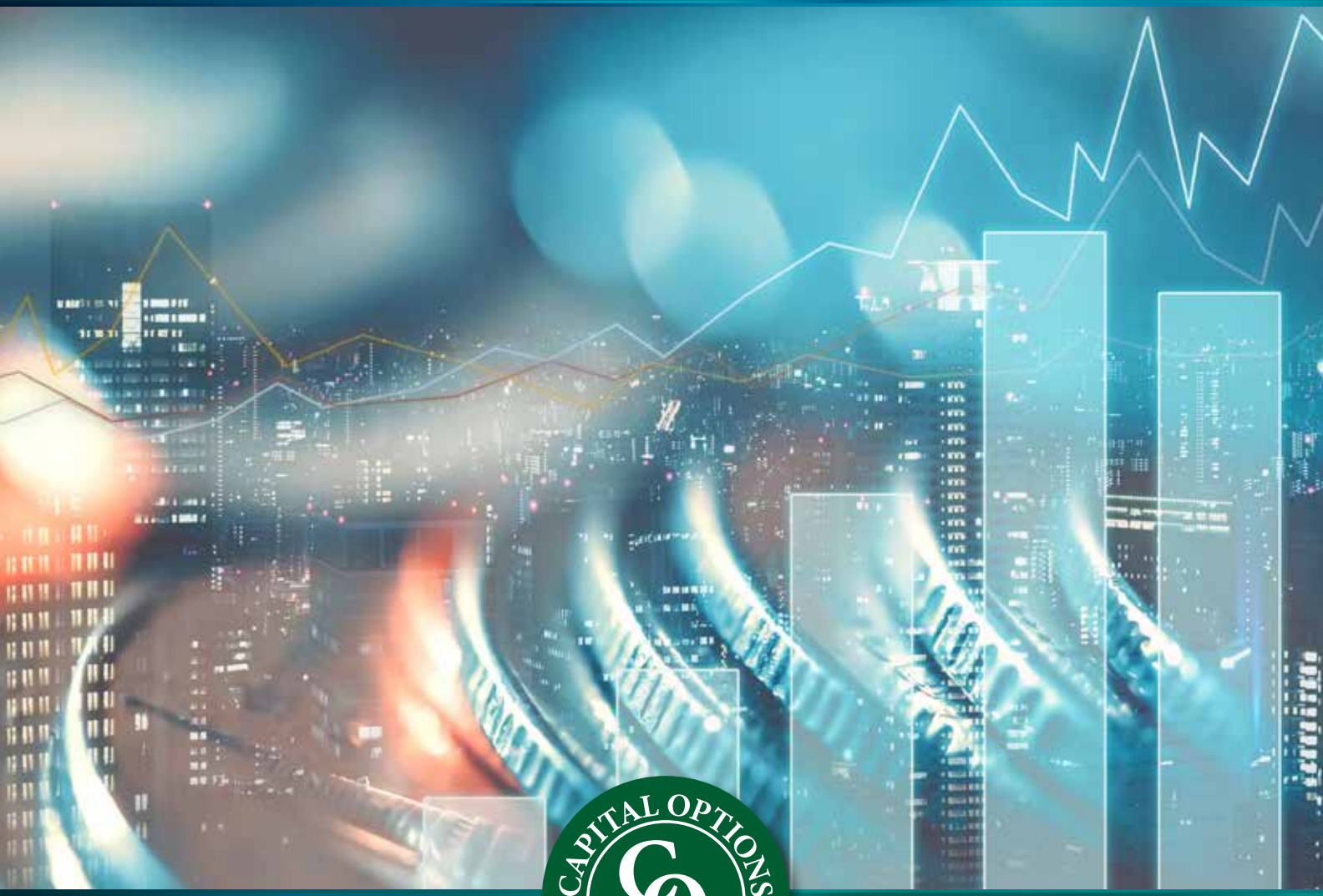
ENERGY TRANSITION

CAPITAL OPTIONS



CAPITAL OPTIONS 2022

A supplement to

Oil and Gas Investor

A supplement to:

Oil and Gas Investor

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About the cover: The energy future needs money and business leaders who understand how to monetize the energy value chain. (Image courtesy of Number1411/Shutterstock.com; Cover design by Max Guillory)

All of the Btu—and CCUS

Nissa Darbonne, Editor-at-Large

It's all Btu—oil, gas, wind, solar, renewable gas, hydrogen, biofuels and more.

And veteran producers of the primary Btu, oil and gas, as well as longtime Btu financiers are joining to build operations in additional forms of fuel.

Likely these two groups alone will solve the problem—including some by reducing the release of new CO_2, such as at dairy farms, and some by simply stripping CO_2 from the atmosphere via air capture.

The latter will result in burial of most of the carbon; other applications will be in EOR and new products. Over at SpaceX, founder Elon Musk is looking to air-captured CO_2 for stripping out the O_2 to fuel Starship rockets to Mars.

> "The industry that's been vilified the most—oil and gas—is going to be the industry that saves the world from its carbon problems. That's going to be through CCUS."
>
> —Wil VanLoh, *Quantum Energy Partners*

His other point: sending the technology to Mars to strip O_2 from the planet's 95% CO_2 atmosphere, making oxygen for inhabitants and to fuel return trips to Earth.

SpaceX's Starbase on the Texas Coast near Mexico's border is just east along Boca Chica Boulevard of the Rio Grande LNG export facility that NextDecade Corp. has been hoping to build. The Brownsville plant's developers have added CO_2 capture to their plans, offsetting a prospective anchor shipper's concern that the natural gas is sourced from the oily Permian Basin and Eagle Ford.

Longtime oil and gas private equity financier Quantum Energy Partners has been investing in alternative energy since 2010. CEO Wil VanLoh, who founded the firm in 1998, explained on page 32 that, ultimately, it is carbon capture, utilization and storage (CCUS) that is the greatest contributor to reaching climate goals.

