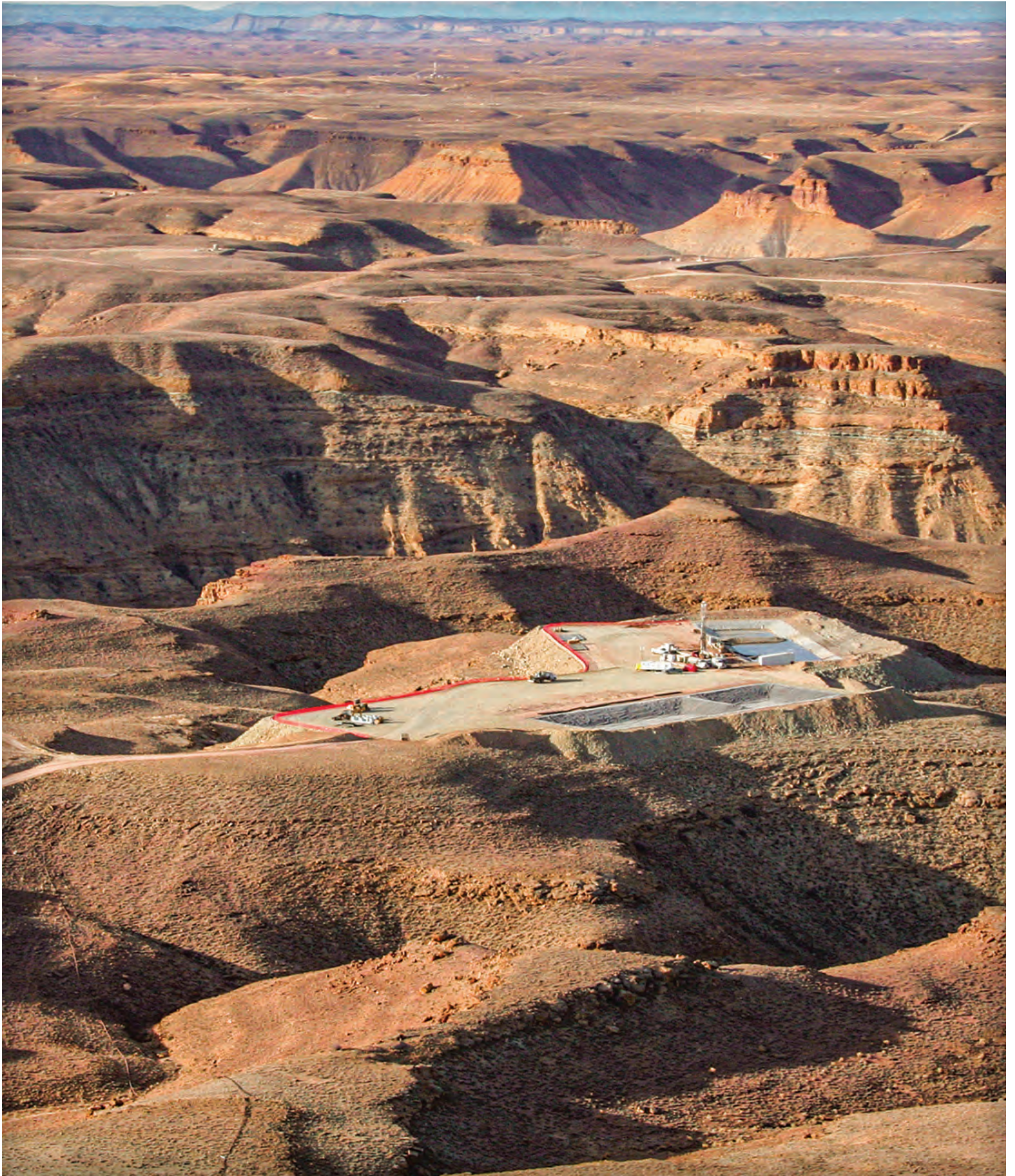
Oil and Gas Investor

DECEMBER 2021



Why it's a structurally different North American gas market now.

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BUILDING BLOCKS OF A STRONGER OIL & GAS INDUSTRY

$500 MILLION
TALOS ENERGY
SENIOR SECURED NOTES
Senior Co-Manager

$560 MILLION
MARTIN MIDSTREAM PARTNERS
HAS SUCCESSFULLY CONSUMMATED ITS DEBT EXCHANGE, FINANCING, AND CASH TENDER
Financial Advisor

$535 MILLION
LONESTAR RESOURCES
CHAPTER 11 RESTRUCTURING
Financial Advisor

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DEBT RECAPITALIZATION
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UNDISCLOSED
USA RAIL TERMINALS
A PORTFOLIO COMPANY OF
HR High Roller Group AND JIM DONNAN COMPANIES
HAS BEEN ACQUIRED BY
alpenglow rail
AND
CONNOR, CLARK & LUNN INFRASTRUCTURE
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UNDISCLOSED
NORTH AMERICAN TRANSPORTATION AND SERVICE PLATFORM
CORPORATE CARVE OUT
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UNDISCLOSED
INTREPID
HAS ACQUIRED CERTAIN ASSETS OF
gyrodata
Financial Advisor

$270 MILLION
elkpetroleum
ADVISOR TO THE AD HOC CROSSOVER LENDER
Financial Advisor

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FOLLOW-ON OFFERING
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Financial Advisor

$28 MILLION
VIKING MINERALS
ASSET DIVESTITURE
Financial Advisor

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ENERGY GROUP KEY STATISTICS

$54+ Billion
Aggregate Transaction Volume since 2009

$320 Million
Average Transaction Size

169
Transactions Closed since 2009

ENERGY GROUP AGGREGATE TRANSACTION VOLUME

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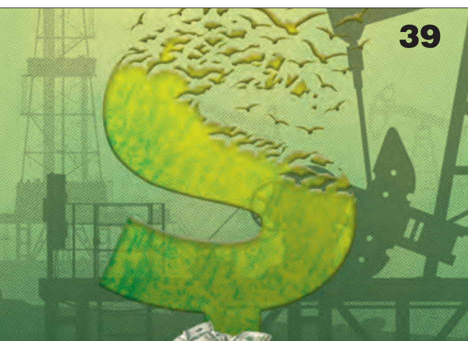
Oil and Gas Investor

DECEMBER 2021/VOLUME 41/NUMBER 12



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STEADY DEMAND GROWTH PRESSES GAS PRICES HIGHER

Supply is limited by hesitancy from investors and producers, as well as logistics constraints.

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THE NEW DAWN OF CARBON CAPTURE

Although carbon capture, transport, use and storage is dominated by oil and gas producers now, it represents a significant growth area for the midstream sector.

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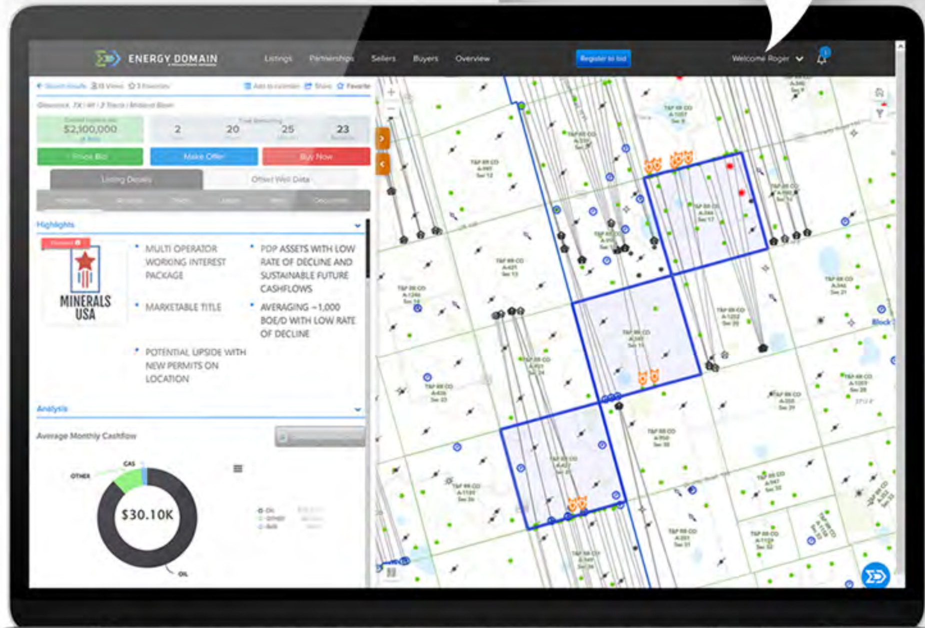

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ABOUT THE COVER: Caerus Oil and Gas' Greater Natural Buttes asset in Uintah County, Utah. Photo courtesy Caerus Oil and Gas.

Information contained herein is believed to be accurate; however, its accuracy is not guaranteed. Investment opinions presented are not to be construed as advice or endorsement by Oil and Gas Investor.

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LATEST CONTENT

Carbonic Convergence? Analyst Details Profit Potential In Carbon Capture

By Joseph Markman, Senior Editor

As the price of carbon rises and the cost of CCS falls, there could be money to be made in keeping CO_2 out of the atmosphere.

Continental Resources Enters Permian Basin In $3.25 Billion Expansion

By Emily Patsy, Senior Managing Editor

Oklahoma City-based Continental Resources struck an agreement to acquire all of Pioneer Natural Resources' assets in the Delaware Basin portion of the Permian.

Energy Technology Investment: The Quest For Emissions-Free Production

By Faiza Rizvi, Senior Associate Editor

Executives of four energy technology companies discuss how digitalization is making carbon management goals possible in the oil patch.

Northern Oil & Gas To Add Veritas Permian Assets In Largest Acquisition To Date

By Emily Patsy, Senior Managing Editor

Northern Oil and Gas agreed to acquire Veritas Energy's nonoperated oil and gas properties located in the Delaware and Midland basins for a cash purchase price of $406.5 million.

EIA Forecasts Oil Prices To Fall In 2022

By Hart Energy Staff

Forget about $100 oil, the EIA projects crude oil prices will fall to around $60/bbl by this time next year.

India's Reliance Deals Eagle Ford Asset To Ensign, Exiting U.S. Shale

By Emily Patsy, Senior Managing Editor

The acquisition of Reliance's U.S. shale position is set to make Ensign Natural Resources one of the premier private operators in the Eagle Ford, the Houston-based company said.

ONLINE EXCLUSIVES

Amplifying The ESG Message: What's Next For Oil And Gas?

By Faiza Rizvi, Senior Associate Editor

With increasing expectations of thorough and transparent ESG reporting, oil and gas companies must effectively communicate their ESG commitments to get the sustainability message across.

Shale Gas Giant EQT Recognized For Advancing Women's Leadership, Board Diversity

By Hart Energy Staff

In addition to achieving 50% female representation on its board of directors, EQT—the largest natural gas producer in the U.S.—increased the percentage of female hires by 15% and diverse hires by 5% in 2020.

Energy Tech Startup ComboCurve Marks Growth Milestone In Rapid Time

By Len Vermillion, Editorial Director

Only 18 months into existence, Cloud-based energy operating system ComboCurve realizes 700% revenue growth.

Hart Energy's Unconventional Activity Tracker

By Larry Prado, Activity Editor

Updated weekly, Hart Energy's exclusive rig counts measure drilling intensity. They exclude units classified as rigging up or rigging down, and also exclude rigs drilling injection wells, disposal wells or geothermal wells. They are designed to offer the most accurate picture of what is actually occurring in the field.

HART ENERGY VIDEOS

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Forty Under 40 Honoree Interviews

For your introduction to these role models, we invite you to enjoy these video and audio interviews, extended narratives and personal insights.

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Cybersecurity In Oil And Gas: How To Protect Data And Profits

Cybersecurity experts discuss the extent of the cyber threats currently facing the energy sector and what steps oil and gas companies can take to reduce the risk.

hartenergy.com/ep/exclusives/cybersecurity-oil-and-gas-how-protect-data-and-profits-196981

Energy ESG: Targeting Emissions In The Oil Patch From The Sky

SkyX head of product Jamie Alexander sat down with Hart Energy to discuss how SkyX is revolutionizing emissions detection technology plus a recent partnership with U.S. oil producer Denbury.

hartenergy.com/exclusives/energy-esg-targeting-emissions-oil-patch-sky-197424

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WE'VE GOT THIS

LESLIE HAINES, EXECUTIVE EDITOR-AT-LARGE

Longtime readers probably noticed a few changes to our staff in the past couple of years, what with retirements and the sad, untimely passing of editor-in-chief Steve Toon in October. These changes can bring a bit of uncertainty, but they offer new opportunities as well. Let's seize them.

Readers and editors alike may also be wondering about the future of the oil and gas industry and thus, of this magazine, what with the advent of ESG issues and capital pressures, the great debate on the energy transition and the role traditional oil and gas will play in the years to come.

Have no fear: The industry will be here, and so will we. We plan to cover the changes, whatever they entail, just as we have done for 40 years. We'll offer CEOs, bankers, analysts, up-and-comers and others a forum for expressing their take on it all—their hopes, concerns and plans. In print, online video or during one of our conferences, we'll be looking for the story. What is the opportunity, the challenge, the solution? Where is the colorful anecdote?

In such a volatile business, oil prices will always careen from negatives to $100/bbl and above. Presidential decisions will continue to make no sense. Congress will always demand to know why oil prices are so high. We can watch in dismay as OPEC decisions roil markets, for good or bad.

It's all part of an irrational script with no real director other than Mr. Market, and it's been that way for decades.

But, says the U.S. industry, and *Oil and Gas Investor* adds, "Hey, we've got this—if you let us rip."

A couple of recent IPOs have shown that the industry always turns over a new leaf. Reinvention is its middle name. These were not SPACs, mind you; these were regular offerings that show us the strength of the industry to constantly renew itself. High praise and admiration are due for the people who make it hum day in and day out. They are always creating, always coming up with a work-around, always jumping through hoops.

As for me, this is my last column in this space, as I want to slow down and not jump through quite as many hoops. I'll write some articles though because the industry still fascinates me.

I've been writing about oil and gas since the early 1980s, first while living in Williston, N.D.; then from Midland, Texas; then Denver, and finally, from Houston. And now, from an unlikely place, you might think: New Hampshire. Alas, it's pretty hard, if not impossible, to get a natural gas pipeline or power line built through here. Consumers will soon find out to their dismay the verities of that when their energy bills soar.

I cannot thank enough the many friends and acquaintances I've met through the years while working here at Hart Energy. So many people have been big supporters of the entire staff.

Thank you to everyone who answered our frantic calls for info, who agreed to speak at our events or who took us out to the rigs and platforms. I've been fortunate to have traveled to the North Sea (too cold), offshore Equatorial Guinea (too hot), to China (too fascinating) and many other locations. I've been hosted in so many swanky offices in Houston, Dallas, New York, London, Aberdeen and Midland. I say this with deep gratitude, not to brag.

I've eaten barbeque with rig hands on location, our plates perched on the hood of a Ford pickup. By the way, the hard hats and safety gloves never did fit me right. The earpieces never stayed in either, so yes, I did hear the diesels roar. Then too, I sat in the 3D room that envelops us in a wondrous subsurface world.

And, because I've heard so many corporate presentations, I can promise you this: Everyone has the lowest-cost production, best-in-class operation and returns, yet the most undervalued stock.

I also know this: The oil and gas industry will survive and thrive for many years to come, while doing so alongside other energy sources. The gap is widening between rising energy demand and the spending needed to satisfy that, while the decline of old reservoirs continues unabated. It adds up to a ton of opportunities ripe for the taking.

"… demand is not following the net-zero trajectory," Morgan Stanley's Martijn Rats told Bloomberg. "Demand will be above 100 million barrels a day for the rest of the 2020s, but on the supply side, we're not going to produce that with current investment levels." So, there's more work to do.

Oil and Gas Investor, of which I am so proud to have played a role, also has more work to do. It will be here, trying to make sense of all this and bringing the color of the oil patch to you each month.

Stay safe, drill more, best wishes and thanks a million.

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FOURTH QUARTER SHOTS

DARREN BARBEE,
SENIOR EDITOR

A precision strike in November created a large debris field in orbit around the planet.

This is not a reference to the reckless weapons test by the Russian Federation that shot down a decommissioned satellite (putting its own astronauts in potential danger) but of course recent comments by Occidental CEO Vicki Hollub.

Hollub's was asked in mid-November about President Joe Biden's recent pleas to OPEC+ for an oil production increase. Asked by CNBC about whether Biden had made a misstep reaching out to the cartel instead of U.S. producers, Hollub said she personally would rather have made a local call than dialing long distance. We'll pause here and let the under 30 crowd Google "long distance phone calls."

"I think first you stay home, you ask your friends and you ask your neighbors to do it. And then if we can't do it, you call some other countries," CNBC reported Hollub as saying at an energy forum … in Abu Dhabi, the capital of the United Arab Emirates.

Speaking of rockets, the fourth quarter shot off with a couple of large deals, including Southwestern Energy's purchase of GEP Haynesville LLC for $1.85 billion. Combined with Southwestern's earlier purchase of Indigo Natural Resources, Southwestern will have spent a combined $4.55 billion in Louisiana when the GEP deal closes.

If there's a race to consolidate in the Haynesville, Southwestern seems determined to win, as in, it has already won, discussion over.

Southwestern CEO Bill Way said Southwestern's GEP acquisition has now poised it to become the largest producer in the Haynesville. The company's base in Appalachia remains a juggernaut of production with 3 billion cubic feet equivalent (Bcfe). GEP would bump up Haynesville production to 1.7 Bcfe from 1 Bcfe.

"This strategic move positions Southwestern as the largest producer in the Haynesville and enhances our leading presence in the top two premier natural gas basins in the U.S.," Way said in a news release.

Keeping to the rocketry theme, there seems to be some confusion about trajectory of Continental Resources Inc.'s recent transactions.

The longtime Bakken and Oklahoma producer has made two large acquisitions this year. The first put it in the Powder River Basin with a relatively low-priced $215 million acquisition of Samson Resources II LLC. Continental said the deal added 130,000 net acres in Wyoming. It was an outlier acquisition or so it appeared at the time.

On Nov. 3, however, Continental launched the equivalent of an Atlas V rocket at the Permian Basin. The deal was different, perhaps too different for some analysts' tastes.

Continental's Atlas V sized deal for the Permian is different—in fact perhaps too different for some analysts' tastes. In part, this may be because Continental agreed to buy Pioneer Natural Resources Co.' Delaware Basin assets for $3.25 billion in cash.

This deal firmly establishes or re-establishes a few truisms about the Permian. The first is that when Pioneer CEO Scott Sheffield says he doesn't really like the Delaware basin, he really, really means it.

Recall that Pioneer acquired the Delaware acreage in its merger with Parsley Energy Inc.—a combination that closed in January for at a cost of roughly $7 billion.

But Continental's move south also had some analysts concerned that it might affect hurt the company's ability to return free cash flow to investors.

"Needless to say, it caught us (and a majority of investors) by surprise," Raymond James analyst John Freeman wrote of the deal.

The acquisition includes 92,000 net acres in the southern Delaware, with production of 55,000 boe/d, about 70% of which is oil.

"Most importantly, however, the acquisition is accretive to CLR paying a 3.6x EBITDA multiple (about 17% FCF yield), below the company's current 4.3x multiple," Freeman wrote.

The deal also confused the strategic intent of Continental for Gabriele Sorbara, analyst at Siebert Williams Shank.

More concerning for Sorbara, Continental may be ramping up for another $375 million in various property acquisitions to "increase its position in multiple strategic plays."

"The uncertainty around its M&A strategy has us concerned and is likely to weigh on the stock performance, especially given the current environment where investors are seeking discipline and cash returns."

Indeed, the company's stock initially slid by about 6%.

On the other hand, Tudor, Pickering, Holt & Co. noted that Continental increased its quarterly base dividend and has more than $600 million remaining for share buybacks to assuage any doubters. Also, improvement in oil prices could see the Delaware acreage value rise closer to $4 billion.

Call this deal a careful gamble.

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CAN WE FOCUS ON REALITY FOR A MINUTE?

JACK BELCHER,
CORNERSTONE
GOVERNMENT
AFFAIRS

Coming out of the pandemic, the world economy is set to grow significantly. But the global energy situation is in dire need of realistic public policies that support U.S. production to the benefit of not only the U.S. but energy markets around the world.

In the midst of a global energy crisis, public figures recently converged on Glasgow. The crisis has been catastrophic in Europe. Electricity prices have sky-rocketed due to higher natural gas prices and few sources of electricity. This pricing surge is killing Europe's manufacturing sector, making it uncompetitive globally. Manufacturing plants are either being subsidized by the government, operating under an emergency EU exemption or are shutting down.

After having proven incapable of dealing with the reality of its energy situation, Europe is now held hostage by Russia and is scrambling to secure LNG supplies. It's considering a second look at nuclear.

The inescapable fact is that Europe needs natural gas and nuclear energy in order to meet its energy needs and greenhouse gas (GHG) reduction goals.

Further east, China is also suffering from significant energy shortfalls and is struggling to secure supply at home and abroad. Although China recently made news by committing to carbon neutrality by 2060, a closer look into what is really happening inside the country underscores that this commitment is mere words. China is currently the world's largest GHG emitter, comprising about 27% of global emissions. With about 250 megawatts of new coal generation coming online in the next few years, China's contribution to emissions should only move higher in the coming years.

The U.S. is also suffering from its own energy crisis, albeit not as significant as what Europe and Asia are facing—yet. A big reason for this is because we produce much of our own energy, and we don't have exorbitant taxes on what we produce and consume.

However, that could change. U.S. policies are not focused on increasing oil and gas production or even keeping it from declining. Rather, they are focused on reducing domestic production.

At the same time, President Biden and U.S. officials blame high gasoline prices on OPEC and Russia, asking them to increase production and take our market share. Our own officials scoff at the notion of making up supply from domestic resources even though we were net exporters a few months ago.

At press time, President Biden had signed the $1.2 trillion infrastructure bill into law and the U.S. House of Representatives had passed the $1.75 trillion "Build Back Better" (BBB) reconciliation bill. The infrastructure bill contain language incentivizing the carbon capture and storage, and the budget reconciliation package expands the 45Q tax break for CCS activities.

BBB also puts forth a large fee, $900 per ton of methane in 2023 ramping up to $1,500 per ton by 2025, on "waste methane" from oil and gas facilities. The fee, if passed into law, will hurt U.S. gas consumers and will impact the competitiveness of U.S. LNG. Thankfully, a slew provisions that would have removed decades old allowances for tax deduction for certain expenses, was dropped from the House bill. The BBB now goes to the Senate where its fate is unknown.

In a 50:50 Senate, at least two Democratic Senators have raised opposition to the bill as is and some others would probably require changes to the bill before they could vote for it. Fears of inflationary impacts could sink the bill in the Senate. It is difficult to believe that the U.S. has this golden opportunity to ramp up its production during a period of very high oil and natural gas commodity prices, and our policymakers are snubbing the notion of facilitating the opportunity.

Through the shale revolution, the U.S. showed that it could significantly increase global market share and become a net exporter despite decades of conventional wisdom saying it cannot be done.

Today it can be done, more efficiently and cleanly, than anywhere else in the world. Why are we asking other countries to sell us what we can produce here?

Abroad, the easiest way for Asia to reverse its coal power ramp up and meet its carbon neutrality goals is to replace those plants with gas-fired ones that use imported U.S. LNG. This is also a part of the solution for what ails Europe. The $100 billion being sought at COP26 to help the developing world deal with climate change could be used to help Asia develop the infrastructure needed to turn American natural gas into power and deliver it to homes and businesses. U.S. natural gas has helped the U.S. reduce its own GHG emissions.

Good public policy could help the rest of the world do it as well. To do that though, we must deal with reality.

EVENTS CALENDAR

The following events present investment and networking opportunities for industry executives and financiers.

EVENT	DATE	CITY	VENUE	CONTACT
2021				
World Petroleum Congress	Dec. 5-9	Houston	George R. Brown Conv. Ctr.	Ctr.23wpchouston.com
DUG East	**Dec. 6-8**	**Pittsburgh**	**David L. Lawrence Conv. Ctr.**	**dugeast.com**
2022				
IPAA Private Capital Conference	Jan. 20	Houston	JW Marriott Galleria	ipaa.org
NAPE Summit	Feb. 8-11	Houston	George R. Brown Conv. Ctr.	napeexpo.com
The Energy Venture Investment Summit	Feb. 16-17	Golden, CO	The Colorado School of Mines	theenergyventuresummit.com
DUG Midcontinent	**March 1-3**	**Oklahoma City**	**Oklahoma City Conv. Ctr.**	**dugmidcontinent.com**
LOGA Annual Meeting	March 7-8	Lake Charles, LA	Golden Nugget Hotel & Casino	loga.la
CERAWeek by IHS Markit	March 7-11	Houston	TBD	ceraweek.com
EnerCom Dallas	April 6-7	Dallas	Dallas Petroleum Club	enercomdallas.com
Mineral & Royalty Conference	April 18-19	Houston	Post Oak Hotel	mineralconference.com
Women In Energy	**April 29**	**Houston**	**TBD**	**hartenergyconferences.com**
Offshore Technology Conference	May 2-5	Houston	NRG Park	2022.otcnet.org
Energy Capital Conference	**May 10**	**Houston**	**TBD**	**hartenergyconferences.com**
DUG Permian	**May 16-18**	**Fort Worth, TX**	**Fort Worth Convention Center**	**dugpermian.com**
Louisiana Energy Conference	May 24-27	New Orleans	The Ritz-Carlton, New Orleans	louisianaenergyconference.com
DUG Haynesville	**May 25-26**	**Shreveport, LA**	**Shreveport Convention Center**	**dughaynesville.com**
CIPA Annual Meeting	June 9	Carlsbad, Calif.	TBD	cipa.org
Unconventional Resources Technology Conference	June 20-22	Houston	George R. Brown Conv. Ctr.	urtec.org
IPAA Annual Meeting	July 20-22	Colorado Springs, CO	The Broadmoor	ipaa.org
EnerCom Denver	Aug. 8-11	Denver	TBD	enercomdenver.com
Energy Transition Conference	**Sept. 6-7**	**Houston**	**TBD**	**hartenergyconferences.com**
ESG Conference	**Oct. 11-12**	**Houston**	**TBD**	**hartenergyconferences.com**
A&D Strategies and Opportunities Conference	**Oct. 25-26**	**Dallas**	**Fairmont Hotel**	**adstrategiesconference.com**
Executive Oil Conference	**Nov. 2-3**	**Midland, TX**	**Midland County Horseshoe Pavilion**	**executiveoilconference.com**
DUG East/Marcellus-Utica Midstream	**Dec. 6-8**	**Pittsburgh**	**David L. Lawrence Conv. Ctr.**	**dugeast.com**
Monthly				
ADAM-Dallas	First Thursday	Dallas	Dallas Petroleum Club	adamenergyforum.org
ADAM-Fort Worth	Third Thursday, odd mos.	Fort Worth	Fort Worth Petroleum Club	adamenergyfortworth.org
ADAM-Greater East Texas	First Wed., even 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.com
ADAM-Permian	Bi-monthly	Midland, Texas	Midland Petroleum Club	adampermian.org
ADAM-Tulsa Energy Network	Bi-monthly	Tulsa, Okla.	The Tavern On Brady	adamtulsa.com
ADAM-Rockies	Second Thurs./Quarterly	Denver	University Club	adamrockies.org
Austin Oil & Gas Group	Varies	Austin	Headliners Club	coleson.bruce@shearman.com
Houston Association of Professional Landmen	Bi-monthly	Houston	Houston Petroleum Club	hapl.org
Houston Energy Finance Group	Third Wednesday	Houston	Houston Center Club	hefg.net
Houston Producers' Forum	Third Tuesday	Houston	Houston Petroleum Club	houstonproducersforum.org
IPAA-Tipro Speaker Series	Second Wednesday	Houston	Houston Petroleum Club	ipaa.org

Email details of your event to Brandy Fidler at bfidler@hartenergy.com.
For more, see the calendar of all industry financial, business-building and networking events at HartEnergy.com/events.

