

# Oil and Gas Investor

THE OGINTERVIEW

## SMALL WONDER

Surrounded by Investment Bank Goliaths, Petrie Partners Stands Tall

**BEHIND  
THE DEAL**  
The XOM-PXD Merger

**US LNG**  
Powering Energy  
Development in Vietnam

**MOVING  
THE NEEDLE**  
NOV Improves Rig Safety

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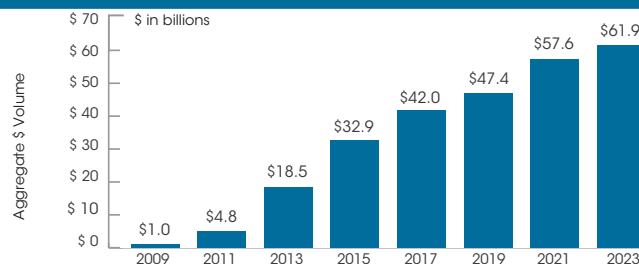
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Violeta Alvaraz captured the image of Petrie Partners CFO Mike Bock, CEO Jon Hughes and COO Andy Rapp at Hart Energy's Houston office.

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The 2024 event schedule is designed to focus on the topics you want to hear about and to make scheduling your year even easier. We've decreased the number of events and pumped up the amount of content to make them larger, more informative and more engaging.

Save these dates and start planning your 2024 event schedule now!

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UNDER  
**40**

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# Feds Take Aggressive Posture on Oil, Gas Consolidation



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In December, the U.S. Department of Justice (DOJ) and U.S. Federal Trade Commission (FTC) released updated merger guidelines, which had been in the works since the beginning of 2023. The guidelines offer a view of what these agencies will consider as they examine the evidence of a deal and how that evidence may be persuasive one way or the other. One of the boundaries set in the December filing is that any combined market share greater than 30% is potentially problematic.

"That's a very aggressive posture toward any potential deal," Jeffrey Oliver, a partner in the Washington, D.C. office of Baker Botts, told me. "It's been decades or longer since any court has found a problem with a deal in which the combined shares are 30%, the shares almost invariably have to be much higher than that for there to be a viable antitrust claim."

It doesn't mean that a deal resulting in a market share of 30% or more will be blocked; it simply indicates the agencies want dealmakers to know they are now concerned about deals within that ballpark.

Questions of market share have always driven antitrust law because it has always been the best indicator and the biggest metric on which deals are judged from an antitrust perspective, said Oliver, whose practice is based in antitrust law with an emphasis on U.S. and international merger reviews.

Traditionally, a deal that presents a market share between 40% and 50% might be subject to an extended review with perhaps some enforcement action. A deal representing market share between 30% and 40% traditionally has not faced much scrutiny.

Defining the "market" presents some discretion whether pitching a deal or analyzing it. The Exxon Mobil acquisition of Pioneer Natural Resources will give the pro forma company some 15% of the Permian Basin market share, Pioneer CEO Rich Dealy said in an exclusive interview with Hart Energy in January.

Extrapolate beyond the Permian, and the Exxon that emerges from closing will control 5% of U.S. production and 3% of global production, Dealy said.

It's a lot, but still a significant distance from 30%. And, as Oliver pointed out during our chat, "Most everyone knows that crude trades globally and the prices are largely determined by factors that are global, not local."

Nevertheless, those companies, as well as

Chevron and Hess Corp., received formal Second Request notifications from the FTC.

The most recent megamerger announcement between Chesapeake Energy and Southwestern Energy—the subject of months' worth of speculation—has a sizeable market share of some 25% in the Haynesville Shale and more than one-fifth of the Marcellus Shale.

This deal, too, is likely to face FTC scrutiny, but it is still below the 30% threshold. By the time *Oil and Gas Investor* was delivered to the printer, those firms had not reported Second Request notifications.


Insiders say it's unlikely the FTC's attention will derail the recent deals, but it could have a temporary chilling effect on the timing of when future deals are announced in a heated election year. Senate Democrats have demanded investigations of the Exxon and Chevron deals.

Still, upstream deals rarely generate Second Request notes from the FTC. There are exceptions, however. In 2022, a Second Request from the FTC ultimately led to enforcement action in which EnCap Investments agreed to sell EN Energy's entire Utah oil business to resolve federal concerns that the deal would lead to higher prices in the region. EnCap made the divestiture, selling the assets to Crescent Energy, which created a new competitor in the Uinta Basin.

The new guidance does give the current leadership a way to differentiate itself from previous administrations.

"It's just a very easy way for them to say, 'We're different. We're more aggressive. We're not going to let deals fly through without review that maybe would have flown through under prior administrations,'" he said. "I think that's why they chose the 30%. It's a very flashy number ... I don't think there was much math behind it."

Nor is there much—if any—precedent behind it.

"It's a way to advertise themselves as being very aggressive, but it does not mean—it absolutely does not mean—that deals presenting a post-transaction, 30% market share are going to invite enforcement to action," Oliver said. "That would be shocking." 

**DEON DAUGHERTY**  
EDITOR-IN-CHIEF





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# There's Methane to our Madness



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**A**nother methane regulation. Another ultimately unwinnable battle over a methane regulation.

In early December, in an announcement at the United Nations COP28, the U.S. Environmental Protection Agency (EPA) released its final rule for methane emissions in the oil and gas industry.

The rule will require frequent monitoring and repair of methane leaks. It also covers storage vessels that regulations have not touched previously. And, it aims to phase out venting and flaring of gas from oil wells.

The rule is necessary and benefits both the environment and the energy industry.

"This final rule is one of the Biden Administration's signature actions to address climate change," Gibson Dunn attorneys wrote in an analysis. "In finalizing the rule, EPA ... also moved forward with its novel 'Super Emitter' program that allows third parties to track large emissions events."

The rule has been in the works since President Joe Biden took office, and EPA evaluated plenty of input (almost 1 million comments) in crafting its 1,690 pages. When it takes effect, all sources of methane emissions built, modified or reconstructed since Dec. 6, 2022, will need to be in compliance with the rule's standards.

The Biden administration expects the rule to prevent 58 million metric tons of methane emissions from 2024 to 2038. That would result in net climate and ozone health benefits of almost \$100 billion during that time (in 2019 dollars). The rule encourages the use of advanced methane detection technology, including satellites and aerial surveys, to detect leaks and streamlines the process for owners and operators to employ new technologies.

## Not a good look

A question over its necessity might stem from its timing. North American emissions from flaring fell 28% from 2019 to 2022, and levels fell in three consecutive years, from 2020 to 2022, according to the International Energy Agency (IEA).

So, things are great, right? Or at least headed in the right direction?

No to the first, sorta/kinda to the second. Despite those drops, emissions from flaring were 63% higher in 2022 than in 2010. U.S. crude oil production rose 117% in that time, so the industry performed extremely well in limiting emissions during the shale revolution.

But while emissions in a relative sense went down, in an absolute sense, they went up. That is the wrong direction for battling climate change, particularly for the industry most blamed for climate change. Job No. 1 for the oil and gas industry has to be reducing emissions from its own operations by 60% by 2030, which the IEA has said is necessary to meet net-zero goals by 2050.

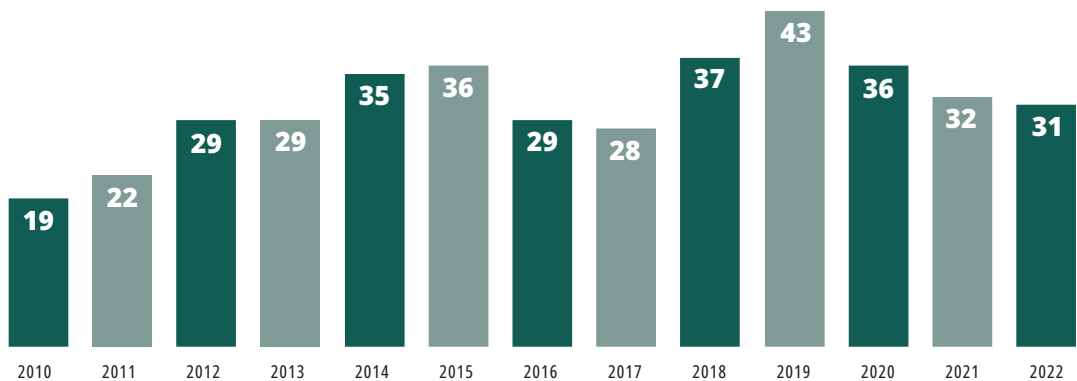
No sooner than the kilobytes hit the servers, the EPA's regulation faced resistance. Rep. Cathy McMorris Rodgers (R-Wash.), chair of the House Energy and Commerce Committee, immediately knocked the agency's latest "rush-to-green" effort.

"I'm deeply concerned these latest steps to enact additional burdensome regulations for methane could dramatically expand the agency's regulatory reach in a manner that will stifle innovation, increase operational costs and increase the price of energy," she told Bloomberg.

Jeff Eshelman, CEO of IPPA, said "the EPA's overbearing regulatory regime will undoubtedly harm America's oil and natural

## Flaring level falling

Direct CO<sub>2</sub> combustion emissions from flaring and flaring intensity in the Net Zero Scenario, North America, million metric tons



Source: International Energy Agency



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**The EPA's headquarters in Washington, D.C. The agency evaluated almost 1 million comments in crafting its 1,690 pages.**

gas producers and could lead to the shutdown of as many as 300,000 of the nation's 750,000 low-production wells "that are essential to our country's energy production."

The rule shifts much of the enforcement burden to the states and could result in higher costs for oil and gas states' regulatory agencies, as well as the industry and consumers. However, the Inflation Reduction Act includes billions to help meet those requirements, and New Mexico has seen emissions decrease as its oil and gas production increased since it implemented its own methane rules.

There is another reason, perhaps an existential one, to not fight the EPA's new rule. The oil and gas industry currently ranks near the bottom of business sectors in reputation, according to Gallup. That's just barely ahead of the federal



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**The EPA's methane rule aims to phase out venting and flaring of gas from oil wells.**

government and the pharmaceutical industry, and well behind healthcare, advertising and the legal field.

Read that sentence again. Lawyers—lawyers—are more popular than oil and gas.

The problem transcends reputation, per se. Staying in business requires innovation and that requires attracting and retaining a new generation of talent. The industry's bad rep harms that effort.

Taking the lead on limiting methane emissions is good for the environment, good for production by capturing and selling gas instead of allowing it to escape, and a good start to restoring the industry's badly damaged reputation.

Fighting the EPA's methane rule accomplishes none of that. It just sets up the industry for long-term setbacks. **OGI**

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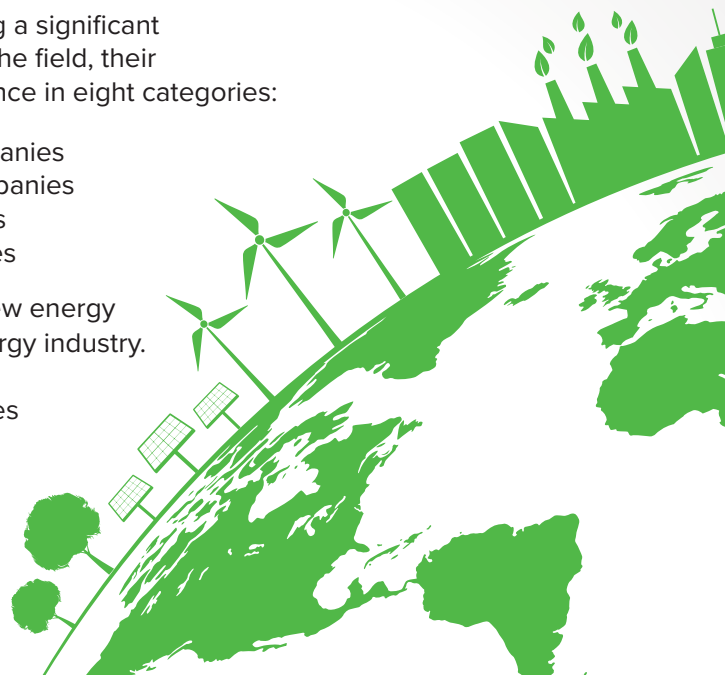
Nominations due April 5, 2024

The Energy ESG Awards recognize energy companies making a significant impact on environmental, social or governance objectives in the field, their communities and their businesses. The awards honor excellence in eight categories:

- Public Producers
- Private Producers
- Public Midstream
- Private Midstream
- Public New Energy Companies
- Private New Energy Companies
- Public Service Companies
- Private Service Companies

Nominations are open to producers, operators, midstream, new energy (wind, solar, and more), and service companies within the energy industry.

These ESG champions will be highlighted with in-depth profiles inside a special section of *Oil and Gas Investor* in June and promoted through Hart Energy's multi-channel network.



# Hirs: Crypto, Energy and Society



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**C**ryptocurrencies are not real currencies. They are figments of the imagination that have bad effects on the real world—fake money with government blessing but without government backing, the laundering of real money, erosion of governments' revenue collection and, ironically, causing damage to the electric grid upon which these imaginary assets rely.

Real currencies have three characteristics: They are a store of value, a unit of account and a medium of exchange, that is, legal tender.

Cryptocurrencies have none of those characteristics. They are not backed by any assets, making cryptocurrencies worse than Bernie Madoff's scheme. After the collapse of Madoff's empire, billions were recovered. With the collapse of Samuel Bankman-Fried's empire, there is no money to recover. His pedestrian fraud was not secured by blockchain technology. It was a made-up Excel spreadsheet that fooled real banks and real people.

Cryptocurrencies are also claiming another victim, one that may be less sympathetic than the retiree who invested her pension in crypto, but which has far broader stakes from a societal and economic standpoint.

Cryptocurrency miners and their ravenous appetite for electricity are creating widespread problems for electricity grids that are already short of capacity; so far, miners are at work in 38 states. The proof-of-work algorithm Bitcoin miners use to prove transactions and to create more Bitcoin increases exponentially in difficulty, requiring more and more computing power. As a result, the cryptocurrency miners require more and more electricity.

Daily, cryptocurrency miners in Texas use more electricity than the city of Austin. In its most recent disclosure, the Electric Reliability Council of Texas reported pending applications for 33,000 megawatts (MW) of demand by cryptocurrency miners. For perspective, summer peak demand in 2023—the state's second hottest on record—was just more than 80,000 MW.

## The payoff

Clearly, this is paying off for the crypto miners. The primary profits reported by publicly traded cryptocurrency miners, at least those in Texas, are generated by an arbitrage of the Texas electricity market. They buy electricity at 2.5 cents per kilowatt-hour (kWh), below the price necessary to generate a return on investment for new power plants. They then receive credits at market rates of up to \$5/kWh when they shut down during high demand days. Texas consumers are directly

subsidizing the cryptocurrency industry, even as it is driving up their electricity prices and undermining grid reliability.

Cryptocurrency promoters and miners know there is nothing socially redeeming about cryptocurrencies. They only keep score in dollars. And from a dollar perspective, cryptocurrencies are attractive to society's radicals because the transactions are virtually undetectable. Anonymous. And untaxed.

The latter is troublesome. If more of our neighbors turn to crypto, tax collections will decline. Cities, states and federal leadership will be forced to raise tax rates for law-abiding citizens to maintain revenues for schools, roads, law enforcement, retirements, healthcare and the military.


The most pernicious use of cryptocurrencies is to move money across borders, making money laundering easy. Human traffickers, sex criminals and drug traffickers can sell their goods and deposit the cash in the cryptocurrency ATM at the corner store. Text the receipt to the cartel's assistant treasurer. And, presto chango, the cartel can have real currency.

## Wager on top of a bet

The Securities and Exchange Commission approved applications by major investment managers BlackRock, Franklin Templeton and others to offer ETFs, exchange traded funds, to investors for Bitcoin. ETFs themselves merit critical scrutiny. These funds purchase underlying assets to meet the demand of small investors who are unable to participate in the primary market for stocks, bonds, commodities and now Bitcoin.

The oil patch knows full well that the dynamics of managing the ETF can diverge from the underlying market. The negative WTI price in 2020 was caused by the U.S. Oil ETF frantically unloading contracts when there was no storage to accommodate the pending oil deliveries.

In contrast, the value of a Bitcoin can never be negative. The Bitcoin ETFs will be a wager on top of a bet, in which the buyers rely upon the greater fool buyer in both a primary and secondary market.

The SEC stated that its approval of the Bitcoin ETFs does not represent an endorsement or approval of the ETFs or the underlying cryptocurrencies. But it is a fact the SEC has approved a financial instrument that is backed by nothing. Brokers will tell their retail investors: "The Bitcoin ETFs are safe because the SEC allows them. The SEC would never allow you to buy something that is worthless." A house of cards is more substantial. 

# Belcher: Guaranteed Policy and Regulatory Uncertainty



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*Jack Belcher is a principal at Cornerstone Government Affairs, where he focuses on regulatory affairs, risk management and ESG matters within the energy and transportation sectors.*

**B**ecause we are in an election year, politicians are sure to be making some big promises over the coming months. With an expectedly close presidential election and small margins of control in both houses of Congress, we are again susceptible to massive swings in political power and public policy outcomes. These dynamics ultimately create more policy and regulatory uncertainty for the U.S. oil and gas industry.

Consider EPA's methane rule, where a final regulation was issued in December after years of conflicting regulatory, congressional and legal actions dating back to 2012. For years, ambiguity regarding that rulemaking has left oil and gas producers, service companies and midstream companies uncertain about the investments they need to make to comply with emissions leaks and mitigation requirements. After 11 years, while there appears to be some resolution about the rule's leak detection and mitigation and repair program, litigation is likely to proceed, especially regarding the "Super Emitter Response Program."

Another example of regulatory uncertainty pertains to the rollout of many provisions of the Inflation Reduction Act (IRA). In late December, the Treasury Department issued proposed rules on the use of the IRA's 45V Clean Hydrogen Production Tax Credit that, according to many hydrogen advocates in industry and government, limit the ability of non-wind and solar energy sources to be competitive in the hydrogen market.

Draft requirements for the \$3 per kilogram tax credit would require qualified projects to show, by 2028, that every hour of electricity they use to produce hydrogen is matched by another hour of qualifying green electricity. U.S. Sen. Joe Manchin (D-W.Va.), who played a key role in writing and passing the IRA, was joined by other key Senate Democrats in criticizing the proposal, which Manchin said did not reflect the intent of the statute and would "kneecap" U.S. hydrogen producers. It is unclear how the administration is going to respond to this feedback.


Guidance and regulations regarding other provisions of the IRA and federal regulations concerning greenhouse gas emissions reporting are due to be released in the coming weeks and months. Resource challenges within federal agencies, coupled with political and policy disputes surrounding their details, are creating further uncertainty for those impacted by these policy decisions. The complexities of election year politics exacerbate the situation.

For the Biden administration, this means walking a political tightrope when it comes to energy and environmental policy. With U.S. oil and natural gas production and exports at record levels, the Republican arguments regarding the administration's "war on energy" are less effective. At times, the administration likes to take credit for these accomplishments, but for some people, they appear to be in direct contradiction to Democratic climate policy goals. Additionally, bragging about oil and gas production might deflect criticism over high energy prices, but it doesn't sit well with the party's base.

President Joe Biden does have the advantage of not having to face a primary challenger who could flank him on the left regarding climate policy. As a result, he can boast about the climate accomplishments in the IRA and from the COP28 climate conference, as well as U.S. energy and national security benefits associated with high levels of energy production and exports to allies overseas.

Meanwhile, Republican candidates will continue to criticize the Biden administration for delaying and paring down oil and gas lease sales on federal lands and waters, fueling inflation and high energy prices, and the burdens that climate and ESG-related policies are having on businesses.

Such positions are playing well in the primary with the Republican base. Republican policy alternatives include more federal leasing for oil and gas, less regulation and more regulatory reform, and rolling back federal laws including the methane rule and federal grants and tax credit provisions of the IRA and Bipartisan Infrastructure Law, like the 45Q tax credits for carbon capture and storage and funds for orphan well remediation. While oil and gas producers would benefit from more favorable policies toward leasing and permitting, they could also benefit from having stable regulatory and tax policies in place so they can make informed investment decisions with certainty.

As we head toward Election Day, we can be certain that the administration will promulgate more regulations that will be consequential to the oil and gas industry. We also can be certain that Republican and Democratic candidates will spar over energy and climate policies. Finally, given an evenly divided nation, we can be certain that through Election Day and beyond, we will continue to have policy and regulatory uncertainty. 

# Delaney: 45Q and 45Z Legal Considerations for CCUS Projects



SCOTT DELANEY  
WINSTON & STRAWN

*Scott Delaney is a partner in the Dallas office of Winston & Strawn, where his practice focuses on corporate transactions for public and private companies, as well as private equity sponsors and their portfolio companies, with a particular emphasis on the energy sector. Samuel Peca and Luke Smith at Winston & Strawn contributed to this article.*

The Inflation Reduction Act (IRA) expands the tax credits and other financial incentives available for energy transition and renewable energy projects, which has spurred investment in carbon capture, utilization and storage (CCUS) projects. There are three important legal considerations related to the interaction of Sections 45Z and 45Q under the IRA; however, it is important to recognize that additional credits and tax implications at the federal and state level may also apply.

Section 45Q of the IRA provides a tax credit for qualified carbon oxide (CO<sub>x</sub>) captured and either securely stored in underground geological formations or reused for specified purposes. The credits may be claimed by the taxpayer who owns the carbon capture equipment and ensures (whether physically or contractually) the capture and disposal or utilization of the CO<sub>x</sub>. 45Q credits are available to a qualifying CCUS project for 12 years, beginning when the equipment is placed in service.

Section 45Z of the IRA provides a tax credit for production of low-emissions transportation fuels, including low-carbon ethanol, biodiesel and sustainable aviation fuels. The credits apply to fuels produced and sold from Dec. 31, 2024, through Dec. 31, 2027, and may be claimed by the taxpayer who owns the fuel production plant.

## Creating a framework to make elections

CCUS projects may result in eligibility for multiple tax credits (and multiple taxpayers who may claim such credits) under the IRA, particularly when one of the project participants produces sustainable fuels in its ordinary course. The IRA generally prohibits double-dipping on such credits, so project documents must set forth a clear framework to establish the process for making elections between mutually exclusive credits. Elections are made annually, and the IRA permits a participant to toggle between claiming 45Q and 45Z credits (on an annual basis).

The participants may decide, based upon practical considerations, who will take the decision-making role, and so long as the project documents include sufficient specificity as to defining, calculating and comparing each credit's aggregate economic benefit, then the framework will drive alignment among the parties to maximize overall project value. A few items to consider in regard to the election framework include: information sharing obligations, reporting obligations of the

participant making the election and to what degree the participants wish to expand the election framework to cover future credits that may replace or extend 45Z credits following their expiration in 2027.

## Sharing in the 45Z upside


Because the participants in a CCUS project may toggle between 45Q and 45Z credits during the life of a project, project documents need to contemplate economics for 45Q years and economics for 45Z years.

We have observed a general preference among clients toward setting baseline project economics based upon expected 45Q credit value, and then providing for a sharing of net benefits in the event that 45Z credits are elected in a given year. Participants should consider how each will benefit in any excess value resulting from an election of the higher value credit. If so, the participants must carefully negotiate the allocation and calculation mechanics of this sharing of the upside in coordination with other economic considerations of the project.

## Allocating risk of recapture

An important distinction between credits is that 45Q credits are subject to recapture for CO<sub>x</sub> that ceases to be properly captured or used within the recapture period. For example, 45Q credits could be recaptured due to leaks of CO<sub>x</sub> from secure storage or use of sequestered CO<sub>x</sub> for non-qualified uses. 45Z credits are not currently subject to recapture under the IRA.

For CCUS projects primarily contemplating 45Q credits, participants may be able to obtain insurance and/or indemnity to allocate risks of losses related to the recapture of credits. Participants should consider that insurance and indemnity proceeds may have different tax attributes than the credit proceeds for which they serve as a substitute and whether coverage will be included for leaks of CO<sub>x</sub> stored in the current year (in which case fewer credits may be claimable, but there is no recapture of credits previously claimed).

The tax incentives in the IRA provide an exciting opportunity for project developers in the clean energy industry in the U.S., but also create new types of uncertainty and risk. Participants in CCUS projects should ensure that project documents are clearly drafted to delineate the rights and economic interests of each participant with respect to available tax credits and allocate the inherent risks. 

# W INFLUENTIAL WOMEN IN ENERGY

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## Join us to celebrate Influential Women in Energy

### NETWORKING LUNCHEON

March 8, 2024  
10:30 AM - 2:00 PM  
Hilton America's - Houston

In recognition of International Women's Day on March 8, 2024, Hart Energy's *Oil and Gas Investor* will hold its 2024 Women in Energy luncheon at the Hilton Americas - Houston downtown.

International Women's Day is a global day celebrating the historical, cultural, and political achievements of women. The gala lunch will showcase the accomplishments of distinguished women who have influenced all aspects of the oil and gas industry.

Mark your calendar and join us as we raise a glass and toast these amazing women.

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# Jelinek and Kirsch: Four Actions for Oil and Gas in 2024

PAT JELINEK AND  
DAVID KIRSCH  
ERNST & YOUNG

*Pat Jelinek is EY's Americas oil and gas leader. David Kirsch is EY's managing director, energy. The views reflected in this article are those of the authors and do not necessarily reflect the views of Ernst & Young or other members of the global EY organization.*

The energy transition will require both significant new investments in low-carbon energies and continued use of traditional hydrocarbons to meet the expected energy demand of an expanding global economy. Fortunately, the past two years have demonstrated the U.S. oil and gas sector has the capability to lead in both facets of the new energy economy.

Most immediately, responding to strong global expansion and supply disruptions around geopolitical unrest, companies operating in the U.S. oil and gas sector have steadily increased production of oil and natural gas. They have done so while still driving greater efficiency and amid market uncertainties, continuing to return value to shareholders even as oil prices cooled. This continued discipline positions the sector well for the increasing likelihood of much slower economic growth, or even the possibility of a recession in the U.S. or other major markets in 2024.

Oil and gas companies have committed billions of dollars to develop future businesses around carbon capture, utilization and storage (CCUS) and hydrogen, aimed at abating the climate impact of hydrocarbon fuels and providing decarbonized energy solutions for those industrial emissions not easily decarbonized through electrification. By some estimates, committed CCUS projects will reduce carbon emissions at a scale equal to those mitigated by the rapid adoption of electric vehicles (EVs).

Importantly, these companies are doing so while continuing to deliver value to shareholders, basing their strategic turn into the energy transition on solid footing with their investors. To continue this strong performance in 2024, oil and gas companies should focus on four main actions:

- 1** Transact to transform through strategic mergers and acquisitions (M&A).
- 2** Continue to maximize operations across the front and back office.
- 3** Embrace more proactive, strategic emissions planning, management and operational decarbonization.
- 4** Innovate new markets for carbon capture and hydrogen beyond traditional use cases.

## **Transformative, strategic M&A**

While high interest rates and inflationary pressures cooled dealmaking in many sectors last year, the oil and gas sector saw a surge in announced M&A activity, driven by strong cash flows, renewed investor confidence and increasing recognition that oil and gas will continue to play an important role in the energy landscape.

While deals have grown again, including more enterprise-level transactions than seen in the recent past, companies are executing transactions in areas that meet well-defined strategic rationales, in both the traditional oil and gas space, as well as in new low-carbon businesses. The industry wants to match the best operator with each asset, drive performance across operations, and optimize capital and carbon management. This has set the stage for a wave of consolidations, with integrated oil companies and large E&Ps looking to secure acreage, enhance their cash flow and maximize returns via acquisition rather than traditional exploration.

One indication of this disciplined approach is the lower premiums paid in many of these deals, compared with similar deals in the recent history of the sector. Identifying a target, completing the due diligence and announcing the deal is only the beginning of the hard work. Oil and gas companies need to attack post-close integration with the same vigor to realize the full value of these deals. Integrating the best of both organizations, across their front- and back-office operations, enables success.

## **Maximizing operations**

The influx of M&A also creates a case for companies to improve business fundamentals, such as driving down operating costs, leveraging scale, jumping the curve on differentiated capabilities and strategically thinking about talent management.

Maximizing operations is not a new description for simply doing “more with less.” Rather, it is operating by exception and problem-solving using technology at speed, innovation at scale with humans at the center. To drive immediate results and limited disruption, there must be collaboration among teams responsible for performance in the field: subsurface, production operations,



*Maximizing operations is not a new description for simply doing “more with less.” Rather, it is operating by exception and problem-solving using technology at speed, innovation at scale with humans at the center.*

facilities, maintenance and supply chain. Companies need to take a people-led approach in business or technology transformation implementations. In every project, people are critical and the change champions that ultimately drive success.

Real-time data and emerging technologies are essential to enable better, faster and more strategic decisions. This is true holistically across the entire value chain—in both the front office and back office, but also specifically in subsurface prediction, drilling and completions, asset surveillance and optimization, maintenance and materials management.

Considering different operating models, such as managed services, is particularly important when companies develop new business areas. For example, the front- and back-office functions for low carbon will be different from traditional oil and gas. As low-carbon business areas begin to scale, companies should consider multiple operating models before committing to specific processes and technologies. This will allow them to find synergies by integrating traditional business areas or pivot to innovative and emerging ecosystem models.

Lastly, oil and gas companies that are able to integrate artificial intelligence (AI) and generative AI (GenAI) capabilities in their everyday decision-making will jump the curve on business value. This shift will require companies to establish a strong foundation of trusted data while also implementing AI and GenAI engineering best practices, robust governance and risk management. The adoption curve for AI is faster than for any other technology so far, so companies must act quickly.

### **Managing emissions**

New operating models and the introduction of low-carbon businesses both underscore the ways oil and gas companies can accelerate the net-zero journeys of their customers and place a premium on having a more strategic perspective around their own greenhouse gas (GHG) footprint. In 2023, California and the European Union finalized and provided clarity around reporting requirements for affected companies—some of these impacts could occur in 2024 with reporting in 2025, the SEC has proposed rules that it has yet to finalize but finalization is expected in the near term.

This regulatory uptick led petroleum companies in the U.S. to accelerate efforts to reliably monitor and report Scope 1 and 2, and at least some Scope 3 emissions. Uncertainty around the timing and fullest scope of the

proposed SEC rule—and the lack of uniform standards for GHG emissions reporting more generally—has been a complicating factor; there is also an opportunity for companies to move to an approach that treats emissions data almost on par with production data.

Understanding the emissions footprint in near real time will be critical for the strategic planning and operational decarbonization of energy companies. Therefore, a shift in thinking from compliance to operational intervention can help companies make real strides in reducing emissions as a part of overall operational optimization. It also prepares companies for future commercial opportunities in carbon-differentiated product markets.

### **Developing decarbonized markets**


Once oil and gas companies have an enterprise view of the emissions impact of their product, they also unlock the opportunity to rethink their product portfolios.

Carbon exists not only as an attribute for a company's existing products, but also as a future standalone product. Oil and gas companies have already responded dramatically to changing investment conditions for carbon capture and other decarbonized energy technologies, especially hydrogen. The federal government has offered generous support via tax credits in the Inflation Reduction Act (IRA) for hydrogen production and CCUS and a further \$7 billion from the Infrastructure Investment and Jobs Act (IIJA) to establish seven hydrogen hubs around the country.

Government support for these low-carbon solutions has not been met with similar subsidies or tax credit for downstream CCUS of hydrogen markets. And adoption of a federal carbon tax—a straightforward means of fostering these markets—is not politically viable in the short term.

Architects of the IRA believed the support for hydrogen production and CCUS would incentivize the market to create its own demand. The real winners of the IRA and IIJA will be those companies that can best innovate new commercial approaches to these novel business areas.

To accelerate decarbonized development, oil and gas companies will need to adopt both more holistic views of their ecosystem, and more collaborative ways of working with their value chain, from suppliers through the customers of their customers.

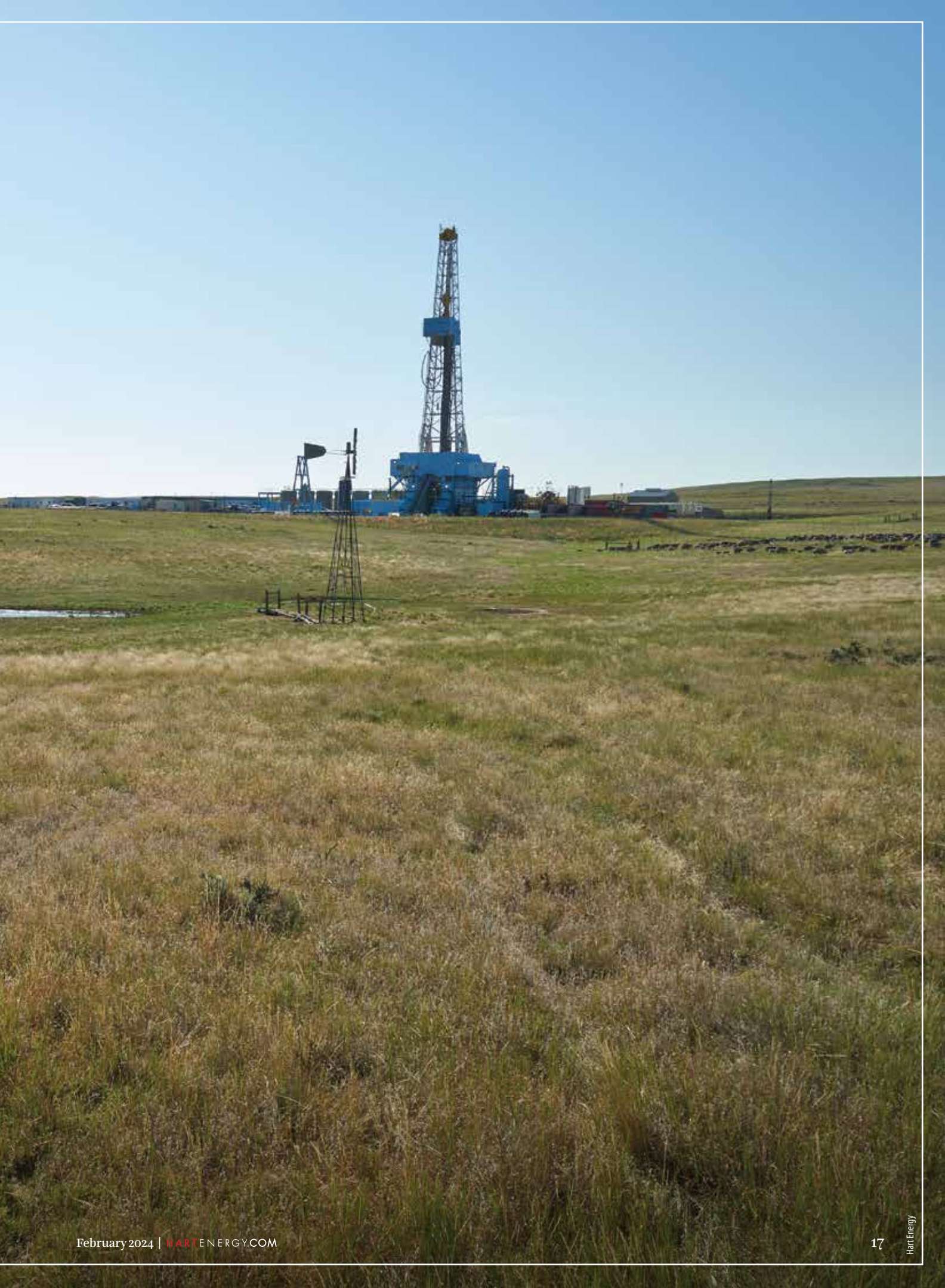
Oil and gas companies that seize opportunities to maximize their operations, proactively manage emissions, transform via transactions and embrace new energies will thrive in the decades to come. 

**ACTIVITY** HIGHLIGHTS

# 9.1 MMBoe

**Monthly production in the  
Powder River Basin**





# FOCUS ON: POWDER RIVER BASIN

Operators continue to see upside from the Powder River Basin of Wyoming and Montana, despite takeaway constraints.

Monthly oil output from the Powder River Basin was about 5.15 MMbbl in July 2023, according to the most recent data from Rextag.

EOG Resources is the basin's top producer, with output of 13.87 MMboe over the past 12 months, per Rextag figures.

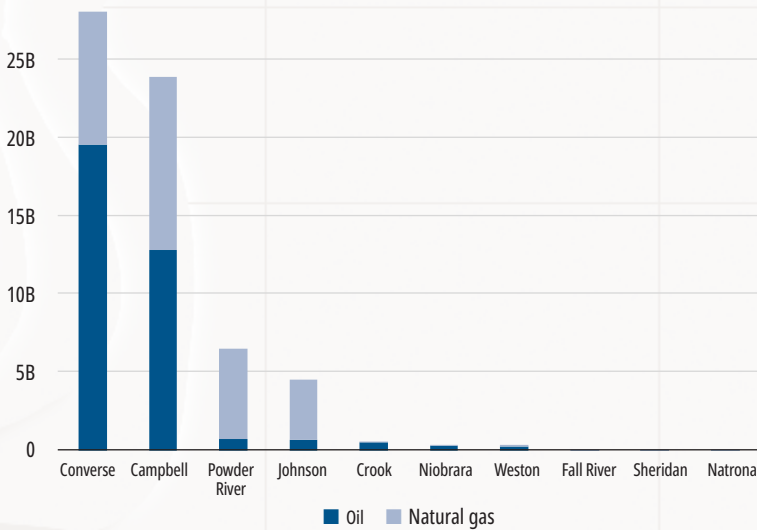
Anschutz Exploration is the second-largest producer, with 8.17 MMboe in the past year.

