NOIA ESG NETWORK

2023 REPORT

A FOCUS ON EMISSION REDUCTIONS, INCLUDING INDUSTRY CASE STUDIES FOR REDUCING GREENHOUSE GAS EMISSIONS

Photo Credit: Talos Energy/McDermott/ David Duncan Photography

NOIA ESG NETWORK


NOIA
America's Offshore Energy Industry

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NOIA's

MEMBERSHIP

NOIA has more than 100 member companies, representing offshore oil and natural gas, wind and 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.

NOIA's

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.

NOIA's

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.

NOIA's

OBJECTIVES

- To promote the common interests of the members of the offshore energy industry.
- To educate the public and policy makers with scientifically grounded information about the industry and its impact on our everyday lives.
- To serve as a resource for the government and other stakeholders.
- To influence public policy in support of the offshore energy industry.
- To promote the role of a competitive, fair and free market in the development of offshore energy resources.
- To facilitate a meaningful energy dialogue from diverse perspectives.
- To 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 offshore energy sector continues to perform at the highest levels in environmental stewardship, social responsibility, and corporate governance – the three pillars of ESG. While there are three letters in ESG, the major focus of ESG has clearly been on addressing the impacts of climate change and reducing GHG emissions. To that end, the offshore energy industry has a demonstrated track record of innovation and technological advancement that is solving energy challenges, increasing efficiency, and reducing emissions.

Not only can we help solve energy and climate problems, but we can also scale and deploy real-world solutions. Whether it is the buildout of new offshore wind projects, developing CO2 storage facilities, finding new ways to produce hydrogen, or optimizing logistics and operations to reduce our carbon footprint, the offshore energy industry is at the forefront of empowering energy solutions and emission reductions. We must never forget that the road out of poverty and into prosperity is through the provision of energy.

Energy lifts society. A system of reliable, abundant, and affordable energy is essential for meeting basic societal needs, including healthy living conditions, health care, education, and mobility, economic or otherwise.

Oil and gas fill the fuel tanks of passenger vehicles and airplanes. They are transformed into the essential building blocks of smartphones, clothing, and medical equipment. They are in so many products we use every day that they underpin the conveniences of modern life.

Natural gas is recognized as a key energy source for providing electricity, heating, cooling, and clean cooking. More than 750 million people around the globe do not have access to electricity, which leaves entire communities at a severe and fundamental disadvantage. According to the World Health Organization (WHO), “Access to energy is critical when it comes to the functionality of health-care facilities and the quality, accessibility and reliability of health services delivered.

Electricity is necessary for the operation of critically needed medical devices such as vaccine refrigeration, surgical emergency, laboratory and diagnostic equipment, as well as for the operation of basic amenities such as lighting, cooling, ventilation and communications.”

Globally, 2.6 billion people do not have the means for clean cooking and must use solid fuels such as wood, crop wastes, charcoal, and dung in open fires and inefficient stoves. The WHO attributes 3.8 million premature deaths each year to indoor air pollution caused by the fumes and soot generated by inefficient and dirty cooking.

The tragic impacts of energy insecurity are not only experienced abroad; 44 percent of low-income American households experience energy insecurity, spending 10 percent to 20 percent of their income on energy expenses.

Energy insecurity has adverse consequences on both physical and mental health. Millions of Americans are faced with the "heat or eat" dilemma, regularly having to choose between paying utility bills and paying for food.

All forms of energy, including oil and gas, wind, solar, nuclear, geothermal, and emerging forms of energy such as hydrogen, can play a role in raising the standard of living and lifting communities out of poverty.

The offshore energy sector is particularly well poised to deliver reliable, abundant, and affordable energy of many types for society. Traditionally recognized as a key producer of oil and gas, the offshore sector has emerged as a leader in offshore wind, is spearheading the deployment of carbon capture and storage technologies, and is playing a vital role in developing innovative hydrogen 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. We are pleased to release many case studies from our member companies in this report that provide amazing examples of approaches for reducing emissions. We view the offshore energy sector as a team that works together to support each other and lift the performance of the entire industry. The case studies help foster the learning and sharing that is vital to the industry's collaborative approach to continuous improvement. This report also highlights the work that we do, as a trade association representing the offshore energy sector, in advancing solutions for positive performance in all aspects of ESG. We welcome any company that is not a member of NOIA to contact me to learn more and hopefully become part of a growing network of leaders in the offshore energy sector.

ERIK MILITO
NOIA PRESIDENT

About the 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 is now embedded activities of NOIA.

Foundational Principles

- 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, as innovators, we strive to contribute solutions and best practices to optimally balance societal and environmental needs.

Environmental Principles

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.

NOIA Climate Change Principle

> 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.
> *See the NOIA Climate Change Position on page 10 for detailed position with principles.*

Social Principles

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.

Governance Principles

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.

The 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 supports the role of recognized 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.

The Importance of the NOIA ESG Network

Erik Milito

President
National Ocean Industries Association

"The American offshore energy industry has positioned itself as a foundation of an energy system that lifts society on a truly global scale. NOIA members are part of an incredible ecosystem that drives all forms of abundant, reliable, and affordable domestic energy supplies for Americans, while continuously driving down emissions.

"The record of success NOIA documents in the report reflects the spirit of relentless innovation shared by our members. NOIA members make the world better and we are grateful that they have embraced the NOIA ESG Network to help them learn, collaborate, align, and improve in their stewardship, governance, and performance."

Paul Danos

Owner & CEO
Danos

NOIA Chair

"Environmental, Social, and Governance performance is not just a catchphrase, it's a core part of how the offshore energy industry does business. At Danos, ESG has been a focus for a long time. From protecting, preserving, and restoring the environment by installing nature-based infrastructure solutions that reduce carbon emissions with our partners Natrx to the support the Danos Foundation has offered to more than 80 organizations in need since its launch in 2017, we want the areas where Danos employees live, work, and recreate to be healthy and happy.

"Our industry is made up of thousands of other companies and hundreds of thousands of women and men who along with producing energy safely and sustainably also want to be the best neighbor they can be. This attitude is how we lift our communities and it is how we are solving pressing environmental and societal challenges, at home and around the world. The NOIA ESG Network brings together the full diversity of offshore energy companies to the same table so we can learn from each other and build a pathway of continuous improvement."

NOIA Members Sign the Participation Pledge

All NOIA members can participate in the activities of The NOIA ESG Network, and it has been great to see almost all of our members join us for NOIA ESG Network events in-person and virtually. Members can also officially sign up for our ESG program. 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, and offshore service vessels have signed the NOIA ESG Network Participation Agreement.

Signatories pledge their companies will participate in NOIA ESG efforts, 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.

America's Offshore Energy Industry

CASE STUDIES FOR REDUCING GREENHOUSE GAS EMISSIONS

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. We are pleased to highlight the following case studies from our member companies that demonstrate innovative approaches for reducing emissions.

CASE STUDY:

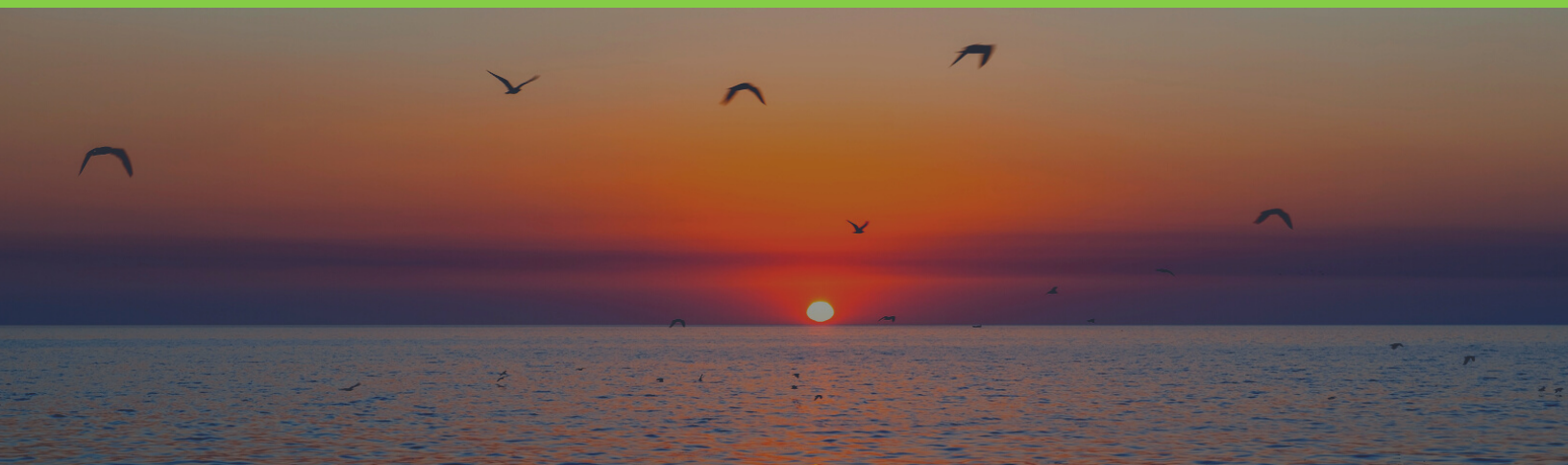
BEACON OFFSHORE ENERGY

Beacon Offshore Energy LLC, (“Beacon”) and its Shenandoah development drill ship contractor, Transocean, have undertaken a carbon dioxide equivalent (CO2E) reduction initiative using a fuel additive. Beacon invested in an upgrade to allow Transocean’s new eighth generation drillship, Deepwater Atlas, to automatically dose the fuel additive during the Shenandoah drilling and completions campaigns, and any future drilling operations.

The proprietary fuel additive is 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. Use of the fuel additive also reduces the heat of combustion, lowering nitrous oxide (NOx) emissions.

Due to more efficient fuel use, Deepwater Atlas is expected to use an average of 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.

One other marine vessel provider for Beacon has agreed to implement a fuel catalyst, and Beacon is awaiting results from the testing of this particular implementation.



CASE STUDY:

Na Kika Compressor Speed Control:
Fuel gas accounts for about 80% of emissions on bp's offshore platforms. The largest power users on the bp Na Kika platform are the Field Gas Compressors which account for approximately 65% of the total fuel gas consumed on the facility. Increasing the efficiency of these compressors provides a good opportunity to reduce emissions.

The Field Gas Compressors are direct drive machines each with their own dedicated variable speed gas turbine. Originally, the suction pressure for the compressor was controlled by recycling gas from the discharge to the suction of the unit. This resulted in a larger proportion of the fuel gas and associated emissions being wasted as gas had to be re-compressed.

In January 2022, bp installed an automatic speed controller on the turbines which controls the suction pressure to a desired set point through speed modulation of the compressors. The controller increases the turbine speed when the pressure is above the set point and decreases the turbine speed when the pressure is below set point. In the case of slugging, the compressors will speed up to reduce the suction pressure spike. This speed control brings more stability to the process.

There is still a compressor recycle, but the pressure set point for the speed controller is set slightly higher than the recycle set pressure to allow it to be in control most of the time and reduce energy usage. If there is a sudden pressure drop, the recycle will take over to stabilize the suction pressure and then the speed control will take back over.

This causes the compressor to operate more efficiently by not re-compressing as much gas unnecessarily. This reduces emissions as much less fuel gas is consumed to re-compress gas. Less fuel gas usage also saves money. As is common with many emission reduction projects, there are additional benefits to just lower emissions.

The automatic speed controller also reduces the amount of gas required to start up the compressor after an outage which results in decreased flare emissions associated with compressor start-up.

bp operators were trained on this speed optimization and easily adopted the change. The equipment enhancement resulted in close to 9,000 metric tons of CO_2e emissions reduction in a 12-month period. bp is evaluating and installing similar compressor upgrades throughout the Gulf of Mexico to improve efficiency and reduce emissions.

CASE STUDY: HALLIBURTON

Halliburton works to reduce emissions, improve efficiency, and advance clean energy development. Halliburton recognizes that affordable and secure energy is key to global economic development, and that oil and gas still have an important role to play in pursuing and achieving these goals.

Worldwide, oil and gas remains an essential source of affordable energy. At Halliburton, the company understands that the low-carbon energy transition must be envisioned as a multi-decade journey. Halliburton also knows that lower carbon intensity oil and gas production is a critical part of facilitating a low-carbon future. As such, Halliburton deploys world-class technical expertise, resources, and versatile capabilities to develop new technologies that minimize environmental impacts and support customers' decarbonization efforts. Their most significant contribution toward sustainability goals is to help customers reduce their own environmental impact by using our technologies.

Featured are examples of Halliburton technologies designed to reduce emissions:

Halliburton Cementing PSL has developed the NeoCem™ E+ Cement system, which reduces the amount of Portland cement in the wellbore isolation barrier by an average of 50-70% by mass Portland. (Portland cement accounts for the majority of the carbon footprint in a cementing job, as its manufacture and transport releases air pollutants.)

Halliburton is transforming the use of digital and electrification capabilities to drive actionable insights for reservoir and emissions management. Halliburton Completion Tools introduced the Future of Completions™, an embodiment of solutions that introduce an end-to-end digital ecosystem. eCompletions™ is a digital ecosystem that advances completions by improving service quality, accelerating continuous improvement, and leveraging autonomous capabilities that will exponentially improve how customers manage their reservoirs.

The FloConnect® surface automation platform is the industry's first fully automated and scalable solution for surface well testing operations. The data-centric platform automates testing operations while monitoring and measuring factors related to the production of hazardous effluents. It helps reduce operational variability and optimizes workforce deployment, allowing more time and focus on data monitoring, collection, and quality. The platform combines pivotal data visualization with interactive analytics to aid decision making and quick identification and resolution of potential issues.

Digital sustainability solutions:
Envana™ Digital Emissions Management provides solutions to make emissions impacts more transparent for oil and gas planning by forecasting greenhouse gas emissions from the source and tracking them against targets, and by providing a platform for actionable recommendations through asset life. Designed by oil and gas practitioners, Envana™ software provides a centralized dashboard to track, measure, and analyze the emissions impact of engineering and business decisions as they pursue emissions abatement and sustainability goals.

Chemicals:
The BaraHib™ trackable highly-inhibitive system (TIS) is a high-performance water-based fluid which uses advanced inhibitive chemistry that can be quantitatively measured continuously at the rigsite. This unique capability helps operators improve operational reliability and reduce environmental impact, maximizing asset value. In addition, BaraHib TIS provides excellent wellbore stability in various types of clay mineralogy, improved lubricity, and maximum hole cleaning in highly deviated and long lateral wellbore sections.