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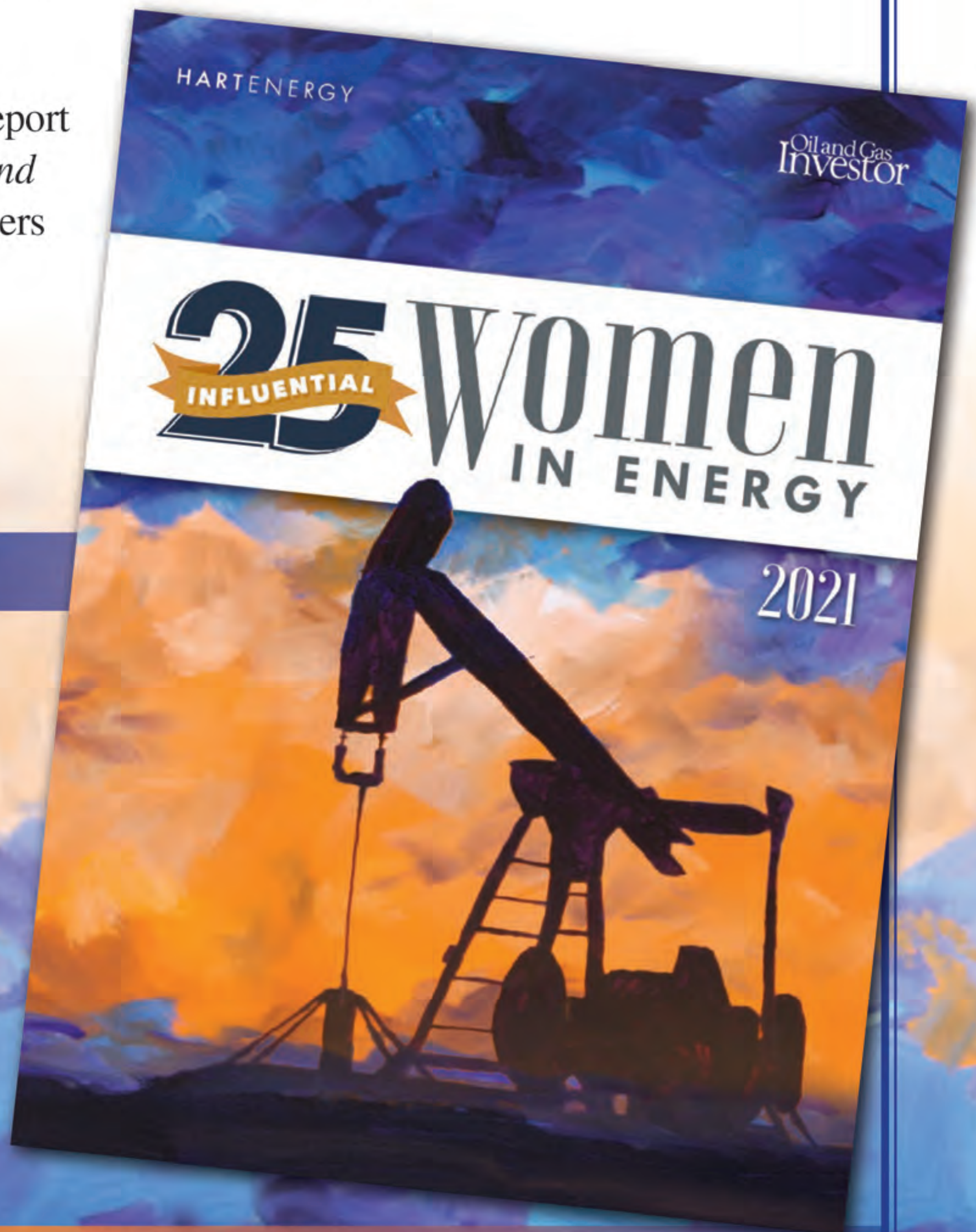
The deadline for nominations is:

Dec. 17, 2021



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Upstream M&A takes breather, but dealmaking remains strong

E&P asset sales picked up steam in the third quarter, but overall M&A fell as a pair of deals—one in the hot Haynesville Shale and the other in the Permian Basin—propped up an $18.5 billion quarter, according to a recent report by Enverus.

Overall, M&A dropped 44% from the previous quarter's record-setting frame, though the $18.5 billion in announced deals still beat the five-year quarterly average of about $16 billion, the Enverus report said.

Public company consolidation slowed, possibly as a result of higher commodity prices lessening the urgency for some small- and mid-cap companies to sell.

"We have seen a red-hot market for upstream M&A since the industry recovered its footing from the initial shock of COVID-19," Andrew Dittmar, director at Enverus, said in the report. "It was inevitable that the hungriest buyers and sellers would find their deals and activity would revert back toward the average. We seem to be hitting that inflection point."

Asset deals ticked up collectively as corporate consolidation resulted in ricochet sales from large oil and gas companies parting with assets they don't see fitting into their development plans, Enverus said. Such assets typically fall outside the areas public companies have deemed noncore. That will continue to create opportunities for private equity investors, which increased their share of acquisition pace by about 20% of transactional value.

"Private equity still has dry powder for deals," Dittmar said. "They are using this to target assets being tagged as noncore by public companies."

Outside of the core of the Permian Basin and a few other key areas, competition for deals drops, according to Dittmar, who noted that these positions are often available at "buyer-friendly price points.

"That said, private equity is still a net seller in the space," he continued, "and likely to remain so for the foreseeable future given the number of investments outstanding and how long that capital has been deployed."

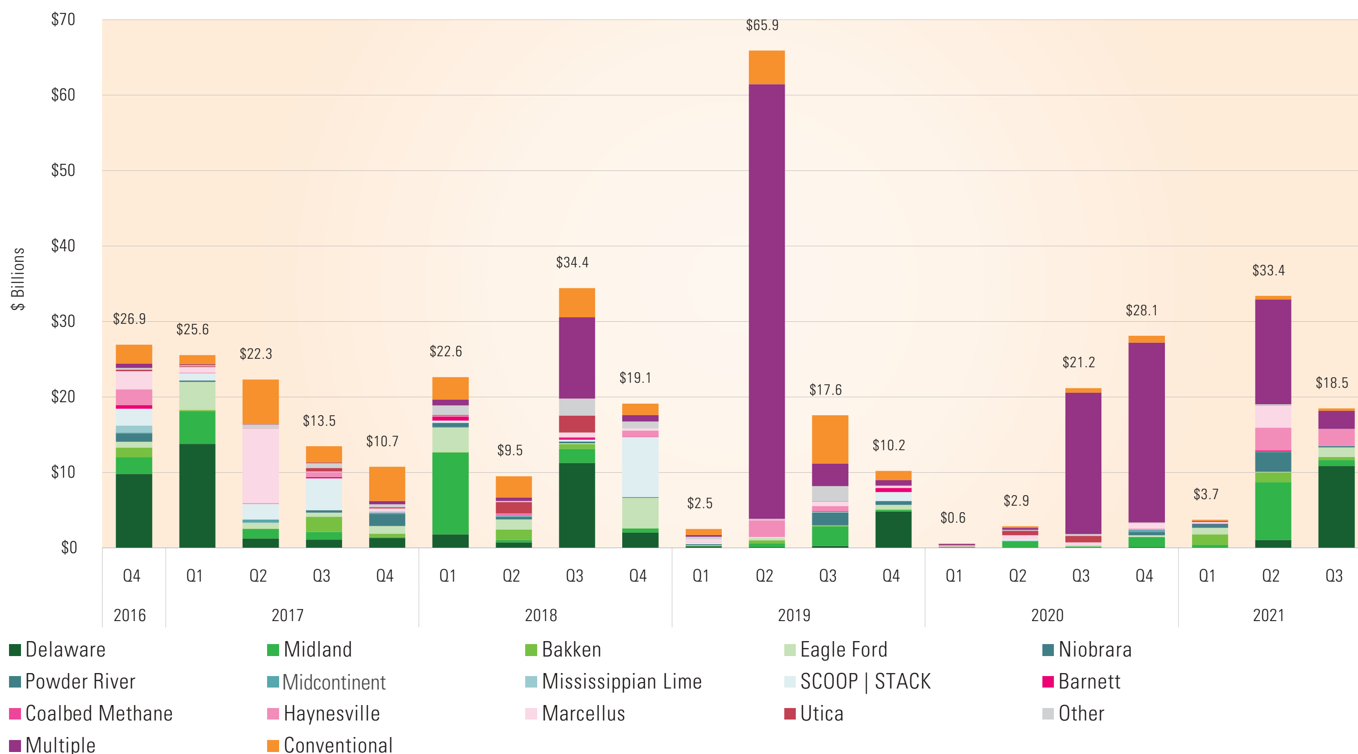
Other private equity investments found exits during the quarter, according to Enverus.

Callon Petroleum Co. agreed to purchase Blackstone-backed Primexx Energy Partners' Delaware Basin position for $788 million. Callon said it would pay $440 million in cash and 9.19 million shares of stock for the acreage.

Callon's purchase of Primexx continues a trend of private equities that are willing to take equity when selling. With tailwinds from strong stock price performance for public E&Ps, that has been an additional source of value for sellers, as shares have generally appreciated in value after the deals close, Enverus said.

Roughly $11.7 billion of transactional value, or 67% of the

Deal Value By Play



Source: Enverus

quarter tally, came on the shoulders of acquisitions by ConocoPhillips Co. and Chesapeake Energy Corp. However, the quarter's top five deals were largely focused on acquiring oil production.

ConocoPhillips said on Sept. 20 it had an agreement to purchase Royal Dutch Shell Plc's Permian position for $9.5 billion. In a departure from recent large-scale deals, ConocoPhillips agreed to pay cash for Shell's assets, making it the largest all-cash deal in three years, according to Enverus.

In contrast, ConocoPhillips closed its January purchase of Concho Resources in an all-stock deal.

Chesapeake's Aug. 11 deal to acquire Vine Energy Inc.'s Haynesville position was the other megadeal of the quarter. The roughly $2.2 billion deal demonstrates the appeal of the Haynesville as a consolidation target, with the shale play seen as having more room to grow compared to Appalachia because of access to infrastructure.

"There are still opportunities for public company consolidation as well as potential private sellers looking to capitalize on price levels for both gas and oil not seen in years," concluded Dittmar. "But the sense of urgency seems to have left the deal market."

"Through the end of the year, we are likely to see mostly smaller sized asset deals as companies trim their portfolios with the chance of an occasional larger public company merger or private E&P sale," he added.

Enverus' report also observed:

- Among the leading shale plays for deals, the Permian Basin remains the most competitive for deals with established players competing for additional economic inventory. Combined with more modest-sized deals, the Permian recorded $12 billion in deal value in the third quarter.
- Appalachian producers will continue to expand in the Haynesville with the two key U.S. gas plays coming under unified ownership.
- The Bakken Shale has several active public companies that could compete for inventory, potentially driving deals to include value for upside.
- The Eagle Ford has many private E&Ps and needs a public company consolidator. Enverus said newly rebranded Ranger Oil could fill that role.

—Darren Barbee

Top Five Third-Quarter Upstream Deals

Date	Buyer	Seller	Deal Type	U.S. Play	Value ($MM)
9/20/21	ConocoPhillips	Shell	Asset	Delaware	$9,500
8/11/21	Chesapeake Energy	Vine Energy	Corporate	Haynesville	$2,171
8/4/21	Callon Petroleum	Primexx Energy	Corporate	Delaware	$788
7/8/21	WildFire Energy	Hawkwood Energy	Corporate	Eagle Ford	$650
7/26/21	Lime Rock Resources	Rosehill Operating	Asset	Delaware	$508

Source: Enverus

Permian Basin poised to lead low-carbon transition, Oxy exec says

The Permian Basin has been a powerhouse in energy for roughly a century and, despite the push for an energy transition currently taking place at COP26, Occidental Petroleum's William Barrett doesn't see that changing.

"You're the pioneers in primary production, secondary production, enhanced oil recovery—all the methodologies there ... and I believe the Permian Basin is poised to become the leader in this transition to a low-carbon world," Barrett told attendees of Hart Energy's Carbon Management Forum on Nov. 3.

Serving as commercial director of Oxy Low Carbon Ventures, Barrett is familiar with the potential role the Permian can play in the low-carbon transition. The venture capital arm of the Houston-based company has chosen the basin to build the world's largest direct air capture facility, expected to begin construction in 2022.

In particular, Barrett noted the enormous amount of CO_2 storage space in the basin during his presentation kicking off the forum.

"The point that is available out here to store carbon dioxide is estimated by NETL (Department of Energy's National Energy Technology Laboratory) to be 50 gigatons," he said. "To put that in perspective, if you were to take all of Occidental's greenhouse-gas emissions and capture those, the Permian Basin would store those for 1,000 years."

Secondly, and equally important to the basin's future success, are the people, Barrett said.

"The high number of innovators and problem-solvers here that are already working in the Permian Basin ... these are the people, you in this room included, that will be the pioneers in this transition," he said. "You will be coming up with the solutions on how we get to the low-carbon world."

Taking a step back, there are multiple pathways for a company to reach its net-zero emissions target, according to Barrett.

"There are many tools in the toolbox, so I think each person in each company has to look at their assets and after analyzing those figure out what's the best pathway," he said.

Occidental, itself, is currently pursuing several different initiatives as part of its commitment to reducing CO_2 emissions and atmospheric carbon levels.

Similar to others in the oil and gas industry, Occidental set a target to reach net-zero emissions associated with its operations before 2040 and emissions associated with the use of its products before 2050. In addition to its own net-zero ambitions, the company has also committed itself to help others in reaching their emissions targets.

In hopes of "spurring ideas" among forum attendees, Barrett shared several of those initiatives Occidental is involved with, including five large-scale point source carbon capture projects underway.

One of the examples he gave during his presentation was Project Tundra, an initiative led by the Minnkota Power Cooperative to build the world's largest capture facility at a coal-fired power plant in North Dakota. Oxy Low Carbon Ventures is providing carbon storage consulting services to advise on the safe design and overall requirements of CO_2 storage for the project with construction slated for 2022.

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In the Permian Basin, Occidental is working with 1PointFive Inc., a joint venture between Oxy Low Carbon Ventures and private equity firm Rusheen Capital Management, to develop the largest ever facility to pull CO_2 out of the atmosphere through a process known as direct air capture for its operations. It will also be the first commercial-scale development using Carbon Engineering Ltd.'s direct air capture technology.

Barrett said Occidental is excited for this project in particular and already has plans to build at least up to 12 additional direct air capture facilities. However, the company chose the Permian Basin to build this first facility because he said a lot of the supporting infrastructure is already in place.

Ultimately, Occidental is aiming to produce net-zero oil, which serves to support further decarbonization of the fuel economy and will play an integral role in the energy transition, Barrett said.

"You have shipping, aviation, rail, long-haul trucking—all of those are going to take more time to transition than it is just for me to go down and take my car and trade it in for an electric car," he said. "I can do that today.

"But these take more time, so that's the transition that we're going to be in," he continued. "It's not going to happen overnight. By definition, transition takes a while to happen."

—Emily Patsy

Deloitte: High oil prices will fund energy transition

Many oil and gas companies will take advantage of the recent surge in oil prices to fund their net-zero pledges, Deloitte said Nov. 9, a notion that defies the common assumption that high prices would slow the energy transition.

"A strong oil price enables investment in riskier and expensive green energy solutions, such as carbon capture, utilization and storage (CCUS)," Deloitte said in its "2022 Oil and Gas Industry Outlook."

"Given that no single stakeholder can provide the necessary investment and absorb all commercial risks associated with building a CCUS industry, all participants in the entire O&G [oil and gas] value chain (from EPCI, oilfield services (OFS), upstream and midstream to downstream) become important, as they are involved in more than half of planned CCUS projects."

Deloitte identified five trends for the industry in its outlook, detailing how ESG challenges and the energy transition are influencing strategic decisions in the areas in M&A, OFS, retail and the workforce. The authors defined four archetypes of companies in terms of approaches to monetizing the low-carbon environment.

"Net-zero pioneers" and "green followers" are most likely to leverage this high-price phase to aggressively fund their vision of making sustainability their core business, the report said. By contrast, "low-carbon producers" and "hydrocarbon stalwarts" will most likely use this time to optimize and decarbonize their hydrocarbon operations.

Two other trends emanating from high oil prices contradict conventional wisdom, Deloitte said.

- **Production and capital discipline**: Fewer DUCs, small production increases for 2021 and a 4%-5% projected reduction in debt signal that "the industry is no longer just managing the cycle."
- **Joining the net-zero club**: U.S. oil and gas companies and Canadian oil-sand producers followed their European counterparts in making net-zero commitments in 2021.

Upstream M&A activity has not followed rising oil prices in a departure from the norm, Deloitte noted. In the first eight months of 2021, the number of deals was down 30% from the same period in pre-pandemic 2019. The value of those deals was off by 46%.

Capital discipline is certainly a primary cause for the lack of an M&A comeback, Deloitte said, but it's not the only reason. Buyers aiming to fulfill net-zero pledges will likely hesitate to pursue deals without knowing a seller's carbon profile.

Those companies would seek to either purchase low-carbon-intensity barrels or sell high-intensity ones. That could mean acreage consolidation or portfolio restructuring. While large resource size and a good price may have been enough to close a deal in the past, a buyer intent on meeting net-zero goals is now more likely to walk away.

"Therefore, M&A activities would need not only to be financially accretive, but also to support ESG goals," Deloitte said.

However, citing Enverus data, Deloitte acknowledged that only 12% of upstream transactions so far in 2021 referred to emissions reductions, decarbonization synergies or improving ESG performance as primary reasons for the deal. That might be due to a lack of uniform reporting standards or lack of clarity as to the impact of ESG reporting on valuations, Deloitte said.

OFS spending is expected to be 25% below 2019 levels until 2025, an indication that the sector is already positioning itself to operate independently of upstream cycles, Deloitte said. Companies can take advantage of decarbonization mandates across industries, the authors said.

"Many large service providers have already diversified beyond core services," Deloitte said, noting that one large OFS company had restructured its business by making big bets on cloud and edge computing. Halliburton and Baker Hughes have partnered with startups and academic institutions to push forward with technology development for energy and industrial applications.

There are limits to the digitalization trend, though.

"The sector needs to get even leaner and greener," the report said. "Providing integrated solutions for decarbonizing upstream projects, implementing subscription-based revenue models or diversifying into the low-carbon space could be key enablers of the future OFS strategy."

Partnerships, alliances and consolidation seem to be already gaining importance in the sector, Deloitte said, with low carbon poised to be the new driver. In 2021, 20% of OFS deals involved a company with renewable energy operations, compared to 5% of deals between 2017 and 2020.

Brand preference has been eclipsed by convenience in the fuel retailing sector. That can be attributed to millennials, who consider convenience and user experience to be more important than brand and price, Deloitte said.

Retailers must also adapt to a changing fuel mix, with automakers transitioning to electric vehicle (EV) production that could account for 50% of new car

sales by 2030. But simply adding charging infrastructure will not be enough, the report said, even though about two-thirds of Deloitte's survey respondents in the industry consider alternative fuel offerings as a key requirement for transformation.

"Even front-end operations of fuel retail outlets must be redesigned to focus on nonfuel offerings such as convenience stores, groceries, pharmacies and curbside pickup of e-commerce products," the report said.

The challenge of attracting and retaining talent intensified when the COVID-19 pandemic hit, and the oil and gas industry responded to crashing oil prices with the fastest layoffs (107,000 jobs) in its history. Deloitte made the following recommendations for companies to cope in the energy transition era:

- Provide industry-leading health care and well-being;
- Develop new compensation benefits, an example being BP's share award program for all global employees, regardless of hierarchies;
- Develop agile workforce structures to match skills to projects, with reskilling programs and vocational training to reduce the skills gap;
- Build avenues for career growth through cross-skilling programs in the new energy space, with new roles such as carbon reduction analysts or emissions control officers.

"While traditional roles such as geophysicists and petroleum engineers remain core to the business," the report said, "new and evolving skills such as digital design, data science, design thinking or cybersecurity are the needs of the hour."

—Joseph Markman

Private Permian operators take center stage as oil price soars

While publicly traded producers in the Permian Basin are continuing to practice capital discipline even though oil prices recently soared to over \$80/bbl, the ambitious growth plans of the privately held operators are expected to drive a drilling surge in the nation's largest shale play.

Vaccine-fueled demand recovery has paved a path for private operators to increase spending and pump more in West Texas and parts of New Mexico.

For instance, Tyler, Texas-based Mewbourne Oil Co. is now running 17 drill rigs in the U.S., more than Exxon Mobil Corp. and Chevron Corp. combined, Bloomberg reported earlier this month.

Meanwhile, Trigo Oil & Gas, a subsidiary of Wheat Resources, just drilled its first two wells in Reeves County, Texas, near the New Mexico border, with a third on the way.

According to Rystad Energy forecasts, an increase in production from the Permian Basin could lead to pre-pandemic output of 4.9 MMbbl/d by this month, which is currently being driven by a drilling surge from the privates.

"In general, private players in the U.S. oilfield currently have advantages over their publicly traded peers," Doug Sheridan, managing director and founder

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of Houston-based EnergyPoint Research, told Hart Energy

"At the moment, private players operate approximately 60% of rigs in the U.S., compared with about 40% just before the pandemic. This is no accident. Not only are private producers less beholden to ESG and other potential value-destroying pressures of the day, because of their smaller size, they can raise production with little fear of affecting the price of oil or spooking OPEC. It's an enviable position, and one that private companies will certainly—and likely successfully—exploit," he said.

Even as private operators continue ramping up drilling, $80 WTI isn't enough to trigger a drilling boom in the Permian—at least not yet.

One of the reasons is the "backwardated" nature of crude prices, Sheridan noted.

"Although the front-month price of WTI is currently just above $82, the curve falls significantly as time goes on. With current 12- and 24-month strips at just under $78 and $74 respectively, it's hard to see publicly traded producers—who have sworn themselves to discipline—opening up their checkbooks in a big way," he said.

However, in the longer term, should backwardation lessen and the strip eventually reach $85, Sheridan said greater producer confidence will cause drilling to rise to the point where it "certainly feels like a boom."

"Add another $5 to $10, and we're almost certainly in boom territory. Of course, all of this assuming that headwinds like supply-chain bottlenecks, oilfield inflation, labor shortages and Biden administration obstinacy don't freeze the industry out from taking advantage of higher prices."

There is a growing consensus in the oil market that the forward oil price curve could mean $100/bbl very soon.

Sheridan expressed doubt over the popular belief that U.S. shale producers are likely to maintain their current production discipline even if prices soar to $100/bbl.

"Discipline can be a good thing, but leaving value on the table for the sake of austerity should not be a permanent strategy," he said.

"As prices rise, I suspect many management teams will decide to let themselves out of the penalty box," he continued. "In most cases, they would be right to do so. With very high prices, most will be better off adjusting production higher, in line with market fundamentals … assuming supply-chain and regulatory issues don't become prohibitive. Of course, their challenge will then be to grow within their means. I believe most will."

James West, senior managing director at Evercore ISI, also added, "If oil prices spike to $100 a barrel, privates will keep spending more while the public companies may choose to increase returns to shareholders from unexpected windfall profits."

West believes that in the current situation, private equity-backed producers are also at an advantage because "the motivations for these companies is not to return capital to shareholders but rather spend to grow production."

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"These entities will get bigger at higher oil prices as their cash flow increases," he said.

—Faiza Rizvi

U.S. shale industry prepares for more cost inflation

U.S. shale players are experiencing cost inflation that is expected to continue into 2022, including in the Permian Basin, as costs continue to rise for services and goods such as labor, fuel, pressure pumping, OCTG and sand, according to the head of the world's largest independent E&P company.

ConocoPhillips Co. CEO Ryan Lance said inflation is ranging from high single-digit to low double-digit in the Lower 48, compared to 2% to 3% inflation globally. In the U.S., inflation rates could be around the mid-single digit range going into next year. Speaking to analysts this week on the company's earnings call, Lance said ConocoPhillips has been seeing inflationary pressures but doesn't expect it to lead to a significant departure from the company's June capex guidance or a shift in where capital is allocated.

"As we think about it going forward, it's an opportunity for us to try to offset as much of that through some modest scope reduction and efficiencies," Lance said.

Oil and gas companies have been finding lasting operational efficiency gains by drilling longer laterals, simultaneously stimulating horizontal wells with one pressure pumping unit and utilizing other time- or money-saving technologies and techniques.

Many have been doing more with less, looking to keep costs in check and investors happy, even as demand picks up and oil prices improve. The continued focus comes as the industry—like other sectors—copes with supply chain woes and labor shortages.

Oilfield service companies had already warned of inflation and passing along rising costs.

A Federal Reserve Bank of Dallas third-quarter 2021 survey of more than 140 E&P and oilfield service firms in mid-September showed costs were rising sharply. The index for input costs for oilfield service firms hit a record high of 60.8, indicative of significant cost pressures, the Dallas Fed survey said. For E&Ps, indexes for finding and development costs as well as lease operating expenses also rose.

Add to this longer supplier delivery times.

"Among oilfield service firms, the index for supplier delivery time increased from 14 in the second quarter to 26.7 in the third, the highest reading since the survey's inception in 2016," the survey showed. "The index measuring delays in deliveries increased to 26.7, also a record high. Similarly, among E&P firms, the index for supplier delivery time increased from 4 to 10.5."

As ConocoPhillips finalizes plans for 2022, Lance said the company is closely watching the macro and keeping eyes on inflation and potential OBO [or best offer] pressures while undertaking its typical capital high-grading processes.

"It goes without saying the market certainly appears to be more constructive," Lance said, "but we must always remember that this is an incredibly volatile business."

Inflation was among the recurring topics of interest for analysts questioning top oil and gas executives on third-quarter earnings calls.

Diamondback Energy CEO Travis Stice addressed inflation concerns within the first few minutes of his opening remarks, speaking about how the company has offset inflationary items through efficiency gains in design and execution.

"On the drilling side, we've decreased the number of days it takes to drill from spud to total depth by nearly 30% this year alone, and we are now drilling 3-mile laterals in roughly 10 days in the Midland Basin," Stice said. "On the completion side of the business, we've seen a step change in efficiency as we transition the majority of our completion crews to simul-frac operations and are now completing wells in the Midland Basin nearly 70% faster than when we were utilizing the traditional zipper frac design."

The gains, he said, drove Diamondback's beat on capex for the third quarter and enabled the company to lower its capex for the second consecutive time this year.

Diamondback decreased its full-year capex budget by 10% to between $1.49 billion and $1.53 billion, compared to its original 2021 budget.

"The efficiencies gained this year will be permanent," Stice said. "And while inflation may impact services prices next year, Diamondback will be more insulated than our peers given our control over the variable cost of well design, days to total depth on the drilling side and lateral feet completed per day on the completion side of the business."

Stice said 2021 has been a year of rising costs for steel, diesel and sand. He called it logical, however, given labor tightness. Where the rig count goes next will factor into preparations for potential 2022 service cost inflation.

Coterra Energy, which recently formed through the merger of Cabot Oil & Gas and Cimerex Energy, has also experienced inflation. Like some of its peers, the company's capex trended toward the low-end of guidance—thanks again to operational efficiency.

"We've seen inflation just like everybody else. We've seen it in steel; we've seen it in fuel; we've seen it in labor," said Blake Sirgo, vice president of operations for Coterra. "We're working right now to try to model that for '22. ... But we expect continued operational efficiency to help offset any future inflation."

The company, however, is still trying to quantify cost savings from simul-frac.

"Right now, we really like our zipper operations. We like our pad operations. We've seen tremendous efficiencies there," Sirgo said.

Given the continued conversation about steady cost inflation and operational efficiencies, one analyst wanted to know whether the company or industry in general is thinking more about maximizing the potential of scale or perhaps focusing on a narrower set of basins.

When it comes to scale, aggregating land to be able to drill 2-mile or 3-mile laterals can lead to "tremendous cost savings," Coterra CEO Tom Jorden said, adding aggregation to most efficiently deploy infrastructure dollars and procurement are also important.

However, he said, "scale can be overblown" once these areas

are covered and great operational teams are in place.

"If scale alone was the answer, I think the majors would have the lowest cost structure in our business, and clearly that's not the case," Jorden said. "I think scale is important, but it's important to a point."

—Velda Addison

Financing a greener future: Obstacles and opportunities

As the world moves faster toward renewables, the energy industry faces a great deal of uncertainty in how to finance the transition while still generating revenue. However, the task is not as financially infeasible as many seem to think. In the webinar "Financing the Energy Transition" hosted by DNV, several guest speakers discussed what financial and policy provisions need to be made in the transition.

Jeremy Parkes, global business lead for electrical vehicles at DNV who authored the "Financing the Energy Transition" report, predicts "an equal mix of fossil and non-fossil sources of primary energy supply" by 2050, compared to 80% of the world's energy supplied by fossil fuels and 20% non-fossil fuels in 2019.

"We forecast that the growth in energy demand starts to slow down and then plateaus off due to the continuous improvement in energy efficiency," Parkes said. "That also means that there'll be a substantial reduction in the use of fossil fuels. However, they do remain about half of the energy mix assets at 2050, but we see aspects such as electrical energy demand that will double over the period from today out to mid-century."

According to the report, the world needs to move at a faster pace to align with the Paris Agreement targets. However, it also insists that the world is financially capable of accelerating the energy transition.

"I think in terms of really being able to afford an accelerated transition, then what we would say is that instead of having that reduction in the percentage of GDP that we spend on energy, instead of doing that, hold the amount of GDP that we spend a consistent over those three decades," Parkes said. "And if we were to do that, then there could potentially be of the order of 60 trillion U.S. dollars available to spend on a faster transition.

"If you truly were to spend that amount, that's more than enough to accelerate that transition and get us onto a path where we can achieve a 1.5 degree, future for the temperature rise compared to two pre-industrial temperatures," he continued. "The question then becomes how do we orchestrate that massive redirection of capital in order to achieve that accelerated transition whilst maintaining reliable energy systems that are truly affordable to all?"