Continental Resources, Exxon Mobil and Devon Energy are also notable producers in the region.

The bulk of Powder River Basin crude production comes from Converse and Campbell counties, Wyo. Both counties also produce significant volumes of natural gas.

Powder River County, Mont., and Johnson County, Wyo., also produce large volumes of gas.

## Top 10 producing counties

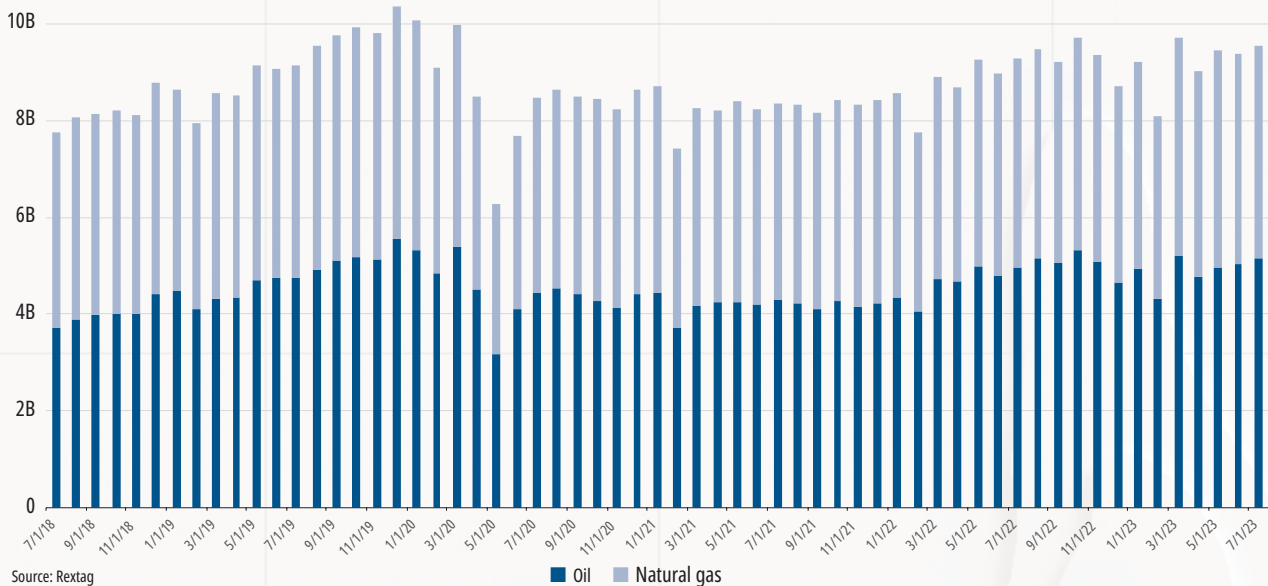


## Top 10 operators by production

| Operator                     | Boe (last 12 months) |
|------------------------------|----------------------|
| EOG Resources                | 13,866,220.67        |
| Anschutz Exploration Corp.   | 8,171,801.67         |
| Continental Resources        | 7,617,901.17         |
| Exxon Mobil                  | 6,791,368.83         |
| Devon Energy                 | 5,456,783.50         |
| Carbon Creek                 | 5,166,920.50         |
| Occidental Petroleum         | 3,889,043.17         |
| Ballard Petroleum            | 2,116,841.67         |
| Peak Powder River            | 1,355,267.50         |
| WRC Energy                   | 1,312,628.17         |
| Providence Operating         | 25                   |
| Kerr-Mcgee Oil & Gas Onshore | 25                   |

## Powder River Basin production

oil and natural gas, bbl, monthly, July 2018-July 2023



Source: Rextag

▶ ACTIVITY HIGHLIGHTS

# PERMITS

The Permian Basin steals the spotlight, but the Rockies are stealing the attention of operators big and small.

There were 730 drilling permits filed in counties across Texas in the month ended Jan. 10, according to Rextag.

But basins in the Rockies also garnered their fair share of the action: operators filed 262 drilling permits in Wyoming and 195 in Colorado over the same period.

The Powder River Basin drove a considerable amount of permitting activity. Converse County, Wyo., in the core of the play, saw 113 drilling permits filed in the past month.

To the north, drillers filed 94 permit applications in Campbell County, Wyo. And Johnson County, Wyo., on the basin's western edge, drew 24 permits.

Weld County, Colo.—Colorado's top oil-producing county, state records show—drew 96 drilling permits by operators during the month. Adams County, the state's second-leading producer, nabbed 25 permits to drill.

And Rio Blanco County, Colo., in the Piceance Basin, saw 56 permits filed.

Despite notable gains by the Rockies, the Permian continues to play an important role in the future drilling plans of operators.

Midland County, Texas, drew 99 permits.

Loving County, Texas, in the core of the Delaware Basin, drew 57 permits. The adjacent Reeves County drew 54 permits.

In South Texas, Karnes County attracted 52 drilling permits.

## Permitted wells by state

| State        | Well Count |
|--------------|------------|
| Texas        | 730        |
| Wyoming      | 262        |
| Colorado     | 195        |
| North Dakota | 63         |
| Oklahoma     | 29         |
| Louisiana    | 26         |

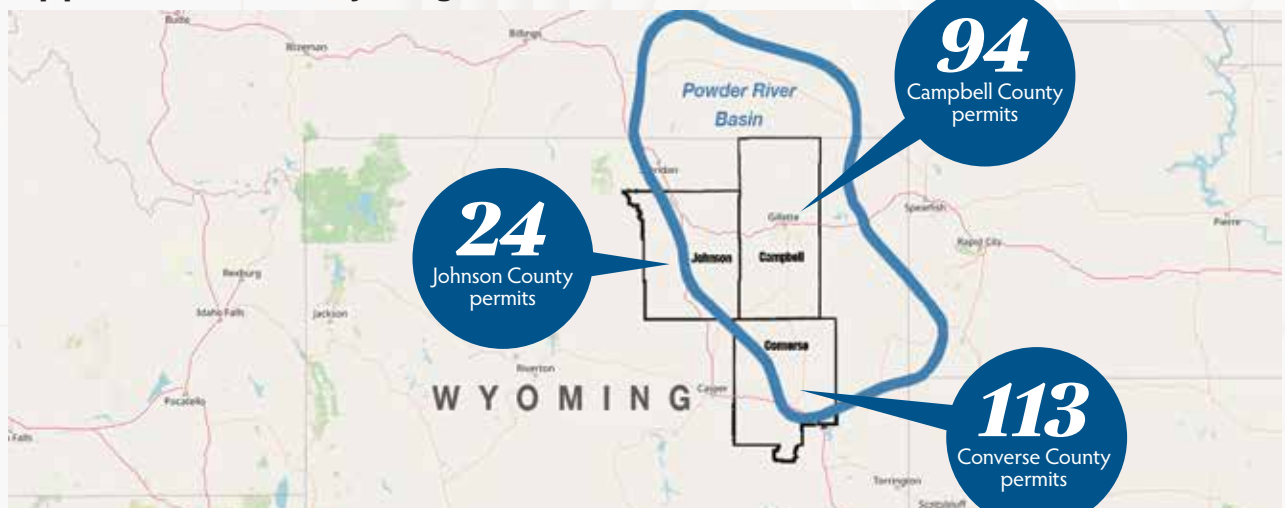
## Permitted wells by operator

| Operator                   | Well Count |
|----------------------------|------------|
| Anschutz Exploration Corp. | 96         |
| Pioneer Natural Resources  | 74         |
| Continental Resources      | 46         |
| Anadarko E&P Onshore       | 40         |
| ConocoPhillips             | 39         |
| EOG Resources              | 36         |
| TEP Rocky Mountain         | 34         |
| DE IV Operating            | 32         |
| Devon Energy Production    | 27         |
| Noble Energy, Inc.         | 26         |
| Providence Operating       | 25         |
| Kerr-Mcgee                 | 25         |

## Permitted wells by county

| County & State    | Well Count |
|-------------------|------------|
| Converse, Wyo.    | 113        |
| Midland, Texas    | 99         |
| Weld, Colo.       | 96         |
| Campbell, Wyo.    | 94         |
| Loving, Texas     | 57         |
| Rio Blanco, Colo. | 56         |
| Reeves, Texas     | 54         |
| Karnes, Texas     | 52         |
| Crane, Texas      | 33         |
| Upton, Texas      | 33         |
| Martin, Texas     | 32         |
| Howard, Texas     | 29         |
| McKenzie, N.D.    | 28         |
| Adams, Colo.      | 25         |
| Johnson, Wyo.     | 24         |
| Webb, Texas       | 23         |
| McMullen, Texas   | 22         |
| Reagan, Texas     | 22         |
| La Salle, Texas   | 19         |

## Top permit counties in Wyoming



Source: Rextag

# APA Takes Callon as Permian M&A Wave Hits '24

The \$4.5 billion all-stock deal heralds a new year of basin consolidation.



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**A**PA Corp. is getting deeper in the Permian Basin with a \$4.5 billion takeout of **Callon Petroleum**, the latest deal in a historic wave of consolidation across America's hottest oil play.

The acquisition of Houston-based Callon will give APA—and its subsidiary **Apache Corp.**—a notable boost in the Delaware Basin of West Texas and New Mexico. Callon holds about 119,000 net acres in the Delaware and another 26,000 in the Midland Basin.

APA holds about 281,000 net Permian acres, with 84,000 net acres in the Delaware and 197,000 net acres in the Midland, according to an investor presentation.

The deal will also grow APA's oil and gas production in the Permian by about 48% compared to APA on a standalone basis. Pro forma daily average production was 311,000 boe/d during third-quarter 2023.

Oil, gas and NGL output from Callon's Delaware footprint averaged 75,000 boe/d during third-quarter 2023; the company's Midland volumes

averaged 26,000 boe/d over the same period.

The all-stock deal will exchange each share of Callon common stock for 1.0425 shares of APA common stock.

The takeout of Callon represents a roughly 15% premium, based on CPE's stock price at last close.

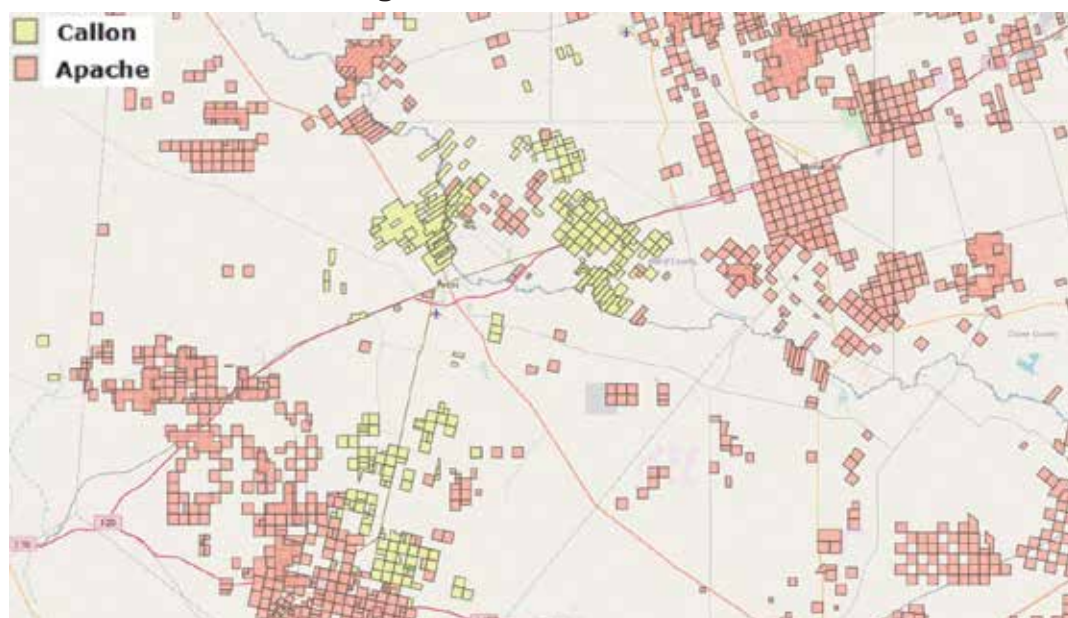
"APA has a rigorous process for evaluating potential transactions and Callon fulfills our key criteria," said John J. Christmann IV, APA's president and CEO, during an early January conference call with analysts.

Joe Gatto, president and CEO of Callon, said he believes combining with APA was the best path forward for Callon, which sold its position in South Texas and pivoted into a Permian pure-play last summer.

Combining with APA will unlock significant additional value for shareholders and enhance the company's ability to succeed through the up-and-down cycles of the oil and gas industry, Gatto said.

"We know Apache will be a good steward for the Callon name and the assets that we have built over the last 70-plus years," he said.

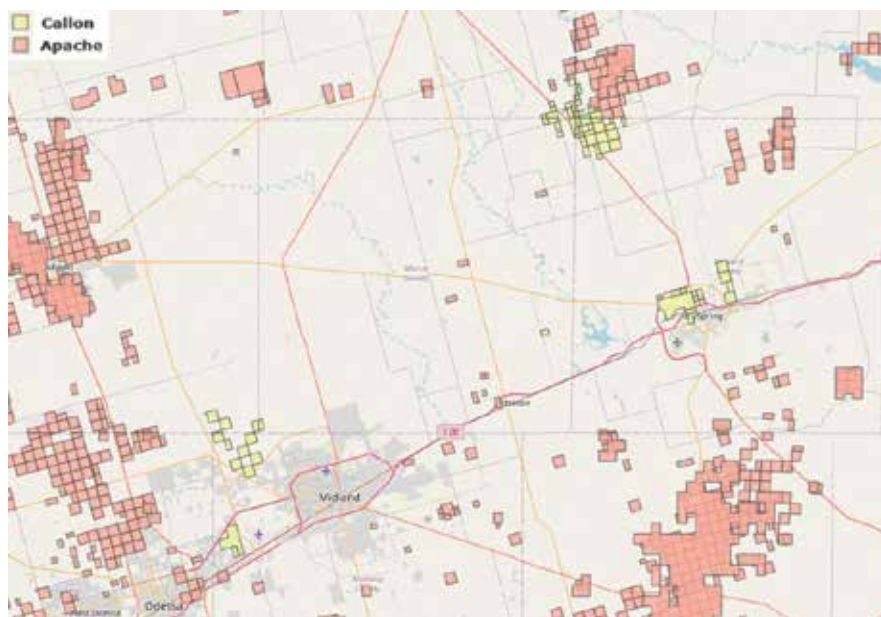
## APA-Callon Delaware acreage



Source: Rextag

**APA Corp. has 84,000 net acres and 49,000 boe/d of production in the Midland Basin. Callon holds around 119,000 net Midland acres and production of 75,000 boe/d.**

## APA-Callon Midland acreage



Source: Rextag

**APA Corp. has 197,000 net acres and 93,000 boe/d of production in the Midland Basin. Callon holds around 26,000 net Midland acres and production of 26,000 boe/d.**

### Rig watch

APA has been running six rigs in the Permian, in contrast to Callon's five-rig program, **TD Cowen** analyst David Deckelbaum wrote.

While declining to offer specific plans for rig activity after closing, Christmann said Callon's drilling program competes for capital in APA's own plans.

"We envision continuing those [rigs] right now," he said. "We'll continue ours, they'll continue theirs."

"Obviously, we get past close, we'll look at that. But we like what they're doing and we like the opportunity set that it brings to the combined company."

Analysts, oilfield services providers and midstream operators alike are interested in APA's plans for Callon's asset base once the deal closes.

Acquiring companies have largely deployed a buy-and-cut strategy when it comes to drilling and preserving inventory on their newly acquired assets.

When the deal closes, drilling activity is typically slashed to a fraction of the pre-deal activity levels. That's because operators are in no hurry to ramp up organic production by drilling into their highest quality inventory; the goal is to preserve those locations for years, or even decades, into the future.

The effects of the buy-and-cut strategy have been most notable on acquired assets that were held by private E&Ps. Acquired private operator rig counts were reduced by nearly 70% in 2023 due to Permian upstream consolidation, according to data compiled by **East Daley Analytics**.

APA envisions a comfortable drilling runway to the end of the decade based on its current drilling cadence and well design, Christmann said.

"We see similar duration in the Callon assets," he said.

boxes, Christmann said.

### New year, new deals

The APA-Callon combination is the latest in a historic deluge of M&A inked across the Permian Basin in recent months.

Last October, **Exxon Mobil** announced a \$60 billion takeover of **Pioneer Natural Resources**—the largest shale oil transaction ever signed—in a deal that will reshape the order of power in the Permian for decades to come.


**Occidental Petroleum** is also digging deeper into the Permian by signing a \$12 billion deal to acquire **CrownRock**, one of the most attractive remaining private E&Ps in the basin.

Those megadeals top a long list of bolt-ons, scoop-ups and carve-outs made by smaller E&Ps in the Permian in 2023: **Permian Resources**, **Civitas Resources**, **Ovintiv**, **Vital Energy** and Callon itself drilled billions of dollars into Permian acquisitions last year.

The Permian, and other attractive U.S. shale basins, are awash in M&A as operators search for high-quality drilling locations.

Quality, low-cost drilling locations are hard to come by. In the Permian, the vast majority of these so-called Tier 1 drilling locations are already owned by a small handful of public operators.

For operators to get their hands on the best rock, they typically have to buy it from one, or several, of their competitors.

This scarcity-fueled M&A bonanza fueled more than \$100 billion in upstream transaction value across the Permian last year, according to a **Wood Mackenzie** analysis. The previous record was \$65 billion in 2019. 

**\$150**  
million

annual savings in  
APA-Callon deal

# Will Tokyo Gas-Rockcliff Deal Reopen Natgas M&A?

After Tokyo Gas Co.'s \$2.7 billion bid to acquire Haynesville E&P Rockcliff Energy II, the window for natural gas deals could be reopening.

Commodity price volatility chilled the market for natural gas M&A in 2023. But after **Tokyo Gas Co.** inked a deal to acquire Haynesville Shale E&P **Rockcliff Energy II**, could more gas deals cross the finish line?

Through its U.S. upstream subsidiary **TG Natural Resources**, Tokyo Gas acquired Rockcliff Energy II for \$2.7 billion, the companies announced in mid-December. The deal closed later that month.

Rockcliff, backed by private equity firm **Quantum Capital Group**, developed a sizable position in the East Texas side of the Haynesville Shale play since making its first acquisitions in 2017.

The company operates more than 200,000 net acres and over 1.3 Bcf/d of gross operated natural gas production across five Texas counties.

Tokyo Gas has been seeking to add scale near its existing footprint of natural gas assets in Texas and Louisiana, the company said in an investor disclosure.

With U.S. gas demand expected to rise due to the construction of several new LNG export terminals on the Gulf Coast, Tokyo Gas looked to grow its exposure to U.S. shale.

Rumors swirled last year that Tokyo Gas wanted to acquire Rockcliff for about \$4.6 billion; natural gas prices were about \$3/mcf at that time.

But a potential deal fell apart, apparently due to declining natural gas prices.

Analysts at **Truist Securities** say there's credibility that lower natural gas prices may loosen up the markets and allow for more M&A.

"We continue to believe the recent move in the gas strip has caused a shakeup in any potential deals as privates feel a capital funding pinch, likely making some companies more attainable for the publics (if they are still willing to ink a deal at these levels)," Truist analysts wrote in mid-December.

The Rockcliff deal's size is smaller than most public gas-focused E&Ps, but the transaction does shed some light into the current market for natural gas corporate M&A.

TG Natural Resources agreed to pay between \$3,600 and \$3,700 per flowing MMcf/d of gas output, which screens "a little better than the public group's average by 11%," according to Truist's calculations.

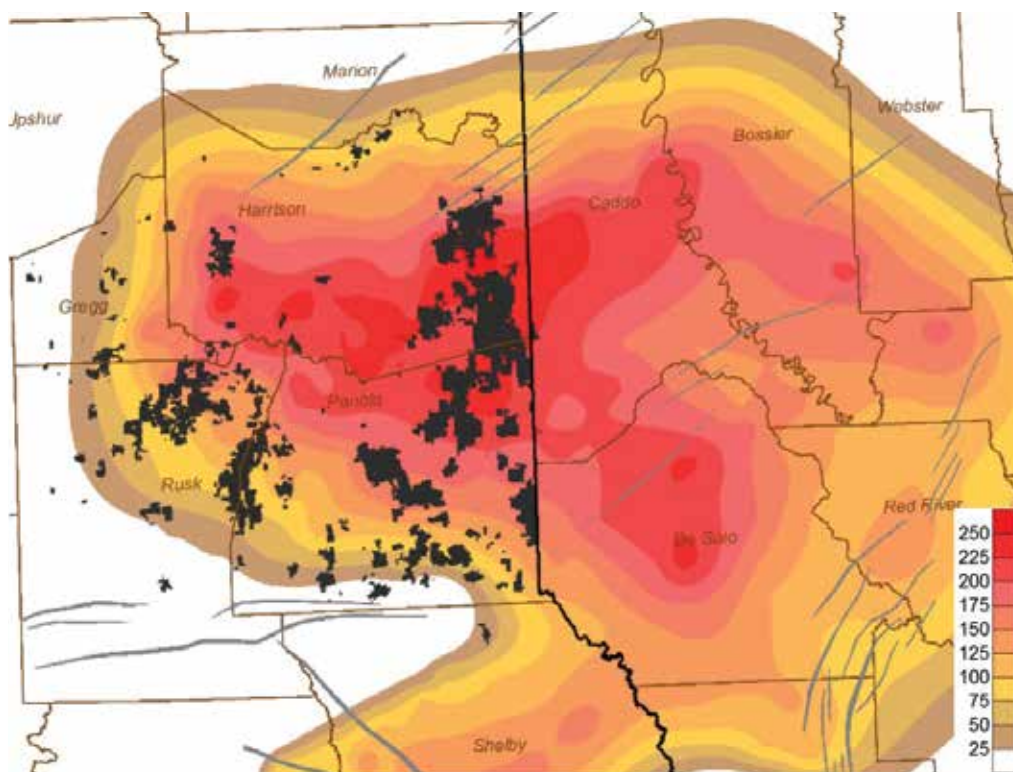
On a valuation basis, the deal gives a positive indirect read-through for several public gas E&Ps, including **Antero Resources**, **Chesapeake Energy** and **Southwestern Energy**.

And it's a more direct comparison in valuation to **Comstock Resources** as the only public pure-play E&P in the Haynesville.

"A key for transactions will remain the preference for equity over cash to allow for ride-along upside in a commodity recovery environment," Truist wrote.

—Chris Mathews, Senior Editor, Shale/A&D

**Haynesville original gas-in-place per section (bc/section)**



Source: Rockcliff Energy, Hart Energy

**Rockcliff Energy II operates over 200,000 net acres and 1.3 Bcf/d of gross operated natural gas output from the East Texas Haynesville Shale.**



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Contact: [meainfo@hartenergy.com](mailto:meainfo@hartenergy.com) with any questions.

**HART ENERGY**

# Talos Energy Lands QuarterNorth for \$1.29 Billion

Deal will add 30,000 boe/d in average daily production, mostly from the Katmai discovery in the Green Canyon.

**T**alos Energy executed definitive agreements to acquire private Gulf of Mexico E&P **QuarterNorth Energy** in a cash-and-stock transaction valued at \$1.29 billion.

Talos estimates QuarterNorth's average daily production for 2024 will be approximately 30,000 boe/d (75% oil), inclusive of planned downtime. QuarterNorth's producing assets include six major fields and are approximately 95% operated and 95% in deep water.

QuarterNorth operates and holds a 50% working interest in the Katmai discovery in the Green Canyon region, producing an estimated combined 27,000 boe/d gross from two early-life wells.

Talos expects the Katmai Field to average more than 34,000 boe/d gross with minimal decline over the next several years. The estimates are based on a successful field development plan that includes two future well locations and a facilities

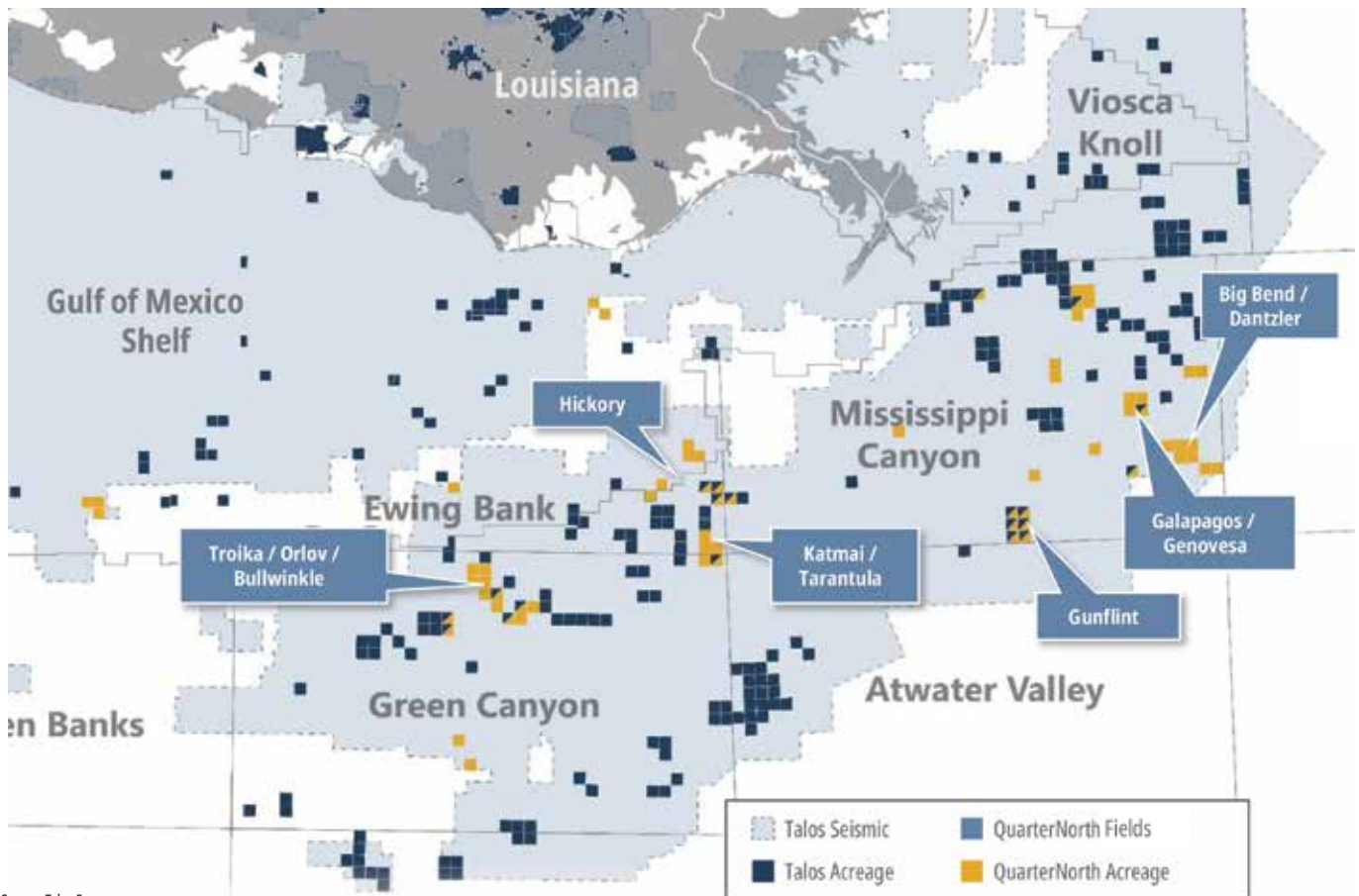
upgrade project in early 2025.

QuarterNorth also holds interests in the Big Bend, Galapagos, Genovesa and Gunflint fields with "strong production histories with nominal declines," and future development potential, Talos said in a press release.

Talos will pay for the transaction with a combination of 24.8 million shares of common stock and approximately \$965 million in cash. The board of directors of both Talos and QuarterNorth unanimously approved the transaction, which is expected to close by the end of first-quarter 2024, subject to certain customary closing conditions and regulatory approvals.

The transaction is expected to improve Talos's base decline rate by approximately 20%, providing increased production stability and lower reinvestment rates, the company said. The deal will also improve Talos's balance sheet, with expected year-end 2024 leverage ratio of 1x or less.

## Overview of QuarterNorth Energy



Source: Talos Energy

Talos President and CEO Timothy S. Duncan called the deal a milestone that will build a large-scale offshore E&P company.

"The addition of QuarterNorth's overlapping deepwater portfolio with valuable operated infrastructure will increase Talos's operational breadth and production profile while enhancing our margins and cash flow," Duncan said in a press release. "This transaction aligns with Talos's overall strategy of leveraging existing infrastructure and complementary acreage to accelerate shareholder value creation."

The pro forma footprint in the U.S. GoM should allow Talos to capture meaningful operating synergies, Duncan said. Talos said it expects annual run-rate synergies of approximately \$50 million by year-end 2024.

The expected financing structure of the transaction accelerates de-leveraging, immediately improves the company's credit profile, is accretive on key metrics "and positions us

to consider additional capital return initiatives following deleveraging in the near term," he said.

Talos secured \$650 million in bridge financing from a syndicate of banks representing most of the company's reserve-based loan lender group. Talos expects to fund a portion of the cash consideration with the RBL and "opportunistically" through debt or equity financings. Talos expects to repay the majority of the RBL funding for the transaction in the next 12 months.

**PJT Partners** and **Greenhill (Mizuho Securities M&A)** are serving as lead financial advisers to Talos. **J.P. Morgan Securities** and **Intrepid Partners** are also serving as financial advisers. **Akin Gump Strauss Hauer & Feld** is serving as legal adviser to Talos.

**Barclays** is serving as financial adviser to QuarterNorth, and **Holland & Knight** is serving as legal adviser.

—Hart Energy Staff

# Shell Sells Nigerian Onshore Business for Up to \$2.4 Billion

Shell is selling its Nigerian onshore oil and gas business to a Nigerian-led energy consortium for \$1.3 billion and will receive additional payments of up to \$1.1 billion from the European group.

**S**hell is selling its Nigerian onshore business for \$1.3 billion—with potentially more than \$1 billion in additional payments—as the European supermajor prioritizes investment in deep water and integrated gas.

Shell agreed to sell its Nigerian onshore subsidiary, **The Shell Petroleum Development Co. of Nigeria Limited (SPDC)**, to energy consortium **Renaissance**, the company announced in mid-January.

Renaissance is comprised of four E&P companies based in Nigeria—**ND Western, Aradel Energy, First E&P** and **Waltersmith**—and **Petrolin**, an international energy group.

Renaissance will also make up to \$1.1 billion in additional payments to Shell, primarily relating to prior receivables and cash balances in the Nigerian onshore business. The majority of the balance is expected to be paid at closing.

The net book value of SPDC was approximately \$2.8 billion as of year-end 2023.

The transaction remains subject to approvals by the Nigerian government and other closing conditions.

"This agreement marks an important milestone for Shell in Nigeria, aligning with our previously announced intent to exit onshore oil production in the Niger Delta, simplifying our portfolio and focusing future disciplined investment in Nigeria on our Deepwater and Integrated Gas positions," Zoë Yujnovich, Shell's integrated gas and upstream director, said in a news release.

The SPDC joint venture (JV) holds 15 leases for onshore petroleum mining operations and three for operations in shallow water offshore Nigeria.

Proved reserves subject to the transaction were approximately 458 MMboe as of year-end 2022, per the announcement.



Shutterstock

Sunset over Lagos Island in Lagos, Nigeria.

Shell has three other main businesses in Nigeria that are outside the scope of the onshore transaction:

- **Shell Nigeria Exploration and Production Co. (SNEPCo)** produces in the deepwater Gulf of Guinea;
- **Shell Nigeria Gas**, which provides gas to industrial and commercial customers in Nigeria; and
- **Daystar Power Group**, which provides solar power to commercial and industrial customers in West Africa.

Shell will retain a role in supporting the SPDC JV facilities that supply a major portion of the feed gas to **Nigeria LNG**—an LNG export project in which Shell will continue to hold a 25.6% ownership stake.

"Now, after decades as a pioneer in Nigeria's energy sector, SPDC will move to its next chapter under the ownership of an experienced, ambitious Nigerian-led consortium," Yujnovich said.

—Hart Energy Staff

# Battalion Sale Could Portend More Go-Private Deals

Newly formed E&P Fury Resources purchases Delaware Basin producer for \$450 million.

Publicly traded E&P **Battalion Oil** is being taken private by newly formed E&P **Fury Resources**—bucking the more common trend of public E&Ps tucking in private assets.

Although significantly fewer small- and micro-cap public E&Ps are around today than during the shale boom, a smattering remain spread around the Lower 48. Could go-private transactions become more common for smaller E&Ps with limited runway in the public markets?

Fury Resources is acquiring all of Battalion's outstanding common shares for \$9.80/share in cash, representing a total transaction value of approximately \$450 million.

The acquisition terms imply a whopping 85% premium compared to Battalion's closing stock price of \$5.28/share as of Dec. 14. Battalion's shares skyrocketed more than 81% to close at \$9.59/share after the deal was announced on Dec. 15.

For Battalion Oil, which was raising money to stave off a liquidity crunch and seeking strategic alternatives, a go-private transaction with Fury was "by far the best solution for them and their common equity holders," **Enverus Intelligence Research** Senior Vice President Andrew Dittmar told Hart Energy.

"They didn't really have capital to develop their asset or go out and buy new assets," Dittmar said.

"They were a bit hamstrung as a small public company—probably not attractive to another public company buyer given a combination of the asset quality plus the capital structure that Battalion had, which was heavy on debt and preferred equity," he said.

The Permian Basin has seen a historic amount of M&A activity in 2023, with total upstream dealmaking rising above \$100 billion for the year, according to analyses by **Wood Mackenzie** and Enverus.

A huge chunk of that came from **Exxon Mobil's** \$60 billion acquisition of **Pioneer Natural Resources**, the largest and most significant shale oil transaction the market has seen to date.

Public E&Ps followed suit, actively buying up the most attractive private opportunities to add greater scale in the Permian. And several other public E&Ps have added greater scale in the Permian through M&A with private companies this year.

But a private E&P scooping up a public player is a much rarer occurrence, Dittmar said.

"The industry is consolidated to a point where most of the small publics are going to be too big for one of these

go-private deals," Dittmar said.

The most recent comparable transaction might be the \$480 million acquisition of **Goodrich Petroleum** by **Paloma Partners VI**, backed by private equity firm **EnCap Investments**, in 2021.

## Sweetening a sour outlook

Battalion owns working interests in about 40,400 net acres in the Delaware Basin—primarily located in Pecos, Reeves, Ward and Winkler counties, Texas.

In its latest quarterly earnings, the company reported third-quarter sales volumes of 12,717 boe/d.

Battalion's main asset—called Monument Draw—sits in the eastern part of the Delaware up against the Permian's Central Basin Platform. The company reported recommencing drilling operations in Monument Draw during the third quarter.

But Battalion has also had to manage large quantities of H<sub>2</sub>S sour gas being produced from Monument Draw.

Last year, Battalion entered into a joint venture (JV) with **Caracara Services** to develop an acid gas treatment and carbon sequestration facility to treat sour gas volumes emerging from Monument Draw.

The acid gas injection JV project continues to go through workover operations. Additional complications were encountered with the project during the third quarter that required higher-than-expected costs, Battalion disclosed in its latest earnings report.

"Essentially because of that sour gas, Battalion has a way higher operating structure than any comparable company," Dittmar said.

Battalion's current forecast assumes the acid gas injection facility will be online and processing 20 MMcf/d of natural gas in first-quarter 2024.

Developing the acid gas treatment project is expected to reduce overall gathering and related costs by 20% to 30% annually, Battalion said when announcing the project.

"Once that comes online, it should bring the operating costs more in-line with the basin average, which is going to increase the value of that asset—both the existing production and the value of the inventory," Dittmar said.

That might have been a key consideration for Fury to move forward with a deal, he said. With sour gas treatment online, Battalion's overall runway looks a lot sweeter.

"With the treatment facility, it's still not going to be core Delaware—it's still Southern Delaware, Tier 2, Tier 3," Dittmar

**\$450 million**

Battalion's price tag

**\$100 billion**

Permian Basin M&A value in 2023

said. “But, it is comparable to similar quality assets in the area once you have a [treatment] facility online.”

Based on Battalion’s current operating costs, which are relatively high, Enverus estimates the production value for Battalion was worth around \$300 million.

Fury is paying about \$3,700 per acre, or about \$1.3 million per remaining net location, to acquire Battalion.

“I think the dollar-per-location is pretty comparable to what we’ve seen for similar Southern Delaware Tier 2 or Tier 3 assets,” Dittmar said. That’s comparable to some of the deals players like **Vital Energy** and **Callon Petroleum** have inked in the Southern Delaware.