WaterWeb® service uses unique polymer chemistry to help create oil-water separation in the reservoir, impeding water flow, and enhancing hydrocarbon flow to the wellbore. With our WaterWeb service, the resulting improved oil/gas recovery potential stems from a reduced water column which improves natural lift for the residual oil and/or gas. In addition, it helps justify prolonged and sustained production by enhancing reservoir drainage.

Decontamination of hydrocarbon and petrochemical equipment is essential for the removal of hazardous materials and gases, such as hydrogen sulfide, benzene, and other volatile materials. Reliable decontamination ensures the safety of the process system vessels, piping, as well as the personnel required for efficient maintenance work. SureDcon™ D is an effective agent for the decontamination of crude oil processing/refining systems that require cleaning by recirculation methods. The “fastbreak” nature of the chemistry allows for hydrocarbon recovery. SureDcon™ P non-ionic surfactant is the ideal choice for de-oiling, decommissioning or decontamination of pipelines.

CASE STUDY:

MARINE CONTRACTORS

To reduce local emissions significantly, in February 2020, Heerema Marine Contractors' first pilot has taken place on board the vessel *Thialf* to test the performance of Gas-to-Liquid (GTL) and Hydrotreated Vegetable Oil (HVO). These alternative fuels showed a decrease in NOx emissions by about 15% and Particulate Matter (PM) by at least 50%. SOx emissions are virtually eliminated using these types of fuel. HVO has the potential to reduce carbon footprint (well-to-exhaust) by up to 80%. Biofuels are thus a proven way to prevent carbon emissions. After an extensive research and testing program, Heerema has taken the pilots to a next level in the year 2021.

By doing so, *Thialf* became the largest vessel to bunker Hydrotreated Vegetable Oil (HVO). For the test one engine was selected as test engine. This engine just had its major service completed and therefore could be used as reference engine. During the test, auxiliary systems like transfer pumps and filters ran like before, without any malfunctions observed.

After consuming all HVO, several inspections were conducted on the test engine. Additionally, a sample was drawn and analyzed from the engine lubricating oil. No irregularities were observed during these inspections.

Other biofuels are being looked into while the use of biofuels in Heerema fleet should gradually increase up from 0% in 2020 to almost 40% in 2025 in order to prevent 95.000 [mT] of CO2

Thialf bunkered GoodFuels' HVO biofuel for the first time!

1.996,18 tons of CO2eq saved with this bunker!

CASE STUDY:

Since its founding in 1977, LLOG has achieved industry leading exploration success and exceptional growth with an uncompromising commitment to safety. LLOG is committed to managing its footprint in the GOM, which already produces some of the least carbon-intensive production in the world. As part of its history of success and innovation, LLOG constantly looks to integrate the latest technology into the development of new fields. In 2022, LLOG sanctioned a new project for two discoveries, Leon and Castile, where it is working with its partners to safely, efficiently, and cost effectively develop these fields.

Leon is a discovery in the deepwater GOM in Keathley Canyon 642, in approximately 6,000 feet of water. The discovery well was drilled to a total depth of about 32,000 feet and encountered nearly 700 feet of high-quality net oil pay in multiple sands in the Lower Tertiary where LLOG has significant experience from past drilling. The Castile discovery was drilled in KC 736 in over 6,500 feet of water to a total depth of over 31,000 feet and encountered nearly 400 feet of high-quality net oil pay, also in the Lower Tertiary.

In May 2022, LLOG announced the development of the Salamanca production facility, which is comprised of a uniquely designed Floating Production Unit (FPU) that repurposes a former GOM production facility that was decommissioned. The FPU will serve as the collection point for production from the joint development of the Leon and Castile discoveries. LLOG will operate the development, and the facility will be located on KC 689 in approximately 6,400 feet of water. Both discoveries are expected to be tied back to the Salamanca FPU mid-2025.

This project is special because the FPU is being constructed from an existing decommissioned production system. The topsides and decks have been removed from the existing platform and modifications are being made to the hull. With the old topsides equipment removed, LLOG will be able to install new production equipment that will allow us to optimize the facility for the development of the discoveries. Once the new topsides equipment has been installed on the decks, the entire topside unit will then be rejoined to the hull. By modifying a previously built production unit compared with constructing a new facility, LLOG was able to significantly reduce the time and cost to bring these discoveries online. As important, the project has a significantly positive ESG impact as it reuses an existing unit compared with abandonment of the unit, while also accomplishing approximately a 70% reduction in emissions impact compared to the construction of a new unit. All of the major topsides repurposing and modifications will be done in the U.S. using local labor.

As LLOG looks to the future, it remains dedicated to maintaining the same high ethical and operational standards that have helped guide the company for the past 45 years. By incorporating sustainability in all phases of its operations, LLOG is able to improve overall economics and better implement more environmentally friendly projects.

CASE STUDY:

LEVERAGING DATA TO DRIVE EMISSION REDUCTIONS

Noble Corporation has installed advanced monitoring equipment on deepwater drilling rigs, enabling the company to accurately track and model fuel consumption and derived carbon emissions.

During 2022, the carbon emission reduction efforts of Noble Corporation have been focused on energy efficiency optimization, particularly on board the company's deepwater rigs. With this initiative, the Texas based offshore drilling contractor aims to identify, analyze and implement behavioral changes that ultimately result in reduced carbon emissions.

Mapping the fuel consumption on a given drilling rig is the foundation for any optimization processes aiming to yield significant and sustainable reductions in fuel consumption and emissions. Noble bases this on data from sensors installed on multiple rigs, providing the potential for greater insights and control.

The focus has been on embedding the use of these data into operations, applying them to a range of existing processes and workflows to ensure that energy efficiency becomes an integral part of the way the rigs operate.

The most significant results have at this point come from the ability to directly compare data across rigs and benchmark against the best. In general, access to precise, unit specific data has made discussions with and within crews more impactful. One visible result has been a significant optimization of thruster operations on Noble's deepwater floater rigs; a significant source of continuous fuel consumption since the rigs use the thrusters to maintain station during drilling operations.

COLLABORATING WITH CUSTOMERS FOR GREATER EFFECT

The availability of fuel and emissions data has also opened up better informed conversations with the rigs' customers.

Within offshore drilling, it is industry standard that the customer takes responsibility for the supply of and payment for the fuel used during drilling campaigns and hence is directly responsible for the associated carbon emissions. This means that collaboration towards shared targets, supported by the right incentives, can establish a win/win scenario where cost and emission reductions go hand in hand to the benefit of both parties, and Noble prioritizes early engagement with customers on the subject.

In one case, Noble entered an energy efficiency and data sharing agreement with an international customer, covering the operations of two drillships. The agreement contributed to driving behavioral changes on board the rigs, supported by monthly energy efficiency reports as the foundation for transparency and continuous conversations with the customer.

On board the Noble Voyager, the tangible outcome was an emission reduction of more than 400 metric tons of CO2 over three months, driven by behavioral changes only.

DIGITAL MONITORING BASED ON FLOWMETERS

By end-2022, Noble had rolled out the digital monitoring tools on 11 rigs in total. Each rig is equipped with high accuracy fuel flowmeters and sensors connected to the control and monitoring systems, which are then connected to offshore servers. The offshore servers collect and send energy usage data to an onshore remote operations center and to Noble's cloud computing database, where it can be accessed and modeled. This is then used to visualize how fuel is consumed on the rig and to help crews understand where they can improve energy efficiency.

The data collection and modeling is done in Energy Efficiency Insight (EEI), a software system Noble has developed with the specific aim of tracking energy efficiency.

During 2022, the floater rigs have been the main focus of the energy efficiency initiative, but the optimization capabilities are also being rolled out to other parts of the fleet. By end-2022, fuel data were available on all of Noble's CJ70 XLE jackup rigs as well as two R-series CJ50 jackup rigs. Sensors will additionally be installed on the latter's two sister rigs, meaning that all four R-rigs are expected to gain access to the EEI system during the first half of 2023.

CASE STUDY:

NOV has a long and proud legacy of innovation and technology dating back to the earliest days of the oilfield. Building on that history, they continue to provide technology-driven solutions that empower the global energy industry. While oil and gas will remain critical to powering the global economy, the transition to clean, carbon-neutral energy sources represents an enormous opportunity for organizations that can improve the economic competitiveness of renewable energy. From major developments in the offshore wind market to the development of a fit-for-purpose, post-combustion Carbon Capture System design, to groundbreaking drill bits shattering geothermal records, NOV is rising to meet the challenges of this evolving industry.

As the world's leading independent equipment and technology provider to the energy industry, whether from traditional oil & gas or renewable sources, NOV facilitates access to reliable, affordable, and clean energy around the world. NOV's core engineering, manufacturing, and project management expertise allows them to continue to support oil and gas operations while also providing opportunities to help the world expand sustainable energy.

"NOV is committed to growing our business with more services and technologies that help the energy industry reduce its carbon footprint," said Michael Loucaides, NOV's HSSE Officer. "At the same time, we are looking for ways to reduce our own carbon emissions and improve our operational efficiencies."

NOV's Sjøhest – Norwegian for "seahorse" – blade installation solution improves offshore wind turbine installation efficiency by 20 to 30% and reduces the operation's carbon footprint. While larger installation vessels install the towers and nacelles, a dedicated Sjøhest jack-up vessel connects directly to the tower with a telescopic leader boom, like how a seahorse uses its unique and strong grasping tail to resist ocean currents. This creates an aligned and stable platform from which a trolley horizontally transports the blade along the leader, rotates the blade into a vertical position, and connects the blade to the rotor.

NOV's Maestro™ diesel engine optimization software reduces the rig's fuel consumption and carbon emissions by shaving power peaks on the drawworks through S-Curve and rate of change features. The configurable system determines loads and required power generation to stop and start engine/generator sets automatically. Maestro can integrate with NOV's PowerBlade™ kinetic energy recovery system and other energy storage systems to calculate and use stored energy.

The iNOVaTHERM™ portable treatment unit efficiently treats oil-based drilling waste at the wellsite offshore or onshore, reducing transportation requirements and related carbon emissions. The iNOVaTHERM has proven to recover oil and water from the drilling waste, consistently delivering as low as 0.1% oil on cuttings for safe and compliant disposal. The system's higher treatment capacities, decreased energy consumption, and reduced manpower requirements also lower operating costs.

The Ideal™ eFrac fleet dramatically reduces the costs and greenhouse gas emissions involved in hydraulic fracturing operations without sacrificing safety or performance. The Ideal eFrac fleet offers lower carbon emissions, greater power density, faster rig-up times, and limits operational costs, headcount, and non-productive time while maintaining the redundancy that efficient fracturing operations require. Compared to conventional operations, the Ideal fleet reduces fuel costs by up to 89% with wellhead natural gas-powered turbines and lowers CO2 emissions by up to 74% compared to Tier 4 fleets that flare gas. In addition, it is less disruptive to neighboring communities due to its reduced noise and smaller footprint, requiring more than 40% fewer truckloads for delivery.

The energy industry relies on NOV's expertise and technology to continually improve operations and advance the energy transition toward a more sustainable future. For more information, visit www.nov.com.

CASE STUDY:

OIL STATES INTERNATIONAL LEVERAGES AND LAUNCHES TECHNOLOGIES TO REDUCE GHG EMISSIONS FOR ITSELF AND OTHERS

Oil States International, Inc. is a technology-focused manufacturing and energy services company that is advancing the future of affordable and reliable energy. Our strategic focus blends supporting traditional oil and gas customers with new technologies and best-in-class service while enabling pathways to a diverse multisource energy mix comprised of emissions-reduced oil and gas supplies along with lower-carbon sources to meet growing global energy demand.

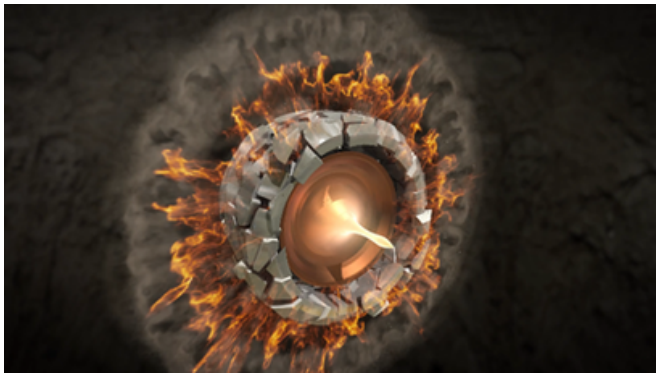
“We are proud of our existing low-carbon footprint present across our global operations and continue to strive for improvements to further our sustainability initiatives,” said Cindy Taylor, President and CEO. “Our leading technologies, including the FTLP™ Floating Wind Platform, Active Seat Gate Valve, HydroPull™ Extended-Reach Tool, Connex™ Perforating Charge, and Deepsea Minerals Gathering Systems help reduce GHG. Additionally, our fleet vehicle management initiatives have further reduced emissions across our own operations."

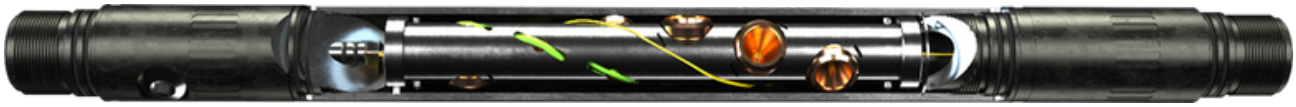
Rooted in 40+ years of fixed offshore and deepwater floating infrastructure experience, the OSI Renewables™ enterprise has developed the FTLP™ Floating Wind Platform (or Fixed TLP) – a potentially game-changing technology offering mid-water offshore wind operators the benefits of a highly-stable, fixed-platform structure with substantially reduced cost and streamlined installation capability compared to traditional floating wind platforms. The FTLP is expected to save approximately 4,000 carbon units compared to a semi-submersible hull while reducing the seabed environmental impact by utilizing fewer and smaller anchors.

The sealing performance of the Active Seat Gate Valve dramatically reduces the amount of heavy grease required during frac operations by hundreds of pounds per well, while also significantly reducing grease disposal upon well completion. Maintenance intervals at the wellhead are substantially cut, boosting personnel safety and efficiency.

The Tempress HydroPull™ tool provides operators with a proven solution for frac plug drill-out and clean-out in a single trip, saving time, friction-reducing chemical use, frac fleet CO2 emissions, and total well cost.

