photograph of a large red and white offshore supply vessel sailing on a blue sea under a clear blue sky. The vessel is seen from a high angle, moving towards the right. On its deck, there are numerous large black cylindrical objects, likely spools of pipe, and various red and blue hoses. A crane is visible on the right side of the vessel. The text 'NOIA' is superimposed in the center of the image.

NOIA

America's Offshore Energy Industry

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MEMBERSHIP:

NOIA has more than 120 member companies, representing offshore oil and natural gas, wind, carbon capture & storage (CCS), mineral production, drilling contractors, service providers, geophysical explorers, manufacturers and suppliers, marine construction, marine and air transportation, and law, finance and professional services, among other offshore industry segments. The diverse members of NOIA are committed to innovation, best practices, and deployment of advanced technologies that are central to addressing the climate challenge, as well as in promoting excellence in corporate citizenship and governance.

MISSION:

NOIA represents and advances a dynamic and growing offshore energy industry, providing solutions that support communities and protect our workers, the public and our environment.

VISION:

NOIA is the sought-after and credible voice, advocate and forum for uniting and advancing the interests of the offshore energy industry, recognized for promoting solutions that provide the energy vital for lifting society in a safe and environmentally sustainable way.

ASSOCIATION OBJECTIVES:

- **Promote** the interests of the members of the offshore energy industry
- **Educate** the public and policy makers with scientifically grounded information about the industry and its impact on our everyday lives
- **Serve** as a resource for the government and other stakeholders
- **Influence** public policy in support of the offshore energy industry
- **Promote** the role of a competitive, fair and free market in the development of offshore energy resources
- **Facilitate** a meaningful energy dialogue from diverse perspectives
- **Be** a learning organization and foster the mutual improvement of its members, including safety and environmental performance, through collaborative industry programs and efforts
- We strive to **contribute** solutions and best practices to optimally balance societal and environmental needs for meeting the climate challenge

a year's overview

MESSAGE FROM THE PRESIDENT

The NOIA ESG Network and our fourth annual ESG report underscore the boundless creativity companies apply towards building the workforce of tomorrow and tangible progress in emissions reduction efforts, two key and critical areas of importance for the industry in the ESG paradigm.

NOIA, its members, and the broader offshore energy industry are focused on attracting and retaining the workforce of tomorrow through efforts to boost diversity, equity, inclusion, and belonging in the workforce. While NOIA member companies respectively have company initiatives to advance these objectives, NOIA continues to serve as a center for learning and collaboration for the industry so that its members can gain an advantage in workforce development by engaging with the experts to enhance and implement programs and best practices.

The American offshore is producing more energy with a smaller footprint and lower emissions. The carbon intensity of the U.S. Gulf of Mexico is one half of the intensity of other producing regions. Additionally, 18 deepwater U.S. Gulf of Mexico facilities, which equate to about the size of only nine city blocks, produce about the same amount of oil as the entire state of North Dakota.

As demonstrated by NOIA members on a daily basis, the offshore energy sector as a whole operates in a manner that is enabling the lower carbon energy transition. From new low emission fuel additives for drillships to enhanced compressors on offshore platforms to new connection systems for subsea jumpers to the electrification of production systems, there is determined and measurable progress in reducing emissions. Moreover, the oil and gas and renewable energy industries are increasingly partnering on lower carbon energy projects.

The offshore oil and gas industry helped build the first U.S. offshore wind farm offshore Block Island, Rhode Island. The offshore oil and gas industry is now involved in other wind projects up and down the Atlantic Coast. The Block Island Wind Farm showed that the synergy between offshore oil and gas and wind expedites renewables development and can be leveraged into other sectors.

New offshore wind projects under development dot the U.S. East Coast and the first lease sales have been held along the Pacific Coast. Expanded American offshore wind development could spur \$120 billion in new investments.

Similarly, carbon sequestration is an innovative approach to mitigating greenhouse gas emissions, and it is a critical tool for achieving climate change ambitions and goals that have been established by diverse stakeholders around the world.

The U.S. Gulf of Mexico offshore region provides advantages for an emerging U.S. CCS sector. With 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, and an accessible engineering and energy knowledge base and workforce, along with associated RD&D capabilities, the U.S. Gulf of Mexico is well positioned to be the leader in CCS.

Early projections show that 50 million tons of CO₂ annually could be stored beneath the Gulf of Mexico by 2030, more than all the CCS currently operating globally. The Gulf's storage capacity could double by 2040.

The success of the offshore energy sector means that all forms of energy can be produced in a reliable, responsible, and affordable manner. Conversely, removing or restricting investment opportunities for the offshore oil and gas sector would eliminate a key source of engineering expertise, not to mention RD&D funding that can find, scale, and deploy the solutions to many of the technical challenges currently associated with decarbonization efforts. The future success of emission reduction efforts depends upon continued revenue generation from companies in the oil and gas sector.

The American offshore energy sector reveals how producing the energy the world demands can also mean providing the climate solutions the world needs. For more than 50 years, NOIA has worked tirelessly – and successfully – to advocate on behalf of the U.S. offshore energy industry before U.S. policymakers and other stakeholders. From educating Congress, including testifying before Committee hearings and engaging directly with Members of Congress and their staff, to building the public record of our industry through media outreach, to holding industry-wide forums and workshops, NOIA has been the voice of the American offshore energy sector.



ERIK MILITO
NOIA PRESIDENT



ABOUT NOIA ESG NETWORK

The National Ocean Industries Association launched its new Environmental, Social & Governance (ESG) program, The NOIA ESG Network, in January 2020 as a platform for learning, collaboration and continued improvement in ESG. ESG and ESG investing present both expectations and opportunities for the offshore energy community. The investment community no longer only defines strong investments through cash and other financial metrics alone, but also through positive and sustainable impacts on communities and the environment. At the same time, ESG creates a tremendous opportunity for offshore energy companies to expound their case for excellence in performance in ESG and to demonstrate continuous improvement to investors and the public at large.

The offshore energy industry has a strong track record of high performance in ESG, from producing zero emission offshore wind energy to producing offshore oil and gas with lowest emissions of the oil producing regions to implementing innovative approaches for advancing safety and environmental performance to supporting local communities through philanthropic initiatives to transparently reporting performance to external stakeholders.

Dozens of companies, representing oil and natural gas producers and operators, wind producers, drilling contractors, geophysical services, marine construction, manufacturers and suppliers, the service sector, offshore service vessels and the non-profit community have already signed the NOIA ESG Network Participation Agreement.

NOIA member companies make an official commitment to ESG by signing a Participation Agreement. Signatories pledge their companies will participate in the NOIA ESG effort, providing support to the initiative by encouraging new member companies to attend, helping to create content for the events, and providing information and resources, such as examples of ESG programs and reports. Importantly, all members of NOIA benefit from our ESG program, which serves as the foundation for advancing the diverse objectives of the association, from advocacy to energy dialogue to collaboration. ESG content and conversation are now embedded activities of NOIA.

NOIA ESG PRINCIPLES

Foundational ESG Principle:

NOIA member companies provide the energy that is essential for our everyday lives and raises the quality of life of our communities, reducing poverty and hunger while promoting good health and well-being.

We operate in coastal and ocean environments with safety, health, environmental protection and sustainability as core values.

We share a commitment to a high standard of corporate citizenship and continuous improvement in environmental, social and governance performance.

We recognize the risks of climate change and the need for continued action. As innovators, we are committed to contributing solutions and best practices to optimally balance societal and environmental needs.

1. Environmental: NOIA and its Members commit to:

- Using energy efficiently;
- Managing water and waste responsibly;
- Advancing best practices to reduce environmental impact and promote ecosystem health.

Climate Change: NOIA and its member companies commit to a collaborative approach with all stakeholders in providing solutions that balance environmental, social, economic, energy, and national security needs for society. We contribute to the advancement of principles of innovation, conservation, efficiency, resiliency, mitigation, and adaptation that must be part of a systematic approach to addressing the climate challenge.

2. Social: NOIA and its Members commit to:

- Diversity and inclusion in hiring and employment practices;
- Safe and healthy working conditions for employees and partners;
- Improving communities where we work and live.

3. Governance: NOIA and its Members commit to:

- Operate in an ethical manner and in compliance with laws and regulations.
- Implementing processes that incorporate ESG principles and practices.
- Manage risk through appropriate controls.

NOIA CLIMATE CHANGE POSITION

Building upon the foundational ESG principles released in 2020, NOIA published its Climate Change Position and Principles in May 2021. Based upon this position and principles, NOIA promotes and advocates solutions to address the climate challenge:

- We recognize the risks of climate change and the need for continued action. As innovators, we are committed to contributing solutions and best practices to optimally balance societal and environmental needs.
- NOIA and its member companies commit to a collaborative approach with all stakeholders in providing solutions that balance environmental, social, economic, energy, and national security needs for society. We contribute to the advancement of principles of innovation, conservation, efficiency, resiliency, mitigation, and adaptation that must be part of a systematic approach to addressing the climate challenge.
- NOIA supports the aims of the Paris Agreement.
- NOIA recognizes the role of authorities in climate science in the development of research and data for addressing the climate challenge, such as, for example, the Intergovernmental Panel on Climate Change.
- NOIA supports and encourages the efforts of our members in understanding their emissions impacts, in setting sustainability goals and targets, and in deploying technologies and best practices for emissions reductions. NOIA will assist our members by facilitating collaboration and enhancing organizational capability to support emissions reduction efforts. NOIA's ESG Network effectively serves as a learning and collaboration tool for continued improvement in the area of emissions reductions.
- NOIA seeks to be a constructive partner in the development of thoughtful and balanced national policy to address climate change.



It is NOIA's position that U.S. climate policy, whether through new or amended laws or regulations, should:

- Support the development and availability of all forms of abundant, reliable, and affordable domestic energy supplies for Americans, while continuously driving down emissions.
- Result in meaningful GHG emissions reductions across all sectors of the U.S. economy.
- Balance environmental, social, economic, energy, and national security needs.
- Provide for transparency related to the benefits and costs for society.
- Leverage the power of markets to drive economy wide emission reductions at lowest possible societal costs. This may include the utilization of market-based approaches such as a price on carbon that can provide predictability and economic efficiencies in investments and outcomes.
- Support continued funding for federal research, development, and demonstration for innovation and the advancement of emissions mitigation technologies, including, but not limited to, carbon capture, use, and storage, energy efficiency, hydrogen, renewable energy, nature-based solutions, and carbon offsets.
- Seek to eliminate redundant or conflicting policies.
- Be compatible with global agreements and efforts to address the issue on a global scale.



Advancing Social Responsibility through the Workforce of Tomorrow

Offshore oil and natural gas project development and operations support significant levels of employment. While the employment impact of offshore oil and natural gas is focused on the Gulf Coast states, almost all, if not all states see employment supported due to offshore project development. Project development and operations support a large number of highly paid jobs directly, especially highly paid blue-collar jobs, and additionally supports significant employment through the industry's supply chain (indirect jobs), and due to increased spending by workers (induced jobs). The offshore oil and natural gas industries supply chain is spread throughout the country, while the Gulf Coast states (especially Texas and Louisiana) receive the majority of spending associated with offshore project development, all 50 states are home to industry suppliers. In addition to the large number of diverse jobs supported due to offshore project development, the quality of employment provided directly by the industry is also well above the national average with an average annual wage of nearly \$69,650, around 29 percent higher than the national average of slightly over \$54,000.

NOIA, its members, and the broader offshore energy industry are focused on attracting and retaining the workforce of tomorrow through efforts to boost diversity, equity, inclusion, and belonging in the workforce. While NOIA member companies respectively have company initiatives to advance these objectives, NOIA continues to serve as a center for learning and collaboration for the industry so that its members can gain an advantage in workforce development by engaging with the experts to enhance and implement programs and best practices. In 2023, we heard from industry leaders and experts in the field who have committed their careers to advancing principles of DEI.

Building the Workforce of Tomorrow

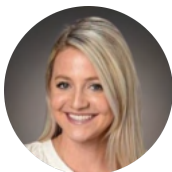
NOIA held a Workforce of the Future Event at Rice University's Baker Institute for Public Policy in January 2023, at which panelists were asked to share their views on how oil and gas companies can overcome challenges by recruiting the next generation of energy industry workers, creating an appealing, inclusive work environment for everyone, and improving diversity, equity and inclusion in the workplace. Jennifer Medcalf, President of The REACH Group and a member of the NOIA Board of Directors, moderated this insightful panel discussion. As a leader in The REACH Group, she is at the forefront of initiatives aimed at strengthening the oil and gas workforce. The REACH Group specializes in coaching to implement a performance culture that ensures safe and efficient operations. With her extensive background, Jennifer Medcalf brought her expertise to guide this panel, ensuring a productive and tailored conversation that resonated with the audience.

**Benigna Cortes Leiss***Fellow at the Baker Institute*

Benigna Cortes Leiss, with her decades of experience and leadership in the industry, explained that oil and gas companies are looking for employees to grow with companies and build the talent pool. Her solution to this growing problem is a robust summer internship program, which allows students to learn more about the company and vice versa. In addition, summer internships are opportunities for individuals who want to be challenged in a very rewarding environment.

Companies can provide incentives that are appealing to a diverse group of individuals. These incentives can include hybrid work schedules, increased pay, or block schedules for offshore workers. However, what incentivizes one person to work for a company may pique only some people's interest. Therefore, companies must develop a robust incentive program to appeal to more applicants.

Benigna believes that a strong sense of teamwork in the company environment can promote an inclusive work environment. Growing collaboration and living out company values is a great way to improve workplace diversity, equity, and inclusion, she said.

**Jamie Elrod***Co-host of Flipping the Barrel podcast
and Sales Director Americas for Baker Hughes*

Jamie Elrod has risen as a vocal leader for women in the industry, and Jamie emphasized that how we speak and engage with the community on the industry's positive impacts will encourage students to participate in internship programs. The oil and gas industry is beginning to have reputational challenges with members of the younger generation; therefore, it is essential to meet individuals where they are. Companies need to grow their outreach programs to engage with potential hires on platforms where they are present. It is also essential to educate people on the widespread impact of the oil and gas industry on everyday life. Oil and gas aren't just found in the car you drive; it's what powers the stove you cook your breakfast on and makes the clothes on your back. Oil and gas are all around us, and it is essential to engage by demonstrating the positive impacts the industry makes.

Jamie also touched on the impacts of quiet quitting and how it relates to companies' challenges with creating an appealing work environment. The new hybrid work schedule has led to employee burnout. With a rise in social media culture incentivizing employees to quit their jobs, employees are

re-prioritizing their lives. Companies need to be flexible in the hours their employees work and implement a well-rounded work/life balance to combat employee burnout.

In response to how companies can improve diversity and inclusion, Jamie responded, "Diversity isn't just about hitting the numbers; it's about making employees feel included." She focuses on how companies can bring groups of people together using a diverse set of activities that don't rely on after-work networking events. These events need to be able to include a wide range of people and can fit everyone's schedules.