"I really think that the industry that's been vilified the most—oil and gas—is going to be the industry that saves the world from its carbon problems," VanLoh said. "That's going to be through CCUS."

Meanwhile, oil and gas are an essential part of the future. He told Wall Street, "You shouldn't be divesting of them; you should be investing in them."

His point is that, while wind, solar and other sources of energy join the Btu grid, crude oil and natgas demand will increase, as energy-poor countries join the first-world economy with access to these fuels and as the world's population continues to grow.

Quoting Warren Buffett at Hart Energy's inaugural Energy Transition Capital Conference in October 2021, VanLoh said, "I think we're going to have a lot of hydrocarbons for a long time. And we'll be very glad we've got them."

In addition to a bounty of private equity ready to invest, discussed in these pages are public-equity sources of funding alternative energy operations and sustainability-linked bonds (SLBs) and loans (SLLs) that energy firms are accessing at lower interest.

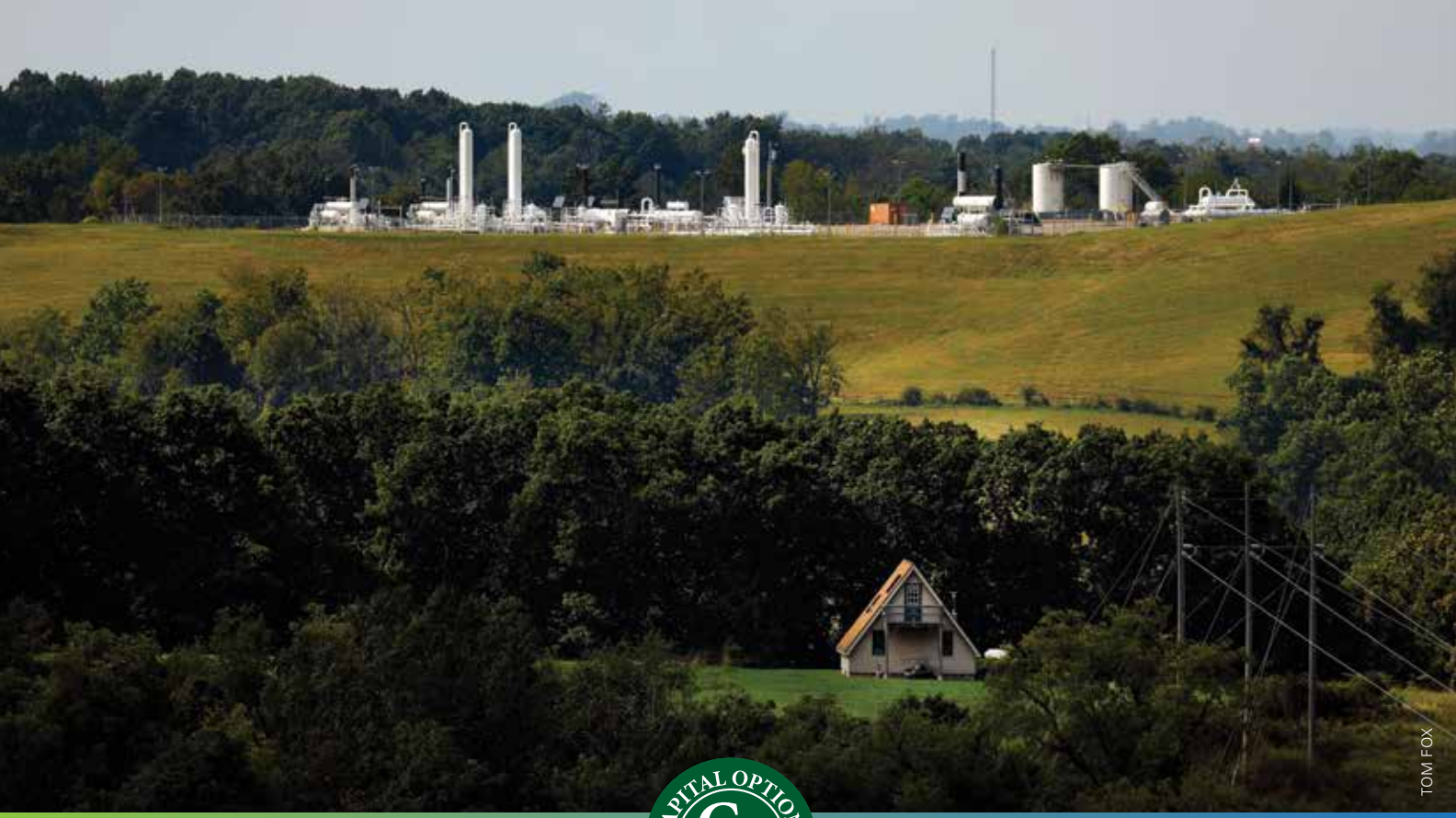
There's a lot of money looking to fund the energy transition, according to Kassia Yanosek, a partner at McKinsey & Co. If more than 70% of current oil and gas demand is replaced by renewables, investment of some $225 trillion is needed—$7 trillion per year between now and 2050.

The uptake of these new opportunities within the veteran oil and gas industry is great, said Sanjay Bhatia, co-founder of the Evolve Collective energy consultancy and a longtime oilfield services professional.

When Evolve formed two years ago, "there was just kind of crickets coming from the traditional players," he explained in the article on page 16. Now there is a chorus. "Almost every player we talk to, from oilfield services to the E&P side, has a group or a venue [where] we can start to introduce these [transition] startups."

Over at EnCap Investments LP, which has funded oil and gas startups for 30 years, it has added a dedicated energy transition fund.

"It is a growing space," said Kellie Metcalf, managing partner leading the fund, in the story on page 18. "A bit counter to what [others] say, there are definitely investment opportunities that can make money." ■



TOM FOX

CAPITAL OPTIONS 2022

NATURAL GAS

Going for the Green: RSG

Producers are winning premiums for their responsibly sourced gas. But the bigger prize is in positioning their companies into sustainable investments.