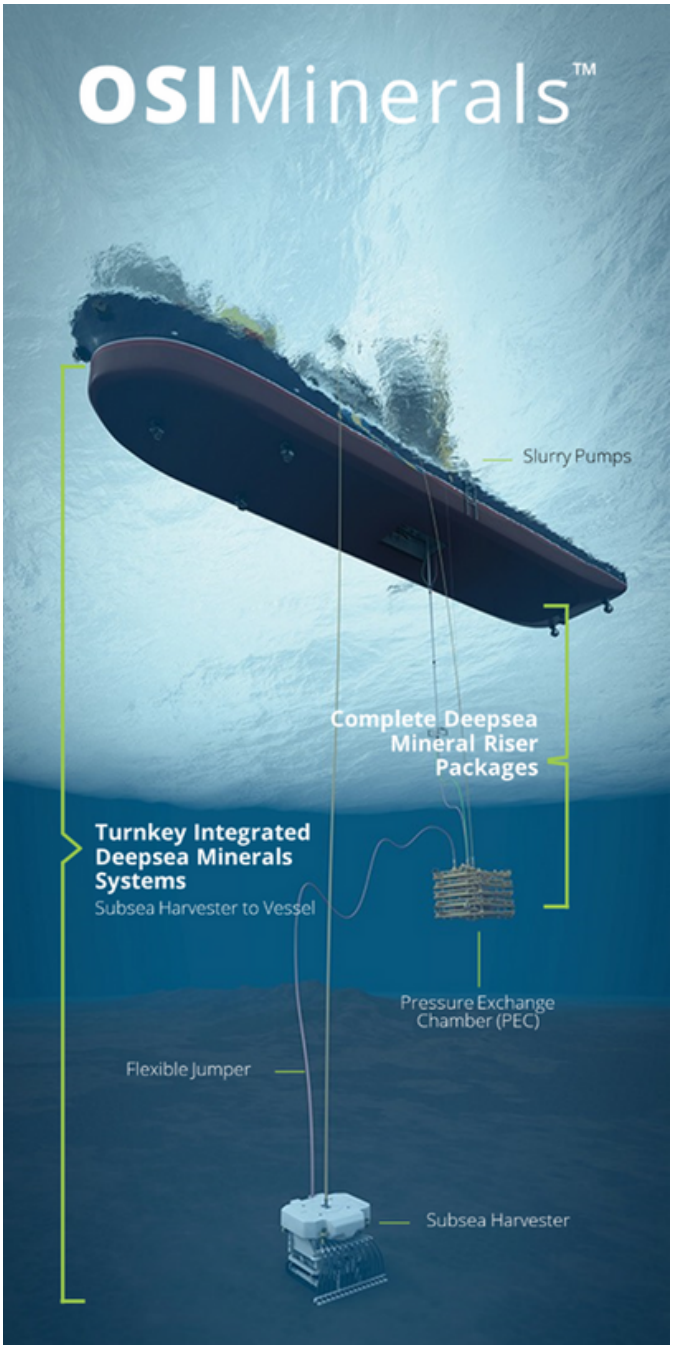
The Connex perforating equipment enables operators with the ability to store carbon. This application of Connex allows depleted, decommissioned wells to be repurposed for Carbon Capture Storage and Utilization (“CCUS”) by injecting liquified carbon emissions into depleted reservoirs, thereby reducing carbon emissions.





Based on the deepwater riser systems, the OSI Minerals™ enterprise has developed Integrated Deepsea Minerals Gathering Systems to collect polymetallic nodules which are high in concentrations of minerals required for production of electric vehicle batteries.

Complementing these advanced technologies, Oil States was presented the 2021 Energy Workforce & Technology Council ESG Accelerator Award. During that year, the company reduced fleet GHG emissions by 17% by reducing vehicle use and idling while employing real-time electronic telemetry data to quantify fuel use, efficiency and GHG emissions. Oil States' three-year goal is a 10% reduction of all GHG emissions intensity (Scope 1 and 2).



CASE STUDY:

promethean energy

Promethean Energy is a mid-to-late life oil and gas operator with an integrated approach to the development, production, and ultimate decommissioning of mature assets.

In the first half of 2022, Promethean assumed operatorship of 10 leases in the GoM for the sole purpose of safe, cost-efficient, timely decommissioning to high ESG standards.

Having assumed operatorship, Promethean established an overall ESG framework within which it identified the most material ESG issues. For each issue It then agreed goals, pathways and indicative KPIs for their achievement.

To reduce GHG emissions, Promethean reviews all aspects of the decommissioning program through a carbon lens. Promethean has focused on identifying technologies, best practices, and different ways of executing work programs, as well as exploring the establishment of a baseline for a Business As Usual decommissioning program.

The following emissions reductions and the associated safety and cost improvements have been achieved through practical initiatives implemented by Promethean's alliance partner:

1. Logistics – relocating the mobilization site to one closer to the field reducing vessel trip duration and fuel usage
2. Re-commissioning platform cranes to eliminate the need for a crane vessel
3. Adding additional quarters to a platform to eliminate the need for a flotel
4. Minimizing the size of the vessels and only using DP vessels when necessary
5. Using a trash compactor to reduce the number of crane lifts and vehicle usage at the dock

CASE STUDY: SEACOR MARINE

SEACOR Marine has been a leader in investing in ways to cut fuel consumption and emissions, as well as implementing strategies to meet reduction goals. Even through an industry downturn, SEACOR Marine has carried on making significant investments in hybrid conversions and vessels, all without any subsidies or grants. SEACOR Marine prioritizes improving efficiency while reducing overall power consumption on board. It offers fuel efficient platform supply vessels (PSVs) through a combination of hull and propulsor design, advanced underwater coatings, efficient engine plant and hybrid offerings, fuel consumption optimization and systems and operational procedures to combat biofouling. Through these investments, SEACOR Marine has become the market leader in hybrid power PSVs and the only owner of large hybrid PSVs operating in the offshore theater outside the North Sea and Gulf of Mexico.

Through its diverse fleet and experience operating in global markets, SEACOR Marine is helping clients operate in increasingly environmentally efficient ways. Consistent with SEACOR Marine's commitment to reduce fuel consumption and carbon emissions, it has invested over $4.2 million since 2015 in FuelTrax systems that accurately record fuel consumed and emissions produced on board and inform vessel crew on optimum throttle settings via best speed and best economy functions. The installation of additional FuelTrax systems across SEACOR Marine's fleet remains an ongoing focus. As of June 2022, 21 vessels have been fitted with FuelTrax Electronic Fuel Monitoring Systems, including fast support vessels (FSVs), conventional PSVs and diesel electric PSVs. Vessels with these systems regularly operate in "Best Economy" and "Best Speed" mode which significantly reduce fuel consumption and emissions.

SEACOR Marine is also supporting fuel efficiency across its fleet, by using alternative construction materials such as 5083 aluminum alloys (instead of the weaker 5086 aluminum alloys) which allow SEACOR Marine to use thinner plates and less material to construct FSVs. This results in lighter vessels and promotes greater fuel efficiency for vessels and customers. To maintain vessel hulls in optimum condition with significantly reduced bio fouling, SEACOR Marine has commenced a program to incorporate Ultraguard Ultrasonic anti fouling systems and has already outfitted eight vessels with this technology. Further, SEACOR Marine uses autopilot systems which also contribute to reduced emissions by mitigating minute deviations and maintaining course better than manual control.

SEACOR Marine's commitment to improvements does not end with these efforts. SEACOR Marine is evaluating an investment of $15 million to upgrade five large UT771 CDL diesel electric class PSVs with high-power density Energy Storage Systems (ESS), as well as improving the efficiency of six large UT 771 WP Class hybrid diesel electrics Class PSVs by replacing existing emergency generators with Harbor emergency generators to meet the highest IMO emission standards while also reducing the in port fuel consumption by approximately 20%.

SEACOR Marine also leverages new lithium-ion battery power technology and integration on board its hybrid PSVs to significantly drive energy efficiencies and reduce emissions. SEACOR Marine's battery modules are 90-95% recyclable and designed for a 10-year marine duty life.

CASE STUDY:

Shell has been a pioneer in the Gulf of Mexico over the last four decades, and access to offshore resources has long been critical to meeting U.S. demand for energy. One of Shell's climate targets is to reduce operational emissions by half by 2030. Every business within Shell has a role to play in meeting those climate targets. For years, Shell's assets in the Gulf of Mexico have been producing some of the most carbon-advantaged barrels of oil in the world. Through engineering expertise and a zeal for innovation, Shell will continue to reduce emissions in the Gulf of Mexico, while still delivering the energy Americans need today.

The following examples of emission reduction opportunities were realized in 2022.

Enchilada was commissioned in 1997, relying on two gas turbine generators (GTGs), each of which produces GHG emissions, to power facility operations. As Shell has strengthened its climate targets, its engineers and operations staff explored whether it would be possible to shut down one unit while continuing to safely produce oil with only one GTG. In May 2022, after analyzing data extensively and studying a range of operational scenarios, the team began operations on a single GTG at Enchilada. Enchilada's emissions have decreased by 30% – amounting to an avoidance of 600 - 900 tonnes of CO2e each month.

Olympus was commissioned in 2012 with six GTGs to power facility operations, including the power to operate the facility's platform drill rig activities. Rig load is intermittent and dependent on the type of work ongoing, necessitating the need for a large spinning reserve to avoid a load-shed or blackout if drilling adds load to the power system. In August 2022, Olympus shifted operational philosophy to focus on power management. Through improved communications on Power reserves/demand, the platform was comfortable reducing spinning reserve alarm settings. Through these changes, Olympus has avoided 260 - 350 tonnes of CO2e each month.

Shell's Enchilada platform

The **Appomattox** platform is one of the world's first offshore projects to feature a steam power plant. The steam system uses waste heat from the GTG exhaust to boil water and generate high pressure steam, which in turn is used to run the Steam Turbine Generator (STG) for additional, free power. As the steam system was undergoing commissioning, Appomattox was operating with three GTGs. Following a robust commissioning journey, Appomattox was able to shift operational philosophies in January 2022 and power the facility with only two GTGs and the STG. With the STG online, Appomattox has avoided 3,300 – 6,000 tonnes of CO2e each month.

Through these three initiatives, Shell has avoided approximately 66 kilotonnes of CO2e emissions in 2022. That's the equivalent of taking 14,000 gasoline-powered cars off the road. While these achievements are a fraction of the carbon reductions that Shell will deliver to meet the 2030 target, this initiative illustrates how every asset team is looking across their operations, across their supply chains, and considering the tools and technology necessary to reduce emissions.

CASE STUDY:

As the largest oilfield services provider, SLB has the potential to make a significant impact through its vision of enabling high performance with sustainability. The company is committed to achieving net-zero greenhouse gas (GHG) emissions by 2050, encompassing Scope 1, 2, and 3 emissions that cover its entire value chain—a first in the energy services industry.

Scope 1 and 2 road maps are tailored to each geography and focus on emissions generated in SLB's operations and facilities. They aim to decrease energy usage in line with the interim target of 30% reduction in emissions from fuel and power consumption by 2025. With respect to Gulf of Mexico operations, SLB has a multipronged approach.

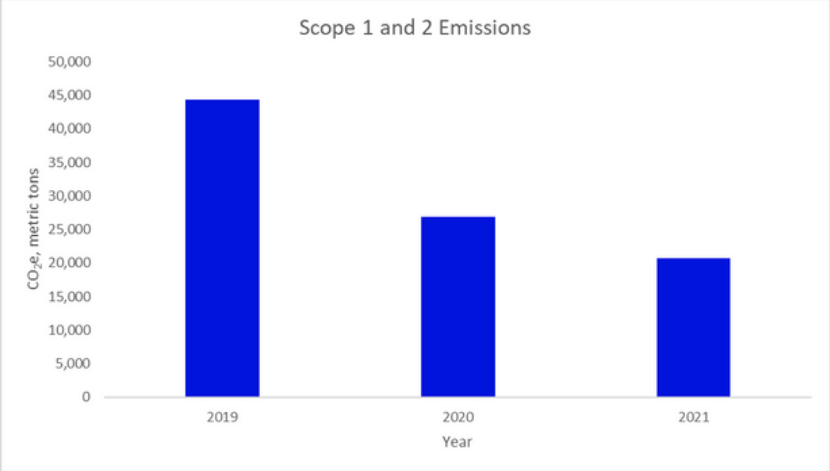


Fig. 1—Scope 1 and 2 emissions from SLB's North America Offshore operating unit show a steady decline over the years.

- It is rationalizing and optimizing facilities and has reduced its physical footprint by 50% over the past 3 years. Work is ongoing to further consolidate four facilities into one.
- Each facility is leading a site conservation program to own and reduce its emissions.
- An operational base in Louisiana has replaced all (>1,000) light fixtures with LED lights, which will reduce annual electricity consumption by an estimated 506,760 kW.h. SLB is also working with a consultant to promote behavior change and reduce energy usage at a manufacturing plant in Louisiana.
- The company has analyzed fuel consumption to identify opportunities for improvement across all facilities and fleets. Scope 1 and 2 emissions data is tracked with the help of a dashboard, as shown below for SLB's North America Offshore operations.

Scope 3 emissions constitute 95% of the company's baseline emissions inventory. Road maps for tackling them focus on emissions generated from use of SLB technologies. The Transition Technologies* portfolio under development comprises products and services that quantifiably reduce customers' GHG emissions while continuing to drive high performance, reliability, and efficiency. Recent examples from the Gulf of Mexico include the following:

- A proprietary connection system for subsea jumpers cut installation time by 50% in deep water and eliminated 189 metric tons of CO2e.
- Using optical fiber for simultaneous 3D seismic profiling in four producing wells and advanced processing techniques reduced acquisition time by 88 days and avoided >7,500 metric tons of CO2e.
- A unique instrumented wireline intervention service has averted the need to mobilize coiled tubing and expedited numerous interventions, significantly reducing environmental impacts.
- Advanced drilling technologies and services saved 36 drilling days on three deepwater wells, reducing the well construction CO2 footprint.
- All-electric production systems drive significant reduction in offshore infrastructure size, decreasing emissions during manufacturing, installation, operations, and maintenance. A partnership with bp led to the first all-electric subsea manifold for the Matapal project.

Fig. 2—The outboard receiver structure of SLB's proprietary vertical clamp connection system is mounted to the end termination of either rigid or flexible jumpers and subsea flowlines.