Jeannie Gardner

Board Chair for Girls, Inc. of Greater Houston and Global Leader in Digital and Asset Transformation for KBC

Jeannie Gardner has years of experience within the energy sector, and Jeannie shared her recruitment story, showing why companies should turn to nontraditional Colleges, Junior Colleges, Universities, and Technical Schools in a wide variety of locations for their recruiting. She emphasized that location plays a large part in recruiting and how exposure and access can lead to increased opportunities.

When asked how companies can create an appealing work environment, she emphasized how a company should listen to the wants of its employees. Employees want a robust work/life balance, professional development, and to see their added value to the company. She identified that many companies operate under work structures established over 50 years ago. Her solution is for companies to communicate the organization's long-term goals (the why factor) through downward communication. This lets employees answer the question, "how does my work contribute to the overall goal?" She also suggests transparent and open communication, empowering employees to do their jobs, employee recognition programs, and avenues for employees to build connections inside and outside their company.

Jeannie's approaches to improving diversity, equity, and inclusion in the workplace require companies to look beyond race and gender. First, she asked participants to stand up if they knew their company's values and invited some participants to share them. Then, after hearing a few different values, Gardner asked the audience if they lived by their companies' values. "If we live by our values, you won't have a problem with implementing inclusion." Companies should focus on their values with manager-focused, value-based leadership programs.

Improving DEI in the Workplace and Fostering an Inclusive Work Environment



Ally Cedeno

Founder and President, Women Offshore

The NOIA membership had the pleasure to hear and learn from Ally Cedeno, Founder and President, Women Offshore, during NOIA's Annual Meeting in April. Ally is the Founder of Women Offshore and a 2008 graduate of the U.S. Merchant Marine Academy. She is licensed as a chief mate of unlimited tonnage vessels and dynamic positioning operator. Ally's experience on the water spans both the maritime and offshore energy industries over the last 11 years. Ally spent much of her career at sea as one of the only women in operations on the vessels she worked on, yet she is determined to change that with the Women Offshore Foundation, an online organization and resource center for a diverse workforce on the water. The Women Offshore Foundation propels women into meaningful careers through access to a worldwide community and professional development resources, while raising awareness amongst industry leaders and decision makers about issues affecting women on the water.

Ally gave a compelling talk to NOIA, explaining, “for many years of my career, while I loved it, I was an anomaly on deck, and felt like I didn’t belong—which made it a struggle to see myself [in the industry] long-term.”

Throughout this fireside chat, Cedano discussed with moderator Jennifer Medcalf, President of The REACH Group, and shared with NOIA members what it feels like being a woman in a male-dominated industry. And beyond that, Ally shared what her company is doing to change the industry to embrace and support underserved mariner groups.

As she explained the importance of DEI offshore, she exclaimed, “We need men, especially white men, to be the catalyst of change. You hold the majority of the power in this industry.” She followed this statement with actionable ways leaders can ensure their offshore work environments are inclusive of all experiences and help drive systemic change.

First, cultivating flexible work environments. Ally brought light to the fact that many assume after a woman has a child, she won’t want to return to work, which is a myth that needs debunking in her opinion, as she knows for a fact that women genuinely want both—families and offshore careers. She suggested the solution is job sharing or onshore work. Most offshore rigs operate on hitch rotations, so you can allow team members to leapfrog one another, giving them the opportunity to ease back in with fewer hitches. Or you can allow them to take a step back and put their technical knowledge to use in an onshore operations capacity until they’re ready to get back to physical offshore work.

She shared, “It’s expensive to find that next backfill. If you can give people opportunities to get through that season of life, it’s worth it in the long run, and you will see the return.”

Next, investing in resources that set a precedent that women and other minority groups are accepted on board. This could be something as seemingly simple as women’s coveralls, as those are often overlooked on board. Ally emphasized that when you invest in resources like female coveralls, there’s a dual impact. The women are safer, and they’ll be able to work efficiently—it’s a win-win.

Other suggestions Ally discussed were services like victim advocacy in the case of assault at sea, unbiased performance reviews, ensuring that DEI efforts aren’t solely wrapped up in lower levels of human resources where there isn’t necessarily decision-making power, and creating mentorship opportunities among all team members.

Ally recommended that members reach out to her or take advantage of the Boston Research Group’s Diversity and Inclusion Assessment tool, as it’s allowing organizations to start taking that look inward so they can help drive real DEI change in the industry.



Unconscious Bias



Judge Derek Mosley

Director, Lubar Center for Public Policy Research and Civil Education at the Marquette University Law School

In a compelling session on Unconscious Bias, Judge Derek Mosely explored the inherent and internalized biases present in all individuals. He delved into the importance of awareness and strategies to overcome this limiting process.

Judge Mosley commenced his presentation with a thought-provoking statement, asserting that from birth, one's mind is constantly bombarded with information. Considering this influx of information as puzzle pieces, he illustrated how these pieces shape an individual's identity without conscious awareness.

Expanding on the concept of unconscious bias, Judge Mosley clarified that it operates at a subconscious level, often conflicting with our stated beliefs. Through slides and thought games, he demonstrated how the mind, inundated with information, takes shortcuts in processing it. Despite societal changes over the past 60 years, Judge Mosley emphasized that unconscious bias remains prevalent, permeating various aspects of society beyond academic tests. Biases are subtly embedded in film, media, advertising, and culture.

Concluding his presentation, Judge Mosley offered insightful steps to combat unconscious bias, empowering individuals to actively address and challenge their biases:

- Enhance awareness of personal biases and understand beliefs, even those not consciously recognized.
- Avoid color blindness, recognizing that responses to culture are diverse.
- Acknowledge and appreciate the beauty in differences.
- Be conscious of one's makeup within social structures.
- Reflect on thoughts, beliefs, and values before making decisions.

Advancing Environmental Stewardship by Continuously Reducing Greenhouse Gas Emissions and Deploying Zero Carbon Technologies

NOIA's member companies continuously innovate and deploy new technologies and practices to enhance company performance in all areas of ESG, and specifically in emissions reduction.

NOIA Study: U.S. Gulf of Mexico Oil Industry Stands Tall as Among the Lowest Carbon Intensive Producing Regions in the World

In June 2023, NOIA released a comprehensive study on global oil production emissions completed by ICF International, the *GHG Emission Intensity of Crude Oil and Condensate Production*. The report reveals that the greenhouse gas intensity of U.S. oil production, particularly in the U.S. Gulf of Mexico, is significantly lower compared to most other regions around the world.

- Total U.S. oil production has a carbon intensity 23% lower than the international average outside of the U.S. and Canada.
- The U.S. Gulf of Mexico has a carbon intensity 46% lower than the global average outside of the U.S. and Canada, outperforming other nations like Russia, China, Brazil, Iran, Iraq, and Nigeria.
- Using the largest crude category from the Gulf of Mexico (API Gravity 37.5), instead of similar crudes from outside the U.S. and Canada, could result in a 50% reduction in the average international carbon intensity.
- The report includes a sensitivity analysis of global methane emissions, indicating that U.S. production, especially in the Gulf of Mexico, performs much better relative to the global average in terms of emissions intensity even when measured using other methane estimation methodologies.
- This report highlights the record of the U.S. and the Gulf of Mexico in reducing greenhouse gas emissions while maintaining a robust energy production system.

NOIA President Erik Milito says, "The U.S. Gulf of Mexico energy production sets the standard for oil and gas production worldwide. The world needs both climate solutions and a growing amount of energy, and we don't have to choose between the two. Thanks to the remarkable efforts of the women and men producing energy in the Gulf of Mexico, we have an incredible source of reliable and responsibly produced energy. The Gulf of Mexico produces a massive amount of energy with significantly lower GHG intensity compared to most of the world, and its continued success is critical for our energy security, national security, and energy affordability. This study validates the importance of the U.S. Gulf of Mexico as a source of energy with demonstrably lower carbon intensity barrels."

The report provides a robust data set that validates what researchers have underscored for many years – the lower carbon intensity of the U.S. Gulf of Mexico elevates the region as a premier global oil producing basin.

The U.S. Gulf of Mexico region presents a most compelling case as a premier global oil producer. The U.S. offshore operates under one of the strongest regulatory and oversight regimes in the world, which means production here in the United States is more environmentally friendly than operations in many producing regions in the world. The carbon intensity of the Gulf of Mexico is 50 percent of that of other producing regions. Part of the reason is that U.S. Gulf of Mexico developments deliver high volumes of oil and gas with a far smaller physical footprint. In 2019, 18 offshore facilities (with a combined surface area equal to about nine city blocks) produced 75 percent of offshore production.

The region is also a leader in managing methane emissions. This is in large part because methane releases are closely regulated offshore. Volumes of gas, of which methane is a primary component, to be flared or vented from offshore facilities are tightly regulated under the provisions of 30 CFR 250 Subpart K. Over the past few decades, operators have moved away from using natural gas driven pneumatic devices to instrument air, eliminating the methane emissions from operation of such devices. Furthermore, gas detection systems are generally deployed on facilities, allowing operators to identify and address methane gas leaks, further reducing methane emissions from offshore facilities.



Management practices and related regulations for venting and flaring of methane in the offshore have helped to dramatically reduce the practice in the Gulf of Mexico. The U.S. Gulf of Mexico accounted for 15% of U.S. oil production in 2019, yet EIA data shows venting and flaring emissions from offshore oil and gas operations accounted for a mere 2.6% percent of nationwide energy production venting and flaring emissions in 2019. EPA data also shows methane emissions from offshore oil and gas production accounted for less than one percent of total nationwide methane emissions in 2019.

In short, the U.S. and world depend upon reliable supplies of oil and natural gas for a high quality of life and U.S. offshore production should be the basin of choice for producing that energy because of demonstrably lower GHG and environmental impacts for an energy source we will continue to need for years to come.

In fact, a 2016 report at the end of the Obama Administration—issued under then-Secretary Sally Jewell—stated, “U.S. GHG emissions would be higher if BOEM were to have no lease sales.... Emissions from substitutions are higher due to exploration, development, production, and transportation of oil from international sources being more carbon intensive.”

Recent research from multiple sources continues to validate the lower carbon benefits of U.S. Gulf of Mexico oil leasing and production:

The Breakthrough Institute:

The Breakthrough Institute, a global research center that identifies and promotes technological solutions to environmental and human development challenges, recently examined the need for continued investment in greenfield oil and gas projects in the United States even in the context of aggressive emissions reductions scenarios that aim to meet ambitious climate objectives.

In the report, “Oil and Gas Assets at Risk, How will clean energy's rise impact oil and gas communities in the United States amidst shrinking fossil fuel demand?”, authored by Rystad Energy, Dr. Zeke Hausfather, Mark Boling, and Peter Liu, the Institute finds “Despite potentially significant declines in global oil and gas demand across the climate scenarios by 2050, our findings clearly indicate that investment in new oil and gas fields may still be necessary to meet future demand for oil and gas in all three of the climate change mitigation scenarios.”

The authors considered four scenarios, including the Sustainable Development Scenario (SDS) of the International Energy Agency, which is aligned with the Paris Agreement goals of keeping warming well below 2° Celsius.

The report includes key conclusions:

- “Growing economies tend to increase their energy demand especially for the transportation of goods from producers to consumers. Petroleum products such as diesel and gasoline are the fuels that keep the cargo ships, aircraft, and trucks that underlie supply chains operating smoothly.”
- “ [A]pproximately 10 million bbl/d of oil production from new fields is needed between 2030 and 2050 in order to meet global oil demand in SDS, the most ambitious climate scenario.... [A]dditional investment in new gas production will be required in the ambitious SDS scenario as well.”
- “New investment in oil and gas fields is likely to occur throughout the world, driven primarily by economic competitiveness and proximity to demand centers of each field. In the Rystad modeling, substantial greenfield investment occurs in all of the major producing regions in the world to 2050, including the United States.”
- “[N]ew investment could be required in greenfield oil and gas production, including substantial new greenfield production in the United States, in order to meet future demand. Political initiatives to entirely ban oil and gas production or prevent investment may therefore be unrealistic or uneconomic.”
- “The total greenhouse gas impact of oil varies quite substantially across the world based on the source and method of production....”
“Our field-level economic analysis demonstrates that US oil and gas production is relatively low carbon and, therefore, would be minimally impacted by carbon pricing in absolute terms relative to production in other regions. In particular, US oil is the “cleanest” on average in the world, although not the cheapest....”
- “This finding has implications for domestic US oil and gas policy. To reduce the marginal emissions of oil and gas production, while ensuring security of supply for the United States and its allies, policy makers should avoid penalizing or preventing US production exclusively. Rather, *policies that promote more aggressive emissions reductions for US oil and gas production could also seek to displace higher-emitting products from other major regions of production, thus minimizing the climate impact of remaining global oil and gas use in a low-emissions future.*” (emphasis added.)



Wood Mackenzie:

According to Wood Mackenzie, reducing oil production from the U.S. Gulf of Mexico would increase the average emissions rate for global oil production:

Using our recently updated Emissions Benchmarking Tool, which profiles emissions for more than 2,800 oil and gas assets around the world, [researchers] Oberstoetter and Usoro were able to compare the carbon intensity of the principal sources of crude used in the US. Numerous factors drive the differences in intensity: emissions in Venezuela, Colombia and Canada are driven by the more energy-intensive processes needed to produce the heavier crude qualities, while in Iraq flaring is the big problem. The overall picture is clear, however: the deep water of the Gulf of Mexico is one of the lowest-carbon sources of oil used in the US, with only Saudi Arabia coming in lower. In the light of that, Oberstoetter and Usoro argue, restrictions on US production in the Gulf could end up having a counterproductive impact on global emissions.

McKinsey:

In the report titled “How the Gulf of Mexico can further the energy transition,” McKinsey describes four key factors that give the deepwater Gulf of Mexico a “low carbon advantage”:

First, in contrast to other regions where flaring natural gas without a market is more commonplace, most of the natural gas produced in the Gulf of Mexico is sold to local markets, which results in minimal routine flaring and, consequently, less GHG emissions. Second, the facilities have efficient, modern designs that minimize methane leakage. Third, wells and production facilities have a high throughput, minimizing the number of energy-intensive processes required to bring on new supply, such as drilling. And fourth, operators have made active decarbonization efforts to stay in line with environmental sustainability goals and in compliance with regulations.

McKinsey estimates production from the U.S. Gulf of Mexico could decrease by about 800,000 barrels per day by 2040 without additional projects beyond those that have already been sanctioned. In that situation, McKinsey expects lost production would be made up by substitutions from other parts of the world without much oil demand destruction. The country would be able to import sufficient oil, but it would come from higher-emitting basins, resulting in an increase in greenhouse gas emissions globally:

This supply reduction would have to be offset by alternative sources to meet global demand, which could hinder net-zero goals significantly. Because many other oil producing regions globally have total unit costs similar to those in the Gulf of Mexico, global oil price increases or substitution with other energy sources wouldn't be expected, and global demand for oil would remain unchanged.