Members of the energy industry have made it known in recent years their concerns about financing the energy transitions, as it sounds like a massive undertaking. According to Hilde Roed, senior vice president of climate and sustainability at Equinor, a lot of those concerns stem from the uncertainty surrounding how to invest capital as the industry continues to adapt.

"There is a need to change the way we invest very fast, and there's also a need for investments in climate adaptation. So all of this of course creates both challenges, but also industry opportunities," Roed said. "And for us as a company and companies that go to that, that's oil and gas companies, we want to change, and we think that we have a very central role to play in this transition because we have capital and they also have the technologies and people in space to drive some of these changes that are necessary."

To keep up with the evolving energy environment, companies like Equinor are putting their investments toward renewable technologies and policies, such as carbon pricing, as opposed to traditional fossil fuel-reliant technologies. However, Roed said that the government should help ease the financial burden of transitioning.

"We've seen with renewables how important it is to get help from governments and how to get policy frameworks, actually into markets and get enough scale and that you can costs down and thereby also stopping competitive on the costs," she said. "So we think that governments are needed to share risks, to provide incentives and also to ensure our unit provides currency and predictability and stability in the policy framework, so that businesses, and also our supply chains are willing to make the investments."

Seeing a number like $60 trillion can make the energy transition seem unattainable, but it may not be as out of reach as one would expect. Daniel Wong, global head of Macquarie Capital and chair of Macquarie's Green Investment Group, pointed out that since the energy transition has been underway for decades now, a lot of the notable green technologies—primarily wind and solar—have become more cost efficient as they've worked their way into the framework of the energy industry.

"With respect to clean power, wind and solar, I think it's pretty fair to say that it's cheap power now," Wong said. "And in many respects it's cheaper than conventional sources of power. And it's just a case of taking the level of deployment and scaling up to levels that we haven't seen before.

"I'm also optimistic because there are a number of ecosystems being built around this green energy, and you've got electricity or electric vehicles and the electrification of everything," he continued. "And the key constraint in that clearly was the price point for batteries, which has actually come down so much to facilitate the electrification of transport, which is already starting to accelerate, tipping points have already happened."

Wong also insisted that global governments need to take a more hands-on leadership role when it comes to preparing the environment for these rapid evolutions in technology. Leadership must enforce regulations to allow companies to understand how to invest their money into environmentally friendly projects moving forward.

"I think the most important thing for the government to do here is to set the price signals so that investing in these technologies will actually deliver a revenue line that can cover expenses, including the capital expenditure," Wong said. "And then as that equation starts to make sense with some degree of government support, then plainly the technology

curve should play in all of the cost of this capital expenditure to come down over time."

—Madison Ratcliff

CEO of shale giant calls for cross-sector collaboration

When it comes to the energy transition and reducing global emissions, the oil industry has something to offer. The problem is some people don't want to talk, according to Vicki Hollub, president and CEO of Occidental Petroleum Corp.

Occidental, a leading producer in top shale plays in the Permian and Denver-Julesburg basins, also has more than 40 years' worth of experience in handling CO_2 including for EOR. It is through these core competencies around carbon management that Occidental aims not only to reduce its own emissions but provide impactful decarbonization solutions across industries, Hollub said speaking on a panel during a recent energy and economy conference hosted by the federal reserve banks of Dallas and Kansas City.

"Our strategy is to convert our use of organic CO_2 to anthropogenic CO_2 and atmospheric CO_2, and to do that not just in our operations, but to start doing it around the world to help the hard-to-decarbonize industries have some way to get net negative as a corporation and to get net negative fuels to use," she said. "It's absolutely necessary to remove CO_2 from the atmosphere to cap global warming at one and a half degrees."

However, getting in on cross-sector conversations to help devise achievable plans is difficult.

"Most people don't want to be in the room talking to an oil and gas company CEO," Hollub said, noting the need for collaboration across different sectors. "A lot of companies are doing this in a vacuum and trying to help the world get there, and the world cannot get there without us. So, our challenge is to get people to talk to us."

Occidental, which is part of an alliance called CCS+ Initiative targeting carbon removal efforts with a focus on carbon accounting, has been scaling up its own carbon-capture business.

Vicki Hollub

Earlier this month, Occidental subsidiary Oxy Low Carbon Ventures (OLCV) awarded a services contract to Worley for commercial-scale facility in British Columbia that will capture CO_2 from the atmosphere using Carbon Engineering's Direct Air Capture and AIR TO FUELS technologies. OLCV subsidiary 1PointFive is also developing a direct air capture facility in the U.S. Permian Basin that is expected to capture 1 million metric tons of atmospheric CO_2 for permanent storage when complete.

"We expect that because of the difficulty of decarbonizing maritime and aviation that a lot of direct air capture will need to be built," Hollub said. "What we're concerned about is that there's 50% more CO_2 in the atmosphere today than there was in pre-industrial times. So, you have to have direct air capture. You can't just retrofit industry to capture the emissions going forward. Even if you did that, we would still need to build direct air capture to get the CO_2 out of the atmosphere. It's going to happen. We're committed to do it."

Support from regulators, including providing a direct pay option for the 45Q tax credit, could help incentivize and speed up development, she added.

"The more we accelerate it, the sooner we'll be [in] attacking the problem," Hollub said. "We expect that this will be a $3 trillion to $5 trillion industry when you take into account all of carbon capture and sequestration and the equipment required for it."

Hollub was joined on the panel by the heads of wind blade manufacturer TPI Composites, residential solar company Sunnova Energy Corp. and Omaha Public Power District, a public electric utility in Nebraska.

The conversation took place as the world's energy providers carry out emission reductions plans, aiming to hit net-zero, utilizing technology and low-carbon solutions.

For oil companies, the pressure is on to meet growing global energy needs and turn profits without harming the environment or closing doors to capital. A lot of hope is also resting on renewables such as wind and solar. Regardless of how much energy supply mix each occupies, developers of all forms of energy are searching for opportunity in a sea of challenges.

Panelists seem to agree that private sector financing will not be enough to enable the energy transition.

"The energy transition does not happen without some incentives from the government to build the technology," Hollub said. "If we're going to rely on the private sector doing it when we can't even talk across sectors, it's not going to happen. As a world, we're in big trouble."

Taking a strong, balanced portfolio approach is key, added Steve Lockard, board chairman for TPI Composites, pointing out incentives are needed to accelerate deployment of technologies like direct air capture as well as hydrogen, transmission infrastructure and storage.

"We've got to go faster. That's what really helped wind and solar drive costs down in a big way," Lockard said. He later added, "There's a lot of private sector capital that wants to be put to work," supported by incentives.

Private capital won't come, however, without users on the other end, said Javier Fernandez, president and CEO of Omaha Public Power District, turning back to consumers. At some point, how customers pay their bills could evolve in a way that's similar to cell phone bills. "We pay one fixed price. Doesn't matter how much you use, you're paying for the access to the grid."

There should also be incentives to encourage more private and public investment, he said, to ensure investors are truly recovering costs required for a more reliable grid.

—Velda Addison

STEADY DEMAND GROWTH PRESSES GAS PRICES HIGHER

Supply is limited by hesitancy from investors and producers, as well as logistics constraints.

ARTICLE BY GREGORY DL MORRIS

"If there were ever a situation where it is appropriate to say 'it's different this time,' this is it," said J. R. Weston, associate analyst for midstream and NGL, Raymond James. "That is because there really are several things that are structurally different about the North American gas market this time. First, there is the huge pull of LNG exports, as well as the pipeline exports to Mexico. Those two, together, now account for about 20% of U.S. production."

The other major difference is capital discipline. "The financial support for the upstream is much different," Weston said. "We've been vocal about that. As a result, we only anticipate 1 to 3 Bcf/d of cumulative supply growth from 2020 to 2022. We used to see growth of 8 to 9 Bcf/d per year in 2018 and 2019, mostly from associated gas. Now, just about the only incremental supply growth that is responding to prices are private operators in the Haynesville."

The net of significant demand and muted supply response is higher prices. "At present, prices are responding to the relatively low storage," Weston said. "Because of increased exports, total days of supply will continue to drop in 2022, even as we rebuild storage. Physical markets are going to remain tight. People were aware of all these factors, but I don't think many connected the dots."

Modeling weather patterns in line with the 10-year average, Raymond James is projecting domestic gas prices to stay in the $4.25 to $5.25 per MMBtu range through 2022. "Above $5, the market is partially pricing in the risk of a winter weather event. We are a little bearish versus the strip on prices at the end of the winter if we have 'normal' weather. But the bull case from a weather event could be $10, $15 or even higher. The skew is definitely to the upside."

There has definitely been a shift in capital allocation in the upstream oil and gas industry, said Devin McDermott, equity analyst and commodity strategist at Morgan Stanley. "Investors and operators had been focused on growth for at least a decade, if not longer, and that drove persistent oversupply. From 2010 to 2020, the U.S. market for natural gas doubled, but the price fell by half."

The shift in philosophy has mostly been affected by investors, McDermott noted. "Persistent oversupply had been driven by persistent overinvestment. That started to change before the pandemic, but the collapse of prices accelerated and expanded it. The focus is now on generating cash flow, return on capital."

That new capital discipline is one of the two major structural changes that will affect the gas supply equation, and thus prices, in the coming years, McDermott detailed. The other is infrastructure.

"Supply growth is coming from three main areas: the Appalachian region, the Haynesville and associated gas from the Permian," he said. "There has been a significant slowing, even a stoppage, of major transportation projects. Pipeline projects continue to be delayed or canceled, mostly because permitting is so challenging. So, there is a physical constraint on growth, especially in Appalachia."

Progress toward brownfield expansions

On aggregate, McDermott expects a modest structural increase in North American gas prices. "The last five years were a sub-$3 period," he said, "not counting weather-related fluctuations. We see the next few years as a $3 to $4 period. We don't see the recent $5 to $6 range as sustainable, the difference being mostly the fact that storage is below normal."

Against the capital and infrastructure constraints, McDermott anticipates meaningful but not massive increases in demand, mostly from LNG exports. Noting the cancellation of several plans for greenfield liquefaction terminals at the end of the first big phase of export-oriented investment, McDermott reckons

Facing page, owned and operated by Pivotal LNG, the Trussville LNG facility currently has storage of 4.8 million gallons and produces approximately 60,000 gallons per day.

BHE GT&S

that the first steps in the next phase of investment will be incremental.

"We are already seeing progress toward incremental brownfield building," he said. "Cheniere [Energy Inc.] is advancing its stage 3 expansion, supported by significant contracts from Glencore and Chinese buyers. Venture Global, the private equity-backed development in Plaquemines, La., has also gotten sizable contracts with Chinese buyers. Those are also notable because they signal strong renewed interest from China after a multiyear pause."

Other than the U.S., McDermott sees Russia and Qatar as most likely to add major LNG export capacity. He did note the two North American projects on the Pacific—LNG Canada at Kitimat, British Columbia, Canada, and Costa Azul in Baja California, Mexico—but does not anticipate those are the start of any new geographic centers of LNG.

"There is potential expansion at Costa Azul, but growth in gas exports from the U.S. into Mexico should only be modest from here. The country is close to its target for gas into the power generating sector," he said.

"You never say never, but we are modeling our LNG growth in North America out of the U.S. Gulf Coast. That is where the infrastructure and the skilled labor are."

While growth is the long-term forecast, the near-term road is likely to be bumpy. "It used to be that fuel switching was the buffer for rebalancing North American gas prices," said McDermott. "That has been notably absent in this current price cycle, mostly because of the reduced role of coal-fired generation. That is another structural change. Combined with the large volume of LNG exports, this is making North American gas prices more volatile. Global tightness now affects the Henry Hub price. That linkage is here to stay."

Producers' response to higher gas prices is definitely a matter of capital allocation, said Richard D. Weber, CEO of PennEnergy Resources LLC, a gas producer in the Marcellus Shale.

"The improvement in prices has improved rates of return on new drilling, but that is not the only thing we think about. Capital availability, investor demands, target capital ratios, the availability of infrastructure to support growth and drilling inventory are all important considerations."

Cash is king

At PennEnergy, Weber explained, "we are generating significant free cash due to higher prices, strong well performance and our continued control of costs. Over the past few years, we have targeted low single-digit growth rates and have generated strong free cash flows, which have been used primarily to reduce debt. With a total debt-to-EBITDA ratio now approaching 1x, our priority is to begin paying a significant quarterly distribution to our investors."

Given the clear growth in demand and the ability—not eagerness to be sure, but ability—of producers to meet that demand, the question

CAERUS OIL AND GAS LLC

Caerus Oil and Gas' Greater Natural Buttes asset is located near the White River in Uintah County, Utah.

GROWTH CONTINUES IN REGIONAL LNG

While investors and operators consider the next wave of deepsea LNG capacity, there is plenty of action in regional LNG, also called small-scale LNG.

In December 2020, Pivotal LNG's Towanda facility in the middle of the Marcellus Shale at Wyalusing, Pa., supplied LNG to fuel a ship at the Port of Hamilton, Ontario, Canada. That was a first on the Great Lakes and a milestone in the evolution of regional shipping. With a production of 50,000 gal/d and 180,000 gallons of onsite storage, Towanda's market includes commercial and industrial users as well as local gas utilities and power generation facilities.

Roger Williams

"Towanda was considered a toe in the pool by Dominion [Energy Inc.] for small-scale LNG," said Roger Williams, vice president of commercial LNG and gas development at BHE GT&S, a Berkshire Hathaway Energy company. "There is a better established market in the Northeast than anywhere else to sell into while new markets, like bunkering, are developed. The key market is winter peaking, given the lack of new pipeline capacity or expansions."

Bunkering is the second leg, which is done at the JAX terminal in Jacksonville, Fla., and also via truck out of inland facilities in Pennsylvania and Alabama. JAX LNG is a joint venture between NorthStar Midstream and Pivotal LNG, a subsidiary of BHE GT&S.

"Truck-to-ship is proven but is not ideal," said Williams. It's more a matter of establishing viability toward growth in both markets and permanent loading facilities to support those.

The third leg of opportunity for regional LNG is to replace heavier hydrocarbons in existing industrial markets. "That is a large but highly fragmented segment," said Williams. "There are an awful lot of propane, diesel and fuel oil boilers in the country. LNG is a much more environmentally friendly alternative and can readily be supplied by truck."

The logistics for all three legs are primarily road transport and local storage. LNG is moved by dedicated trailers that are insulated but not refrigerated. Conventional tractors are used, but drivers have to be trained and certified in operational and safety procedures. BHE has a small fleet of trailers but relies mostly on specialized third-party logistics providers.

Winter delivery to power utilities is on a contract basis for base load volumes, supplemented by spot deliveries as the local distribution companies see their summer storage depleted. Bunkering at JAX is done by a shuttle barge that is loaded at the liquefaction and storage facility and then goes to the vessel. The LNG for bunkering in Hamilton was delivered by truck and loaded via portable storage and pumping equipment.

"Ultimately more permanent facilities would be installed," Williams explained. "That could either be barge-to-ship as is done at JAX or on-wharf storage directly to ship." The latter approach is what is used at Eagle LNG in the same area.

In September 2020, privately held Eagle LNG Partners received Federal Energy Regulatory Commission authorization for a $500 million greenfield LNG export facility and terminal in Jacksonville. It will produce 1.65 million gal/d with 12 million gallons of storage. There will also be marine- and truck-loading capabilities onsite. Eagle already operates an LNG facility at Maxville, inland from Jacksonville, and a ship bunkering facility on the Crowley Marine wharf in Jacksonville.

JAX is in the process of tripling its output and doubling storage. "We are likely to expand again there," said Williams. "The marine fuel sector is very large, with long-term growth as older ships are replaced by new ones designed for flexible fuels."

Beyond that, LNG is shooting for the moon. "LNG to replace kerosene derivatives to fuel rockets is being developed by every major U.S. space operator," said Williams. "It is much more available and economical than specialty rocket fuel. The first launch using LNG fuel is expected next year."

Cape Canaveral is only 160 miles from Jacksonville, so an easy truck run down the east coast of the state.

keeps falling back to infrastructure to get molecules to market.

Considering the long-standing frustrations of producers in the Marcellus and other Appalachian plays, Weber was quite diplomatic in reiterating that "there is limited takeaway from our basin. That lack of transportation does not encourage aggressive growth."

While that situation persists, the philosophy of investors has changed. "They like to see return of capital versus growth," he added.

"We are in a maintenance-plus mode, growing our production just a few percent a year," Weber said. "Most of our colleagues, but not all, are in the same mode. That situation is likely to continue unless there is some significant change in infrastructure to enable more natural gas to be exported out of the Appalachian Basin. As producers we certainly could accommodate one or more new large LNG export facilities. There is clearly a huge demand overseas. But we don't anticipate any significant new infrastructure in the Northeast in the foreseeable future."

Detailing the inventory that would support such increased supply, Weber stated that PennEnergy has more than 1,000 undrilled locations, as well as a very low decline rate. "Our PDPs [proved developed producing] are declining at only about 14%, which translates to a very low capital intensity. We are producing about 750 million cubic feet of natural gas equivalents per year. Running less than one rig equivalent per year, we are able to grow production at about 5% and still generate significant cash flow."

Without giving away any secrets, Weber said that the low decline rates are a function of the rock PennEnergy has, specifically its high level of organics. "We also make very efficient fracs and don't pull on our wells as hard as others do. We look more to ultimate recovery than to high initial production rates."

That well efficiency extends above ground. "For us, methane emissions are not a significant issue," said Weber. "We have always considered environmental stewardship to be a core value, and for us, that includes maintaining very low methane emissions, among other things. The Marcellus Shale represents one of the largest, scalable, clean-burning resources in the world that could enable the United

In the Midcontinent, "the Rockies gas world is controlled 100% by private investors," said David H. Keyte, chairman and chief executive of Caerus Oil and Gas LLC.

States and other trading partners to meet our climate goals."

ESG verification will be a prerequisite

To provide more transparency to its lenders, investors and customers, PennEnergy has engaged Project Canary to certify each of its producing wells as responsibly sourced gas (RSG). That process is expected to be completed in the first quarter of 2022.

"An independent verification of whether a producer is producing responsibly sourced gas, such as a certification from Project Canary, will soon be a prerequisite to be a supplier of natural gas in North America," Weber said. "Those producers who can't get RSG certified will struggle."

In the Midcontinent, "the Rockies gas world is controlled 100% by private investors," said David H. Keyte, chairman and chief executive of Caerus Oil and Gas LLC. "All the public companies have left. We have good economic and environmental performance and great markets that we service."

Still, at present "we are in a no-growth mode regardless of price. The amount of hedges in producer portfolios is taking much of the gusto out of the gas price increase," said Keyte. "That is going to continue until those hedges roll off, so at least for the intermediate term. Until then, the production response to higher prices will be muted."

Even after that, there is not likely to be any great rush to turn the taps. "There is some skepticism regarding the availability of capital to the upstream," Keyte said. So, at present, "producers are restoring their balance sheets to pristine condition, and capital spending will be restrained because of the demand for distributions by investors."

The investment community sentiment and climate activist's focus on ESG are impacting companies' will to grow. "The ESG mandates from both business and government will have the effect of restricting supply growth," Keyte said. But, nonetheless, "here in Colorado, we have been under zero-emissions requirements for a while and have shown that natural gas production can occur efficiently and economically without the need for flaring."

On the demand side, "increasing exports on top of growing domestic demand are very positive for prices," said Keyte, "that is for the short, medium and long term."

When conditions turn positive for increasing supply, it will likely have to come from the drill bit. "The industry has harvested a significant number of drilled uncompleted wells over the past few years," he said. "When prices are low, that is about the only way we could add production. We've pretty well chewed through that inventory over the last year or two. What is left uncompleted at this point is probably uncompleted for a reason."

As the North American natural gas market is rebalanced, new geographic affiliations are emerging, Keyte noted. "From our acreage in the Rockies, our markets are Midwest and the West Coast. Those markets are in good shape in terms of relative prices. We are about a buck ahead of Appalachia and sell at a premium to Nymex.

"While Louisiana and Texas have access to LNG markets, until the Costa Azul project [on the Pacific coast of Mexico] comes into

JAX LNG is located at Dames Point near Jacksonville, Fla.

BHE GT&S

service, Rockies gas won't have meaningful access to LNG," Keyte said. "As of now, it does not look like the Jordan Cove project [in Oregon] is being built anytime soon, although the market exists and LNG shipments would clearly reduce emissions from India and Asia."

The fuel that came in from the cold

Natural gas "is certainly now an emphasized and interesting part of the 'alternative energy' category," said Bryan Benoit, national managing partner for energy at advisory firm Grant Thornton. "It's not as in vogue as renewable per se, but it is one of the more interesting sides of traditional energy with coal and oil. There is now a strong link between gas and power generation. As interest in ESG and renewable power grows, that will stimulate domestic and international demand for natural gas."

Getting that gas out of the ground and to market in the current environment may have new and unique challenges, Benoit noted. "Given the new administration, political influences, as well as new infrastructure factors, there are discussions at executive levels suggesting gas could go higher than it already has, testing historical highs. Look at electricity rates in the U.K., up four to five times, and the demand for natural gas across Europe may push these higher."

Across an ideal global market any such vast price differential would draw supply and stimulate production. "But global LNG is still emerging," said Benoit. "Some companies have been investing in LNG for more than a decade, but it is far from optimal, and markets are evolving. There was a time just a few years ago that it seemed there was going to be too much too soon—both in the U.S. and worldwide. Now it seems that there is not enough soon enough."

While noting that several of the major liquefaction terminals in the U.S. can add incremental throughput, Benoit cautioned that the next big wave of export capacity is not likely to be in service until the latter part of 2023.

"The entire discussion at the NorthAm Energy Capital Assembly in October was around how investment was moving toward sustainability and environment. Some speculated oil and gas companies may earn more from putting carbon dioxide back in the ground than extracting hydrocarbons. There are kinder ESG headwinds because it is the cleaner side of the business. And clearly some of the successes in LNG today are driving capital to that segment in an expedited way as well."

When major LNG export from North America was first contemplated, capital providers were concerned that, rather than realizing Asian or European prices in North America, the result would be bringing world prices down nearer North American numbers. In the event it seems that the original hopes were closer to the truth.

"The North American price is going to be closer to the global norms than where we have been to this point. The entire economies of China and India are almost all still coal-powered. If you believe that has to change, then you must believe prices will continue to climb marginally over the long term. Perhaps flaring gas becomes a thing of the past at these prices."

That represents a considerable change from just a few years ago when "it seemed like gas

"The more we rely on intermittent sources of renewable energy, the more we need a reliable power source that can step in," said Steve Hendrickson, president of Ralph E. Davis Associates. "Natural gas is the logical choice."

would be $3 forever," said Steve Hendrickson, president of petroleum engineering firm Ralph E. Davis Associates, "but I've been bullish on gas for a while. It was just a matter of when the fundamentals would turn. It was the resumption of economic growth after the pandemic."

Gas is the logical choice

It was also the renewed emphasis on renewable energy. "The more we rely on intermittent sources of renewable energy, the more we need a reliable power source that can step in," said Hendrickson. "Natural gas is the logical choice. There is a clear synergy between gas and renewable power."

In North America in particular, Hendrickson expects the current trends to continue. Notably, "there is the slow and certain death of coal. It's going away. Politicians can't save it, it's done; the only question is when we will hold the funeral." The other continuing trend is the growth of LNG in North America and worldwide.

Predictions are fraught at any time, but the middle of winter may be the worst time to try to predict short-term and even medium-term prospects for gas prices.

"There can always be spikes in winter," Hendrickson said, "but broadly, with the supply response to higher prices in the autumn, it is reasonable to expect that prices will come down somewhat."

Among all the supply, demand, logistics and pricing variables, Hendrickson suggested that one has settled into a relatively steady state: exports. "North America is sending about 11 Bcf/d of LNG over the water and about another 7 Bcf/d by pipe to Mexico. The latter is the Energy Information Administration figures for April through June. Taken together, that is about all we can expect at present. It's not like anyone is about to add 2 Bcf/d of LNG or other exports in the short term."

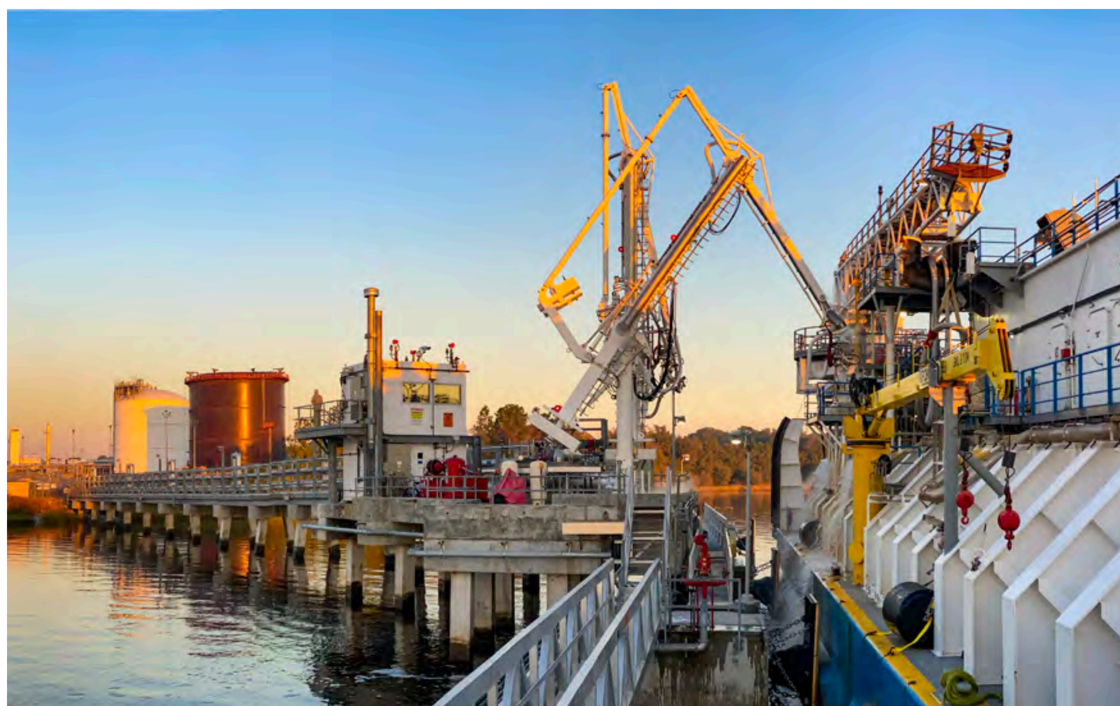
There is also some stasis in supply, at least in the East. "The Appalachians are producing about 34 to 35 Bcf/d," said Hendrickson. "Most of the capacity in that region was installed in the 2010s, and we are now starting to crowd it. There is maybe another 10% to go."

Hendrickson sees a similar dynamic in other regions, mostly governed by the shifting economic model upstream. "It seems obvious that the lease-drill-prove-sell model could not last forever. And sure enough, operators drilled themselves straight off the cliff. But the industry has regained capital discipline, and at some point, prices are going to become so good that operators will pick up rigs again."

That next phase of expansion has a chance to be sustainable, said Hendrickson, "as long as there is no pressure to prove and turn acres. There does not seem to be at present. Quite to the contrary, there is a greater concentration of acreage these days which could make production growth more measured."

There is also an understanding, he added, even an appreciation, that governance matters. Most sources noted that multiple studies have confirmed how operators with robust environmental compliance, sound governance and high safety performance are consistently more profitable than competitors that are not.

"ESG metrics and pressures are having an effect," Hendrickson explained. "Acreage and production is being concentrated in the hands of larger companies that are subject to greater scrutiny. That is especially true of the publicly traded ones. It also applies to operators owned by the big private-equity firms because much of that money comes from pension funds and university endowments. Most of those now have ESG mandates, and that works its way down the food chain." □



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EXECUTIVE Q&A

DEVON DIALOGUE: THE PROMISE OF THE PERMIAN … AND BEYOND

Devon Energy's executive vice president and COO, Clay Gaspar, says the merger with WPX Energy put the newly combined shale giant in a position to build a business that is focused on growth and able to generate significant free cash flow.

INTERVIEW BY
LEN VERMILLION

It's been roughly a year since Devon Energy announced the $5.75 billion all-stock combination with WPX Energy. Clay Gaspar, the company's executive vice president and COO, who made the move from Tulsa to Oklahoma City due to the merger, said everything is coming along nicely but that a combination of such magnitude takes time if you want to get it right.

The merger was one of the first to be announced in late 2020, when most industry watchers were keeping an eye on the inevitable consolidation shale E&Ps following the demand distress and price perils of 2020. The combination of WPX and Devon made the new company even more of a power player in the Delaware Basin, where it now holds approximately 400,000 net acres.