CASE STUDY: TALOS ENERGY

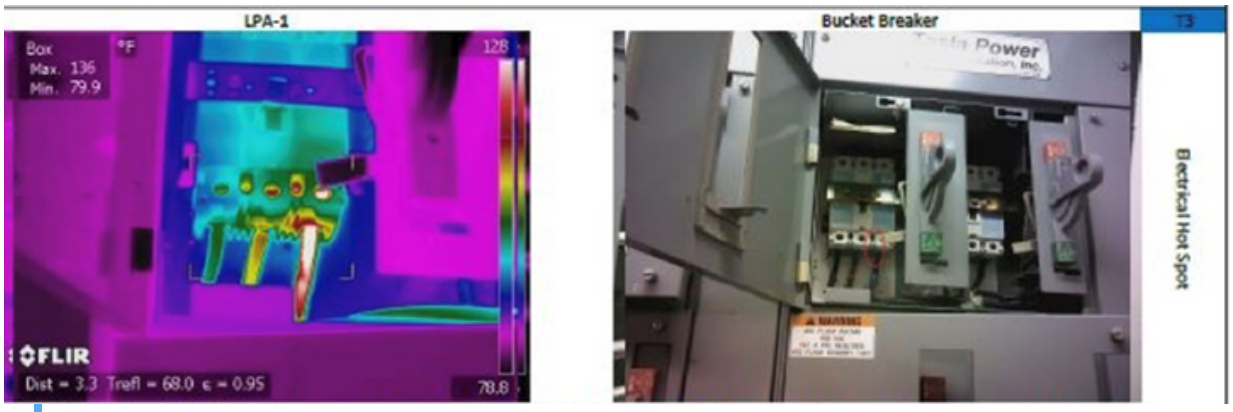
Scanning Today, Protecting People and the Planet for Tomorrow

For decades, the energy industry has used forward-looking infrared (FLIR) cameras to survey onshore oil and gas facilities. Today's FLIR cameras are highly specialized imaging cameras that make it possible to see gases that are invisible to the human eye, identify specific gases, and lead inspectors immediately to the source of a leak. The routine use of FLIR cameras on aging offshore platforms is not a universal standard. In mid-2021, Talos Energy Inc. ("Talos"), a Houston-based independent exploration and production company, implemented a voluntary program to conduct surveys on all its platforms for enhanced safety, environmental protection, and product loss prevention. Talos's primary concern is for the safety of its employees and contractors that live and work on its platforms. FLIR surveys allow Talos to identify fugitive emissions and see arcing and temperature anomalies before a potential ignition occurs. FLIR surveys conducted by Oliver International, an oil and gas industry contractor offering non-destructive examination solutions, provide Talos with visuals and descriptions of any anomalies. Talos can then implement corrective actions quickly.

Since Talos launched its FLIR program, the company has completed over 70 location-specific surveys with more than 8,000 components scanned. In 2022, only seven percent of the scanned components showed anomalies, with the top three anomaly types being tubing/thread connections, valve packing, and compressors. In a few instances, the surveys identified and evaluated equipment running at more than 100 degrees Fahrenheit above the reference temperature before any issues occurred. As repairs are being completed, field teams are evaluating ways to prevent future leaks by modifying materials and repair techniques.

Identification of leak located under deck and encased in thermal insulation that could not be seen. Pipe condition after removing thermal insulation

“We are confident this work is protecting the lives of our employees because a routine scan found a fuel leak on a pipe encased in thermal insulation and located under deck. The FLIR survey technician noted this leak and brought it immediately to operations’ attention, so we could isolate and bleed down the line. This gave operations the needed time to fabricate the line for replacement while ensuring safe operations,” said John Spath, Talos Senior Vice President of Production Operations.



Identification of potential electrical hazard. The LPC-1 feed bucket breaker T-3 lug was operating at an elevated temperature.

Talos chose FLIR surveys for multiple reasons. First, offshore platforms are multi-layered, compact, and subject to water reflections that can interfere with some technologies, which limit solutions. Second, FLIR cameras are certified for hazardous locations, require no contact with equipment, and allow surveys to be performed during normal operations. Third, the cameras can detect small leaks from several meters away, allowing inspectors to work safely and providing visuals to focus efforts efficiently to conduct repairs. Lastly, data analysis over time will enable improved maintenance by identifying the frequency of specific failures, manufacturing brands, or other process enhancements.

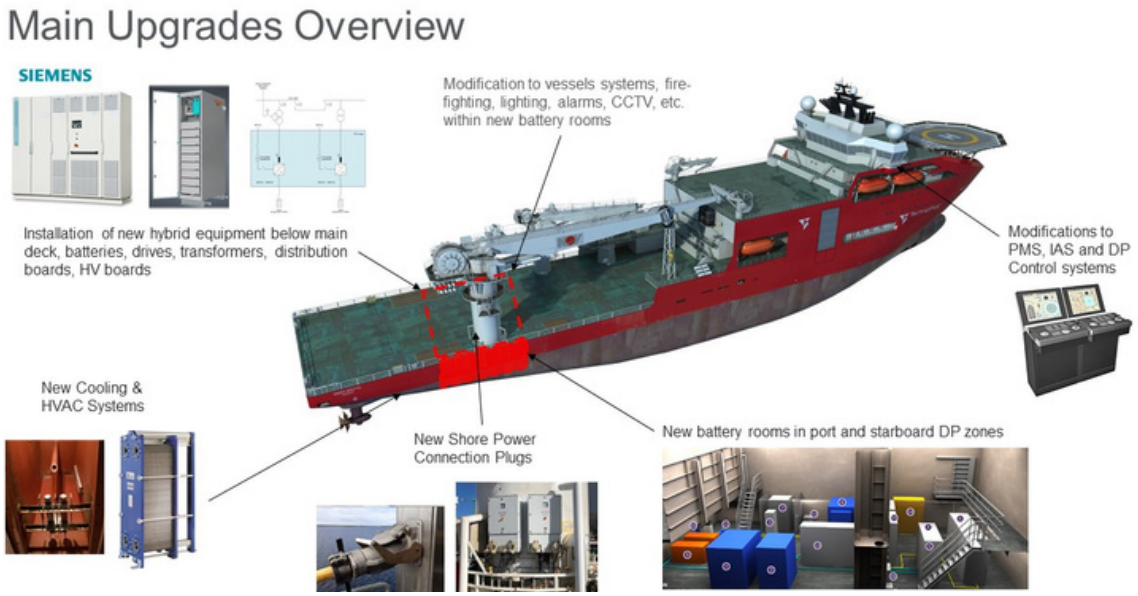
Talos recognizes that continuous monitoring is the ultimate goal. In November 2021, Talos installed a Baker Hughes continuous monitoring pilot on one of its unmanned platforms and is investigating other solutions to advance detection. For the foreseeable future, FLIR surveys will continue to assist Talos in safely protecting people and the environment.

CASE STUDY: TechnipFMC

TechnipFMC's dive support vessel Deep Arctic has been upgraded to run as a battery hybrid in a move that reduces its fuel use and emissions by 18 percent. The change helps the company work towards its 50 by 30 target of reducing our Scope 1 and Scope 2 greenhouse gas emissions by 50 percent by 2030 – two measures which also feature in TechnipFMC's ESG Scorecard.

OneFleet is actively upgrading the company's vessels to improve energy efficiency. David Jousset, Vice President OneFleet, said, "As a company, we are committed to reducing our emissions and OneFleet is looking to solutions that will help us reduce the carbon footprint of our subsea activities. Switching to hybrid power on Deep Arctic is an important step for us."

The rechargeable batteries provide redundancy power for Deep Arctic's dynamic positioning thrusters. Dynamic positioning is used to keep a vessel in a fixed position relative to the seabed for long periods during diving operations.
Using instant access electric battery power as the back-up means fewer diesel generators are kept running, cutting engine running hours and maintenance costs by up to 50 percent.

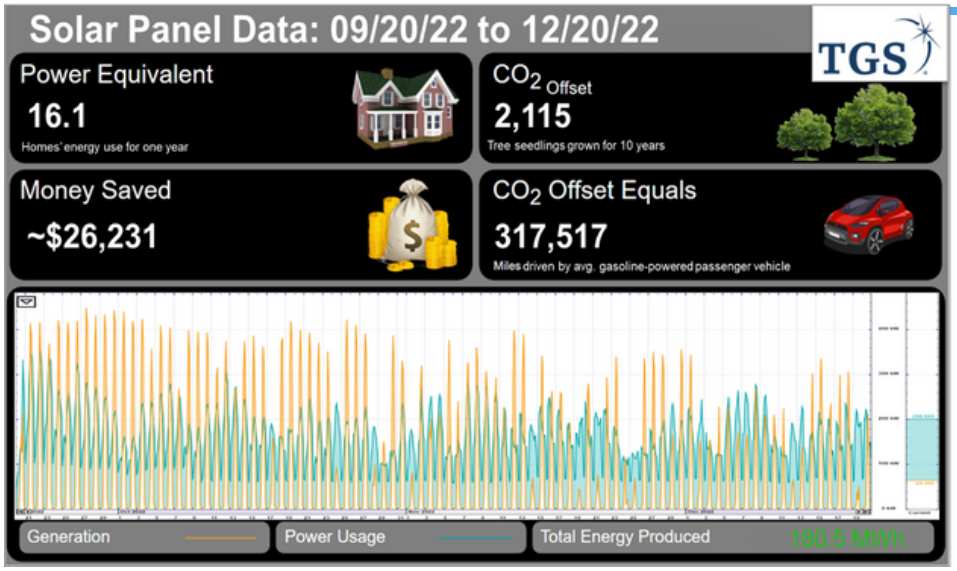


In addition to the batteries, when in port, the vessel can connect to shore power so that mobilization activities can be carried out with no direct emissions, where the infrastructure is available.

By challenging the conventional approach and applying purposeful technology innovation, TechnipFMC has established a means to deliver sustainable emissions reductions and cost savings for clients that utilize the Deep Arctic.

CASE STUDY: TGS

In 2021, TGS announced its commitment to being net zero in its Scope 1 and 2 emissions by 2030 and transitioning the company's offices to renewable energy is critical to achieving this objective.On September 7, 2022, TGS proudly held a ribbon-cutting ceremony at TGS' Houston headquarters to mark the completion of its highly anticipated solar energy parking canopy project. TGS' Houston headquarters is now 100% powered by renewable energy through the solar parking canopies and supplemental renewable energy provided through the energy grid. The Houston office now joins TGS' Oslo headquarters and Rio offices as being powered by renewable energy and this project marks a significant achievement towards TGS meeting its net zero Scope 2 goal by reducing its office-based emissions by over 70%.

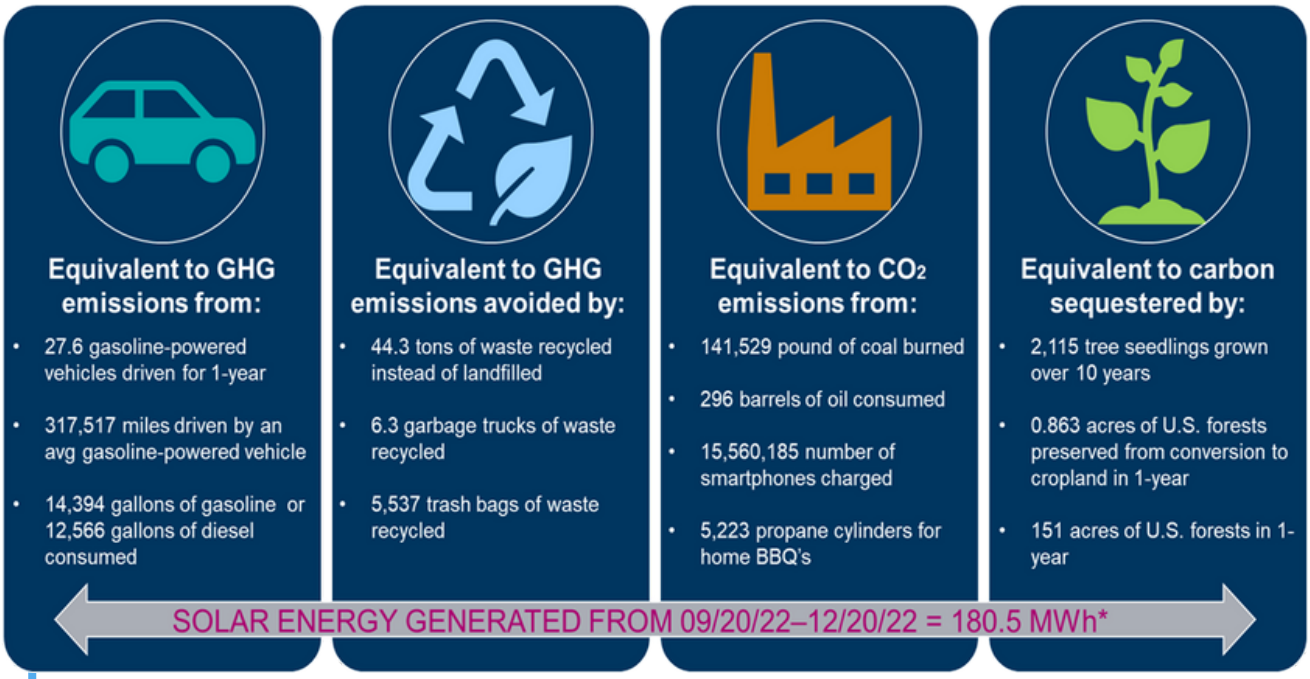


Data from TGS' solar panel project dashboard, showing CO2 offsets and energy production and consumption during a 3-month period

The project involved installing fifteen solar arrays covering 210 spaces in the employee parking lot that are comprised of 1,650 modules which produce over 900,000 kilowatt hours of energy annually. This will enable TGS to slash its carbon dioxide emissions by 1.4 million pounds annually – the equivalent of planting nearly 11,000 trees a year. The solar panel canopy also provides shade from the hot Texas sun and protects employee vehicles from Houston's inclement weather.Additionally, three Electric Vehicle (EV) charging stations were installed during the project, providing six EV charging points for employees that wish to charge their vehicle while at work at no cost to employees, and TGS' partner in this project, Freedom Solar, offers TGS employees discounted rates for solar panel installations in their own homes.

At the ceremony - which was attended by City of Houston officials, the Norwegian Consulate General of Norway, representatives from Freedom Solar, TGS' board of directors and employees - Kristian Johansen, TGS' CEO, noted "This ribbon cutting ceremony will commemorate a milestone — our first major step toward our goal of becoming a net-zero company. For several years, our employees have been asking for covered parking facilities, and we are excited to provide an innovative solution that both satisfies their request and provides a sustainable solution in line with our carbon-reduction goals."

While this is a significant reduction for TGS' office-related greenhouse gas emissions, TGS will continue to explore clean energy initiatives for its other office and data center locations.



Data sourced from the EPA's Greenhouse Gas Equivalencies Calculator for 180.5 MWh of electricity generated by TGS' solar panel project during a 3-month period.

TGS' Houston headquarters is now 100% powered by renewable energy!

CASE STUDY: TIDEWATER

For over 65 years, Tidewater has provided marine and transportation services to the global offshore energy industry, an industry critical to our daily lives, human progress and economic development. Tidewater's mission includes providing these services with the highest level of operational performance to ensure the safety of its people and those of its customers, while complying with all laws and regulations, and respecting the environment and local communities in which the company works. Currently, Tidewater offers the world's largest and most geographically diverse fleet of offshore service vessels, with over 185 active vessels serving customers in over 30 countries as of the end of 2022.