Instead, the reduced Gulf supply would be offset by production increases from other sources, such as other deepwater basins, shale, and OPEC. Based on the higher emissions per barrel of this new supply, global emissions would increase by 50 million to 100 million metric tons of CO₂e through 2040.

McKinsey also points out other significant, adverse consequences if America moves away from deepwater Gulf of Mexico oil production, “A shift in production from the Gulf of Mexico to other basins could also have broader implications for the U.S. economy, including the loss of more than 100,000 jobs and a \$30 billion to \$40 billion reduction in federal government revenue from reduced royalties and lease-sale proceeds.”

Advancing Emissions Reduction Objectives through a U.S. Carbon Capture and Storage Sector

Progress towards addressing the climate challenge will depend upon increased innovation, conservation, efficiency, resiliency, mitigation, and adaptation. Carbon capture, use, and storage (CCUS) is an innovative approach to mitigating greenhouse gas emissions. The wide-spread deployment of CCUS will be critical for achieving the climate change ambitions and goals that have been established by a diverse group of stakeholders around the world. CCUS can serve as an important tool for balancing environmental, economic, and energy needs. U.S leadership in CCUS will help ensure the availability of abundant, reliable, and affordable domestic energy, while continuously driving down emissions.

According to the National Petroleum Council (NPC):

CCUS is an essential element in the portfolio of solutions needed to change the emissions trajectory of the global energy system. In its Fifth Assessment Report, the IPCC concluded that the costs for achieving atmospheric CO₂ levels consistent with holding the average global temperature to 2 degrees Celsius—referred to as a “2-degree Celsius world”—will be more than twice as expensive without CCUS.

**Meeting the Dual Challenge: A Roadmap to At-Scale Deployment of Carbon Capture, Use, and Storage, December 2019, p. 12, Volume 1, Report Summary*

According to the International Energy Agency:

Carbon capture, utilisation and storage (CCUS) technologies offer an important opportunity to achieve deep carbon dioxide (CO₂) emissions reductions in key industrial processes and in the use of fossil fuels in the power sector. CCUS can also enable new clean energy pathways, including low-carbon hydrogen production, while providing a foundation for many carbon dioxide removal (CDR) technologies.

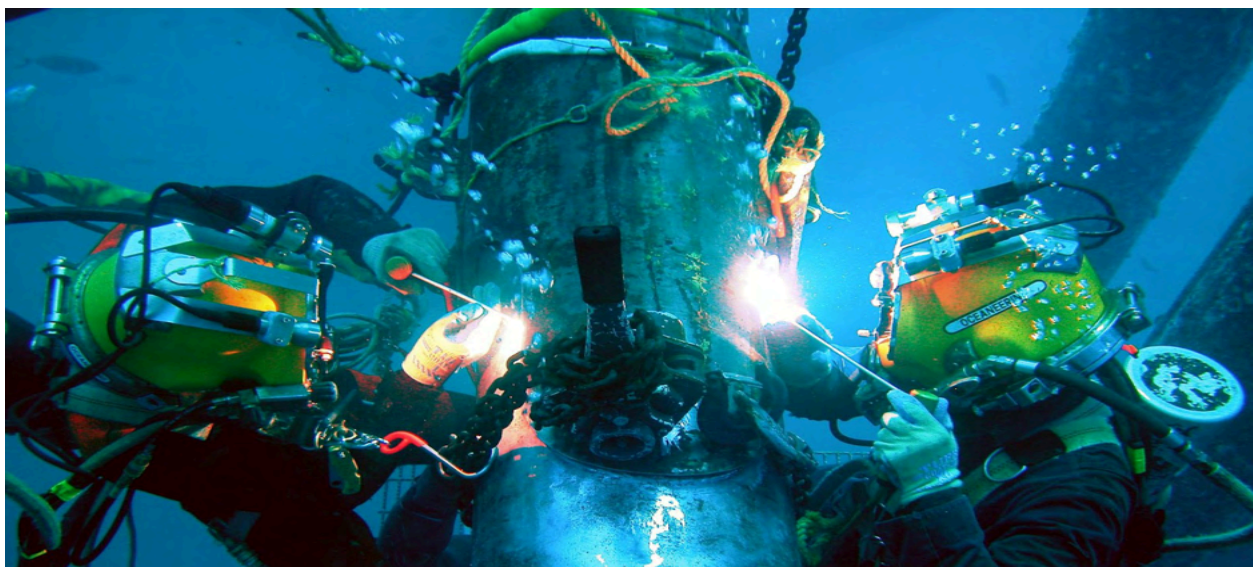
**See <https://www.iea.org/reports/the-role-of-co2-storage>*

As it relates specifically to the offshore, the NPC concluded that “One of the largest opportunities for saline formation storage in the United States can be found in federal waters, particularly in the Gulf of Mexico.” *Meeting the Dual Challenge*, p. 27. This is also true as it pertains to state waters along the Gulf Coast.

The technical and commercial feasibility of large offshore storage projects is being proven on the global stage. The first large-scale CO₂ capture and injection project with dedicated CO₂ monitoring and storage was commissioned at the Sleipner offshore gas facility in Norway in 1996. Today, the facility has stored more than 20 Mt CO₂ at 1 km depth under the North Sea. With operations beginning in 2024, Northern Lights is a new CCS project under construction that will initially store up to 1.5 million tonnes of CO₂ per year with the goal to achieve five million tonnes of CO₂ per year by 2027. The Northern Lights project is part of a larger CCS initiative that will capture CO₂ from industrial sources within Norway, ship liquid CO₂ from capture sites to an onshore terminal on the coast, and then transport the CO₂ by pipeline to an offshore storage site below the North Sea in water depths of more than 300 meters and total depth to injection of 2,500 to 3,000 meters. In the U.S., the Gulf of Mexico is well suited for the development of projects like Northern Lights.

The U.S. Gulf of Mexico offshore region provides advantages for an emerging U.S. CCUS 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, and an accessible engineering and energy knowledge base and workforce, along with associated RD&D capabilities.

The U.S. currently stands as a global leader in CCUS, with 10 of the 19 worldwide projects operating and located in the U.S. in 2019. While most projects to date have included an EOR component, the U.S. is well-positioned to lead in CO₂ storage as well.



According to the National Petroleum Council, the U.S. has become a world leader in CCUS by:

- Executing successful CO₂ capture projects
- Investing in CO₂ pipeline infrastructure
- Establishing a supporting regulatory framework
- Enacting world-leading policy support
- Investing in research, development, and demonstration

The Gulf Coast region is distinctly situated to emerge as a global hub for CCUS. The Gulf Coast is home to the full supply chain of energy companies with the engineering experience, expertise, and vision to deploy CCUS projects with the scale and efficiency necessary for success. As with any capital-intensive industry, the U.S. CCUS sector requires certainty and predictability in the regulatory system, both at the state and federal level. Developments must be made in U.S. laws and regulations to foster growth and enable success in U.S. CCUS.

NOIA, in partnership with the Offshore Operators Committee, or OOC, has engaged with federal regulators in order to provide fact-based, technical information and engage in dialogue for the advancement of a regulatory framework that will enable the build-out of a U.S. offshore CCS sector.

NOIA/OOC Carbon Capture and Storage Symposium

In June 2023, NOIA and the Offshore Operators Committee (OOC) held an in-depth offshore CCUS symposium in Houston, Texas at Rice University's Baker Institute. The widely attended event brought together more than 150 private industry and thought leaders with key regulatory bodies. The symposium offered a great opportunity to continue to collaborate with the regulators and among the offshore energy industry.

Government agencies weigh in on CCS development

The Bureau of Ocean Energy Management (BOEM) is carrying out an assessment of CO₂ storage resources in the northern Gulf of Mexico in water depths less than 200 meters that will consider the static storage capacity of depleted reservoirs, buoyant traps, and saline aquifers. The assessment also will consider containment and operational risks associated with sealing formations, faulting, and well bores.

BOEM Resource Studies Section Chief Carlos Alonso provided data from a 55-mile-long, 35,000-ft deep proprietary seismic traverse in the Gulf of Mexico to explain the analyses underway. "The structurally high area has high fault density, while the low areas, which are not as structurally complex, are a result of salt withdrawal," he said, noting that storage classes can be classified as depleted reservoirs, physical traps, and saline aquifers. Approximately 70 percent of the shelf is underlain by saline aquifer areas, while physical traps make up 25 percent. The remaining 5 percent is occupied by salt diapirs in the subsurface.

“The agency is using regional seismic attribute maps assembled 15 years ago for the oil and gas program to come up with current maps to delineate saline aquifers and potential CO₂ storage areas,” Alonso said. To date, 230 have been preliminarily identified, 142 of which are offshore Texas and 88 of which are offshore Louisiana. The frequency distribution is considerable, he said, noting that they vary in size from 3,000 acres to 310,000 acres with a mean of 66,000 acres.

Analysis indicates the northern Gulf of Mexico shelf is highly compartmentalized by faults and salt, and the least complicated saline aquifer areas are in large salt withdrawal basins. It will be necessary to assess containment risks associated with legacy wells and faults, and conservation measures might be needed to optimize storage resources. This is valuable information, Alonso said, “because a regional understanding of the geologic setting of reservoirs, traps, and saline aquifers can inform assessment, leasing, and regulatory policy.”

Meanwhile, the Bureau of Safety and Environmental Enforcement (BSEE) is working to develop rules that will regulate CCS project development in the Gulf of Mexico. BSEE Chief Well Analyst Becky D’Amico said that although the initial rule is in draft form, “BSEE is still reviewing numerous industry standards and we’re continually learning.” This is one of the reasons it is so important for companies to comment on the draft rules, she said.



Louisiana sets the bar for CCS development

Jason Lanclos, director of the Louisiana Department of Natural Resources, is certain energy diversity will be critical to the future, and he is working to create an environment to facilitate growth in his home state.

“Every state is different, and the pathway to green energy is not straight,” he said, but every state in the nation needs a program to diversify its fuel sources beyond the traditional fuels.

About 2 percent of Louisiana’s energy comes from renewables, and growth areas have been identified to enable wind, solar, and hydrogen to help reduce greenhouse gas emissions, Lanclos said. However, the biggest opportunity with the highest potential for near-term gains is CCS.

“You just need three things for CCS,” he said, “source, transportation, and pore space—and Louisiana has all three.”

Approximately 62% of emissions in the state come from industry along a corridor where there is a mature transportation network and an enormous offshore area that could be used for storage, Director Lanclos said. That is why he and his team began several years ago to reframe the conversation about CCS by working with federal agencies as well as local communities.

Having a plan for pore space and reliability was essential in giving confidence to the US Environmental Protection Agency that Louisiana is laying the groundwork for safe long-term carbon storage.

As critical as it is to establish policies to regulate development, it is not the only significant priority. Getting buy-in from the people of Louisiana also is essential, Director Lanclos said. That is why he and his team have traveled across the state, working in communities and talking to residents about the practicalities of implementing CCS projects. “People have questions that can’t be ignored,” he said. “They need answers if they are going to support CCS development, so we are working to make sure they have a clear understanding of the dynamics.”

This approach has led to significant investment. “Louisiana Economic Development is approaching the \$80 billion mark for CCS and clean energy projects that are in the development and planning stages,” Director Lanclos said.

IRA tax incentives accelerate CCS investment on the Gulf Coast

Energy diversification is a necessity, and thanks in great part to the Inflation Reduction Act (IRA), CCS in the United States is poised for major growth over the next decade, according to Tip Meckel, senior research scientist at the Gulf Coast Carbon Center. A major incentive is the 45Q tax credit of \$85/ton of CO₂(tCO₂) for point source capture and \$180/t CO₂ for direct air capture.

“That means storage associated with power generation, natural gas processing, ethanol production, and chemical plants are all poised to rise, and if plans in place today are executed, those four sources will make up 87 percent of all the capture capacity by 2025,” Meckel said. In fact, if developers follow through on plans currently in place, by 2025, US capacity will jump 292 percent from 2020 levels. Meckel considers this good news for Texas and Louisiana, which are among the biggest producers of refined products in the United States.

Historically, CCS has been done successfully in the region. “Over the past decade, 19 Tcf (nearly 1 Gigaton) of carbon dioxide was injected into subsurface formations throughout Texas,” Meckel said, and that raises the comfort level for future projects.

Offshore CCS also is less complicated in some ways than onshore CCS operations. There is a single land/mineral owner, there are fewer, younger legacy wells, and because it is feasible to transport CO₂ in vessels (as is being done offshore Norway), it could be possible to eliminate the need for an emissions pipeline.

With this concurrent incentive and opportunity, Meckel predicts offshore CCS projects will take off. “The nearshore zone is a sweet spot for CO₂ sequestration,” he said. “It’s mind boggling how much stratigraphy there is.”

The area is already attracting interest. “The number of permits has gone exponential over the last two years,” Meckel said. “The Gulf of Mexico is the most studied basin in the world. We know everything we need to know to get this going at scale.”

Current CCS projects lay the groundwork for future developments

David Tatum, General Manager for CCUS for Chevron New Energies, shared insights from CO₂ injection projects, including Sleipner in Norway, Gorgon in Australia, and Quest, Canada, to show how these projects have generated valuable learnings and vital insights that are helping accelerate global CCUS development.

“CCUS is a proven technology that has been used for decades to store carbon dioxide,” he said, “and although each of these representative projects presents different strengths and unique challenges, each of them shows that CO₂ can be safely stored and effectively monitored.”

At Sleipner, CO₂ injection began in 1996 and has averaged 1 million tons per year (mtpa). The CO₂ is injected at 800 m water depth into a high-quality sandstone saline aquifer reservoir that has a multi unit seal. This project has had a significant impact, David said, because the data gathered from Sleipner has been made available to the research community internationally to accelerate advances in CCS.

On the Gorgon multi decade project in Australia, 4D seismic imaging is being used to monitor plume movement. Currently, CO₂ is being stored at a rate of 1.6 mtpa, David said, and future scale-up to 4 mtpa with the goal of storing 100M metric tons of CO₂ over the life of the project. One of the major contributions from Gorgon, according to David, is that it demonstrates pressure management can be used as an additional tool to optimize carbon storage.

In Canada, Quest has achieved success through collaboration across stakeholders, communities, and regulators, working closely with regulators to amend legal and regulatory frameworks and communicating with the public to gain acceptance for the project. “Quest established early and open communication through both formal and informal engagements and incorporated feedback and concerns,” he said.

These projects, said David, show how CCS projects can be developed and also bring into focus some key considerations for project planning and execution.

Current technologies are a springboard for CCS development

A significant capital investment will be required to develop CCS concepts, so leveraging existing technology and knowledge will be critical to project feasibility.

Scott Eberhardt, Business Development Manager for Carbon Services for SLB,, opened the technical panel discussion, commenting that characterization and feasibility for CCS projects are similar to oil and gas but not exactly the same. CCS projects will require a focus on storage capacity, injectivity, and containment as well as transportation requirements to move CCS to the storage site and monitoring technologies that will be used over an extended time.