By Michelle Thompson, Contributing Editor

It's no secret that the oil and gas industry is working to lessen its impact on the environment. The benefits of doing so are largely well-documented. Lesser known is how responsibly sourced gas (RSG) can improve the bottom line.

Operators that produce natural gas in a carbon-neutral operation could ultimately reap benefits through share-price uplifts, reduced costs of debt and other premiums. Legitimate RSG sites have undergone third-party certification to attest that the operator adheres to the highest industry standards across all operational facets.

Analysts say that, while it will take time for the market to mature, RSG producers are likely to yield financial benefits.

Some market uncertainties make it difficult to predict when—and if—the Independent Energy Standards Corp. (IES)-certified gas market peaks, said Rystad Energy natural gas analyst Zongqiang Luo.

"It depends, for instance, on whether the utilities and end users are willing to pay for the price premium," Luo said. "Will the industry publish another standard to compete with the current standards from IES? Will the

consumers in other countries acknowledge the standards from IES companies? Or even will there be more companies like IES with different standards?"

To pay or not to pay (a premium)

Embracing RSG could yield other benefits, he said, including a bolstered focus on upgrading infrastructure to meet industry standards. Doing so could improve measurement accuracy, which would help a company become more auditable and transparent.

But it remains to be seen whether the majority of customers will be willing to pay more for the responsibly sourced commodity.

"It will be very challenging to see the utilities or end users actually pay a price premium," Luo said.

One IES survey of 1,600 households throughout the Northeast and Midwest found that 80% of people would pay up to 20% extra for responsibly produced gas, S&P Global reported.

Alerian research director Stacey Morris said that while RSG—alongside carbon-neutral LNG cargoes—is going to become more of a trend, it's too soon to predict the financial perks they might include.

"I think it's very early stage, and it may be difficult to chalk up improved valuations or lower debt costs purely to green gas initiatives, especially since natural gas prices have improved so much lately," Morris said.

"In the near term, gas producers' equity values are going to be benefiting more from higher natural gas prices than from smaller forays into renewable (natural gas, renewable natural gas) or RSG."

It's not unheard of to charge a premium for RSG, just as it's not unusual to pay extra for organic food at a grocery store.

The first public transaction of IES-certified gas happened in 2017, when Southwestern Energy Co. sold its RSG to New Jersey Natural Gas at an extra cost. Southwestern, the nation's second-largest gas producer, was the first to commit to 100% certification of its assets.

A few additional deals have happened since, and experts are expecting to see activity strengthen going forward.

"In the near term, gas producers' equity values are going to be benefitting more from higher natural gas prices than from smaller forays into renewable (natural gas, renewable natural gas) or responsibly sourced gas."

—**Stacey Morris,** *Alerian*

A growing market

Chris Romer, CEO and co-founder of Project Canary, said the rise of ESG investing—coupled with heightened investor, regulator and customer focus on environmental performance—is driving activity.

"The certified gas market has grown exponentially over the past year, with approximately 15% of U.S. daily production certified—or soon to be certified—by independent third-party organizations, like Project Canary," Romer said.

"The trend will continue to gain momentum, and we foresee a scenario where certification and continuous, pad-level monitoring is the industry's baseline."

Project Canary, which analyzes 600 data points across the ESG spectrum on a per-well basis, is considered the top certification firm, Romer said.

"Only the top environmental performers receive certification, which means buyers can have confidence in knowing this gas is best-in-class."

Right now the team, which includes data scientists, engineers and industry experts, is working with 50 E&Ps, midstream operators and dozens of other companies looking to embrace RSG.

Romer said of the burgeoning growth, "The certified gas market has grown tremendously during the past 12 months to a point where there is a clearly defined, differentiated market and demand for this sustainable product."

As the market continues to evolve, some trading platforms have become dedicated to the certified gas and low-carbon energy markets. And although transactions between a buyer and seller are mostly confidential, it's understood that a premium of between one and five cents per Mcf has become commonplace for certified gas.

Industry leaders

Going forward, effective measures will continue to be key so that the industry fully understands and addresses methane emissions to gain critical ESG recognition, Romer said.

"Just like a Carfax report or LEED [Leadership in Energy and Environmental Design] rating for a building, gas certification gives the buyer—be it LNG or utilities—trust that the gas was produced in the most environmentally responsible manner possible," Romer said.

"Companies that are forward-thinking, intentional and proactive in their actions are well positioned to attract ESG investments, access more diverse pools of capital, increase [their] customer base and do good by our environment."

Pure gas players in Appalachia, the Haynesville and other basins and plays in the U.S. are leading the certified RSG charge, while associated-gas producers in the Permian and other oil plays are following behind.

There are multiple good reasons for producers to embrace the phenomenon, Romer said.

"Expectations have shifted; shareholders, regulators, customers expect energy companies to engage on climate, lead in the conversation and do more than just loft

aspirational targets but actually take action on emissions," he said.

"That's what certified gas does: It's taking action to tackle unwanted methane emissions. It's a win-win for business performance and our environment."

Tallgrass Energy Partners became a midstream leader via its Rockies Express Pipeline, the first interstate gas transmission pipeline in the nation to receive an independent environmental assessment and certification from Project Canary.

Companies with a positive rating through IES' TrustWell system have succeeded in charging premiums of up to 10 cents for Mcf, then-IES CEO Jory Calukins told S&P Global in 2019.

"We've seen a notable and rapidly growing need from end markets for differentiated gas and a willingness to pay a premium for gas that's been independently and credibly verified as responsible," Calukins said.

Rewarding responsibility

Soledad Mills is CEO of Equitable Origin, which has a fully transparent gas certification system based on independent third-party verification. The nonprofit published the first independent, voluntary certification standard called the EO100 Standard for Responsible Energy Development for the oil and gas sector in 2012.