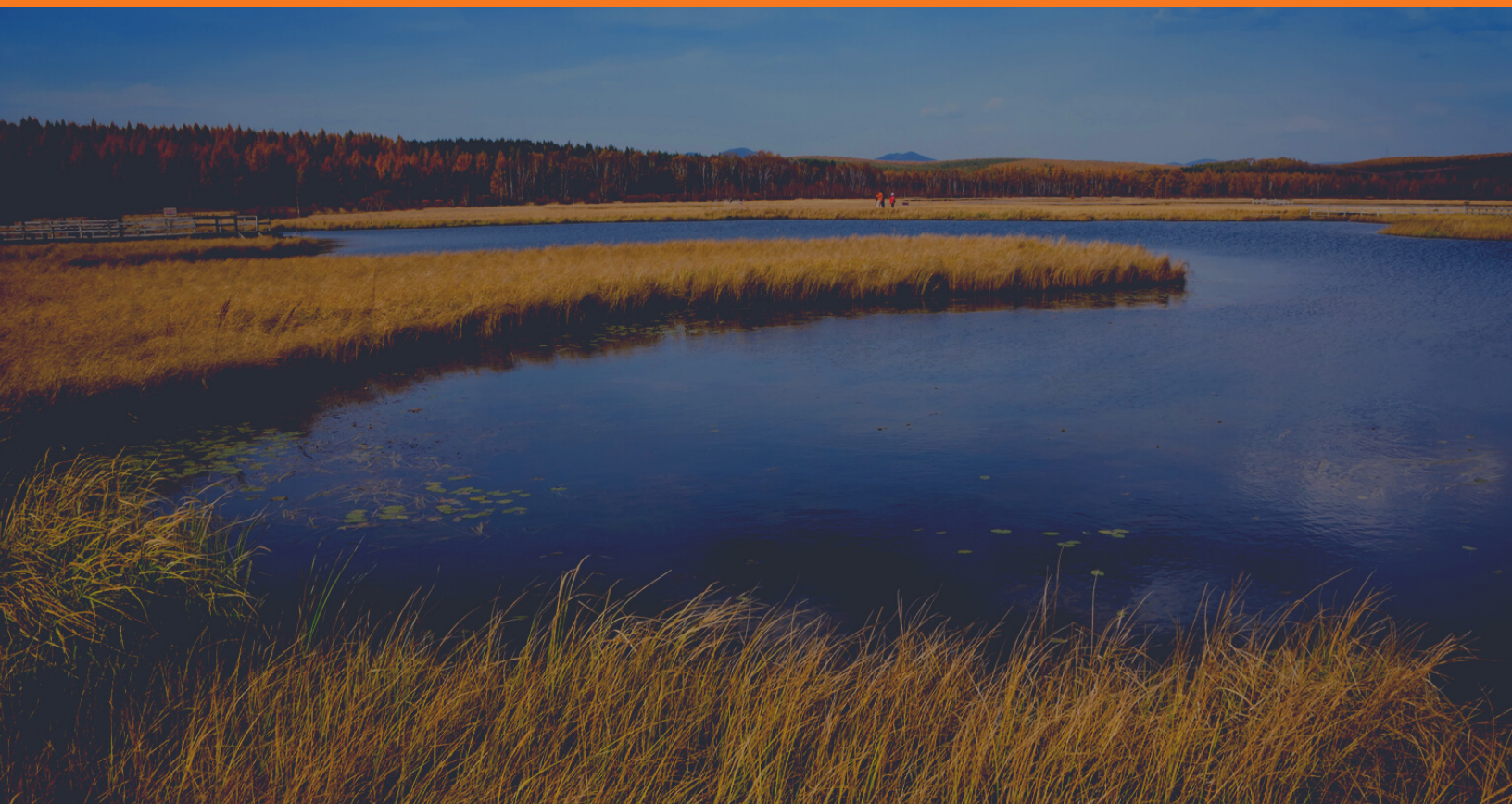
Tidewater is committed to building a sustainable enterprise that considers stakeholders' needs, always focused on operating in a safe, responsible, socially sensitive, and profitable way. At the same time, as a service provider, Tidewater's customers largely determine the day-to-day employment of the vessels, such as the maximum speed of the vessel and the type and cost of fuel used by the vessel. Nevertheless, Tidewater is dedicated to doing its part as an environmental steward as it continues to develop its long-term sustainability strategy and assesses the company's environmental impact and carbon footprint.

Bailey Tide crew posing in front of their Hybrid Battery Installation

To this end, in March 2022, Tidewater's Board of Directors formed a standing Environmental, Social and Governance Committee to oversee and support its ESG strategy, goals and reporting. In addition, throughout 2022, the company took proactive measures to protect the marine ecosystem and reduce its carbon footprint by installing ballast water treatment systems and hybrid battery solutions on several vessels and implementing active fuel monitoring and optimization systems on over 40 vessels.

Implementing these digitalization tools allows Tidewater employees to accurately calculate and track emissions while also providing the ability to analyze the operational efficiency performance among vessel classes within the fleet. More importantly, implementing the active fuel monitoring systems and optimizing vessel performance has not only reduced Tidewater's CO2 emissions from these vessels but also lowered the fuel costs for its customers. In addition, Tidewater has implemented one harmonized Planned Management System across its entire fleet to optimize each vessel's lifecycle and maintenance time, which is expected to extend each vessel's lifecycle and reduce maintenance costs.

The foregoing highlights are just a few examples of Tidewater's core values in action and ESG initiatives to reduce its carbon footprint during 2022. Tidewater is excited to share more in its 2022 Sustainability Report that it expects to publish during the first quarter of 2023.




NOIA
America's Offshore Energy Industry
ASSOCIATION WORK
in
PROMOTING POSITIVE ACTION IN ESG

OFFSHORE CARBON CAPTURE AND SEQUESTRATION

NOIA RELEASES CCS POLICY PAPER

After establishing an Offshore CCS Workgroup for purposes of collaborating and aligning on CCS issues and policy, on January 12, 2022, NOIA the policy paper, Carbon Capture, Use, & Storage: An Economic, Employment, & Climate Opportunity for the U.S Offshore Region. Along with key policy recommendations, the document details the vast advantages that the deployment of carbon capture, use, and storage (CCUS) in the U.S. Gulf of Mexico can provide our nation as we work to meet ambitious emissions reduction targets to address climate change.

"The U.S. Gulf Coast region offers unique advantages as an emerging global hub for CCUS. The full supply chain of energy companies in the region has the engineering experience, expertise, and vision to deploy CCUS projects offshore with the scale and efficiency necessary for success," said NOIA president Erik Milito. "The geology of the U.S. Gulf of Mexico makes CO2 storage attractive but, 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. The technical and commercial feasibility of CCUS is being demonstrated on the global stage and the right policies can enable the advancement of this remarkable emissions reduction opportunity here at home."

The International Energy Agency says that CCUS provides an "important opportunity to achieve deep carbon dioxide (CO2) emissions reductions." The U.S Gulf of Mexico offers tremendous advantages and can accelerate the emerging U.S. CCUS sector and strengthen American leadership thanks to several unique factors:

- **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 assessable engineering and energy knowledge base and workforce, along with associated research, development, and deployment (RD&D) capabilities.**

The NOIA CCUS policy paper details the promise and opportunity which the U.S. Gulf of Mexico offers for CCUS and highlights the policies the Administration and Congress, as well as states, should support to make widespread offshore CCUS development and deployment a reality in the U.S.

NOIA POLICY PAPER

CARBON CAPTURE, USE, & STORAGE

An Economic, Employment, and Climate Opportunity for the U.S. Offshore Region

America's Offshore Energy Industry

WHY CARBON CAPTURE, USE, & STORAGE?

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 CO_2 levels consistent with holding the increase in average global temperature to 2 degrees Celsius—referred to as a "2-degree Celsius world"—will be more than twice as expensive without CCUS.

According to the International Energy Agency:

Carbon capture, utilisation and storage (CCUS) technologies offer an important opportunity to achieve deep carbon dioxide 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.

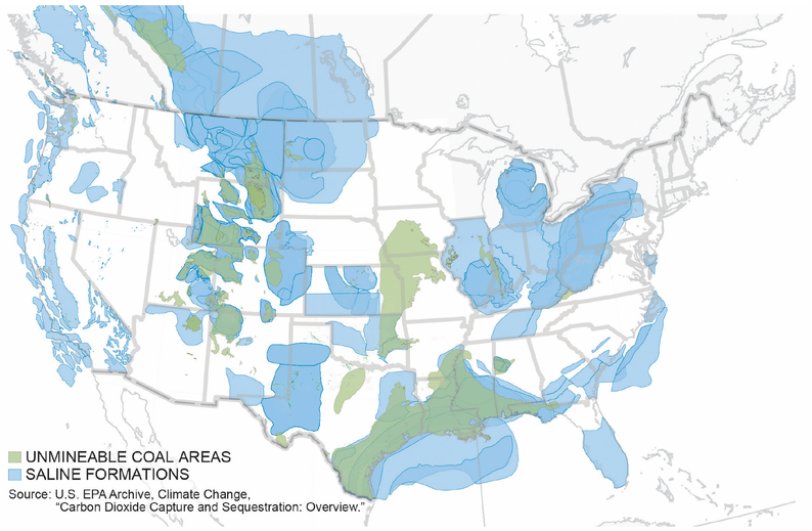
CCUS ON THE GLOBAL STAGE

The technical and commercial feasibility of large offshore storage projects is being proven on the global stage. The first large-scale CO_2 capture and injection project with dedicated CO_2 monitoring and storage was commissioned at the *Sleipner* offshore gas facility in Norway in 1996. Today, the facility has stored more than 20 $MtCO_2$ one km 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 CO_2 per year with the goal to achieve 5 million tonnes of CO_2 per year by 2027. The Northern Lights project is part of a larger carbon capture and storage initiative that will capture CO_2 from industrial sources within Norway, ship liquid CO_2 from capture sites to an onshore terminal on the coast, and then transport the CO_2 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*.

CCUS + THE GULF OF MEXICO?

The U.S. Gulf of Mexico offshore region provides tremendous advantages for an emerging U.S. CCUS sector. The Gulf of Mexico is characterized by vast geologic prospects for CO_2 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.

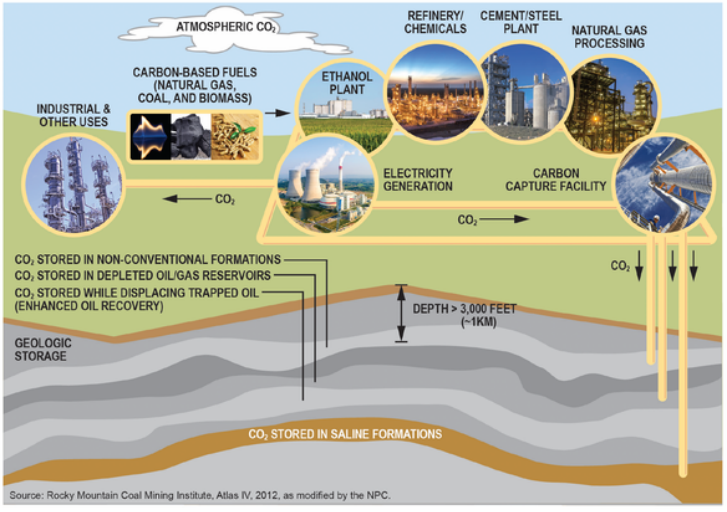


The United States has one of the largest assessed CO_2 geologic storage capacities in the world. Most of U.S. states possess some subsurface CO_2 storage potential. While estimates of U.S. storage resource vary, experts generally agree that it is adequate to store hundreds of years of CO_2 emissions from U.S. sources.

Source: National Petroleum Council, 2019

HOW DOES CCUS WORK?

As its name suggests, CCUS involves the capture of CO_2 from either large point sources – including power generation or industrial facilities – or directly from the atmosphere. The captured CO_2 is then compressed and transported to either be injected into deep geological formations which permanently trap the CO_2 or is used in a range of applications. CCUS uses a robust supply chain and combines various technologies to effectively reduce the amount of carbon dioxide that is emitted into the air, thus mitigating against warming effects and the impacts of greenhouse gases in the atmosphere. Carbon dioxide is the most common greenhouse gas, and it is emitted through various industrial processes and the transportation sector, among others. Industrial processes include emissions from power plants, industrial furnaces and stoves, steel blast furnaces, cement plants, and others.



Source: National Petroleum Council, 2019

CCUS combines several technologies to reduce the level of CO_2 emitted to the atmosphere or remove CO_2 from the air. The CCUS supply chain involves the capture of CO_2 from stationary sources so it can be compressed and transported to a suitable location where it is converted into useable product or injected deep underground for safe, secure, and permanent storage.

CAPTURE

Through CCUS, CO_2 is captured from industrial processes by separating the CO_2 from other gas within the stream of emissions. There are four methods for separating CO_2 from other gas during industrial processes, including absorption, adsorption, membranes, and cryogenic processes. The oil and gas industry has extensive experience in separating CO_2 from hydrocarbons and is uniquely positioned to deploy capture technologies. The Gulf Coast, with its network of industrial centers and facilities, presents a significant opportunity for carbon capture.

TRANSPORT

Once captured, it will generally be necessary to transport the CO_2 to the location where the CO_2 will either be stored or used. Pipelines are recognized to be the most cost-effective means for transporting CO_2. Prior to shipment by pipeline, the CO_2 is converted into a fluid so that the CO_2 can be pumped like other liquids for ease of transportation. Other methods of transportation include railcars, trucks, ships, and barges. The Gulf Coast with its robust network of pipelines and energy transport expertise is well situated for the transport of CO_2 for use or storage.

USE

While the prevalent application of CCUS may be permanent storage, there are other valuable commercial uses for CO_2. This includes the application of technologies to convert CO_2 into products like fuels, chemicals, and materials. This is accomplished through chemical reactions or biological conversions such as thermochemical CO_2 conversion, electrochemical and photochemical CO_2 conversion, carbon mineralization of CO_2, and biological CO_2 use. The conversion of CO_2 to useful products presents a tremendous technological opportunity for future maturation and growth. Also, a common application for CCUS today is for enhancing oil recovery (EOR) by injecting CO_2 into oil-bearing reservoirs for increasing oil production. Some of the injected CO_2 remains trapped—or stored—within the formation, while some of the CO_2 is recovered with the produced oil and re-injected into the same formation for storage.