Companies also will need to invest in engaging communities and providing fact-based information.. “CCS is a relatively new idea compared to mineral rights or oil and gas royalties, and opposition has shut down projects,” Scott said.

The key to success will be finding a way to compare project feasibility using a consistent methodology that allows the best areas to be selected for development, he said.

“Build a digital structural model that includes all the information you can incorporate,” Scott suggested, and include such things as the distance to historical earthquakes, fault leakage and reactivation, and proximal legacy wells and subsurface operations. Conducting a literature and analogue review is also important, as is analyzing structure and fault maps using 2D and 3D seismic surveys and examining legacy well records and well data, including logs, cores, production data, and pressure/temperature characteristics. In other words, success will depend on preparedness.

Diana Grauer, Director of R&D at NOV, explained how her company is leveraging upstream oil and gas processing system expertise to develop a technology portfolio for post-combustion carbon capture and conditioning.

NOV experts are evaluating offshore platform reuse for carbon injection and storage and examining existing loading system designs to figure out how they can be augmented for CO₂ offloading and injection offshore, she said. Engineers already developed a composite pipe, called Fiberspar™, for CO₂ transport applications in the western United States. “We also have analyzed flexible pipe solutions used offshore to confirm that they are compatible with moderate CO₂ content and are close to launching an improved solution for CO₂-rich injection operations under high pressure,” Diana said.

CCS projects are going to need a lot of vessels and a lot of different kinds of offloading capabilities as well, she said, noting that her team is looking at technologies for ship-to-utilization point, ship to onshore storage, ship-to-pipeline storage, and ship-to-offshore storage.

NOV’s primary objective is to develop solutions that will enable the company to extend its reputation as a product and solution provider oil and gas to CCS developments, Diana said.

Meanwhile, global geo-data company Fugro is working on strengthening baseline site characterization to support a comprehensive understanding of the storage complex, the overburden, and the seafloor. Yosmel Sanchez, Director CCS and Subsurface Storage, Americas for Fugro, calls this, “critical for assessing the viability of the storage site and mitigating potential risks.”

A complete assessment of site conditions before entering the development phase is also “step zero” in the monitoring phase, Yosmal said, because everything that follows will be referenced to and compared with this baseline. “In addition to understanding reservoir and seal conditions, knowing the geochemical footprint of shallow soils, for example, including near existing infrastructure, allows for future differentiation between the effects of CO₂ leakage and other factors,” he explained.



Fugro is using high-resolution geophysical data coupled with legacy 3D seismic, geotechnical, and well-log data to generate a dynamic 3D model of the seafloor and overburden section over the entire CCS site. “We can shift from this to a predictive model that isn’t completely accurate at the outset but can be improved as data are gathered over time,” Yosmel said.

Although there are multiple technologies that could be used for long-term monitoring, passive systems will be most practical from a cost perspective, according to Yosmel, who identified fiber-optic cables with pressure sensors, long-term deployable bottom nodes, or buoys fitted with CO₂ and pH sensors at the sediment-water interphase, as some of the available options

Yosmal also pointed out that time-lapse 3D and/or high-resolution 2D seismic (aka 4D) will be required during the life of the storage site. The frequency and type of technology used for measurement and verification will be dictated by the geomechanical model and the data collected during the injection phase. Yosmel indicated there will be “critical phases” in terms of pressurization, volume injected, or other measured parameters in which effective imaging of the subsurface will be needed for site integrity assurance and monitoring of CO₂ plume behavior.

Yosmel also referred to seafloor and shallow subsurface surveys as a resource for monitoring and verification, highlighting the potential of unmanned surface vessels (USVs) as a low-cost, low-carbon, remote solution for infrastructure inspection, ecosystem monitoring, and seafloor data collection over areas of interest.

“The critical point for me is to have a toolbox that not only includes reliable but cost-effective solutions,” Yosmel said.



Policy Considerations for U.S. Offshore CCS



Sasha Mackler

*Executive Director of the Energy Program at the
Bipartisan Policy Center*

Sasha Mackler presented the NOIA membership at the April Annual Meeting in DC on the outlook for offshore CCS. In his presentation, Sasha brought attention to a significant issue within the CCS domain – the misinformation campaigns and misalignment on the role of CCS in reducing emissions, impacting policy support and action on carbon capture. Sasha underscored the impact of the political landscape on this divide, emphasizing the notable bipartisan support for carbon capture despite being a regional concern. He delved into the potential effects of the upcoming 2024 election on the progress of CCS projects, highlighting how political forces could either propel or hinder their advancement based on the level of politicization.

In his concluding remarks, Sasha emphasized that achieving substantial progress in CCS relies heavily on policy reform. Despite recognizing the challenges in unifying various environmental groups, especially in regions vehemently opposing CCS, he proposed a strategy for the industry. This involves garnering public support and countering misinformation. He stressed the importance of showcasing the success of past projects, their positive contributions, and their support for the energy sector and markets, as these elements can play a pivotal role in achieving the overarching objective.

Moving Forward With U.S. Offshore Wind

Building Support for U.S. Offshore Wind



Stephanie McClellan

Executive Director of Turn Forward

Stephanie McClellan, the Executive Director of Turn Forward, delivered a timely advocacy talk on Building Coastal Support for Offshore Wind. Stephanie began by providing an overview of the current status of offshore wind energy projects. While some projects, such as Vineyard Wind in Massachusetts and South Fork, are already under construction, and more are expected to commence shortly, the offshore wind industry faces significant challenges.

One major challenge is the inability to proceed with certain projects due to states rejecting rate adjustments for original bid prices in 2019-2020. Furthermore, inflation has had a significant impact on the market, leading to supply chain disruptions and increased costs for materials and goods. The rapid growth of the wind power sector in Europe has created a bottleneck in demand, further straining an already delicate supply chain market.

Stephanie expressed optimism in addressing these challenges, highlighting the collaborative efforts of state and federal leaders with the wind markets to protect ratepayers and tackle supply chain inflation.

She emphasized the importance of garnering public support for future offshore wind projects. Repeated polling data indicates strong public support for offshore wind, citing the economic benefits such as job creation and local investments it can generate. Stephanie also warned of a misinformation campaign targeting the offshore wind industry, particularly involving inaccurate reports of whale deaths. It is crucial to address these misconceptions to ensure that the public has an informed and balanced understanding.

In conclusion, Stephanie stressed the significance of establishing a consistent, long-term message in support of coastal wind energy. Affordability is a primary concern for voters, and ensuring stable prices can help maintain their support. To combat misinformation regarding whales, it is vital to convey a clear and direct message that explains conservation efforts to protect wildlife.

NOIA has continued advocacy and messaging alignment with Turn Forward. NOIA and Turn Forward operate separate but just as influential lanes when it comes to building support by offshore wind. By taking a proactive and strategic approach, NOIA and Turn Forward can press the right messaging for the right audience forward and continue to bolster support of U.S. offshore wind.

The Investment Outlook for Offshore Wind



Sam Huntington

Director, Climate & Sustainability: North American Power S&P Global

Sam Huntington, Director, Climate & Sustainability: North American Power S&P Global, joined the NOIA Annual Meeting in April to discuss the investment outlook for U.S. offshore wind.

To begin his presentation, he shared that the U.S. offshore wind industry is poised for takeoff, driven by a mix of state and federal policy support, including OCS infrastructure funding, tax credits for renewables, and incentives for domestic production.

With that, there are aggressive targets for offshore wind energy production, with federal targets widely discussed throughout the week, and the introduction of the state-level goal of 50 GW on the East Coast, 28 GW on the West Coast, and 5 GW in the Gulf.

Sam explained that despite these large goals, the US is behind many other regions, such as Europe and Asia, in developing its offshore wind market. It typically takes about a decade to establish the market, which involves setting up legal and regulatory frameworks, developing the supply chain, and deploying initial commercial-scale projects. The East Coast is in stage five and ready to scale up to stage six, while the West Coast is just starting. However, there are supply chain bottlenecks, including equipment and labor shortages, high commodity prices due to global competition and growth, as well as a lack of trained workforce.

One significant constraint is the shortage of jack-up vessels required to install fixed-bottom offshore wind turbines, and the U.S. needs to build its own supply chain due to Jones Act restrictions. These vessels can take up to three years and half a billion dollars to manufacture.

The next point he made was the fact that the industry is also trending towards larger turbines, with offshore turbines expected to double in size by 2030. Why does this matter? Well, combining the take capital cost and average output, you can calculate the levelized cost of energy, basically the lifetime cost of the resource per unit of electricity it produces, which is a proxy for PPA prices. He added that there's been about a 40% decline in levelized cost benefit in the past five years, and probably another 40% over the next ten. Plus, then you have the IRA tax credits, which give about a 30% tax credit relative to the installed cost, and additional tax credit capture for the use of domestic content.

Despite the short-term constraints and competition for resources, the global nature of the industry could help drive innovation and reduce costs in the long term. Sam summarized that while offshore wind progress in the U.S. is clear, S&P Global is a bit pessimistic in the near term but quite bullish in the long term. They believe that the administration's goals will likely be missed by a few years due to the previously discussed constraints. But overall, the strong policy drivers and market response suggest encouraging progress with the U.S. cumulative investment in offshore wind to hit \$150 billion by 2035.

NOIA Continues to Support Offshore Wind Legislation & Federal Policy

The Reinvesting in Shoreline Economies & Ecosystems (RISEE) Act

NOIA continues to support commonsense legislative proposals to boost the emerging U.S. offshore wind sector. An important bipartisan legislative marker is the Reinvesting in Shoreline Economies & Ecosystems (RISEE) Act, introduced by Senators Bill Cassidy (R-LA) and Sheldon Whitehouse (D-RI). The bill would both amend the Gulf of Mexico Energy Security Act (GOMESA) and create a new dedicated stream of funding from future offshore wind development for coastal protection and resiliency.

In the 118th Congress, Senators John Kennedy (R-LA), Angus King (I-ME), Lindsey Graham (R-SC), Jeanne Shaheen (D-NH), Susan Collins (R-ME), Kirsten Gillibrand (D-NY), Steve Daines (R-MT), Chris Murphy (D-CT), Richard Blumenthal (D-CT), Chris Coons (D-DE), Chris Van Hollen (D-MD), Ben Cardin (D-MD), Mark Warner (D-VA), Tim Kaine (D-VA), Debbie Stabenow (D-MI), Martin Heinrich (D-NM), John Hickenlooper (D-CO), Dianne Feinstein (D-CA), Alex Padilla (D-CA), and Brian Schatz (D-HI) joined Senators Cassidy and Whitehouse as original cosponsors.

In addition, bipartisan House companion legislation was introduced by Representatives Randy Weber (R-TX-14), Lizzie Fletcher (D-TX-07), Nancy Mace (R-SC-01), Abigail Spanberger (D-VA-07), Don Davis (D-NC-01), and Anna Eshoo (D-CA-16).

NOIA has been supportive of the legislation and works strategically to build support on Capitol Hill and through the media. Whether it is through coastal restoration, hurricane protection, infrastructure improvement, or through countless other benefits, offshore energy development enables greater resources and infrastructure support for coastal communities. The RISEE Act further connects the dots between continued responsible offshore energy development and environmental stewardship and coastal restoration and resiliency.

The Offshore Wind Jobs and Opportunity Act

NOIA has also supported Senator Edward Markey (D-MA) and the Offshore Wind Jobs and Opportunity Act. The bill would provide a significant boost to the buildout of the offshore wind workforce. Importantly, it directs the Secretary of Labor to identify the offshore wind industry's workforce needs. Then, based on this workforce gap analysis, the Labor Secretary would establish a grant program in consultation with the Secretary of Energy to support the training of both new and current workers, provide tuition financing, and support apprenticeship programs.

Ultimately, the goal is to create thousands of jobs in coastal communities through apprenticeship programs, maritime centers of excellence, and institutions of higher education. NOIA has worked closely with a broad range of groups and Congressional offices to continue to build support for the bill. The offshore wind sector is poised for incredible growth, which is predicated on having a robust and skilled workforce ready to rise to the challenges and opportunities this promising energy segment brings to the nation. As we have seen in recent years, a trained labor force is critical to the success of energy development, particularly for cutting-edge renewable energy projects. The Offshore Wind Jobs and Opportunity Act would address this growing need by fostering the specific training and development of technical expertise needed to support the rapidly expanding offshore wind industry workforce and renewable energy developers.

The Renewable Energy Modernization Rule

NOIA joined with the American Clean Power (ACP) Association and the Business Network for Offshore Wind (now referred to as the Oceanic Network) in submitting comments to the Bureau of Ocean Energy Management (BOEM) proposed Renewable Energy Modernization Rule. In January 2023, BOEM issued the proposed rule as part of its efforts to "modernize its regulations to facilitate the development of offshore wind energy resources to meet U.S. climate and renewable energy objectives."

The rule includes proposals for a schedule of lease sales covering a five-year period; more flexible geophysical and geotechnical survey submission requirements; streamlined approval of meteorological (met) buoys; revised project verification procedures; reform of BOEM's renewable energy auction process; and greater clarity regarding safety requirements. Through these changes and other changes, BOEM hopes to "reduce administrative burdens for both developers and the Department's staff, reduce developer costs and uncertainty, and introduce greater regulatory flexibility in a rapidly changing industry to foster the supply of OCS renewable energy to meet increasing demand, while maintaining environmental safeguards."

The groups support BOEM's overall goals and agree with the urgent need to reduce administrative burdens, costs, and uncertainty and to allow more flexibility in offshore wind development. Collectively and individually, the trade groups are confident that offshore wind can continue to thrive in the United States through the orderly and expeditious development of the Outer Continental Shelf, with appropriate environmental safeguards.

Along with a detailed and broad set of recommendations in the 112-page comment letter, NOIA, ACP, and the Business Network for Offshore Wind urge BOEM to bring the new rule to finality as soon as possible, writing:

We urge BOEM to bring the Mod Rule to finality as soon as possible. The road to the proposal was long. A great deal of experience is already reflected in the proposal. After a dozen years of near-constant evolution, scientific advances, and technological improvement, the opportunities and benefits of offshore wind are here now, and we need a modernized regulatory structure to reap the benefits of responsible development.



The Offshore Industry Shines Together in Advancing ESG: The NOIA ESG Network Programmatic Activities

2023 NOIA ESG Network Workshop

The NOIA Environmental, Social, & Governance (ESG) Network held a workshop, hosted by NOV, in March 2023. Attendees heard from presenters on approaches for achieving emissions reductions in operations, the importance of intentional leadership, and the insurer's perspective on ESG.

Technology advances improve emissions management

The Gulf of Mexico is an emissions-leading basin and a focus area for Talos Energy. According to Senior Production Engineer Michael Melancon, the company is leveraging technology to reduce emissions as part of its long-term plan to provide affordable energy and increase industrial decarbonization.

Talos is progressing its goals in part by employing FLIR (forward looking infrared) cameras in the Gulf of Mexico to reduce fugitive emissions. In 2022 alone, the company carried out 41 FLIR inspections, scanning 8,343 components and identifying a range of anomalies, the most common of which were associated with tubing/thread connections, valve packing, and compressors, he said.