Following his keynote address at the Executive Oil Conference in Midland, Texas, in November, Gaspar gave Oil and Gas Investor *a one-on-one extended interview to explore the merger, Devon's future direction, its cash flow priority, the energy transition and carbon capture possibilities.*

Investor One year into the merger, have you realized the opportunities that were envisioned?

Gaspar What we do is challenging, complex work that affects people, companies, investors—all stakeholders. There are a lot of

moving parts and we are taking the knowledge from both legacy companies and looking for the best opportunities.

We blended the two companies from the board level, all the way through the organization with high expectations of extracting the best ideas from both organizations.

Investor Of course, the merger creates a dominant Delaware position now for you. What kind of value does that combo now create for Devon in the Delaware?

Gaspar We're a 600,000 boe per day organization, and about two thirds of that comes from the Delaware Basin. Certainly, with the price realizations and commodity prices today, it's a tremendous cash-generating business, which was ultimately one of the five criteria we set out before the merger.

A sustainable business model of generating free cash flow and a multifaceted ability to return that cash to shareholders are core attributes of our business strategy.

"As long as we're exceeding the cost of capital, we're doing what the investor is ultimately asking for. And that's beneficial to our business."

Investor You mentioned prioritizing free cash flow over production growth [at the Executive Oil Conference]. We're in the days of free cash flow; the days of just producing that in cost are gone, but why is that?

Gaspar I hear people use the phrase 'produce at any cost,' but I challenge that sentiment. Not that long ago investors placed a premium on companies that had a growth trajectory. That's what they wanted and then rewarded growth with higher share prices.

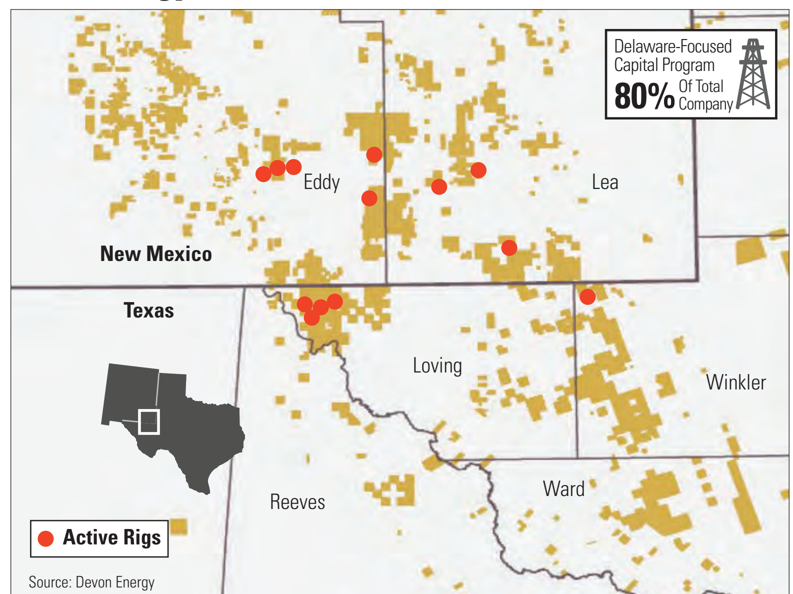
Companies were incentivized to grow production, not at any cost, but definitely with a growth mindset. That way of thinking about growth and capital spend was beneficial to the near-term business, but as production outpaced demand, prices fell and the investment in growth destroyed value.

The external challenge and pressures have changed. Now, investors want to know how we will generate sustainable cash and then return it to shareholders rather than pouring it all back into the business. This quarter, Devon announced a share buyback in addition to our fixed-plus-variable dividend—both are phenomenal shareholder return mechanisms. We are also focused on paying down debt, and are in exceptionally good shape there.

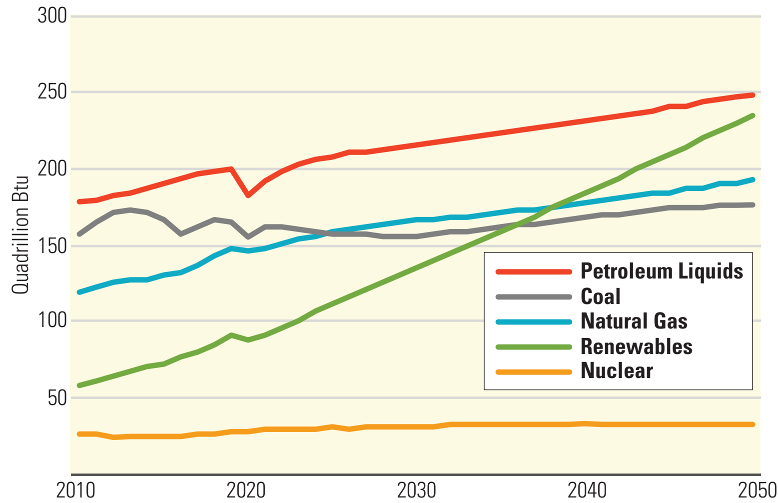
Investor Seventy percent of your assets are in the Delaware Basin. What are your expectations outside of the Permian?

Gaspar On our Q3 earnings call [on Nov. 3], we highlighted our other basin activities as well. For example in the Anadarko Basin, we have a joint venture with Dow Chemical and have seen a lot of success. Dow is very encouraged and see investing in oil and gas as a

Devon Energy's Delaware Basin Assets



Source: Devon Energy



Source: U.S. Energy Information Administration

natural hedge to their business costs. They're carrying about a $100 million of our well cost, while earning about 50% of 133 wells that we drill. This JV is allowing us to invest more in the basin, and is providing great returns for Devon and Dow Chemical.

We also have great positions in the Williston and Powder River basins and in South Texas. While these basins don't get a lot of airtime right now, they are critical to our strategy and we'll be talking about them more in the future.

Investor The projections for oil and gas are that it's not going anywhere anytime soon. What's your take on the numbers on consumption and source transition? How do they affect how the industry, and how Devon should plan its future?

Gaspar I think people, especially outside of the industry, think we should hang up an 'out of business' sign, but I don't see it that way. The world as we know it today and far into our future cannot exist without oil and gas, but that's not a free pass for us. We do need to get better at providing energy with less impact on the environment, and we will continue getting better. I love a good challenge.

We also need to be thoughtful in our investments. We need to honor the wishes of our investors that ultimately own our company. At the same time, we need to provide energy to fuel the world.

Investor What is your transition, your emissions strategy?

Gaspar Here's what we're going to do. Top of the order is reducing emissions, overall. It is the biggest opportunity for us to materially move the needle and answer some of the challenges that we have. I'm not shying away from the fact that, in any business, in any industry, there are negative byproducts. We are working to minimize the negatives and still deliver on the very significant positives.

Investor We talked a lot [at the Carbon Management Forum at Executive Oil Conference] about carbon capture and sequestration. Any thoughts on those?

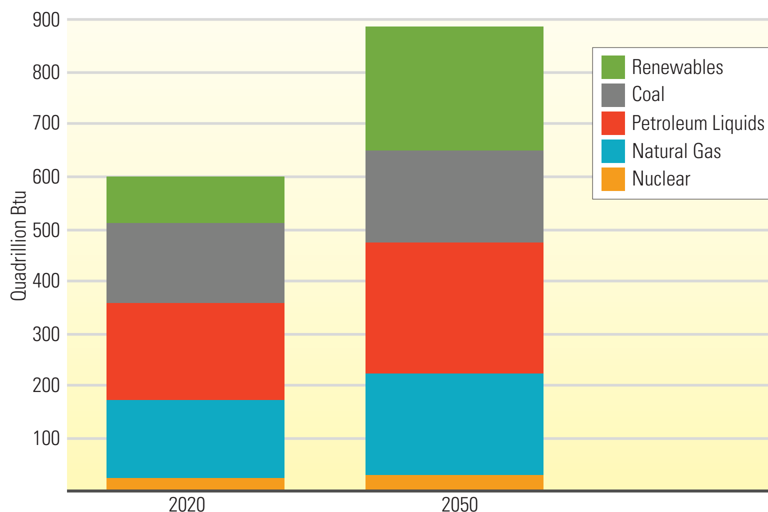
Gaspar I'm very excited to see how the technology evolves. Two of the challenges with carbon capture are concentration and pressure. If you can find a pressurized stream that is highly concentrated, then the challenge becomes subsurface, and subsurface challenges are more similar to gas storage.

There are a lot of smart people, companies, and dollars chasing this. I'm very encouraged with the R&D work that's being done right now, but as an organization, I don't see anything that I want to lean into from a significant investment standpoint.

Investor You have said it's very important to address the values for long-term success. Can you expand?

Gaspar I'm very passionate about values, and I think too often they are thought about, created, put on the website and quickly forgotten. As I get opportunities to speak to internal and external audiences about our corporate values, especially as a new organization, I think it helps reinforce those values.

As a relatively new company coming together, it's so important that we repeat them as often as we can. I love when a leader, and that could be anyone in the organization, puts the values into their own context and perspectives when they communicate. It gets me fired up. □



Source: U.S. Energy Information Administration

“IT IS IMPORTANT TO BE PRESENT AT NAPE AND KEEP THE INDUSTRY RELATIONSHIPS VIBRANT AND RELEVANT.”

— SCOTT NOBLE
CEO and president, Noble Royalties Inc.

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WHERE'D THE BILLIONS GO?

Based on a first-hand survey, private equity and debt providers were asked to describe their investing interests and capacity then versus now. Here are the results.

ARTICLE BY
CAMERON SMITH

"People interested in investing in hydrocarbons these days are those most contrarian," said Peter Leidel, founding director, Yorktown Partners LLC.

You've heard it everywhere: "The upstream sector of the oil and gas industry is being canceled by institutional investors; I've never seen such good opportunities to buy and drill, but there's no capital to pay for it; grandchildren of Momma Cass are singing, 'Where has all the PE gone, long time passing?'"

Oil and Gas Investor heard you and asked COSCO Consulting LLC's Cameron Smith, who helped introduce private equity (PE) to the oil industry and put together the first conferences on PE and energy investing, including Hart Energy's Energy Capital Conference, to conduct a survey on PE's attitude toward investing in the E&P space and interview many of its leaders to find answers to just these questions.

Between the middle of September and early October 2021, the survey was sent to capital sources that characterized themselves as a PE or debt provider who have an interest in E&P. Out of some 125 entities, 19 responded to the survey (which in and of itself may be a partial answer to the email's question).

Fortunately, the survey incorporates a good cross section of large and small private equity providers, specialists in energy, as well as general investors headquartered in the East, in Texas and even Canada, and a few that have added or switched entirely from conventional energy to investing in alternative energy, transition businesses or companies that provide ESG services.

The respondents to the survey have as few as one to as many as 15 active funds, with capital originally raised from $70 million to $42 billion. The amount currently available for new investments ranged from $25 million to $7 billion and for support of existing portfolio companies from $0 to $2 billion. (This last number, due to proprietary concerns, was the question most often left blank in the survey.)

Shrinking investor base

The survey found that all respondents agreed that it is far more difficult today to raise capital for upstream investments than it was three years ago. Part of that observation, however, appears to depend on what types of institutions a fund manager has typically raised its funds.

Peter Leidel, a founding director at Yorktown Partners LLC in New York, said that fewer college endowments, foundations and public pension funds are now investing in upstream, while he's seeing more investment from insurance companies and family offices.

"Most LPs that have been in the E&P space for the past decade are fed up with losing money," said Wil VanLoh, founder and CEO, Quantum Energy Partners.

Wil VanLoh, founder and CEO of Houston-based Quantum Energy Partners, agreed. "Endowments and foundations in general are now anti-hydrocarbons. Ten to 20% of limited partners [LPs] are taking the position that upstream is a verboten asset class," he said. "Others, [such as] corporate pension funds, high-net worth and national investment funds, are a mixed bag.

"ESG has been the excuse to drop hydrocarbon investments, but, really, it's a function of their financial returns. When a bunch of people lose money, it turns everyone off."

Jonathan Farber, co-founder and managing director of Houston-based Lime Rock Partners and Westport CT, attributes much of the movement away from oil and gas to the influence of politically motivated decision makers on the public institutions' boards as opposed to their professional investor staff. These individuals tend to be unaware of the underlying impact and importance of oil and gas versus alternate energy sources, he noted. These classes of investors, many of our respondents noted, are driven by emotions and reactions to what they hear on television, see in the movies and learned in school.

As Jim Hutchison, president of Allegro Capital in Calgary, Alberta, summarized: "The sober side is just plain crazy! Did you see the Wall Street Journal article about problems in Europe? We could have $100 oil this winter! The Whitecaps, Tourmalines and Enerpluses in Calgary are cash flow machines. Even so, there's no public money, and most of the local PE shops have closed down."

ESG concerns

Sophia Friese, head of ESG at EnCap Investments LP in Houston, said, "LPs have been focused on ESG for a while. Questionnaires from LPs have asked about our ESG practices for years, but the industry's recent macroeconomic challenges have increased focus on ESG concerns. Good returns and ESG performance will draw investors back.

"That's one of the reasons EnCap feels the upstream business is so exciting," she said.

Another reason for the surge in ESG concerns is politics. Leidel emphasized the obvious: "Under Trump, energy independence was acclaimed as a huge achievement. Under Biden, we see a 180-degree difference. Biden's doing all he can to discourage the production of domestic hydrocarbons. Next year's elections could flip all of this back around.

"We're in business to make money for our investors," he said. "Whatever we invest in must make economic sense. We can't afford virtue signaling, investing for ESG points. Politics change. When gasoline goes to $4 per gallon, you bet there'll be a blow back. We're already seeing this in California, Germany and France."

People interested in investing in hydrocarbons these days are those most contrarian, according to Leidel.

For example, Pontem Energy Capital, managed by Jeff Bartlett in Houston. Pontem Energy has a single, evergreen investor, an undisclosed $50 billion hedge fund in New York City, which, he wrote, "considers ESG concerns and effects as creating opportunities for even greater and more attractive investment in upstream oil and gas."

According to Bartlett's response to the survey, Pontem has a call on up to $1 billion, which can be used for either new or to supplement existing investments.

What else is behind this crescendo in ESG concern? "Go to Google or any of the social platforms," another respondent to the survey challenged. "I defy you to find a single

article that says anything positive about fracking and natural gas' contribution toward lowering our U.S. carbon emissions." The same person asked, "When was the last time you heard a child come home from school talking about the benefits of the oil industry or watch a thriller where the arch villain wasn't an oilman? 'Dallas,' anyone?"

The point this respondent is making is that the educators, the media, Hollywood and now Big Tech have all teamed up to destroy the hydrocarbon business, and the children that started imbibing this 20 years ago now rule the roost.

But will this attitude last? Tym Tombar, managing director of Arcadius Capital Partners in Houston, wrote, "Many of our historically supportive LPs have moved on from upstream oil and gas. It has been easy, given our sector's relative performance and the headline risk around climate change. But returns will change that. Upstream will become too solid to ignore."

He and many others point to the allure of the oil and gas industry's pending financial future to woo back institutional investors, a claim contested by David Leuschen, co-founder and senior managing director of New York-based Riverstone Holdings LLC.

"Even if field-level economics turn around, investors will have muted responses, due to bad financial returns and ESG concerns. Lots of traditional investors have committed not to invest in hydrocarbons," said Leuschen.

Mark Teshoian, managing partner and co-head of Kayne Energy Private Equity, on the other hand, sided with Tombar. "The world at large is very unaware of, and unprepared for, the consequences of this [ESG] attitude. They're already manifesting in Europe/Asia."

Teshoian said he believes that "shocks to the system will cause investors/policymakers to wake up." He admits that the current environmental trend is necessary, but, he added, "the energy transition needs to be done in a responsible way. Wholesale abandonment of fossil fuels will create real problems, which may result in more resistance to the energy transition movement.

"We certainly don't want the solutions to be worse than the perceived problems."

Let's unpack all this. There is no contesting that a big part of why institutional investors have shied away from investing in hydrocarbons is the dreadful financial performance these investments have provided over the past half-decade or so.

Quantum's VanLoh said in his interview that financial returns for the industry have been bad since 2005.

"The industry since then has been a horrible steward of capital. As a consequence, capital available for investment in the industry is down 75% or more from just five years ago. Most of the large generalist funds are now out of this sector," he said.

"The decision to get out came from the very top because management was tired of being criticized by their investors for the drag their energy investments were having on overall returns. Most of these generalist funds had stubbed their toes badly on energy investments, mostly because they didn't monetize fast enough. They thought they were building companies of scale to take public, but both the rocks and the markets failed them. Even many energy-only funds, particularly the larger ones, were caught by this same failed strategy, and many of them are out of investors."

Lime Rock's Farber had a different take. He believes the reasons the industry performed so badly over the past decade is that the shale play disrupted global precedents.

"Normally, when a new source of supply comes on, prices don't change for some time. New shale technologies, however, drove costs down precipitously, while bringing on world-transforming supplies of both gas and oil. The industry became the victim of its own success; increased supplies disrupted the glide plane of high prices," Farber said.

"On the micro side, as public markets bought into shale, PE flipped quality rocks into the hands of public companies. PE then moved to the basin margins, attempting to force a value step-up. The expectation was that drilling and completion technologies would continue to improve. Ultimately, however, the cumulative effect on supply lowered prices at a rate that outpaced the benefits of lower costs.

Jonathan Farber, co-founder and managing director of Lime Rock Partners, said he believes the reasons the industry performed so badly over the past decade is that the shale play disrupted global precedents.

"LPs have been focused on ESG for a while," said Sophia Friese, head of ESG at EnCap Investments LP.

Pontem Energy Capital managing partner Jeff Bartlett said the company's investor "considers ESG concerns and effects as creating opportunities for even greater and more attractive investment in upstream oil and gas."

"Cynics say that these plays were never economic. Not true! The industry performed way too well. Sure, some plays didn't work out, but many did," he said.

Upstream investment opportunities

Given all this, what does PE think of current and future opportunities in upstream? According to the survey, more than 75% of respondents think global demand for natural gas will be "significantly" higher 10 years from now, while 50% of respondents said they expect global oil demand and WTI pricing for oil also to be higher in both five and 10 years.

"The more intriguing trend is the muted North American supply response, due to capital discipline and the 'no growth' mantra among public companies," Andy Evans, managing director of ARC Financial Corp., wrote in his survey response.

This is something many of the respondents have remarked. As Farber said, "At $70/bbl oil, the industry would normally have 2,000 rigs working. Now, there are only 550. This is way off! There are, of course, some legitimate reasons: less opportunity to drill in A-level shales; rigs are more efficient; and the industry is maintaining a very high level of discipline in terms of distributions versus drilling. But this muted response will have consequences. It appears production this time around is going to take a long time to ramp back up." For Lime Rock, this is the allure of getting back into the upstream, right now. "The five years of bad returns ended nine months ago."

VanLoh agreed, "This is a fascinating world—I've never had a story so good to tell and so hard to sell! The industry can't turn this around quickly. For the last seven years, we have massively underinvested in the business, and, consequently, the supply side is suffering. At $2.75/Mcf gas and $65/bbl oil, we are minting money in shales.

"Both last year and this year, we have had some of the best field-level economics ever. We feel the macros today are the same as in 2000 to 2003. Commodities tend to move in 10- to 15-year cycles. Gas has already been in its cycle for 13 years; oil for seven years. Less than 15% of oil comes from shales. Conventional oil plays take five to 10 years to come online," he said.

"Most of the majors are becoming—forced to become—utilities. No reversal soon. This is the first time in history that the markets are sending signals by raising prices, and the industry is not reacting. The market isn't reacting. If you have assets, if you can raise capital, you have huge tailwinds. If you're a consumer, you have huge headwinds. Comeuppance is a-coming!"

"Many of our historically supportive LPs have moved on from upstream oil and gas," said Tym Tombar, managing director, Arcadius Capital Partners.

What PE wants

So, what is PE looking for? According to the survey, 75% or more of the respondents are looking to back teams who are pursuing acquisitions (versus drilling, which scored below 50% interest), and the percentages get even higher the closer you are to having a specific deal under contract (or at least to talk about). On the other hand, 90% of respondents weren't interested in LNG or the oilfield service sectors.

In terms of structure, the vast majority of respondents continue to favor investment through common stock. PE is showing far more flexibility now than in the past; however, with over a third of respondents reporting they are significantly more likely to invest through partnerships or joint ventures than through C corps—a big change from a decade ago.

Uncertainty about monetization of investments has been a drag on fundraising, according to Michael Keener, CEO and president of KP Energy Management.

So, what do our respondents see as the prospects for exits in today's markets? More than 75% see no opening in the IPO market, at least not as an option on which they can count. Sell to another private company or sell/merger with a public company were anticipated as likely exits by more than 60% of those who responded. The avenue deemed by 75% of respondents to be the most likely, however, is "free cash distributions and asset sales," which is a major shift from the last generation of PE and corroborates the trend in current PE toward real-time return of capital to their LPs.

Kayne's Teshoian cautioned, "Hiring an investment bank and selling assets works for small- to medium-size packages. It's much more challenging if you have sizable assets. You have to be more creative about how to exit. IPOs are more challenging now. Some companies like Vine [Energy Inc.] and Indigo [Natural Resources Inc.] have elected to merge with a public company. Most of Kayne's businesses generate a lot of cash flow, so we don't have pressure to sell anytime soon."

What other lessons are PE managers drawing from the dark days not long past? "Most LPs that have been in the E&P space for the past decade are fed up with losing money," VanLoh said. "Three out of four energy-focused funds they invested in have performed abysmally. Poor returns plus volatility are an LP's nightmare! But if one hedges appropriately and uses little debt, E&P doesn't have to be volatile." So that's one big takeaway.

Many PE sponsors, such as EnCap, are also adopting ESG practices.

"ESG principles have been a priority for EnCap over the course of our history," said Friese. She noted that EnCap has had a formal ESG policy in place since 2012, and ESG matters are discussed at quarterly board meetings. "This just makes good business sense, as a good ESG record increases the likelihood of achieving the highest value at exit.

"Not only is it the right thing to do, but it helps us remain aligned with our investors," she said.

Teshoian added, "ESG is a major and growing issue among our investors." He said Kayne has focused heavily on environmental issues for at least the past six to seven years. Like EnCap, it has a dedicated ESG manager and

coordinates ESG-related activities among all its portfolio companies. Kayne also conducts an ESG conference with its portfolio companies, where ESG best practices are presented and discussed. "There is no doubt that ESG issues will continue to constrain capital available to energy-focused PE," he said, but "it's as much climate change concerns in general, not just ESG."

Of course, another consequence of investors' interest in ESG is a shift by the managers themselves, either to add ESG investments to existing funds, add ESG funds to their stable of funds or to abandon raising new hydrocarbon funds entirely and segue to becoming solely an ESG investor.

Raising funds

Fifty percent of our respondents stated they were "significantly" to "very" likely to raise a new hydrocarbon fund within the next two years. Twenty-two percent of them indicated similar likelihood that within the same time they would also raise an ESG-focused fund. Another 16% reported their intent to raise an ESG fund in lieu of their usual hydrocarbon fund, which clearly indicates the strength of the sector in the eyes of traditional PE.

One of the most assertive in this last group was Riverstone's Leuschen. The company is raising a new fund, he said, all about decarbonization, hydrogen, electric vehicles, batteries and the greening of fossil fuels.

"ESG is good business," Leuschen said. "We're now at clean energy version 2.0, and this provides very attractive business opportunities. None of this is solely altruistic," he said. Leuschen's claim is that he can use Riverstone's experience in conventional energy, plus the firm's own 15 years in renewables, to make attractive investments and create flagship decarb companies.

The new role of Riverstone is "to build post-petroleum companies that materially benefit the decarbonization process," he said. The company intends to invest heavily around electrification of transport, grid flexibility, agriculture and next horizon resource plays (low-carbon jet fuel, hydrogen). Leuschen asserts with a certain amount of passion that Riverstone's investments will "move the needle in cutting down carbon use."

Leuschen noted that Riverstone has been a prolific issuer of special purpose acquisition companies and pipes, having raised $2 billion during the past 12 months, all for investment in the ESG sector. He also said that since COVID-19 began, Riverstone has raised $1.5 billion in two fund-continuation vehicles, which seek to buy decarbon-based companies out of the portfolios of Riverstone's maturing funds, thus giving its investors the chance to cash out or roll forward their ownership in these decarb businesses.

Yorktown is approaching ESG somewhat differently. According to Leidel, Yorktown already has a renewable fund with six or seven smaller investments, mostly involving battery storage. He added that Yorktown has a couple companies looking at carbon sequestration with projects already identified. Most of this is social license, he admitted, but some are economic on their own.

"Every big company today wants to have a signature green project that it can point to." But Leidel's conclusion is that "renewables end up being power, which ultimately gives rise to utility-type returns (high single digit). Therefore, renewables are a challenging sector for PE–except strictly in niches."

Almost all the respondents to the survey included some interest in ESG investment strategies. Cited were growth equity investments in transition businesses, including renewable development, renewable services and manufacturing; transition/CCUS; upstream with carbon capture or ESG overlay; solar, wind, geothermal and storage; and downstream and low carbon energy infrastructure opportunities.

Teshoian had a slightly different take. "Kayne is planning on investing in upstream companies for the foreseeable future. It's simply not good policy for the world to abandon E&P. It will create enormous supply shocks that will negatively affect the economy and generate public backlash.

"Also, the concept of divestiture is very misguided. Majors have bent to public pressure and started divesting of fossil fuels. However, these assets don't magically disappear. It's far better for investors to work with companies to reduce emissions in existing assets than to sell them to companies where there is less transparency," he said.

"While we will continue to invest in upstream, we are also looking at investing in transition businesses, like carbon capture and sequestration, water handling and service businesses that help to plug and abandon orphaned wells. These types of transition businesses fit Kayne better because they operate closer to the upstream business, which is our core competency."

ESG is clearly having a huge effect on the capital that is available to the upstream oil and gas sector and on those PE firms who are smart, good or lucky enough to continue to attract it. It's also having an enormous influence on how that capital is being deployed and how it is being monitored and reported. And, as the surveys found, it has both ardent champions and realists who consider it simply a license to operate. As VanLoh put it, "Everyone soon will have an ESG score, and it will determine who survives!" □

Cameron Smith is the founder and manager of COSCO Consulting LLC. During his 46-year career, he spent the first 15 in the oil industry as an independent producer, the next 20 building COSCO Capital, an investment bank that pioneered line-of-equity financing from private equity for oil and gas startups, and eight of the last 11 as a senior adviser to the energy group at Warburg Pincus.

"Even if field-level economics turn around, investors will have muted responses, due to bad financial returns and ESG concerns," said David Leuschen, co-founder and senior managing director, Riverstone Holdings LLC.

"Wholesale abandonment of fossil fuels will create real problems, which may result in more resistance to the energy transition movement," said Mark Teshoian, managing partner and co-head, Kayne Energy Private Equity.

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TEXAS A&M STANDS UP ANOTHER NEW PROGRAM

Killam Oil Co. and many industry supporters are making a big impact in Laredo, Texas.

ARTICLE BY
LESLIE HAINES

When oilman Cliffe Killam looks out the window of his office in Laredo, Texas, what he sees across the street is the future unfolding before his eyes. There, he sees the buildings of Texas A&M International University (TAMIU), where a new petroleum engineering program he helped start is underway. It was born in April 2020 when a Texas board approved two new degrees, one in petroleum engineering (PE) and one in computer science. The first PE students, 18 of them, were enrolled this year.

"Not too many new PE programs have been created recently. This is something I've worked really hard on, as well as the university staff, to get it approved," Killam said. "Before, they had a few students who could get a general engineering degree but with just a certificate in petroleum engineering. Now they're able to get a full degree."

The first students will graduate in spring 2022, under the aegis of four full-time professors. Application for full accreditation of the program is underway. It's good news for the industry but very important for this area of South Texas, which is mostly Hispanic and has been underrepresented in the sciences and petroleum engineering.

TEXAS A&M INTERNATIONAL UNIVERSITY

These petroleum engineering students at Texas A&M International University in Laredo, Texas, take advantage of the latest engineering software.

"These kids have a strong work ethic and just need the opportunity," said Cliffe Killam, president and CEO, Killam Oil Co.

"TAMIU is experiencing an incredible transformation with enrollment, and the need for research infrastructure continues to grow. There are operators and petroleum companies nearby TAMIU and in South Texas. Graduates from TAMIU's petroleum engineering program will be greatly benefited by providing petro-professionals for the existing petroleum industry," said Fatick Nath, Ph.D., the assistant professor of petroleum engineering in the School of Engineering, College of Arts and Sciences, who heads up the new program.

"TAMIU already has several laboratories—drilling, production, reservoir, formation evaluation, etc.—in place to support the petroleum engineering program with extensive commercial software, supported by dominant petroleum companies," he said. "We are open to collaborate with industry. We are almost done with establishing our five teaching labs."

Industry is willing to step up for the new program. At press time, Schlumberger Ltd. agreed to donate most of its commercial software (for drilling, reservoir, production engineering, fracturing, data management, petroleum economics), for which the equivalent price is $80.8 million.