### Small ball

Analysts expect the trend of upstream consolidation to continue in 2024, as the largest of the large E&Ps get even bigger in U.S. shale.

But what does the runway look like for the smallest of the small public E&Ps, which are out of favor with public investors, lack scale and are often more strapped for cash?

Selling to a private operator could be an attractive route for some smaller publics, Dittmar said.

“Right now, the industry operators, private capital and M&A participants are probably a bit more bullish in how they’re willing to underwrite inventory and upside than what public markets are,” Dittmar said.

Put simply: You’re more likely to get paid for inventory locations in an M&A transaction than for public markets to credit them with value.

So, some of those small public E&Ps are exploring their options—including pursuing a sale.

The most notable example in the Permian Basin is likely **HighPeak Energy**, which told investors in January that it would be exploring “certain strategic alternatives to maximize shareholder value,” up to and including a potential sale.

In the fall, HighPeak entered into a \$1.2 billion loan credit agreement to refinance its debt in what the Midland Basin E&P said is one of the largest privately arranged financings for an independent producer. At that time, company officials declined to say whether HighPeak was positioning itself for a sale.

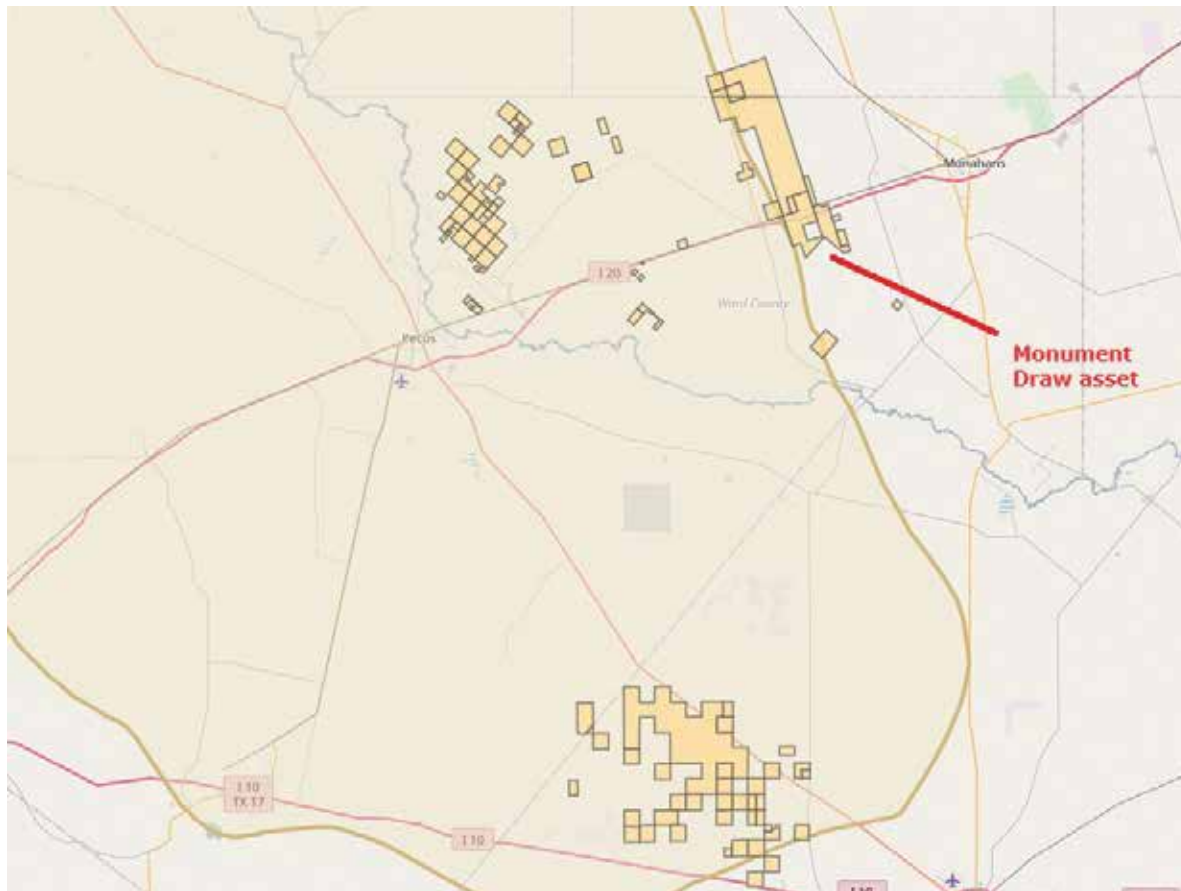
There are also several small- and micro-cap publics with positions outside of the Permian, including **Evolution Petroleum**, **Amplify Energy** and **Empire Petroleum**, among others.

In its third-quarter earnings, Amplify Energy announced plans to pursue a complete sale of its assets in Bairoil, Wyo.; a marketing process is scheduled to begin in the first quarter.

Amplify also noted that its future outlook could be affected by the company evaluating and implementing strategic alternatives.

—Chris Mathews, Senior Editor, Shale/A&D

## Battalion assets in the Delaware Basin



**Battalion owns working interests in around 40,400 net acres in the Delaware Basin—primarily located in Pecos, Reeves, Ward and Winkler counties, Texas. The company’s main asset, Monument Draw, is located in the eastern portion of the Delaware.**

Source: Rextag

# ► TRANSACTION HIGHLIGHTS

## UPSTREAM

**Quantum Capital Group** has closed the \$2.7 billion sale of Haynesville Shale E&P **Rockcliff Energy II** to **TG Natural Resources**, Quantum said in late December.

Rockcliff, a portfolio company of Quantum Energy Partners, Quantum's private equity division, was sold to TG Natural Resources, a subsidiary of **Tokyo Gas**. The Japanese company's acquisition is part of a strategy to triple Tokyo Gas's overseas profits in North America and elsewhere.

The Rockcliff acquisition increases TG Natural Resources's volumes of gas and NGL by approximately 4x from an average 330 MMcf/d to 1,300 MMcf/d.

► **Mach Natural Resources** has closed an \$815 million acquisition of oil and gas assets in the Anadarko Basin, the company said in late December.

Mach said in November it would buy approximately 62,000 net acres in Oklahoma from **EnCap**-backed **Paloma Partners IV**, a privately-held Delaware limited liability company.

In conjunction with the closing of the acquisition, Mach entered into an \$825 million term loan credit agreement to fund the purchase price via a group led by **Chambers Energy Management** and **EOC Partners**, as well as **Mercuria Investments US**, funds managed by **Farallon Capital Management**, **Macquarie Group** and **Texas Capital Bank** among others. Texas Capital Bank acted as the administrative agent.

Mach also entered into a \$75 million super priority revolving credit facility led by **MidFirst Bank**. Mach used proceeds from the term loan facility and cash on hand to repay existing amounts outstanding under a previously outstanding revolving credit agreement.

► Houston-based **Prairie Operating** is acquiring the assets of **Nickel Road Operating (NRO)** for a total consideration of \$94.5 million, the company announced in January.

The consideration includes \$83 million in cash and \$11.5 million in deferred cash payments.

NRO's assets are operations located near Prairie's existing footprint in the Denver-Julesburg (D-J) Basin—largely in rural Weld County, Colo.

The deal includes 5,500 net contiguous acres (90% HBP) and 62 permitted

undeveloped drilling locations.

The liquids-weighted assets produce approximately 3,370 boe/d (84% liquids; 66% oil) from 26 operated horizontal wells.

The assets include third-party proven reserves of around 22.2 MMboe, representing a PV-10 value of \$254 million.

Prairie expects the undeveloped drilling locations to pay out in about a year after beginning production. The low-cost drilling locations are also expected to breakeven below a WTI price of \$30/bbl.

"This acquisition increases and strengthens our overall position within a top-tier U.S. shale basin and aligns with our strategy of creating value through accretive acquisitions," said Prairie Operating Chairman and CEO Ed Kovalik.

The acquisition is expected to close in the first half of 2024.

After closing, Prairie will have around 45,000 acres in Weld County, offset by high-profile operators like **Chevron**, **EOG**, **Occidental Petroleum** and **Civitas Resources**, the company said in investor materials.

"Today's target-rich environment gives us ample opportunity to continue executing our acquisition strategy," said Prairie's President Gary Hanna. "These assets strategically enhance our existing operations, enabling us to capitalize on operational efficiencies in the D-J Basin."

Hanna, a veteran of the oil and gas industry, has served as president and a board director at Prairie since May 2023, regulatory filings show. Hanna was previously chairman and interim CEO of Delaware Basin E&P **Rosehill Resources**.

Prairie Operating was formed following last year's merger of **Creek Road Miners**, a publicly traded company using stranded gas assets to power cryptocurrency mining operations, and Prairie, a vehicle to acquire and develop oil and gas assets.

In conjunction with the merger, Prairie acquired undeveloped leasehold acreage in Weld County from **Exok Inc**. Prairie later exercised an option to acquire additional D-J Basin acreage from Exok.

After closing the Exok transactions, Prairie controlled approximately 37,189 acres in Weld County.

In December, Prairie received approval to list its common stock on the Nasdaq Capital Market exchange.

► **TotalEnergies** is acquiring additional interest in its operated 2913B and 2912 blocks offshore Namibia from **Impact Oil**

**& Gas Namibia**, an investee company of **Africa Oil Corp**.

Under the deal, TotalEnergies is acquiring an additional 10.5% participating interest in Block 2913B and an additional 9.39% participating interest in Block 2912.

The farm-out agreement allows Africa Oil to continue participating in the Venus oil development project "without stretching our balance sheet or exposing ourselves to the execution risk on a large-scale deepwater project," Roger Tucker, CEO of Africa Oil, said in a press release.

The Venus project, in Block 2913B, is a light oil and associated gas field in the Orange Basin. **Wood Mackenzie** called the discovery the largest in 2022, as the field is estimated to hold 3-5 Bboe.

After completing the transactions, TotalEnergies will continue to operate Block 2913B, which contains the Venus discovery, with 45.25% interest, and a 42.5% interest in Block 2912. Impact will retain 9.5% interest in each license.

In Block 2913B **QatarEnergy** holds 30% interest, and Namibian state oil company **NAMCOR** holds 10% interest. In Block 2912, QatarEnergy holds 28.3% interest, and NAMCOR holds 15% interest.

"This transaction not only increases our share in the Venus discovery and remaining prospectivity on these blocks, but also represents a key step toward the development of Venus by consolidating the partnership and securing financing of all partners," said Patrick Pouyanné, TotalEnergies' CEO and chairman, said in a press release.

► **Evolution Petroleum** entered into agreements to purchase non-operated oil and gas assets in the SCOOP and STACK plays in Oklahoma from three companies for \$43.5 million cash—together equaling the largest transaction in the company's history.

Evolution will acquire an average of 1,550 boe/d in production consisting of 42% oil, 15% NGL and 43% natural gas from **Red Sky Resources III**, **Red Sky Resources IV** and **Coriolis Energy Partners I**. The deal includes approximately 230 production wells with an average working interest of about 3%. The interests are in the Anadarko Basin's Blaine, Canadian, Carter, Custer, Dewey, Garvin, Grady, Kingfisher, McClain and Stephens counties.

Evolution said the transaction comes with "significant upside associated with

approximately 3,700 net acres in the SCOOP and STACK plays with more than 300 gross undeveloped locations" with an average working interest of about 3%.

Evolution expects to fund the transactions from cash on hand and borrowings from its senior credit facility with **MidFirst Bank**. As of year-end 2023, and prior to the transaction, the company had approximately \$8 million in cash on hand and had no outstanding borrowings under the facility. The company estimates that net debt after closing the transaction will be within its targeted leverage ratio of 1x pro forma Adjusted EBITDA.

Kelly Loyd, Evolution's president and CEO, said the transactions are a significant achievement for the company and demonstrate its ability to buy high-quality assets in a core basin with "best-in-class operating parties."

The assets are managed by E&Ps including **Continental Resources**, **Ovintiv** and **EOG Resources**, among others.

► California-based **Trio Petroleum** secured an option from **Heavy Sweet Oil** to acquire 20% interest in a low-sulfur, heavy-oil Asphalt Ridge development project in Uinta County, Utah.

Trio Petroleum secured the option to participate in Heavy Sweet's initial 960-acre drilling and production program, which is slated to begin in first-quarter 2024, according to the company's filing with the Securities and Exchange Commission (SEC).

The Asphalt Ridge option involves a nine-month term ending Aug. 10 with a purchase price of \$2 million, which may be paid in tranches provided and the first tranche is paid out during the option period. In late December, the company paid the \$200,000 advance of the total purchase price and attained a 2% interest in the Asphalt Ridge Leases.

Heavy Sweet Oil also agreed to fund a maximum of \$5 million for the initial development program, with additional participating parties splitting costs thereafter based on ownership interests.

Heavy Sweet Oil also entered into a leasehold acquisition and development option agreement with **Lafayette Energy Corp.** to acquire up to 30% of the Asphalt Ridge Leases. In Trio Petroleum and Heavy Sweet Oil's option agreement, provided Lafayette Energy does not exercise its option rights, Trio Petroleum has the right to acquire up to all 30% of the Lafayette Energy option.

"It is excellent to be able to diversify our exciting portfolio of California opportunities with such a high-potential asset in Utah, especially one that will not require a lot of additional capital expenditures according to the operator's development plan," Michael L. Peterson, Trio Petroleum's CEO, said in the press release. "Development is commencing now and, with success, the Utah asset may be cash flowing in mid-2024.

"We now have two major assets in our portfolio, the South Salinas Project in California and the Asphalt Ridge Project in Utah."

► **Diversified Energy** sold assets from its Appalachia portfolio as the natural gas E&P works to reduce debt.

Diversified sold producing assets in Appalachia to a special purpose vehicle (SPV) for proceeds of approximately \$200 million, the Alabama-based company announced in early January.

The transaction was comprised of an asset-backed securitization placed at the SPV and the sale of an 80% interest in the SPV for approximately \$30 million.

Diversified said it retained a 20% minority interest and operatorship of the assets.

The implied valuation of the deal represents a 5.7x multiple of the expected hedged 2024 EBITDA of about \$35 million.

The Appalachia assets were previously used as collateral on Diversified's sustainability-linked loan. The sale resulted in the company's revolving credit facility being redetermined at \$305 million.

The PV-10 of the divested assets was approximately \$230 million, based on forward-looking commodity prices; gross production averaged around 50 MMcfe/d.

"This latest transaction further demonstrates the attractiveness of Diversified's asset base that provides reliable production and consistency of cash flows," Diversified CEO Rusty Hutson Jr. said in a news release. "At an attractive multiple, this transaction has provided a path for the company to unlock additional value from our assets, reduce our outstanding debt and enhance our liquidity."

Proceeds from the asset sale were used to repay outstanding borrowings from Diversified's revolving credit facility, which reduced net debt by approximately 12%.

Diversified ended the third quarter with a leverage ratio of 2.4x, the company

disclosed in its most recent earnings report.

► Oil and natural gas operator **U.S. Energy Corp. (USEG)** completed a series of non-core asset divestitures in January.

USEG's divestiture highlights include:

- All-cash proceeds of approximately \$7.2 million;
- Divested assets averaged approximately 200 boe/d (83% oil) from July-September 2023 or 12% of USEG total production over the same period;
- All proceeds used to reduce existing debt, leaving USEG materially debt-free;
- No changes to the company's existing \$20 million borrowing base; and
- Represents the majority of USEG's non-operated assets.

With proceeds from the divestitures going toward the company's debt reduction, "U.S. Energy now sits in a position of increased liquidity across all measures and meaningful portions of [U.S. Energy's] 2024 oil production, hedged at an average price in the low \$80's," USEG's CEO Ryan Smith said. "As we enter 2024, we look forward to focusing our capital allocation efforts on the company's highest rate of return growth initiatives, maintaining a strong balance sheet and driving shareholder returns."

► **Phoenix Capital Group** has acquired nearly 600,000 oily net mineral acres in the Bakken play from financial institution **AgWest Farm Credit**.

In early January, Phoenix purchased interests in four states, including more than 50,000 net mineral acres in Montana's Richland and Roosevelt counties. The deal is one of the largest Phoenix has made.

Financial terms of the transaction weren't disclosed. The minerals interests generate approximately \$200,000 in royalties per month and in 2023 reached \$2.47 million—an amount expected to grow as the company further develops the acreage.

Phoenix said the assets include 441 stable producing, shallow decline wells on the acreage acquired from AgWest and anticipates more than 100 new well locations that can and likely will be drilled in the future across the acquired land.

Justin Arn, Phoenix chief land and title officer, said that when the company

learned AgWest was considering a divestment of its interests, "our team swung into action."

"While deals like these are considered a 'once-in-a-generation' occurrence in the oil business, due to their overall size and complexity, Phoenix Capital Group was founded precisely to become the preferred buyer for these large divestments," Arn said.

Phoenix has actively acquired minerals and leasehold in Richland and Roosevelt counties since 2019. The Montana side of the Bakken continues to be a focus area for the company, as the state offers "some of the most attractive investment opportunities in the Williston Basin," the company said.

## MIDSTREAM

In January, **Moda Midstream** completed its previously announced sale of a 50% interest in an NGL storage and terminal facility for an undisclosed amount.

Moda, backed by **EnCap Flatrock Midstream**, sold its joint venture interests in the terminal to Madrid's **Exolum**, a European logistics company. Financial terms of the deal, announced in December, weren't disclosed.

The Vopak Moda Houston (VMH) terminal is located on the Houston Ship Channel and is the only waterborne ammonia terminal with the deepwater berth capable of accommodating very large gas carrier vessels.

The VMH acquisition is part of Madrid-based Exolum's diversification strategy, the company has said.

"Moda has again accomplished its mission to develop the most advantaged, sophisticated terminaling infrastructure in our industry," Jonathan Z. Ackerman, Moda CEO and co-founder, said in a news release. "I applaud the collaboration and execution by Moda's team of experts in commercial development, engineering and design, project management, operations and sustainability."

## SERVICES

**Voyager Interests**, a Houston private equity firm specializing in investments in the energy services and equipment sector, has acquired Tulsa, Okla.-based **Aegion Coating Services (ACS)**.

Financial terms for the transaction were not disclosed.

ACS is a global leader in field joint coating services, using robotics to apply protective coatings to internal and external segments of natural gas, crude oil, potable water and saltwater pipelines, Voyager said in a press release. ACS's services are used throughout the Middle East, South America and Asia.

Robert Trainer, partner at Voyager, said ACS has established a track record of "excellence in the industry for more than 40 years. We are thrilled to welcome them into the Voyager family and are confident that, together, we will achieve new heights of success."

Bryan Kirchmer, president of ACS, said the partnership with Voyager presents a new chapter for ACS, "where we have access to capital and a growth mindset that will enable us to provide an enhanced service proposition to our customers."

► Rental equipment company **H&E Equipment Services** completed the acquisition of Arizona-based equipment company **Precision Rentals**.

H&E Equipment Services supplies construction equipment to a variety of companies, including those in the energy industry. The acquisition adds to H&E's presence in the Phoenix and Denver areas and adds approximately \$70 million in original equipment to its fleet.

Following the closing of the transaction, H&E now operates 139 branch locations across 30 states in the U.S.

► **Forum Energy Technologies (FET)** announced it completed the acquisition of **Variper Energy Services**, a manufacturer of customized downhole technology solutions that provides sand and flow control products for heavy oil applications.

Forum paid a total consideration of \$150 million of cash and 2 million shares of FET's common stock for a total of roughly \$190 million. The deal is subject to customary purchase price adjustments.

"This accretive acquisition enhances FET's downhole and artificial lift product portfolio by adding a leading manufacturer of customized downhole technology solutions in sand and flow control for heavy oil applications," said Neal Lux, president and CEO of FET. "We expect the combined global footprint of FET and Variper to benefit both legacy FET and Variper products. We are excited to welcome the Variper employees to the FET team."

Cash consideration for the transaction was funded from cash on hand, borrowings

under FET's asset-based lending (ABL) credit facility and a \$60 million seller term loan. The seller term loan will mature in December 2026 and provides for an initial interest rate of 11% that is subject to escalation after the first anniversary of the loan. The seller loan is payable at any time without penalty.

As previously disclosed, FET completed an amendment to the company's ABL credit facility in November 2023 to permit the Variper acquisition, increase the aggregate revolving commitments from \$179 million to \$250 million, extend the maturity date to September 2028 and allow the seller term loan.

## POWER & RENEWABLES

► **Ormat Technologies** has acquired a portfolio of solar assets in four U.S. states from **Enel Green Power North America** subsidiary **Enel SpA** for \$271 million.


The acquired portfolio also includes two contracted operating geothermal power plants and one triple hybrid geothermal, solar photovoltaic (PV) and solar thermal power plant. The geothermal plant has approximately 40 megawatts (MW) of capacity; solar PV has 20 MW; two solar assets have a nameplate capacity of 40 MW; and two greenfield assets are in development.

The assets are in Nevada, Utah, Connecticut and California, and increase Ormat's electricity segment generated portfolio to 1,215 MW.

The overall transaction was funded through available cash, in combination with \$200 million in newly issued long-term corporate debt.

The acquisition is expected to be immediately accretive to both revenues and EBITDA. Ormat said it intends to further improve the performance of the acquired asset portfolio through a series of operational enhancement and optimization initiatives.

Doron Blachar, CEO of Ormat Technologies, said the close of the transactions will begin adding to the company's shareholders.

"The acquired assets will be immediately accretive to Ormat's profitability, and we expect to improve the generation, revenues and EBITDA performance through a series of value-enhancement initiatives, including the integration of Ormat's own state-of-the-art equipment," Blachar said. 



# Kissler: Red Sea Conflict Could Cause Oil Shortage



**DENNIS KISSLER**  
BOK FINANCIAL SECURITIES

*Dennis Kissler is SVP of Trading for BOK Financial Securities. He is based in Oklahoma City.*

In the early days of 2024, we saw crude oil prices dropping rapidly, with WTI down more than 4% and Brent down more than 3%. The fall in prices was sparked by Saudi Arabia's state-owned oil company having cut the prices of its Asia crude exports to the lowest levels in more than two years. This move was due to China's struggling economic recovery post-COVID and resulting decreased need for oil.

So, will we see a freefall in oil prices during these early weeks of 2024? I still don't think so. While crude oil supply and demand fundamentals are favoring a global supply surplus, there are underlying issues that should keep a floor under prices.

In the near term, the conflicts between Russia and Ukraine in Eastern Europe, and Israel and Hamas in the Middle East are keeping oil prices higher than we might expect, given the drop in Chinese demand. While both wars seem to be on a path of escalation at the time of this writing, it's the Israeli/Hamas conflict that is taking precedence, as the tensions have now expanded into Iran and the Red Sea area.

## Shipment disruption?

The disruption of shipment through the Red Sea would have a major impact on global markets, particularly the energy market. Already, we've seen Houthi forces in Yemen using Iranian intelligence and weapons to target ships. Although they have said they're targeting only Israeli ships, that doesn't seem to be the case.

If the conflict in the Red Sea continues to escalate, exported crude supplies out of the straits of Hormuz could be cut along with Iranian crude exports that are in excess of 1.5 MMbbl/d. Such an event a year ago was not even on the radar and now could immediately flip global fundamentals into a crude shortage.

## Other factors

Meanwhile, the U.S. government has been continuing its efforts to replenish the Strategic Petroleum Reserve (SPR), which is requiring a constant purchase of crude. Most recently, the Department of Energy has said that it wants to buy as much as 3 MMbbl of U.S.-produced sour crude oil for delivery in April. (Sour crude is more difficult and costly to refine because of its high sulfur content, making it less expensive than sweet crude oil.)

Large purchases like that are necessary




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**The MSC United VIII container ship was attacked in the Red Sea by Houthi forces in late December.**

for the SPR to be replenished, given how much the reserves have been drawn down. Approximately 290 million barrels have been released since 2021, including the record 180 million barrels sold in 2022 to help fight high oil prices after Russia invaded Ukraine. The current rate of refill (or, contracted refill so far) is 7.6 MMbbl, with 14 MMbbl more supposedly contracted. This all means there is a long road ahead in which more purchases will be needed. While it is evident that the buyback will be much more orchestrated than the heavy selling that took place in 2022, there seems to be a floating bid under prices at least through most of 2024.

Finally, heightened environmental regulations and economic sanctions likely will support oil prices. The last run-up in prices resulted in some relaxation of environmental policies and some sanctions to be eased, which allowed oil exports from China, Russia and Venezuela to enter the market, increasing global supplies very quickly. However, now that prices have receded, it's more likely that environmental regulations will tighten again and economic sanctions will be more heavily enforced, pulling barrels from these countries back off the global market.

Of course, demand will remain an issue, but even with the continued slowdown in the manufacturing sector, global demand (especially for jet fuel) has remained well above most expectations. If we continue to see the U.S. economy head toward a soft landing (as opposed to a recession), the seasonal spring demand could once again outperform most estimates. One thing that will remain is market volatility moving into 2024. 

# Feds to Take Close Look at CHK-SWN Deal

Dominant positions in the Haynesville and Appalachia are likely to raise eyebrows.



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The megamerger between Chesapeake Energy and Southwestern Energy—a deal that would establish a new E&P with a commanding sway over the Haynesville Shale and the Appalachian Basin production—follows an energy industry trend seen picking up speed in 2023. Large, cash-flush companies are acquiring other major players to establish even more advantageous shale play positions.

Some federal legislators, however, are pushing back, calling the deals anticompetitive and demanding regulators step up scrutiny of the deals.

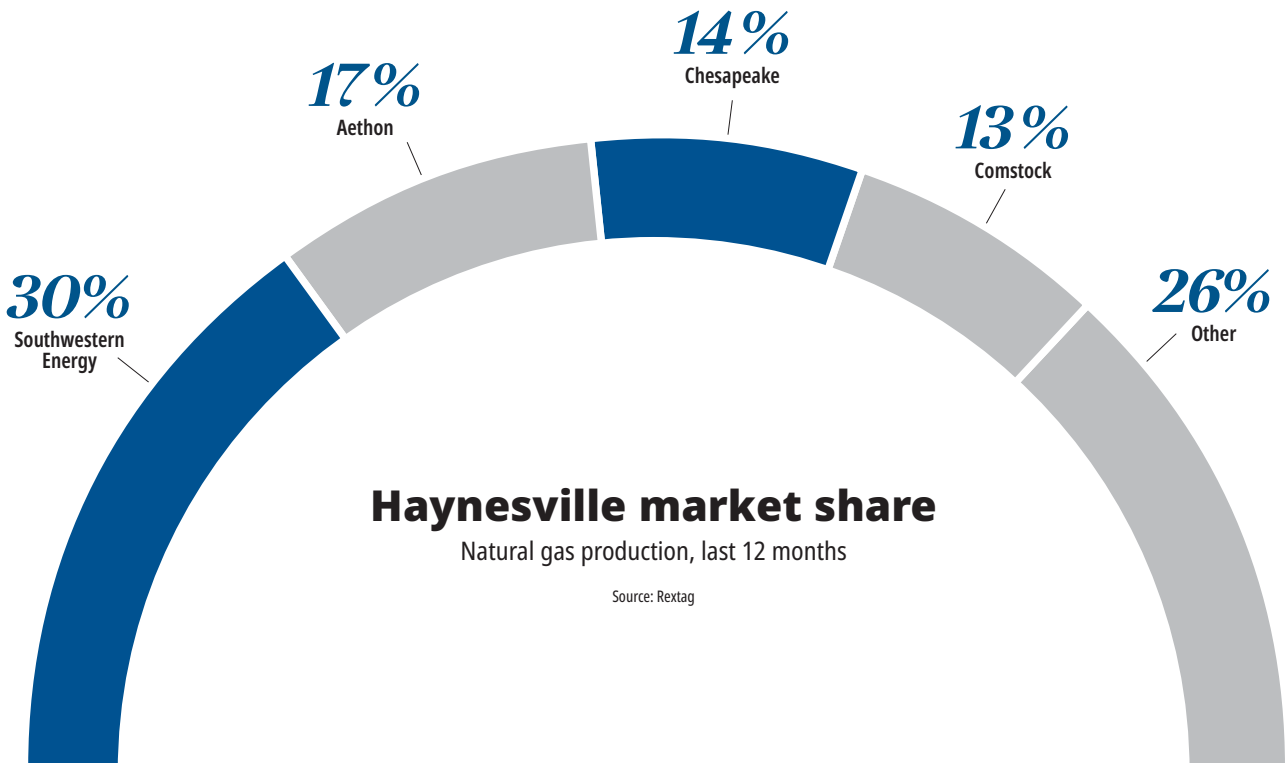
“On the back of the last couple of years, it comes as no surprise that there is a war chest of capital available for most oil and gas companies to go out and invest and avoid playing the debt management and dividend game,” said Joanne Salih, a Houston partner in the Oliver Wyman Energy Practice. “So, it’s

the best time possible to go after some of these acquisitions.”

The next step, however, is getting the deal past a federal government in which some political leaders have been critical of the large recent deals and in which natural gas mergers bring intense scrutiny. The \$7.4 billion deal would create the largest natural gas producer in the U.S.

“The oil market is a global market and gets a little bit less scrutiny than the gas market,” said Ajay Bakshani, director of analytics for East Daley Analytics. “Even with the FTC [Federal Trade Commission] investigation, I think most people expect the Exxon Mobil deal to go through pretty smoothly. But there have been rumors of more pushback from regulators.”

Exxon Mobil’s acquisition of Pioneer Natural Resources in October has brought calls of alarm from Congress. Senate Majority Leader Charles Schumer (D-N.Y.) demanded





*"I don't think (the Chesapeake-Southwestern merger) is of the size to really, in and of itself, result in a significant pushback."*

—Joanne Salih, partner, Oliver Wyman Energy Practice

a Federal Trade Commission investigation of the deal, saying the merger would result in higher prices for the customers. The FTC, which enforces antitrust laws, is currently reviewing the deal. Schumer has also called for a review of Chevron's acquisition of Hess.

U.S. natural gas, for the time being, remains in a far more domestically centered market, Bakshani said, even though LNG exports have more than doubled since 2018 and are expected to double again by the end of the decade.

"So, regulators are taking a closer eye on energy deals than they might have in the past," Bakshani said. "On top of that, when we look at the latest merger, which is EQT buying Tug Hill in a much smaller deal, that took about 11 months to close."

In September 2022, EQT announced the acquisition of gas producer Tug Hill Appalachia and midstream company THQ-XcL Holdings in a \$5.2 billion deal. The FTC did not give final approval for the deal until August 2023.

The FTC had antitrust concerns about the deal, and eventually approved the acquisition after EQT and Tug Hill backer Quantum Capital Group signed a consent order "that prevents entanglements between the two companies and the exchange of confidential, competitively sensitive information."

The commission was concerned enough that for the first time in 40 years it enforced Section 8 of the Clayton Act, an antitrust law that seeks to stop "interlocking directorates," when an officer or director of a firm also serves as an officer or director of a competing firm.

The FTC's consent order prohibits Quantum from occupying a seat on the EQT board of directors and requires the private equity firm to divest its EQT shares.

Before the Chesapeake and Southwestern announcement, JP Morgan reported that there would be scrutiny, as a combined Southwestern-Chesapeake "would control about 21% of Appalachia's gross production ... and about 25% of Haynesville's gross production."

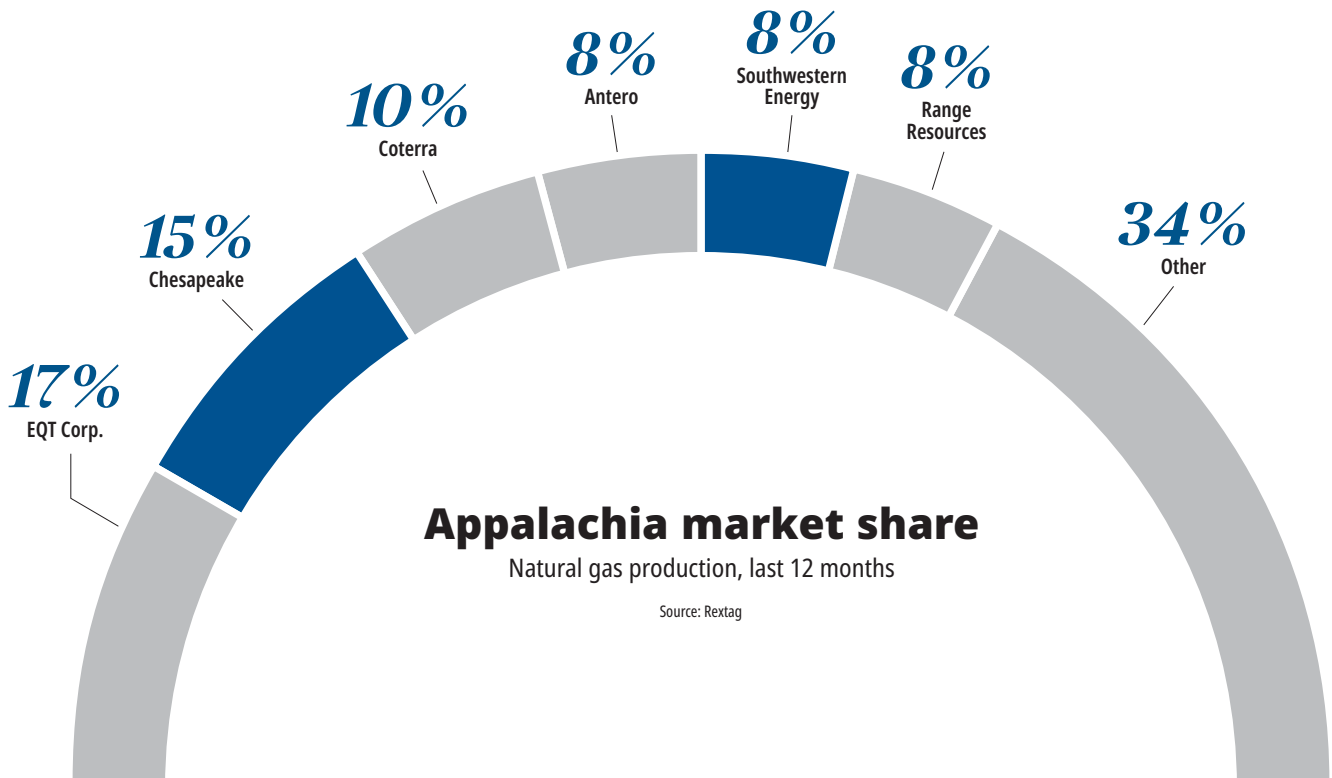
Bakshani said the deal was likely to "take some time" to pass through regulatory hoops.

However, Salih said she believes the merger will ultimately pass muster with regulators.

"Governments come and go," she said. "In general, if you look over the last century, to the periods of times when there is consolidation in oil and gas, especially of a particular size, there's obviously always issues around competitiveness and overgearing towards a few major players."

People and governments fear overconsolidation that shifts all decision to a small group or one person.

"Nobody wants that," Salih said. "But I don't think (the Chesapeake-Southwestern merger) is of the size to really, in and of itself, result in a significant pushback."



# Survey: E&P Execs Expect, Worry About M&A

The Dallas Fed reports that spending is likely to be flat for 2024.



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**M**ost E&Ps are likely to keep spending the same or less in 2024, but how producers deploy capital depends largely on the size and type of company, the Federal Reserve Bank of Dallas said in its fourth-quarter 2023 survey.

Michael Plante, Dallas Fed senior research economist and adviser, said the oil and gas sector appears to have entered a holding pattern, but that plans for companies vary greatly, depending on the size.

"A majority of executives at smaller E&P companies report their primary goal for 2024 is to maintain or grow production," he said. "On the other hand, executives at larger E&P firms were more likely to report their goal is to acquire assets or reduce debt levels."

Among smaller E&Ps, 25% of respondents wanted to maintain production, while 41% said they intended to grow volumes. At larger operators, 35% of respondents were focused on acquisitions, followed by the 20% focused on reducing debt.

The survey, conducted in early December, asked 144 energy firms—including 96 from E&Ps and 48 at oilfield service firms—about spending, M&A, commodity prices and

access to capital, among other topics.

## Shale 'inching toward death'

M&A unified E&P and oilfield service respondents the most. Among all respondents, 77% said they anticipate continued large-scale M&A.

After a year in which U.S. acquisitions totaled more than \$150 billion, respondents were asked if they expected more megadeals, similar to those by Exxon Mobil and Chevron, to continue within the next two years.

Service companies, however, expressed concerns about further M&A, with some of those surveyed seeing further combinations as a threat to smaller E&Ps.

"The consolidation of operators will impede the growth and sustainability of the oilfield service sector," one executive told the Dallas Fed. "This will lead to the demise of small independent oil and gas operators, as they will be unable to obtain reasonable pricing from the few remaining service providers."

Another said the Federal Trade Commission "should adopt a policy that would stop the wholesale purchases of these large companies, as it is detrimental to the energy health of the



nation and economic stability to our communities.”

M&A activity, another respondent said, has made smaller operators, which are the sector’s target customers, more cautious in their decisions. That’s resulted in new business growth slowing.

Still another observed that the acquisitions “occurring in the oilfield are not helpful.”

One E&P executive also saw 2023 M&A as the writing on the wall for smaller operators.