According to Mike, the FLIR program is reducing fugitive emissions and giving Talos the ability to collect data that is enabling process enhancements and improvements in asset maintenance. In addition to providing workers with another tool in the toolbox to monitor aging infrastructure, FLIR is preventing serious instances of escaping gas and is protecting the lives of offshore workers.

Building on the success of its FLIR program, Talos is evaluating other technology, including drones and LiDAR (Laser Imaging Detection and Ranging), to incorporate in its monitoring program.

A Senior Air Specialist in Chevron's GOM Business Unit (GOMBU) also participated, and said FLIR is an established part of her company's annual monitoring program, with Chevron's methane strategy focusing on facility design, operating practices, and advanced technology.

Advanced detection, the third pillar of the program, "is a key piece for us," said the Chevron SME.

To date, Chevron has employed satellites, aircraft, and drones to monitor emissions in various business units. In GOMBU, FLIR camera surveys are regularly conducted, and testing of emerging technologies is ongoing to identify the best option for offshore monitoring.

Like Chevron, bp is working to reduce methane emissions from its Gulf of Mexico assets. According to Jennifer Osterhaus, Gulf of Mexico HSE and carbon manager, a near-term company goal is to install methane measurement on all existing major oil and gas processing sites, gather and publish the data, and reduce the methane intensity of bp operations. Focus areas for methane emissions reduction on bp's Gulf of Mexico assets are flares and fired equipment exhausts because, as Osterhaus explained, they account for the majority of methane emissions in offshore operations.

These improvements will be essential for bp to meet its goal of getting to net zero by 2050, she said. The company is using existing flare metering and process modeling to understand the potential range of compositions of gas going to flare and computational fluids dynamic (CFD) models to better determine destruction and removal efficiency (DRE) at varying operational and atmospheric conditions. These in turn give better estimates of actual methane emissions and will support moving to real-time monitoring of flare performance.

The company also is using a Predictive Emissions Monitoring System (PEMS), a technology that historically has not been used for methane monitoring, to track exhaust emissions. The technology uses turbine and engine data to predict methane emissions. By the end of the year, probes will be placed in the exhaust stacks to allow testing and calibration of the software to improve methane emission estimates. "This will give more confidence to what we're monitoring, how much methane we're emitting, and what we are reporting," Jennifer said.



By incorporating new technology, working with peers, and encouraging advocacy around robust methane policies, “We hope to move to a better place with methane measurement and methane reduction,” she said.

The value of Conscious Leadership in realizing ESG objectives

ESG has become an integral part of the business landscape, and companies are looking for ways to adopt and implement ESG precepts. This is a formidable challenge, but according to adjunct professor, coach, advisor, and author, Dr. Liz Sweigart, it is not mission impossible.

Dr. Sweigart explained how conscious leadership can benefit organizations that are experiencing difficulty integrating and capitalizing on ESG, even those that at present perceive ESG as irrelevant or view it exclusively as a regulatory reporting requirement. By using the techniques and insights she shared, organizations can incorporate ESG initiatives as part of a broader business philosophy that emphasizes sustainability as a pathway to long-term growth and profitability.

It all starts with leaders understanding that by leading themselves, they are best prepared to lead others, she said. “When you lead yourself, you become a role model,” she said.

Conscious leadership requires self-awareness, situational awareness, self-regulation, and empathy, especially under duress. And that is accomplished by keeping things in perspective. “The stimuli we’re subjected to make us think something is a crisis, and that compromises our ability to make good decisions,” Dr. Sweigart said. “The key is to recognize that most of the time, it is not a crisis.”

Good leaders can remove themselves from the crisis mindset to avoid reacting in the moment. That ability to control how they respond enables them to take considered actions rather than follow knee-jerk reactions, and it allows them to empower others to do the same, she said.

Once leaders are able to make pragmatic decisions, they can affect significant change using a balance of transactional and transformational management, Dr. Sweigart said, noting that exclusively employing one or the other leads to dangerous pitfalls. The transactional approach focuses on getting things done but can devolve into “dictatorship and autocracy,” creating an ineffective workforce that is “under-led and overmanaged.” A transformational approach, on the other hand, can sometimes end up being a “feel good” process that focuses on emotions but is short on deliverables. Successful leaders need to understand which approach is effective in a given situation and to move nimbly between the two.

Another imperative for conscious leadership is the knowledge that there is no creation without destruction. “Change management fails with the thinking that you can create something new without destroying something old,” she said.

According to Dr. Sweigart, people resist change when they do not understand why it is happening. “Social science evidence tells us that when people understand why a change is being made—even if they do not agree with it—they won’t resist taking part in it over time,” she said. Conscious leaders invest in educating the workforce and clearly communicating how changes are being made to make the company more competitive.

Finally, leaders need to recognize that “purpose” and “profit” are not at odds. They must reconcile their own ethics with corporate objectives to be able to genuinely embrace and pursue goals. Visualization is central to execution, she said, explaining, “To achieve goals, we have to know what we are trying to achieve, what success will look like when we accomplish it, what obstacles will have to be overcome, and how to get started.”

The best way to begin is by engaging others through powerful questions that are provocative but nonjudgmental. Leaders can leverage the insights gained through this process to address the issues that impede progress and help people be part of the solution.

“The number one skill of leadership is coaching,” Dr. Sweigart said.

ESG, Insurers, and Why the Oil and Gas Industry Needs to Lead the Conversation

For many companies in the oil and gas sector, ESG has become a corporate pillar, but figuring out how to leverage it to gain the confidence of insurers and investors remains a challenge.

William Helander, Head of Natural Resources North America and Houston Corporate Risk & Broking at Willis Towers Watson, explained that part of the reason for this is the way the ESG label has been used.

“ESG has become a bridling dynamic to financial markets, to insurance providers, and to a whole series of critical capital providers. The macrotrend is that insurers are looking askance at things that create disproportionate volatility and inflammatory dynamics with investors,” he said.

According to David de Roode, Lockton Partner and EVP for Lockton Global Energy & Marine of the Lockton Companies, and NOIA board member, the ESG construct is foundational to building a resilient and sustainable business. In his view, the path to success starts with capitalizing on the positive results of implementing a strong ESG program just as companies in the sector did when they adopted more stringent HS&E strategies.

“If you focus on your people, make sure they’re well trained, focus on how you do things, give back to the communities you operate in, if you’re making money and doing things the right way, environmental stewardship is going to naturally come with it,” he said.

Robert Sheninger, Vice President of HSE and Sustainability for Energy and Marine at McGriff, underscored the point. A solid ESG program is more than a license to operate, he said, and companies that go beyond compliance capture significant benefits.

“ESG facilitates top line growth, reduces costs, and optimizes capital expenditures, while increasing employee productivity, particularly with younger workers, who want to work for companies that reflect their values,” he said.

Although many companies have incorporated ESG in much the same way that they adopted stringent HS&E programs, there continues to be a huge disconnect between performance and perception, de Roode said. “Investors are asking for some feedback. Nobody knows what to make of the sum of the parts.”

This lack of clarity is a serious concern. “We are migrating into uncharted waters,” Helander said. “We don’t know exactly what the framework or rubric will be. The onus is going to be on us to think more strategically about whom to partner with.” A strong relationship between an insurer and a client is critical, he said, and companies need to foster that through meetings and site visits.

Insurers make decisions based on evidence, and that is part of the challenge. “The US has been a leader in HS&E, but we don’t have the data to prove it,” David said. Without compelling evidence, insurers cannot discriminate. “How do you pick a winner from a loser?” he asked.



The answer is to use data to tell a story. “We don’t know how to aggregate the existing data to tell that story,” David said, noting, “The biggest sin a company can commit is to collect data and not use it.”

He pointed to the fact that companies have been reporting to the EPA, the Department of Labor, OSHA and others for years. “But it’s siloed reporting,” he said. “The sum of parts really is the secret sauce—but there are a lot of parts. Companies don’t do enough to understand their own business, understand the risks, and then doing something about it.”

Robert believes true leaders in the insurance industry will partner with the energy companies as they understand the profound impact fossil fuels have in addressing energy insecurity around the world. “This resonates strongly with investment in the US Offshore energy industry, which boasts the lowest carbon intensity of any operating basin and a strong record of pollution prevention,” he said.

Emphasizing that time is of the essence, David said the best way forward is to work together. “There is a lot more that can be done collaboratively as an industry to set the record straight,” he said. “You can go alone and get somewhere faster, but if you go together, you can go a lot farther.”

The first step is to stop being a passenger and take the wheel, he said. “Start aggregating all the good things we are doing so you can educate consumers about how important we are and how we make modern life possible.”

William agreed. “It is incumbent on industry to collaborate,” he said. “It all comes down to telling the story effectively, and that is a challenge,” he said.

Learning and Collaborating: Presentation by 2022 ESG Award Winner Vallourec

At the NOIA Annual Meeting in April, the Vallourec team, winners of the inaugural NOIA ESG Excellence Award for their strong commitment to ESG performance, shared their ESG story, internal and external communications strategies, and recommendations for cultivating a culture of ESG in offshore organizations. Vallourec has been able to use its ESG program to gain employee engagement, new business, and strengthen relationships with current clients.

Amy Paff, Environmental & Sustainability Program Manager, started by addressing a concern that many leaders starting an ESG program may have and that the program was started in 2007, she thought it seemed like a large undertaking, without a good reason why.

Just three years ago, Jeannie Hill, Communications Manager, met with both Amy and her colleague Joe Mook, Environmental Manager, and she shared that she was blown away by the things Vallourec NA was doing—and shared that if she didn't know about it, likely other employees didn't either. While employees and clients may have thought the industry had a reputation for not being very green, in reality, Vallourec was pioneering sustainability in the field and doing it well.

So, they implemented town hall meetings where Joe and Amy could answer questions directly and came up with quantifiable messaging that broke ESG initiatives down into statements like “By recycling, we saved 300,000 cars worth of steel.” And “We saved an aircraft carrier from a landfill.” The team found that by pointing out initiatives in this way, they more easily gained team buy-in and support.

Now, why is this important? Jeannie noted that when you're able to communicate with your employees, and they understand who you are and what you stand for, they want to stick with you. Your employees are your biggest advocates, so ensuring that they fully understand what you're doing is incredibly important to ESG program success. It helps breed a culture of ESG that then filters down to your community and customers.

Now, team members go beyond just sharing the story. They welcome customers into their facilities in Ohio to see it firsthand. The North American team periodically hosts groups of 20-25 for a week, where they educate them on their process live at the mill, and Amy or Janine are on-site to share and answer questions about the Vallourec ESG journey.

Jeannie shared they want clients to know that they are sincere. This is not greenwashing; it's real. With that in-person interaction, customers are able to see that firsthand. This has been a benefit in gaining new clientele, and they were actually recently featured in a client's annual ESG report because they've played such an integral role in that process for them.

TechnipFMC Wins NOIA 2023 ESG Excellence Award

NOIA named TechnipFMC as the winner of the second annual NOIA Environmental, Social, & Governance (ESG) Excellence Award during the NOIA Fall Meeting in October. The NOIA ESG Excellence Award highlights and recognizes those who, by their actions, design, or influence, are contributing to the advancement of the ideals embodied by the NOIA ESG Principles.

NOIA President Erik Milito congratulates TechnipFMC, saying, “Our industry is constantly striving to be the best neighbor while providing the essential energy that uplifts society. TechnipFMC’s ESG initiatives reflect a comprehensive and thoughtful commitment to fulfilling this aspiration. We extend our congratulations to TechnipFMC for this well-deserved recognition and express our gratitude to all other participants. Across the board, applicants for this award and the industry as a whole have showcased impressive dedication to ESG performance. The NOIA ESG Excellence Award highlights just one of the many ways our industry fosters innovation and contributes to the betterment of our communities.”

TechnipFMC is recognized for the NOIA ESG Excellence Award for commitment to ESG performance across every level and every segment of the company. Their entry reflected “long-term ambition, short term actions” being used to drive actual and measurable results. From the integration of an ESG scorecard to the adoption of governance structures and the implementation of advanced management systems and standards to ensuring industry-wide adoption, TechnipFMC has demonstrated significant progress across all Environmental, Social, and Governance segments.

Jonathan Landes, President, Subsea, at TechnipFMC, says, “How we do business is as important as why we do business, and we are all proud to win this year’s NOIA ESG Excellence Award. It’s a clear acknowledgment of our commitment to respecting the environment, making a difference in our communities, and always acting with integrity.

“We are continually working to enhance the performance of our industry and drive real change through relentless innovation and global collaboration, and we will do this in a safe and responsible way. And thanks to our colleagues’ work, we are constantly strengthening our ESG culture to pave the way for a better future.”

The award-winning entry from TechnipFMC was evaluated by an independent panel of experts from FTI Consulting, Pickering Energy Partners, Cornerstone Government Affairs, and an independent industry expert. NOIA received applications from a diverse cross-section of NOIA membership, highlighting the support for ESG performance among the full ecosystem of companies involved in the offshore energy sector.

Offshore Industry Commitment to Safety as Core Value Demonstrated through NOIA Safety in Seas Awards

The winners of the 2023 NOIA Safety in Seas Awards presented on their entries to the NOIA membership at the NOIA Fall Meeting. Halliburton was recognized as the Safety Practice award winner, and Oil States International received the Culture of Safety award.

Senior Vice President & Chief HSE Officer, Summer Condarco, represented Halliburton. She delved into Halliburton's ambitious vision known as the "Journey to ZERO," which strives to achieve zero safety incidents, zero environmental incidents, and zero non-productive time. Summer underscored the importance of learning from mistakes and carrying those lessons forward, even when plans encounter setbacks. Halliburton begins by conducting rigorous risk assessments to thoroughly evaluate potential risks. Their digital platform facilitates global access to risk assessments, ensuring effective evaluation of potential risks. This comprehensive approach reflects Halliburton's commitment to providing a safe environment at sea for all involved.

Gary Childress, Vice President of Health, Safety, Environmental, and Sustainability, discussed Oil States International's entry. He echoed the significance of safety and sustainability in both offshore and onshore communities. Gary acknowledged the challenges that can arise within the energy sector, given its diverse cultural backgrounds, but he emphasized that collaboration and meaningful activities can overcome these challenges, engaging the entire workforce.

Oil States International has implemented an HS&E management system that prioritizes efficiency and streamlines various processes. Notably, incident reporting, forms, inspections, and notifications have been simplified. This system provides real-time information access to all employees, even in the absence of WiFi or email connectivity. Additionally, QR scanning allows Oil States to effectively secure equipment requiring servicing or that is not yet ready for use.

Gary emphasized the crucial role of effective communication in upholding safety within a company. Through their dedication to robust communication practices, Oil States has positioned itself as a prominent leader in offshore safety.