A group of community leaders, the Killam family and EOG Resources Inc. raised $2 million in about a month, Killam said, to get the initiative started. This involved lobbying the state legislature and state education boards for final approval, which came in 2020, a bright spot in an otherwise epic year for negative news in the oilpatch. In Killam's favor was the fact that he already had a good relationship with John Sharp, the Texas politician who was chancellor of the Texas A&M system at the time, and who was very supportive.

"There were some roadblocks along the way," Killam recalled. "When the price of oil dropped and things were pretty miserable, everyone was saying oil and gas is dead anyway, so why bother? But I'm still very bullish about the future of hydrocarbons, and I think there will be lots of job opportunities. I'm proud to offer this educational opportunity to bright young people in South Texas."

Planning for the long term is like second nature to Killam, who helps runs his family's oil and other business interests in Laredo as president and CEO. This attitude has permeated the family culture ever since his great-grandfather, Oliver Winfield Killam, founded the company in 1919.

The family has also been supportive of higher education for many years. It donated about 300 acres to the university in the past, back when it was known as Laredo State (it became part of the A&M system in 1993). Killam's parents, Radcliffe and Sue, were board members of the old University System of South Texas from 1979 to 1986, and Sue was also on the advisory board of the A&M's Chancellor's 21st Century Council of Advisors.

Cliffe served as an adjunct professor in the past before the formal program was approved, and he helped create an oil and gas accounting certificate. He also taught business law alongside an oil and gas attorney friend of his.

This education commitment is a way for the family to pay back its good fortune. It started when Killam's grandfather found production in this part of South Texas. The elder Killam sold those assets eventually and restarted, this time by going out on his own, buying his own leases and other interests—a common strategy for independents to this day. In 1924, for example, he sold production to Magnolia Oil Co., a forerunner of today's Exxon Mobil Corp. Ever the wildcatter, the elder Killam also drilled what was, at the time, the world's deepest and hottest natural gas well, with the forerunner of Exxon.

"I grew up as a kid hearing stories from my father and grandfather," Killam said. "One lesson is that there are multiple perspectives. We've been able to be critical and look at this with a long-term perspective." That means long-term thinking for oil and gas but also for education that helps create a brighter future for

TEXAS A&M INTERNATIONAL UNIVERSITY

young people in this part of Texas, where immigration and poverty create challenges.

The family businesses, which also include ranching, investments and commercial real estate, are fairly conservative or even defensive, he said. They harvest assets when it's prudent, always setting aside money for a rainy day.

Now, Killam has been instrumental in starting to pass on those lessons to a new generation, by helping to establish and fund the new petroleum engineering program at this branch of Texas A&M University. "I sat down with the previous president of TAMIU (now retired) and told him there was this new thing called the Eagle Ford Shale, and it was going to be big around here. I thought we were going to need more petroleum engineers based right here in South Texas," Killam said.

"I spoke to the president of A&M about this idea as long as eight or nine years ago," Killam said. "We had seen the Eagle Ford play happening in South Texas, and we knew we would need more petroleum engineers based in Laredo and Cotulla."

Killam helped raise the funds for the new program, and in every session of the Texas legislature, he would travel to Austin to advocate for the new university. This effort fits in well with his long-term thinking.

Momentum

Momentum has been gathering since then. A new engineering building opened on the campus in 2020, incorporating several other engineering disciplines, and now it includes petroleum engineering as well. The school now offers reservoir and production engineering, petroleum economics and petroleum engineering capstone design, which is the field project required of seniors.

In May 2021, the Killam Family Foundation donated $1 million to endow a PE professorship. In October 2021, Petex Petroleum Experts Inc. (Petex) donated $3 million worth of its latest software to the program, so students can get hands-on experience in the state-of-the-art computer lab at the school. The software enables juniors and seniors to model oil and gas production systems: subsurface reservoirs, producing wells and the affiliated surface network. Halliburton Co., Schlumberger and other service providers have also donated software licenses.

INDUSTRY SUPPORT BUILDS

Guest lectures this year:

- Exxon Mobil Corp., on shale engineering.
- Drilling Systems, on a comprehensive overview of the functions of the DS 5000 (basic) Rig Floor Simulator.

Donations:

- **Killam Oil**: For a new petroleum engineering professor. ($1MM)
- **Halliburton**: 15 student licenses for its frac modeling software, GOHFER. ($180,000 value)
- **Petroleum Expert Ltd. (Petex)**: 10 educational licenses of its Integrated Production Modelling Toolkit (IPM suite). ($3MM value)
- **Schlumberger Ltd.**: Its drilling, production, reservoir engineering educational software. ($80MM value)
- **Kappa Engineering**: 25 licenses for its well-test analysis software ($1.25k value)
- **Rock Flow Dynamics (RFD)**: 10 licenses of geomodeling and reservoir simulation software, t-Navigator. ($1.8MM value)
- **Neuralog**: 10 licenses of the 'Neurolog Pro' packages for well logging and formation evaluation. ($600,000 value)

Source: Texas A&M International University

Although well grounded in South Texas culture, Killam has a diverse background that has allowed him to range far and wide from his South Texas roots and appreciate how much a good education can do to elevate a person's life. He went to boarding school in Connecticut, then took a degree in English literature at Boston University. He returned to Laredo after that and was paid minimum wage as an oilfield laborer for about a year. He left again to get a master's degree in energy and mineral resources at the University of Texas at Austin and to earn an MBA as well—he was the only liberal arts grad in the energy program, he noted. His thesis, written in 2005 before the shale revolution took off, explored the growing importance of natural gas to the U.S. economy.

Later, he worked as an analyst at research firm Wood Mackenzie and for the London-based Harrison Lovegrove & Co., doing international M&A advisory assignments.

Armed with these varied education and work experiences, he returned to Laredo in 2011 to rejoin the family businesses, where he remains, working closely with his father and brother.

Killam's experiences informed his decision to help create TAMIU's new PE program offering a Bachelor of Science.

"I don't see the industry going away in 2030 or 2040. Things may be different, but that doesn't mean there won't be a need for hydrocarbons. The energy transition is going to take some time. There will be opportunities along the way for people to evaluate, such as solar, but it's going to take multiple generations."

Killam said he is proud to offer this new opportunity to kids in South Texas, many of whom come from families without means. The TAMIU experience is a marriage of the petroleum business, job opportunity and education, all values the family holds dear. □

"TAMIU is experiencing an incredible transformation with enrollment, and the need for research infrastructure continues to grow," said Fatick Nath, the assistant professor of petroleum engineering in the School of Engineering, College of Arts and Sciences.

OIL AND GAS ACCOUNTING:

A WINDING ROAD OF QUESTIONS AND CONSIDERATIONS

From taxes to carbon credits and impairments to divestitures, these are the questions our accounting roundtable panelists have heard the most in 2021. Here are their thoughts on the matters at hand.

As 2021 comes to an end, financial officers at oil and gas operators are hunkered down preparing for year-end reporting. They're also gearing up for tax season. Like 2020, this year was another strange journey in the life of oil and gas producers. So, how to make sense of it all? More importantly, how do you document it, report it and ensure you're making the right decision for the bottom line?

We assembled a group of certified public accountants (CPAs) working with oil and gas clients for an outside opinion. In this first part of our two part series—look for part two in the January issue of Oil and Gas Investor*—our panelists and guest moderator take a look at the pressing questions you'll have to deal with when it comes to year-end reporting, taxes, disclosures and more.*

Panelists:

Kristie Ondracek
CFO/COO
TXCPA Houston
(Moderator)

Heather Bain
Managing Member
Bain CPA Business Strategies, LLC

Mohamad Al-Kawafha
Audit Principal
Briggs and Veselka Co.

Leslie Warren
Deals Director
PwC

Kristie Ondracek (moderator) What accounting issues are you discussing with your clients, current for year-end reporting? We're in the fourth quarter, and people are starting to prepare for year-end.

Mohamad Al-Kawafha Technically, I've been asking them how all the changes related to COVID-19 are impacting them. For example, what they did for internal control since we are now in the second year. So, hopefully, they have a system in place.

Hopefully, we [are] not going to have delays. They have to be prepared if we have a shutdown or everything is closed. The way I'm looking at it is about all the macroeconomic factors that related to COVID-19. How are they going to deal with the federal government versus the state government laws? How will it impact their financials?

Talent retention, how they're coping with that inflation? Is their impact in their industry or not, or a specific segment? Do they have pain if it's causing any delay to their clients?

Heather Bain Primarily we have been discussing the disclosures on funds, such as PPP [paycheck protection program] loans; the forgiveness of the loans and that sort of status we're reporting as far as where funding came from. The upstream within oil and gas lending has been very tight.

If there needs to be any funding through a lender, that needs to be disclosed. Also, anything that the lender may want to see in the year-end financials that would help with the lending process and loan compliance.

We're looking at those disclosures right now. Also, of primary concern in the oil and gas upstream is the basis of pricing for reserve valuations because we've seen such a huge fluctuation in the last year-and-a-half in oil and gas prices.

From negative pricing all the way up toward 80-something dollars a barrel, it's so uncertain what the future pricing will be. This has made the reserve reporting is much more difficult. Those issues are getting a lot of attention right now.

Leslie Warren I would echo what Mo and Heather both said. What I focus on, and what I've been focused on for the last 12 to 15 months, has been a lot of the consolidation that's been happening in the upstream space.

It kicked off last August or September and then went on a bit of a roller coaster since then with a number of transactions in the sector. From a controls perspective, what I usually think about for big acquisitions are a company's one-time controls, so being sure that the company has their opening balance sheet right and that their fair value controls are locked down, regardless of whether they've internally prepared that fair value because they have the capabilities and resources to do it, or if they've hired a third-party advisor to prepare that valuation for them. It's important that management have the requisite internal controls in place to really take ownership of those deliverables from their advisor to be able to demonstrate that they've sufficiently reviewed them and how those values feed into the financials.

And then to Heather's point on reserves pricing, the ASC 932 GAAP accounting rules drive what pricing you use in your reserves report for a company's SMOG [standardized measure of oil and gas calculations] disclosures. But for impairments, if you're a successful efforts company for example, you also have to think about prices from a forward-looking perspective, whether assessing proved or unproved properties. I think impairments, or lack thereof, will definitely be an area that gets a lot of scrutiny this year just like it did last year, but almost for an entirely different reason because now the outlook has almost changed 180 degrees. I think most companies probably already took the hit in an earlier period this year. As pricing has gone up in the third and the fourth quarter, especially once companies get to year-end, it probably won't be as painful of an exercise.

In terms of other questions that we get from clients, and it's not necessarily a year-end question, but we do also constantly get questions from full cost companies about converting to successful efforts. I think it'll just be interesting to see as the price of oil and gas continues to go up and companies think about where they might have excess funds, so to speak, they may ask the question, "Is now the time?" Especially now that we've kind of gotten a few years out from that 2014, 2015 low period.

When you think about the recasting of historical financials that you have to do when you elect such an accounting policy change to convert from full cost to successful efforts, I would say we've been getting a couple of those feeler type questions from companies in terms of what level of effort does it take, what do they need to think about from a systems perspective and how big of an undertaking is this?

Al-Kawafha There's one item also that maybe we do not think about a lot that we ask our clients since most of us are remote: what controls they use to capture [data from] all of their employees, especially from tax

perspective, because they have to withhold their income tax for state purposes. So that's probably going to create another hurdle to some of their human resources that they need to be aware of from compliance perspective.

Ondracek Then it goes into the second half of this first question of the tax issues. We have the carbon credit, there's other tax laws out there that oil and gas companies need to be aware of and Heather brought up the PPP. Then, you had the loan forgiveness, which has tax ramifications. What are clients being told?

Al-Kawafha I am not a tax person, but I could just maybe say from my understanding talking to my colleagues, I know there is a lot of opportunity from solar, just from the green energy, in general. They have, I think now a 30% tax credit for whatever you spend on the specific project. But, when it comes to carbon credit, to be honest with you, we do not do it at our firm.

There are a lot of people right now concerned about the Biden plan. I know it's hitting a lot of the oil and gas industry, including fossil fuel taxes and paused leasing in federal land. A lot of them they are uncertain what path to go by because most of the oil and gas industry is required large capital investment, and a lot of them think for futures and with the uncertainty in the tax policy I think it deters a lot of investors from even investing in the industry.

I don't know how it's going to evolve, but for now we still struggle, but it seems it's not going to impact a lot because it seems this Biden agenda started to change more favorable lately to align with the U.S. producers.

Ondracek Can you give any input or insight about the tax issues and the energy companies?

Bain Actually, tax issues have been not so much focused on credits as much as the tax rates going up. And with different entity structures, within the oil and gas industry we have LLCs, limited partnerships, corporations, there's so many different types of structures, and a lot of my small business clients are looking at whether it makes sense to change the business structure for tax purposes.

They're also looking at deferring some of their expenses, which is something that they usually don't do. But because they're anticipating that taxes will be higher going forward, they're not trying to prepay contracts. They're not looking to spend more money this year, unless they can reap the higher oil and gas prices right now. So, for the foreseeable future, most of my clients are looking at how to adapt to the changing tax rates and the changing tax landscape with the uncertainty that you've already mentioned.

Ondracek Leslie, did you want to talk to the accounting treatment of carbon credits and other credits that maybe coming for energy companies?

Warren I've definitely had a couple of questions from clients this year that have purchased carbon offset credits related to their production volumes. The biggest thing there is determining whether you are going to classify those as inventory or an intangible asset on your balance sheet because once you make that election, basically as an accounting policy election, you're stuck with it. It's going to set the precedent for any future contract with those same terms that you enter into later down the road. So, just kind of something for folks to think about in terms of establishing the day one accounting for those types of contracts, just because it will set the precedent and then obviously the corresponding income statement and cashflow presentation issues associated with each of those classification items.

Ondracek What questions are companies asking that you feel that all clients should be asking their CPAs?

Bain The best question is how can I, as an oil and gas business, be more efficient and keep my operations adaptable to the rapidly changing business environment. That, to me, includes developing the flexibility to rapidly fund increases in capital expenditures or increase funding opportunities for acquisitions, being able to change positions and just setting up the company so that it can take advantage of opportunities is the best question that I usually get asked.

Warren I think it's very similar in terms of the organization being nimble, to Heather's point, and being able to maybe not even be reactive, which is great, but even proactive in terms of financing ability for large acquisitions or just being able to fund your development program.

But I think from an individual [employee] perspective, digital upskilling the workforce is a question that we get asked a lot at PwC pretty frequently. On a quarterly basis, we host an energy accounting webcast that's available to anyone that registers for CPE [continuing professional education] credit. And we always do a couple polling questions

in terms of what do participants want to get out of those webcasts, and what are things that they find challenging in their roles or within their organizations. Digital upskilling is one of the most popular responses that we get from folks, as well as just feeling like they have system limitations and other technological constraints in doing their day to day job. I can definitely sympathize and empathize with that based on my experience in audit with my clients and just working in industry. Things are still such manual processes.

So, getting back to Heather's point about spending money on capital, it'll just be really interesting [to see how it plays out]. Unfortunately, I don't have the crystal ball answer, but it's how do you spend the right amount of money on capex, but then how do you spend the right amount of money on your IT and cybersecurity and all these other things that are maybe a little bit more G&A in nature, but are equally important to some extent. And then with all of that, how do you spend the right amount of money on your ESG efforts and being a responsible corporate citizen and responsible operator and all that as well.

Al-Kawafha I think this is the most important question to any oil producing company or operators, just to look about how they can be efficient and how they can be showing cash flow from their operation to be able to attract investors into the industry.

I think technology probably is the best option for them, even though I think the industry was not adapted to technology for a long time. After 2015, I think they started going through the technology, and they adapted it a little bit. So, I think we are moving in the right direction, but I don't think they still fully going into technology.

There are a lot of manual processes within the process itself. From operation, from accounting. Which, I think, it's not making their processes efficient, but it's the most important piece is to understand their supply chain; especially with all the bankruptcies we have a lot of vendors that are out of business. How they manage to have vendors to replace their old vendors is important. I've spoken to one of my friends who works for a larger operating company, and he noted some of the parts required to certain tools they used to get it from certain vendors that no longer exist. Now the company trying to figure out if they need to build those parts. which is going to delay the process and be more costly, and bring us back to the old issue in 2015, where it takes a longer time to drill a well. Compared to now, it's taken less time to drill the same well, and as I said, they need to manage the cash flow from operation, but I think efficiency is going to play a big part to help the industry come back stronger.

Warren I think one other thing that I've heard from a number of folks in the industry is, whether it impacts the accounting group, the reserve engineering group or your geologists or whoever, is just about how does the industry as a whole, especially the upstream sector, retain and attract new talent and a younger generation of talent that I think has, or what feels like to me, a pervasively different view of the fossil fuel industry. Again, it's something I don't have the crystal ball answer to, but to me, it's one of those things like, how do you attract people to this industry that is just getting really beat down in all of the public media, at least from my perspective is how it feels.

It feels tough to be in oil and gas right now. I always say I'm kind of on the periphery. My clients are all oil and gas clients. I'm just an accountant at an accounting firm, but I feel like I feel it for my clients and you feel like you're producing the oil that gets converted to the gas that everyone puts in their cars most days, but it still doesn't resonate with the media or whoever it is.

Ondracek In 2020, we heard a lot about the impairment write-downs due to the COVID-19, the pandemic. What in 2021, when we're looking at year-end reporting, and these companies have gone through most of their valuations and they're together, what are some of the various issues that you guys are seeing? When we come down to the 2021 year and reporting? Aren't they ready to report their consolidate earnings and from the mergers and acquisitions?

Warren I would say just from an M&A perspective, if you closed a deal earlier this year and you're still within your 12 month measurement period from the acquisition close date, I think it's just ensuring that you have really gone through the exercise of looking at all the information that you have available as of your Dec. 31, 2021, reporting date to be sure that your ASC 805 disclosures in your Form 10-K are accurate and complete. I think from a data perspective, most companies are probably pretty good with their production volumes and all that info.

But I know that as companies are looking forward [to year end], what companies struggle with, or will continue to struggle with, is just how to aggregate all of the data that will ultimately need to be reported. A lot of that is not in the financial statements at this point necessarily. It's maybe more in the forepart of the Form 10-K within the MD&A section. I think understanding where data is coming from, which parts of the organization that it's coming from, and what is the right disclosure [are all important].

Al-Kawafha I think what is the most important is just to determine the accounting treatment too, for two business combination versus asset acquisition and meeting the timeline and even following the curve out definition, not a totally, fully merger, is it just buying a component, especially with a lot of

bankruptcies at the moment. I think this is going to be the major issue.

Bain I hope I'm answering the question appropriately, as far as the acquisition and ESG component. A primary concern for the acquisitions is about the tax issues. When acquisitions are being created and negotiated, they might have been completed earlier this year with certain tax expectations that have maybe changed. And so, how do you disclose that a transaction occurred earlier this year with an expectation that it would have one type of impact on tax assets and liabilities, but in fact, because of tax law changes, it will have a different outcome going forward as far as the valuation of the acquisition? Does that make sense?

Ondracek It does make sense. It was because when we do accounting, the treatment we're all concerned about making sure we have the accounting done and then tax comes in afterwards for the basis and everything. Like, oh, maybe this should have been done differently now we have the whole picture. The planning wasn't done as concisely as maybe it should have been. So, yeah, Heather, that to me makes sense, especially with the tax uncertainty that we're going through.

Bain Right. Exactly. And so that part of the transaction is going to have to be analyzed again with the new tax changes.

Ondracek So, you get to do the rework, which we all love doing. Leslie, do you have anything to add to Mo or Heather's comments?

Warren I think to Heather's point from an ASC805 perspective, you have to think about your purchase price accounting, and what truly is your day one opening balance sheet and the tax effects of that, based on information that you knew at that point in time versus information that has come subsequently, post-transaction close. I think to Heather's point, companies and accountants need to be very careful about saying, "Okay, this is a change in our purchase price accounting, or this is a measurement period adjustment, or this is actually just a normal accounting entry for tax purposes."

Ondracek Those are really good points. In 2020, we did have impairments, write-downs, divestitures. I'm going to ask you, and as accountants, we don't usually do this. Get out your crystal ball, and knowing what we know today, do you think that there are going to be some surprises at year-end for write-downs or that numbers are just not going to be there? So there's going to be any surprises that companies are going to have to do impairments or write-downs?

Al-Kawafha Me, personally, I say by looking at the prices at the moment it doesn't seem that there's going to be any impairment. If you look at the price through the whole year, it was much larger than what is the ending price at last year. So all that points to showing the industry's in the good position, and they really wrote down their assets last year to reduce it to the lower price. If they are successful efforts, they're going to go with fair value. And, the average SEC prices were around $40 at Dec. 31, 2020. And through the whole year through November 2021, it was $65, the lowest in 2021 is $49 with the highest at $84.

But I think a lot of companies started having their employee to go back to work. A lot of operations went back as normal. Independent restaurants, most of them are full. You look at the streets, they're really full with cars. So, I don't see any time soon that right now in December, that the prices will go down that will require impairment. From divestitures, this is probable if some larger company with the mergers start seeing noncore assets, and they want to just take them away from their portfolio just to generate some cash flow. But I said, I think it's been, there are a lot of divestitures before, but there are not a lot of buyers because there's no financing market to support it. So, I think this is what is the big challenge. At least that's why a lot of companies, they go in through M&As. They're going stock for stock. So, see there's no cash flow involved.

Bain I do agree with Mo that there is not much financing for acquisitions for cash. Also, there may not be a lot of buyers right now because the price is high in the smaller space. In the small producer space, a lot of the companies would be willing to sell at the high price, but they wouldn't be willing to buy because they remember what happened in 2014.

Warren I guess along those lines, I think it's not directly responding to the question that was asked, but maybe just trying to reflect on hindsight, I think in the 2014 crash that happened, and then in the 2015 and 2016 wave thereafter, it seemed like there were a lot more Chapter 11 bankruptcies than I think actually ended up playing out in this downturn more recently in 2020. I think from my perspective, it seemed like you see negative pricing, you see just how the world shut down and everything else, I think there was an initial expectation that there would be this brand new wave of bankruptcies that would occur, like what happened in 2015 and 2016. But from my perspective, I don't think that actually happened. I think predominantly that was a result of the fact that everyone had already cleaned up their balance sheets a couple of years ago.

And so that ended up being a helpful fact. I think most companies, or at least most of my clients, were really just kind of battening down the hatches and rode out the storm that was the last 12 to 18 months. Now, it will just be interesting to kind of see how the deal landscape evolves going forward. I feel like Q4 is usually a busy time of year for the M&A space, or at least it was last year. It will just be interesting to see how that kind of continues now that, as Heather pointed out, I think the bid-ask spread is probably growing again. So, I think things might tighten up a little bit. □

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SELECTED RECENT TRANSACTIONS

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TASCOSA ENERGY PARTNERS — PetroCap
CARRIER ENERGY PARTNERS — HPS — May 2021
VENTANA MIDSTREAM LLC — BASIC ENERGY SERVICES — June 2021
TEXSTAR — IRONWOOD MIDSTREAM energy partners — July 2021
SELECT ENERGY SERVICES — BASIC ENERGY SERVICES — October 2021

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THE NEW DAWN OF CARBON CAPTURE

Although carbon capture, transport, use and storage is dominated by oil and gas producers now, it represents a significant growth area for the midstream sector.

ARTICLE BY
JEFF LEE

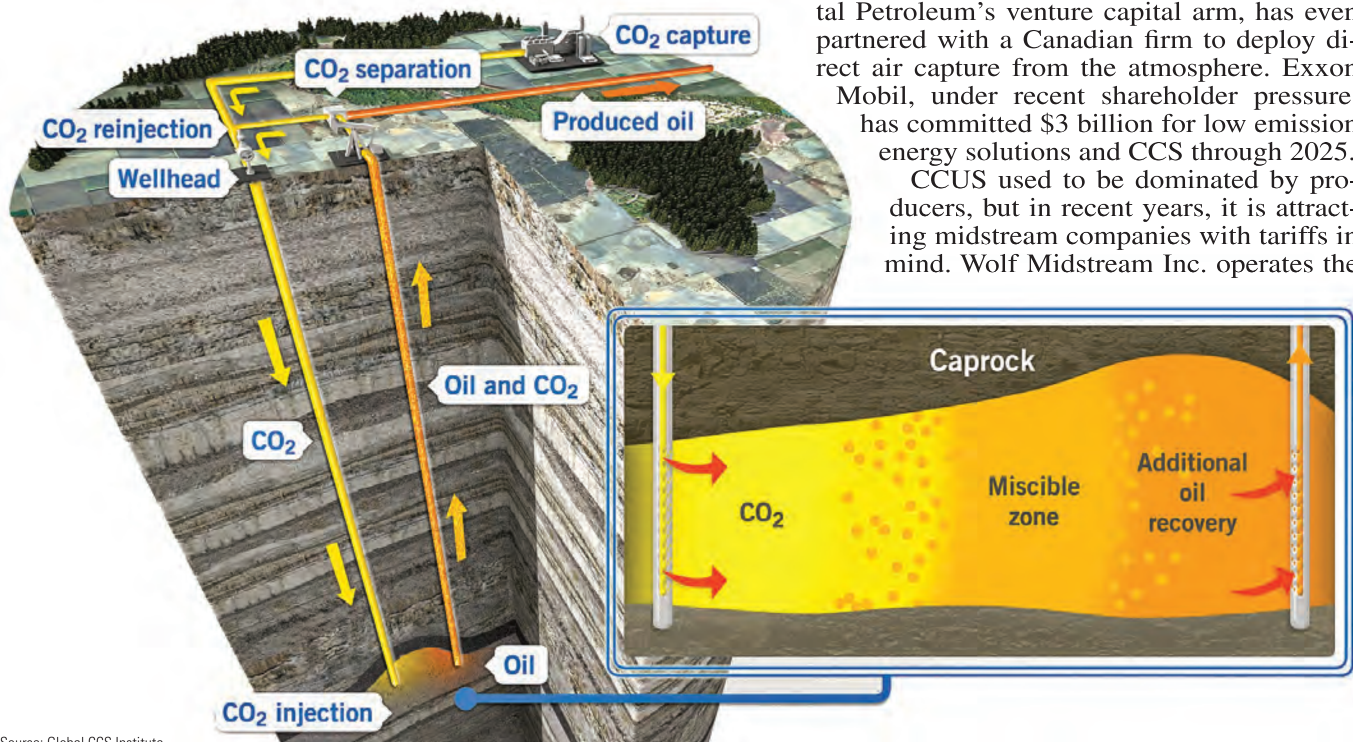
With ever-sharpening investors, shareholders and government focus on climate issues, oil and gas companies around the world are increasingly on the defensive to justify their businesses and adjust their operations to reduce carbon footprint and cut greenhouse gases. Some argue that instead of resisting this macroeconomic shift, oil and gas companies should modify their business model to capture the entire value chain by selling carbon fuel and capturing/storing waste carbon, merging "Big Oil" with "big sink."

There is an array of green initiatives on the menu, including solar, wind, geothermal, battery and hydrogen. One area of decarbonization technologies, carbon capture, utilization and storage (CCS, or CCUS), is particularly suited for oil and gas operators due to their vast expertise in managing large and complex infrastructure, industrial gas treating, pipelines and reservoir management. It is an understated component critical to achieving net-zero emission goals. With governments beginning to price carbon and offer incentives or disincentives ranging from emissions credits, tradable certificates, carbon taxes, grants and penalties to encourage CCS development, a viable revenue model is taking shape, and a large addressable market is emerging.