The organization's vision is to recognize and reward responsible energy producers and give that recognition value in the marketplace.

And if the Canadian utility company Energir is any indication, it's working. In 2020, it procured gas at a premium from an EO100-certified supplier. The Quebec-based company, which has 520,000 customers there and in the northeastern U.S., has committed to sourcing 100% of its gas from EO100-certified suppliers.

Although Equitable Origin is set to certify about 10% of U.S. natural gas production in the coming year, Mills said the industry hasn't yet reached a tipping point. She expects the market to peak—alongside oil and gas demand—in the mid-2020s.

Certified companies throughout the nation are seeing premiums of varying amounts, said Mills, who added that the exact amount has not been publicly disclosed.

But she expects that to soon change.

"As the market evolves, we expect to have more data on this," she said. "However, we have heard anecdotally that even if small premiums (for example, less than 1%) are achieved on a portion of the gas produced, it can yield significant returns due to the volumes involved."

A willing customer

Statistics suggest that customers are willing to pay more for certified gas.

Nearly two-thirds of Americans will spend extra for environmentally sustainable products, a GreenPrint study found. The study, released in March 2021, also found that people are more likely to buy a product that's clearly identified as being environmentally friendly.

Newly Devalued: 'Business as Usual'

Phil Lookadoo

In the first blush of renewable energy, there was a perceived risk that existing oil and gas assets would become stranded, either economically, as investment left the sector, or physically.

But the oil and gas industry has risen to the challenge, changing up operations to increasingly reduce its own emissions.

"If you have a genuine clean energy aspect to your operation, you can attract investors," said Phil Lookadoo, a partner with law firm Haynes Boone LLP. He was working in October 2021 with a group pursuing an emissions-free gas pipeline project that will be able to participate in hydrogen or responsibly sourced gas transactions.

There is now a realization that there is growth potential in existing assets as part of the energy transition, said Lookadoo, "and that is attractive to investors from midstream to upstream.

"Producers can be rewarded for being in the top 25% taking steps to eliminate methane emissions and can even get a premium for their gas," he said.

To ensure credibility, several third-party organizations, such as Equitable Origin, Methane Intelligence and Project Canary, independently verify and certify ESG performance. Haynes Boone, widely known for its upstream bankruptcy tracker and quarterly capital-access surveys, has recently started an ESG tracker.

"There is a sense at every level of the energy industry that this is not greenwashing, but that ESG performance is a legitimate factor for operators and investors," Lookadoo said. "Energy transition is happening across the economy, and everyone can see it's happening."

The big investment houses are looking for big plays, but there are opportunities at many deal sizes, he added.

"The majors can use balance sheet financing for energy transition. But, for the smaller operators to do things like retrofitting, they are looking to the smaller investment shops."

Bondholders are also stepping up. "They have seen that, if they want to secure their return for years into the future, everyone has to come up with something more than business as usual. Because 'business as usual' is declining in value."

Environmentalists have raised awareness, "but they have not been so great on how we are supposed to get from here to there. They have not been so great on operations.

"That is where energy companies come in. They have the operational capability. They have the track record of supplying reliable energy for decades," Lookadoo said.

"The winners in this energy transition will be determined by economics, not by politics. By who can provide energy that is both reliable and clean."

—Gregory DL Morris

"As for the average consumer, they may need more education in order to be willing to opt into a premium on their electricity bill," Mills said. "But the survey shows that 75% of millennials are willing to pay a premium for environmentally friendly products."

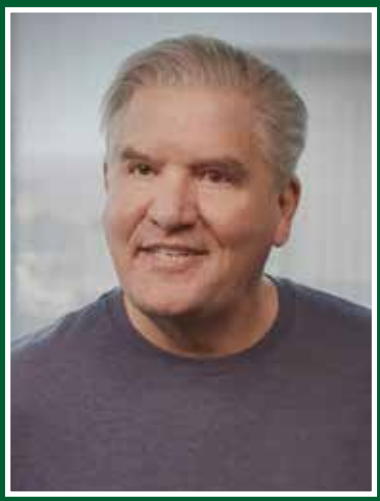
While consumer appetite for RSG grows, so too does the amount of gas being certified throughout the U.S. and Canada.

Mills has also observed increasing interest from Europe, which adopted a methane strategy in 2020.

"We expect to see this trend grow globally as multinational companies adopt certification as a strategy to measure and manage ESG risks across all their assets and as foreign companies follow the leading practices of North American producers," she said.

Several studies have shown that ESG compliance reduces the cost of capital, but Mills said the benefits extend beyond finances.

"Certified natural gas can help producers measure and manage their ESG performance more efficiently by providing an independent framework that consolidates and aligns globally recognized management systems, performance and reporting indicators and industry guidelines."

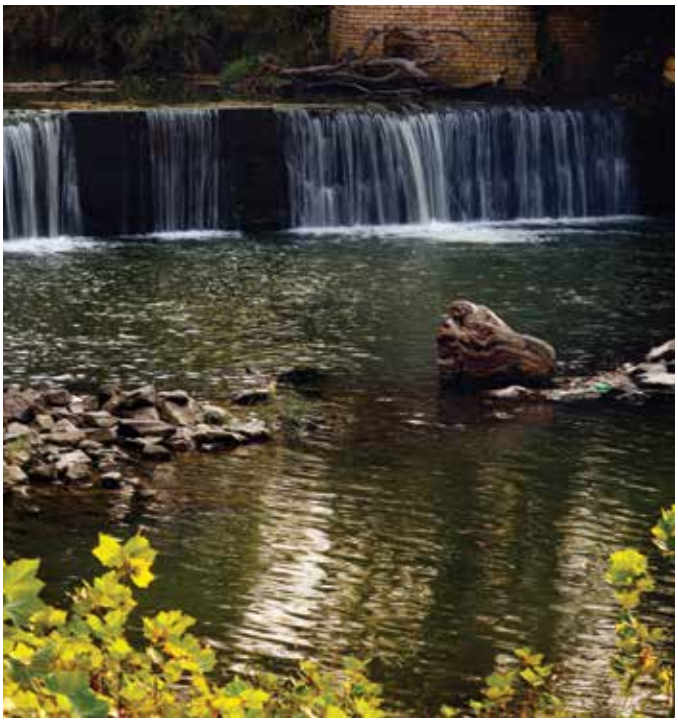


"Only the top environmental performers receive certification, which means buyers can have confidence in knowing this gas is best-in-class."