“Majors are explicitly investing on the thesis that the back end of the forward curve for oil is just plain wrong,” the executive told the Dallas Fed. “Inventory for U.S. onshore will be extremely valuable in five years as shale inches toward death and moves to terminal decline. Prices are likely closer to \$150 than \$50 at the end of the decade. The young folks in energy need to learn offshore and international exploration quickly.”

### Commodity price worries

Another broad area of agreement was commodity prices, regardless of an operator’s size. About 64% of respondents

said they were basing their capital plans around prices ranging from \$70/bbl to nearly \$80/bbl.


For planning purposes, the average respondent said they assumed WTI prices of \$71/bbl—relatively close to 2023 assumptions of \$73/bbl. Overall, respondents expected a Henry Hub natural gas price of \$3.09/MMBtu at year’s end.

While the survey was conducted, WTI spot prices averaged \$69.77/ bbl and Henry Hub spot prices averaged \$2.48/MMBtu.

Nevertheless, oil prices left some executives feeling uncertain about 2024 economics.

“The recent decline in the oil price and a more negative economic outlook are possible headwinds for clients’ budgets in 2024,” one respondent said.

“Weakening oil prices below \$70 per barrel and near-zero residue gas prices in the Permian, along with weak natural gas liquids prices, will limit capital investment in 2024, as it is determined by operating cash flow.”

Another E&P executive said the “big question is will OPEC+ be able to keep the price of crude oil up.” 

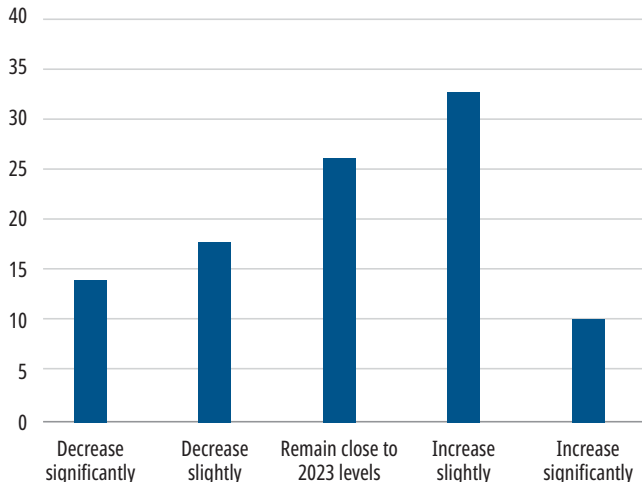
## Dallas Fed energy survey business activity index



Source: Federal Reserve Bank of Dallas

## What are your expectations for your firm’s capital spending in 2024 vs. 2023?

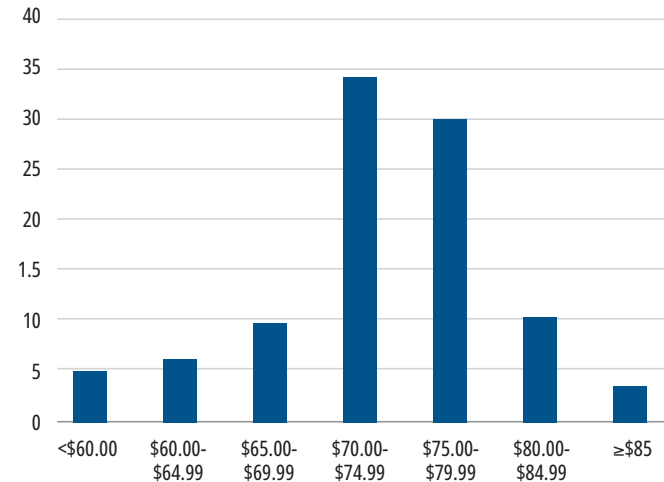
Percent of respondents



NOTE: Executives from 141 oil and gas firms answered this question during the survey collection period, Dec. 6-14, 2023. Source: Federal Reserve Bank of Dallas

## What do you expect the WTI price to be at the end of 2024?

Percent of respondents (Dollar per barrel)



NOTE: Executives from 140 oil and gas firms answered this question during the survey collection period, Dec. 6-14, 2023. Source: Federal Reserve Bank of Dallas

# West: Oil Service Tells A Tale of Two Markets



**JAMES WEST**  
EVERCORE ISI

*James West is a senior managing director at Evercore ISI, responsible for research coverage of sustainable technologies and clean energy, and the oil service, equipment and drilling industries.*

**A**s the industry turned the calendar into 2024, several themes became clear: 1) The U.S. land market will experience a decline in activity; 2) international land growth is poised to continue, especially in the Middle East and in certain pockets in Latin America and Asia; and 3) the offshore momentum will be on full display.

As investors, we maintain our view that those companies leveraged to the growth in offshore where assets are in short supply, technology is dominated by a select few and consolidation has already unfolded, are best positioned to significantly grow earnings, cash flow and margins, and maximize shareholder returns.

North American activity growth began to slow considerably as 2023 unfolded, with companies maintaining capital discipline, natural gas activity muted with high inventories and low prices, and heavy M&A among the E&Ps. Consolidation in the E&P space is a net negative for oil service providers as capital budgets following transactions tend to be optimized, resulting in lower OFS equipment utilization and sometimes pricing declines.

The M&A announcements last year, and so far in 2024, have been very large. This loss of market power for OFS will likely be felt as industry activity declines this year. We firmly believe the oil service industry needs to refocus on consolidation; the benefits of a consolidated market are clear in subsectors such as land drilling, pressure pumping and offshore drilling where major changes to market structure have led to better economics and returns across the board. When your customers consolidate faster than you, then you are deconsolidating even if you don't realize it.

The international land markets remain strong, particularly in the Middle East where the desire to restore productive capacity, produce more natural gas to consume internally and the plans to raise productive capacity are driving all-time highs in E&P spending and rig counts in many countries. Many OPEC+ countries are producing below their maximum stated capacity, but this has not prevented prominent members of the group such as Iraq, the UAE, Kuwait, Iran and even Saudi Arabia from increasing investments to potentially expand their oil production capacity.

Saudi Arabia, Iraq and the UAE are targeting a total 4 MMBbl/d of new oil production capacity by 2027, representing a 47% increase on average from current stated capacity. Kuwait is similarly

targeting to invest in 1.9 MMBbl/d of new capacity by 2040, 68% of its current maximum.

The global offshore oil and gas markets have rebounded and will be the largest drivers of E&P spending growth in 2024. The offshore market is back in focus after a very tough decade. The push into U.S. oil shale from 2010 to today kept offshore spending at bay for most of that period, which led to a painful downturn.


The downturn was exacerbated by a massive expansion of offshore assets, especially in deepwater starting in the early 2000s. As a result, the industry found itself extremely over-leveraged, deconsolidated and in need of a serious restructuring. Almost every publicly traded offshore asset-heavy company went through a bankruptcy and debt restructuring. What emerged in late 2020 and 2021 was an industry with fewer assets and reduced debt leverage.

The industry is quickly running out of available modern offshore rigs, vessels and aviation assets to support the surge in activity. As a result, asset values are surging and day rates have jumped considerably. There is a scramble for assets underway, which is playing into asset owners' hands. Many of the negotiations for assets are happening

directly, reflecting the desire of the oil industry to quickly and quietly secure assets for many offshore drilling programs.

Major oil companies, national oil companies, international independent operators and some U.S. independents are all getting in on the offshore action. The majors and NOCs recognize the need to replenish baseload, low-decline rate oil production, while international independents are attacking prospects divested by the majors in prior years.

There is also a shift toward targeting natural gas in the Middle East to replace oil in electricity generation and in many other regions to supply the major LNG facilities currently under construction. Energy security concerns are a driver of this trend, as is the desire for lower-carbon fuels.

We anticipate solid free cash flow generation across our coverage universe and expect more capital to be returned to shareholders through buybacks and dividends as the cycle continues. Most companies have announced shareholder return frameworks. The industry is also in an enviable position to help drive the energy evolution and de-carbonization of oil and gas. 

## MARKET WATCHERS

# Paisie: Economics Edge Out Geopolitics



**JOHN PAISIE**  
STRATAS ADVISORS

*John Paisie is president of Stratas Advisors, a global research and consulting firm that provides analysis across the oil and gas value chain. He is based in Houston.*

The price of Brent crude failed to break above \$80 during December and the first half of January, while the price of WTI failed to move above \$75 and some change.

The oil market has continued to discount the geopolitical risks, even though the Israel-Hamas conflict is widening with the involvement of the Houthis, who are disrupting maritime traffic through the Red Sea. Furthermore, the threat of increased involvement of Hezbollah remains.

Instead of the geopolitical risks, the oil market remains more concerned about the economic outlook conditions and oil demand.

- While the headline number associated with the recent U.S. jobs report exceeded market expectations, the report has some underlying signs of weakness: labor force participation remains low at 62.5%, with 683,000 workers falling out of the labor force in December; a record high 8.69 million workers are holding multiple jobs; since June, 1.5 million full-time jobs have been eliminated, while 796,000 part-time jobs have been created.

- The latest Purchasing Managers' Index reports from the Institute for Supply Management also indicate weakness in the U.S. economy. The ISM services PMI for December decreased to 50.6 from 52.7 in November. The ISM manufacturing PMI for December increased to 47.4 from 46.7 in November; however, the index has remained below 50 (which reflects contraction) for 14 consecutive months.

- The manufacturing sector in the Eurozone also remains under pressure with manufacturing activity contracting for 18 consecutive months. There are concerns about inflation accelerating again with the initial estimate for the Consumer Price Index in the Eurozone for December reaching 2.9%, in comparison to 2.4% in November. Increases in the costs of food and services offset the moderate decrease in energy costs.

- Early in January, the World Bank issued its forecast for China's economic growth for 2024 (4.5%) and 2025 (4.3%), which compares to 5.2% in 2023. China's economy continues to be hampered by its real estate sector, where investment has decreased by 18% during the last two years and a limited recovery in consumer spending.

Additionally, like Europe, there is the growing realization that the Federal Reserve in the U.S. is likely to be keeping interest rates higher for longer than the optimistic view held at the end of last year. The inflation rate (excluding energy and food) is remaining well above the 2% targets and in recent months has stopped declining.

Besides the concern about the growth in oil


demand, the oil markets are not convinced that OPEC+ will move forward with the additional cuts announced at its Nov. 30 meeting.

OPEC+ agreed to reduce its oil production by an additional 700,000 bbl/d—which will come from Iraq, UAE, Kuwait, Kazakhstan, Algeria and Oman. Saudi Arabia also agreed to extend its voluntary cut of 1 million bbl/d, and Russia agreed to reduce its exports of refined products by 200,000 bbl/d beyond its current reduction of 300,000 bbl/d.

The additional production cuts were slated to start at the beginning of 2024. But there are fears of additional supplies from Iran and Venezuela. Iranian oil exports have increased to around 1.5 million bbl/d, with rising Iranian production approaching 3.2 million bbl/d. Venezuela was able to increase its oil exports to roughly 700,000 bbl/d in 2023, which is an increase of more than 10% in comparison to 2022. The U.S. is taking about 20% of Venezuela's exports and China is buying 65%. Venezuela aims to increase production above 1 million b/d, but production increases will be dependent on the extension of the U.S. license beyond April along with the allowance to continue importing condensate from Iran.

Consequently, the sentiment of oil traders continues to be negative. The net long position of WTI traders remains at a depressed level and near the level seen in July 2023 before the announcement of the voluntary cut of 1 million bbl/d by Saudi Arabia. Since late September, WTI traders have reduced their net long positions by more than 70%. Traders of Brent have also been reducing their net long positions with short positions increasing significantly.

The traders' sentiments could become more positive with verification that OPEC+ is following through with the additional supply cuts. Another development that could support higher oil prices would be the U.S. reimposing tighter sanctions on Iranian oil exports. Any increased sanctions would place the U.S. in starker opposition not just to Iran, but also to China, which imported 1.2 million bbl/d of Iranian crude in December.

The full impact of these developments, however, will take time. We are expecting the oil markets to continue discounting the geopolitical risks unless there is a material impact on oil flows. Without such an impact on volumes, we expect that, during first-quarter 2024, oil prices will bounce upward with any negative geopolitical news. But any price increase will quickly fade once the markets see that oil is still flowing. 

# Small Wonder

Petrie Partners may not be the biggest or flashiest investment bank on the block, but after over two decades, its executives have been around the block more than most.



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Petrie Partners CEO Jon Hughes is the first to admit that he doesn't run the biggest or flashiest investment bank. Indeed, few are familiar with the firm outside of the oil and gas industry. The Petrie Partners team totals only about 20 employees, but when you're surrounded by Goliaths, there are benefits to being the smaller, nimbler David.

It was Petrie Partners executives who advised Pioneer Natural Resources on its \$65 billion acquisition by Exxon Mobil, and it was Petrie Partners advising Noble Energy on \$7 billion of acquisitions that allowed the company to enter the Permian Basin.

The list goes on for the firm that, following the model of its predecessor Petrie Parkman & Co., has built a name and reputation for itself inside the relatively tight-knit oil and gas industry.

Leveraging geography has helped. By maintaining offices in oil and gas hubs like Houston and Denver, as opposed to the financial capital of New York City, executives were able to rub shoulders with titans of the hydrocarbon business and land some of their first major clients.

Tom Petrie, who transitioned to the firm's chairman emeritus in May 2023, said this gave the firm a front row seat to watch U.S. shale development and the fracking revolution unfold.

Petrie remembers meeting Barnett Shale pioneer George Mitchell in the early 1970s, but he didn't really follow Mitchell until shale development began to pick up. Little did Petrie know at the time that a firm tied to his name would advise on the largest U.S. shale transaction ever signed.

Exxon Mobil's all-stock acquisition of Pioneer Natural Resources, valued at approximately \$59.5 billion, or \$253 per

share, brings together two of the largest crude oil producers in the nation's top oil-producing basin. Exxon Mobil will also acquire Pioneer's outstanding debt.

The merger adds Pioneer's over 850,000 net acres in the Midland Basin to Exxon's portfolio of 570,000 net acres across the Permian. Combined, the company will have an estimated 16 Bboe of oil and gas resource in its Permian portfolio.

Petrie Partners, Goldman Sachs, Morgan Stanley and Bank of America Securities acted as financial advisers to Pioneer on the deal; Exxon Mobil was represented by Citi as lead financial adviser and Centerview Partners as financial adviser.

"We compete with the bulge bracket banks," said Petrie Partners CFO Mike Bock. "This isn't the first deal where we've been on the same side or the other side of Goldman, Credit Suisse, Morgan Stanley—all the big names."

## Seat at the table

Whether Exxon's acquisition of Pioneer or the other transactions during a historically active M&A market, dealmaking is being driven by scarcity of quality drilling locations across the shale patch, Hughes said. And as geopolitical instability rocks Europe and the Middle East, the relative stability of operating in the U.S., or the Western Hemisphere more broadly, becomes even more attractive.

There has also been a recognition that the world is going to demand oil and gas for decades to come, Hughes said, and you can only do that if you have new locations to drill.

"High-quality drilling opportunities truly are limited because we've had a good decade of drilling A-plus inventory," Hughes said. "There's still some left, but it's not as plentiful as it used to be."

THE OGI  
INTERVIEW

Watch the video  
interview here:







**(Left to right): Mike Bock, CFO at Petrie Partners; Jon Hughes, CEO; Andy Rapp, COO**

*“High-quality drilling opportunities truly are limited because we’ve had a good decade of drilling A-plus inventory. There’s still some left, but it’s not nearly as plentiful as it used to be.”*

—Jon Hughes, CEO, Petrie Partners

That’s particularly true in the Permian Basin, where the vast majority of the so-called “Tier 1” drilling locations are already held in the portfolios of a small number of public E&Ps. To get their hands on the best rock, operators, by and large, are having to go out and buy it from one, or several, of their competitors.

This scarcity-fueled M&A bonanza culminated in more than \$100 billion in upstream transaction value across the Permian last year, according to a Wood Mackenzie analysis, though a huge chunk of that record total is represented by the Exxon-Pioneer tie-up. The previous record was \$65 billion in 2019.

So, how does a small boutique firm land as an adviser on one of the largest oil and gas deals ever signed?

One major factor is firm partner Jim Rogers, who has



**Jim Rogers**

maintained a long relationship with Pioneer. “As I like to say, he’s the new guy. He’s only been with us five years,” Hughes said.

The firm had an existing relationship with Exxon, so was able to act with trust and confidentiality with both sides of the table.

Andy Rapp, COO of Petrie Partners, said the firm has long acted as a

sounding board for operators thinking about the direction of the energy industry or contemplating entering the A&D markets.

“It was a role that I think we were able to play effectively and confidentially for the senior management of Pioneer over the years,” Rapp said.

Being small can also be advantageous when trying to keep details about potential deals from finding their way outside the office walls. The Petrie team thinks confidentiality is more likely if fewer people are involved in the overall process.

“In the conflicts department at a bulge bracket firm, there are more people that have to know about clearing conflicts to sign up an engagement than we have employees,” Hughes said.

There were benefits of scale and status when the firm’s predecessor, Petrie Parkman, was acquired by Merrill Lynch in 2006. Then again after Merrill’s takeover by Bank of America during the financial crisis.

But there are also attractive features about not being a bank: No need for a balance sheet for oil and gas lending, no road shows with investors. Petrie Partners isn’t trying to commoditize the entire M&A advisory value chain like the big banks have tried to do, Hughes said.

“We work really hard on one deal and hopefully we get the next deal. Then that client mentions it to another client,” Bock said. “We don’t have to spend a lot of time pitching.”

“We have to win business on merit,” he said.

The executives also credit the longevity of the Petrie

Partners team for some of the firm’s success in the market.

“This sounds arrogant but it’s true: We have really good people,” Hughes said. “We keep them, we train them. Andy, Mike and I have done that all our careers together.”

Then of course, there’s the benefit of the doubt that Petrie Partners receives by nature of Tom Petrie’s reputation within the energy industry, Rapp said. It helps when you’ve had a chairman of the board with over four decades of analyzing global commodity markets and brokering billions of dollars in transactions.

### **Petrie Parkman & Co.**

Tom Petrie and Jim Parkman hadn’t even opened the doors to their new boutique investment firm, Petrie Parkman & Co., in 1989 when foundational oil and gas clients started to approach them.

Petrie and Parkman, both already veterans and influencers of the Wall Street financial world, met at the First Boston investment bank in New York when Parkman joined in 1982. But by the time that First Boston was being bought out by Credit Suisse in 1988, the two had decided to go their own way.

Still, leaving a major investment bank to start a single-industry boutique was a fairly novel idea in the late 1980s, Petrie said.

One of Petrie’s clients was Clark Johnson, CEO of Union Texas Petroleum. The two had worked closely together to get Union Texas Petroleum’s difficult IPO process across the finish line.

Petrie and Johnson were together at a dinner in Denver when Johnson made a proposal.

“When we went off to dinner, he held me back from some of his people and said, ‘I know in all likelihood you’re going to be thinking about what else you want to do after the Credit Suisse deal with First Boston closes,’” Petrie said. “And I just want you to know I want to be a founding client.”

“I called Jim that night and said, ‘We’re off and running.’”

It wasn’t before long that Apache Corp. co-founder Raymond Plank approached the nascent investment bank seeking its services.

Plank had relocated Apache from Minneapolis to Denver just a few years before Petrie Partners launched. Petrie had known Plank since his time covering Apache as an oil analyst in the early 1970s, but Apache coming to Denver made it that much easier to check in with him.

Plank eventually came to Petrie Parkman with the goal of getting bigger.

“He was talking about how he’d founded the firm—he’d done it with drilling funds in the early years, in the ‘60s to early- to mid-‘70s,” Petrie said. “But now, he really felt like he was ready to step up.”

The scale Plank was seeking came in the form of a large

*“We compete with the bulge bracket banks. This isn’t the first deal where we’ve been on the same side or the other side of Goldman, Credit Suisse, Morgan Stanley—all the big names.”*

—Mike Bock, CFO, Petrie Partners

parcel in Texas and New Mexico that Amoco wanted to part with. The former Standard Oil Co. was well-known for making negotiations difficult, and the two sides were stuck on price.

Petrie Parkman came up with a production payment plan to bridge the wide gap between Amoco’s asking price and Apache’s own bid. The \$550 million acquisition of MW Petroleum was completed in 1991, doubling Apache’s size.

“That reinforced what Clark Johnson had said to me, as well,” Petrie said. “If we are willing to work hard and really develop and deepen our network of contacts, we could have a base of business operating independently.”

Much of the firm’s early work focused on conventional assets. Unconventional development, horizontal drilling and the fracking revolution opened up new avenues.

One of the last things Petrie and Parkman did while at First Boston was finding a buyer for a client’s gassy shale properties in Appalachia.

After launching in Denver, Petrie Parkman started to assist clients with acquiring, trading and divesting properties in the

Denver-Julesburg (D-J) Basin.

But one deal that really drove home the untapped potential of U.S. shale was the \$421 million acquisition of Lyco Energy Corp. by Enerplus in 2005, Petrie said. The transaction included approximately 120,000 net acres of undeveloped land in Montana and North Dakota, and light oil production from the Bakken dolomite formation.

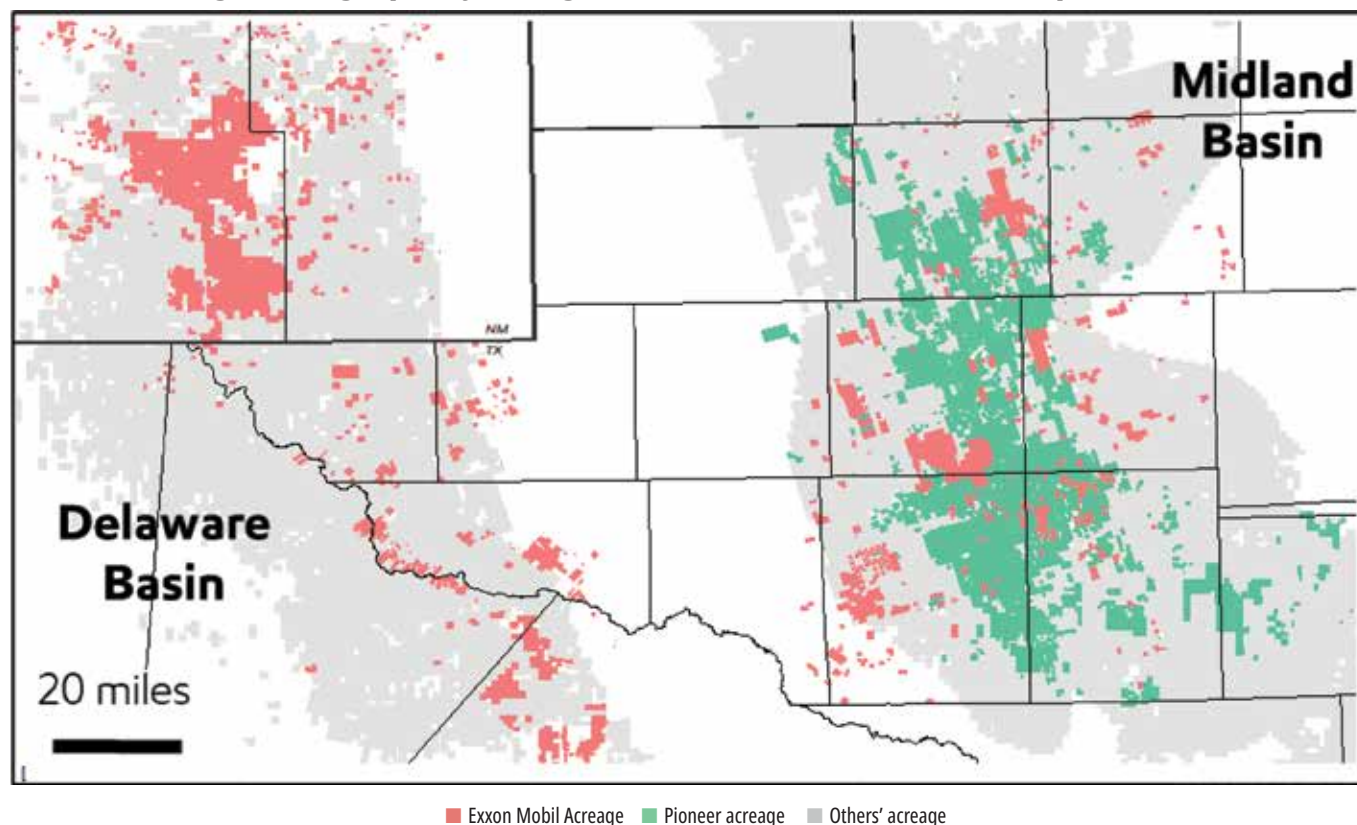
“It was the real evidence that the ability to develop the shale potential in oil was going to happen,” Petrie said.

The firm started to get in on the shale action itself, benefitting from the enormous amounts of new capital coming into the domestic oil and gas sector and the rapidly increasing value of land in several well-known basins.

Petrie recalls advising on a sale of Barnett Shale properties by privately-held Chief Holdings, one of the first large-scale unconventional asset divestitures in the market. Devon Energy picked up the Barnett assets for \$2.2 billion in cash.

In 2006, Petrie and Parkman sold their firm to Merrill Lynch. Petrie became vice chairman of Merrill Lynch when the

### Pioneer’s contiguous, high quality acreage enhances Exxon Mobil’s Permian position



Source: Exxon Mobil-Pioneer investor presentation

deal closed, while Parkman joined Houston-based Parkman Whaling. In 17 years, the firm had engaged in transactions totaling \$84 billion.

### There and back again

The acquisition by Merrill Lynch gave Petrie Parkman much greater scale, but longtime team members missed life as a boutique firm.

The big bulge bracket banks are able to work with larger balance sheets, but they are also encumbered by a lot more moving parts: one side of the coin is pushing the bank's lending arm, another is pushing the hedging arm, or the asset management arm.

They've also got a lot more employees vetting and analyzing potential transactions—which can lend itself to leaks and lapses in confidentiality.

There's a lot more turnover at the big banks compared to Petrie Parkman, as well. Several Petrie Parkman team members had worked together since the firm's founding in 1989. Others joined the firm as it established itself as a player in the oil and gas M&A realm throughout the 1990s.

Hughes was one of Petrie Parkman's first hires. He led the firm's mergers and acquisitions business before eventually becoming head of investment banking and a member of the Petrie Parkman board.

Mike Bock joined Petrie Parkman in 1993; he brought new skills in finance and corporate balance sheets to the firm, Petrie said.

After graduating from Rice University, Rapp joined Petrie Parkman's Houston office in 1999 to work on energy asset valuations, acquisitions and divestitures.

Petrie, Hughes, Bock and Rapp all joined Merrill Lynch through the acquisition in 2006, then moved to Bank of America when the giant bank swallowed up Merrill for \$50 billion in 2008. Not everyone was enamored by life under a big-name bank.

"After the financial crisis and becoming part of Bank of America, it was a challenge to integrate into an organization that big and to combine the Petrie, Merrill Lynch and BofA teams," Rapp said. "But it also gave us a tremendous amount of ongoing autonomy—just the ability to keep doing the things that we felt like we did well and with the clients we knew and had great relationships with."

By 2011, Hughes, Bock and Rapp were able to leave Bank of America Merrill Lynch to launch their own boutique advisory, Strategic Energy Advisors, focused entirely on energy transactions.

After back and forth with Bank of America Merrill Lynch on branding negotiations, Tom Petrie left to become the new firm's non-executive chairman in 2012; Strategic Energy Advisors changed its name Petrie to Partners.

Petrie had actually been planning to retire after leaving Bank

of America, planning to budget more time toward writing his book, "Following Oil." He found the idea of putting the band back together, so to speak, to be contagious.

But he did have a condition: Petrie wasn't willing to be CEO of an investment banking firm again. So Hughes, with whom Petrie had worked together for 25 years at that point, agreed to become CEO to lead the next iteration of the firm.

"I thought very much that Jon had the skill sets and the vision to carry on," Petrie said. "And as it turned out, that was the beginning of the entity that we talk about now as Petrie Partners."

### Deal deluge

Did the Exxon-Pioneer merger kick off a wave of scarcity-fueled upstream M&A activity?

Some analysts think so: When thought leaders make big moves, their competitors wonder if they need to make a big move, too. Others think the upstream industry was destined for more consolidation as top-quality drilling locations got developed and started to run dry.


Eye-popping and industry-shaking deals continued to get signed in fourth-quarter 2023 and first-quarter 2024:

- Chevron unveiled a \$53 billion takeover of Hess Corp. in October 2023, picking up a piece of the world's newest and hottest offshore oil discovery in Guyana;
- Back in the Permian, Occidental Petroleum plucked private E&P CrownRock off the drawing board for \$12 billion;
- APA Corp. and subsidiary Apache acquired Callon Petroleum for \$4.5 billion;
- Permian Resources added runway in the Delaware and Midland basins through a \$4.5 billion acquisition of Earthstone Energy; and
- Ovintiv, Matador Resources and Vital Energy were among several acquirers of private equity-backed E&Ps in the Permian last year.

And despite significant volatility in natural gas prices, gas-focused M&A has also started to pick back up.

Chesapeake Energy and Southwestern Energy agreed to combine in a \$7.4 billion merger, bringing together two of the top gas producers in Appalachia and Louisiana's Haynesville Shale. Late last year, Tokyo Gas Co. subsidiary TG Natural Resources acquired Haynesville E&P Rockcliff Energy II for \$2.7 billion.

All signs point toward an M&A deluge poised to continue for at least another six to 12 months, Hughes said. Petrie Partners aims to continue to be a sounding board, a trusted adviser and an advocate for the oil and gas industry as other companies evaluate the current M&A landscape.

"When you look back through history and when [the supermajors] get active, if you're not paying attention or following it closely, you're missing the boat," Rapp said. 

## DEAL DOCKET

Petrie Partners has worked on several notable transactions in the energy industry. Here are a few you might remember:

- Advised **Pioneer Natural Resources** on its pending \$65 billion merger with **Exxon Mobil**;
- Acted as sole adviser to **Noble Energy** when it entered the Permian Basin through the acquisitions of **Rosetta Resources** and **Clayton Williams Energy**, collectively valued at ~\$7 billion;
- Served as independent adviser to the Board of Directors of **Ecopetrol** on the Colombian national oil company's entry into the Permian Basin as a partner with **Occidental** and its diversification into electricity transmission;
- Advised **Extraction Oil & Gas** on its Chapter 11 restructuring, followed closely by a three-way merger with Bonanza Creek and **Crestone Peak** to form **Civitas Resources**; and
- Principals advised U.S. LNG export pioneer **Cheniere Energy** on its full life-cycle financing, from formation and early development and construction capital through the IPOs of its three public entities.

# NOV's Tech Chief: Moving the Drilling Cabin to Move the Needle on Rig Safety

NOV's tests of how removing the driller's cabin from the rig floor impacts operations suggests a critical step in industry safety is close.



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**N**OV is bringing together robotics, automation and cameras to do what was once thought impossible: move the driller's cabin from the drill rig floor. On a test rig in Navasota, Texas, NOV in December established a proof of concept setup to move the driller's cabin from the drilling rig floor to the ground next to it. High-resolution cameras captured the action and delivered the visuals to monitors inside the relocated cabin where drilling engineers successfully managed their operations. In an exclusive interview with Hart Energy's Jennifer Pallanich, NOV's CTO David Reid explained his mission to remove people from the danger of the drill floor.

**Jennifer Pallanich: Tell me about the process of moving the drilling cabin from the rig floor.**

**David Reid:** We've been doing a lot of things to bring in machines and try and get people away from danger. But the one thing we had not done was having people sitting there and watching. We started our robotics journey, and once you see actual industrial robots working, it's very different than everything we've done before. We've built our own robots, we've designed our own systems. We have mining robots out there that are usually down in mines. They're used to high-cycle work, don't take a lot of maintenance, but they do the exact same thing over and over. They took away all the work around the rotary table. But two things happen when you watch them.

The first thing is, it's really boring. They do exactly the same thing. They're very precise and repetitive. But the second thing that happens is, there's an emotion where you feel like, "I feel better about this. I don't know why." When you own or run a rig, or you know the people, you're responsible for that rig. You just have a sense of danger and big heavy things. There's big steel above them. There's things flying around and you

just sense, "Ah, I'm going to have to keep my eyes on everything. Everyone needs to keep their eyes on everything." But when the robots are working, that feeling changes. You don't feel that intensity.

As soon as I became responsible for the rig, the first day as CTO, I was like, "We have to take the cabin off." The guys who were working around the robots were like, "yeah, exactly." The crew weren't so sure, but we managed to take the structure off.

A lot of people are asking, "Well, can I run it from far away?" Possibly, but that wasn't the intent. The first intent was, just prove that we can do this. We didn't have them leave the site, we just had them move away

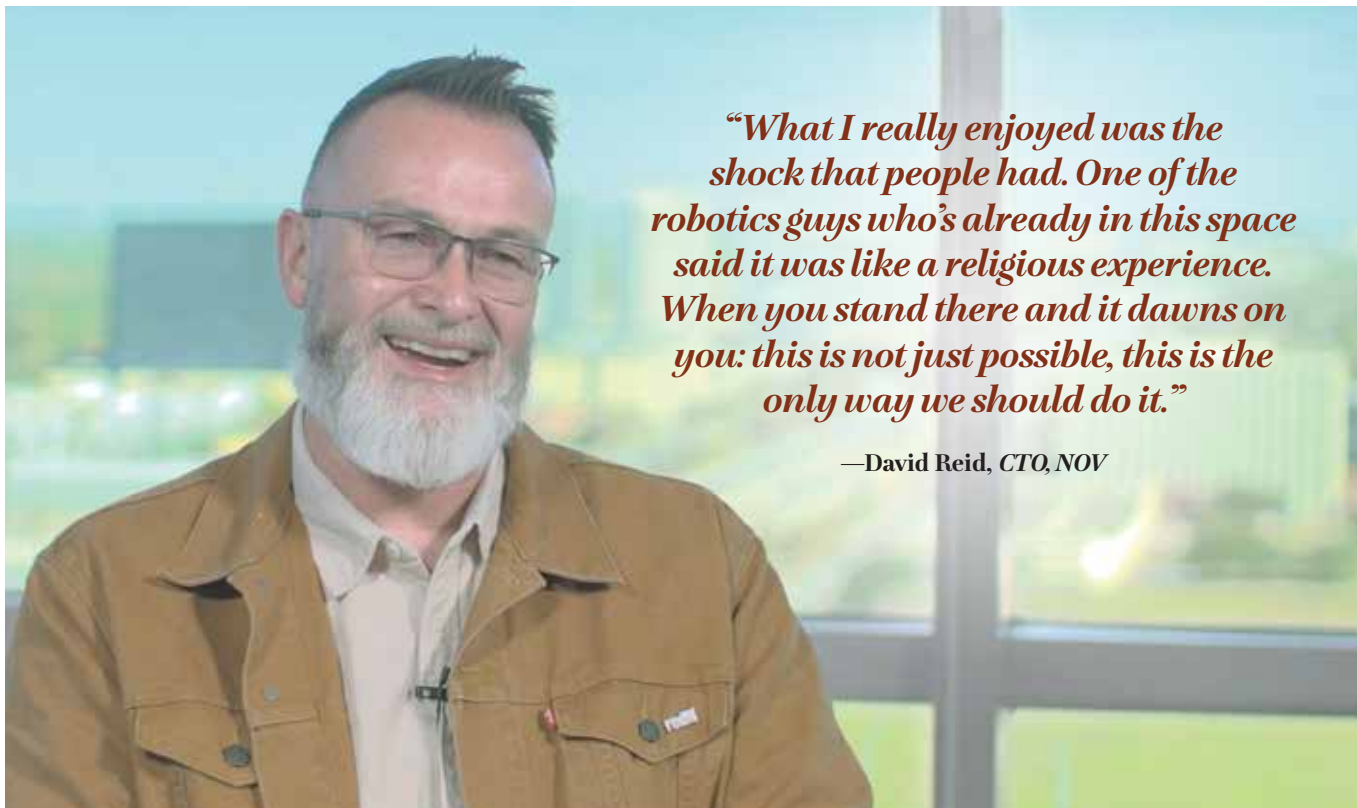
from the dangerous place where if there's a blowout, you need to be able to get away.



**JP: How far away have we moved the driller's cab?**

**DR:** It's not far. I literally said, "Just drop it down here, get me a screen, get me good video cameras, and we'll be good." So, we extended the cables pretty much. We're not running through the cloud or any of that, which is probably the next phase.

But the first thing is, if we do this, what happens in operations? Because usually, if



*“What I really enjoyed was the shock that people had. One of the robotics guys who’s already in this space said it was like a religious experience. When you stand there and it dawns on you: this is not just possible, this is the only way we should do it.”*

—David Reid, CTO, NOV

Hart Energy

you’re there, you’ll go manual to solve a problem. It helps us a bit to do this and see operationally what we learn, what gaps are there, what more things do the robots have to do? We’re in that process right now.

**JP: So, you would consider this basically a proof of concept?**

**DR:** It is. The robots we’ve been [using] for two and a half years out there, they’re all good. They’re working fine and we’re deploying those all over. We’ve been running operations for a while, but not drilling. We’ve been running the robotics and testing systems for most of this year (2023).