NOIA MEMBER COMPANY EXAMPLES

Beacon Offshore Energy



In its ongoing efforts to reduce emissions, Beacon Offshore Energy LLC, ("Beacon") continues to emphasize leveraging the latest technologies in its rig and marine vessel operations. Beacon's efforts are centered around four key elements: OSV Fleeting Strategy, Enhanced Electronic Fuel Management Systems, Dynamic Positioning (DP) Operating Philosophies, and Diesel Fuel with Enhancing Additives.

OSV Fleeting Strategy

The Beacon fleeting strategy emphasizes employing vessels with diesel-electric propulsion systems which allow for variable RPM versus fixed RPM operations. In certain operational configurations, variable RRM operations achieve up to a 50% fuel burn efficiency. Across the vessel's operational spectrum, total reduction of fuel burn has averaged ten percent. At an individual vessel level this can reduce CO₂ by 207,487 kg which is equivalent to 45 passenger cars or 2,305 cruising hours on a 737 annually.

Diesel-electric variable speed engines offer an innovative approach in the pursuit of reducing CO₂ emissions. Diesel-electric variable speed engines integrate the diesel generators with electric propulsion systems and operate by generating electricity through diesel engines, which then powers electric motors to drive the machinery.

Unlike traditional fixed-speed diesel engines, these systems allow for variable speed operations. By modulating the engine speed to meet the instantaneous power needs of the vessel, engines can run closer to their peak efficiency, minimizing fuel consumption, and subsequently reducing CO₂ emissions. Furthermore, diesel-electric systems enable the use of energy regeneration techniques. When the load decreases, excess energy can be redirected to charge batteries or other energy storage systems, reducing waste and further enhancing efficiency. This stored energy can then be utilized during peak demands, lowering the reliance on diesel consumption. While Beacon does not currently have vessels outfitted with energy storage systems such as batteries, as this technology expands to the OSV markets, it will be a consideration in the Beacon fleeting strategy.

Enhanced Electronic Fuel Management Systems

To complement diesel-electric propulsion systems, Beacon is investing in the installation of new advanced electronic fuel management systems on its term Offshore Supply Vessels (OSVs). These advanced fuel management systems are designed to help vessel operators increase efficiency and reduce both fuel burn and emissions by optimizing speed versus economy. Advanced fuel management systems employ independent precision sensors that deliver auditable ESG (Environmental, Social, and Governance) data to decision-makers in real-time. Throttle optimization protocols are available to onboard personnel, and shoreside users can configure alerts for deviations from best practices.

Dynamic Positioning Operating Philosophies.

Using the latest technology, power management systems on rigs and vessels allow for the connection between the two switchboards into one (Closed Bus) with a "smart" circuit breaker. This circuit breaker recognizes potential electrical failures in such a short time (nanoseconds) that it will automatically open and separate the power (open the bus) before the fault has a chance to affect the entire system. Closed Bus operations reduce the number of generators/engines required online. By taking advantage of this technology, Beacon can maintain safe operations while reducing power consumption and emissions.

Diesel Fuel with Enhancing Additives

Beacon continues to support its previous investment in upgrades to allow drillships to automatically dose fuel additives during drilling and completion operations. Proprietary fuel additives are designed for diesel engines. It raises the ignition quality of the fuel, allowing ignition at lower compression and a longer burn during each stroke. This improves combustion and lowers the amount of unburned fuel expelled in the exhaust. The use of the fuel additive also reduces the heat of combustion, lowering nitrous oxide (NO_x) emissions. Due to more efficient fuel use, Beacon is experiencing between 4% and 6% less fuel, with less CO₂E produced, providing an annual reduction of more than 2400 MT CO₂E in carbon dioxide equivalents and an annual fuel cost savings of more than \$500,000.

In summary, on an annualized basis Beacon estimates that the combined results from its multifaceted GHG reduction strategies will reduce CO₂ emissions by 3,700 metric tons. Commensurate savings of approximately 360,000 gallons of diesel fuel and an estimated dollar saving approaching \$1 million based on current fuel prices.

Danos



Workforce Development – Danos’ On-the-Job Learning Program

The need to find and train new workers is an ongoing concern within the energy industry. As more experienced personnel retire from the workforce, it is imperative that a new generation of workers is prepared to step up and replace the vacancies. Danos is advancing workforce development and diversity, equity and inclusion (DEI) through our on-the-job learning program, also known as the internship program.

Danos’ on-the-job-learning program partners with community and technical colleges and with our customers. It has two major aims: first, to provide a solution for the industry talent gap with a more inclusive and diverse workforce. And second, to ensure students receive job-relevant training and opportunities with hands-on skill development.

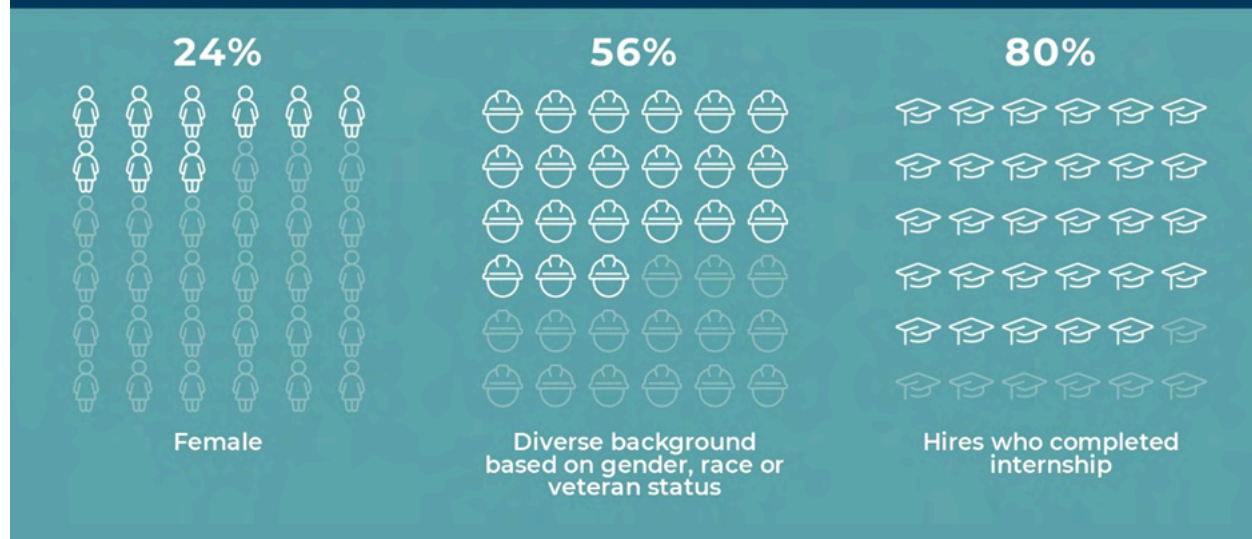
This innovative program offers students and recent graduates who are interested in energy careers the opportunity to gain valuable experience at real job sites. By intentionally promoting the program to students of varied backgrounds and demographics, and by providing practical experience, Danos is contributing to the growth of diverse new talent for the industry.

Each participant in the program spends six to nine months receiving hands-on training in an offshore or onshore environment. Internship opportunities are made possible through the support of oil and gas operators – Danos customers.

Since the program began in 2018, Danos has placed 89 employees. 71 of the 89 individuals have been hired for internship rolls. The other 18 were hired for entry level roles from the candidate pool through program partners. 21 of the 89 hires are females, and 50 are from a diverse background based on gender, race, or veteran status.

INTERNS BY THE NUMBERS

Since 2018, Danos has placed **89 employees**.



In addition to the program's benefits for students, it also serves the needs of oil and gas businesses and the industry. Danos currently partners with 16 technical and community colleges throughout Louisiana, Mississippi, Texas and Alabama. The program has led to improved curricula and the development of a more competent and diverse applicant pool available to address the needs of operators and producers. It has also generated greater enthusiasm and awareness of the benefits of oil and gas careers. These advances help to strengthen the pipeline of talent needed to power the industry into the future.

Danos is a family-owned company, driven by values, vision and purpose. It's something that sets the company apart, guiding its actions in everything from high-level strategy to day-to-day worker interactions. Its core purpose is honoring God and developing great people to solve big challenges for customers and communities. This on-the-job-learning program reflects Danos' vision to set the standard for operational excellence, customer service and care for people. Through the support of customers and collaboration with participating schools, Danos is developing the next generation of workforce - one intern at a time.

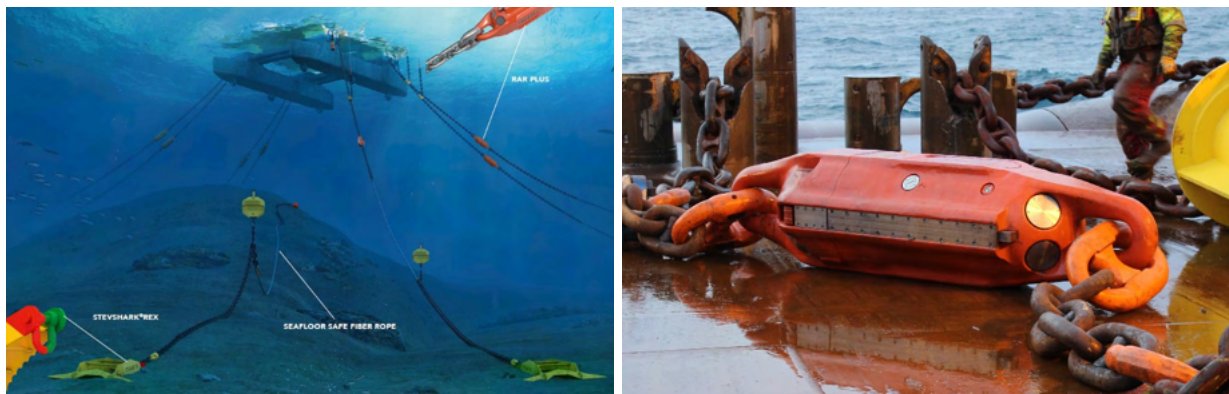
Delmar



Emissions Reduction Through Releasable Mooring System

Delmar Systems is helping its customers reduce their carbon footprint and costs by utilizing its revolutionary RAR Plus™ Releasable Mooring System. This system consists of Delmar's proven and industry preferred RAR Plus™ tool, Seafloor Safe fiber, and Delmar's patented StevsharkREX® anchors.

The RAR Plus is a patented, fully redundant, and quick-release tool that allows for rapid release or mooring lines under tension using acoustic triggering technology with a mechanical backup. The backup mechanical release bypasses the acoustic, electric, and hydraulic systems in the RAR Plus, and can be actuated from the rig itself, ensuring that the tool releases 100% of the time without the need for an Anchor Handling Tug Supply (AHTS) vessel or ROV assistance.

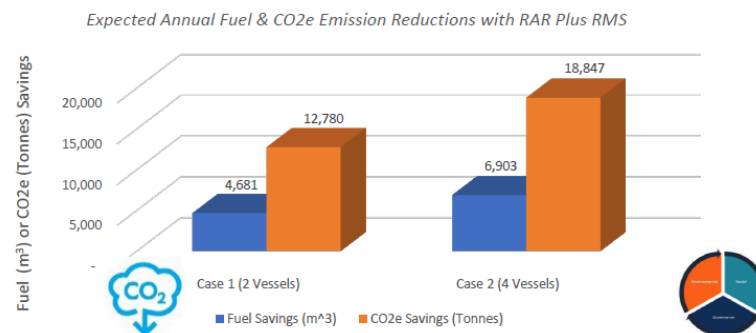


Left: Delmar Releasable Mooring System (featuring the RAR Plus, Seafloor Safe fiber, and StevsharkREX anchors); Right: RAR Plus

The RAR Plus has been used by a wide client base and has been deployed all over the world. It has a proven track record of success, with over 45,000 connected days and over 700 mooring line releases without a single failure, allowing customers to unmoor their assets with confidence – in less than one hour.

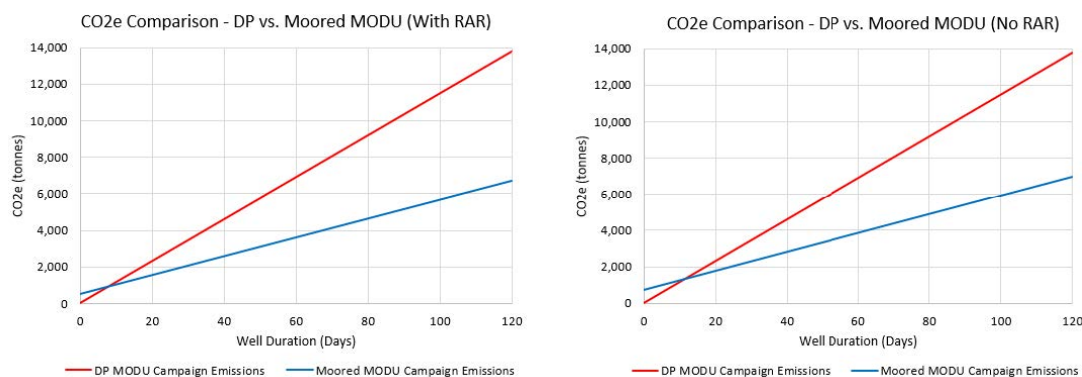
The figure below shows the fuel savings and CO₂ emission reductions that can be achieved by comparing a DP/Moored rig operating on a traditional preset mooring system with and without the RAR Plus™ Releasable Mooring System. These savings are achieved through eliminating the need for AHTS vessels, MODU critical path time, and associated fuel and CO₂e reductions during MODU mooring disconnection. It should be noted that increased downtime due to weather and operational delays, or longer mobilization or vessel transit times, will often increase these fuel and emission savings substantially.

Besides CO₂ emissions reduction, other benefits of the RAR Plus™ Releasable Mooring System include cyclone/hurricane evasion, iceberg evasion, reduced HSE exposure, rig move efficiency and cost savings.



Emissions (and Noise) Reduction of Mooring vs DP

Mooring of an offshore asset, such as a semi-submersible rig or a drillship, is a green alternative for dynamic positioning (DP) if the drilling project is expected to last beyond 15 days, or 10 days if the RAR Plus is used. An asset operating on DP maintains its position using thrusters, which is a continuous source of fuel consumption that generates substantial CO₂ emissions. However, mooring eliminates the need for operating thrusters and therefore eliminates the associated CO₂ emissions. The graphs below show the breakeven point in well duration (days) after which point moorings result in significant emissions reduction, with or without the RAR Plus.



Additionally, the use of moorings on an asset instead of DP substantially reduces acoustic emissions, which is beneficial for marine life. In fact, Australia's National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) has rejected DP permits due to acoustic emissions and the negative impacts on marine fauna. According to NOPSEMA, "marine fauna impacts that may be attributed to acoustic emissions in the marine environment include mortality, physical injury, hearing loss (permanent or temporary), stress, diminished health, masking of communication, displacement from important habits and behavioural disturbance." Additional indirect impacts identified by NOPSEMA include "prey displacement or depletion, reduced catchability or stock availability of commercially targeted fish species, and reduced reproductive success."

Using releasable mooring systems instead of DP has the potential to play a critical part in offshore operators achieving their carbon emissions reduction goals and protecting marine life.