—**Chris Romer,** *Project Canary*

Maturing market

Determining how long it might take for the market to mature depends on how a person defines "mature," she said.



TOM FOX

"A mature market could imply that more parts of the value chain become involved in driving performance disclosure and improvements across the life cycle of production," she said.

"It could also mean increasing demand for certified natural gas and potentially a requirement from buyers to only purchase gas from certified sources. The growth of certification in this space has been exponential, and the market continues to evolve with each new certification and transaction."

Mark Callahan, director, gas and power pricing, at S&P Global Platts, said at a gas conference in Chicago in September 2021 that it will take time for the market to build an appetite for RSG.

"In engagements that we have done, largely we've seen that the producers are ahead of the game—a bit more educated than the end users at this point in time," Callahan said during the panel.

"Combined with the fact that this is a voluntary market, and you don't have a lot of public utility commissions that have given the approval for end users to go out and pay this premium, those are just a few factors why I think this is going to take time."

Bob Schults, head of North American markets for Xpansiv CBL Holding Group, said at the Chicago conference he's hopeful that producers benefit financially from operating in environmentally sustainable ways.

"I certainly hope that there is some sort of premium to begin this marketplace in order to encourage producers to do the right thing and to start making some economic decisions that can improve their methane intensity."

Big customers

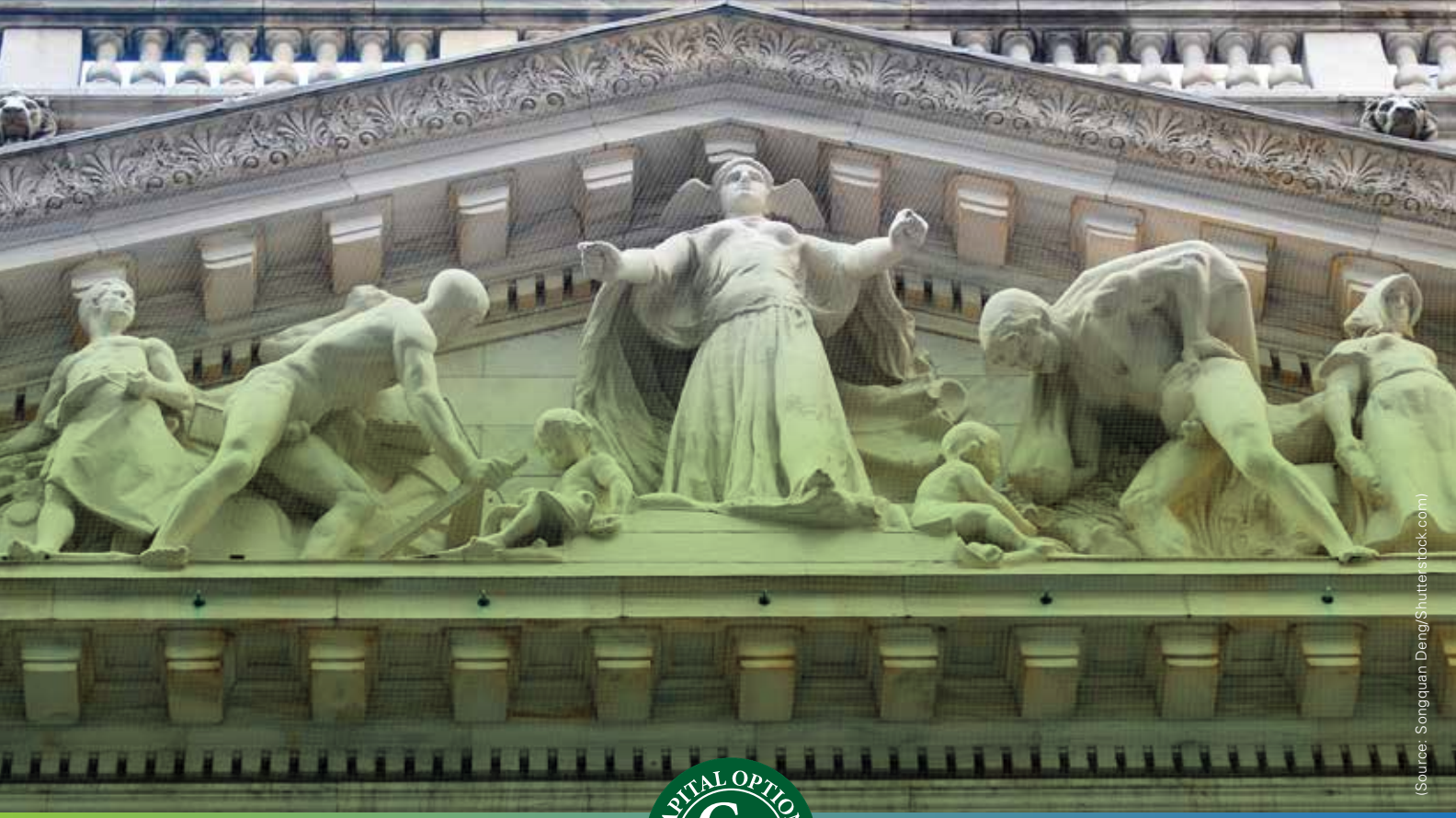
It seems more utility companies—the largest buyers of gas—are getting behind RSG.