Midstream attraction

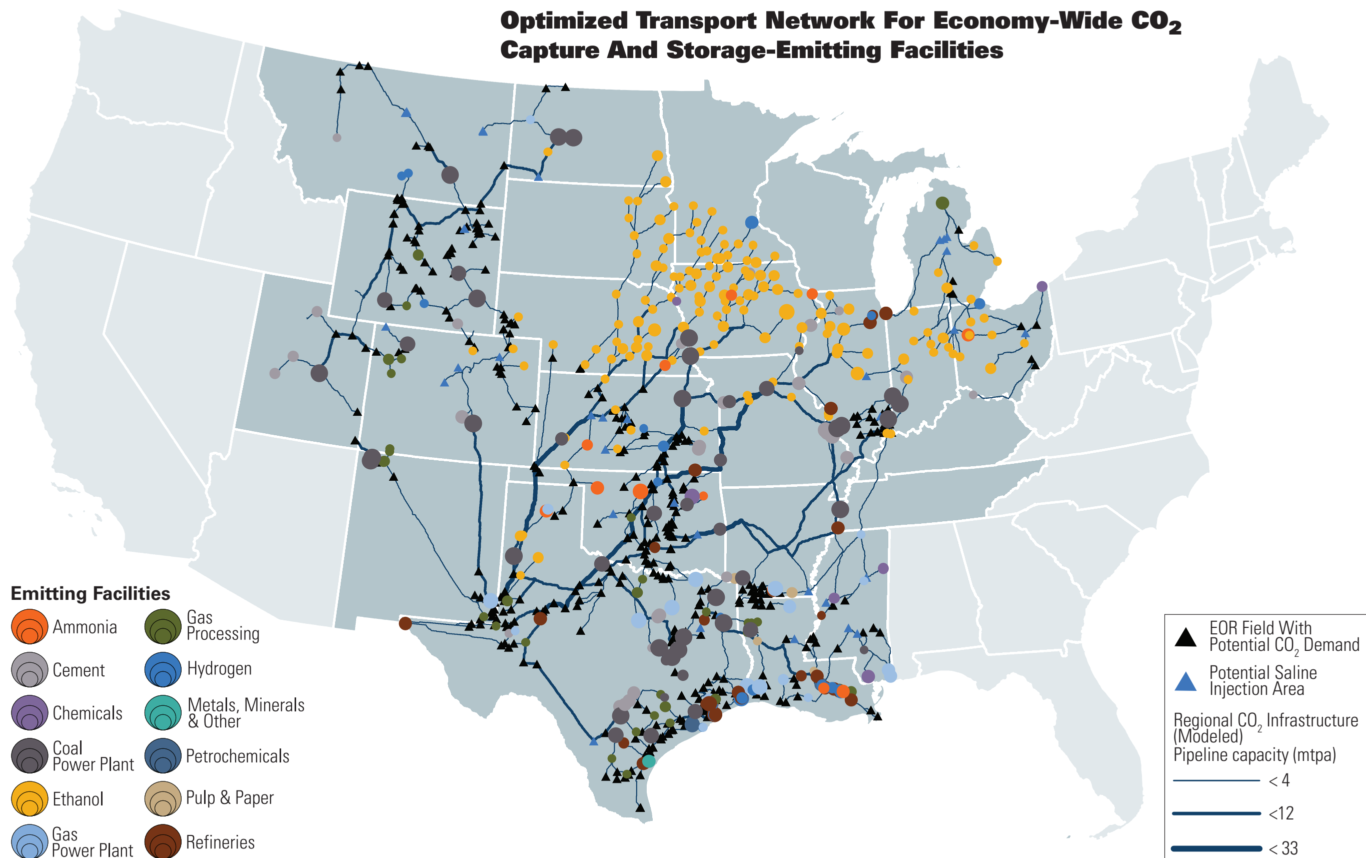
Historically, oil and gas companies have used CO_2 for EOR. Decades of data have shown that high-pressure CO_2 that acts like a lubricant can coax out as much oil as primary production methods. Occidental Petroleum Corp., Royal Dutch Shell Plc, Exxon Mobil Corp., Kinder Morgan CO_2 and Denbury Inc. are active in this space. It all started by drilling for naturally occurring CO_2, but the trend is now shifting toward anthropogenic (manmade) CO_2 captured from industrial sources. Oxy Low Carbon Ventures LLC, Occidental Petroleum's venture capital arm, has even partnered with a Canadian firm to deploy direct air capture from the atmosphere. Exxon Mobil, under recent shareholder pressure, has committed $3 billion for low emission energy solutions and CCS through 2025.

CCUS used to be dominated by producers, but in recent years, it is attracting midstream companies with tariffs in mind. Wolf Midstream Inc. operates the



An overview of a CO_2 EOR operation.

Source: Global CCS Institute



Source: Great Plains Institute; University of Wyoming

Alberta Carbon Trunk Link, transporting captured CO_2 from refineries and fertilizer plants. Valero Energy Corp. and BlackRock Global Energy & Power Infrastructure Fund III announced plans in March to develop industrial scale CO_2 pipeline systems to match sources and sinks in the Midwest.

In the U.S., the 2018 bipartisan passing of 45Q, a reformed federal carbon oxide sequestration tax credit, has brought about much interest among project developers in oil and gas and industrial sectors. It places values on carbon oxide at $50/ton for geologic storage or $35/ton for EOR/utilization, according to a progressive schedule indexed to inflation, provided that the project commences by Jan. 1, 2024.

The ability of project developers to transfer the credit allows for tax equity investors to participate and thus increases the appeal of CCS. In addition, this credit can be combined with other state and local incentives, such as the $200/ton Low Carbon Fuel Standard in California, where applicable. The minimum storage thresholds are fairly low to qualify. However, the economic viability of projects is highly dependent on the sources as the concentration of captured CO_2 can play an important role.

According to recent data from the Global CCS Institute, an advocacy group, the capture cost from ethanol, chemical and natural gas processing plants ranges in the teens, coal power plants and refineries can range in the $40 to $60/ton and steel and cement plants can fall in the $60s to $70s/ton range. With the incremental oil revenue from EOR at a lift ratio of 0.5:1.5 ton CO_2/bbl of oil, many projects appear feasible with the tax credit.

Methods of CO_2 capture

Captured CO_2 can be used or sequestered in a variety of ways, such as fuel production and injection into concrete. Most take significant energy input and thus emit more CO_2 than is sequestered. Currently, the most economic CCUS subset is EOR, which requires CO_2 capture equipment at the emission source, typically process/flue gas from a gas processing plant, chemical plant, power plant or other industrial facilities.

The methods of CO_2 capture are primarily solvents (physical, chemical) or membranes. The CO_2 concentration in the gas stream varies across industrial sectors, and it is the key factor in optimizing capture efficiency. In most cases, there are even several process gas streams at the same facility, but only some are economical to recover.

The lowest cost capture option is often liquid solvent/regeneration that is tried-and-true in the gas processing industry, e.g. amine. Other emerging technologies are being developed but will need to show commercial viability. Captured gas is typically at atmospheric pressure and is compressed into a supercritical phase for transportation.

Safe, long-term storage options are primarily oil fields that utilize the CO_2 for EOR while sequestering the gas or deep saline formations that have the right geologic characteristics. Many suitable reservoirs exist along the Gulf Coast and in the Permian Basin, but the Gulf Coast has the added advantage of proximity to large clusters of emission sources.

The Department of Energy, through the sponsorship of the Midwest Regional Carbon

CO_2 Capture Costs Across Sectors

Industry	Average Estimated Cost $/ton	Range of Cost Estimates $/ton
Gas Processing	$14	$11-$16
Ethanol	$17	$12-$30
Ammonia	$17	$15-$21
Chemicals	$30	$19-$40
Hydrogen	$44	$36-$57
Refineries	$56	$43-$68
Coal Power Plant	$56	$46-$60
Cement	$56	$40-$75
Gas Power Plant	$57	$53-$63
Steel	$59	$55-$64
Petrochemicals	$59	$57-$60

Source: Great Plains Institute; University of Wyoming

Initiative, has studies throughout the Midwest that cover more than one-third of domestic CO_2 point sources for suitable storage reservoirs. Monitoring, measurement and verification requirements in the regulatory framework in different jurisdictions are somewhat inconsistent, but they usually entail insurance, leakage penalty, liability transfer to the state after a defined period of time and the establishment of financial security/trust. State laws are evolving on pore space rights and liabilities, but the concepts are not foreign to fossil fuel producing jurisdictions.

Transportation of CO_2 is generally not technically complex but plays a significant part in the cost of deployment, especially when the sources and sinks are far apart. The common assumptions for tariffs are about $10/ton and EOR purchase at $20/ton for base case analysis.

As with typical midstream infrastructure, aggregation of volume can bring down unit cost meaningfully for regional transportation and spur project development. To that end,

1 Mtpa 45Q Tax Credit—12 Years

	EOR/Utilization		Disposal	
Year	$/ton	$MM	$/ton	$MM
2021	$24.0	$24	$36.0	$36
2022	$26.0	$26	$39.0	$39
2023	$28.0	$28	$42.0	$42
2024	$31.0	$31	$45.0	$45
2025	$33.0	$33	$47.0	$47
2026	$35.0	$35	$50.0	$50
2027	$35.5	$36	$50.8	$51
2028	$36.1	$36	$51.5	$52
2029	$36.6	$37	$52.3	$52
2030	$37.1	$37	$53.1	$53
2031	$37.7	$37	$53.9	$54
2032	$38.3	$38	$54.7	$55
		$398		$575

This chart shows a 45Q tax credit schedule and example calculations.

"CCUS used to be dominated by producers, but in recent years, it is attracting midstream companies with tariffs in mind."

the Great Plains Institute performed a study with Los Alamos Lab to produce the conceptual corridors. Technically, CO_2 pipelines need to be designed for mitigation of ductile fracture propagation and carbonic acid corrosion, but it is readily achievable. Maintaining supercritical conditions for high density, i.e. transport efficiency, also requires the system to be designed for higher operating pressure.

Another unique aspect of CO_2 pipelines is the asphyxiation risk in populated areas in case of an accidental release. Air dispersion modeling in the route selection process is helpful in overall risk assessment.

Capitalizing on CO_2

As a sign of the times, leveraging our experience implementing CCUS in the U.S., we are currently assisting a development bank and China's Ministry of Ecology and Environment to develop a CCUS pilot project that aims to demonstrate the technical and economic viability of retrofitting a coal-to-chemical plant to capture, transport and sequester ~0.4 to 1 million tonnes per annum of high-concentration CO_2 for EOR purposes. Given that China has a vast collection of coal-fired power plants and industrial facilities as well as newly aggressive decarbonization targets by mid-century, we expect similar projects to proliferate in the decades to come.

Since industrial facilities are not familiar with oil and gas pipelines and reservoir management, it is generally difficult for them to assemble the components in a complex CCUS value chain. Producers and midstream companies are in an excellent position to capitalize their knowledge and experience to bring solutions to the emitters, take advantage of the tax credits and potentially the global carbon offset market, while expanding their business model for a new commodity. Climate change, ESG investment theme, social pressure and government initiatives will provide impetus for global CCS project development.

We are excited about this multidecade trend and are well-positioned to help investors and project developers navigate the policy, economic and technical landscape of CCUS. □

Jeff Lee is the principal consultant for Kronos Management, a boutique consulting firm that caters to the midstream sector. Seasoned engineers and commercial specialists work with oil and gas operators, banks, private equity companies and law firms to deliver transaction advisory, expert witness and capital project development/management services. Lee can be contacted at LeeJeff@engineer.com.

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Continental Resources Enters Permian Basin In $3.25 Billion Expansion

AFTER ROUGHLY A half-century operating as a leading U.S. oil and gas producer, **Continental Resources Inc.** is entering the country's top shale basin.

The Oklahoma City-based company struck an agreement with **Pioneer Natural Resources Co.** on Nov. 3 to acquire all of Pioneer's assets in the Delaware Basin portion of the Permian Basin in an all-cash transaction valued at approximately $3.25 billion.

"Continental's foundation has always been built upon a strong geology-led corporate strategy," CEO Bill Berry commented in a company release. "This continues today and has directly led us to our new strategic position in the Permian Basin."

Pioneer's Delaware Basin position covers approximately 92,000 net acres with net production of approximately 50,000 boe/d, which Berry said will complement Continental's existing deep inventory portfolio in the Bakken, Oklahoma and, most recently, the Powder River Basin.

"In addition to the competitive geologic attributes," he said, "this transaction is accretive on key financial metrics and supports our long term target of 1.0x net debt to EBITDAX by year-end 2022 at $60 WTI."

According to Continental, the transaction includes over 650 gross operated locations in Third Bone Spring/Wolfcamp A and B, totaling more than 1,000 locations when including the additional zones producing in the basin. Further, the company expects the acquisition to be accretive to cash flow per share, earnings per share, cash margin and return on capital employed with PDP representing roughly 75% of transaction price.

"These Permian assets contain the key strategic components common to all of our assets with significant untapped potential to enhance performance through optimized density development, wellbore placement, operational efficiencies and further exploration," added Jack Stark, president and COO of Continental.

For Pioneer, the transaction marks the Irving, Texas-based company's exit from the Delaware side of the Permian Basin.

"This transaction returns Pioneer to being 100% focused on its high-margin, high-return Midland Basin assets, where we have the largest acreage position and drilling inventory," CEO Scott D. Sheffield in a separate company release.

Pioneer expects to recognize a pretax loss of $900 million to $1.1 billion associated with the divestiture. Proceeds will be used to strengthen the Pioneer balance sheet, including supplementing the company's "industry leading base and variable dividend program," Sheffield said.

The transaction is expected to close toward the end of the fourth quarter, subject to the satisfaction of customary closing conditions, including regulatory approval.

Citi Global Market Inc. is Continental's financial adviser, and **White & Case LLP** is the company's legal adviser with respect to the transaction. Pioneer retained **BofA Securities Inc.** as a financial adviser, and **Vinson & Elkins LLP** as legal advisor for the transaction.

—Emily Patsy

Southwestern Spends Another $1.85 Billion For Haynesville Producer

SOUTHWESTERN ENERGY Co. snatched up another private Haynesville producer as the Spring, Texas-based company continues to grow its position in the shale gas play, expanding exposure to the LNG corridor and growing demand centers along the U.S. Gulf Coast.

According to a company release on Nov. 4, Southwestern entered an agreement to acquire **GEP Haynesville LLC** in a cash-and-stock transaction valued at $1.85 billion. The third largest private Haynesville operator, GEP is a joint venture between **GeoSouthern Energy**—an E&P founded by billionaire oilman George Bishop—and **Blackstone Inc.**'s credit arm.

"This strategic move positions Southwestern as the largest producer in the Haynesville and enhances our leading presence in the top two premier natural gas basins in the U.S.," Southwestern CEO Bill Way commented in the release.

The GEP deal follows Southwestern's entrance into the Haynesville earlier this year with its $2.7 billion acquisition of privately held Indigo Natural Resources, which Way at the time described as a "logical move" for the formerly Appalachia pure play.

GEP, which had acquired a bulk of its position through a 2015 acquisition from **Ovintiv Inc.,** known as Encana at the time, adds roughly 226,000 net effective acres with estimated net resource potential of 6 Tcfe. With the addition of approximately 700 MMcf/d of production and 700 locations across stacked-pay Haynesville and Middle Bossier from GEP position, Southwestern projects total company production of approximately 4.7 Bcfe/d pro forma of the transaction.

"The company's increased scale from both a reserves and production perspective is expected to deliver higher margins, enhanced economic returns and improved per-share cash flow metrics," Way said.

Upon closing, Southwestern expects to realize at least $25 million in annual synergies, driven by G&A and other operational savings. Further, the company projects pro forma free cash flow of approximately $2.3 billion in 2022-23.

The total consideration of $1.85 billion will be $1.325 billion in cash and approximately $525 million in Southwestern common shares. Southwestern expects to finance the cash consideration "in a manner that affords near-term and efficient debt reduction, extends its maturity runway and lowers its cost of debt," according to the company release.

Southwestern added that the acquisition valuation compares favorably to other recent natural gas transactions, with the $1.85 billion purchase price representing 2.9x estimated 2022 EBITDA using a $4/Mcf Nymex Henry Hub price, which is below today's strip prices, the company said.

"This transaction reflects the company's strict adherence to our rigorous acquisition framework and will build on our leading execution in the integration and development of large-scale assets," Way added. "The financing and hedging strategy for the deal aligns with our commitment to financial strength and disciplined enterprise risk management."

The transaction was unanimously approved by each of Southwestern Energy and GEP Haynesville's boards of directors and is expected to close by year-end 2021, subject to regulatory approvals and customary closing conditions.

Goldman Sachs & Co. LLC is exclusive strategic adviser to Southwestern for the transaction. **JP Morgan**, **Bank of America**, **Citigroup**, **RBC** and **Wells Fargo** served as financing advisers and provided $1.325 billion committed financing in connection with the transaction. **Intrepid Partners LLC** also provided a fairness opinion to Southwestern. Intrepid was advised by **Gibson, Dunn & Crutcher LLP**, led by partner Hillary Holmes.

Credit Suisse Securities (USA) LLC served as exclusive strategic and financial adviser to GEP. **Skadden, Arps, Slate, Meagher & Flom LLP** is legal adviser to Southwestern, and **Kirkland & Ellis LLP** served as GEP's legal adviser.

—Emily Patsy

"This strategic move positions Southwestern as the largest producer in the Haynesville and enhances our leading presence in the top two premier natural gas basins in the U.S."

—Bill Way,
Southwestern Energy Co.

EnCap Flatrock's Combines Eagle Ford Assets

IRONWOOD MIDSTREAM announced a significant expansion in the Eagle Ford Shale on Nov. 16 through the "strategic combination" with **Nuevo Midstream Dos**.

"This strategic combination marks an important step for Ironwood as we continue to expand our midstream infrastructure for Eagle Ford producers, offering safe, consistent and competitive access to premium and growing export and industrial markets along the Texas Gulf Coast," Ironwood chairman, president and CEO Mike Williams commented in a release by the San Antonio-based company.

Both financially backed by private equity-firm **EnCap Flatrock Midstream**, Ironwood II said in the release it had completed an asset merger and assumed management of Nuevo Midstream Dos' Eagle Ford assets. The terms of the transaction weren't disclosed.

"We are excited about the consolidation of these complementary Eagle Ford assets as it further positions them for growth and value creation," said EnCap Flatrock managing partner Bill Waldrip in the release.

Nuevo Dos was formed in 2015 with a $400 million initial equity commitment from EnCap Flatrock Midstream. The Nuevo management team had previously built a significant midstream footprint, also backed by EnCap Flatrock, in the Delaware Basin, which ultimately was sold to **Western Gas** in 2014.

In 2019, Nuevo entered the Eagle Ford Shale through the acquisition of Republic Midstream LLC from an affiliate of **ArcLight Capital Partners**. Nuevo assets include approximately 100 miles of crude oil gathering pipeline in Lavaca, Gonzalez and Fayette counties in South Texas that feeds the Lavaca Terminal, which consists of 300,000 bbl of crude oil storage and a six-bay truck station.

The Nuevo system also includes a 26-mile intermediate pipeline that moves volumes from the terminal to third-party transportation pipelines with access to refineries, petrochemical plants and export terminals on the Texas Gulf Coast.

"The Nuevo team has a strong track record and EFM has enjoyed a long and successful partnership together," Waldrip said. "The team has built highly valuable relationships in the Eagle Ford and has done an excellent job commercializing these assets."

According to the release, Nuevo President and CEO Randy Ziebarth will join the Ironwood board as part of the merger.

"I've personally known Mike and Randy for a very long time," Waldrip added, "and their collective skill sets, and deep roots and relationships will serve this combined platform well."

As a result of the combination, Ironwood II now operates approximately 400,000 bbl/d of crude oil throughput capacity and 410 MMcf/d of natural gas throughput capacity in the Eagle Ford region. The company operates 390 miles of crude oil and natural gas pipelines with 245,000 dedicated net acres.

The company also operates a crude oil gathering system in the Permian Basin in Midland County, Texas, with 40,000 bbl/d of throughput capacity that delivers to Centurion Pipeline.

"The Nuevo team has built an excellent system and we look forward to continuing to operate it with integrity and reliability," Williams also said.

Mayer Brown was the legal counsel to Ironwood II. Locke Lord, and **Shearman & Sterling** were legal advisers for Nuevo and Encap Flatrock Midstream, respectively.

—Emily Patsy

Colgate Energy Continues Permian Expansion In New Mexico

COLGATE ENERGY PARTNERS III LLC entered a definitive agreement with an undisclosed seller on Nov. 7 to purchase approximately 22,000 net acres directly offset Colgate's existing position in New Mexico's Eddy and Lea counties for $190 million.

"Given the depth of our current inventory, we have a very high bar for acquisitions and this one was just too good to pass up," Will Hickey, co-CEO of Colgate, commented in a company release.

The deal marks the third acquisition for privately held Colgate Energy so far this year. Previously, the company completed two acquisitions in the southern Delaware Basin in West Texas—first, with its all-stock acquisition of **Luxe Energy** followed by a $508 million cash acquisition of acreage in Reeves and Ward counties, Texas, from **Occidental Petroleum Corp**.

"Building on the transformative transactions completed earlier this year in Texas, this New Mexico acquisition adds to Colgate's position as one of the premier private operators in the Permian Basin," James Walter, co-CEO of Colgate, said in the release.

Based in Midland, Texas, Colgate Energy was founded in 2015 by Walter and Hickey with initial equity commitments from **Pearl Energy Investments** and **NGP**. Pro forma for the Nov. 7 deal, Colgate's position in the Permian Basin will cover roughly 108,000 net acres with estimated current net daily production of 62,000 boe/d.

In his statement, Hickey also noted that the latest acquisition directly offsets its legacy Parkway operating area in the northern Delaware Basin where Colgate has recently drilled some of the best wells in company history.

The acquisition adds over 200 "high-quality locations," according to the company release.

The acquired acreage has an average 8/8ths net revenue interest of over 80% and is over 95% operated with a 78% average working interest. Current estimated average net daily production from the assets is roughly 750 boe/d.

Colgate expects to finance the acquisition through a combination of cash on hand, borrowings on its revolver and/or other potential debt financing.

"Colgate's strong balance sheet and ample liquidity allows us to execute a cash transaction of this size while continuing to target 2022 leverage of less than 1.0x," Walter added.

The effective date of the transaction is Sept. 1, and closing is expected to occur in first-quarter 2022.

—Emily Patsy

Northern Oil & Gas To Add Veritas Permian Assets

NORTHERN OIL AND Gas Inc. agreed on Nov. 16 to acquire **Veritas Energy**'s nonop position, significantly expanding its Permian Basin footprint in Northern's largest acquisition to date.

"This transaction completes the strategic transformation of our business that began in 2018," commented Northern CEO Nick O'Grady in a company release.

According to the release, Northern entered an agreement with Veritas to acquire its nonoperated oil and gas properties located in the Delaware and Midland basins for a cash purchase price of $406.5 million, subject to typical closing adjustments. The assets are primarily located in New Mexico's Lea and Eddy counties and Loving, Reeves, Ward and Winkler counties, Texas.

As part of the transaction, Northern will issue the Veritas roughly 1.9 million seven-year equity warrants with a strike price of $28.30 at closing. The company said it expects to commence a public equity offering to fund a portion of the acquisition.

In total, the Veritas transaction is estimated to be worth $537.7 million.

"It will drive immediate significant accretion across the board to our investors," O'Grady continued of the Veritas transaction, "increased cash returns, and importantly, creates a truly diversified business of scale, with substantial free cash flow that can self-fund future growth."

"The Veritas transaction marks our fourth significant transaction in 2021 as we return focus to the Delaware Basin, further scaling our business and building inventory with premier operators," added Northern COO Adam Dirlam in the release.

Veritas Energy's nonop position covers approximately 6,000 net acres in the Permian Basin (about 70% Delaware), including over 600 risked gross undeveloped Delaware locations. Current production is about 9,100 boe/d (2-stream basis, 60% oil) with an estimated proved developed PV-10 of roughly $429 million.

The acquired assets include 31.7 net producing wells, 5.6 net wells in process, 4.0 AFE'd or permitted net wells and 40.8 risked net future development locations.

The assets are projected to be immediately self-funding at closing, generating approximately $43 million to $45 million of cash flow from operations in the fourth quarter with $50 million of capex and expected closing adjustments.

The effective date for the transaction is Oct. 1, and Northern expects to close the transaction in first-quarter 2022.

Morgan Stanley & Co. LLC is Northern's lead financial adviser. **Bank of America** is a co-adviser to Northern on the transaction. **Kirkland & Ellis LLP** is serving as Northern's legal adviser. **Tudor, Pickering, Holt & Co.** is financial adviser to **Veritas**. **Willkie Farr & Gallagher LLP** is serving as Veritas's legal adviser.

—Emily Patsy

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Diversified Energy Sells Chunk of Recently Acquired Tanos Haynesville Acreage

DIVERSIFIED ENERGY CO. Plc agreed on Nov. 12 to sell undeveloped Haynesville Shale acreage it had recently acquired from **Tanos Energy** for approximately $72.8 million in cash.

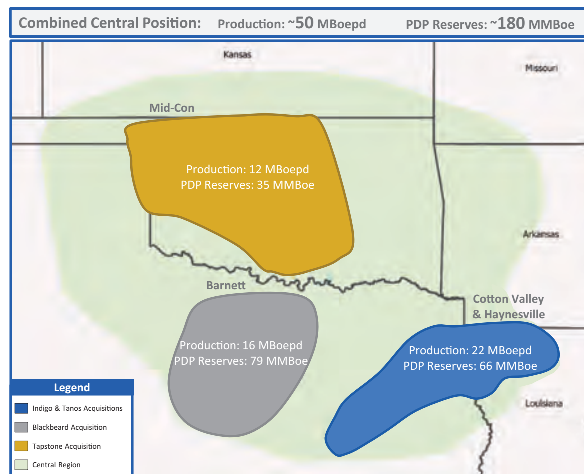
"I am proud of our team's actions to enhance the value of our recent Tanos acquisition, significantly reducing our net purchase price by successfully monetizing these assets," commented Diversified CEO Rusty Hutson Jr. in a release by the company.

"The sale proceeds enhance our liquidity as we evaluate other value-accretive opportunities," Hutson added.

Diversified had acquired Tanos earlier this year, continuing the company's expansion in its newly established "central" regional focus area covering Louisiana, Texas, Oklahoma and Arkansas. The Birmingham, Ala.-based company had previously focused exclusively on buying PDP natural gas assets in the Appalachian Basin until a May 2021 acquisition added a footprint in Louisiana.

The acquisition of Tanos, which included Cotton Valley and Haynesville assets in Louisiana and Texas, was completed in August through a co-investment with funds managed by **Oaktree Capital Management**. Diversified had lined up a $1 billion acquisition partnership with the global investment firm in 2020 to pursue larger acquisition opportunities.

Diversified Energy's Combined Central Position



Source: Diversified Energy Co.

Net to Diversified, the sale on Nov. 12 includes nearly $33.7 million for 22,729 net acres of predominantly undeveloped Haynesville Shale leasehold in Harrison, Leon, Panola, Robertson and Rusk counties, and $3.6 million for 38 gross Haynesville Shale wells on the same acreage producing approximately 1,700 net Mcf/d as of November, representing just 2% of the production that Diversified originally acquired from Tanos, according to the company release.

Consistent with previous acquisitions, Diversified said it had ascribed no value to the undeveloped Haynesville leasehold in its transaction with Tanos.

"This transaction exemplifies our strategy of efficiently managing our producing assets and extracting maximum value from predominantly undeveloped resources," Hutson explained further.

The divestiture effectively reduces Diversified's investment in the previously announced Tanos transaction by 30% to $81 million from the original $118 million, net of purchase price adjustments.

The company added that, as part of the divestiture agreement, Diversified will retain an overriding royalty interest on certain of the undeveloped leasehold in Panola and Rusk counties along with the development rights to all geologic formations other than the Haynesville Shale in the divested acreage.

Diversified expects to close the divestiture transaction in mid to late December subject to the purchaser's normal and customary diligence.

—Emily Patsy

Oil Drillers Noble, Maersk To Combine In $3.4 Billion Merger

U.S. RIVAL NOBLE Corp. will merge in a $3.4 billion deal with **Maersk Drilling** to form one of the world's largest offshore oil drilling rig companies, they said on Nov. 10.

The combined company is expected to reap annual cost savings of $125 million and it will take Noble Corp.'s name and be headquartered in Houston, with ownership split roughly 50:50 between the two companies' existing shareholders.

"The combination of Noble and Maersk Drilling will create a leading offshore driller with global scale, a strong balance sheet and significant free cash flow generation potential," Noble board chair Chuck Sledge said in a statement.

The transaction is backed by a majority of shareholders at both companies and the new entity's shares will be listed in both New York and Copenhagen, a joint statement said.

Noble chief exec Robert Eifler will become CEO of the merged business.

The company will maintain a significant operating presence in Stavanger, Norway, to retain proximity to customers and support operations in the Norwegian and broader North Sea regions.

The merger will lead to job losses to help deliver cost cuts, the companies said without specifying numbers.

"In the short term the combination will, unfortunately, impact our organization, but it will also create a larger and stronger company, which will provide future opportunities for growth and new jobs," said Maersk Drilling CEO Jorn Madsen.

The deal was "primarily" an all-shares transaction, though Maersk Drilling shareholders will have the ability to elect to receive cash instead of shares for up to $1,000 each, subject to an aggregate cap of $50 million.

A Maersk spokesperson said the company had estimated the combined market capitalization of the two companies at approximately $3.4 billion.

"The combined company will hold an industry leading balance sheet, significant cost synergies, a modern fleet and with access to an international shareholder base," said Robert Uggla, CEO of **A.P. Moller Holding**, Maersk Drilling's biggest shareholder.

—Reuters

SERVICE & SUPPLY

■ A group of leading companies that market and trade natural gas in North America including **Shell Energy North America** and **BP** have announced the formation of an independent company named **Eleox**. The initial participants in this joint venture—the first of its kind in North America—also include **Castleton Commodities International LLC (CCI)**, **Koch Energy**, **Macquarie Group** and **Mercuria Energy America**.

Eleox will re-imagine commodity post-trade processing through the creation of an enterprise-grade application based on distributed ledger technology to replace many existing, siloed post-trade systems with a unified, full lifecycle platform, the companies said Nov. 15.