STORAGE

CO_2 storage involves the injection of CO_2 into subsurface geologic formations either onshore or offshore. Subsurface geologic formations must have sufficient pore space to hold CO_2 (defined as porosity) in commercial quantities, as well as pathways within the pore space (defined as permeability) so that the CO_2 can be injected throughout the storage reservoir. The formation must also have a seal of non-porous, impermeable rock to prevent the CO_2 from escaping the formation. Finally, the formations must be at the appropriate depths to ensure effective and efficient storage. The Gulf of Mexico, in waters under both state and federal jurisdiction, presents a significant CO_2 storage opportunity because of its recognized geologic capacity for long-term storage of CO_2 (i.e., high porosity, high permeability, and a good seal to maintain containment).

THE CCUS OUTLOOK

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. Most projects to date have included an EOR component, and the U.S. is now well positioned to lead in CO_2 storage projects in the offshore region. According to the National Petroleum Council, the U.S. has become a world leader in CCUS by:

- Executing successful CO_2 capture projects
- Investing in CO_2 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. Improvements must be made in U.S. laws and regulations to foster growth and enable success in U.S. CCUS.

NOIA POLICY RECOMMENDATIONS

The legislative and regulatory changes below provide a reasonable, effective roadmap for promoting the build-out of the U.S. CCUS sector. Some of the recommendations come directly from the National Petroleum Council, which is a federally chartered advisory group comprised of balanced representation from the oil and natural gas industry and from consumers, states, Native Americans, academic, financial, research, and public interest organizations and institutions.

1. The U.S. Department of the Interior and individual states should, respectively, promptly promulgate regulations to authorize access to and use of pore space for geologic storage of CO_2 in federal and state waters.
    a. Interior should establish clear lease terms, processes, and regulations to enable access to pore space in federal waters.
2. The U.S. Department of the Interior should take the lead in promptly completing necessary reviews under the National Environmental Policy Act for approvals of CCUS projects in the Gulf of Mexico, including leases and rights-of-way. Interior should coordinate a whole-of-government approach to confirm that all agency actions in the federal family are covered by NEPA review to the extent required by law.
3. Congress should amend Section 45Q to eliminate the deadline for starting construction, extend the duration of credits, lower the CO_2 volume threshold, and increase the value of credit for storage and use applications.
4. As recommended by the NPC, the combined incentives need to reach a level well above the current credit amounts under Section 45Q.
5. Congress should provide grant funding to help develop infrastructure to support the development of the CCUS sector in the Gulf of Mexico and along the Gulf Coast.
6. Congress should amend existing appropriations language to allow for all CO_2 sources and fuel types in the allocation of RD&D funding for CCUS.
7. The Administration should create a CO_2 infrastructure working group made up of relevant federal and state regulatory agencies and interested stakeholders to study the best way to harmonize the federal, state, and local permitting processes; grant access; administer eminent domain authority; facilitate corridor planning; and possibly coordinate tariffs.
8. The Administration should convene an industry and stakeholder forum to consider liability issues.
9. State and federal leaders should publicly embrace and promote offshore CCUS and the role it will play as a climate solution and economic stimulator, including the expansion of state level credits. The efforts of policy makers should seek to educate the public and build confidence in the emerging role of CCUS as a safe and secure means of managing emissions.

For a deeper look at CCUS and NOIA policy recommendations for CCUS visit noia.org/ccus

OFFSHORE CARBON CAPTURE AND SEQUESTRATION

NOIA-OOC OFFSHORE CCS SYMPOSIUM

In June 2022, NOIA and the Offshore Operators Committee (OOC) held an in-depth offshore carbon capture, use, and storage symposium in Houston, Texas. 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. Topics discussed included an overview of CCUS opportunities for the full supply chain, geologic, downhole and monitoring considerations, and lessons from major international projects.

The full day event was kicked off by Tim Duncan, President & CEO of Talos Energy, who gave insight to how Talos Energy – and similar companies - could apply the Gulf of Mexico exploration and production skill set to offshore CCS. Thomas Manuel Ortiz, Ph.D., P.E., of the Texas General Lands Office also delivered a keynote address to offer the audience insight on how the state government of Texas was thinking about offshore carbon sequestration and how other regulatory agencies should be thinking about the emerging industry.

Following the remarks by Duncan and Ortiz, the symposium progressed through different offshore CCS subjects areas, with discussions led by subject matter experts:

- **From Capture to Storage: Overview of the CCUS Opportunity for the Full Supply Chain.** The conversation was led by Alexi Vyssotski, GM of Carbon Capture for Chevron, and Assad Mohanna, Senior Director of Low Carbon Solutions for NOV. Alexi and Assad gave a detailed look the shared goal of enabling CCUS at scale in the Gulf of Mexico. They also discussed proposed CO2 lease lifecycle phases and what relevant regulatory regime could potentially look like.

- **Geologic, Downhole, & Monitoring Considerations**. This session was led by Dr. Ganesh Dasari, Technical Team Lead for ExxonMobil, Katja Akentieva, VP New Ventures & Business Development of TGS, and Nikhil Joshi, Director of Innovation & Technology of Talos Energy. These speakers addressed the role of geophysical companies and technologies within the CCS lifecycle. They also spoke about the geological challenges which are known and well understood and which ones still need to be solved. They also discussed technologies for mitigating C02 leakage as well as other mitigating measures for subsurface challenges.

- **Lessons from Major International Projects**: The session leaders were Damian Lynch, Leading Geophysicist of Equinor, and Hernan Silva, CCS Project Director for Continental Europe TotalEnergies. Damian and Hernan gave a look at several case studies, including the Equinor Sleipner project offshore Norway and the TotalEnergies Aramis system in the Netherlands. Damian and Hernan looked that development and performance of these projects, the supporting regulatory structure of the host nations, and financial considerations the companies have learned as they have brought these projects to maturity.

- **Government Regulator Panel & Discussion**: There was a regulator-led session to provide attendees an outlook at what stakeholders could expect from the federal government. In November 2021, the Bipartisan Infrastructure Framework passed Congress, setting of a deadline for the Department of the Interior to promulgate the first U.S. federal offshore CCS regulations. This discussion was led by Mike Celata, Regional Director of the Gulf of Mexico Region for the Bureau of Ocean Energy Management (BOEM), and Stacey Noem, Chief Office of Offshore Regulatory Programs (OORP) of the Bureau of Safety & Environmental Enforcement (BSEE).

OFFSHORE CARBON CAPTURE AND SEQUESTRATION

NOIA ENGAGEMENT WITH FEDERAL GOVERNMENT TO ADVANCE CCS

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. Improvements must be made in U.S. laws and regulations to foster growth and enable success in U.S. CCUS. NOIA, partnering with the Offshore Operators Committee, has engaged with the federal government to advance a leasing, permitting, and regulatory systems that will attract investment to the U.S. for offshore CCS project development. This includes working directly with the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement in the development of the regulations to authorize leasing and permitting of carbon sequestration in the U.S. outer continental shelf.

NOIA also submitted recommendations to the White House Council on Environmental Quality in response to a request for comment seeking assistance to federal agencies for regulating and permitting CCS. NOIA provided various constructive recommendations for streamlining the red tape that occurs when multiple agencies have regulatory oversight. NOIA emphasized:

> *This Administration has an opportunity to set the stage for a 21st century in which carbon is responsibly captured and transported for long-term geologic storage or even beneficial use. The offshore, and particularly the Gulf, present one of the most logical opportunities in the United States, but it will be dependent upon thoughtful regulations and careful coordination among governing agencies. We stand ready to help make it a reality and applaud the Biden Administration for stepping up to the plate.*

NOIA also played an important leadership role in representing the interests of the industry with NOIA President Erik Milito testifying before the House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, in a hearing entitled “The Opportunities and Risks of Offshore Carbon Storage in the Gulf of Mexico” on April 28, 2022. In his testimony, Erik made clear:

> *This Administration has an opportunity to set the stage for a 21st century in which carbon is responsibly captured and transported for long-term geologic storage or even beneficial use. The offshore, and particularly the Gulf, present one of the most logical opportunities in the United States, but it will be dependent upon thoughtful regulations and careful coordination among governing agencies. We stand ready to help make it a reality and applaud the Biden Administration for stepping up to the plate.*

NOIA ESG WORKSHOP - MARCH 2022

The NOIA Environmental, Social, & Governance (ESG) Network held a workshop, hosted by Kosmos Energy, in March 2022. Attendees heard from presenters on approaches for achieving emissions reductions in operations, best practices for employing minority owned contractors, and trends and considerations for ESG reporting.

Environmental Stewardship Block

This block tackled approaches to reducing emissions from offshore facilities. Giving a deep look at industry examples, Tim Hejin, VP Business Development & Strategy of TotalEnergies E&P USA, and Kyle Golston, Asset Manager – Exploration and Production International – U.S. for Equinor, discussed with the audience how their companies were innovation new ways to lower emissions. These methods ranged from reducing flaring and venting, introducing more electrification offshore, as well as developing behavior and efficiency gains.

Social Responsibility Block

The second block of the day discussed best practices for employing minority contractors. This panel discussion was led by: Sang Truong, Supply Chain Manager North America Operations for Schlumberger and leads Schlumberger's Supplier Diversity Initiative; Lee Jackson, Chairman and CEO of Jackson Offshore; Shona Mathie, General Manager of Supply Chain for Deepwater Americas for Shell. Jennifer Medcalf, President of The REACH Group, moderated the panel. The panelists discussed how companies could find new opportunities to expand their supplier portfolios as well as how to grow suppliers and help them scale up to meet future business needs.

Corporate Governance Block

The final session of the day examined trends and considerations for ESG reporting. Dan Romito, Director of ESG Strategy & Integration of Pickering Energy Partners, presented to NOIA members on this important issue. Dan gave a valuable context to the rise of ESG metrics, especially as they related to the world of finance, and what companies can and should be doing to tell their positive message. Dan also discussed the potential scope and scale of future ESG reporting requirements, in the U.S. and abroad.

NOIA SUBMITTED COMMENTS ON SEC CLIMATE CHANGE DISCLOSURE RULE

NOIA submitted comments on the U.S. Security & Exchange Commission (SEC) Proposed Rule on climate-related disclosures. NOIA received extensive input on the original draft and we worked to accommodate the member feedback into the final document. Significant revisions were made to the original draft and the final comments are intended to create as much alignment as possible across the broad NOIA membership. NOIA worked through the ESG Committee and Climate Policy Workgroup in the development of the comments, which were also shared with the Government Affairs Committee.

In short, the theme of NOIA's comments is best conveyed by this line from the document:

> *In terms of the proposed rule, "The Enhancement and Standardization of Climate-Related Disclosures for Investors," we recommend that the Commission modify the rule to instill greater clarity, certainty, and predictability for the regulated community, and to further the collective goals of the industry and the government in addressing climate change and providing meaningful transparency to the investment community.*

NOIA provided a list of specific recommendations to the SEC for improving the proposal:

- Definition of "climate-related". The definition of "climate-related" in the proposal is vague and the final rule should provide greater certainty around the definition. The rule must provide a definition with sufficient scope for clear and consistent disclosures, and the definition should be clearly tied to the financial materiality standard.
- Quantification of climate-related impacts. In addition to adhering to the materiality standard, the final rule should provide clarity on the expectations for quantification of climate-related impacts. In other words, there should be little uncertainty within the regulated community about the scope, methods, and formats for quantifying and reporting of climate-related impacts that are financially material.

- Materiality threshold. The one percent threshold per line item for including climate-related financial impacts is significantly lower than a typical materiality threshold not specifically tied to a line item. The final rule should align with the traditional standard.
- Safe harbors. The SEC should enhance and strengthen safe harbor protections in the Proposed Rule and should ensure that safe harbor protections apply to third party data sources, including data from contractors, project partners, and other companies relied upon to provide emissions data. The SEC should also consider the issuance of guidance related to the use of third-party data and the associated applicability of a safe harbor.
- Transition plans. There is questionable value in the requirement to disclose "transition plans." This type of information is generally recognized as internal and deliberative. Such information often includes sensitive and competitive data. As such, the requirement to disclose this information could result in a chilling effect on companies attempting to make progress in mitigating climate impacts. This in turn could stifle innovation and the deployment of technologies and best practices. The SEC should reconsider this requirement and the scope of required information related to this proposed provision to avoid these implications.
- Location of properties, processes, or operations subject to physical climate risks. The specific description of properties, processes, or operations raises critical security and competitive concerns. The energy industry has vast amounts of critical infrastructure and great care is given to the protection of information related to location, processes, and operations in an effort to promote the highest levels of security for the protection of the entity as well as the public. Also, the location of assets is often an inherently competitive data point that deserves confidentiality. The SEC should reconsider these proposed requirements and ensure that the final rule does not sacrifice security or competitive information in any way.
- Demonstration of director expertise in climate-related risks. The SEC should provide greater detail and guidance in order to help registrants determine whether directors meet the criteria for qualifying as a climate expert.

In closing, NOIA reiterated that "NOIA and the full diversity of its membership are committed to the advancement of principles of innovation, conservation, efficiency, resiliency, mitigation, adaptation, and best practices that must be part of a systematic approach to addressing the climate challenge, and we share a commitment to a high standard of corporate citizenship and continuous improvement in climate and ESG performance."

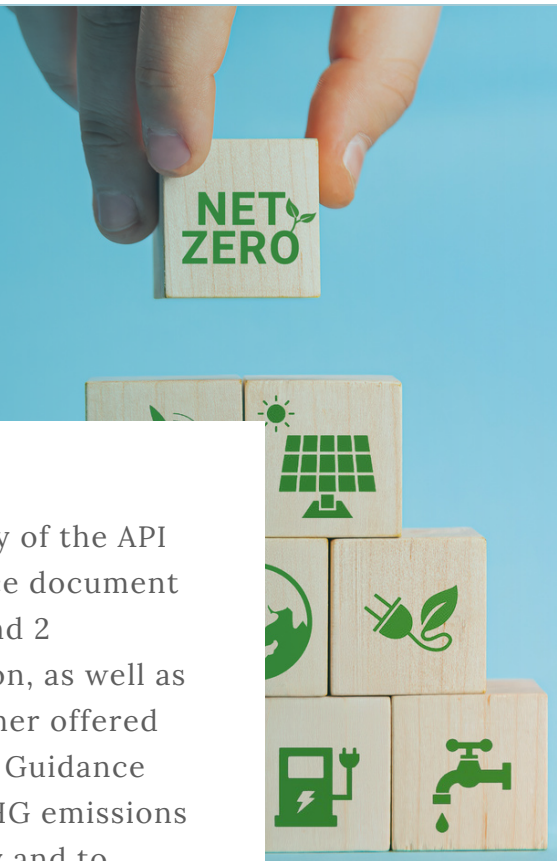
JOINT NOIA-OOC WEBINAR

UNDERSTANDING GHG REPORTING FRAMEWORKS

In November 2022, NOIA and the Offshore Operators Committee (OOC) held the interactive virtual forum, Understanding GHG Reporting Frameworks. The webinar tackled both voluntary and US Environmental Protection Agency (EPA)-mandated greenhouse gas emissions reporting frameworks. The first of the two-session forum brought in GHG reporting and framework experts to give an overview of the current landscape and to offer where key frameworks are heading. The first panel was made up of Neil Stewart, Director of the IFRS Foundation, Chris Merker, Director of Private Asset Management at Robert W. Baird & Co. and Director of the Sustainable Finance and Business program at Marquette University, and Grace Lacher, API Policy Analyst.