Colorado Springs Utilities announced in March 2021 that it will buy certified RSG through a pilot project involving Project Canary, Bayswater Exploration & Production LLC, Rimrock Energy Partners LLC and Kinder Morgan Inc.

"This partnership will allow us to further diversify our energy portfolio and expand our commitment to environmental stewardship," the utility's CEO, Aram Benyamin, said in a press release. "This is [a] first-of-its-kind pilot project in the nation, and I'm proud to say we are at the forefront of exploring this newly evolving RSG market."

Bayswater CEO Steve Struna said in the release that doors are opening for those who embrace ESG.

"Stakeholders are looking to companies to enhance transparency regarding operations. This win-win partnership enables us to produce both oil and natural gas resources in an environmentally responsible manner while attracting new customers and markets." ■



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EAST COAST PRIVATE EQUITY

The Private Equity View from the Northeast

Northeastern U.S. private equity investors are seeing value across the energy spectrum that now includes alternative energy and the infrastructure it needs.

By Gregory DL Morris, Contributing Editor

"Energy transition is not binary," David Foley, global head of Blackstone Energy Partners, said. "It's not only about coal and thermal power versus renewable power generation.

"You must also electrify other areas of the economy, such as transportation, real estate and industrial energy users. The new energy economy will be built on the infrastructure of the existing energy economy," he said.

To underscore the point, Foley noted that "there has been a lot of money spent on renewable energy around the world, but in the past 50 years the share of global primary energy consumption generated by fossil fuels has only decreased from 95% to 85%."

While there has been progress in Europe and North America, population and economic growth elsewhere "means the needle has not moved much worldwide."

BEP is Blackstone's energy-focused private equity business that has placed more than $17 billion globally to date across the energy spectrum. Among its picks was early backing of Cheniere Energy Partners LP's tack change, building an LNG export plant after having nearly just opened the intake on its LNG import plant.

Foley, based in New York, has been involved in Blackstone's energy investments since 1995.

He told *Oil and Gas Investor*, "The good news is that we see many attractive private equity investment opportunities in the energy transition."

In the past 26 years with Blackstone, he's seen myriad chapters in the history of energy. Underlying these, "the attention to climate change has been going on for a long time, but it has recently achieved a critical mass and momentum across many countries and broad swaths of the economy, not just power generation."

The transition will cost trillions, he estimates, and "will not be smooth, which creates investment opportunities for us."

He cited both greenfield and brownfield investments, stressing existing energy infrastructure, particularly the midstream. The key is "existing."

"It is extremely challenging to get permits for energy infrastructure, particularly right-of-way permits for pipelines and electric transmission lines, even if the pipelines are carrying hydrogen and not crude oil," Foley said.

"The good news is that we see many attractive private equity investment opportunities in the energy transition."

—David Foley,
Blackstone Energy Partners

But existing midstream companies have the storage, processing and transportation assets, existing rights-of-way and know how to incorporate low carbon fuels and hydrogen into the mix.

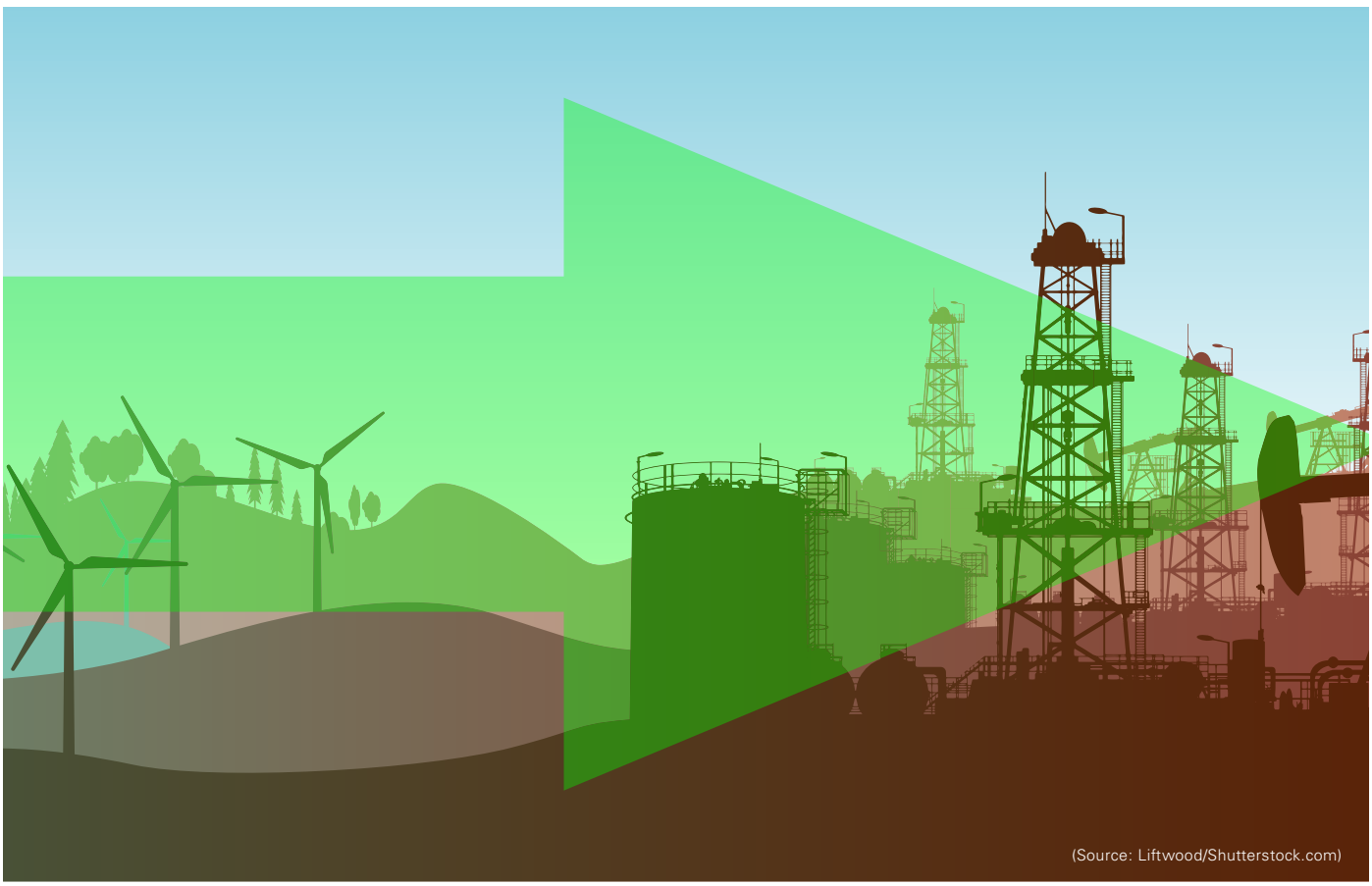
"This represents an additional opportunity for our investments in major midstream companies."