This secure, real-time digital approach is being created to manage transactions from post-trade through settlements, replacing paper-based contracts and manual reconciliation processes, and will initially focus on enhancing the post-trade process for North American physical natural gas. The enhanced settlement processing platform will result in increased transparency and accountability while maintaining data security using distributed ledger technology, a single source of truth throughout the trade life cycle and fewer data errors, fewer mismatches and less manual reconciliation, minimizing delays in transaction settlements

The platform will be designed by Eleox and tested by its founding members, which will constitute a key segment of its projected user base and is expected to be available for use by all market participants in late 2022.

MIDSTREAM

■ **Oasis Petroleum Inc.** agreed to sell its midstream affiliate in a $1.8 billion transaction that CEO Danny Brown said gives the Houston-based independent E&P company an advantage in future M&A activity.

"Oasis is now well-positioned to further participate in industry consolidation opportunities," Brown commented in an Oct. 26 release.

Oasis recently closed on a $745 million acquisition of **Diamondback Energy**'s Bakken asset on Oct. 21, completing its transformation into a pure-play Williston Basin operator. The strategic shift included the sale of its Permian Basin position on the upstream side through a series of transactions earlier this year.

In its release on Oct. 26, Oasis said that Oasis Midstream Partners had entered into a definitive agreement under which it will merge with **Crestwood Equity Partners LP** in an equity and cash transaction.

Oasis Midstream Partners, which went public in September 2017, was formed by Oasis as its sponsor to own, develop, operate and acquire a diversified portfolio of midstream assets. The company's current assets are located in the heart of the oil-rich Bakken and Permian basins, according to its website.

"The combination of OMP and Crestwood immediately enhances value for Oasis shareholders while increasing transparency with deconsolidated financial reporting, highlighting the Company's E&P operations," Brown said.

In exchange for Oasis' approximately 33.85 million OMP common units and non-economic GP interest, Oasis will receive $160 million in cash and 21 million common units in Crestwood, representing an attractive valuation of roughly 8x 2021E OMP EBITDA, according to the release.

Upon completion of the transaction, Oasis will own approximately 21.7% of Crestwood common units. Public OMP unitholders, which will receive 0.87 units of Crestwood common units for each unit of OMP owned as part of the transaction agreement, are expected to own approximately 35% of Crestwood's outstanding common units.

LNG

■ **JERA Co. Inc.** agreed to boost its holdings in **Freeport LNG** through a $2.5 billion investment in the Houston-based LNG export company as JERA, the world's biggest buyer of LNG, aims to shore up long-term supplies of gas for power generation in Asia.

"JERA believes it will be possible to supply LNG to Japan when supply is tight and to otherwise respond flexibly to the LNG supply and demand situation in the Asian region," JERA said in a Nov. 15 release announcing the transaction.

According to the release, JERA, which already has a share of Train 1 of Freeport LNG, agreed to acquire **Global Infrastructure Partners**' 25.7% interest in **Freeport LNG Development LP** for $2.5 billion, subject to customary purchase price adjustments. GIP's second flagship fund, Global Infrastructure Partners II, acquired the stake in 2015.

Freeport owns and operates an LNG export facility with 15 million metric tonnes per year (mtpa) of nominal liquefaction capacity on the U.S. Gulf Coast near Freeport, Texas. The company plans to expand by adding a fourth liquefaction train, which has received all regulatory approvals for construction.

JERA, a major supplier of electricity in Japan where the company is headquartered, has been promoting the adoption of greener fuels. However, JERA has also included gas-fired power generation in its decarbonization plan citing the use of natural gas, which emits less CO_2 than power generation using other fossil fuels, as a flexible supplement to intermittent renewable energy.

"As evidenced by the current gas price hikes around the world, securing a stable supply of competitive LNG is becoming increasingly important," the company noted in the release.

JERA Americas Inc., the Houston-based subsidiary of JERA, appointed **Goldman Sachs & Co. LLC** as its exclusive financial adviser and **Sidley Austin** as its legal adviser. The Sidley deal team was led by Houston-based partner Brian Bradshaw. Other Sidley partners involved included Cliff Vrielink, Heather Palmer, Zackary Pullin and Jim Mendenhall.

Rothschild & Co. and **Mizuho Securities USA LLC** are serving as joint financial advisers, and **Simpson Thacher & Bartlett LLP** is serving as legal adviser to GIP.

TEXAS

■ **Exxon Mobil Corp.** on Nov. 15 launched a sale of its oil and gas properties in the Barnett Shale field, a spokesperson confirmed, as part of a portfolio reshuffling to focus on more lucrative assets.

The top U.S. oil producer set a goal three years ago of raising $15 billion from asset sales, and put several U.S. and international assets

on the market as energy prices have recovered from the pandemic-induced slump.

It will open a data room on Nov. 18 for its Barnett Shale holdings that include 2,700 wells across about 182,000 acres in North Texas, home of the first horizontally drilled shale wells. Exxon Mobil spokesperson Sarah Nordin confirmed the sale process.

Production operations will continue normally during the marketing process, Nordin said. There has been no agreement reached on a sale and no buyer was identified, she said.

The producing properties are valued at between $400 million and $500 million, according to a person familiar with the matter. U.S. gas prices are up 75% year to date, settling at $5.01 per MMBtu on Nov. 15.

Bids are due Dec. 21 and Exxon Mobil aims to close any sale in January. The properties' shale gas production has declined by half since 2016, to around 227 MMcf/d in the first half of this year, according to a marketing document seen by Reuters.

The wells were among natural gas properties Exxon Mobil last year said it wanted to sell. It put about 5,000 natural gas wells in the Fayetteville Shale in Arkansas on the block in August.

Exxon Mobil, which suffered a historic $22.4 billion loss in 2020, is selling assets in Asia, Africa and Europe as it focuses on production ventures in Guyana, offshore Brazil and the Permian Basin.

MINERALS AND ROYALTIES

■ Fort Worth, Texas-based **Kimbell Royalty Partners LP** has agreed to acquire mineral and royalty interests from an undisclosed seller on Nov. 9 in an all-cash transaction valued at approximately $57 million, subject to purchase price adjustments and other customary closing adjustments.

According to Kimbell's estimates, the seller's royalty assets produced 700 barrels of oil equivalent per day (boe/d), 240 barrels per day (bbl/d) of oil, 123 bbl/d of NGLs and 2,021 Mcf/d of natural gas across a diverse property set with over 26,000 gross producing wells concentrated in the Permian (39%), Midcontinent (31%) and Haynesville (14%) basins.

The acquisition is expected to increase Kimbell's average daily net production to 14,783 boe/d and bring its total gross well count to over 26,000 producing locations and 5.9 MMboe in total proved reserves. The company currently operates oil and gas mineral and royalty interests in across 13 million gross acres with 123,000 gross wells and a total of 63 active rigs in 28 states.

HAYNESVILLE

■ **Chesapeake Energy Corp**. completed its acquisition of **Vine Energy Inc.** on Nov. 1, making Chesapeake the largest producer in the Haynesville Shale, according to the Oklahoma City-based company.

Chesapeake had previously announced the acquisition of Vine in August in what the company called a "zero premium" transaction valued at approximately $2.2 billion. The deal was expected to increase Chesapeake's Haynesville exposure to 348,000 net acres with pro forma second-quarter net production of 1.58 Bcf/d, according to a research note by **Tudor, Pickering, Holt & Co**.

Based in Plano, Texas, Vine Energy first entered the Haynesville in 2014 through the acquisition of **Royal Dutch Shell Plc**'s position by its predecessor, which was backed by private equity firm Blackstone Energy Partners. According to its website, Vine held 227,000 net effective acres in the Haynesville Basin in northwest Louisiana at the time of the announced agreement with Chesapeake.

PERMIAN

■ **Diamondback Energy Inc.** is selling certain water assets to its midstream affiliate, **Rattler Midstream LP**, through a recent dropdown transaction.

Rattler, according to an Oct. 21 release, agreed to pay $160 million in cash to acquire the assets, which consist primarily of produced water gathering and disposal systems, produced water recycling facilities and sourced water gathering and storage assets acquired by Diamondback through its acquisitions of **QEP Resources** and **Guidon Operating** earlier this year.

Additionally, Rattler and Diamondback amend commercial agreements on Oct. 21 covering the produced water gathering and disposal and sourced water gathering services between Rattler and Diamondback to add certain Diamondback leasehold acreage to the Rattler dedication.

Rattler intends to fund the dropdown transaction, expected to close in the fourth quarter, through cash on hand and borrowings under its revolving credit facility.

Raymond James & Associates Inc. and **Hunton Andrews Kurth LLP** are financial and legal advisers, respectively, to the conflicts committee of the board of directors of the general partner of Rattler in connection with the transaction.

DENVER-JULESBURG BASIN

■ **Brigham Minerals Inc.** recently announced an acquisition of acreage with top producers in the Denver-Julesburg (D-J) Basin that marked the company's biggest transaction since its IPO in 2019.

"I'm extremely pleased to announce our largest transaction to date, which is anticipated to provide significant near-term cash flow per share accretion that continues to grow into 2023 as 3.1 net DUCs and permits are turned in line to production," Brigham Minerals CEO Robert M. (Rob) Roosa commented in a company release on Nov. 4.

According to a Nov. 4 release, Brigham entered an agreement with an undisclosed company to acquire 8,400 net royalty acres primarily in Colorado's Weld County operated by top D-J Basin producers—**PDC Energy Inc.**, **Chevron Corp.**, **Occidental Petroleum Corp**. and **Civitas Resources Inc**.

Brigham said it agreed to acquire the assets for $44 million in cash and the issuance of about 2.2 million Class A common shares, which represents the company's initial utilization of equity directly to the seller in an acquisition, according to CFO Blake C. Williams.

"Given approximately 50% of it is being financed with equity, it provides us with nearly $150 million of post-close pro forma liquidity to continue to execute upon our ground game acquisition strategy and other large scale consolidation opportunities," Williams added in the release.

Enverus estimates the total purchase price of the transaction at $95.6 million based on the company's prior-day closing price of $23.44 per share, the firm said in a Nov. 9 note. Brigham intends to

finance the cash portion of the purchase price through a combination of cash on hand and borrowings under its revolving credit facility.

In total, the Brigham Minerals D-J acquisition includes 10.37 net producing wells, 1.6 net PUDs and 1.5 net drilling permits, according to the Enverus note.

■ **Bonanza Creek Energy Inc.** has officially rebranded as **Civitas Resources Inc.** following the recent closing of Bonanza Creek's merger with **Extraction Oil & Gas Inc.** and subsequent acquisition of **Crestone Peak Resources**.

"Civitas embodies an E&P model that is poised to deliver value for all of our stakeholders through disciplined capital deployment, operational and cost excellence, and governance standards aligned with the highest expectations—including our status as Colorado's first carbon-neutral oil and gas producer," commented Ben Dell, chairman of Civitas, in a company release on Nov. 1.

Earlier this year, Bonanza Creek laid out plans to form Civitas Resources—"to exemplify the new E&P business model for U.S. producers"—through the consolidation of fellow Denver-Julesburg (D-J) Basin operators, first its all-stock merger agreement with Extraction Oil & Gas and later Crestone Peak.

Upon closing, Civitas became the largest pure-play energy producer in Colorado's D-J Basin, operating across more than half a million net acres with an enterprise value of $4.5 billion. The estimated production base of Civitas was also projected to be approximately 160,000 boe/d with year-end 2020 proved reserves of more than 530 MMboe.

"Civitas has the resource quality, low-cost structure, meaningful free cash flow generation, and low financial leverage to deliver sustained shareholder value," added Eric Greager, president and CEO of Civitas who previously served in the same roles at Bonanza Creek.

EAGLE FORD

■ India's **Reliance Industries Ltd.** announced its exit from U.S. shale with the divestiture of its Eagle Ford Shale position to privately held **Ensign Natural Resources LLC**.

Ensign on Nov. 8 agreed to acquire the Eagle Ford assets of **Reliance Eagleford Upstream Holding LP**, a step-down subsidiary of Reliance Industries, for an undisclosed amount. The deal is set to increase Ensign's current ownership to 100% in the leases and wells it acquired from Pioneer Natural Resources Co. and Newpek LLC.

"We are excited to complete the puzzle with the acquisition of Reliance's interest and now operate one of the premier assets in the basin," Brett Pennington, president and CEO of Ensign, commented in a company release

The Reliance acquisition includes approximately 62,000 net acres in Bee, DeWitt, Karnes and Live Oak counties in South Texas and current net production of roughly 18,000 boe/d. The sale is "at a consideration higher than current carrying value of the assets," according to a separate release by Reliance.

Post the Reliance acquisition, Ensign will own and operate 130,000 acres in the core of the Eagle Ford with current production approaching 40,000 boe/d, making it one of the premier private operators in the basin, the company release said.

Sidley Austin LLP provided legal counsel to Ensign for the transaction, and **Citigroup Global Markets Inc.** arranged financing for the acquisition. **Citigroup Global Markets Inc.** was financial advisor to Reliance, and **Gibson, Dunn & Crutcher LLP** served as its legal counsel. The Gibson Dunn team was led by partner Michael P. Darden and included partner Jonathan Whalen and associates Graham Valenta, Zain Hassan and Adri Langemeier.

MIDSTREAM

■ **Brazos Midstream** recently expanded its footprint in the Permian Basin with two significant transactions with Diamondback Energy Inc. and its midstream affiliate **Rattler Midstream**.

Headquartered in Fort Worth, Texas, Brazos is one of the largest private natural gas and crude oil midstream companies in the Delaware Basin of the Permian. However, on Nov. 3, the company said it has now expanded to the Midland Basin through the acquisition of Diamondback's Mustang Springs Gas Gathering System, marking Brazos' first acquisition on the Midland Basin side of the Permian.

The acquisition of the Mustang Springs Gas Gathering System located in the Northern Midland Basin was made through the company's newly formed affiliate Brazos Midland. Diamondback reported net consideration of approximately $54 million from the sale of the Mustang Springs Gas Gathering assets.

"We are also very pleased to form Brazos Midland to complete the acquisition of a high-quality asset supported by Diamondback's strong existing production and robust development plans, which provides a great platform in the core of the Midland Basin with tremendous potential for third-party growth," Brazos CEO Brad Iles commented in a company release on Nov. 3.

The Mustang Springs Gas Gathering System currently serves Diamondback in central Martin County, Texas. Brazos plans to expand the system to serve both Diamondback and other producers' "significant growth plans in the area," according to the company release.

On Nov. 3, Brazos Midstream also announced the acquisition of the Pecos Gas Gathering System in the southern Delaware Basin from Diamondback Energy and its midstream affiliate. Brazos has operated the Pecos Gas Gathering System on behalf of Diamondback and Rattler since 2017.

EAST TEXAS

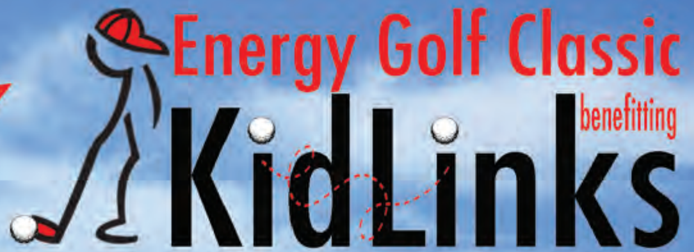
■ **Crescent Pass Energy LLC** recently closed on an acquisition of operated and nonoperated assets in East Texas, making it the second significant acquisition by the privately held E&P company in the region in the past two months.

In the bolt-on transaction announced Nov. 3, Crescent Pass acquired approximately 60,000 net acres in East Texas, flowing roughly 12.5 MMcfe/d of natural gas weighted production, across a region with multiple producing horizons and favorable access to Gulf Coast markets.

"This acquisition is an exciting milestone for us as it marks our second significant growth transaction in fewer than two months," Crescent Pass CEO Tyler Fenley commented in a Nov. 3 release.

Thank You!

To Our Sponsors & Participants!



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PERMITS

There were 73 permits issued for Delaware Basin wells in Reeves County, Texas; most of the wells in the county produce from Wolfcamp. The majority of the permits in Texas were for Midland Basin counties. Also in the Permian Basin, there were 55 permits for Lea County and 49 for Eddy County, N.M. Pioneer Natural Resources Co. received 46 permits, and Endeavor Energy Resources LP received 39 Midland Basin permits. The other major Texas region for permitting was in the Eagleville Shale play by EOG Resources Inc.

The Gulf of Mexico had a total of 29 new permits issued for Green Canyon (13) and Mississippi Canyon (12). The Mississippi Canyon permits were for Shell Oil Co. The majority of the Green Canyon permits were for Murphy Exploration & Production Co. (four) and BOE Exploration (eight).

In the Appalachian Basin, there were 98 new permits in Pennsylvania, 31 in Ohio and 30 in West Virginia.

Oklahoma reported 73 new permits, with nine in Kingfisher County, nine in Carter County, seven in Canadian County and six each in Stephens and Kingfisher counties.

In the Rocky Mountain region, 23 permits were issued to XCL Assetco LLC for Duchesne County, Utah. Colorado had 72 permits, 47 in Weld County and 17 in Garfield County for TEP Rocky Mountain, where the company has had recent success from commingled Williams Fork/Cameo, Cameo, Cozzette/Corcoran and Corcoran gas discoveries.

New Permits By State: September 2021

State	New Permits
Texas	716
New Mexico	105
Pennsylvania	98
Oklahoma	73
Colorado	72
California	65
Louisiana	53
Utah	34
Ohio	31
West Virginia	30
Northern Gulf Of Mexico	29

Source: Datalink

New Permits By Company: September 2021

Company	New Permits
EOG Resources Inc.	52
Endeavor Energy Resources LLP	49
Pioneer Natural Resources Co.	48
Chevron Corp.	41
Mewbourne Oil Co.	28
Diamondback E&P	27
Sentinel Peak Resources	26
XCL Assetco LLC	24
CrownQuest Operating	22
Nickel Road Operating	22

Source: Datalink

Data from Rextag ENERGY DATALINK

RIG COUNT

The active U.S. rig count increased by in the beginning of November, according to Enverus Rig Analytics. The count is up by over 3% and 76% in the last year.

The Permian Basin had the largest week-over-week gain, adding five rigs. The Anadarko Basin had the largest loss, dropping five rigs. The most active operators in the U.S. are currently Pioneer Natural Resources Co. with 25 rigs; EOG Resources Inc. with 22; Mewbourne Oil Co. with 18; Continental Resources Inc., ConocoPhillips Co. and Devon Energy Inc. with 17 each; and Occidental Petroleum Corp. with 16.

In the Permian, Mewbourne was the only operator to add more than one rig during the beginning of November, increasing its Permian total to 16. Quantum Energy Partners-backed Rio Oil & Gas II dropped both of its rigs in the Permian and was the only company to drop more than one.

No operators in the Anadarko Basin gained or lost more than one rig. Of the 11 companies that dropped a rig week-over-week, nine were only running one rig to begin with. Conversely, all six operators that added a rig were inactive in the play in November.

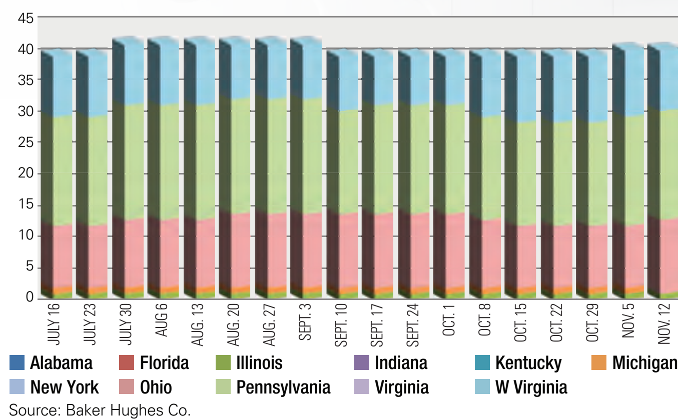
WTI crude futures in the U.S. rose close to their highest prices since 2014 earlier in November and were trading around $81/bbl on Nov. 12.

With oil prices up about 67% so far this year, some energy firms said they plan to boost spending in 2021 and 2022, but that spending increase, however, remains small as most firms continue to focus on boosting cash flow, reducing debt and increasing shareholder returns rather than adding output.

Natural gas had a larger price increase than oil—futures were up 91% so far this year but has not yet encouraged drillers to seek much more gas.

Eastern U.S. Rig Count

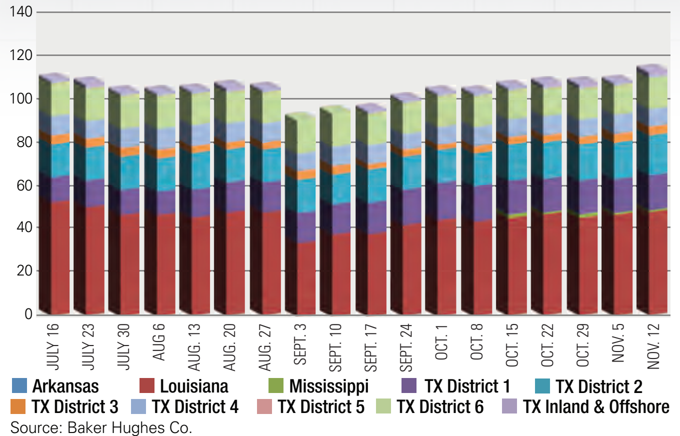
July 16, 2021-Nov. 12, 2021



Source: Baker Hughes Co.

Gulf Coast Rig Count

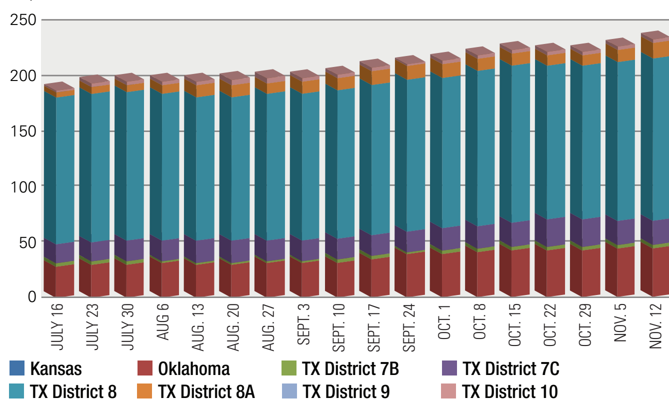
July 16, 2021-Nov. 12, 2021



Source: Baker Hughes Co.

Midcontinent & Permian Basin Rig Count

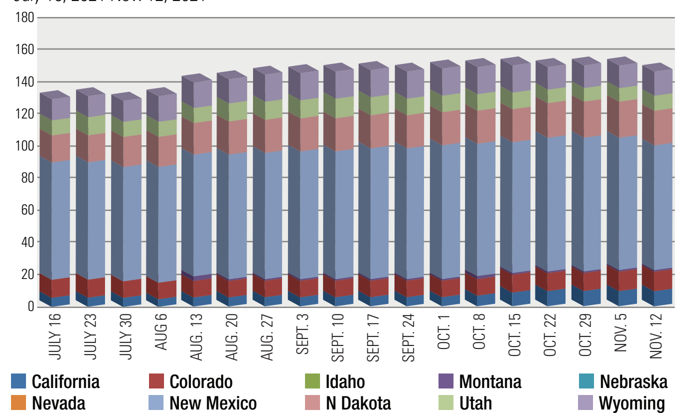
July 16, 2021-Nov. 12, 2021



Source: Baker Hughes Co.

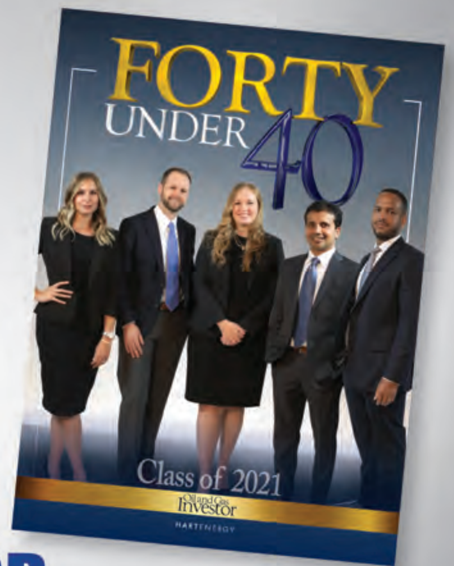
Western U.S. Rig Count

July 16, 2021-Nov. 12, 2021



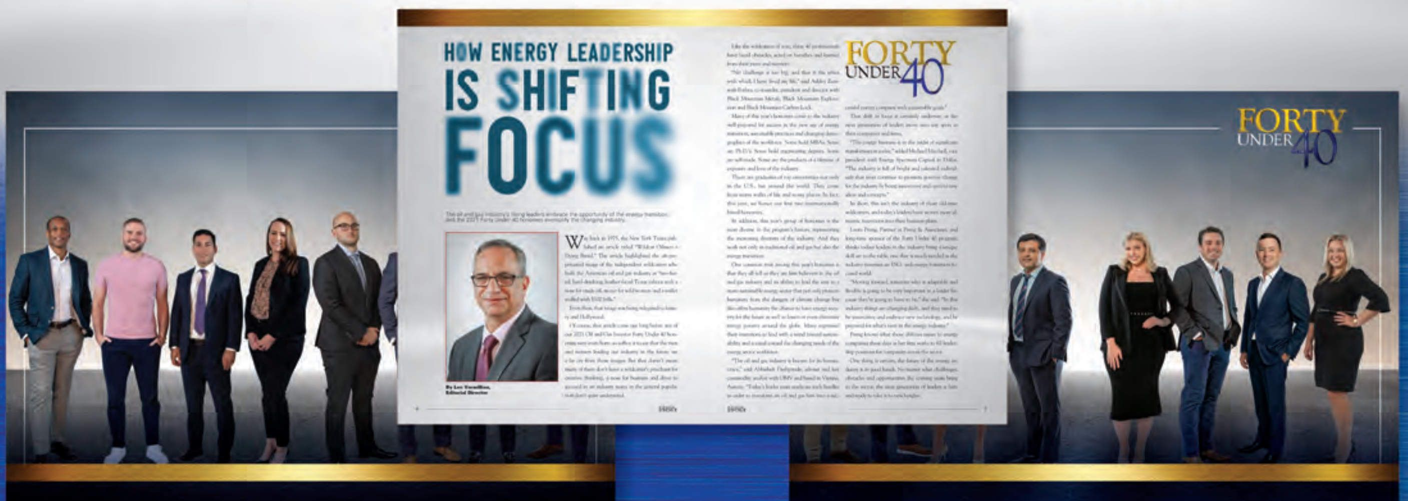
Source: Baker Hughes Co.

FORTY UNDER 40



We invite you to NOMINATE those that are
MOVING INDUSTRY FORWARD

Oil and Gas Investor is accepting nominations for the **2022 Forty Under 40 in Energy awards**. We encourage you to nominate yourself or a colleague who exhibits entrepreneurial spirit, creative energy and intellectual skills that set them apart. Nominees can be in E&P, finance, A&D, oilfield service, or midstream. Help us honor exceptional young professionals in oil and gas.



Honorees will be profiled in a special report that ships with the November issue of *Oil and Gas Investor* and on HartEnergy.com.

Nominees should display:

A desire to find new challenges

Community involvement

Leadership initiative

Creative problem solving

Professional excellence

Entrepreneurial spirit

Oil and Gas Investor

Deadline for submissions is June 1, 2022

HARTENERGY

FOCUS ON

Marcellus Shale and Utica Shale

According to the Energy Information Administration (EIA), Appalachian Basin dry gas (Marcellus and Utica shales) production in Pennsylvania, West Virginia and Ohio has been growing since 2008, and monthly production has recently set new record highs. Production in the region reached 32.5 Bcf/d in December 2020, and it averaged 31.9 Bcf/d during the first half of 2021, the highest average for a six-month period since production began in 2008.

The Marcellus and Utica formations accounted for 34% of all U.S. dry natural gas production in the first half of 2021. According to the EIA, the Appalachian Basin would have been the third-largest natural gas producer in the world the first half of 2021, behind Russia and the rest of the U.S.

The record-high gas production in the first half of 2021 was made possible by growth in pipeline takeaway, primarily from the basin in the Midwest. From 2008 to 2020, total pipeline takeaway capacity from the basin increased from 4.5 Bcf/d to 24.5 Bcf/d, alleviating some congestion and supporting higher wholesale natural gas prices in the region. Most of the increase in takeaway capacity happened between 2014 and 2020, when pipeline capacity increased by 16.5 Bcf/d.

Pipeline takeaway capacity from Appalachia to Canada and to the Southeast has also increased. The pipeline gas is being sent to the Southeast to be used for export as LNG.