Chris Merker offered NOIA and OOC members map out the frameworks and bodies associated with GHG reporting framework as well as provided insight to the likely thought process of the U.S. Securities and Exchange Commission (SEC) as it develops its climate-related financial disclosures regulations. Merker also discussed how companies can and should implement their future strategy towards the increasingly complex world of ESG reporting.

Underpinning how most of the global regulators understand GHG reporting, Neil Stewart discussed progress made by the International Sustainability Standards Board (ISSB) and next steps. Stewart discussed how the ISSB is mapping ESG risks and opportunities within specific industries, including the energy sector. But more input is needed on industry-based standards, which may be finalized during the second half of 2023. In addition, Stewart underscored several reasons why companies should prepare for IFRS Sustainability Disclosure Standards.



Grace Lacher provided the audience with a case study of the API Guidance Document for GHG Reporting. The Guidance document prompts for data on absolute and intensity Scope 1 and 2 emissions, absolute Scope 3 emissions, GHG mitigation, as well as indications of additional climate-related targets. Lacher offered insight to the key features and metric tracking of the Guidance while emphasizing this is a living process, and any GHG emissions tracking process is only as good as its ability to verify and to adapt to changing reporting boundaries.

The second panel of the forum brought in subject matter experts from the EPA to lead a workshop with NOIA and OOC members on the EPA GHG Reporting Program. Mark DeFigueiredo, USEPA Climate Change Division -Subpart W, and Mike Hannan, USEPA Greenhouse Gas Reporting Program - Subpart C, led the workshop.

Providing valuable context to GHG Reporting Program, DeFigueiredo and Hannan went into more detail about Petroleum and Natural Gas Systems (40 CFR Part 98, Subpart W) and General Stationary Fuel Combustion Sources (40 CFR Part 98, Subpart C). They went into detail about the software EPA uses and how users can improve data quality before users submit to the EPA. They also showed various ways users could help improve data quality. DeFigueiredo and Hannan ended the session by reviewing the proposed amendments to the EPA GHG Reporting Program, which were published in June 2022.


NOIA
America's Offshore Energy Industry
LEARNING
&
COLLABORATION
Sessions

NOIA Fall Meeting Session

STATUS & RECENT DEVELOPMENTS ON OFFSHORE CARBON STORAGE

Dr. Tip Meckel, Senior Research Scientist and geologist at the Bureau of Economic Geology for the University of Texas at Austin, spoke on the outlook for offshore carbon capture and storage (CCS) at the NOIA Fall Meeting.

"This 'Energy Transition' is more of an evolution," Meckel began. It will be a long, incremental process to get from A to Z. In Meckel opinion, 'transition' is not so much about energy sources and mix, but about evolving focus on carbon intensity and where to achieve big emissions reductions quickly. "CCS is a big hammer in the low-carbon toolbox," he said.

Meckel talked about how the CCS business is evolving, and how more money is being put into capturing carbon right now. He reviewed storage options, telling NOIA members that companies "have already done a lot of CCS globally," and the U.S. offshore is in a position not only to catchup, but to lead.

Future CCS at-scale will have to be an offshore business, Meckel said. The U.S. Gulf of Mexico, and the part of the country along the Gulf Coast, is where he believes the U.S. CCS hub will happen. The Gulf Coast provides 75% of annual storage capacity. "This is the end game for national policy and we'll win," he said. "We're good at it." Meckel also can see a future where the US takes on CCS for countries around the Caribbean basin.

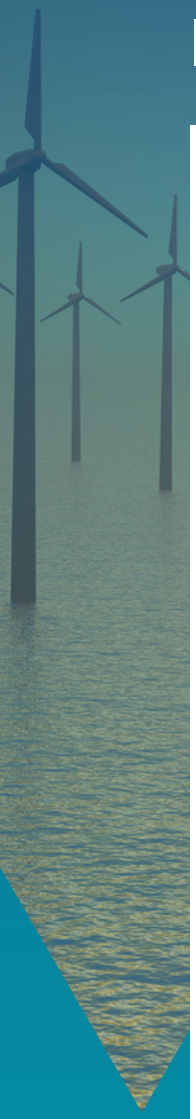
Meckel listed several reasons why offshore is better, including better speed and more space, data availability, fewer and younger legacy wells, and being able to avoid US drinking water. "The geology in the Gulf is phenomenal," he said.

Meckel gave a brief overview of the Inflation Reduction Act of 2022, stressing that it's all carrots and no sticks, at least for federal policy regarding CCS. Though CCS is very significant, it's not the main element in the IRA by far. He reminded us that CCS is bipartisan - both parties agree on the need. He went into some details on benefits of the IRA as well as what was left out. "The carrot has never been bigger," he stressed.

To summarize, the global offshore continental margins represent the best near-term opportunity for Gigatonne-scale CCS. This resource is available to many of the largest emitting countries. The Gulf of Mexico is ideal geologically and geographically. The CCS experience is mature and can deliver needed scales on needed timeframes. Federal legislation and funding are at unprecedented levels. CCS is a major growth opportunity for the offshore industry, Meckel concluded.

NOIA Annual Meeting Session

OFFSHORE WIND: A NEW OPPORTUNITY IN OCEAN ENERGY



Kris Ohleth, executive director of the Special Initiative on Offshore Wind, gave an exciting outlook about the investment and supply chain associated with the growing U.S. offshore wind industry and the ability of the industry to coexist with other oceanic stakeholders.

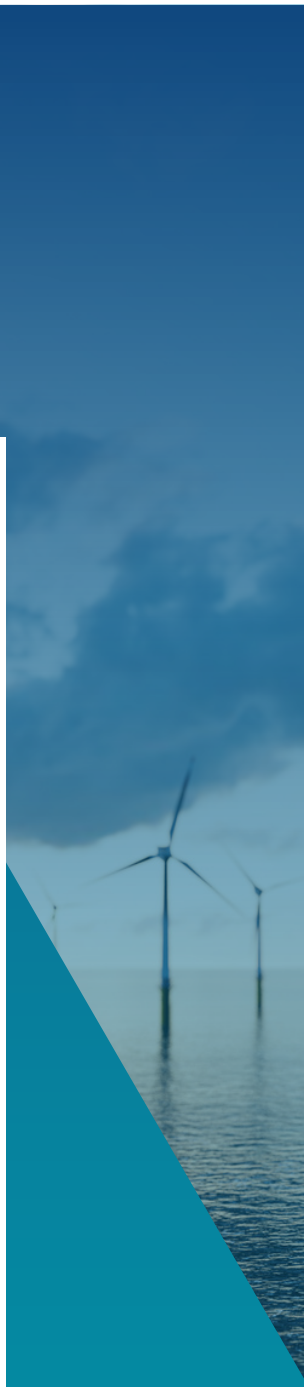
One thing the organization has found, though, is the utility and benefit of offshore wind.

“One of the great things about offshore wind is, you can put it pretty much so far offshore that it can’t be seen – the turbines, that is,” she said. “You bury the cables so they have minimal interactions with the fishing community or other marine uses, and then the cables are buried when they come to shore so…we’re really trying to have a low impact on coastal communities.”

Currently, the U.S. has a national target of 30 GW by 2030. There are currently 42 MW operating.

“We have a long way to go in eight years, but I do feel that with all the dedication and energy and excitement here and otherwise, we are still able to meet that 30 GW goal, and the industry is really excited about charging forward,” she said.

The Gulf of Mexico is also a hot spot for potential development, and BOEM is currently accepting comments on potential development there. Environmental groups are voicing concerns regarding possible interruption of avian migratory trails in the Gulf, so that is being investigated, as well.



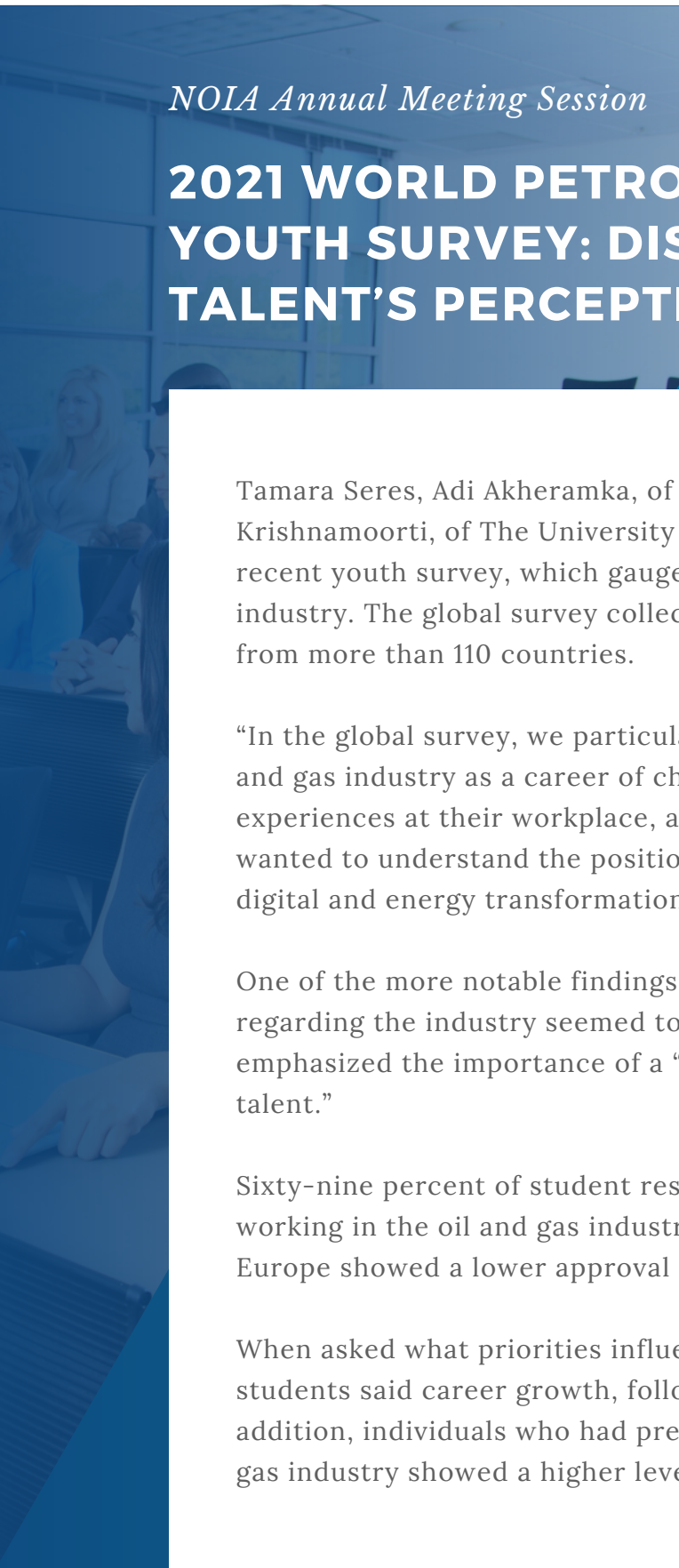
However, she said, she thinks “the potential is there [and] the industry is there.”

The economic and environmental benefits, as well as the positive impact on climate change and investing in a reliable energy supply, make offshore wind an attractive option for renewable energy. Specifically financially, the offshore wind pipeline boasts the potential of almost $110 million in revenue over the next ten years. However, challenges do exist. Supply chain constraints and interconnection, as well as stakeholder issues, complicate the production of this resource.

Ohleth also noted that the costs of offshore wind have dropped quite a bit – 60 percent in the last five years in Europe. This is due to technology development, refined supply chain and, in the U.S., a pipeline that assures payoff of supply chain investments.

Ohleth finished her lecture by ensuring that the idea that has circulated via news outlets that there is a correlation between inflation and clean energy is “just not true,” but said that this purported relationship is “being conflated in popular dialogue.”

“Right now the Special Initiative is doing some work to show those proof points about the cost of wind falling and really being an opportunity for our country as opposed to being a potential threat to our country,” she said.