In energy transition, Blackstone's portfolio includes several electric transmission-related investments as well as in solar, battery storage, midstream infrastructure, services and equipment that improve energy efficiency.

Foley said, "There has been a lot of venture capital and SPAC [special purpose acquisition company] interest in energy transition companies, but many of these have unproven business models, little to no current profitability and relatively high risk.

"Despite this, until recently, some of these received very high valuations in the public equity market."

Foley is anticipating some of these companies "that went public too early at lofty valuations" will miss projections, collapsing the share price. "We will be there to pick out some great companies that we can acquire for reasonable valuations."



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(Source: Peshkova and buffaloboy/Shutterstock.com)

Meanwhile, the firm remains focused on companies with proven business models. Just since 2019, it has committed some $11 billion to energy transition companies or projects. "That is Blackstone scale."

SPAC too

There are strong tailwinds supporting a rapid transition to a lower-carbon energy economy, said Neil Wizel, managing director at Connecticut-based First Reserve Corp.

"And government support for the decarbonization of energy production, electrification of energy consumption and digitization of the power transmission grid will only accelerate that shift."

The private equity firm, which has raised more than $32 billion since inception, has invested for nearly four decades across diversified energy, infrastructure and general industrial end-markets. Its sponsored SPAC, First Reserve Sustainable Growth Corp., was formed in 2021 to finance the transition.

At press time, the SPAC was expected to close an initial acquisition of EO Charging, an electric vehicle charging solutions provider to fleet operators across the U.K., Ireland and Europe.

"There have been recent, publicly announced long-term sustainability targets from the public and private sector alike, focused on areas such as emissions reductions and limiting dependence on fossil fuels," Wizel said.

"In our view, achieving those goals will require substantial investment from capital providers that intimately understand the energy sector and what's required to drive change."

The firm has made a number of investments during the past half-dozen years in equipment and services businesses focused on sustainability. "As the space has continued to evolve, we have seen increasingly more opportunities to invest in oil and gas assets in a responsible and ESG-friendly way," he added.

"As the space has continued to evolve, we have seen increasingly more opportunities to invest in oil and gas assets in a responsible and ESG-friendly way."

—Neil Wizel,
First Reserve Corp.

While deploying capital in alternative energy, First Reserve sees opportunity in recent underinvestment in traditional energy. In particular, there is opportunity in nonoperated interests in producing fields that have potential upside from development.

Oil and gas demand is projected to continue to grow in the near to medium term by most industry participants. That said, "we believe, though, that the world will demand oil and gas that is responsibly developed and produced, which is why we are continuing to evolve," said Wizel.

"Oil and gas operators must have a strong ESG focus and must prioritize responsible management and emissions control and reduction while maintaining cost-efficient operations." ■

TAILWATER CAPITAL LLC

Approaching Energy with a Solutions Focus

The innovative investors at Tailwater Capital know energy is an exciting place to be. Energy is a field that is essential and constant, while also dynamic and ever evolving. By enabling other sectors like education, health care, communication, and technology (to name a few), energy is the foundational underpinning of modern human life.

Today, many investors take a narrow definition to the energy and growth infrastructure opportunity set. Tailwater's differentiated "full immersion" approach, however, pioneers ***solutions*** that address critical gaps throughout all energy economies with an "all-of-the-above" mindset. The firm's strategy has always been to invest creatively and move nimbly, with the presence and experience to recognize the "white space" and focus on returns for its investors and portfolio partners.

Through this solutions-based approach, Tailwater's wide – yet deeply informed – lens has identified investment opportunities throughout the traditional, transitional, and low carbon energy economies for years. Since inception, the firm has executed over 100 transactions representing $22 billion in total transaction value.

In 2014, the firm invested in Petro Waste Environmental, leveraging its upstream and recycling expertise to build oilfield waste handling locations in the core of the Permian and Eagle Ford. In 2021, Tailwater announced the acquisition of NorTex Midstream, a strategically located natural gas platform facilitating additional renewable power to the grid while reducing intermittency. Recently, the firm committed to Frontier Carbon Solutions, pursuing greenfield carbon capture, utilization, and sequestration opportunities.

Jason Downie
Co-Founder and Managing Partner, Tailwater Capital LLC

Tailwater believes attractive investment targets exist in the sector of **Energy Supply**, where North America's evolution from non-renewable to renewable sources continues to provide a diverse opportunity set. Tailwater invests in responsibly sourced hydrocarbons that bridge necessary reliability, as well as alternative power and fuels that reduce carbon emissions.

Edward Herring
Co-Founder and Managing Partner, Tailwater Capital LLC

Additionally, the firm focuses on **Delivery & Logistics Infrastructure**, driving advanced efficiency in energy and growth infrastructure as well as mitigation of environmental impact. Tailwater's team leverages deep historical knowledge to invest in critical infrastructure that supports energy efficiency, reliability, and emissions reductions.