**JP: What are some of the chores or tasks that the robots carry out?**

**DR:** They do everything that a human would do. They’ve got enough strength, probably more than a human, so they’re handling the pipe, they’re moving the pipe in and out, which is pretty normal, but they’ll go grab a doping system and a centralizing system, and they’ll do that together. They can clean, as well. They have a mud bucket system, so they’ll change out their device and go over and get the mud bucket. That’s been a lot of the work that we’ve been doing so far.

There’s some development on handling of BHAs (Bottom Hole Assemblies) that we’re in the middle of right now on the rig. We’re just bringing up BHAs and doing them off the rig.

A lot of the offshore applications we’re looking at—BHAs makeup, completion tools—we’re trying to get the cost down so that we can manage most tasks and get most of this so that [workers] don’t have to be there.

**JP: Can you outline for me the next steps of this person-less drilling rig floor?**

**DR:** We’ve done studies to make sure that we have everything covered. But [we are] trying to really thrash it out in real operations.

We’re seeing a pickup in offshore and in land where people are starting to say, “OK, this is the right answer,” [for] a couple of reasons. One, it’s efficient, but also, it’s hard to get people to do those jobs or [when] there’s new people coming in, there’s high risk with those jobs. So, we’re seeing a lot of uptake in that area.

But we’ve been automating so much, it seems like this is the progression. This is the way we have to go. And if you could have a rig with no one on it, would you? Yes. If you could not sit on top of a nuclear reactor, would you say, “I don’t want to be here.” Yeah, you’d probably say, “We’re very safe, but I’d rather be far away.”

When you look at the design of safe systems, people are moved away from potential risk. We haven’t been able to perceive that until now.

And here we are. We’re basically connected by a cable. The next stage has to be, “Can we run from in the building?” which we have a setup already. We have a simulator set up, and we’re going to tie that in and say, “Can we drill from here?” We’re looking for partners who want to start doing that development.

**JP: Makes a lot of sense. So, you have driven this whole change, this whole project to get the cabin off the rig floor. What was your first thought when you saw it actually not there and sort of functioning?**

**DR:** It was a great feeling. It was more watching other people because up until the day it got taken down and we set up, everyone was questioning it.

In the future, will we have cabins? We may still have the cabin there and be able to be somewhere else. The point was that the physical removal was really important for operational learning.



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Hart Energy

**1. For the personless rig floor proof of concept, NOV moved the driller's cabin from the rig floor to the ground below the rig. 2. A combination of well-placed cameras and high-definition screens are giving the drilling engineer a better idea of what's happening with the drilling operation even though the cabin is not on the drilling floor. 3. NOV's test rig in Navasota, Texas, with the driller's cabin on the ground level. NOV tested drilling operations with this set up in December 2023. 4. The video cameras keep an eye on rig floor activity, and the view appears on high-definition screens in the driller's cabin. 5. The rig floor is now a long flight of stairs away from the driller's cabin 6. The drilling engineer can watch the robots perform their tasks. 7. Robots are handling tasks on the drill floor like handling pipe.**

We had to physically do that because these people today are doing a well and they have to get the job done. They're not going to get to say, "Well, we didn't have the cabin up." They're going to have to get the job done.


And so, doing that was really important. What I really enjoyed was the shock that people had. One of the robotics guys who's already in this space said it was like a religious experience. When you stand there and it dawns on you: this is not just possible, this is the only way we should do it.

If you've had that feeling, when anyone has been on a rig during a blowout, it is the most eerie and strange feeling. Everyone's tense, everyone's away who doesn't have to be there. It's a risky time and you can feel that we're really focused. But being able to know if everything goes wrong, I'm not in the most dangerous area—that's a really good thing. And I think it will change for all of us. People have thought it's not possible. And as we get to the end of this,

(it's) going to be good for people to be in a safer place.

**JP: What does it take in terms of commercialization, in terms of cost, in terms of having other people have that religious experience, seeing the rig floor free of humans?**

**DR:** Well, many are coming to see it. They're coming to see the thing happen, and I think they change because [there are] really not a lot of barriers to doing this. It's really operationally making sure you're there, but you can have remote capability. You can be going somewhere else to watch operations.

And so, it's quite easy to soft build up toward it. I think we'll go there faster than you would imagine. There's a lot of new things [that] happen when you have robots, things you have to sense, things you have to do differently. But really operationally, watching remote is the best answer. I think it's coming fast. 

# The Pioneer-Exxon Deal from A to XOM

Behind the scenes, the machinations included pursuit of an unidentified Midland Basin E&P, years of 'preliminary discussions' and wordsmithed statements about confidentiality agreements.



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**P**ioneer Natural Resources was looking at buying an unidentified E&P last spring before beginning talks on June 22 to exit to Exxon Mobil, according to an updated preliminary proxy statement filed with the Securities and Exchange Commission.

The resulting \$65 billion deal was the largest globally among some 54,000 deals worldwide in 2023, closely followed by Chevron's \$60 billion bid for Hess, according to London Stock Exchange Group data.

Identified only as "Company A," Midland Basin-focused Pioneer had "preliminary discussions" on terms, such as how much of Pioneer the Company A shareholders would own post-closing, the company reported at year-end.

But no agreement was reached on that or other terms, it added.

It described the target as "an upstream company with operations in the Permian Basin," but did not identify it further, such as whether it is a fellow Midland Basin pure play, a Permian (both Midland and Delaware Basin) E&P or a multi-basin operator.

J.P. Morgan Securities analyst Arun Jayaram reported in June that Rich Dealy, Pioneer's president at the time and now CEO, said at a recent dinner that Endeavor Energy Resources was interesting to Pioneer but "at the right price."

Meanwhile, the description in Pioneer's proxy statement would exclude buying wholly Appalachian gas-focused Range Resources. Pioneer was compelled to comment in February on a report by Bloomberg that the company was in talks to buy Range.

Pioneer's stock price fell from more than \$200 to \$180 in intra-day trading. To quell the rumors, it made a rare statement

that "it is not contemplating a significant business combination or other acquisition transaction."

The Wall Street Journal then reported on April 7, citing unidentified sources, that Pioneer and Exxon Mobil held "preliminary talks" to merge and that Exxon was looking at a second potential target as well.

During Pioneer's April 27 earnings call, then-CEO Scott Sheffield said he wouldn't comment on the new rumor.

Pioneer did state in its December proxy that it and Exxon had "preliminary discussions" at times during the past several years about what a deal could bring to each, but none resulted in proposals before last summer.

## HOW IT PLAYED OUT

### FEBRUARY

- Pioneer Natural Resources denies a Bloomberg report that it was in talks to buy Range Resources.

### APRIL

- Wall Street Journal reports "preliminary talks" between Exxon Mobil and Pioneer.
- Pioneer CEO Scott Sheffield refuses to comment on talks during first-quarter earnings call.

### JUNE

- Exxon Chairman and CEO Darren Woods initiates conversation with Sheffield.

### SEPTEMBER

- Woods presents a formal proposal to Sheffield with 9% premium on stock price and one board seat. Pioneer's board rejects it.
- Pioneer agrees to an exclusivity agreement in response to revised offer from Woods. Negotiations continue.

### OCTOBER

- Deal is signed before markets open on Oct. 11.

## Earthstone? Endeavor?

Publicly held Permian merger deals signed in 2023 included the combination of Midland- and Delaware Basin-focused Earthstone Energy with Delaware-focused Permian Resources.

Earthstone's proxy describing the background of that deal stated that it and Permian Resources had already entered a confidentiality agreement (CDA) beginning April 19. Pioneer reported in its proxy that, prior to the Exxon deal, it had not signed a CDA or similar agreement in the "past several" years.

But it limited that statement to CDAs involving a potential "acquisition of" Pioneer. It did not mention whether it had signed a CDA as a potential buyer during that timeframe.

Permian operators remaining in conversations this year as potential sellers include Endeavor Energy, which Hart Energy estimates could fetch up to \$30 billion on the market based on the valuation metrics of the Pioneer-Exxon deal.

Pioneer reported that it ultimately didn't pursue a deal





Hart Energy

**Pioneer Natural Resources CEO Scott Sheffield insisted on two seats for his company on Exxon Mobil's board.**



CERAWeek by S&P Global

**Exxon Mobil's Chairman and CEO Darren Woods reached out to Pioneer's Scott Sheffield in late June 2023.**

with Company A further because of "potential investor reaction," among other reasons. Instead, it "concluded that the transaction with Exxon Mobil would be more advantageous."

It did not provide a timeframe of when that decision was made, except alluding to it via stating that the Exxon deal was already on the table when mulling over whether to remain independent and buy Company A.

### In 110 days

On June 22, however, Exxon's Chairman and CEO Darren Woods initiated a conversation with Sheffield. In a back and forth through early October, they ultimately agreed to keep Pioneer's Irving, Texas, and Midland offices for at least two years and "seek to retain most of" Pioneer's employees for two years.

On other points, Sheffield told Woods as late as Sept. 6 that he personally supported a 20% premium on the Sept. 5 closing prices of the two stocks.

Also, Pioneer wanted two members on Exxon's board, Sheffield said.

On Sept. 19, Woods presented a formal proposal (dated Sept. 18) to Sheffield, including a 9% premium based on the current stock prices and one board seat. Pioneer's board rejected the offer.

Woods returned on Sept. 26 with a revised offer and the Pioneer board agreed to an exclusivity agreement through Oct. 15.

Woods's new offer included the right for Pioneer to terminate the deal if it received a superior proposal; two Pioneer board members; and up to 18 months for deal completion.

### Walk-away fee

The new offer also included a termination fee Pioneer would have to pay in "certain situations" of 3.25% of the \$59.5 billion in equity value that the final deal ultimately came to—about \$1.9 billion.

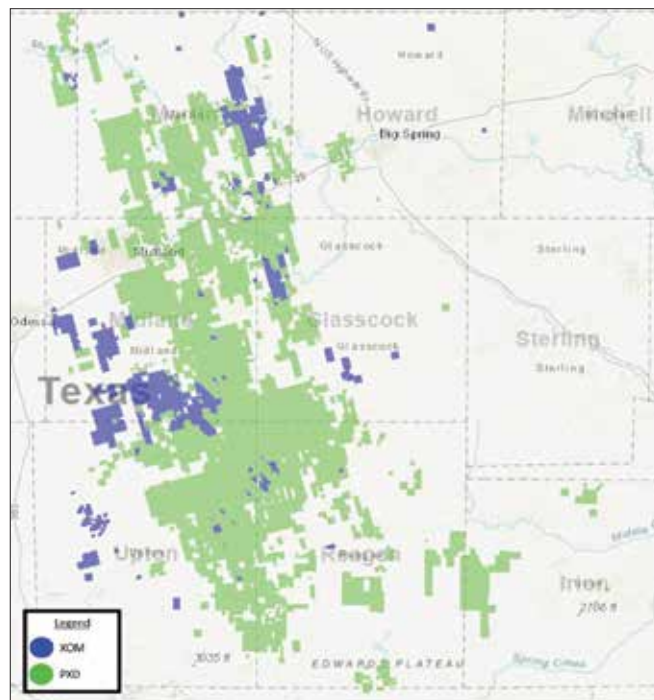
Exxon also wanted to be able to walk away if any antitrust ruling required it to divest assets or do anything it considered adverse to the combined companies.

Neither party would be allowed to look at buying anything before closing that could interfere with getting regulatory approval. And Exxon wouldn't have to pay a termination fee if the deal failed to clear antitrust hurdles.

Pioneer countered on Oct. 2 with paying both its base and variable dividend for the first quarter and, after that, an unspecified amount.

Also, Exxon would have to pay a reverse termination fee if it didn't get antitrust clearance and the deal would end after

### XOM and PXD acreage in the Midland Basin.



Source: J.P. Morgan Securities

12 months, but have another six months if only still waiting for regulatory approval.

On Oct. 5, Exxon rejected the reverse termination fee.

The talks continued.

Sheffield told Woods that Pioneer shareholders should own 12% of the combined company; Woods offered 11.75%. Eventually they split the difference and agreed to 11.875%.

Pioneer followed with an ask of a base-plus-variable dividend through April 1, then quarterly dividends of no more than \$1.25 per Pioneer share. Also, it offered a 3% termination fee if Pioneer didn't close the deal but a 3% reverse-termination fee if Exxon didn't win antitrust clearance.

Exxon accepted the termination-fee deal but limited the first-quarter dividend to 75% of free cash flow and nothing more.

Pioneer agreed to limit the fourth-quarter 2023 variable part of the dividend to 75% and the current quarter to 50%, then a fixed \$1.25 total dividend thereafter.

An exchange ratio of 2.3234 XOM share per PXD was settled.

The deal was signed Oct. 10 and announced before markets opened Oct. 11. The transaction is in customary review by the Federal Trade Commission.

# An LNG Wait in 2024

Natural gas production increased over the last decade, but 2024 will test the market's patience as producers wait for export capacity to come online.



**in SANDY SEGRIST**  
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**U**nlike the winter, the forecast for natural gas prices as 2024 arrives isn't mild.

Many industry experts predict a strong demand for U.S. LNG exports will result in a dominant U.S. position in the global gas market. However, producers are waiting for new LNG export terminals to come online, and another warm winter will spell trouble for a market that already has abundant supplies.

A few brief cold spells hit parts of the U.S. in October and November. However, the influence of El Niño has driven a relatively warm winter in the northern U.S., which is heavily dependent on gas for heating.

According to the U.S. Energy Information Administration (EIA), natural gas storage on Jan. 5 was at 3.336 Tcf, about 11.6% above the five-year average of 2.988 Tcf. Natural gas storage levels have been above the five-year average since January 2023, and the price of gas stayed under \$3/MMBtu for most of 2023.

Jack Weixel, senior director of East Daley Analytics, said that if temperatures stay up, the price of gas will hit a rough spot in the spring.

"Fifteen-day weather forecasts have been mega-bearish for the market and essentially have told the market that, as far as winter is concerned, December is cooked," Weixel said. East Daley estimated that a warm winter would knock out about 2 Bcf/d of incremental residential and commercial demand. "January and February are still somewhat unknown, but overall, the damage may already be done unless those months are unseasonably cold."

The natural gas market has reacted to the weather: the futures price has hovered around \$2.50/MMBtu since early December.

"What this means is that the market has come to a realization that storage will remain above the five-year average for the foreseeable future

and end-of-season March inventories could come in over 2 Tcf, or a surplus to the five-year average of around 500 Bcf," Weixel said. "That kind of surplus means \$2 gas and, if it were to grow larger, sub-\$2 gas."

Meanwhile, U.S. gas producers have not significantly decreased their output, according to the EIA.

U.S. natural gas production hit a monthly record high in October 2023, with 3.914 Tcf in gross withdrawals, according to the EIA. The monthly production has been above 3.71 Tcf for nine of the first 10 months of 2023, while monthly production hit that threshold five times in all of 2022.

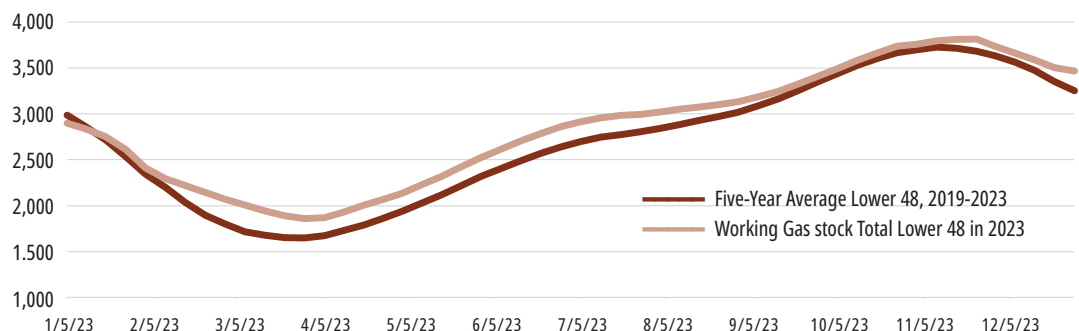
Gas production in some parts of the U.S. continued to increase toward year-end 2023, despite high levels in storage. East Daley Analytics noted that gas samples for flows heading out of the Permian Basin hit a record 6.3 Bcf/d in November.

## Focus on transition

High output may seem counterproductive when storage is full, but the natural gas industry is focusing on transitioning, according to East Daley Analytics. Producers are preparing for 10 new LNG export terminals opening up on the North American coastline, resulting in a dramatic increase of LNG for the global market. Capacity is expected to more than double by 2027, from 11.4 Bcf/d today to 24.3 Bcf/d. Most of the projects are in the U.S., though Canada and Mexico are adding capacity as well.

Venture Global LNG has targeted its Plaquemines LNG facility in Louisiana to begin exporting by the end of 2024. The Golden Pass LNG facility near Port Arthur or the Corpus Christi Stage 3 LNG facility, both located in Texas, are expected to come online in 2025.

## 2023 natural gas storage, five-year average (Bcf)



Source: East Daley LNG Export Forecast, SPA Tracker, & Project List\_12-2023



**Producers are preparing for 10 new LNG export terminals opening up on the North American coastline, resulting in a dramatic increase of LNG for the global market. Construction progress continues at the Golden Pass LNG export project site and is on track to start up Train 1 in 2024 and be fully online in 2025.**

Golden Pass LNG



***“Fifteen-day weather forecasts have been mega-bearish for the market and essentially have told the market that, as far as winter is concerned, December is cooked.”***

—Jack Weixel, *senior director, East Daley Analytics*

However, Cheniere Energy's Corpus Christi facility is ahead of schedule and may also start production by the end of 2024.

The international demand for North American LNG came from several trends over the last few decades. Countries in Europe and Asia are seeking LNG supplies thanks to its predictable availability from the United States and a tightening supply of natural gas abroad, said Majed Limam, Americas' Manager for Poten & Partners' natural gas and LNG advisory team.

“LNG is naturally more flexible than pipelines. LNG can directly connect the buyers and the seller point to point,” Limam said during a seminar on the impact of global conflict on future LNG supply projects. “Also, the low-hanging fruits, the gas fields that used to be closer to the buyer, are gone.”

Russia's invasion of Ukraine in 2022 and the political fallout that followed interrupted gas pipeline flows to Europe. The war appears to be a long-term situation, meaning that European countries would prefer another source for their energy for the long term, as well. In 2022, LNG became the primary player on the global natural gas market, taking 56% of market share to the 44% delivered by pipelines.

“Europe has learned a lesson,” Limam said. “A strong

reliance on Russia for energy is dangerous. The infrastructure has been developed to provide Europe alternatives to Russia and Europe will use that.”

According to Poten & Partners, the U.S. will play the primary role in adding new supply to the growing demand. Over the next five years, 50% of new LNG supply on the world market, about 180 million tons a year, will be from the U.S.

For the time being, however, North American natural gas producers will have to wait for the capacity to come online or for the weather to change, including weather outside the U.S.

One of the primary LNG shipping routes for Gulf Coast facilities, where the majority of U.S. LNG is produced, is through the Panama Canal to East Asia.

A drought in Panama in 2023 forced the canal authority to cut the number of vessels allowed to pass through from 38 to 32 in July, with more cuts expected to come at the end of 2023.


Shipping through the Panama Canal costs \$1.68/MMBtu; shipping to East Asia through other routes cost more than \$2.50/MMBtu, Limam said.

The U.S. domestic market should provide some relief for gas producers, even without a cold winter in 2024. Natural gas now generates more electricity than any other source in the U.S., according to the EIA. Gas produced 39.9% of American electricity as of Oct. 23, while coal finished second with 19.7%. The trend is expected to continue as coal plants are retired to reduce CO<sub>2</sub> emissions.

Meanwhile, Weixel said natural gas prices should start rebounding before the LNG facilities come online.

“The only cure for low prices is low prices,” he said. “Production slows, the storage surplus erodes as net summer injections trail the five-year average injection. Cheap gas means elevated power burn throughout the summer.”

By August, the market will react to an emerging storage deficit before winter and note that the newest LNG terminals will be online near the beginning of 2025.

“The 2024-25 winter strip should start to respond, and prices should begin a sharp recovery,” he said. 

# In Permian, More M&A Means Fewer Rigs

E&Ps are radically cutting drilling activity on their new assets.

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**Public E&Ps have widely deployed a buy-and-cut strategy when acquiring private equity-backed Permian producers.**

**A** historic amount of Permian consolidation is altering the landscape of rig deployments across the basin.

With Occidental Petroleum's \$12 billion bid to acquire private Midland Basin E&P CrownRock, the total transaction value in Permian Basin assets has now eclipsed \$100 billion for 2023, according to figures compiled by Wood Mackenzie.

That's up significantly from the previous peak of \$65 billion transacted across the Permian in 2019.

"This transaction cements an absolute banner year in Permian acquisitions and divestments spend," said Robert Clarke, vice president of upstream research at Wood Mac, in a note.

"Coupled with other mega 2023 deals like Exxon Mobil and Pioneer, it solidifies Permian scale and multi-decade longevity as a 'must have' trait for U.S. majors and super-independents," he said.

Outside of the massive Exxon-Pioneer and Occidental-CrownRock deals, the Permian has seen a frenzy of smaller M&A by small- and mid-cap E&Ps.

Companies including Civitas Resources, Permian Resources, Ovintiv, Vital Energy and Matador Resources spent billions of dollars adding scale across the Permian's Midland and Delaware basins last year.

Most of these large-scale transactions have focused on deepening E&P's portfolios of undeveloped Permian drilling inventory.

Producers across the basin have been racing to buy up high-quality drilling locations—locations

that can generate a return on investment even at depressed oil prices; Tier 1 inventory breakevens generally range between \$40/bbl and \$50/bbl.

## Inventory preservation

A significant amount of Permian M&A activity in 2023 has been fueled by private equity firms monetizing their upstream investments.

As part of that trend, Occidental's acquisition of CrownRock, backed by private equity firm Lime Rock Partners, pushed last year's upstream private equity exits to a five-year high of about \$30 billion.

For the private E&Ps looking for an exit, the name of the game has been adding runway, said Matthew Bernstein, senior shale analyst at Rystad Energy.

"Really, if you're going to survive as an attractive target to be acquired, there needs to be a little more discipline for the sake of inventory preservation," Bernstein said. "That's what we're expecting to see more of from the private E&Ps in the coming couple of years, as well."

Public E&Ps have widely deployed a buy-and-cut strategy when acquiring private equity-backed Permian producers.

When an acquisition is complete, drilling rig activity on the acquired asset is typically slashed compared to pre-deal levels.

That's because companies aren't in a hurry to pursue aggressive spending to ramp up production and drill through their top-tier

inventory. Preserving inventory is the goal.

But this buy-and-cut strategy has yielded notable effects on the oilfield services and midstream sectors.

Acquired private operator rig counts were reduced by nearly 70% in 2023 due to Permian upstream consolidation, according to East Daley Analytics.

E&P capital discipline and inventory preservation are superseding reactivity to market fundamentals, East Daley said. Despite rising commodity prices, the total Permian Basin rig count fell by 24% from January through November.

East Daley expects consolidation to continue reducing the Permian Basin rig count through 2030.

And if the trend continues at a similar rate to what was seen last year, Permian oil volume growth would be reduced by 7%.

### Shale barons

Larger companies, such as Exxon and Chevron, have largely adopted the buy-and-cut strategy to see more opportunity to grow their shale oil production.

Consider Exxon's acquisition of Pioneer Natural Resources: Exxon will have so much inventory and resources that it plans

to grow production faster than Pioneer would have seen on a standalone basis, Bernstein said.

Exxon's previously stated goal before acquiring Pioneer was to grow Permian oil and gas output to 1 MMboe/d by 2027. Exxon now expects its Permian production to grow to approximately 1.3 MMboe/d after closing the Pioneer deal.

By 2027, the Texas-based supermajor aims to boost its Permian volumes up to 2 MMboe/d.

"They have enough of a long-term runway and enough of a diversified business at a corporate level where that's something you're really able to do," Bernstein said.

Chevron's \$53 billion acquisition of Hess Corp. was mainly about getting into offshore Guyana—the world's hottest oil discovery. Hess owns a 30% interest in the prolific Stabroek Block offshore Guyana; Exxon holds a 45% interest and China's CNOOC Group owns the remaining 25%.

But Chevron is also getting deeper in shale by acquiring Hess's sizable Bakken portfolio in North Dakota. The company's Bakken production is expected to average 200,000 boe/d by 2025, before plateauing around that level for nearly a decade, executives have said. 

### Permian Basin M&A hits new record in 2023

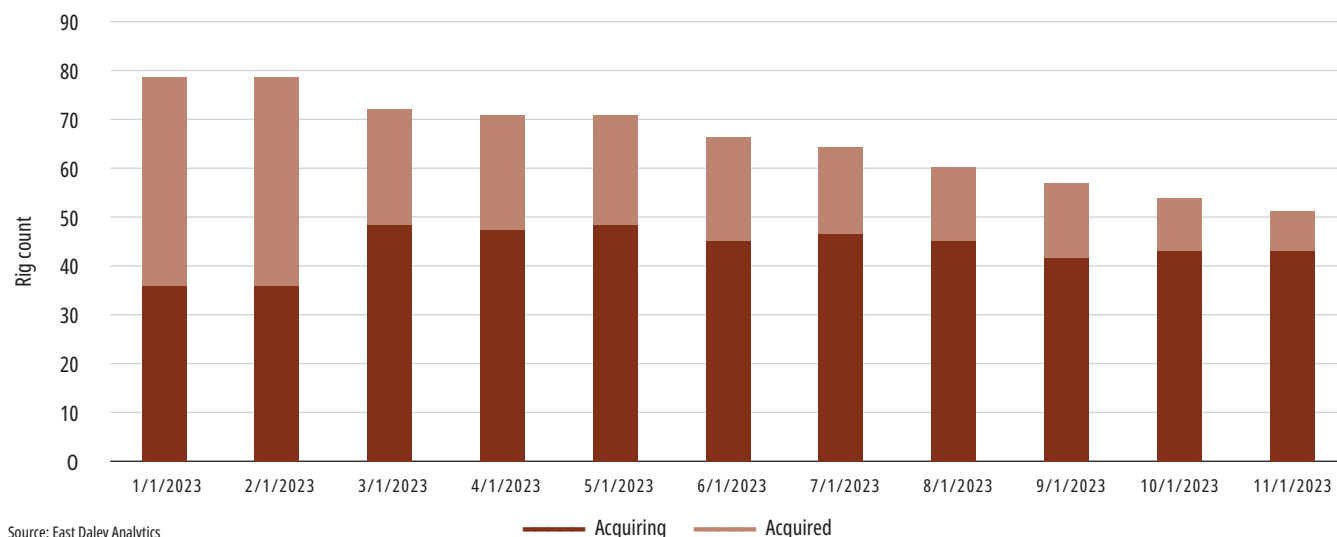
The value of upstream M&A transactions in the Permian Basin surpassed \$100 billion in 2023, according to Wood Mackenzie. Here's a look at some of last year's largest deals in the Permian.

| Buyer                | Seller(s)   | Purchase Price  |
|----------------------|---|-----------------|
| Exxon Mobil          | Pioneer Natural Resources   | \$65.4 billion  |
| Occidental Petroleum | CrownRock (Lime Rock Partners portfolio company)  | \$12 billion    |
| Civitas Resources    | Hibernia Energy III and Tap Rock Resources (NGP portfolio companies)                      | \$4.7 billion   |
| Permian Resources    | Earthstone Energy   | \$4.5 billion   |
| Ovintiv              | Black Swan Oil & Gas, PetroLegacy Energy and Piedra Resources (EnCap portfolio companies) | \$4.275 billion |
| Civitas Resources    | Vencer Energy   | \$2.1 billion   |
| Matador Resources    | Advance Energy Partners (EnCap portfolio company)   | \$1.6 billion   |
| Vital Energy         | Henry Energy, Tall City Exploration III and Maple Energy Holdings                         | \$1.165 billion |

Source: Oil & Gas Investor analysis

### 2023 M&A rig count attrition

E&P buyers slashed rig activity on their newly acquired assets while keeping their overall rig counts mostly flat in 2023. Acquired private operator rig counts were reduced by nearly 70% in 2023 due to Permian upstream consolidation, according to data compiled by East Daley Analytics.



Source: East Daley Analytics

# California Regs Derail Restart; Result is Rancor, Write-offs

Chevron and Exxon are set to write off billions on California assets because of strict environmental rules.

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**E**xxon reported to the U.S. Securities and Exchange Commission in January expectations of up to \$2.4 billion in impairments in fourth-quarter 2023, citing “continuing challenges in the state regulatory environment” in a project to restart production at the company’s California offshore Santa Ynez Unit.

An impairment charge is an accounting tool used by a company to write down the value of assets. Write-offs can be triggered by a variety of factors. In 2016, for instance, BHP Billiton wrote down the pre-tax value of its onshore U.S. assets by \$7.2 billion because of a sharp drop in commodity prices.

Exxon isn’t alone. Two days before the company’s announcement, Chevron notified investors it would write off up to \$4 billion for the fourth quarter, blaming California’s environmental regulations. Some bankruptcies of Gulf of Mexico operators are also likely to shift liabilities to Chevron.

“The company will be impairing a portion of its U.S. upstream assets, primarily in California, due to continuing regulatory challenges in the state,” Chevron wrote in its filing with the SEC.

Exxon’s current difficulty with the state centers around the Santa Ynez Unit, which consists of three offshore platforms near Santa Barbara County. Operations at the unit shut down in 2015 after a pipeline leak. At the time, the unit produced 30,000 bbl/d in crude and condensate. Exxon has sought to restart production since then.

In October, a federal district judge ruled against Exxon in a suit the company filed against Santa Barbara County to allow shipments of oil produced from the platforms via truck. The platforms remained closed.

## California ‘closed for business?’

San Francisco-based Chevron has had public confrontations with the state government prior to its impairment charge filing at the end of fourth-quarter 2023.

Last spring, California Gov. Gavin Newsom signed a law aiming to penalize oil and gas producers for price gouging. The rule has not come into effect, however, as state lawmakers are still determining how to implement it,

seeking to come up with definitive legal definitions for terms like “price gouging.” The California Energy Commission is currently defining an acceptable margin between production costs and prices.

Some of the proposals require refiners to send transaction reports to the Energy Commission on a daily basis, as well as monthly reports on profit margins. According to the governor’s office, the purpose of the new laws is to expose price manipulation as it happens.

Andy Walz, president of Americas products at Chevron, blasted the law in a December letter to the commission.

“Setting a margin penalty would absolutely discourage investments here,” Walz wrote. “Further, these arbitrary attacks on a disfavored industry do more than this—they signal to every industry, entrepreneur, manufacturer and employer that California is closed for business.”

## Court battles rage

Major energy firms have been in court battles with the state already.

In September, the state government sued Exxon Mobil, Chevron, Shell, BP, ConocoPhillips and industry trade association American Petroleum Institute. The suit claimed the companies misled the public on climate change and demanded help in recovery efforts for extreme weather events.

“For more than 50 years, Big Oil has been lying to us—covering up the fact that they’ve long known how dangerous the fossil fuels they produce are for our planet,” Newsom said in a news release announcing the suit.

At the time, an Exxon spokesman responded that the company had repeatedly acknowledged that climate change is real and has a business arm dedicated to reducing emissions.

Ryan Meyers, the general counsel for API, said the suit was meritless and an “enormous waste of California taxpayer resources.”

The state’s battle with the energy industry is extended to the 2024 election, with a specific spot on the ballot. In November, California voters will consider a referendum on SB 1137, which would prohibit new

California environmental regulations have posed challenges for oil and gas operators.



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*“For more than 50 years, Big Oil has been lying to us—covering up the fact that they’ve long known how dangerous the fossil fuels they produce are for our planet.”*

—Gavin Newsom, *governor, State of California*

oil and gas wells within 3,200 ft of homes, schools and hospitals. It was originally passed by the legislature in 2022.

The proposed law made it onto the ballot after a petition drive sponsored by the California Independent Petroleum Association garnered 978,610 signatures. The organization said the law threatens the jobs of more

than 50,000 residents and would result in more foreign-produced oil coming to the state’s refineries.

“Local oil companies’ desire to restart production and contribute to the state’s economy is strong among our member companies, as demonstrated by the 1,400 permit applications for new wells that sit unreviewed at the state,” Zierman said. 

# Financing and the Quest for Net Zero

McKinsey Partner Kassia Yanosek details private equity's unique role in climate transition, despite corporate uneasiness, and the need to quadruple funding while government ramps up support.



**in** PATRICK MCGEE  
CONTRIBUTING EDITOR



McKinsey & Co. partner Kassia Yanosek, who recently co-authored a piece in the journal *Foreign Affairs* about private finance's role in the

energy transition, spoke with contributing editor Patrick McGee about how 2023 spending on the energy transition will compare to the \$1.1 trillion spent globally in 2022.

*The work of private equity has been an encouraging sign and can provide long-term financing other markets cannot. But she noted that this is just the beginning, and to meet climate goals, energy transition funding will need to quadruple.*

**Patrick McGee: Why are investors increasingly willing to spend on the transition to cleaner energy?**

**Kassia Yanosek:** Investors look for major growth trends, and the energy transition is one of them. There are clear drivers that are going to back this massive amount of capital that's needed to go into this transition energy system. McKinsey research recently showed that by 2050, we're going to need more than double the amount of electricity demand in the world today. That's going to require an incredible amount of capital. Investors see that opportunity. They also see this opportunity to invest in decarbonization because we are going to be decarbonizing our energy system. That was certainly one of the things that came out of COP28.

The transport industry is going to decarbonize. That means new fuels, new ways of creating new, cleaner molecules. That is why investors are

putting money into the transition. Our numbers say that we need about \$4 trillion a year to meet net zero by 2050. Some figures are even higher than that. When you see those kinds of dollars, that's when investors start to line up.

**PM: Energy transition investment has increased dramatically. It's enough to make headlines. Will it be enough to reach zero emissions?**

**KY:** Whether it's \$4 trillion or \$5 trillion, the number is massive, and that's the amount of capital that is needed per year between now and 2050 to reach a decarbonized energy system. Today, a quarter of that is being spent. We're going to need a lot more than we're putting in today, and we're at the beginning stages of that. Not only is investment going up, but we're also seeing capital being formed in private capital pools and that is also going up. Last year, \$160 billion was raised globally by private equity and infrastructure funds from the sovereign wealth funds and the pension funds, etc., for transition. Just to put it in perspective, that is about eight times the amount that was raised last year for oil and gas funds. Clearly, we're seeing the owners of capital allocate capital [for] the transition, and we're starting to see it play out, but there's still a lot more that needs to be done.

**PM: How much is going into which technologies and what does that say about the investors' faith in a lot of these solutions, many of which are still unproven?**

**KY:** The majority of that \$1 trillion, 80% to 85%, went to proven technologies—wind, solar and batteries and related technologies for electric vehicles. In our *Foreign Affairs* article, we call that



**Kassia Yanosek, partner,  
McKinsey & Co.**

McKinsey & Co





**The Carbon Engineering Direct Air Capture (DAC) carbon capture plant is located in Squamis BC, Canada. Occidental acquired Carbon Engineering in a \$1.1 billion deal announced in August, 2023, and recently announced a partnership with BlackRock to invest \$500 million into their first direct air capture plant in the Permian Basin.**

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Mitsubishi Power

**An alkaline water electrolyzer cell stack manufactured by HydrogenPro AS. Some industry equipment companies are increasingly investing in green technologies to get ahead of their peers, such as hydrogen electrolyzers.**



Plug Power

**A Plug Power green hydrogen storage and handling facility is shown in Apple Valley, Calif. Investments in deep decarbonization technology such as green hydrogen is necessary for significant results, according to McKinsey partner Kassia Yanosek.**

“shallow decarbonization” because renewable energy is really only impacting our overall carbon emissions by a couple of percentage points. What’s really needed is more investment in what we call deep decarbonization. Deep decarbonization is some of the game changers that can transition significantly. Green hydrogen, for example, carbon capture and storage at scale, direct air capture—which is the ability to take carbon out of the atmosphere and capture it—much cleaner fuels getting down to a zero-carbon fuel. Those are the types of technologies that we still are not yet seeing as attractive to investors at scale because they’re still new, because the markets don’t exist yet. They’re too expensive for investors to really see a return on their capital. That’s why investors are not yet going there, but they’re trying.

**PM: There are so-called “brown” firms investing in green technologies. Are they serious, or are they just investing as a way to keep tabs on new technology and on the competition?**

**KY:** My honest answer is that it’s an all of the above. There are some brown firms that are out way ahead of their peers. They’re typically the ones that are really well-performing in their core business and have the ability to convince their investors to allocate some capital to transition. Occidental Petroleum is a great example. They’ve made a big splash with their low-carbon ventures group and just announced a partnership with BlackRock to invest \$500 million into their first direct air capture plant in the Permian Basin. Some of the equipment companies also are [investing] because they see that getting ahead of the market will position them very well. Baker Hughes is an example.

*“Whether it’s \$4 trillion or \$5 trillion, the number is massive, and that’s the amount of capital that needed per year between now and 2050 to reach a decarbonized energy system. Today, a quarter of that is being spent.”*

—Kassia Yanosek, partner, McKinsey & Co.