Halliburton

HALLIBURTON

Emissions Reduction at Halliburton: Adding value to customers

In 2020, Halliburton recognized deficiencies in existing solutions to standardize emissions governance, integrate emissions into existing systems, and provide consistent decision-making emissions information to customers. Recognizing this as an industry-wide need, Halliburton's Sustainability team initiated a transformative journey.

Solution:

Envana meets the oil and gas industry's need for a tailored emissions management solution. Envana innovation and product development stemmed from Halliburton's 100+ years of experience and understanding of the oil and gas market. Tailored to address the unique needs of the oil and gas industry, Envana Catalyst emerged as a comprehensive emissions management solution. Leveraging a bottom-up approach to calculations and emissions inventory, the software became the cornerstone of Halliburton's emissions management strategy to decarbonize core operations and empower clients with actionable data.

Envana Catalyst allows Halliburton business lines to use the most up to date models for job-level emissions estimation. Envana Catalyst seamlessly integrates with multiple resource and operations planning software, facilitating the identification of lower-carbon options within budget constraints, and embedding emissions impact into project planning and operations.

At Halliburton, Envana Catalyst has been integrated into service delivery workflows that cover about 75% of Halliburton's Scope 1 and 2 emissions. This reduces the burden on operations and allows for complete, consistent and correct emissions calculations. Halliburton continues to implement Envana Catalyst throughout the rest of the business lines that generate Scope 1 and 2 emissions, enabling the company to provide repeatable and auditable reporting—based on consistent methodology and clear activity-based methods—where implemented.

Result:

Integration of Envana into service delivery workflows of select Halliburton Business lines has enabled the teams to generate actionable recommendations for emissions improvement throughout the asset lifecycle. This integration into standard workflows used for job planning and KPI collection allows engineers to see the emissions impact of their choices while planning and after executing a project.

The benefits realized include efficiency gains, reduced manual data entry, and improved consistency in emissions governance. While the full potential of the software is yet to be realized, Halliburton's transition from one-off emissions calculations to a central hub with Envana Catalyst has provided consistency in governance of inputs, emissions calculations, and generation of outputs.

Conclusion:

Envana provides automatic emissions calculation that allows for traceability of data, consistency of calculation across the global organization and centralizes governance. It has enabled the user to become more efficient by reducing manual emissions calculations. Envana has simplified our emissions inventory process and allows us to meet our customer's decarbonization objectives.

LLOG



LLOG's commitment to protecting and preserving the environment can be seen in a culture which is built around exceptional safety practices and minimizing their operational footprint. One example is the Taggart Field, a three-well development located in the Deep Water Gulf of Mexico, approximately 150 miles SE of New Orleans, LA and within a few miles of the Devils Tower Spar in Mississippi Canyon. While subsea tiebacks to third party platforms are fairly common, there was a unique opportunity to access an existing subsea manifold, flowline, riser, and topsides processing equipment that would bring the Taggart field online at a lower cost and with significantly lower greenhouse gas (GHG) emissions relative to a home run tieback to the Spar.

LLOG's efforts to protect and minimize its operational impact on the environment is part of the evaluation of all of its projects. As a result, LLOG hired EDG Consulting Engineers to evaluate the emissions intensity of the proposed development plan, which resulted in emission savings of 46% due to the reduced scope of the project and the re-use of existing and under-utilized infrastructure.

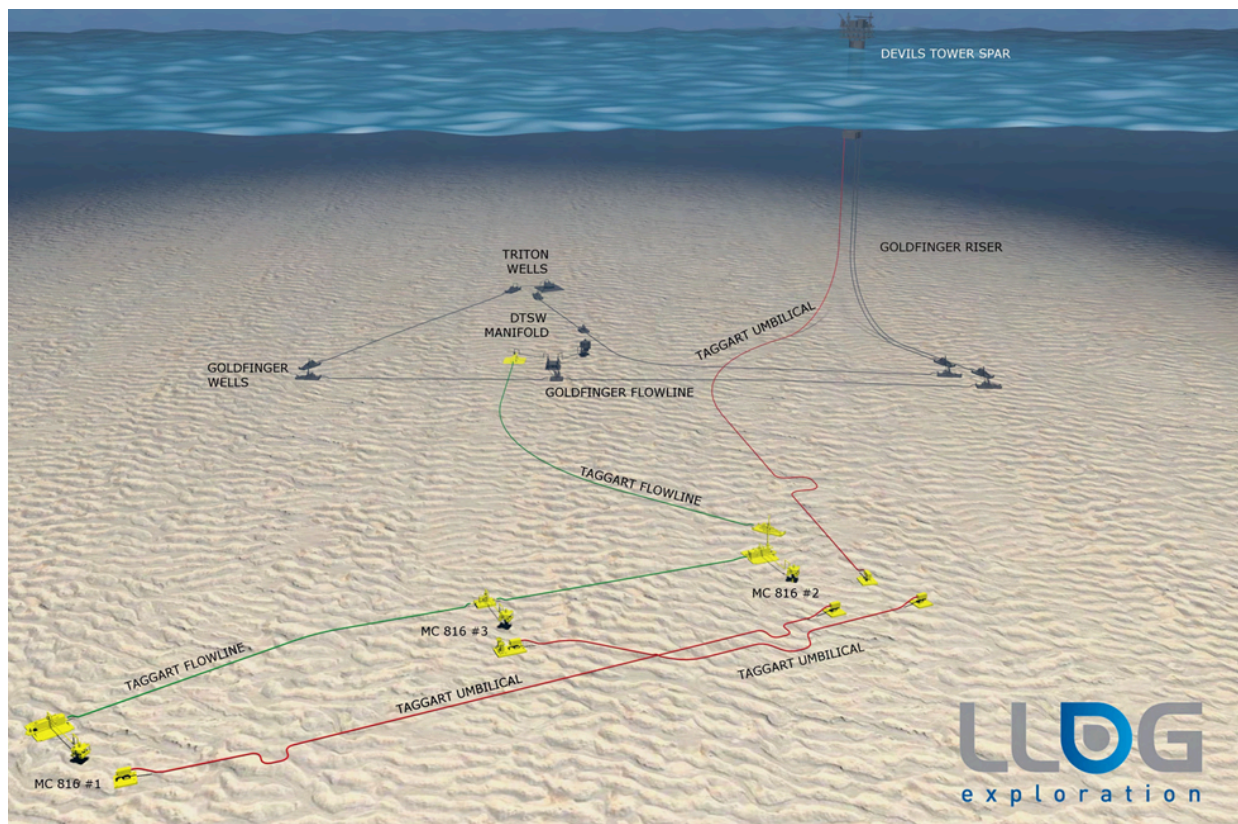
GHG Emissions Delta (% savings): $\left[\frac{(\text{Dedicated System Total GHG Emissions}) - (\text{Shared System Total GHG Emissions})}{\text{Dedicated System Total GHG Emissions}} \right]$

Total Shared System Emissions (tons)	267,264
Total Dedicated System Emissions (tons)	494,155
Total Emissions Savings (tons)	226,891
Emissions Savings	45.9%

To make this subsea-to-subsea development plan into a reality, LLOG partnered with the infrastructure owners, none of whom had ownership in the Taggart discovery, to gain access to the manifold and the FPS. The deals created value for all stakeholders, while increasing production at a significantly lower carbon footprint and better utilizing existing infrastructure.

Prior to executing the commercial access agreements, LLOG and the infrastructure operator carried out multiple inspections to ensure that the integrity of the system was suitable to handle the new wells. Once completed, the parties signed a connection agreement to allow the Taggart satellite flowline to tie directly into the existing subsea manifold and ultimately back to Devils Tower for processing and export. Additionally, the production riser was equipped with gas lift which is critical for maximizing the expected oil recoveries from Taggart's relatively shallow, low-pressure reservoirs.

The tie-in of the three Taggart wells into the existing subsea manifold was a success on many levels, with lower overall project costs and a significant reduction to GHG emissions. In early 2023 the project began producing first oil and the field ramped to a peak production rate of 17,000 BOPD by mid year. LLOG Exploration remains committed to creating value in the Deep Water Gulf of Mexico through operational excellence. By incorporating sustainability in all phases of its operations, LLOG was able to improve overall economics and better implement more environmentally friendly projects. The Taggart project is an excellent representation of LLOG's abilities and ongoing commitment as a leading operator in the Gulf of Mexico.



Noble



Using equipment-level energy data insights to drive sustainable behavior

Noble has rolled out a fuel consumption monitoring solution fleetwide to support energy-efficient operations. During 2023, Noble completed the implementation of Energy Efficiency In-sights (EEI) on all its marketed rigs, which means the solution is now enabled on 29 rigs in total.

EEI is an emission-monitoring solution that supports the rigs in tracking, analyzing, and modeling emissions from operations, thereby allowing the crew to gain insights into potential emission reductions.

The EEI solution is proprietary and was developed in-house. By installing a multitude of sensors onboard a rig, fuel consumption and derived emissions can be monitored and tracked back to different energy consumers and types of operations. This can provide the basis for further modeling and identification of best practices. Lessons learned on emission reductions can then be shared between comparable rigs, contributing to smart behavior across the fleet.

Regular use of the system enhances awareness by providing real-time insights into energy usage, encouraging sustainable fuel consumption patterns onboard. The tool enables the optimization of daily activities and understanding the impact various energy efficiency initiatives will have on greenhouse gas emissions. It gives our operations transparency into fuel consumption and the impact of decarbonization efforts and enables customer dialog for collaboration. In this way, EEI establishes an important foundation for future initiatives in addition to the immediate impact from insights into potential improvements.

The ability to see equipment-level consumption data on a rig paves way for catered sustainable behavior programs to further the rig's dedication to reducing emissions. Noble aims to roll out a sustainable behavior program for rigs equipped with EEI to ensure the data collected builds stronger sustainability awareness and contributes to fuel and emission efficiency improvements.

The program also focuses on facilitating analysis and dialogue to identify best practices, including meeting with customers focused on consumption reduction and optimization of multiple aspects of daily operations, ranging from drilling equipment utilization to the temperature provided in accommodation. By facilitating this ongoing dialogue, the energy efficiency focus, and mindset become embedded onboard, so sustainable behavior remains top-of-mind for the crews and eventually becomes a habit.

Across multiple operations and rig types, it has been documented that EEI, supported by the sustainable behavior program, can deliver 6–10 percent reductions in fuel consumption and derived emissions.

“EEI is a game changer that we use actively to track our energy consumption patterns and overall environmental footprint. We host a bi-weekly ‘green meeting’ with our customer and EEI forms the base for discussions that have resulted in optimizing fan settings, thruster operations, drilling equipment utilization and reduced accommodation temperature amongst others.” — **Jorgen Schaffer Rig Manager, Noble Venture**

Ambition of diverse slate for onshore leadership positions

Embedded in Noble’s DEI policy is an ambition to include at least one individual on the slate of final candidates for senior onshore leadership positions who is diverse relative to the team by either gender, age, nationality, ethnicity and / or education. Since we commenced tracking slate diversity in August 2023, a female candidate has been included in the final slate in more than 60 percent of the cases, and a minimum of one candidate diverse relative to the team was observed in close to 90 percent of the cases.

During 2023, female representation in Noble’s onshore workforce has increased to 37 percent. Additionally, female representation in onshore leadership roles has increased to almost 30 percent.

Gender representation continues to be a challenge across the offshore oil and gas industry. Therefore, one of Noble’s DEI focuses is to promote equal employment opportunities and attract a gender diverse offshore talent pool.

In 2023, Noble embedded questions on the DEI experience for employees across our global workforce into a global employee engagement survey. This feedback loop is a critical element of Noble’s DEI roadmap and will help guide future efforts in the right direction.

“Being a workplace that keeps people safe, offers meaningful career opportunities, and positively impacts the lives of the people we engage with, is a prerequisite for long-term success of our business. We focus on DEI because it is the right thing to do – and because it is good for business.” — **Mikkel Ipsen VP, Human Resources**

Promethean Energy



Promethean Energy's strategy is focused on mature oil and gas assets. Promethean stewards mid- to late-life assets in a continuum from development and production to their end-of-life and decommissioning. Promethean believes high environmental, social and governance standards are critical for the success of Promethean. They reflect the company's values, address expectations of stakeholders, and support organizational and operational excellence.

Early-stage companies are heavily focused on business development and safe execution of activities. Promethean attaches additional importance to building out governance, corporate infrastructure and appropriate policies.

Promethean has implemented a series of policies including a Code of Conduct and Ethics, and a Supplier Code of Business Conduct. As a privately held company, Promethean has established a charter for a Board of Advisors and appointed two advisors to that board.

Finally, Promethean identified the material environmental, social and governance topics currently relevant for its business, and which underpin the Sustainability Framework it has developed.

Sustainability Framework

Promethean incorporates the following policies, goals, and processes into its governance and in contractual arrangements with partners and counterparties.

Priorities

Environment

1. **GHG Emissions:** Promethean measures and reduce emissions.
2. **Spills and Leaks:** Promethean ensures structured health, safety, and environment management systems are in place.
3. **Waste, Re-use, Recycling:** Promethean applies the waste hierarchy to decision-making: reduce, re-use, recycle, recovery, landfill.
4. **Emissions to Air:** Promethean minimizes emissions to air in line with best practice.
5. **Habitat and Biodiversity Impacts / Site Restoration / Impact on Other Uses:** Promethean includes these considerations when assessing options including for rigs to reefs and Net Environmental Balance Analysis (NEBA) impacts.
6. **Water:** Promethean's goal is to minimize negative impacts on water resources.

Social

1. **Health and Safety:** Promethean ensures structured health, safety, and environment management systems are in place.
2. **People, Diversity, Training and Development, Employee Engagement:** Promethean wishes to deliver a working environment across the value chain that encourages collaboration, transparency, and a workforce that draws on the best talent available, regardless of race, nationality, religion, gender, age, sexual orientation, marital status, or disability.
3. **Human Rights, Human Trafficking and Modern Slavery:** Promethean is committed to respecting human rights and to mitigating risks associated with modern slavery and human trafficking.
4. **Anti-bribery and Corruption:** Promethean has adopted an anti- bribery policy.
5. **Community Impacts:** Where Promethean's work makes use of or shares resources and environments with communities, the goal is to maximize positive net impacts.

Governance

1. **Contract Governance:** Promethean has transparent, collaborative, and aligned governance to facilitate cost-effective, timely and safe execution of activities.
2. **Risk Management:** Promethean applies integrated risk management taking account of risks wherever they exist in the chain.
3. **Stakeholder Engagement:** Promethean ensures operations and performance are informed by relevant stakeholder input.
4. **Sustainability Framework:** Addressing material environmental, social and governance risks and opportunities through the lens of the Framework helps deliver on legal and contractual responsibilities, Promethean's strategy and values.
5. **Climate Risk Governance:** Promethean takes account of both physical and transition risks and opportunities arising from climate change.