Top West Virginia Marcellus Shale Producing Counties

County	IP Rate (boe)*
Monongalia	83,939
Harrison	34,210
Tyler	33,858
Doddridge	32,221
Broole	19,316
Marshall	17,323
Wetzel	12,218
Upshur	2,978
Ritchie	226

*Marcellus Shale wells in West Virginia produce oil and gas
Data source: Datalink

Top Pennsylvania Marcellus Shale Producing Counties

County	(MMboe)
Bradford	215.54
Washington	204.27
Susquehanna	193.26
Wyoming	119.93
Lycoming	88.33
Tioga	73.42
Greene	49.78
Westmoreland	46.74
Beaver	42.49

Data source: Datalink

Top Pennsylvania Utica Shale/ Point Pleasant Producing Counties

County	24-hour IP (cu ft of gas)	24-hour IP (boe)*
Tioga	461,380.53	76,896.76
Potter	298,351.22	49,725.21
Greene	252,488.61	42,081.43
Cameron	102,520.96	18,673.29
Westmoreland	90,729.12	15,121.52
Elk	69,528.29	11,588.04
Washington	38,462.88	6,410.48
McKean	23,205.74	3,867.62
Beaver	10,808.73	1,801.46

Data source: Datalink
* 24-hour oil production data not available

Top Ohio Utica Shale/Point Pleasant Producing Counties

County	24-hour IP (boe)	24-hour IP (cu ft of Gas)	24-hour IP (bbl of Oil)
Belmont	163,343.19	978,775.48	213.94
Guernsey	65,699.34	206,096.82	31349.87
Jefferson	57,316.37	343,873.98	4.03
Harrison	52,188.38	236,356.41	12795.65
Monroe	45,303.15	271,038.33	130.09
Carroll	17,224.96	84,182.11	3194.61

Data source: Datalink

Data from Rextag ENERGY DATALINK

INTERNATIONAL HIGHLIGHTS

Oil and natural gas prices have reached multiyear highs during the past few months, and the prices surged to record levels as widespread energy shortages occur in Asia and Europe.

According to the International Energy Agency (IEA), a global energy crunch is expected to boost oil demand by half a million barrels per day and could stoke inflation and slow the world's recovery from the COVID-19 pandemic.

Increased demand in the last quarter led to the biggest draw on oil products stocks in eight years, while storage levels in OECD countries were at their lowest since early 2015.

Meanwhile, the IEA estimated that OPEC+ is set to pump 700,000 bbl/d less than the estimated demand for its crude in the fourth quarter of this year, and demand will outpace supply at least until the end of 2021.

Spare production capacity from OPEC+ is set to shrink rapidly from 9 MMbbl/d in the first quarter of this year to only 4 MMbbl/d in the second quarter of 2022. The output capacity is concentrated in a handful of Middle East states.

The agency also said that the investment in renewable energy needs to triple by the end of the decade if the world hopes to effectively fight climate change.

—Larry Prado

1
2
3
4

1 *Cuba*

Melbana Energy announced that exploration well #1-Alameda found hydrocarbons and moveable oil from upper thrust sheet mud and cuttings samples at the Block 9 test. The oil shows occurred continuously to a depth of 1,130 m for a total gross thickness of 670 m. The operator is drilling ahead from 1,820 m to limestone and clastic sediments in the upper thrust sheet. Intermediate casing is planned at approximately 2,200 m and a wireline logging program will evaluate the current openhole section. Block 9 is estimated to contain 14.8 Bbbl of oil in place with prospective resources of 676 MMbbl (best estimate). Melbana is based in Sydney.

2 *Trinidad*

Touchstone Exploration completed exploration well #1-Royston in the Ortoire Block in Trinidad. Drilling and wireline logging indicated that it encountered substantial hydrocarbon accumulations. The well was drilled to a depth of 10,700 ft and found a total Herrera turbidite thickness of 1,014 ft in two stacked thrust sheets. Based on mud gas logging and openhole logs, the overall Herrera section contained approximately 609 ft of clean sand with 393 gross ft in two unique thrust sheets. Approximately 30 ft of hydrocarbon pay was detected in the shallow Lower Cruse, and 30 ft of pay was noted in the Karamat Gr7a sands. The #1-Royston was the final exploration commitment under Touchstone's Ortoire Block license. Further testing is required to determine the economic viability and potential of the well, and the Calgary-based company plans to begin completion and production testing operations. Touchstone has an 80% operating working interest in the well, and **Heritage Petroleum Co.** holds the remaining 20% working interest.

3 *Guyana*

Frontera Energy and **CGX** have scheduled exploration well #1-Kawa in offshore Guyana in the northeast quadrant of the Corentyne Block. Area water depth is approximately 355 m, and the planned depth of the venture is 6,685 m. The well will be targeting light oil in combination structural-stratigraphic traps in large Santonian and Campanian slope fan complexes. The primary target is a Santonian Sand with updip and lateral pinch-out of the reservoir and a counter-regional dip and structural closure. The venture is also expected to penetrate secondary objectives in a shallower Campanian Sand and a deeper Santonian Sand with additional hydrocarbon potential. According to the Calgary-based company, the stacked targets in #1-Kawa are considered analogous to the discoveries immediately adjacent to the Corentyne Block in Block 58 in Suriname. The #1-Kawa is expected to de-risk multiple other prospects on the block, which also have stacked reservoirs and similar structural geometries.

4 *Guyana*

Exxon Mobil Corp., based in Irving, Texas, has announced an updated estimate of recoverable resources for the offshore Guyana Stabroek Block. The updated resource estimate of 10 Bbbl includes a new discovery at #1-Cataback, which encountered 243 ft of net pay in high-quality, hydrocarbon bearing sandstone reservoirs. The well is about 4 miles east of the #1-Turbot and was drilled in 5,928 ft of water. Additional testing is planned. Exxon Mobil is the operator and holds 45% interest in the Stabroek Block. Project partners include **Hess Corp.** (30%) and **China National Offshore Oil Co.** (25%).

5 *U.K.*

Hartshead Resources reported

that it has identified an additional 112 Bcf of gas in place in the Viking Wx gas field in the North Sea. The geological model by **Xodus Group** also noted that there are additional resources in the Victoria gas fields. An extension to the gas field has been identified as a fault block in the southeast part of the field. The fault block contains 40 Bcf of additional gas in place (included in the new total field estimate). It will be evaluated as an additional target location for development drilling, which is expected to add recoverable resources to the Phase I development. Adjacent and to the northeast of the field, an undrilled structure has also been identified that will be evaluated as a potential near-field exploration prospect that could also add further gas volumes to the Phase I development. Perth-based Hartshead is 100% owner and operator of License P2607, which is comprised of five blocks in Quads 48 and 49 on the United Kingdom Continental Shelf in the Southern Gas Basin.

6 *Norway*

Neptune Energy, based in London, announced the completion of formation and flow testing at an appraisal well #34/4-16 S in offshore Norway's Production License PL 882. In March 2021, an appraisal well was drilled and temporarily plugged and abandoned and was re-entered in September 2021 to identify the oil-water contact and delineate the Dugong discovery in Rannoch. A secondary objective was to formation-test the reservoir if a sufficient amount of hydrocarbon bearing sand was encountered. The well encountered a 25-m oil column in Rannoch, 22 m of which consists of sandstone of primarily moderate reservoir quality. The oil/water contact was encountered at a vertical depth of 3,443 m. A formation test was conducted in the upper part of Rannoch, where a 13-m section was perforated and flowed approximately 2,100 bbl/d of oil during testing on a 32/64-inch choke.

7 *Norway*

Var Energy has announced a discovery at the Rodhette exploration well in the Norwegian North Sea. The #7122/6-3 S encountered a 29-m hydrocarbon column in the primary target in the Middle Jurassic Sto in moderate-to-good quality sandstone. Data acquisition indicates a gas column of approximately 18 m in the well over an oil rim. Preliminary estimates indicate that the discovery is between 9 MMboe and 12 MMboe (gross). Additional testing is planned, and the company will evaluate other sites near the find. The well is about 30 km north of the Goliat Field. Stavanger-based Var holds 80% interest with partner **Longboat Energy** holding 20%.

8 *Indonesia*

Indonesia Energy Corp. reported an oil discovery at #26 Kruh. The Kruh Block venture in Sumatra hit approximately 111 ft of oil sands at 3,100-3,228 ft. The Jakarta-based company had a previous completion at #25 Kruh. According to the company, full production is anticipated at the end of October and will increase the company's overall daily revenues and oil production by more than 100%. Both wells were drilled to approximately 3,376 ft, and stimulation and additional testing is planned. The company has a three-year plan to drill 18 wells, and five are planned for 2021 completions.

9 *China*

China National Offshore Oil Corp. announced a large heavy oil discovery in the Laizhou Bay Sag in the southern portion of Bohai Bay. The #10-2 Kenli encountered oil in the lower member of Neogene Minghuazhen. The original discovery well at #10-2-4 Kenli was drilled and completed at a depth of 1,520 m and hit about 27 m of oil. The appraisal well was tested to produce approximately 569 bbl/d of oil. Area water depth is about 16 m.

10 *Australia*

Buru Energy spudded a conventional oil exploration well at #1-Rafale in Western Australia. The venture is in EP 428 in the Canning Basin. The #1-Rafael is being drilled on a large structure that has more than 450 m of mapped closure. It has a large regional structure that is interpreted to have similarities to large and prolific oil producers of Devonian-aged carbonate structures in Western Canada. The #1-Rafael is the second well in the company's drilling program in the basin. The first well in the program, #1-Currajong, encountered an interpreted oil accumulation in the Ungani Dolomite equivalent section.

EQUITY

Company	Exchange/ Symbol	Headquarters	Amount ($MM)	Comments
Devon Energy Corp.	NYSE: DVN	Oklahoma City	$1,000	Authorized share-repurchase program through year-end 2022. Program is equivalent to approximately 4% of the company's current market cap. After funding the dividend concurrently announced, remaining free cash flow generation will be deployed toward share repurchase activity and continued improvement of balance sheet.
ESGEN Acquisition Corp.	NASDAQ: ESAC	Dallas	$276	Closed IPO of 27.6 units, which includes the full exercise of the underwriters' option to purchase 3.6 million additional units, at a price of $10 each. Proceeds will be used by the company, which is affiliated with **Energy Spectrum Capital**, to concentrate on identifying opportunities in the North American energy and infrastructure value chain and contiguous industries that it believes will fundamentally change the current energy landscape by accelerating a shift to a low-carbon future. **Citigroup** and **Barclays Capital Inc.** were bookrunning managers. **Ladenburg Thalman & Co. Inc.** was co-manager.
Black Mountain Acquisition Corp.	NYSE: BMAC	Fort Worth, Texas	$240	Priced upsized IPO of 24 million units at a price of $10 per unit. Each unit consists of one share of Class A common stock and three quarters of one redeemable warrant, with each whole warrant entitling the holder thereof to purchase one share of the Class A common stock at an exercise price of $11.50 per share. Underwriters were granted a 45-day option to purchase up to an additional 3.6 million units at the IPO price. Proceeds will be used for the purpose of effecting a merger, capital stock exchange, asset acquisition, stock purchase, reorganization or similar business combination with one or more businesses focusing on opportunities and companies in the energy industry in North America. **EarlyBirdCapital Inc.** and **Stephens Inc.** were bookrunning managers and representatives of the underwriters.
Aris Water Solutions Inc.	NYSE: ARIS	Houston	$229.5	Priced IPO of about 17.7 million shares Class A common stock at a price to the public of $13 each. Underwriters were also granted a 30-day option to purchase up to roughly an additional 2.6 million shares of stock at the public offering prices, less underwriting discounts and commissions. The Class A common stock is expected to begin trading on the NYSE on Oct. 22. Proceeds will be used for distributions to existing owners and for general corporate purposes. **Goldman Sachs & Co. LLC** and **Citigroup** are joint bookrunning managers and representatives of the underwriters. **J.P. Morgan Securities LLC**, **Wells Fargo Securities LLC, Barclays Capital Inc.** and **Evercore Group LLC** are joint bookrunning managers.
Cenovus Energy Inc.	NYSE: CVE	Calgary, Alberta	CA$227.5	Closed the bought deal secondary offering of 50 million common shares of **Headwater Exploration Inc.**, including 5 million shares sold pursuant to the exercise in full of an over-allotment option granted to the Underwriters, completed on a bought deal basis at a price of $4.55 per share, pursuant to an underwriting agreement dated effective Sept. 27 among Headwater, Cenovus, **Cenovus Marten Hills Partnership**, a wholly owned subsidiary of Cenovus and a syndicate of underwriters led by **Peters & Co. Ltd.** and **BMO Nesbitt Burns Inc.** and including **CIBC World Markets Inc.**, **RBC Dominion Securities Inc.**, **Scotia Capital Inc.** and **TD Securities Inc**. Proceeds will be used by Cenovus as part of its plan to reduce its net debt levels toward its $10 billion interim target and accelerate shareholder returns.
Kosmos Energy Ltd.	NYSE: KOS	Dallas	$123.8	Priced a registered underwritten public offering of 37.5 million shares of common stock at a price to the public of $3.30. Underwriters were granted a 30-day option to purchase up to roughly an additional 5.6 million shares of stock at the public offering price less underwriting discounts. Proceeds will be used to repay outstanding borrowings under its commercial debt facility, including borrowings incurred to finance a portion of the previously announced acquisition of **Anadarko WCTP Co. Barclays**, **BofA Securities** and **Jefferies** were joint bookrunning managers.
Kimbell Royalty Partners LP	NYSE: KRP	Fort Worth, Texas	$52.5	Priced a public offering of about 3.8 million common units representing limited partner interests at a public offering price of $14 each. Underwriters have been granted an option to purchase up to 562,500 additional common units at the public offering price less the underwriting discount and commissions. Proceeds will be used to fund a portion of the cash purchase price for the pending acquisition of oil and natural gas mineral and royalty interests held by an undisclosed seller. Pending the closing of the acquisition, proceeds will be used for the repayment of outstanding borrowings under its revolving credit facility. **Citigroup** and **Raymond James & Associates** are joint bookrunning managers. **RBC Capital Markets LLC** is book-running manager. **KeyBanc Capital Markets Inc.**, **Stephens Inc., Stifel, Nicolaus & Co. Inc.** and **TD Securities (USA) LLC** are co-managers.

Company	Exchange/ Symbol	Headquarters	Amount ($MM)	Comments
HighPeak Energy Inc.	NASDAQ: HPK	Fort Worth, Texas	$20.2	Priced an underwritten public offering of 2.2 million shares of common stock at a price to the public of $10 each. Underwriters were also granted a 30-day option to purchase up to an additional 330,000 shares of stock at the public offering price, less underwriting discounts and commissions. Proceeds will be used for general corporate purposes, which may include accelerating its drilling and development activities and funding further bolt-on acquisitions. **Roth Capital Partners** was sole bookrunning manager. **Northland Capital Markets** and **Seaport Global Securities** were co-managers.
Talos Energy Inc.	NYSE: TALO	Houston	N/A	Priced an underwritten public offering of an aggregate of 6 million shares of common stock by certain affiliates of **Apollo Global Management** and **Riverstone Holdings LLC**. Underwriters have a 30-day option to purchase up to an additional 900,000 shares of common stock from **AP Talos Energy LLC**. Talos is not selling any shares of common stock in the offering and will not receive any proceeds from any sale of shares by the selling stockholders. **J.P. Morgan** is sole underwriter.

DEBT

Company	Exchange/ Symbol	Headquarters	Amount ($MM)	Comments
Continental Resources Inc.	NYSE: CLR	Oklahoma City	$1,600	Priced a private placement of $800 million of 2.268% senior notes due 2026 and $800 million of 2.875% senior notes due 2032. Proceeds will be used to fund a portion of the purchase price in the recently announced Permian Basin acquisition from **Pioneer Natural Resources Co.** and to pay the fees and expenses associated with this offering. If the Pioneer acquisition is not consummated, proceeds will be used for general corporate purposes, which may include repayment of certain indebtedness.
Summit Midstream Partners LP	NYSE: SMLP	Houston	$700	Subsidiaries **Summit Midstream Holdings LLC** and **Summit Midstream Finance Corp.** priced a private offering of 8.5% senior secured second lien notes due 2026 at a price of 98.5% of their face value. The notes will pay interest semiannually on April 15 and Oct. 15 of each year, commencing on April 15, 2022, and will be jointly and severally guaranteed, on a senior second-priority secured basis, by the partnership and each restricted subsidiary of the partnership that is an obligor under the credit agreement by and among Summit Holdings, as borrower, **Bank of America NA**, administrative agent and trustee and the several lenders and other agents party thereto. Proceeds will be used together with cash on hand and borrowings under the ABL credit agreement to repay in full all of Summit Holdings' obligations under the third amended and restated credit agreement dated May 26, 2017 among Summit Holdings, the lenders from time to time party thereto and **Wells Fargo Bank NA** as administrative agent and collateral agent, fund the previously announced conditional redemption of all of the 5.5% senior notes due 2022, pay accrued and unpaid interest on the revolving credit facility and 2022 notes and for general corporate purposes, including fees and expenses associated with the offering.
Diamondback Energy Inc.	NASDAQ: FANG	Midland, Texas	$650	To redeem 0.9% senior notes due 2023, representing all of the outstanding 2023 notes, at a redemption price equal to 100% of the principal amount thereof, plus accrued and unpaid interest on the 2023 notes redeemed to but not including the redemption date of Oct. 31.
Phillips 66 Co.	NYSE: PSX	Houston	$450	To redeem the entire outstanding principal amount of its floating rate senior notes due 2024. The redemption date for the notes is Dec. 15 and the redemption price for the notes will be equal to 100% of the principal amount of the notes outstanding, plus accrued and unpaid interest thereon to, but not including, the redemption date. Cash on hand will be used to fund the redemption. **U.S. Bank National Association** is the trustee.
DCP Midstream LP	NYSE: DCP	Denver	$400	Wholly owned subsidiary **DCP Midstream Operating LP** priced an offering of 3.25% senior notes due 2032 at a price to the public of 100% of their face value. Notes will be fully and unconditionally guaranteed by the partnership. The operating partnership intends to use proceeds to repay indebtedness under its revolving credit facility and for general partnership purposes. **J.P. Morgan Securities LLC**, **Mizuho Securities USA LLC**, **RBC Capital Markets LLC**, **Barclays Capital Inc.**, **Citigroup Global Markets Inc.**, **MUFG Securities Americas Inc.** and **TD Securities (USA) LLC** are joint bookrunning managers. **PNC Capital Markets LLC**, **Regions Securities LLC**, **SMBC Nikko Securities America Inc.** and **U.S. Bancorp Investments Inc.** are co-managers.
Kosmos Enegy Ltd.	NYSE: KOS	Dallas	$400	Priced 7.75% senior notes due 2027. Proceeds will be used, together with cash on hand, to refinance the $400 million aggregate principal amount of private placement notes the company issued to fund its acquisition of **Anadarko WCTP Co**.

Company	Exchange/ Symbol	Headquarters	Amount ($MM)	Comments
Athabasca Oil Corp.	TSX: ATH	Calgary, Alberta	$350	Closed the issuance of senior secured secondary lien notes with a coupon rate of 9.75% and a five-year term until 2026. Proceeds will be used along with cash on hand will be used to redeem existing $450 million senior secured second lien notes. **Goldman Sachs** was lead active bookrunner. The syndicate included **ATB Capital Markets** as co-lead joint book-runner and **BMO Capital Markets** as joint bookrunner. **Norton Rose Fulbright Canada LLP** was legal adviser.
Colgate Energy Partners III LLC	N/A	Midland, Texas	$200	Priced a private offering to eligible purchasers of 5.875% senior notes due 2029. The notes mature on July 1, 2029, pay interest at the rate of 5.875% per year and were priced at 101.75%, which implies an effective yield to worst of 5.441%. The notes are being offered as additional notes under an indenture pursuant to those issued on June 30, 2021, $500 million aggregate principal amount of notes, and will have identical terms as the existing notes. Proceeds will be used to fully repay amounts outstanding under its revolving credit facility and the remaining net proceeds to fund a portion of the purchase price for the acquisition of certain assets in New Mexico's Eddy and Lea counties, referred to as the Parkway acquisition. If the Parkway acquisition is not consummated on the terms currently contemplated or at all, proceeds will be used for general company purposes.
Northern Oil and Gas Inc.	NYSE American: NOG	Minnetonka, Minn.	$200	Priced a private placement to eligible purchasers of additional 8.125% senior notes due 2028 at an offering price equal to 106.75% of par, plus accrued interest from Sept. 1, representing a yield to worst of 6.31%. The notes will be issued under the same indenture as the notes issued on Feb. 18, 2021, and will form a part of the same series of notes as the existing notes. Proceeds will be used to repay a portion of the outstanding borrowings under its revolving credit facility.
Riley Exploration Permian Inc.	NYSE American: REPX	Oklahoma City	$175	Entered into an amendment to its senior secured revolving credit facility under which the $135 million borrowing base and elected commitments of the lenders party thereto have been increased by $40 million in connection with its regularly scheduled semiannual redetermination.
PDC Energy Inc.	NASDAQ: PDCE	Denver	$102.3	To redeem the remaining amount of its 6.25% senior notes due 2025 on Dec. 1. The redemption price for the notes will be equal to 103.125% of the principal amount thereof plus accrued and unpaid interest, pursuant to the indenture, dated as of Nov. 29, 2017, among PDC (as successor to SRC Energy Inc.) and the trustee **U.S. Bank National Association**. Interest on the notes will cease to accrue on and after the redemption date.
Tidewater Inc.	NYSE: TDW	Houston	$175	Finalized the terms of the offering of senior secured bonds in the Nordic bond market. The bonds will mature in November 2026 and bear interest at 8.5% per annum. Proceeds will be used the refinancing of outstanding debt and for general corporate purposes.
Helix Energy Solutions Group Inc.	NYSE: HLX	Houston	$80	Entered a new asset-based revolving credit facility with a syndicated banking group replacing its existing credit facility and term loan, which was concurrently repaid in full. The ABL facility has five-year term or 91 days prior to the maturity of Helix's 2026 convertible senior notes plus Separate U.S. and U.K. tranches of $45 million and $35 million, respectively, and an additional $70 million accordion, subject to lender approval. **Bank of America NA** and **Wells Fargo Bank NA** were joint lead arrangers. **Bank of America NA** will continue to serve as administrative agent.
Tellurian Inc.	NYSE American: TELL	Houston	$50	Priced an underwritten public offering of 8.25% senior notes due 2028. Underwriters have been granted a 30-day option to purchase an additional $7.5 million aggregate principal amount of notes. Proceeds will be used for general corporate purposes, including the potential acquisition of upstream assets. **B. Riley Securities Inc.**, **Ladenburg Thalmann & Co. Inc.** and **William Blair & Co. LLC** are joint bookrunning managers. **EF Hutton**, division of **Benchmark Investments LLC**, is lead manager, and **Aegis Capital Corp.**, **Boenning & Scattergood Inc.**, **Colliers Securities LLC**, **Newbridge Securities Corp.**, **Revere Securities LLC**, **Wedbush Securities Inc.** and **B.C. Ziegler and Co.** are co-managers.
Macquarie Infrastructure Holdings LLC	NYSE: MIC	New York	$34	Announced offer to repurchase any and all of its 2.00% convertible senior notes due 2023 at par plus accrued interest. **Wells Fargo Bank NA** is the trustee, paying agent and conversion agent.
Piñon Midstream LLC	N/A	Houston	N/A	Closed on a new senior secured credit facility with **BOK Financial** in August 2021. Proceeds will be used to fund expansion projects and for other general business purposes.

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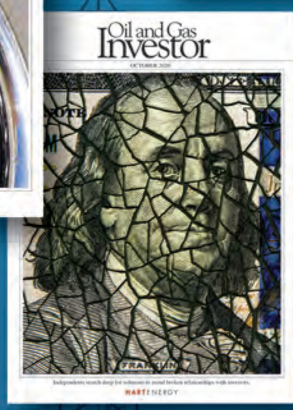

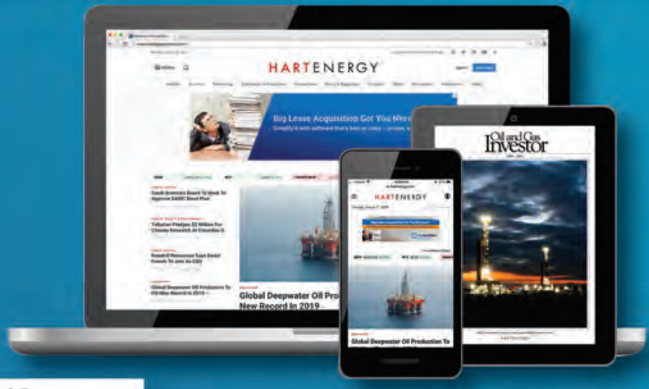

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THE OVERREACH COMMITTEE

NISSA DARBONNE,
EDITOR-AT-LARGE

If you missed the House Committee on Oversight and Reform hearing on Oct. 28, don't watch it now. If you must, have a blood pressure monitor and tele-doctor nearby.

The day after, Rob Clarke, vice president, upstream research, for Wood Mackenzie tweeted what his followers—folks who make energy, invest in it, write about it, analyze it—felt as well, confirming that (1) the hearing did happen and wasn't a mass hallucination and (2) it was, yes, very disturbing.

Clarke typed into a meme of Bart Simpson writing lines on a chalkboard: "I will stop watching C-SPAN clips of yesterday's energy hearing."

Concurrence was received by many of Clarke's followers, including the CFO of an independent, Permian-focused E&P: "I feel you; still irate over here."

The producer added, "It just bothers me that congressmen can tell outright lies about your company—hurting your shareholders and their investment—and you can't push back. I'm pretty sure if Chevron 'owed $50 billion for environmental disasters' (as alleged in the hearing) it would be disclosed in SEC filings."

So what happened? And what was learned?

The answer to the latter is not what the committee might have sought to learn—whatever that may have been. Rather, the committee learned nothing, while viewers learned that a large portion of Congress may be just as uneducated about energy as their constituents.

As for what happened: A California congresswoman performed a pre-K show-and-tell using a jar of candy, followed by a pre-K case of "acting out" by pouring rice onto her driveway from the back of her SUV, while yelling questions to Gretchen Watkins, then interrupting Watkins, preventing the Shell Oil Co. president from answering anything.

There was more.

But, as Clarke suggested, we won't rewatch it.

Committee members who understand energy—and comport a basic respect of others—ended up using their time to apologize to the Btu leaders. Among them was Rep. Byron Donalds of Florida.

A tweeter responded: "He made some friends in Midland today, that's for sure." Another: "Let's throw him a Midland fundraiser."

The day before the hearing, an oil producer had tweeted, "I expect a lack of basic energy knowledge, no understanding of economics and a 'show' to win votes."

A show it was—a circus.

Afterwards, a follower replied, "Well, you nailed it."

There were pre-show optimists: "I want to see AOC [Alexandria Ocasio-Cortez] wax poetic on gas lift." A reply: "This would be the culmination of my life."

In the end, there were two kings left on the board: Nothing gained—at least, in terms of what may have been the point of the hearing.

This was all conducted and viewed via electricity-powered phone, laptop or other device in a climate-controlled setting with clean drinking water, while robed in fully or partially poly-based fibers.

Altogether, it was just as vague as the point of the committee itself. Its legislative jurisdiction is administrative, including holidays, celebrations, the postal service, the census and municipal matters of the District of Columbia. It further states it has jurisdiction in "any matter" within the jurisdiction of other House committees—which is to say it is redundant.

It's an "overreach" committee.

Others testifying—trying to testify, that is—were Mike Wirth, chairman and CEO, Chevron Corp.; Darren Woods, chairman and CEO, Exxon Mobil Corp.; and Dave Lawler, CEO, BP America.

And Neal Crabtree, former welder on the former Keystone XL project.

Here was an enlightened highlight. Crabtree, who was able to complete his remarks, uninterrupted, said, "Build Back Better shouldn't mean neglect and destruction of the energy infrastructure as we know it … There seems to be no thought given to the hundreds of thousands of workers in this industry or the millions of products that we use every single day that are provided by fossil fuels."

He admonished, "There shouldn't be a fear of a heating shortage this coming winter. But, yet, here we are." Energy shortages in the U.S. aren't the result of rising prices; instead, "rising prices are a direct result of the lack of infrastructure to get products moved to where they need it most."

He concluded, "My crisis right now is the mortgage payments I have due every month, the food I need to put on the table and the healthcare I need to provide my family.

"And instead of demonizing the CEOs and presidents here today, I would like to thank them for the opportunity they provided me and my family and my union to work these past few decades."

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exceptional results

Aethon Energy is a private investor and operator of onshore oil & gas properties across North America. We believe unconventional thinking can generate exceptional results and are always looking for talented individuals to join our team.

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We produce the energy needed to make our world work.

And not just now, but will for generations to come. It is not an understatement to say that without the miraculous properties of our domestically produced hydrocarbons, modern American life couldn't exist. The oil and natural gas we find and produce transports us, feeds us, illuminates us, comforts us, and even cures us. Petroleum and its byproducts are everywhere and in everything, we are essential and irreplaceable. In short, we produce the energy needed to make our world work. And we do it responsibly, affordably, abundantly, and innovatively. To learn more, visit **CLR.com**

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