They’re very much involved in transition businesses, whether that be gas-related or hydrogen electrolyzers. Then you have companies like Exxon Mobil, who have made big bets that they are mostly funding themselves. CO<sub>2</sub> carbon capture is one of Exxon’s big focus areas, and they just acquired Denbury, which happens to have one of the most critical CO<sub>2</sub> infrastructure assets, the CO<sub>2</sub> pipeline in the Texas region. Those are a couple of examples, but there are certainly others that are saying, “I’m going to wait. I’m not going to be a first mover,” and there’s many of those. It really runs the gamut.

**PM: There are some oil and gas companies that have pulled back from their green investments. Can we take that as a sign that the technologies’ promise might be overblown?**

**KY:** There is definitely a clear message that the public shareholders are telling energy companies when you look at the difference in value [and] valuation between the U.S. energy companies who have been a bit muted in their movements into the energy transition—at least in terms of big moves into, say, electric power and renewable power—versus the European firms which have made big forays into renewable energy and renewable power. There’s a huge valuation gap in between those. BP and Shell trade at a 45% to 50% discount, as of about a month ago, to their U.S. peers. If you look at the data of the U.S. versus the European firms, you see an inflection point where values start to diverge around 2019 when the European firms started to make these bigger moves into cleaner energy.

These energy companies that have decided to move very quickly in the transition, invested hard into power technologies which is not their competitive advantage—they’re oil and gas companies with oil and gas capabilities—and many of those assets also have much, much lower returns than their oil and gas business. Just by nature of the math, they’re going to be creating less value than their peers if they’re shifting all that capital into the transition businesses. So, I wouldn’t say that’s a sign that the promise of technology is overblown because they were actually investing in proven technologies—wind and solar proven technologies. It’s just that they weren’t the right owners of those assets.

Going forward, I think you’re going to see energy companies focus much more on new energies that are much more aligned with their core business and their core understanding. Carbon capture, for example. You need to understand the geology in order to store that carbon. They’ve got that capability. Some are looking at geothermal, drilling into the earth. That requires geologic expertise and understanding. Hydrogen and other related new fuels require engineering capability and systems technologies that many of the downstream and upstream producers have. I think there’s going to be a shift to technologies where they’re the better owners of those technologies and, right now, many of those technologies are still too nascent.

**PM: Why do you see optimism for the transition in private capital markets?**

**KY:** If you look at the capital that’s coming from pension funds and sovereign wealth funds, they are looking for long-dated assets to meet their liabilities. Many of the pension funds have been eyeing infrastructure assets in that particular asset class have certainly grown over the past 20 years. The energy transition fits very well into meeting those goals. So, they’ve become very interested in investing in funds that are deploying into, say, the electrification trend, which is going to be long term. Solar and wind, for example, already are proven technologies and should throw off long-dated cash flows. I think that part of the optimism is just the long-term nature of this transition and how it’s going to match the liabilities that these funds need to address.

I also would say, and this is more on the riskier front, private equity is known historically to be at the epicenter of disruptions. Whenever an industry is disrupting, private equity is often there and can really create value because they can create growth in areas where they see an opportunity to pick out a technology or company and make it more efficient.

**PM: Private equity is often vilified on Main Street and in the mainstream media, but you believe it can play a positive role in the energy transition. Can you describe that?**


**KY:** Private equity, at least in the energy sector, is much more attuned to either just buying a company outright or backing a developer, and that developer on Main Street is developing assets. What is changing is that private equity is now going to be starting to partner directly with corporates. That is a new role for private equity to play. Many corporates don’t trust private equity, [but] private equity is starting to partner in joint ventures or off-balance-sheet vehicles to work with corporates and scale their businesses. There is going to be a new mindset that private equity needs to take on so they can be great partners. I do think there will be some transition as we start to see these new innovative financial models.

**PM: What size corporates do you think they will partner with?**

**KY:** They’re going to be partnering with the Fortune 500. We already see some examples of that with Brookfield partnering with California Resources Corp. for a \$500 million investment in carbon capture and storage development. Occidental and BlackRock also announced a joint venture. They are starting to spread. I think we’re going to see many more of them.

**PM: Your Foreign Affairs article says private investments are not enough, at least not at the moment. We’re going to need government subsidies. How can we have confidence these subsidies will be allocated to the right places?**

**KY:** About 25% of the capital that was invested last year came



An aerial view of Drax Power Station in Yorkshire, UK, showing biomass storage tanks and carbon capture capabilities. A large valuation gap between U.S. and European investment into clean energy and decarbonization efforts started to grow in 2019.

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*“Going forward, I think you’re going see energy companies focus much more on new energies that are much more aligned with their core business and their core understanding.”*

—Kassia Yanosek, partner, McKinsey & Co.


from public sector and public subsidies. The private sector is really going to be driving the transition, but the public sector has a really important role to play to enable capital to come off the sidelines in areas where we aren’t seeing the markets work. The public sector needs to be very thoughtful about the right types of subsidies and supports to bring more capital into the space. One thing that is apparent, for example, is that historically governments tend to support technologies. There are tax credits for certain technologies, certainly the Investment Reduction Act funded a lot of technologies. You’ve seen a lot of investment go into these new technologies, but in order to really see that those numbers scale we need to see a market. There needs to be more of a systems approach that governments take when they start to say, “How can we actually make this entire market get off the ground? If there is no market for green hydrogen, how do we fill the gap between the buyer and the seller in order to create long-term contracts for green hydrogen or green ammonia or green LNG?” There needs to be more of a systems approach that governments take to enable these entire markets to get off the ground.

**PM: What do you mean by government taking a systems approach?**

**KY:** You can say, “I’m going to support a subsidy on the supply side. I’m going to provide a tax credit for hydrogen.” But if there is no market for that green hydrogen, then, even

though it has government money coming into it, the numbers won’t allow it to get developed because there’s nobody that’s going to buy the green hydrogen. You both need supply and demand to be balanced, and we need the government to play a bigger role in helping to create the markets, particularly for new molecules where there is no price point for them. A large hydrogen project that costs \$5 billion is going to need long-term contracts to pay for the capital investment up front, but today there’s no 20-year contract for green hydrogen that they can get in the market. That’s where government can help come in to potentially subsidize that price of green hydrogen or to play a role in between a buyer and seller and pay the difference between what the buyer of that green hydrogen and the seller that hydrogen needs in order to backstop the investment of their project.

**PM: You were at COP28. What do you think about the agreement that they came to?**

**KY:** I’m a practical person, and I have to say, I think it’s an amazing opportunity for all of us that want to see the world transition. The fact that there was an agreement to begin reduction of the consumption of fossil fuels is, in my view, a huge success. The work behind the scenes shows real leadership, and I was not surprised that we got to the agreement that we did. I think that we’re on track for more progress and to do it in a way that’s bringing industry in to help solve the problem. 

# Hydrogen Tax Credit Rules Provide Answers, Spur More Questions

The proposal aims to help jumpstart the hydrogen market, but some say it lacks flexibility.



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**H**ydrogen producers hoping to claim tax credits offered in the Inflation Reduction Act (IRA) received long-awaited guidance from the U.S. Treasury Department as 2023 ended. The wait continues for other missing pieces, however.

The proposed rules for the hydrogen production tax credit (45V), detailed in a 128-page document, were met with an uneven response from industry associations, hydrogen producers and politicians.

Hydrogen producers meeting certain prevailing wage and registered apprenticeship requirements could qualify for a credit ranging from \$0.60 per kilogram (kg) of hydrogen produced to \$3/kg, depending on the lifecycle greenhouse-gas (GHG) emissions from hydrogen production, including its power source.

However, to capture the credit available for 10 years for facilities that start construction before 2033, hydrogen producers:

- Must have used electricity from a clean power facility built within three years of a hydrogen plant entering service;
- Produce clean power from the same region as the hydrogen producer; and
- Provide proof of purchase of clean power, which comes in the form of an energy attribute certificate (EAC), that must be matched to production on an hourly basis, “meaning that the claimed generation must occur within the same hour that the electrolyzer claiming the credit is operating,” the Treasury Department said, noting the proposed rules include a transition to allow annual matching until 2028.

The proposed requirements are considered the three pillars to building a clean hydrogen industry.

“Incentives in the Inflation Reduction Act are

helping to scale production of low-carbon fuels like hydrogen and cut emissions from heavy industry, a difficult-to-transition sector of our economy,” U.S. Secretary of the Treasury Janet L. Yellen said in a press release.

## Seeking feedback

Backers are counting on hydrogen to help decarbonize a fossil-fuel dependent society. Hydrogen’s flexibility and its near-zero GHG emissions make it one of the must-haves to hit net-zero targets. Hydrogen, predominately used today in oil refining and ammonia production, has the potential to decarbonize high-emissions sectors such as steel, maritime and aviation; power fuel cells; generate electricity; store energy; and serve as a transportation fuel—displacing carbon-emitting fossil fuels.

While most demand is met today by hydrogen produced with natural gas as feedstock, hydrogen supplies with low-carbon intensity are expected to rise. The ability to capture tax credits factor into the economic viability of some projects, including those involved with hydrogen hubs lined up to receive billions of dollars of funding from the U.S. Department of Energy.

Feedback is still being sought on some aspects of the proposed rules. This includes how generation from existing clean power generators can meet the new clean power rule and how to consider transmission of clean power between regions—which is one of the ultimate goals of the U.S. hydrogen hubs. Clarity is also needed on how to qualify hydrogen production from renewable natural gas and fugitive methane, such as coalbed methane.

The industry is also awaiting guidance on the 45Q carbon capture tax credit.

“The safeguards outlined in the proposed rules are critical to preventing the credit from subsidizing hydrogen production with higher

**Backers of the U.S. Treasury proposal are counting on hydrogen to help decarbonize a fossil-fuel dependent society.**



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***“It makes no sense to kneecap the hydrogen market before it can even begin.”***

—**Joe Manchin, U.S. senator and chairman of the Senate Energy and Natural Resources Committee**

lifecycle greenhouse gas emissions than allowed by the statute,” the Treasury Department said.

Leaked details of draft guidance from the Treasury Department were reported earlier this month. Citing anonymous sources, media reports claimed the Treasury Department would issue draft tax credit guidance backed by climate advocates instead of fossil fuel producers. Electrolytic hydrogen, or green hydrogen, produces hydrogen with electricity made from renewable energy resources, while blue hydrogen utilizes natural gas as feedstock with carbon capture and storage

**Mixed reactions**

Reactions to the proposed rules were mixed.

U.S. Sen. Joe Manchin (D-W.Va.), chairman of the Senate Energy and Natural Resources Committee, said the proposal imposes rules that are not included in the IRA and makes it difficult to jumpstart the hydrogen market because it favors solar and wind.

“For an administration that wants to reduce emissions and fight climate change, it makes no sense to kneecap the hydrogen market before it can even begin,” Manchin said. “Hydrogen has the potential to be the new horsepower of our country and will strengthen our energy security so we are less dependent on foreign adversaries, and crucially, it can be produced carbon-free.”

A so-called lack of flexibility in the proposed rule was of concern to the American Council of Renewable Energy (ACORE), which took issue with hourly matching.

“As our analysis with E3 demonstrated, an annual match accounting approach could help unleash America’s nascent clean hydrogen industry and accelerate our energy transition,” ACORE

CEO Ray Long said. “ACORE will continue to work with the Administration throughout this comment period, and we remain



**Ray Long**

hopeful the final rule ultimately released has the needed flexibility to support the scale and role that hydrogen can play in achieving our decarbonization goals.”

Others emphasized that strong rules are needed to reduce emissions.

“As a project developer with laser focus on the promise of renewables-based hydrogen production in the U.S. and globally, stringent rules that channel

maximum benefit to projects with the strongest environmental credentials will pave the way for a vibrant and successful new green hydrogen industry,” CWP Global Co-CEO Alex Hewitt said. “Put simply, we can’t get to net zero without it.”



**Seifi Ghasemi**

Longtime hydrogen producer Air Products applauded what CEO Seifi Ghasemi called the Biden administration’s “strong three pillar hydrogen tax credit proposed rule.”

“Air Products has made a more than \$15 billion commitment to clean hydrogen projects to decarbonize the heavy-duty transportation and industrial sectors of the economy, including in-

progress U.S.-based projects that will deliver real and verifiable emissions reductions from day one,” Ghasemi said.

He said the proposed rule will be “essential to delivering real emissions reductions, creating the stimulus for broader investments across the hydrogen value chain and cementing the U.S. global climate leadership.”

# Natron Energy Scales Up Sodium-ion Batteries

The lithium alternative does not rely on critical materials because sodium is abundant, cheap and safe, experts say.

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**W**hen it comes to batteries, lithium-ion reigns. The high-energy density batteries—used for electronics, powering electric vehicles and energy storage—are smaller and lighter than some other battery types. However, its composition of critical materials, which includes lithium, cobalt and graphite, can be an invitation to potential supply chain disruptions and fluctuating costs.

Another battery chemistry—sodium-ion—is giving the energy industry something to think about. The sodium-ion battery does not rely on critical materials and its main ingredient, sodium, is abundant, cheaper and safer, experts say. Though its heft may factor into its ability to dethrone lithium-ion batteries, at least for certain applications, efforts are underway to advance sodium-ion battery technology.

Targeting the critical and industrial power sectors, including oil and gas, California-based Natron Energy is carving out its place among sodium-ion and other battery startups. The company is backed by Chevron, Nabors Industries and United Airlines, among others.

"We don't have lithium. We don't have copper. We don't have nickel. We don't have a lot of the materials that are going into electric vehicles," Jack Pouchet, vice president of sales and marketing for Natron Energy, told Hart Energy. "And that means that as the electrical vehicle industry continues to take off, we aren't supply constrained."

In a report published earlier this year, Wood Mackenzie pointed out that although sodium-ion batteries lack the energy density of certain lithium batteries, sodium-ion batteries are safer, perform better and are expected to be at least 20% cheaper than lithium iron phosphate batteries because they don't have lithium.

"The lower pack cost of a Na-ion battery will be a leading reason to substitute Na-ion batteries for Li-ion applications," wrote Max Reid, principal analyst of Wood Mackenzie's EVs and battery supply chain service. "Na-ion manufacturing uses the same processes used in Li-ion gigafactories, so production capacity could scale up quickly."

Wood Mackenzie forecasts there will be about 40 gigawatt-hours (GWh) of base case sodium-ion cell production capacity by 2030 as cell producers step up commercial production. If the sector sees success by 2025, the firm forecasts another 100 GWh of production capacity is possible.

Leading the small pack of sodium-ion cell producers are China's CATL and the U.K.'s Faradion.

## Something blue

What sets Natron's sodium-ion batteries apart from others is Prussian blue—a compound dating back to the 18th century that was used to dye uniform coats for the Prussian army.

The compound—the same blue pigment used in paint, blue jeans and as an antidote for heavy-metal poisoning—enables electrodes to store the sodium ions in a unique structure that results in a faster charge, faster discharge and a longer cycle life, according to Natron.

"Natron sodium ions are smaller than the Prussian Blue structures which hold them, making thermal runaway impossible," the company said. Thermal runaway, a rapid rise in the battery cell temperature that leads to fires, is slower with sodium-ion than lithium-ion batteries.

"We shoot our batteries. We take high caliber rifles and we shoot holes in them. We take drills and we drill holes through them. We crush them. We light them on fire. Nothing happens," Pouchet said. "These are some of the important things, especially as we look at industrial use cases, oil and gas, fracking."

Any fine chemical manufacturer in the U.S. or elsewhere can make Prussian blue. The recipe isn't difficult, Pouchet said. Such batteries are unencumbered by supply chain problems.

"We can source the vast majority of our materials right here in the U.S. to make the battery," he said. The battery's aluminum, plastic pouches and metal case are all materials that can be sourced in the U.S., which eases supply chain concerns. However, moving up to gigascale status like some lithium-ion battery manufacturers will require scaling up production of Prussian blue.

Pouchet acknowledges the batteries are not ideal for all uses.

"We're not putting our battery into automobiles. We're putting our battery into stationary power applications, industrial applications," he said. "We're sticking them in the Niobrara Shale reserve."

Sodium-ion batteries are larger than most, Pouchet said. From a physics viewpoint, lithium has a much smaller molecular structure than sodium.

"I can only put so many sodium ions in the same space," he said.

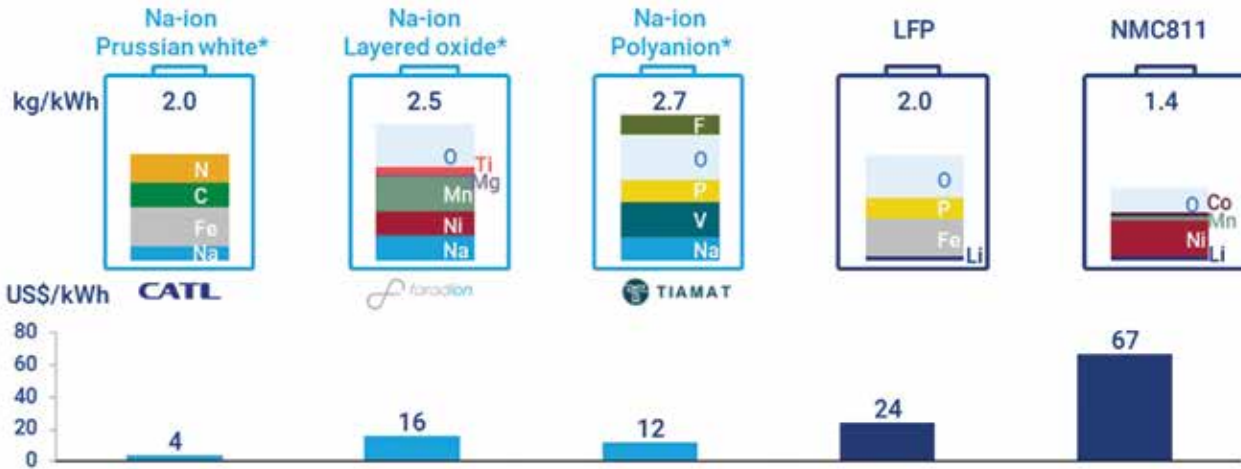
The company is working to improve the rate at which energy flows in and out as well as making the battery more efficient, he said.

## Potential applications

Wood Mackenzie sees the best opportunity for

# Sodium-ion (Na-ion) battery chemistries contain lower-value materials than lithium-ion (Li-ion) ones

Metal intensity and 2022 cost of Na-ion and Li-ion cathodes

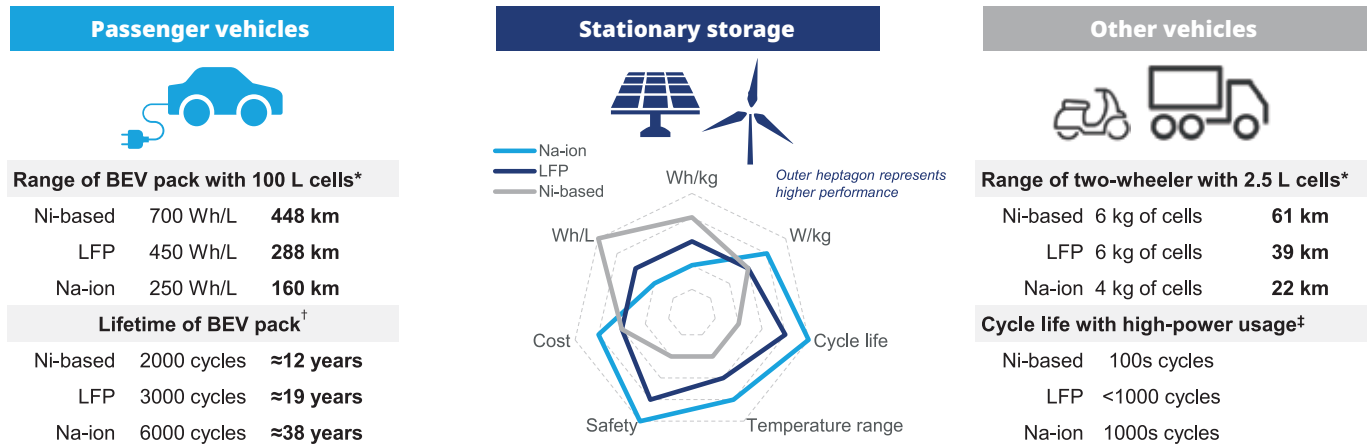


\*Prussian white =  $\text{Na}_x\text{Fe}[\text{Fe}(\text{CN})_6]$ , Layered oxide =  $\text{Na}_{0.833}\text{Ni}_{0.317}\text{Mn}_{0.467}\text{Mg}_{0.1}\text{Ti}_{0.117}\text{O}_2$ , Polyaniion =  $\text{Na}_3\text{V}_2(\text{PO}_4)_3\text{F}_3$

Source: Wood Mackenzie

## The low range from a Na-ion EV pack would rekindle consumer 'range anxiety' that Li-ion has now largely tackled

Na-ion could see use in the energy storage system market as well as low-range vehicles



The lifetime of a Na-ion pack outclasses its Li-ion counterparts but at the cost of a severely reduced range. This would be exacerbated further by the Na-ion pack being much heavier.

Greater safety and a longer lifetime make Na-ion prime for the stationary storage sector, especially with requirements for daily or hourly charge/discharge cycles and less stringent requirements for low mass and volume units.

The emerging two/three-wheeler markets with low range and regular charging suit Na-ion technology, while Na-ion's high power capability can suit heavy duty applications.

\*with a BEV efficiency of 6.4 km/kWh and two-wheeler efficiency of 35 km/kWh † with two full charges per week  
Source: Wood Mackenzie

‡ with high depth of discharge at > 1C rate

sodium-ion batteries in the energy storage system market and low-range vehicles.

Applications could also include EV fast-charging infrastructure, among others.

In December 2023, EV charger company DG Matrix said it would integrate Natron's sodium-ion batteries into its power systems.

United Airlines announced in late 2022 a strategic equity investment in Natron, saying sodium-ion batteries could help the airline electrify its ground equipment. Potential uses included charging electric ground equipment and future electric aircraft, managing electricity demand at airports and improving resiliency regarding inclement weather, the air carrier said.

Natron has been operating commercially in low volumes for about two years, according to Pouchet. The company is scaling up to capture market share in the critical power space—data centers and telecom—as well as industrial power. The oil and gas

sector is among its targeted markets, with the company seeking businesses looking to decarbonize or reduce emissions.

"How do we decarbonize the industry? Well, you go from running four diesel generators to three or two by putting a battery in to handle some of those dynamic loads that generators don't do very well," Pouchet said. "And there's other use cases. When you're out in the oil fields and you need to start fracking, you're starting up 30 megawatts of generators every single day. What's your supply source for that? Again, that's a good use for batteries."

Nabors Industries has been helpful in providing guidance on potential use cases, he added, including with Vast Renewables. The concentrated solar-thermal power company recently merged with Nabors Energy Transition Corp.

Natron plans to begin shipping batteries from its new Holland, Mich., plant by the end of March, boosting its manufacturing capacity to up to 650 megawatts to 700 megawatts. The site is a former lithium-ion battery facility.

# New Energies in Focus

## CARBON MANAGEMENT

### Carbon Terravault's CCS Plans Progress with Release of Draft Well Permits

California Resources Corp. (CRC) moved closer to its goal of capturing and storing CO<sub>2</sub> at the Elk Hills Field after the U.S. Environmental Protection Agency (EPA) released draft Class VI well permits for CRC's carbon management business called Carbon TerraVault (CTV).

The wells will be located about 20 miles west of Bakersfield, Calif. Public comments are gathered as part of the process.

If required regulatory approvals are secured, the company will have permission to drill California's first wells for underground CO<sub>2</sub> sequestration in a depleted oil and gas field. Plans include injecting CO<sub>2</sub> at a rate of about 1.46 million metric tons (MT) per annum into Elk Hill's 26-R reservoir located in California's Kern County. The reservoir, part of the CTV I carbon capture and storage (CCS) vault, has an estimated capacity of up to 38 MMmt, CRC said.

The EPA has proposed issuing four Class VI Underground Injection Control permits to construct and operate the wells—one permit for each well—authorizing injection of CO<sub>2</sub> at a depth of about 6,000 ft. Three of the four wells will be newly drilled to inject carbon into the ground, while one well is an existing injection well that will be converted to a Class VI well.

## SOLAR

### Wisconsin's Largest Solar Park Begins Full Operations



We Energies

**The Badger Hollow Solar Farm provides enough electricity to power about 90,000 homes, We Energies says.**

The solar park, developed in two 150-MW phases, is capable of providing enough electricity to power about 90,000 homes, according to a news release. The project's first phase came online in December 2021.

Located near the communities of Montfort and Cobb in Iowa County, the solar park features 830,000 solar panels that capture solar energy on both sides.

The solar park's second phase is owned by We Energies (100 MW capacity) and MGE (50 MW capacity). The first phase is jointly owned by We Energies' sibling company, Wisconsin Public Service, (100 MW) and MGE (50 MW), according to the release.

The 300-MW Badger Hollow Solar Park, the largest solar project to date in Wisconsin, has become fully operational with the completion of its second phase, operator We Energies and partner Madison Gas and Electric (MGE) said.

### AEP to Net \$115MM After Sale of New Mexico Solar Assets

American Electric Power (AEP) entered an agreement to sell its 50% interest in New Mexico Renewable Development to Exus North America Holdings, according to a press release.

Combined, AEP and utilities business PNM Resources, which also owns 50% of New Mexico Renewables, plan to sell 15 solar projects totaling 625 MW to Exus for about \$230 million. AEP's share of the proceeds is approximately \$115 million. The deal is expected to close in February, the release stated.

AEP launched the sale process for New Mexico Renewables in June. The portfolio includes nine operating solar developments totaling 185 MW and six projects under development with an estimated output of 440 MW.

KeyBanc Capital Markets is serving as financial adviser and Foley & Lardner is serving as legal counsel to AEP and PNM Resources.

### CIP Acquires Soltec's Solar PV Portfolio in Denmark

Copenhagen Infrastructure Partners (CIP) is acquiring several early-stage photovoltaic-solar power projects from Soltec in Denmark.

CIP will obtain 100% ownership of Soltec's Danish solar PV portfolio through CIP's Energy Transition Fund I (CI ETF 1), the Copenhagen-based firm said.

The portfolio of development projects has a combined potential installed capacity of about 850 MW. The project sites are scattered across Denmark with the majority located in Jutland.

CIP plans to develop, build and operate the projects to provide renewable electricity for ETF 1's Danish Power-to-X projects—including projects for producing clean synthetic jet fuel and green hydrogen.

## WIND

### Avangrid, CIP Deliver First Power from Vineyard Wind



Worldview Films/Vineyard Wind

**A GE Haliade-X turbine stands in the Vineyard Wind 1 project area south of Martha's Vineyard.**

Iberdrola's U.S. renewables unit Avangrid and Copenhagen Infrastructure Partners (CIP) they delivered 5 MW of power from their Vineyard Wind 1 project offshore Massachusetts.

The milestone was reached as the U.S. continues efforts to increase offshore wind energy capacity, targeting 30 MW by 2030.

As part of the commissioning process,

CIP said one turbine delivered about 5 MW of power on Jan. 2. Tim Evans, partner and head of North America for CIP, said the accomplishment "marks the dawn of a new era for American renewables and the green transition."



Developers plan to have five turbines operating at full capacity early this year as they move toward producing 806 MW of power in total from 62 wind turbines. With a height of up to 260 m and a rotor diameter of 220 m, each turbine has one tower, three 107-m blades and one nacelle.

Vineyard Wind is expected to generate enough electricity for more than 400,000 homes and businesses, lowering carbon emissions by more than 1.6 million metric tons per year. That is equivalent to removing 325,000 cars from roads annually, CIP said in a news release.

Offshore construction for the project off Martha's Vineyard started in late 2022. Power is transmitted via underground cables that interconnect to the New England grid in Barnstable, Mass. CIP and Avangrid said additional onshore and offshore testing at Vineyard Wind is expected to happen in the coming weeks.

## RENEWABLES

### Pattern Energy Closes \$11B Financing for Clean Energy Projects

Renewable energy company Pattern Energy Group said it has closed \$11 billion in non-recourse financing and started full construction of SunZia Transmission and SunZia Wind projects, the company said in a press release.

Together, they represent the largest clean energy infrastructure project in U.S. history, the company said.

SunZia Transmission is a 550-mile, 525 kv high-voltage direct current (HVDC) transmission line between central New Mexico and south-central Arizona. The line will have the capacity to transport 3,000 MW of "clean, reliable and affordable

electricity" across Western states.

SunZia Transmission will deliver power generated by Pattern Energy's 3,515-MW SunZia Wind facility, which the company described as the "largest wind project in the Western Hemisphere." The wind facility is being constructed across Torrance, Lincoln and San Miguel counties, N.M., the company said.

The financing includes an integrated construction loan and letter of credit facility; two separate term facilities; an operating phase letter of credit facility; an "innovative tax equity term loan facility;" and a holding company loan facility.


Pattern Energy said about \$8.8 billion will be used for construction and term facilities. The company also secured a \$2.25 billion tax equity term loan facility.

### BrightNight Closes \$375MM Corporate Credit Facility

Renewable power company BrightNight closed a \$375 million corporate credit facility—a pre-approved loan for an extended time period—to execute its U.S. renewable energy solutions portfolio, according to a press release.

Funding for the portfolio, which includes solar, energy storage and integrated technologies, "will support equipment deposits, letters of credit and project buildout," the company said.

"It [the funding] enables us to accelerate our projects, procure equipment at attractive terms and deliver clean renewable power for our customers," BrightNight CEO Martin Hermann said.

Latham & Watkins and PEI represented BrightNight in the transaction. Norton Rose Fulbright served as the lender counsel. 

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# Romito: Time to Evaluate Carbon Price



**DAN ROMITO**  
PICKERING ENERGY  
PARTNERS

*Dan Romito is a consulting partner at Pickering Energy Partners focusing on quantitative ESG strategy and implementation.*

**A**t the end of 2023, the global energy mix remained about 82% reliant on fossil fuels, down only 5% from 2010. If this trend remains at its current pace, fossil fuels will cease to exist within the global energy mix in approximately 2225 or, in other words, not anytime soon.

However, global demand for fossil fuels did not remain flat last year. Instead, Asian demand is anticipated to drive fossil fuel demand to record highs. For example, as China and India continue to increase their societies' standard of living, they must provide the energy to fuel the immense demand for power, heating, and transportation.

Both countries installed a record amount of renewable power but also burned a record amount of fossil fuels in 2023. This dynamic is not relegated to just China and India. All developing countries are not transitioning away from fossil fuels. Instead, they are expanding, enhancing and innovating their ability to access all types of energy.

Global detractors must accept that a worldwide move away from fossil fuels will not happen over the foreseeable future. Objective analysis indicates fossil fuels will be required for at least six more generations. While developing countries execute their industrial revolution, their focus will naturally be prioritized ahead of any Western-based climate-related agenda.

The United States accounted for only approximately one-fifth of the 26 million metric tons of CO<sub>2</sub> released by the world's 10 largest emitters in 2022. For perspective, China, India and Russia account for nearly 62% of the emissions released by the world's top 10 emitters during the same period. It is unlikely that China, India and Russia can be convinced to reprioritize their emissions policy at the expense of future economic progress.

We can pursue net zero to enhance environmental and financial priorities in the U.S., but it is a questionable strategy on the international stage to permanently adopt an absolute and universal "net-zero or bust" mentality.

As these realities come to light, we think the capital markets and regulatory landscape will move away from demanding absolute net zero. Capital is a finite resource, and investors cannot continue to splurge on investments that yield little to no return.

A balance between policy and alpha is required. Whether intentional or not, the European Union's introduction of the Carbon Border Adjustment Mechanism (CBAM) represents an alternative attempt to impact emissions-based policy and investment. CBAM essentially assigns a carbon price to specific carbon-intensive imports by taxing

foreign producers with less stringent emissions-based regulations.

The primary imports falling under the purview of CBAM include iron, steel, aluminum, electricity, cement, hydrogen and fertilizer. Implementation of CBAM will come in four distinct phases. Phase One was enacted in October 2023 and is intended to allow operators, importers and EU member states to "develop and refine necessary processes." Phase Two is scheduled to begin in January 2026 and marks the beginning of payment obligations. Phases Three and Four are ambiguous but focus on creating a reporting infrastructure to expand the roster of goods included.

Since Europe is the forerunner that typically impacts policy in the U.S., we envision the regulatory environment to increasingly entertain the thought of similar directives. The European Union, New Zealand and Mexico have a "cap and trade" system. Some U.S. states, namely California and Washington, have enacted carbon pricing, with Hawaii anticipating passing something similar soon.

The industry should also increasingly become more aware of the PROVE IT Act from Sen. Chris Coons (D-Del.), which "would put high-quality, verifiable data behind manufacturing practices to bolster transparency around global emissions intensity data and to hold countries with dirtier production accountable."

Politically speaking, it seems unlikely that those clamoring for net zero will reverse course. However, given the emerging geopolitical environment and the fact that China is a leading global exporter of iron and steel, there is a realistic chance that net-zero cynicism will coincide with an increased enthusiasm for a domestic instrument like a carbon border tax.

Assuming there exists a genuine desire on behalf of policymakers to decarbonize, a U.S. carbon border tax displays a high likelihood of passing if the largest exporters of carbon-intensive products also happen to be the countries with a lower focus on emissions. Rampant existing inflation plus the incremental potential cost deriving from such a tax would have to be considered. Theoretically, increasing the competitive positioning of the U.S. could be aided by such a measure.

That said, the U.S. cannot institute a border tax without establishing a carbon price. Suffice it to say, based on regulatory trends in Europe, energy demand movements in Asia and the current state of global pro-net zero policies, the fossil fuel industry must better understand its respective cost of carbon and how a CBAM-equivalent tax within the U.S. will impact its strategy. 

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# Drilling Tech Rides a Wave

Can new designs, automation and aerospace inspiration boost drilling results?



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**N**ew technology—from innovating on engineering designs to invoking the powers of automation and AI—is increasing drilling consistency and precision.

At Patterson-UTI, part of the focus on the drilling side has revolved around cutting-edge bit technology, wellbore guidance systems inspired by the space industry and automated platforms.

About a year ago, Ultrerra introduced its WaveCut drill bits, which stagger the cutting surface so the cutters don't all hit the rock at the same time.



**Chris Gooch**

"Each of these is cutting their own individual arc, and they're encountering the formation at different times from each other, and that helps to distribute the energy," Chris Gooch, product development manager for

Ultrerra, told Hart Energy. "It's all about energy distribution across the face of the drill bit."

And that energy distribution is speeding up drilling, according to the company. In the Midland Basin, operators using 12¼ inch WaveCut bits have drilled an average of 6,848 ft with an ROP of 185 ft/hr, according to the company. The fastest 12¼ inch intermediate run was a 6,060-ft section, which achieved a 258 ft/hr ROP.

The WaveCut design was inspired by the rolling wheels that crush engine blocks.

"These things are huge," Gooch said. "It literally mashes them using these waved teeth that separate and move the energy."

The WaveCut's designer saw the possibility for changing energy distribution with the drill bit, he said.

"It's not a hard rock technology, but these days that doesn't really discount a whole lot. But for 95% of drilling applications around the world, the WaveCut would be applicable," he said.

The company runs about 25,000 drill bits per year, and WaveCut is currently making up between 10% and 15% of that number, he said.

## Automation focus

Automation is increasingly driving drilling processes. Saul Martinez, drilling optimization engineer at Patterson-UTI, told Hart Energy that its Cortex automation software is helping provide efficiencies and consistencies in



John Long/Hart Energy

**The WaveCut drill bit design was inspired by the rolling wheels that crush engine blocks.**



**Saul Martinez**

drilling operations.

"Some of the customers that have been using our software, they can definitely see a lot more consistencies in the way that we're 'tagging bottom,'" he said.

It's important to avoid inadvertently damaging

the BHA or causing premature trips due to improper tagging bottom procedures, he added. The software helps mitigate some of those risks, and without the Slips to Weight software, which is part of Cortex, tagging bottom times can be "all over the place," with one connection happening quickly and another more slowly, Martinez said.

One operator in the Permian Basin averaged a manual tag bottom time of 2.13 minutes. Using Slips to Weight software trimmed that average time to 1.4 minutes. A Haynesville Shale operator saw average manual times of 2.99 minutes but automated average times of 2.22 minutes, according to Patterson-UTI.

"This software, it helps smooth out a lot of those times," he said. "We're not trying to get



*“Operators spend a lot of money in their budget planning to develop a reservoir. And so, when we’re drilling the wells, we want to be as cost-efficient as possible.”*

—Ryan Kirby, VP of operations, Superior QC

record-breaking slips to weight times every time. We’re going for consistency.”

#### **Location awareness**

Wellbore positioning gets a lot of attention because operators want to ensure the wellbore goes where they want it.


“Operators spend a lot of money in their budget planning to develop a reservoir. And so, when we’re drilling the wells, we want to be as cost-efficient as possible. Speed is key, economics are key, but if your wellbore is not optimally placed within the planned spacing of how you want to drain that reservoir, you’re not going to capture the EUR that you’re projecting,” Ryan Kirby, vice president of operations for Superior QC, told Hart Energy.