NOIA Annual Meeting Session

2021 WORLD PETROLEUM COUNCIL YOUTH SURVEY: DISSECTING THE TALENT'S PERCEPTION OF THE INDUSTRY

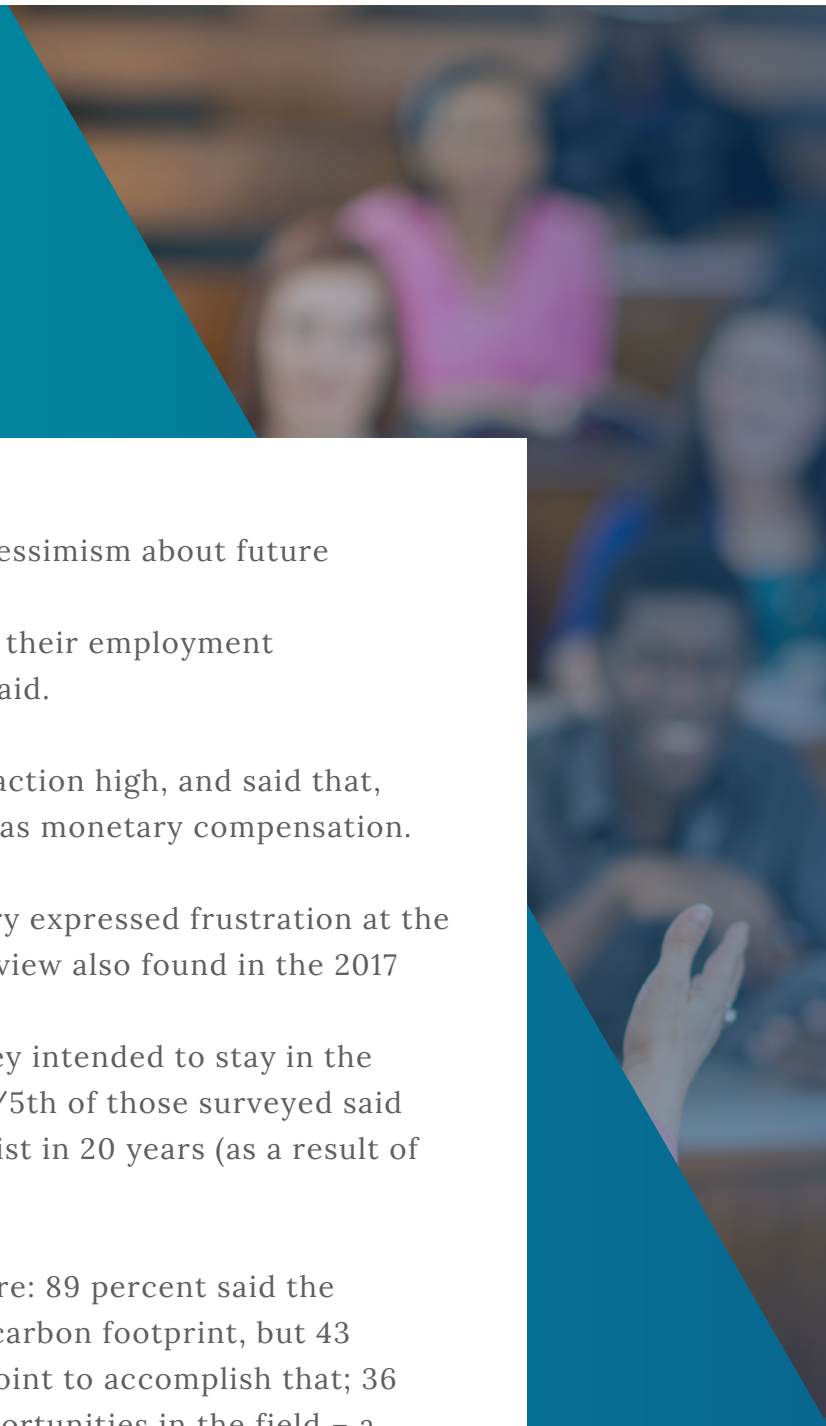
Tamara Seres, Adi Akheramka, of the World Petroleum Council, and Dr. Krishnamoorti, of The University of Houston, shared the findings from WPC's recent youth survey, which gauged respondents' views on the oil and gas industry. The global survey collected responses from more than 5,600 people from more than 110 countries.

"In the global survey, we particularly looked into the attractiveness of the oil and gas industry as a career of choice. We wanted to understand respondents' experiences at their workplace, and their workplace preferences, and we wanted to understand the positioning of oil and gas in the global, geopolitical, digital and energy transformations," said Seres, who led the presentation.

One of the more notable findings of the study, she said, was that views regarding the industry seemed to be very similar across different regions. This emphasized the importance of a "consistent approach to attract and develop talent."

Sixty-nine percent of student respondents and job seekers said they'd find working in the oil and gas industry attractive. Notably, North America and Europe showed a lower approval rating of the industry than other regions.

When asked what priorities influence their selection of a job, 56 percent of students said career growth, followed by salary and personal development. In addition, individuals who had previously had direct contact with the oil and gas industry showed a higher level of interest in it.



Generally, the survey exposed a sense of pessimism about future prospects.
“A striking 80 percent of students felt that their employment opportunities had been jeopardized,” she said.

Employed individuals rated their job satisfaction high, and said that, unlike students, their driving motivation was monetary compensation.

Young employees in the oil and gas industry expressed frustration at the lack of career visibility and progression, a view also found in the 2017 survey.
Though 69 percent of respondents said they intended to stay in the industry for more than ten years, almost 1/5th of those surveyed said they didn’t think their workplace would exist in 20 years (as a result of the energy transition), Seres said.

Other notable findings from the survey were: 89 percent said the industry would need to greatly reduce its carbon footprint, but 43 percent said it isn’t doing enough at this point to accomplish that; 36 percent said women do not have equal opportunities in the field – a notion shared by male and female respondents alike; and 57 percent said they felt the industry would become obsolete due to the energy transition.

Overall, the panel agreed, it will be important to demonstrate the longevity of the oil and gas industry for current and future employees.

NOIA Fall Meeting Session

THE FUTURE OF HYDROGEN FOR THE GULF COAST

During the NOIA Fall Meeting, NOIA held a session on the outlook for hydrogen development in the U.S. Gulf of Mexico. McKinsey & Company Partner Kassia Yanosek led the session on hydrogen, which is an energy segment innovating as fast or faster than other sectors, which examined myths and realities associated with hydrogen and the energy transition.

Myth #1 is that the world will be net-zero soon, with hydrogen and renewables replacing gas and oil. The reality is that the energy transition will occur incrementally over 30+ years, with slow but steady H2 growth, and steady growth in gas and oil. “Global oil demand continues to grow in this decade in all scenarios, and remains a crucial part of the energy mix,” Yanosek noted.

Myth #2 is that the so-called “hydrogen economy” is just a passing fad that will never happen. The reality is that it’s real and is already beginning. It could accelerate based on incentives in the Inflation Reduction Act. “One of our clients is building H2 hubs,” she said. She pointed out that hydrogen offers many industrial uses and decarbonization solutions which could drive growth. She discussed the differences in hydrogen production types, and how we will be moving more into green and blue low-carbon production, supplanting gray, depending on the region and resources.

She shared that the value chain offers many entry points with potentially $1.9 trillion to be invested through 2050 in the H2 economy. The primary barriers to growth are related to infrastructure, supply chain, technology hurdles, and how quickly we can scale. She mentioned that the US Gulf Coast has the potential to form major H2 hubs combining production, distribution and storage, end use, and export.

Myth #3 is that the hydrogen economy will be easy to implement across industrial and transportation uses. In reality, significant technological and infrastructure hurdles need to be addressed over the coming decades. Yanosek pointed out three enablers which are needed to unlock the hydrogen economy: infrastructure and supply chain development; technological advancements and manufacturing scale-ups; and government support. “The Inflation Reduction Act will help in the next ten years,” she said. “But we need international cooperation.”

Myth #4 is the perception that the Gulf of Mexico is an aging basin with nothing to offer the energy transition. In reality, deepwater Gulf of Mexico production is growing, as both America and the world need the uniquely low-carbon, secure, and cost-effective energy provided by Gulf of Mexico oil production. “Yes, shale is quick and easy,” Yanosek said. “But the Gulf of Mexico is like Beverly Hills.” She pointed out that the emission intensity of Gulf of Mexico oil production is among the lowest in the world.

In her conclusions, Yanosek reiterated that the H2 economy is developing and could accelerate based on incentives in the IRA. The USGC and surrounding region will be a natural “hub” given infrastructure/port access and supply chain access. Importantly, activity in deepwater Gulf of Mexico is growing given the attractiveness of low cost, low carbon intensity barrels. Without continued Gulf of Mexico development, oil demand will be met by regions with higher carbon intensity, increasing overall global emissions.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NOIA
ESG
Awards
ESG EXCELLENCE
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SAFETY IN SEAS

The Inaugural

NOIA ESG EXCELLENCE AWARD:

vallourec

The National Ocean Industries Association named Vallourec as the winner of the inaugural NOIA Environmental, Social, & Governance (ESG) Excellence Award. The NOIA ESG Excellence Award highlights and recognize those who, by their actions, design, or influence, are contributing to the advancement of the ideals embodied by the NOIA ESG Principles and the NOIA Climate Change Principle.

NOIA President Erik Milito congratulated Vallourec, saying, “The offshore industry is an essential component of an energy system that serves to lift society. Vallourec is a reflection of how NOIA membership strives to be the best neighbor while supporting the development of all forms reliable, responsible, and affordable domestic energy supplies. We congratulate Vallourec on their well-earned recognition and thank all the entrants. The NOIA ESG Excellence Award highlights just one part of the cycle of innovation and improvement our industry embraces.”

Vallourec is recognized for the NOIA ESG Excellence Award through their strong commitment to ESG performance. They have deployed a holistic approach that is supported across the organization. The Vallourec ESG roadmap is a proactive approach that prioritizes measurable, third party validated impacts and targets, communication with employees and stakeholders, building trust with communities, along with teamwork and innovation.

Bertrand Frischmann, Senior Vice President, Vallourec North America says, “We are honored to be recognized as the first recipient of NOIA’s Environmental, Social and Governance Excellence Award. This award demonstrates our long-standing commitment to the principles of ESG and our continued pledge to ensure we are doing the right thing for our environment, our communities, and our employees.”

NOIA President Erik Milito with Amy Paff, Jeannie Hill, Gary Hauck, and Nick Mawford of Vallourec at the 2022 NOIA Fall Meeting

The award-winning entry from Vallourec 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.

2022 marked the first year of the NOIA ESG Excellence Award competition. The NOIA ESG Excellence Award competition is open to any offshore service or supply company that is in good standing with NOIA. The NOIA ESG Excellence Award competition was open to any offshore service or supply company that is in good standing with NOIA. Judges will be conducted by an independent panel of industry and ESG experts, consisting of:

- Scott Cameron, Independent Consultant & former Member of the NOIA Board of Directors
- Alanna Fishman, Managing Director, FTI Consulting
- Brent Greenfield, Vice President & Counsel, Cornerstone Government AffairsDan Romito, Partner, Pickering Energy Associates

2022 NOIA SAFETY IN SEAS AWARDS:

AKER SOLUTIONS & TECHNIPFMC

TechnipFMC and Aker Solutions were the winners of the 2022 NOIA Safety in Seas Awards competition. TechnipFMC was the 2022 NOIA Safety in Seas Culture of Safety Award winner and Aker Solutions was recognized for the 2022 NOIA Safety in Seas Safety Practice award.

The Culture of Safety Award honors overall organizational immersion in and commitment to safety, which has resulted in remarkable, measurable, and sustained safety performance over a prolonged period of time. The Safety Practice Award recognizes specific technologies, approaches, methods, or projects with direct and demonstrable impacts on improving safety.

Culture of Safety Award: NOIA President Erik Milito presents the award to Sock Hwang Lim, Christina Hudson, and Jonathan Landes of TechnipFMC.

TechnipFMC was recognized for the Culture of Safety Award for their Pulse and Impact Quality programs. Impact Quality focuses on leadership behaviors that drive a culture of prevention, accountability, and continuous improvement. Pulse is the company's global Health, Safety, Environment, & Security (HSES) culture and engagement program. Through training, self-assessment, and communication, Pulse provides TechnipFMC with the skills, tools, and behaviors needed to maintain and strengthen HSES culture. Since its launch in 2018, the Pulse and Impact Quality programs have engaged more than 6,000 internal and external stakeholders and the Total Recordable Injury Rate (TRIR) has declined from 0.44 to 0.26.

Safety Practice Award: NOIA President Erik Milito presents the award to Jim Altieri of Aker Solutions.

Aker Solutions was recognized for their Control of Work program. The new program was developed to allow for each Aker Solutions segment and functional area to be graded throughout the year on implementation and adherence to the use of Safe Working Essentials tools. A key aspect of the program is encouraging the use of Stop Work Authority in an effort to support continuous safe operations. Between 2020 and 2021, Aker Solutions' US operations saw a 92% increase in Stop Works, initiated from all areas of manufacturing, offshore services, maintenance, engineering, office personnel and contractors. This significant increase in Stop Work usage across the entire value chain demonstrates strong employee ownership of HSSE performance and, moreover, a culture of proactive risk identification across the business.

During the 2022 NOIA Fall Meeting, Christina Hudson, Director of OneExcellence TechnipFMC, presented TechnipFMC's award winning entry. Jim Altieri, Senior HSSE Manager Aker Solutions, Subsea US, also presented on behalf of Aker Solutions. The award-winning entries from TechnipFMC and Aker Solutions were evaluated by an independent panel of judges from the U.S. Coast Guard, the Bureau of Safety and Environmental Enforcement, the National Academy of Science's Transportation Research Board, and two industry safety consultants. NOIA has held the SIS awards competition since 1978 to recognize those who contribute to improving the safety of life in the offshore energy industry. The awards are sponsored by Compass Publications.


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America's Offshore Energy Industry

INFLATION REDUCTION ACT ADVOCACY

NOIA SECURES SWEEPING OFFSHORE ENERGY POLICY WINS IN HISTORIC INFLATION REDUCTION ACT

The passage of the Inflation Reduction Act (IRA) was a major accomplishment for NOIA, elevating the association to a high level of success in advocacy in Washington, D.C. The legislation includes landmark provisions that serve to help protect and preserve continued oil and gas leasing. Continued leasing in the Gulf of Mexico strengthens the outlook for continued low carbon oil and gas production. Without new access, energy consumers will have to look elsewhere – often to higher emitting regions.

Key provisions in the IRA include:

Offshore Oil & Gas

- Lease Sale 257 is reinstated and high bidders must get their leases.
- A new royalty minimum offshore of 16.66%, with a maximum of 18.75%.
- Lease sales 258, 259, and 261 must be held. A timeline for the lease sales was established as well. Lease Sale 258 would occur no later than December 31, 2022, Lease Sale 259 would occur by March 31, 2023, and Lease Sale 261 by September 30, 2023.

Offshore Wind:

- The offshore wind leasing moratorium in the Southeastern US and Eastern Gulf of Mexico is lifted.
- There is an increase in staffing money for BOEM and NOAA.
- Extension of Production Tax Credits (PTC) and Investment Tax Credits (ITC) for offshore wind.
- New tax credits for offshore wind vessels.
- OCSLA is amended to allow for wind lease sales offshore U.S. territories.

Carbon Capture & Storage:

- Increases the federal 45Q tax credit to $85/ton if wage/apprenticeship requirements are met and construction commences before January 1, 2033.
- Direct pay is available for the first five years after the project is placed in service. There is no direct pay for the final seven years except for nonprofits and co-ops, which can receive all 12 years.

A reporter from the Houston Chronicle said that NOIA pulled off an "oil and gas coup" with this legislation. Every Democrat currently in Congress is now on record for voting for legislation that mandates Gulf of Mexico oil and gas leasing in the near term and provides incentives for lease sales in the long term. NOIA was the only lobbying group representing oil and gas interests achieving its objectives with the final passage of the bill.

While media reports expressed surprise at the Manchin deal, NOIA's policy-oriented engagement with Senator Manchin and his office put NOIA in a unique position to advocate on behalf of the U.S. offshore energy sector and NOIA membership. In May 2022, NOIA sent a private letter to Senator Manchin and his staff requesting specific legislative action related to Lease Sale 257 and continued offshore leasing. NOIA executives then met with Senator Manchin just one week before the announcement of the deal on the IRA.

NOIA worked tirelessly to educate Senator Manchin, other Members of Congress, and key Congressional staff on the economic and environmental advantages of U.S. offshore production, including the small operational footprint and low emissions intensity.

PARTICIPATION **PLEDGES**

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

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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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