SEACOR Marine



Measuring The Carbon Footprint

SEACOR Marine strives to be a part of the solution in the world's transition to a lower-carbon economy by reducing emissions across its business operations. Aligned with its sustainability and environmental, social, and governance (ESG) goals, SEACOR Marine continues to invest in reliable, safe, and green transport solutions, along with technology and software to improve operations and minimize environmental impact.

By measuring both direct and indirect emissions and employing digitization and digitalization for data standardization, automation, aggregation, and analysis, SEACOR Marine gains a comprehensive understanding of its environmental impact. This approach enables the identification of areas for further operational improvement. Supporting the maritime industry's shift toward digitization and automation, SEACOR Marine embraces digital technologies and solutions to enhance operational efficiencies and achieve decarbonization goals. The continued installation of Electronic Fuel Measuring Equipment supplied by FUELTRAX across the entire fleet allows real-time fuel monitoring and advanced data analytics, enhancing vessel operational efficiency and significantly reducing carbon emissions.

Through its development with Spinergie of a carbon intensity indicator (CII) metric adapted for offshore supply vessels, SEACOR Marine is able to determine the annual reduction factor needed for continuous improvement in emissions across its fleet. This CII tool aggregates, analyzes, and standardizes inputs to provide an accurate snapshot of a vessel's fuel consumption and energy efficiency, guiding operations and contributing to future designs. Although the utilization of this CII measurement tool has not been made mandatory for vessels under 5,000 gross tons, SEACOR Marine's commitment to reducing emissions goes beyond regulations and it will continue to hold itself to a higher standard.

Moreover, SEACOR Marine's continued implementation of Spinergie's digital platform across its fleet, Smart Fleet Management, provides real-time visibility into fleet performance, focusing on intelligent reporting, operational tracking, and actionable key performance indicators. This platform allows SEACOR Marine to evaluate the underlying operational drivers behind direct emissions, including the influence of speed, cargo, crews, weather and operating requirements from charters. Implementing the Smart Fleet Management platform has allowed SEACOR Marine to observe the environmental impact of its fleet and to use the platform's data to arrive at a carbon intensity number as a baseline for further improvements, driving operational efficiencies and reduced costs.

Harnessing Renewable Energy



In recognizing the crucial role of renewable energy in the global energy transition, SEACOR Marine remains dedicated to investing in green technology solutions and exploring various fuel alternatives. SEACOR Marine's platform supply vessels (PSV) equipped with hybrid battery power systems (Hybrid PSV) provide solutions that reduce fuel consumption and emissions by up to 20%. As of June 2023, SEACOR Marine owned and operated nearly 10% of the global fleet of 70 Hybrid PSVs, with plans to further investment in hybrid battery power systems. SEACOR Marine continues to evaluate projects for its transition to the future, including cold ironing in port using green hydrogen-powered fuel cells or auxiliary generator sets and Power-to-X technology through harnessing green hydrogen and hybrid stored energy solutions.

Commitment to Diversity, Equity, and Inclusion

SEACOR Marine's commitment to diversity, equity, and inclusion is evident through its employee-led Diversity, Equity, and Inclusion Committee. This committee assists the Sustainability Council in fostering an environment that attracts talent, encourages innovation, ensures a supportive work environment, and values diversity. SEACOR Marine's Diversity, Equity, and Inclusion Statement underscores its dedication to providing a workplace free from discrimination, harassment, and retaliation. Mandatory training for all employees covers discrimination and harassment prevention policies, recognizing stereotypes and biases, and respecting different viewpoints and life experiences. As an equal opportunity employer, SEACOR Marine makes hiring and employment decisions based on merit, qualifications, and abilities, fostering a culture that promotes a sense of belonging among its diverse talent base.

SLB



SLBs Workforce Development Program

At SLB, people are the first value and the company is committed to promote development and inclusion for all, as well as to serve in the communities where they live and work. SLB believes in the power of a diverse workforce, which fuels innovation through varied perspectives, skills, and experiences, enhancing problem-solving and yielding better outcomes for our teams and business.

One significant initiative reflecting this commitment is SLB's tailored workforce development program for underserved communities. The aim is to empower individuals with pertinent skills through personalized training and mentorship, aligning curriculum with our local job demands. This focus on soft and technical skills, coupled with ongoing support, not only secures initial job placements but also aims for long-term career growth.

This commitment is reflected in various initiatives:

1. Workforce Development: Tailored for native Alaskans.
2. Internship Programs: Catering to high school students with disabilities.
3. Employee Resource Group (ERG) Council: Advocating for and supporting employees.
4. Partnerships: Collaborations with organizations like Noah's House in Houston, TX and Fletcher Technical Community College in Schriever, LA.

Collaborating with local communities provides a skilled talent pool, fostering innovation and community ties. Impacting over 40 individuals in 2023, SLB takes pride in meeting workforce needs while empowering communities through sustainable employment opportunities. SLB is committed to driving both personal and communal growth through initiatives and recognize the value a diverse team brings.



Transition Technologies by SLB

SLB is committed to quantifiably reducing the environmental impact of operations in the oil and gas industry, without compromising performance. SLB's Transition Technologies portfolio comprises technologies and services across SLB that enables customers to significantly improve sustainability and avoid emissions in their operations, while simultaneously driving our traditional values of performance, reliability, and quality.



Using a scientific methodology developed by SLB engineers, the impacts of these technologies have proved to reduce footprint. In 2022, SLB was awarded the SEAL Environmental Initiatives Award in recognition of its leadership in reducing greenhouse gas emissions in oil and gas operations through low carbon technologies.

SLB launched many of these new technologies in their North America Offshore operation in 2023 and have seen a 20% increase in the implementation of this portfolio year on year. A few examples of these include subsea boosting systems, drilling fluids, waste management, and reservoir testing technologies.



Increasingly adopted across operations, these innovative technologies not only exemplify SLB's commitment to environmental stewardship but also underscore their dedication to delivering sustainable solutions without compromising industry-leading performance.

TechnipFMC



Emissions Reductions

TechnipFMC is more than a global leader in the energy industry – TechnipFMC is a leader with a vision. TechnipFMC works to enhance the industry's performance and drive real change through relentless innovation and global collaboration, and does this in safe and responsible ways. The TechnipFMC team's work constantly strengthens ESG culture, laying foundations for a better future.

A commitment to emissions reduction

In 2020, TechnipFMC announced the 50 by 30 commitment to reduce Scope 1 and Scope 2 greenhouse gas (GHG) emissions by 50 percent by 2030. It has three focus areas:

- Purchase energy and fuel from renewable sources
- Increase energy efficiency
- Adopt technologies that support the decarbonization journey

TechnipFMC vessels (OneFleet)

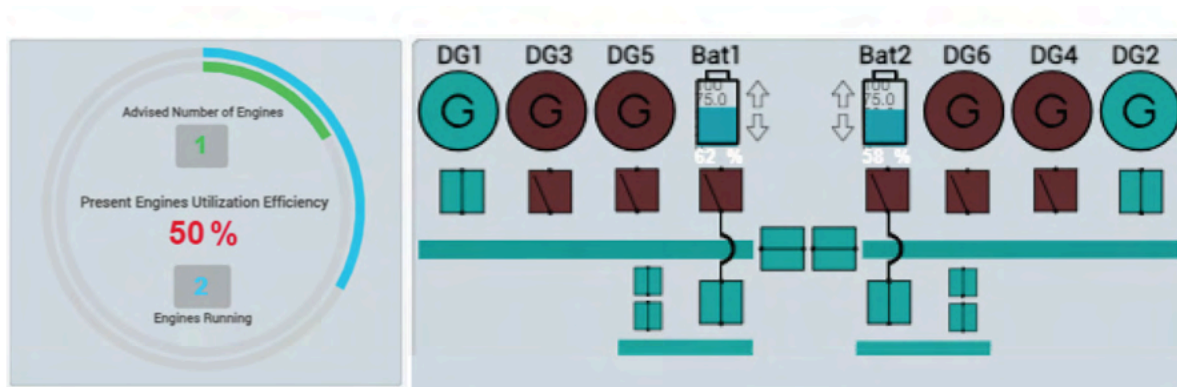
TechnipFMC's Subsea business deploys a state-of-the-art fleet specialized in a wide range of field activities to support client projects with reliable assets, people, equipment, and expertise.

OneFleet's GHG emissions account for more than 75 percent of the company's Scope 1 and 2 emissions. Finding ways to reduce the fleet's emissions is essential to the success of TechnipFMC's 50 by 30 commitment. OneFleet's decarbonization plan is being rolled out to reduce fuel consumption and emissions, thereby minimizing the environmental impact, improving operational efficiency, and reducing cost.

OneFleet's decarbonization plan highlights the importance of the Ship Energy Efficiency Management Plan (SEEMP) introduced in 2013 by the International Maritime Organization (IMO). The company's crews embraced the challenge of bringing SEEMP 'to life' – proactively seeking opportunities to improve efficiency, reduce the amount of machinery online, and operate leaner at higher loads.

Thanks to engagement and collaboration internally and with clients, vessels are transiting at speeds that optimize fuel efficiency – reducing fuel consumption and lowering emissions.

A fleet-wide digital platform provides operational insight and energy consumption awareness. The platform's dashboard (Figure 1) enhances data accuracy and informs decision-making to achieve significant reductions in fuel consumption and emissions.



The decarbonization plan includes technological upgrades, such as battery hybridization. In 2021, Deep Arctic (Figure 2) – a Dynamic Positioning Class 3 Dive Support Vessel (DSV) – became the industry's first battery-hybrid DSV. Battery hybridization reduces annual fuel consumption and corresponding emissions by approximately 18 percent.



OneFleet also assessed the impact of alternative fuels on vessel engines and is ready to use them in compliance with applicable law or where otherwise commercially viable, which would further reduce Scope 1 emissions. OneFleet continues to evaluate opportunities to collaborate with clients to use low-carbon sustainable fuels, such as Hydrotreated Vegetable Oil (HVO) blends. OneFleet keeps abreast of the latest regulatory developments and is involved in industry groups to better understand and assess new requirements.

Overall impact

TechnipFMC's OneFleet has welcomed a step change in carbon-conscious decisions, and the company will continue to evaluate further actions that can deliver material and sustainable reductions in both fuel consumption and GHG emissions.

TGS



TGS provides data, intelligence, advanced processing, analytics, cloud-based data applications, and other specialized services and solutions to energy companies across the energy spectrum, whether it is oil and gas, CCS, solar or wind development. TGS has the world's largest integrated subsurface data library that includes seismic data, magnetic and gravity data, multibeam and coring data, digital well logs, and production data from deep-water offshore to conventional and unconventional plays worldwide.

TGS has a global presence to support customers in any market with corporate headquarters in Oslo, Norway; and operational headquarters in Houston, Texas, USA; and with additional offices located in Brazil, Australia, United Kingdom and Canada.

TGS Summer Internship Program

Being a leading energy data and intelligence company, TGS recognized the need for diverse skill sets to keep pace with the evolving landscape of the industry. Further, there is a collective need across our industry to attract junior workers who may not fully appreciate the opportunities available to them within our industry. TGS' comprehensive summer internship program not only provides valuable career development experiences to students, but also serves as a talent pipeline for the future of our industry and company.

TGS interns are recruited from universities across the US, UK, and Norway as well as other countries where we have offices, and given the opportunity to work on real-life, TGS projects that contribute to the company's success in areas of data analytics, offshore wind, imaging, and business development. For example, some of our intern projects provided contributions to TGS' MDIO technology that is the underpinning of our Data Verse offering, while other interns' projects provided key input to advance our Wind Axiom platform. At the end of the program, the interns present their work to the company in office-wide presentations, showcasing how their work advances TGS. This approach not only benefits the interns by providing practical experience but also adds value to TGS by tapping into diverse perspectives and skill sets.

A critical aspect of our internship program is recruiting candidates from various academic backgrounds in both undergraduate and graduate programs who are pursuing degrees in a variety of fields beyond geoscience such as data science, technology, and environmental studies. TGS also pairs each intern with a mentor within their department and a TGS "buddy" in a different department, and ensures the interns meet with the different business units across the company to get full exposure to all the opportunities available to them within this industry.

The success of TGS's internship program is evident in the rate at which interns are hired for full-time positions after graduation: 100% of the interns accept jobs offered at TGS following the end of their internship. By providing a platform for students to showcase their abilities and contribute meaningfully to the company during their internships, TGS has created a seamless transition from student life to professional employment.

The key impact and benefits of the TGS Summer Internship Program include:

- **Diversity of Thought:** The internship program has brought in fresh perspectives and ideas, enhancing the company's ability to innovate and adapt to industry changes.
- **Skill Diversification:** TGS now boasts a workforce with a broader skill set, allowing the company to tackle challenges and explore opportunities beyond the traditional scope of the oil and gas sector.
- **Employee Recruitment and Retention:** Interns who have transitioned into full-time roles are likely to have a higher level of job satisfaction and loyalty, having already experienced the company culture and workflow during their internships

TGS' summer internship program fosters a culture of inclusivity and generates a critical pipeline of innovative talent to continue to position TGS as an industry leader in embracing the changing face of the energy industry.

Using Vessel Emissions Data to Achieve Efficiency Gains

In 2019, TGS committed to supporting the Climate Action Sustainable Development Goal (SDG 13) and began to track and report on vessel emissions as part of our strategy to ascertain our carbon footprint and reduce emissions. TGS utilizes Maress, a cloud-based digital management system owned by VPS-Decarbonisation, on every vessel it charters to provide real-time information on the vessel's emissions and fuel consumption. Prior to the use of Maress, emissions data was manually derived using self-reported fuel consumption data, allowing for increased human error and operational inefficiencies.



Since Maress' implementation two-and-a-half years ago, TGS has collected sufficient emission and fuel consumption data from multiple vessels to establish fuel consumption and emission baselines, thus allowing TGS to benchmark performance on a vessel-by-vessel basis, visualize related outputs through the Maress dashboards, and make operational decisions that take into account fuel consumption and emissions impact. This has resulted in new efficiency gains being recognized and implemented.

For example, by analyzing and comparing fuel consumption and emission trends for TGS' chartered vessels against similar types of vessels, TGS recognized that better fuel consumption efficiency and emission reductions are achieved by chartering vessels built

within the past 15 years. When chartering vessels, TGS aims to prioritize newer vessels where possible, subject to other factors including vessel availability, to achieve fuel consumption efficiencies and reducing the carbon footprint.

TGS continues to work closely with VPS-Decarbonisation on how to utilize the Maress system to make sustainable operational decisions that take into account fuel consumptions and emissions.

MOVING SOCIETY FORWARD.



The National Ocean Industries Association (NOIA) Environmental, Social & Governance (ESG) Program brings together the companies and the best practices that make the offshore energy industry such a good neighbor. Together, we are providing solutions to social, governance, environmental and climate challenges.



NOIA ESG PARTICIPATION PLEDGES



To learn more about the NOIA ESG Network visit noia.org/ESG



NOIA represents and advances a dynamic and growing offshore energy industry, providing solutions that support communities and protect our workers, the public and the environment.

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