The company’s Hi-Fi Guidance wellbore positioning process, which is based on aerospace technology, starts with a fault detection, isolation and recovery algorithm. Hi-Fi Nav generates additional outputs, such as improved bit accuracy, for the drilling team, he said.

“We calculate the motor yield rates, both the effective and max in real time,” he said, adding the rotational tendencies are also outputted in real time to give the drilling engineer more information about how BHA interacts with the formation.

The company’s guidance platform is designed to maximize the efficiency in terms of where the steering intervals should be placed in the wellbore inside of the drilling window, Kirby said.

“To maximize the efficiency, we want to rotate as much as we can because that’s faster for the most part, and less sliding and less steering creates less doglegs,” he said. “We see it as improving wellbore quality by using these wellbore placement services and technology offerings.”

The HiFi Nav’s high-density trajectory estimation was able to point out wellbore placement errors in a pair of Permian Basin wells and enable resteeering to avoid the need for sidetracks, the company said. The first well had 70 ft of horizontal error and 33 ft of TVD error while the second well had 120 ft of horizontal error and 50 ft of TVD error. 



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## SCAN HERE TO NOMINATE!

# 'A Single Source of Truth': Rethinking Data Systems

Start from the desired outcome to achieve specific information management goals, expert says.

 **JENNIFER PALLANICH**  
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**A**rtificial intelligence may be all the rage, but computing's axiom of "garbage in, garbage out" still applies—AI is only as good as the source data it uses.

Investing in "right to left thinking" when planning a data program can help ensure a project's success. Lifecycle information management (LIM) calls for thinking about how the data will be used at the end of the project, along with the desired outcomes, Shirley Ike, global director for digital consulting, Wood Plc., said at Hart Energy's DUG Appalachia Conference in Pittsburgh.

She said data has picked up the moniker of "AI currency."

"You need information you can trust from planning to operations. Your asset produces a lot of information, and that requires a lot of sensitivity in order to manage this data in order to retain its value," she said.

Traditionally, there has been a lot of "silo working," with data not always accessible by those who need it.

"You don't have a single source of truth," she said. "That means that you have a lot of contractors who are coming in and there's no data transfer from one stage to another, which can lead to a lot of rework and lack of visibility, and that actually delays when you are ready to start to operate."

Employing an LIM approach requires some up-front effort to configure and collect data, she acknowledged.

"Spending a little bit more effort at the start of your project allows you to reduce the cost and time spent in data management, and you get to a place where you're ready to operate much quicker and at a low cost," Ike said.

Part of the up-front work in an LIM approach includes creating class libraries in which data standards and requirements are defined. Once those standards are set, it's time to consider how to collect information, ensure consistency and optimize data entry. A formalized procedure ensures everyone who works with the data understands the processes at work.

Finally, to collect data a platform is created that can pull information from various systems, extract, transform and automate.

Often at the start of a project, there are gaps in available information, making it difficult to manage assets optimally, she said. There can be a lot of data scraping required, and some data exists only on paper. AI can play a major role in



*"Spending a little bit more effort at the start of your project allows you to reduce the cost and time spent in data management, and you get to a place where you're ready to operate much quicker and at a low cost."*

—Shirley Ike, global director for digital consulting, Wood Plc.

data cleaning and scraping.

"We sit with a lot of the stakeholders and find out where that information actually resides. There's a lot of scraping, there is a lot of initial work that might go into that, but a lot of [clients] also just have the data. It's somewhere, you just have to find it."

She said a customer in the North Sea wanted to reduce offshore visits and maintenance backlog.

At the outset, the customer had poor quality data across different systems, which required "a lot of data cleaning" before a digital twin could be built and linked to the different systems, she said.

The LIM project made it possible for the customer to virtually walk through the asset, click on a pipe or valve and have access to "every single piece of information" that pertains to the equipment, she said. With that information, it is possible to plan a maintenance visit remotely, planning for the equipment that should be taken offshore.

Ike said the clarity in data made it possible for the client to reduce offshore visits by as many as 500 per year. The result: \$9 million in savings following an investment of about \$1 million. Ongoing savings were expected to be about \$7.5 million annually, she added.

"Having access to data, a world of opportunities on things that you can actually achieve for your asset ... I think of it as there's money left behind, and it's buried in this data."



# Excelling Past Spreadsheets: A Better Way to Manage Emissions

Validere's Carbon Hub software looks to push the industry into the world of machine learning.



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▼ **Validere's Carbon Hub software looks to replace spreadsheets typically used in emissions management.**

**M**anaging emissions begins with managing a deluge of data. Information on flaring, temperatures, leaks and maintenance comes from many different directions and, for many operators, lands in an Excel spreadsheet.

"You have quarterly information, yearly information, flyover data, satellite information, handwritten things, things entered on an iPad, things coming into the cloud. All of these data sets are going to their intended user group," Kayla Ball, chief commercial officer of Validere, told audience members at the recent DUG Appalachia conference. "So, what you see is spreadsheets, flow calculation software, field data capture systems, sample management, quality management softwares, and all of the different teams are looking at a different piece of the puzzle on any given day... it's a climb," Ball said.

Though Microsoft's Excel can be a "great workhorse—until it's not," a certain level of difficulty occurs when given "85 different spreadsheets with 85 different tabs each," Ball said. Artificial intelligence (AI) and machine learning can mitigate these effects.

Validere's Carbon Hub software can collect all this information and spew it out for operators in a manageable way. The platform centralizes emissions and operational data and provides context to them, enabling users to track emissions-related events and stage scenario model reduction strategies.

Customers using Validere's platform start with comprehensive mapping of their facility and equipment source-level emissions inventories for bottom-up forecasting. Customers can then supplement this data with additional information collected during field inspections, Leak Detection and Repair (LDAR) programs or other point-in-time measurement campaigns. They then use the emissions data gathered to model scenarios and forecast emissions to develop reduction programs.

Integrating operational data, continuous monitoring data and estimated and measured emissions allows for high-grade detections, efficient responses and prediction of emissions events. This real-time view of operation and emissions data allows customers to more

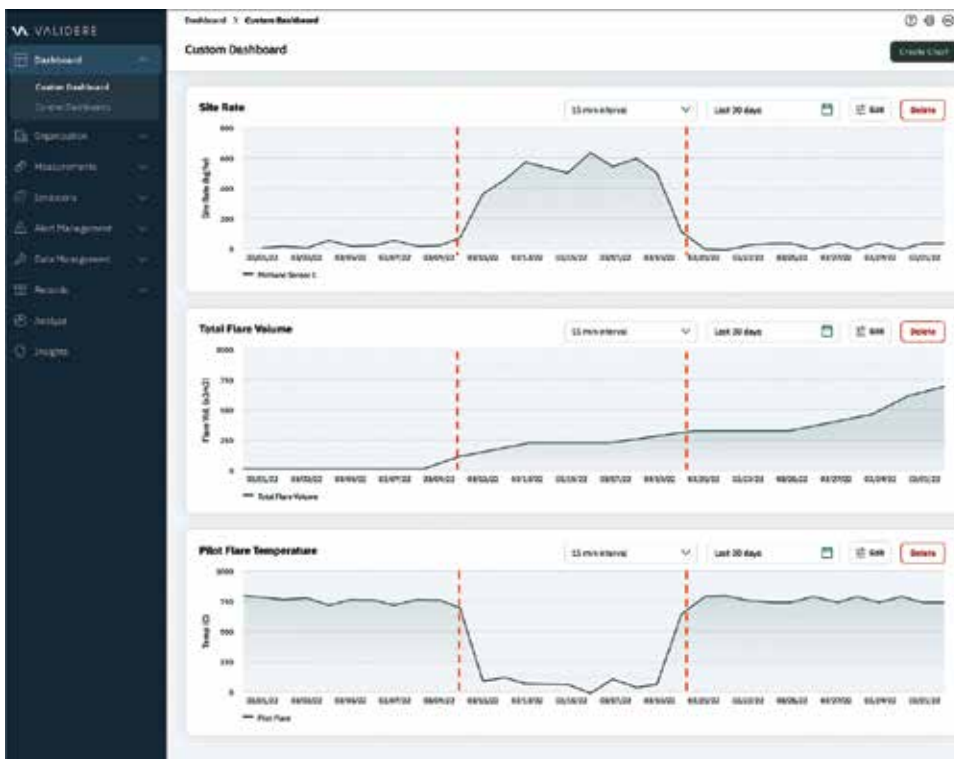
accurately monitor the progress of their emission reduction programs.

But even with the various and proven benefits of AI in the world of emissions management, there is still a reluctance by the industry to fully lean into the world of machine learning as questions of cost and security pop up. Many in the industry continue to rely on traditional tools like Microsoft Excel in an "if it ain't broke, don't fix it" approach.

To meet the criteria of "certified gas," many operators would use newer and advanced approaches to emissions management data. Once achieved, they would revert back to using Excel and other simpler data management systems.

However, Ball doesn't see these issues as problems that will last, as the need for advancement within the industry is constant.

"I still think there's a lot of growth for the additional measurement, and the supply costs are already coming down on these devices."



Source: Kayla Ball/Validere

# Tech Bytes

## SLB to Use Physics-based AI Model Builder

SLB will be able to deploy a physics-informed AI model builder for oil and gas operations following a deal with Geminus AI, SLB said in January.

The investment and technology partnership agreement between the two companies gives SLB exclusive access to deploy Geminus's model builder, which fuses physics-based approaches with process data to produce AI models that can be deployed at scale. The technology is faster and less expensive than traditional AI approaches, SLB said.

In one user case, SLB delivered a Geminus hybrid AI-driven application to optimize economic performance while reducing carbon emissions at a natural gas plant. The application, created by Geminus's physics-informed AI solution, was trained using data from SLB's Symmetry process simulation software. The application took just days to create, including the underlying hybrid AI model, and has the capability to evaluate 20,000 complex scenarios in under one-tenth of a second, SLB said.

In other use cases, the technology has improved the performance of electric submersible pumps and industrial wellsite chokes.

Rakesh Jaggi, digital and integration president for SLB, said in a press release the partnership will produce a step change in operational performance for customers.

"Geminus's capability to fuse AI methods with physics-based simulation data will empower customers to quickly and easily create hybrid models of their operating assets that can be optimized in real time against numerous outcomes, such as opex reduction, increased productivity and carbon emissions minimization," he said.

The Geminus platform uses physics-informed AI computing to translate constraints of the physical world inside digital models. It does not require heavy inputs of data, and models can be easily updated with the infusion of new data points, SLB said. Data scientists and modeling engineers can use the platform to predict the behavior of complex systems and make informed real-time decisions.

## Permian Well Pad Restoration Research Underway

Apache Corp., a subsidiary of APA Corp., in December announced a partnership with the Borderlands Research Institute (BRI) at Sul Ross State University in Alpine, Texas, to launch a well pad restoration research project.

Typically, at the end of a well's service life, the well is plugged, equipment is removed and the pad is reseeded and allowed to gradually return to a natural condition. The project aims to accelerate the return to nature by considering alternative soil preparation techniques.

Through this multi-year partnership, researchers at BRI and Texas Native Seeds, a project of the Caesar Kleberg Wildlife Research Institute at Texas A&M Kingsville, will investigate methods to improve habitat restoration efforts in the Permian Basin with the goal of publishing a best practices document to operators.

The project will inform oil and gas operators in the Permian about how changes in the industry's approach to restoring end-of-service well pads, including alternative soil preparation techniques, can have broader benefits to local biodiversity. The Apache-funded project will assess differences in vegetation, soil humidity, carbon retention, insect diversity and the economics of different restoration methods.

This project also measures increases in soil carbon to passively sequester CO<sub>2</sub> in healthy desert soils.

## Court Rules in Favor of Welltec Patents

The Borgarting Court of Appeal in Norway sided with Welltec and ordered Altus Intervention to pay remuneration and court costs of more than \$1 million, Welltec announced in December. The court ruled that Altus Intervention infringed on and misused a patent covering well intervention technologies belonging to Welltec. The patent was registered in 2015 for innovation concerning downhole milling services used in well interventions.

The court ruled that the patent violation resulted in Welltec losing contracts that it would most likely have won had Altus Intervention not infringed the patent in developing its solutions. All of the

features of Welltec's technology covered under the patent are also present in Altus Intervention's solution.

## KLX Unveils VISION Suite for Downhole Solutions

KLX Energy Services introduced its VISION Suite of downhole completions tools in December.

VISION reimagines downhole completion tool technology to improve performance, reliability and operational efficiency. The VISION Suite includes Oracle-Smart Reach Tool (SRT), Spectra PDC and PhantM Dissolvables.

Spectra PDC, KLX's downhole tubing motor system, is designed to eliminate non-productive time on long lateral runs. Spectra is a mud lube bearing pack allowing operators to pump at increasing rates.

Oracle-SRT, KLX's downhole thru tubing extended reach tool, uses a vibration tool to negotiate long laterals by minimizing the amount of wellbore friction encountered during milling.

PhantM, KLX's dissolvable frac plug, is designed to minimize the need for interventions.

## FPSO Pitting Corrosion Patch Available

MODEC and Toray Industries have jointly developed a carbon fiber-reinforced plastic patch technique for repairs on FPSOs and FSOs, the companies announced in December.

The technique will be available to patch pitting corrosion repair from 2024 without interrupting oil and gas production on the vessels, the companies say. The American Bureau of Shipping has approved the technique for repairing areas with diameters of up to 300 mm that have suffered damage from pitting corrosion.

## Aker BP Upgrades Spill Detection System

Aker BP has contracted Vissim to upgrade oil spill detection solutions at the operator's fixed and floating installations on the Norwegian Continental Shelf, Vissim announced in January.

The new radar-based oil spill detection system uses upgraded image processing technology to detect even smaller oil spills.





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*“The growth has not just been a Permian story. We’re seeing many shale basins that were flattish experiencing a revival.”*

*Francisco Blanch, Head of Global Commodities and Derivatives Research at BofA, (as quoted by Reuters).*

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# FERC: Closure of LNG Plant Threatens New England's Grid

Despite record U.S. natural gas production, New England faces difficulties finding adequate supplies.

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**A**n LNG import terminal that supplies New England customers faces closure in May, and the Federal Energy Regulatory Commission (FERC) says the move would compromise the stability of the northeastern U.S. energy grid.

Constellation Energy may close Boston's Everett LNG import terminal at the end of May. The terminal supplies Mystic Generating Station, an electric generation facility owned by Constellation and the terminal's primary customer. The terminal also supplies natural gas to utilities in the region, which helps to stabilize the heating supply during cold snaps.

The Mystic Generating Station has the highest generation capacity of any station in Massachusetts. Since 2018, Constellation has kept the power station open with a cost-of-service agreement with ISO New England, a non-profit organization responsible for grid reliability in the region. The cost-of-service agreement ends in May.

ISO decided not to renew the cost-of-service agreement, saying the organization's primary concern is with electrical grid reliability and not the natural gas supply.

"ISO New England has no jurisdiction over fuel infrastructure and therefore is not able to retain the LNG facility," said Mary Mannion, spokesperson for ISO-NE. The organization's analysis was that the electrical grid could withstand a cold winter via supplies from other companies.

Constellation spokesperson Mark Rogers said the company is attempting to keep the terminal open, but will have to find new customers for its natural gas.

"Constellation has been negotiating in good faith with purchasing counterparties over supply contracts that would support the facility's continued commercial operation following the retirement of Mystic Generating Station on May 31, 2024—but time is of the essence," Rogers said.

The potential closing of the facility has raised concerns at the federal level.

"We remain concerned about the potential loss of the Everett Marine Terminal (Everett) in New England and the consequences that it might have for the reliability and affordability of the region's

energy supplies," the FERC and the North American Electric Reliability Corp. (NERC) said in a joint statement in November.

The plant has been in operation since 1971 and has a vaporization capacity of about 700 MMcf/d. Most of the gas imported to Everett is burned at the generating station—a 1,413 megawatt power plant—while the rest can be shipped via truck or pipeline to utilities for winter storage.

Two other LNG import terminals serve the region, according to ISO-New England, neither of which is operational on a regular basis. However, ISO released an analysis in the summer saying that the electrical system could manage the retirement of the Everett facility.

The assessment met criticism from other utility companies in the region and was referenced in the statement by the FERC and NERC.

"Although there was evidence that the retirement of Everett would be 'manageable' for the electric system, at least in the near-term, given anticipated new resource deployments and transmission development, minimal load growth, limited resource retirements and increased reliance on non-natural gas generators, the evidence indicates that, should those expectations not materialize as anticipated, ensuring reliability and affordability could become challenging in the face of a significant winter event," they said in the statement.

Companies are currently rushing to build LNG export facilities along the Gulf Coast to take advantage of high overseas demand. Northeastern states, however, have been unable to take advantage of the national gas glut. The region does not have access to a large portion of the natural gas developed in the nearby Marcellus Shale. Pipeline projects have faced intense opposition from environmental and local groups.

Imports are expensive because power companies have to compete on the global LNG market, in part because of U.S. shipping rules. LNG tankers off the Gulf Coast aren't allowed to deliver to U.S. ports because of the Jones Act, a statute passed more than a century ago that restricts port-

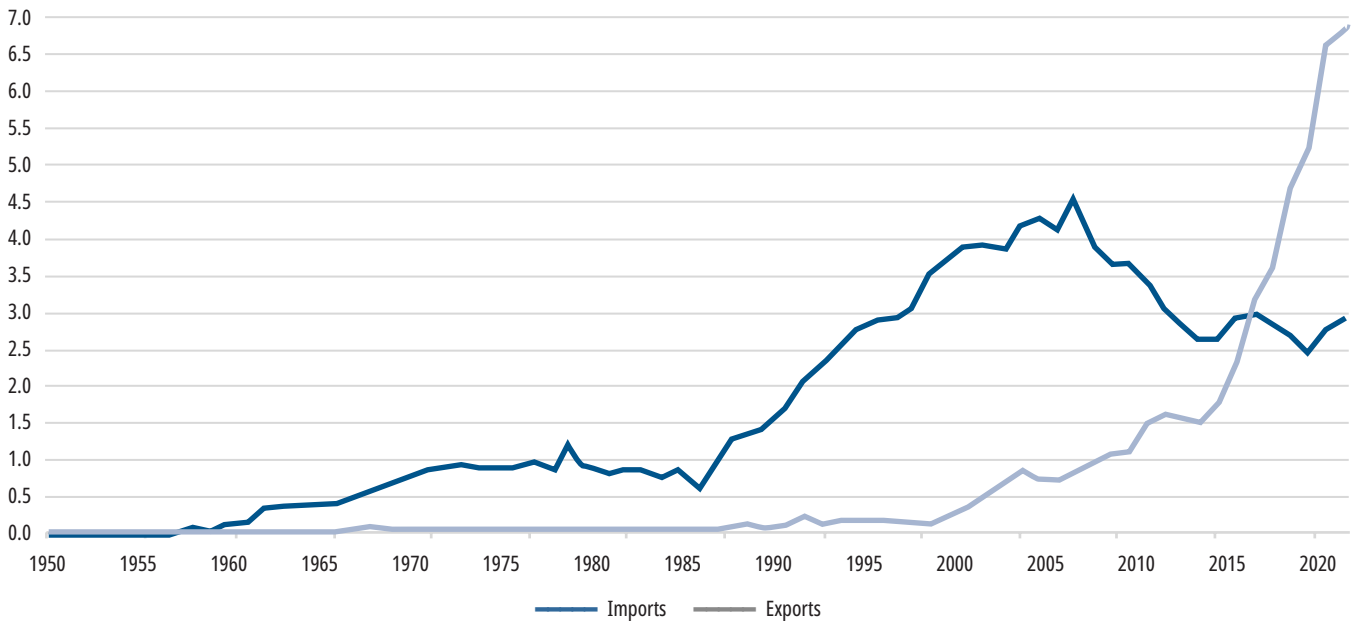


**The Everett Marine Terminal supplies natural gas to utilities in New England.**

Constellation Energy

### U.S. natural gas imports and exports, 1950-2022

Trillion cubic feet



Source: US Energy Information Administration

to-port traffic in the U.S. to ships built in the country and crewed by Americans.

U.S. natural gas production hit an all-time high in October 2023 and natural gas prices are currently considered cheap, with the Henry Hub price lingering at around \$3/MMBtu on Jan. 10. On the same day, the European LNG price was about \$10/MMBtu and the Japan/Korea Marker, the Asian benchmark was above \$11/MMBtu.

In fourth-quarter 2023, the cost of New England natural gas was 31% higher for residents than elsewhere in the U.S., according to the U.S. Energy Information Administration.

The Everett LNG facility last took a delivery in the first week of 2024 when a tanker carrying 2.7 Bcf from Trinidad offloaded, Reuters reported.

# The Enduring Gas Price Slump

Warm winters chill the long-term outlook, with a Bernstein analyst expecting the sluggish market to continue.

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**O**n Jan. 26, 2023, the Henry Hub natural gas spot price dropped below \$3 per MMBtu—after almost 20 months above that mark. Except for a stretch in October, it would not eclipse \$3 again until early January 2024.

It's been a rough patch for natural gas prices, a trend that one analyst expects to continue, perhaps into 2025.

"At the beginning of [2023], we had a bearish tilt but expected most of the brunt to hit in 2024 versus 2023," wrote Jean Ann Salisbury, senior analyst at Bernstein. "We forecast \$4 (per MMBtu) in 2023 and \$3.50 (per MMBtu) in 2024; those curves now suggest \$2.54 and \$2.65, respectively."

U.S. natural gas prices surged in 2022 after Russia invaded Ukraine and European countries scrambled to find supplies elsewhere. The Henry Hub price hit a monthly average of \$8.81/MMBtu in August of that year and was still at \$5.53/MMBtu four months later in December.

According to Salisbury, two major events caused prices to fall in 2023: a warmer-than-expected January and February followed by a surprising surge in U.S. production in October and November of this year.

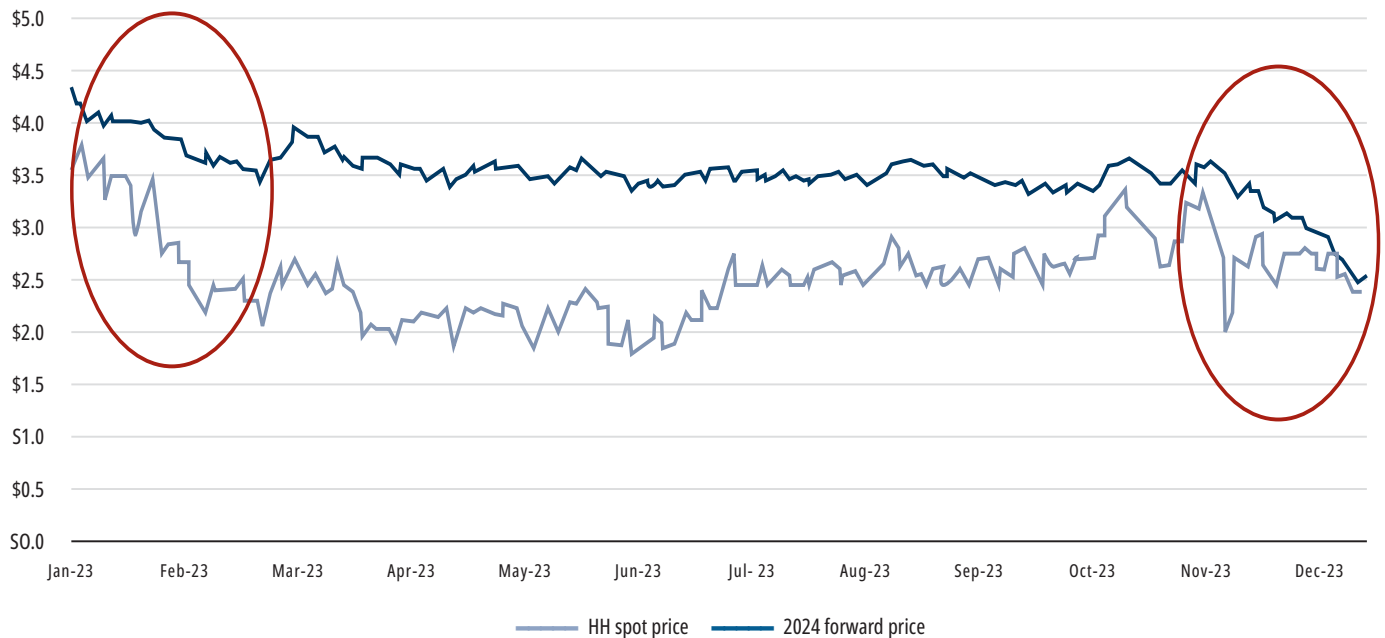
According to the National Oceanic and Atmospheric Administration, the average temperature across the contiguous U.S. from December 2022 to February 2023 was 34.9 F. The temperature was 2.7 degrees above average and ranked as the 17th warmest winter on record.

Gas usage dropped correspondingly. From January to February, the U.S. gas market used 300 Bcf less natural gas than normal. According to Bernstein's forecasts, residential and commercial average usage in 2023 will drop by 1.2 Bcf/d for the year, while industrial demand is expected to finish at 100 MMcf/d less than average.

Bernstein analysts had forecast a drop in residential-commercial usage of only 0.7 Bcf/d as opposed to 1.2 Bcf/d, and an increase in industrial demand of 600 MMcf/d, instead of the drop of 100 MMcf/d.

There were some brighter spots on the market. Natural gas exports to Mexico set a record monthly high average of 6.8 Bcf/d in June. Bernstein analysts expected imports would finish about 500 MMcf/d higher than the five-year average. The power industry also used an average of 2.3 Bcf/d more natural gas than the five-year average. However, the

**A warm winter in January and February, and supply surge in October, lowered U.S. gas prices.**



Source: Bloomberg, Bernstein analysis



**\$3.50**

Bernstein's 2024 natural gas forecast a year ago

**\$2.65**

Bernstein's 2024 natural gas forecast now

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***“Looking forward, at the current 2024 strip of \$2.65, we believe only associated gas will grow in 2024.”***

—Jean Ann Salisbury, senior analyst, Bernstein

increase may have been tied to a deep supply of cheap gas available for power companies to access during the summer.

“It was not hotter than normal, so we believe this was [usage based] mostly on lower price,” Salisbury wrote.

### **October surge**

As fall began, natural gas companies ramped up production and, “partly due to waiting on midstream and partly due to holding back production during the low-priced shoulder month (September), added nearly 5 Bcf/d for the last quarter of the year, sinking the 2024 curve,” Salisbury wrote.

The Permian Basin led the production increase. In 2022, Permian companies produced an average 20.7 Bcf/d of gas, the number is expected to increase to 23.2 Bcf/d for 2023. An earlier-than-expected restart of the El Paso Natural Gas pipeline encouraged basin production, as the line takes Permian gas westward to markets on the West Coast.


However, while more gas flowed west, more natural gas also went into storage. By mid-December, the U.S. Energy Information Administration reported 3,577 Bcf was in U.S.

storage facilities—8.5% higher than the five-year average. Bernstein analysts expected December storage numbers to set a record for the month.

The high storage followed a mild November and December to end 2023 that resulted in lower natural gas demand for heating. While international demand for U.S. LNG remains high, problems with export processing facilities have created bottlenecks.

“LNG utilization rates have been lower than expected at Calcasieu Pass and Sabine Pass due to maintenance and at Freeport due to the delayed startup,” Salisbury wrote.

Bernstein analysts expect natural gas prices to stay flat for most of 2024, and, depending on the startup timeline of new LNG facilities, may remain flat going into 2025.

“Looking forward, at the current 2024 strip of \$2.65, we believe only associated gas will grow in 2024 (at about 2 Bcf/d). This will be paired against flattish demand until LNG starts up in late 2024, suggesting very full storage a year from now,” Salisbury wrote. “This should start to weigh on 2025 price as storage fills, and we remain cautious versus the strip for 2025.” 

# Howard: Oscars Season, Guidance Season

The appeal of the niche midstream sector could take center stage in 2024.



**HINDS HOWARD**  
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*Hinds Howard is a portfolio manager at CRBE Investment Management, where he evaluates listed infrastructure and transportation companies in North America and coordinates research of listed transportation companies globally. He is based in Wayne, Pa.*

I watch a lot of movies. In fact, right now I am writing this while trying to finish “Killers of the Flower Moon,” all 3 hours and 25 minutes of it. In thinking about it, midstream is a little like the film industry, in that there are cinephiles who care deeply about films that the rest of the world doesn’t have much time for. Midstream is a niche area of focus for investors, getting more niche each year.

In the film world, there are a few films each year that cross over and have critical acclaim and massive box office results. Like this year, for example. There were two likely (as of this writing) Best Picture nominees that were also among the top five highest grossing films of 2023: “Barbie” (highest worldwide gross at \$1.4 billion) and “Oppenheimer” (third-highest at \$952 million). Betting odds in early January have “Oppenheimer” as the favorite, but the next two best odds are “Poor Things” and “The Holdovers,” which combined box office gross totaled just \$43 million.

If “Oppenheimer” wins, it will be the highest-grossing Best Picture winner since 2003, when “Lord of the Rings: Return of the King” won. The combination of box office success and critical acclaim has always been rare, but even less frequent in the last 20 years, because of the box office dominance by superhero and franchise films.

When it comes to the stock market, superhero films are like growth stocks, dominating the market’s attention and hoovering up all the fund flows. Midstream stocks are more niche, akin to the more typical Oscar-bait films that a small, but dedicated group obsess over and talk about on podcasts.

Lately, however, Marvel movies, “Star Wars” sequels and the like have bombed, failing to garner nearly as much interest as they once did. It was a good run for Marvel movies, and it continues to be a good run for growth stocks. However, the appeal of the niche midstream sector could take center stage in 2024.

Midstream performed well in a year with falling commodity prices and limited prospects for top line growth, which is unusual. In years past, when commodity prices have fallen so much (like in 2015 and 2020), midstream followed energy stocks lower.

That didn’t happen this time, probably on account of improved balance sheets and free

cash flow that allowed for financial flexibility to better weather uncertain times like these. High free cash flow and recent lower correlation to oil prices could attract broader market interest in midstream in 2024, making the sector a crossover hit like “Oppenheimer.” Or the sector could continue to thrive in obscurity like so many Oscar films do.

## Awards guidance

I considered trying to come up with a list of awards and giving them out to individual midstream companies, like Targa Resources (TRGP) could be Best Picture, Cheniere Energy CEO Jack Fusco could be Best Director, and so on. Maybe Energy Transfer (ET) could win best adapted screenplay for running the same play it did with Enable Midstream a few years ago this year with Crestwood Equity (CEQP). Williams Cos. (WMB) and Enbridge (ENB) could win Best Costume Design for dressing up flagging growth with splashy M&A.

But I didn’t get very far, because that’s all backward looking, and we’ve dwelled on that plenty at this point. First-quarter earnings is about forward guidance, the future winners of such awards.

Is this the year Canadian midstream stocks outperform after several years of trailing midstream returns? Probably so, if interest rates decline, but not if times get tough and high leverage weighs. Will ONEOK outperform the market’s sanguine view of synergies from the Magellan merger? Perhaps. Will companies keep buying assets from private equity rather than buy back their own shares? Probably.

Other themes in the coming year that will drive investment discussions as midstream companies push forward with a fresh year of guidance:

- **Return of capital decisions**, which lately has been more directed toward M&A, capital investments and dividends over buybacks;
- **Elevated capital expenditures**, to facilitate NGL volumes flowing from those plants down the value chain and into the export market; and
- **Weakness in commodity prices** impacting volumes and demand.

Those themes are fairly evergreen in midstream, which is a credit to a sector that’s returned to its roots of being boring and beautiful. One area that could continue to



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**Do midstream stocks represent a crossover hit like "Oppenheimer," or will they thrive in obscurity like "Poor Things"?**


change is investments in ESG, green or sustainable assets, like carbon capture, renewable natural gas and hydrogen. I expect those investments to continue to slow. The technologies are too nascent and the scale too small to continue to garner much attention from midstream companies.

**In memoriam**

Finally, in sticking with the Oscar theme here, it is time for the "In Memoriam" portion of the show.

Since COVID, the midstream sector has lost many once-

proud companies. They went away in the name of synergies, selling out, efficiency, etc. In the last 12 months alone, we lost the following MLPs: HEP (2004-2023), DCP (2005-2023), MMP (2001-2023), CEQP (2011) and GPP (2015-2024).

Since 2020, in addition to the five lost in 2023, 12 other MLPs have gone away, including: CNXM, BPMP, ENBL, EQM, NBLX, OMP, PBFX, PSXP, SHLX, SRLP, TCP and RTL. These MLP tickers and most of their management teams are gone, but their assets live on within their original sponsors or as part of other, larger midstream companies. 



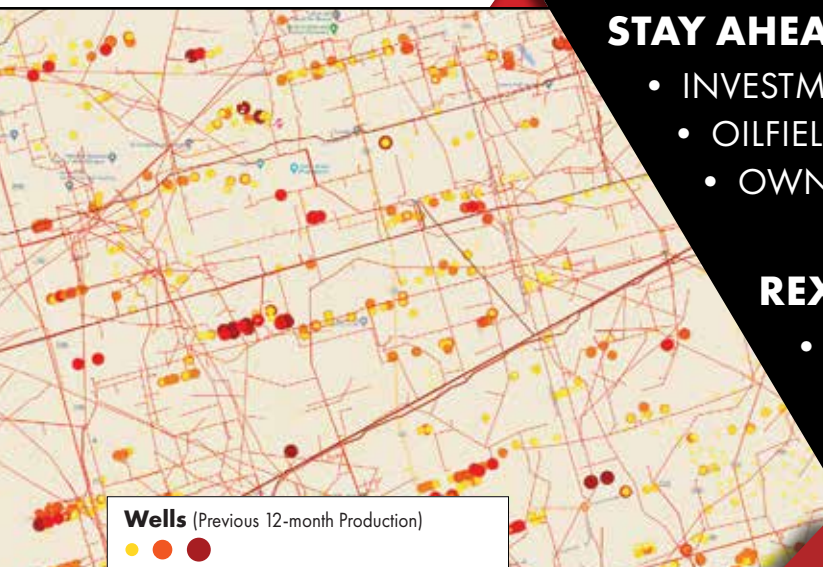
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# Williams' Gas Storage Deal Reflects Tightening Market

Analyst: More transactions like the \$1.95 billion acquisition could be on the horizon.

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**W**illiams Cos.' \$1.95 billion purchase of six underground natural gas storage facilities reflects a trend of companies assembling supply networks to handle a coming surge in U.S. LNG exports, even when natural gas prices remain low, an analyst said.

"The purchase of this group of assets is a bet on the value of gas storage more than it is a bet on gas prices," Zach Krause, energy analyst at East Daley Analytics (EDA), told Hart Energy. "Given the increased demand associated with LNG facilities coming online, without any significant new storage expansions, withdrawal capacity will fall below 100% of total U.S. demand and exports."

Williams bought six underground natural gas storage facilities in Louisiana and Mississippi from Hartree Partners with a total capacity of 115 Bcf, plus 230 miles of gas transmission pipeline and 30 pipeline interconnects. The deal was announced on Dec. 27 and closed on Jan. 3.

"Demand for natural gas has greatly outpaced natural gas storage capacity since 2010, demonstrating the intrinsic value this well-connected and strategically located Gulf Coast storage portfolio brings to our transportation network as we serve growing demand driven by LNG exports and power generation," Williams President and CEO Alan Armstrong said in a release after the closing. "With the acquisition now complete, we look forward to welcoming the Hartree team to Williams and integrating this premier storage platform into our suite of natural gas transportation and marketing services, while delivering additional value to our shareholders."

Following the concurrent increase in crude production, the U.S. was on track to produce record amounts of natural gas in 2023, according to the EIA.

U.S. LNG export capacity is currently capped at about 11.4 Bcf/d, according to the EIA, thanks to a bottleneck of LNG processing along the U.S. coastline. However, that capacity is expected to more than double—to 24.3 Bcf/d—by 2027, thanks to a flurry of LNG terminal construction, primarily on the Gulf Coast.

"It will be more challenging for storage facilities to mitigate the effects of constraints when they arise in the future," Krause said. "This suggests that existing storage assets should become more valuable, a trend that we are noticing."

Revenue reported to the Federal Energy Regulatory Commission from large Gulf Coast storage operators increased by about 20% during the past five years, according to EDA analysis. The total contracted volume on the coastal assets is up 8%, showing increased utilization and increased rates.

Krause said he expects more M&A deals for storage. The U.S. does not have a storage problem, per se, he said, but the problem of storing natural gas is "challenging because there is only so much capacity that exists in salt caverns, depleted reservoirs and aquifers—storage capacity is challenging to expand. Despite the challenges, there are some avenues for expansion and additional storage projects floating around the market."

M&A for storage infrastructure has been slow the past year, but the market should pick up in the near term.

"Acquisitions like this one and (Enbridge's) acquisition of Tres Palacios demonstrate that major midstream players are beginning to recognize the value of storage assets within their strategy to serve growing Gulf Coast export markets," he said.

In its announcement, Williams pointed to two markets that will be impacted. Besides the growing LNG export market, the company also expects demand to grow for power generation, especially for data centers located along the Transco corridor.

Transco is Williams' 9,700-mile pipeline network that curves crescent-like from South Texas to New York City. The network transports about 16% of the natural gas consumed in the U.S., according to Williams.

The power market for data centers is expected to grow about 10% per year until 2030, according to a report from financial analyst firm McKinsey & Co. Power companies are struggling in some segments of the country to keep up with demand, as a data center can use 50 times the electricity of a similar-sized office building, according to civil engineering firm Pape-Dawson. 



# Pitts: Vietnam Seeks Delicate Balance Among US, China, Russia



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Vietnam may still carry a stigma with many in the U.S. dating back to the '60s and '70s, but the geopolitical relationship has shifted dramatically even if the ruling political party has not.

And Vietnamese manufacturing coupled with U.S. natural gas could strengthen the bond further in the years to come.

Specifically, ongoing U.S. tensions with China and Russia offer Vietnam an opportunity to boost economic ties with the North American power. That's if American investors can see past geopolitical smokescreens and invest funds for infrastructure, power and LNG projects. These would power Vietnamese manufacturing, which would, in turn, service the U.S. with its critical minerals needs and more.

Jack Belcher, principal with Washington, D.C.-based Cornerstone Government Affairs, argues that Vietnam's manufacturing demand is, essentially, demand for energy.

"Vietnam wants to get off of Chinese coal, not just for greenhouse gas-emissions purposes, but because they want to get out from under the thumb of China. All of these things are big drivers for U.S. LNG and Vietnam," said Belcher, a former staff director for the U.S. House of Representatives Subcommittee on Energy and Mineral Resources. "It's being able to support the manufacturing sector that's increasing and being able to meet growing demand."

American investors have opportunities to fund projects for pipelines, ports and power plants, as well as for LPG, crude oil and LNG. There also is potential in wind projects.

One U.S. company arguably at the forefront of the push to attract American investments in Vietnam is Houston-based Energy Capital Vietnam (ECV), led by David Lewis. Lewis said the biggest headwind for American investors thinking about investing in Vietnam is perception.

In that vein, Vietnam is at a geopolitical crossroads, considering its major trade routes lead to and from the U.S., China and Russia, and Vietnam aims to continue doing business with all of them in a delicate balance. For instance, Russia supplies military goods for Vietnam to protect itself from China. Therein lies the potential conundrum.

Likewise, while Vietnam sides with the U.S. on China, the controlling government in Hanoi

is, of course, communist.

But today, Vietnam is the U.S.'s seventh-largest trading partner and, over the last decade, Vietnam's gross domestic product (GDP) has grown around 109%, including 8% in 2022 alone to about \$409 billion. Vietnam's energy generation capacity is expected to rise roughly 60% by 2030, according to ECV.

VNDirect Securities Corp., a Vietnamese financial institution, expects Vietnam's economic activity to continue growing thanks to fiscal expansion policies, falling domestic interest rates, increased tourism, and higher agricultural and manufacturing exports.

VNDirect projects total investment demand for power capacity in Vietnam could reach \$98 billion from 2021 to 2030 in a base-case scenario, allocated 30% to gas-fired power and 35% to wind. Solar power also is expected to be a key beneficiary.

The potential is very real, but the geopolitics remain delicate and maybe messy. What happens in Taiwan or Ukraine could easily ripple into Vietnamese relations despite a total lack of direct involvement. On that note, a glance at a portion of Vietnam's defense and international partnership policy might serve as a good reference or starting point.

"According to the Vietnam Defense White Paper in 2019, Vietnam is pursuing a non-aligned policy known as 'four no and one-depend' which is no military alliances; no siding with one country against another; no foreign military bases or no using Vietnamese territory to oppose other countries; no using force or threatening to use force in international relations," said the U.S.-based International Trade Administration (ITA) on its website.

"The 'one-depend' is presented as 'depending on certain circumstances, the country will consider developing necessary defense and military relations with other countries at appropriate level,' which leaves room for military manoeuvre," according to ITA.

But none of that means there is not plenty of opportunity for U.S. energy investment.

"I think Vietnam is a great place for investment. I think it's a great place for U.S. industry," Lewis said. "I think it's a great opportunity just for helping to improve security globally."

# Keep an Eye on Vietnam

It's home to one of the world's largest caches of critical minerals, but needs power and investment to move forward.

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**V**ietnam is undergoing an economic renaissance, says David Lewis, founder, chairman and CEO of Energy Capital Vietnam (ECV), a project development and holding company. That makes the southeast Asian country a promising growth market.

Lewis attributes this to an influx of Western manufacturing, but he says Vietnam, with a population of almost 100 million, needs to dramatically boost its power generation capacity, currently around 80 gigawatts, to sustain its economic growth. Getting there will not be easy: Vietnam looks to move away from coal as a power source as its hydropower output nears capacity, Lewis says. As such, future power generation will be dominated by renewables, supported by base load supply from domestic natural gas and, initially, by imported U.S. LNG. With this transition, Vietnam looks to enhance energy and climate security and realize its net-zero goals by 2050.

David Lewis spoke with Pietro D. Pitts, Hart Energy's international managing editor, regarding Vietnam as an investment destination for U.S. investors.

## **Pietro D. Pitts: Why should U.S. investors keep an eye on Vietnam?**

**David Lewis:** Vietnam's manufacturing sector is the heart of the economy and has been for some time. Given recent tensions between the U.S. and China, coupled with a worldwide push to diversify away from China, Vietnam is increasingly on people's radar.

After the COVID-19 pandemic, the world recognized there was too much risk concentrated in one country: China. This is another reason why Vietnam, which shares a 1,000-mile border with China, has become more attractive. Surprisingly,



Vietnam has the world's second-largest supply of critical minerals with 22 million tons, only behind China, which has 44 million tons.

## **PDP: How does that manufacturing dominance factor in Vietnam's push to displace its coal consumption with gas?**

**DL:** The [manufacturing] focus is about Vietnam's ability to support the semiconductor supply chain. It's not just about manufacturing T-shirts or tennis shoes but it's about growing the value chain. And, as you grow that value chain, the need for energy security only increases. Now, Vietnam is in a position where it needs to double its power generation capacity in the next 10 years.... It's going to be very challenging [for the Vietnamese government alone] to meet these goals.

In terms of the energy transition, Vietnam was an early mover to shift away from coal to gas, and for two main reasons. The first is national security, since previously the plan was to import coal from China. But China's aggression inhibited Vietnam's ability to develop its domestic reserves as much as they would have liked. And even if Vietnam could completely develop its reserves, the country still consumes more than what it'll be able to produce.

The second is because of protests that erupted in the streets of Vietnam about coal-related emissions.

The Vietnamese government recognizes that [tapping into] U.S. LNG kills two birds with one stone since the imports can't be blocked or stopped by the Chinese while at the same time the use of [a less polluting energy source] bodes well with its citizens.



**The LPG tanker Venus 08 anchors close to the harbor of Yung Tau. Vietnam wants to grow its storage capacity for imported refined products to 90 days from 10 days.**

Shutterstock



**Hydroelectric power production in Hoa Binh, Vietnam. The country is nearing its hydroelectric capacity and pursuing other energy options.**

Shutterstock



*“The Vietnamese government recognizes that [tapping into] U.S. LNG kills two birds with one stone since the imports can’t be blocked or stopped by the Chinese while at the same time the use of [a less polluting energy source] bodes well with its citizens.”*

—David Lewis, founder, chairman and CEO, Energy Capital Vietnam

**PDP: What is Vietnam doing to boost its storage capacity for certain refined products and even LNG?**

**DL:** Vietnam is importing LPG and crude oil and we’re in the middle of discussions around supporting Vietnam’s ability through the state-owned company [Petrovietnam] to import LPG and oil from the U.S.

Vietnam has only around 10 days of storage capacity in terms of traditional refined products like LPG and diesel. They recognize that’s a national security risk for them, so they want to grow that to 90 days.

To do that, they will build half of the capacity in the south of the country and the other half in the north. In recent months we’ve inked MOUs [memorandum of understanding] with the provincial authorities over the two strategic locations for these port-related projects, which will be regional hubs. The ports will be for movement of traditional container cargo as well as for the storage and distribution of LPG and LNG.

**PDP: Do the Vietnamese have an appetite to invest in U.S. gas supply projects?**

**DL:** I haven’t had the conversation with [the Vietnamese government] yet, but it makes a lot of sense. I think there’s probably a case to be made for buyers as it relates to co-investment into U.S. upstream, midstream and liquefaction businesses. It’s smart business. That’s the next level, but I can see that evolving.

Over the last eight years, we’ve established strong trust and

relationships with the [Vietnamese] government and they’re actually pushing more things in our direction. Now we’re focused on execution. Importantly, you’ve got the deep port coming whereby we can get more stuff in from the U.S., so you would expect that we’re going to have a boom in bilateral trade between the two countries.

**PDP: In terms of LNG, that’s still some years out before you’ll see the first cargos, right?**

**DL:** Yeah, we’re still looking at probably later this decade.

**PDP: Have you considered looking at Alaska?**

**DL:** Alaska has a ton of potential and is really the next great opportunity. If the U.S. is looking at where and how to begin developing more export capacity, it’s Alaska, in my opinion.

**PDP: Do you think there’s a chance the Aussies could leapfrog the Americans in terms of supplying gas for Vietnam?**

**DL:** The reason why the U.S. is the world’s largest supplier of LNG is because we have the most competitive LNG pricing. Even though geographically [Australia] is closer, the world is already telling us the U.S. molecule is the most competitively priced. When the [U.S.] began exporting in 2016, we effectively ended up breaking the traditional method of how contracting works because we have flexibility and destination and that serves the world’s interest. Really, what the U.S. shale

revolution did was to break the traditional link between oil and gas pricing.

Again, the U.S. has the most transparent, competitive and insulated market and there's no undue exposure to outside risk. So that's a very obvious case for U.S. LNG, but this is why we're winning.

**PDP: Does the Vietnamese government fully understand the importance of private investment to move forward the planned projects?**

**DL:** The government recognizes the need to prioritize energy-related private investment. Resolution No. 55, from the public bureau issued in February 2020, is basically official policy for prioritizing private investment with a focus on prioritizing cleaner forms of energy.

Vietnam wants to prioritize U.S. investment in the country and [in general terms] wants to adopt the Taiwan model, meaning that they want to know that the U.S. isn't going away.

Vietnam recognizes it has a border with a neighbor that's really big and aggressive, hence why they want to become closer friends with the U.S. That was the main reason why [President Joe] Biden was recently there. And even though Vietnam has a communist government, it's with the U.S. on China. There's very strong alignment between the U.S. and Vietnam, which has a really strong workforce that has a lot of potential. At the end of the day, Vietnam is a victim of its own success.

Again, it's not just the molecules they import, but if you look at the energy demand profile, [Vietnam] needs to build out 70 gigawatts of power generation in the next 10 years. An estimated \$150 billion in investment is needed for new power generation and transition infrastructure alone, and that's \$130 billion more than they have.

**PDP: The Vietnamese state remains a big player in the economy. Are there signs the government is willing to listen more to the private sector?**

**DL:** We're witnessing [Vietnam] move from strict central planning to incorporating feedback from the private sector into how the planning process works and how to properly build policies that are conducive to attracting foreign capital.

The creation of wealth for the [Vietnamese] people is inextricably tied to the U.S. because the U.S. is their largest export market. So that's why they say they are in the middle. They import a lot of stuff from China, but they export most stuff to the U.S. Vietnam knows that it would be detrimental to their own good, and really it would be an existential risk if they were to do anything that prohibited the ability to have good relations with the U.S. that [would impact] foreign investment.

Vietnam today is China 20 years ago ... less global ambitions about world domination. But Vietnam wants to be everybody's friend.

**PDP: Should U.S. investors worry about expropriation risks in Vietnam?**

**DL:** The expropriation risk is relatively zero. Again, there's no such thing as zero risk anywhere. But, that being said, the risk of [expropriation] is very low. Again, Vietnam is very committed to following the law.

**PDP: What's the biggest headwind that Vietnam confronts?**

**DL:** Perception. Investor perception about Vietnam, like what do the Vietnamese offer, their history and where they want to go? So, that's the story that's not really being told. There's been a blind spot here and it's going to be corrected and we're at the forefront of that.

**PDP: What does Vietnam's hydropower look like?**

**DL:** Vietnam more or less has already maxed out its hydropower capacity. There's a little bit they can do here or there, like small scale, but it's crumbs, they're nibbling. When you look at base load supply, the world needs to recognize that intermittent power is intermittent. You need dispatchable power base load supply. And currently, as we stand today, that comes in four forms: coal, nuclear, gas and hydro. Again, Vietnam has maxed out hydro, they don't want coal, and they're not comfortable with nuclear. Gas is Vietnam's only option for dispatchable power.

**PDP: What about other renewables?**

**DL:** Vietnam is curious about hydrogen but there's curiosity as to when and how it makes sense commercially. There's a big push and a lot of support for renewables like wind and solar. This is a popular topic of discussion and Vietnam has ambitions and is interested in understanding offshore wind.

**PDP: How is Vietnam viewing the global push to get to net zero?**

**DL:** In November 2021, Vietnam's Prime Minister Pham Minh Chinh announced goals for the country to achieve net zero by 2050. That will require co-investment and high-quality credits. And this is where a collaboration with the World Bank comes into play. The World Bank has a low-carbon city program, and the whole premise is the fastest and best way to reduce carbon is to not produce it. That's where gains in efficiency in Vietnam are huge and where Vietnam can help reduce their emission profile.

**PDP: How do you view Asia, in particular Vietnam, tackling energy security?**

**DL:** The Asians have no illusions about what they need to have energy security. You see Japan, Korea, China all rapidly sucking up long-term contracts. In Vietnam, we're communicating with the government, but we're also developing fully private infrastructure and we're making decisions. We're not assuming commodity risk and we're going to make sure we have the ability to hedge those long-term prices in a manner that passes through easily and efficiently. That's what I believe is fundamental to supporting, enabling this infrastructure to get built. You can't take on risks like that.

**PDP: What's your plan or view on managing commodity risks?**

**DL:** We have developed trust with the government because we showed them early that we could bring the expertise and knowledge. This is how we manage commodity and financial risks in order to bring foreign investment to the country.

For example, the EU-Vietnam free trade agreement provides enforcement mechanisms within the contracts that allows the projects to become bankable without asking anything additional from the government. The reality is, modern Vietnam has quintupled its foreign currency reserves and the country is one notch below credit grade and they'll become creditworthy before the end of this decade.

We're comfortable that the private insurance market has an appetite for Vietnam country risk, so we can provide full private insurance to cover our equity capital. For example, when we sit down with the government and negotiate the power purchase agreement where they guarantee to buy a certain volume of electricity that we'll back with our fuel supply agreement, we make sure that the cost of the commodity is passed through to the cost of power.

The goal is to negotiate where we're sharing risk and by structuring it properly. It allows us to de-risk the project such that it allows the capital to come in. 

# Around the World

## ASIA

### Layaran-1 Well Finds 6 Tcf Offshore Indonesia

Mubadala Energy made a significant gas discovery with its Layaran-1 deepwater exploration well offshore Indonesia, the company said in December. Mubadala said the find de-risks gas resources in the area and provides a foundation for organic growth and additional exploration drilling activities in 2024.

Wood Mackenzie said the Layaran-1 well found more than 6 Tcf of in-place reserves, which solidifies the basin's position as one of Asia-Pacific's most promising emerging deepwater hotspots.

The well was drilled to a depth of 4,208 m in a water depth of 1,207 m and encountered a gas column over 230 m thick in an Oligocene sandstone reservoir. A complete data acquisition including wireline, coring, sampling and production test were conducted. The well successfully flowed over 30 MMcf/d of "quality gas."

Given the size of the structure and the single well drilled to date, Wood Mackenzie estimates an initial 3.3 Tcf of recoverable resources, or over 580 MMboe, making Layaran the second-largest deepwater discovery globally in 2023.

While the resource numbers are globally significant, the road to commerciality remains difficult, Wood Mackenzie director of corporate and upstream research Andrew Harwood said in a news release.

### Valeura Completes Drilling at Nong Yao

Valeura Energy wrapped up an infill drilling campaign at its Nong Yao oil field in the Gulf of Thailand, the company said in December.

Valeura drilled four wells at the Nong Yao A wellhead processing platform, including three production-oriented development wells and one appraisal well.

The development wells encountered targets in line with pre-drill expectations and have been brought online as producers. The appraisal well was designed to outline the extent of certain reservoir intervals in the field that are currently not producing.

Results from the appraisal well exceeded expectations, Valeura said, with the well confirming 50 ft of new net oil pay over several intervals. Valeura anticipates this will give rise to two to four additional development targets, which will form the basis of a future infill drilling campaign.

"Commercialization of the Nong Yao C accumulation remains on track for infrastructure installation and development drilling starting in Q1 2024," Valeura President and CEO Sean Guest said in a company press release.

A drilling rig is expected to return to Nong Yao in first-quarter 2024 to begin the Nong Yao C development.

## EURASIA

### Equinor Exiting Azerbaijan

Equinor is divesting all of its remaining assets in Azerbaijan to State Oil Company of Azerbaijan Republic (SOCAR), Equinor announced in December.



The Deepwater Gunashli platform in the Caspian Sea.

The assets include: a 7.27% interest in the BP-operated Azeri Chirag Gunashli (ACG) oil fields in the Azerbaijan sector of the Caspian Sea; an 8.71% interest in the Baku-Tbilisi-Ceyhan (BTC) pipeline that transfers crude oil to the Turkish Mediterranean coast; and a 50% in the Karabagh field in a water depth of 180 m. SOCAR already holds a 25% stake in ACG, a 25% stake in BTC via Azerbaijan BTC and a 50% stake in Karabagh.

"Equinor is in the process of re-shaping its international oil and gas business, and the divestments in Azerbaijan are in line with our strategy to focus our international portfolio," Equinor executive vice president for international exploration and production Philippe Mathieu said in a press release.

The transaction is subject to regulatory and contractual approvals.

## EUROPE

### DOF Scoops Up Multiple Contracts

DOF Group announced winning multiple contracts in late December and early January.

DOF will handle project management, engineering, logistics and execution of an FPSO cessation project for a North Sea operator. Offshore activities are slated for third-quarter 2024 using four vessels, including *Skandi Hera* and *Skandi Iceman*.

For a field offshore Australia, DOF will handle decommissioning support, including project management, engineering, procurement and offshore services. That project started in December and is expected to be completed over a five-to-seven-week period using the *CSV Skandi Hercules*.

Revenue from the North Sea and Australia projects is estimated at \$30 million.

DOF also won three subsea service contracts valued at more than \$36 million from Australia-based operators. The contracts will use *Skandi Hercules* to carry out various remediation activities, pre-commissioning and commissioning support and field decommissioning operations.

Prime Energy extended DOF Group's contract for the

MPSV *Skandi Hawk* through to the end of 2027 in support of the Malampaya gas field operations offshore Philippines.

### Aker BP Upgrades Spill Detection System

Aker BP contracted Vissim to upgrade oil spill detection solutions at the operator's fixed and floating installations on the Norwegian continental shelf, Vissim said in early January.

Aker BP will equip installations Valhall, Ula, Edvard Grieg, Ivar Aasen, Alvheim and Skarv with the new and upgraded oil spill detection solution.

The new radar-based oil spill detection system uses upgraded image processing technology to detect even smaller oil spills. It also uses machine learning to classify detected phenomena to limit false alarms.

## NORTH AMERICA

### Valaris Buys Newbuild Drillships

Valaris announced in December that it will take delivery of newbuild drillships VALARIS DS-13 and DS-14 for an aggregate purchase price of \$337 million.

"Following the successful contracting of six of our stacked drillships since mid-2021, the purchase of VALARIS DS-13 and DS-14 increases our operating leverage to the attractive ultra-deepwater floater market," Valaris's President and CEO Anton Dibowitz said in a press release.

The two new rigs will move from South Korea to Las Palmas, Spain, where they will be stacked until contracted for work.

In early January, Valaris also announced Petrobras awarded the company a 1,064-day contract for drillship VALARIS DS-4 for operations offshore Brazil. The contract, valued at approximately \$519 million, is expected to begin in fourth-quarter 2024, following its current contract with Petrobras.

## LATIN AMERICA

### Petrobras Starts Drilling in the Equatorial Margin

Petrobras resumed exploration in the Equatorial Margin offshore Brazil with the drilling of the Pitu Oeste well.

The well, located in BM-POT-17 concession, is expected to take between three and five months to complete, Petrobras said in late December. The state-owned energy giant expects to obtain more geological information about the area, and confirm the extent of the 2014 oil discovery made with the Pitu well.

Petrobras also intends to drill the Anhangá well, in the POT-M-762 concession, next to the Pitu Oeste well.

### Enauta Enters Parque das Conchas, Two More Fields

Enauta Participações is acquiring QatarEnergy Brasil's 23% interest in the Abalone, Ostra and Argonauta fields, which comprise the Parque das Conchas in the Campos Basin, for \$150 million.

Shell operates the fields with a 50% interest and India's ONGC holds the remaining 27% interest in the fields, which produce to the FPSO *Espírito Santo*.

Enauta also announced in late December it was acquiring a 100% interest for \$10 million in the offshore Uruguá and Tambaú oil and gas fields as well as associated pipeline infrastructure in the Santos Basin offshore Brazil from Petrobras.

The 178-km pipeline connects the production platform to the Mexilhão Field natural gas infrastructure. The fields' production is processed through the FPSO *Cidade de Santos*.



Modec

Enauta is buying the FPSO *Cidade de Santos* from MODEC to serve the Uruguá and Tambaú Fields the company is buying from Petrobras.

The fields are 80 km west of Enauta's FPSO *Atlanta* location. The deal is subject to customer closing conditions.

Enauta also announced in late December it was acquiring the FPSO *Cidade de Santos*, operated by Modec, which serves the Uruguá and Tambaú fields, for \$48.5 million. Modec said the FPSO has been leased on a charter contract to Petrobras since 2010.

The FPSO can handle 25,000 bbl/d of oil and 10 MMcm/d of gas and can store 700,000 bbl of crude. The transaction is subject to closing conditions and approvals.

### Woodside Awards Trion Shore Base Contract

Woodside Energy announced in late-December it had awarded a major contract to Mexican company Eseasa Offshore to supply shore base facilities and services for Woodside's operations for the Trion oil and gas project offshore Mexico.

Eseasa will provide a range of services out of its shore base location on the Pánuco River coastline. The scope of work includes shore base infrastructure, operations planning and management for vessel mooring, load and discharge, freight and material management and dedicated laydown and staging areas.


First oil from Trion, in a water depth of 2,500 m, is expected in 2028. Woodside operates the project with a 60% interest on behalf of state-owned partner Pemex with a 40% interest.

## AFRICA

### Petrobras Enters São Tomé and Príncipe Blocks

Petrobras is acquiring interest in exploratory blocks 10, 11 and 13 in São Tomé and Príncipe through a competitive process conducted by Shell, Petrobras said in December.

Shell operates all three blocks with a 40% interest. Petrobras holds a 45% interest and ANP-STP holds a 15% interest in blocks 10 and 13. Petrobras holds a 25% interest, Galp holds a 20% and ANP-STP holds a 15% interest in Block 11.

The transaction is part of the scope of the memorandum of understanding (MOU) Petrobras and Shell signed in March 2023. The objective of the MOU includes, among others, identifying business opportunities between the companies. 

# Events Calendar

The following events present investment and networking opportunities for industry executives and financiers.



| EVENT  | DATE                    | CITY                     | VENUE   | CONTACT                        |
|--|-------------------------|--------------------------|---|--------------------------------|
| <b>2024</b>  |                         |                          |   |                                |
| Floating Wind Solutions                                    | Feb. 5-7                | Houston                  | Hilton Americas                                     | floatingwindsolutions.com      |
| NAPE Summit  | Feb. 7-9                | Houston                  | George R. Brown Conv. Ctr.                          | napeexpo.com                   |
| Louisiana Oil & Gas Association Annual Meeting             | Feb. 26-27              | Lake Charles, La.        | Golden Nugget Casino                                | logala                         |
| 5th American LNG Forum                                     | Feb. 26-27              | Houston                  | The Westin Galleria                                 | americanlngforum.com           |
| OTC Asia   | Feb. 27-March 1         | Kuala Lumpur, Malaysia   | Kuala Lumpur Convention Center                      | 2024.otcasia.org               |
| <b>Influential Women in Energy Luncheon</b>                | <b>March 8</b>          | <b>Houston</b>           | <b>Hilton Americas</b>                              | <b>hartenergy.com/events</b>   |
| AOG Energy   | March 13-15             | Perth, Australia         | Perth Convention & Exhibition Centre                | aogexpo.com.au                 |
| CERAWeek by S&P Global                                     | March 18-22             | Houston                  | George R. Brown Conv. Ctr.                          | ceraweek.com                   |
| <b>DUG Gas+</b>  | <b>March 27-28</b>      | <b>Shreveport, La.</b>   | <b>Shreveport Convention Center</b>                 | <b>hartenergy.com/events</b>   |
| MCE Deepwater Development                                  | April 9-11              | Amsterdam                | Hôtel Mövenpick Amsterdam City Centre               | mcedd.com                      |
| International Partnering Forum 2024                        | April 22-25             | New Orleans              | Ernest N. Morial Convention Center                  | oceanic.org                    |
| World Energy Conference                                    | April 22-25             | Rotterdam, Netherlands   | Rotterdam Ahoy                                      | worldenergycongress.org        |
| 2024 AGA Operations Conference & Spring Committee Meetings | April 28 - May 2        | Seattle                  | Hyatt Regency Seattle                               | aga.org                        |
| Offshore Technology Conference                             | May 6-9                 | Houston                  | NRG Park  | 2024.otcnet.org                |
| <b>SUPER DUG</b>   | <b>May 15-17</b>        | <b>Fort Worth, Texas</b> | <b>Fort Worth Convention Center</b>                 | <b>hartenergy.com/events</b>   |
| IADC Drilling Onshore Conference & Exhibition              | May 16                  | Houston                  | Hyatt Regency Houston West                          | iadc.org                       |
| 10th Mexico Gas Summit                                     | May 16-17               | San Antonio              | St. Anthony Hotel                                   | mexicogasummit.com             |
| 2024 AGA Financial Forum                                   | May 18-21               | Palm Desert, Calif.      | JW Marriott Desert Springs Resort and Spa           | aga.org                        |
| ASES Solar 2024  | May 20-23               | Washington, D.C.         | GW University                                       | ases.org                       |
| Louisiana Energy Conference                                | May 28-30               | New Orleans              | The Ritz-Carlton                                    | louisianaenergyconference.com/ |
| Global Energy Show Technical Conference                    | June 11-13              | Calgary, Canada          | BMO Centre at Stampeded Park                        | globalenergyshow.com           |
| URTeC  | June 17-19              | Houston                  | George R. Brown Conv. Ctr.                          | urtec.org/2024                 |
| IPAA Leaders in Industry Luncheon                          | June 18                 | Houston                  | Petroleum Club of Houston                           | ipaa.org                       |
| CIPA 2024 Annual Meeting                                   | June 20                 | San Diego                | TBD   | cipa.org                       |
| <b>New Energies Summit &amp; Expo</b>                      | <b>June 26-27</b>       | <b>Las Vegas</b>         | <b>TBD</b>  | <b>hartenergy.com/events</b>   |
| IAEE International Conference                              | June 25-28              | Istanbul, Turkey         | Boğaziçi Üniversitesi                               | iaee2024.org.tr                |
| SPE Artificial Lift Conference and Exhibition              | Aug. 20-22              | The Woodlands, Texas     | The Woodlands Waterway Marriott & Convention Center | spe-events.org                 |
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| ADAM-Dallas  | First Thursday          | Dallas                   | Dallas Petroleum Club                               | adamenergyforum.org            |
| ADAM-Fort Worth  | Third Tuesday, odd mos. | Fort Worth, Texas        | Petroleum Club of Fort Worth                        | adamenergyfortworth.org        |
| ADAM-Greater East Texas                                    | First Wed., odd mos.    | Tyler, Texas             | Willow Brook Country Club                           | etxadam.org                    |
| ADAM-Houston   | Third Friday            | Houston                  | Brennan's   | adamhouston.org                |
| ADAM-OKC   | Bi-monthly (Feb.-Oct.)  | Oklahoma City            | Park House  | adamokc.org                    |
| ADAM-Permian   | Bi-monthly              | Midland, Texas           | Petroleum Club of Midland                           | adampermian.org                |
| ADAM-Tulsa Energy Network                                  | Bi-monthly              | Tulsa, Okla.             | The Tavern On Brady                                 | adamtulsa.org                  |
| ADAM-Rockies   | Second Thurs./Quarterly | Denver                   | University Club                                     | adamrockies.org                |
| Austin Oil & Gas Group                                     | Varies                  | Austin, Texas            | Headliners Club                                     | coleson.bruce@shearman.com     |
| Houston Association of Professional Landmen                | Bi-monthly              | Houston                  | Petroleum Club of Houston                           | hapl.org                       |
| Houston Energy Finance Group                               | Third Wednesday         | Houston                  | Houston Center Club                                 | hefg.net                       |
| Houston Producers' Forum                                   | Third Tuesday           | Houston                  | Petroleum Club of Houston                           | houstonproducersforum.org      |
| IPAA-Tipro Speaker Series                                  | Third Tuesday           | Houston                  | Petroleum Club of Houston                           | ipaa.org                       |

Email details of your event to Jennifer Martinez at [jmartinez@hartenergy.com](mailto:jmartinez@hartenergy.com).

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# 'Oh So 2022' ESG and 2024's Table Stakes



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John Arnold, Houston-based founder of hedge fund Centaurus Advisors and now a full-time philanthropist, posted on X that he found an “arc of ESG as told through oil and gas quarterly investor presentations.”

Arnold was on the other side of Amaranth Advisors's losing bet on energy futures in 2006.

Before 2020, E&P slides had no ESG mentions, he reported. Between then and 2022, he found “dedicated slide[s] among the first 10 pages of deck[s].” This past year, though, ESG was “mentioned in the back half of presentation[s].”

Still stuck in 2022 is Capitol Hill. Should ESG—the “E” part—give a hall pass to statements that mob neurological circuitry, jarring the brain with acutely uninformed statements for Likes? There are so many of these from members of Congress.

Sen. Amy Klobuchar (D-Minn.) posted on X that the Exxon Mobil combination with Pioneer Natural Resources “could significantly reduce competition and drive up gas prices at the pump.”

X'er “Ken M” replied, “Lol. So as the world goes green, oil corporations are not allowed to increase their investments?”

Klobuchar knows the U.S. is exporting its light-gravity oil because the U.S. doesn't have enough refining capacity for it. And dealing with federal regulatory hurdles doesn't make adding more capacity worth it.

Exxon Mobil controlling some 1 MMBbl/d of Permian oil production doesn't matter to U.S. pump prices.

Sen. Chuck Schumer (D-N.Y.) also X'ed that the deal will increase pump prices. Among the X'ers against the deal, one began a reply with “I am in California and ...” (Meme-makers, go for it.)

But user “Bill Hershey” posted, “Maybe you should tell your [Biden] boss to stop forcing small energy companies out of business.”

And an X'er with a name that's NSFW (in any century) posted, “We are being forced to pay more at [the] pump now due to your green agenda. I'm confused. Shouldn't you be investigated?”

In the business world, i.e., the real world, the over-the-top arc that ESG has reached over time is running out of gas, at least in the U.S.

Reports in early January were that BlackRock was cutting 3% of its roster, totaling some 600 employees and that most of these will be from its ESG portal.

Exxon Mobil has outperformed BlackRock since year-end 2021, with XOM shares gaining 63% and BLK losing 13%, as of the Jan. 9 close. BLK dividends totaled \$39.52/share in those eight quarters, or a 4.3% cash return on the \$915 share price at year-end 2021 close.

XOM has paid \$4.59 or an 8% cash return on a \$61 year-end 2021 closing price.

Arjun Murti, a partner at investment firm Veriten, wrote in his “Super-Spiked” newsletter in early January that profitability and a strong balance sheet are “no longer differentiating for traditional energy names.”

Instead, they're just table stakes. And “the various climate and ESG goals are now table stakes [too] and not differentiating for the most part.”

He added that ESG “has been over-run by ‘climate only’ ideologues and related progressive—U.S. political context—causes, which are now facing reflexive backlash from the U.S. right.”

Veriten's view is that meaningful ESG is key to a company's success now. “The left-wing—i.e., progressive—political orientation of ESG is what needs to go away,” Murti wrote.

Meanwhile, “the right-wing counter that ‘all ESG is a grift’ in our view fails to differentiate between relevant concepts—e.g., governance is indisputably a critical focus area for all investors—and the problematic portions of current-day ESG.”

Rohan Patel, who was a climate and energy adviser to President Obama, posted in January, “I'm a bit baffled that there is still a push amongst climate advocates to continue this ESG investment push.”

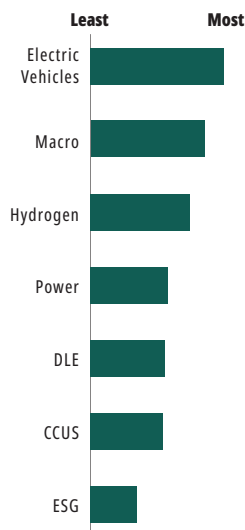
Besides that rating a company's ESG is “irreparably broken,” there is a fundamental problem, he added. “The nature of the term ‘ESG’ is also completely nonsensical as it groups three already broad and somewhat disconnected categories into one set of useless ratings.”

Enverus analyst and “Energy Transition Today” editor Carson Kearn studied the newsletter's 2023 poll participation in summary of the year's hot and not-hot topics. Readers engaged the most in a poll on electric vehicles, he reported. Hydrogen and macro topics were also popular and there was interest in power, lithium extraction and CCUS.

ESG ranked last, though, he reported. “ESG isn't receiving a ton of love ...”

## Enverus energy transition poll participation 2023

Average poll engagement



Source: Enverus

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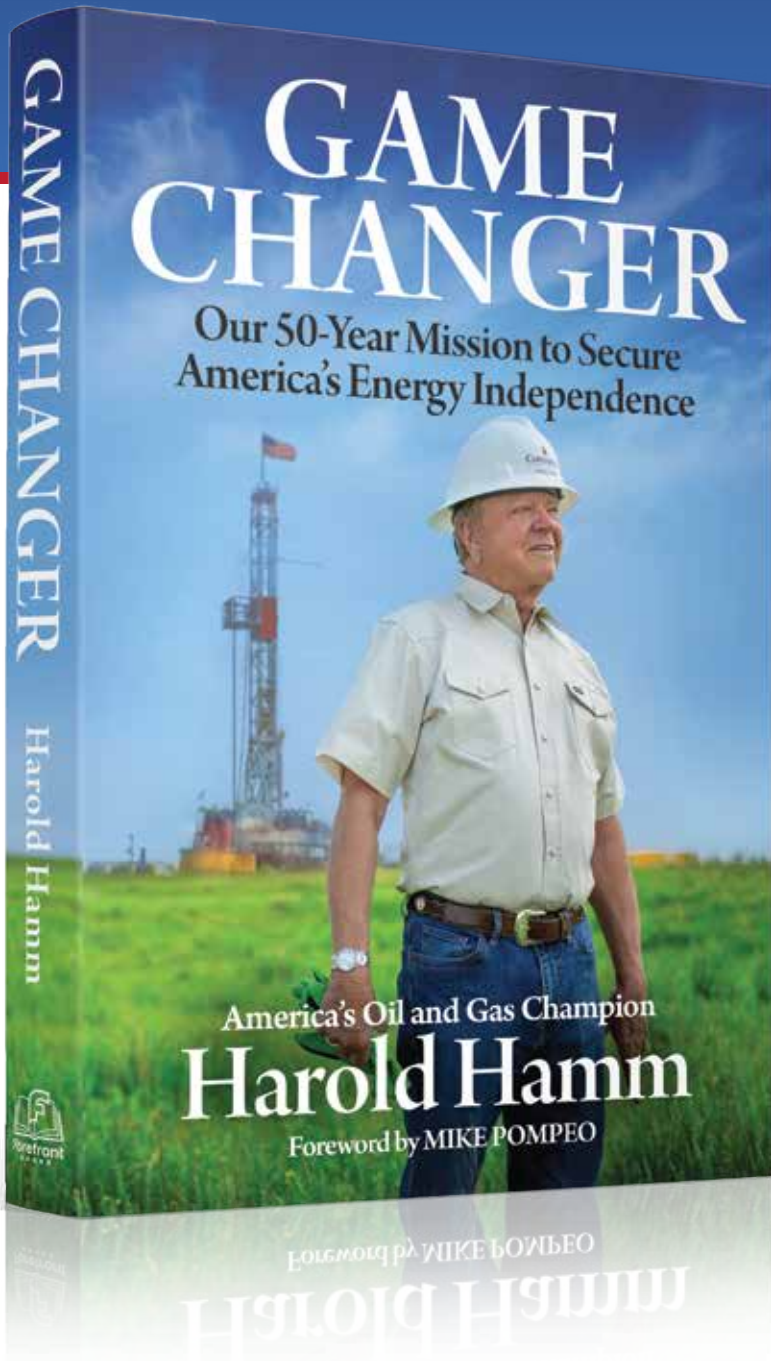
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