Lastly, Tailwater invests behind **Recycling & Byproduct Management**. By investing creatively in sustainable solutions that convert waste into reusable end products as well as environmentally conscious byproduct management, Tailwater is providing a needed solution to bridge to a lower-carbon world.

Utilizing extensive knowledge of the energy and growth infrastructure sectors, Tailwater's investment professionals continue to seek and re-define attractive investment areas. Backed by technical resources focused on ESG / operational responsibility, structural enhancement, basin knowledge throughout North America, customer relationships, and governance, Tailwater is focused on creating truly sustainable value.

This unique, solutions-focused perspective allows investors to tap into the best of energy- and growth infrastructure-related opportunities – in any form of energy economy and at any stage of energy transition. ■

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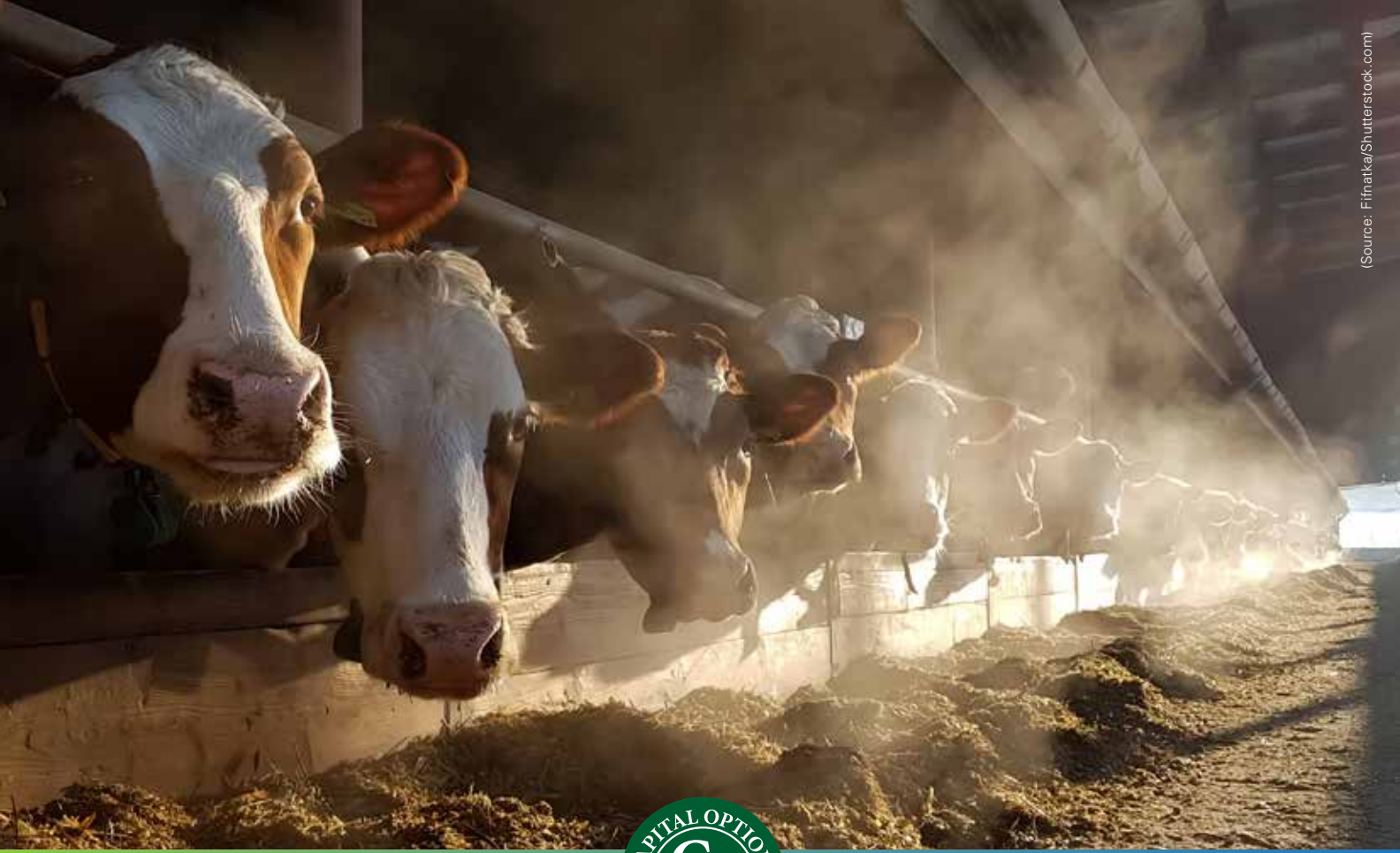

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CAPITAL OPTIONS 2022

THE BANK

Green- and ESG-based Lending

Bankers are issuing green loans as well as sustainability-linked financing to incentivize borrowers to operate with a lower carbon footprint.

By Michelle Thompson, Contributing Editor

As uptake of reducing carbon emissions grows, some lenders are further incentivizing it with green and sustainability-linked loans (SLL) that come with a rate discount.

Throughout the U.S., loans related to environmental targets—and, at times, social and governance metrics—grew by about $52 billion in 2021, representing a staggering 292% year-over-year increase, according to Bloomberg data.

And earlier in 2021, Bank of America (BofA) said it would deploy $1 trillion by 2030 to expedite a transition to a lower-carbon economy.

"We will meet our commitment by working with clients to provide lending, capital-raising, advisory and investment services, and to develop financial solutions and drive innovation to ensure the transition to a sustainable economy," BofA vice chairman Anne Finucane, who leads its ESG efforts, said in a statement.

Some banks have launched "green energy desks" to lend—with ESG strings attached.

Pittsburgh-based PNC Financial Services Group announced in August 2021 that it would commit $20 billion throughout a five-year period to support environmental finance, including environmental sustainability-linked bonds (SLBs) and SLLs.

"PNC recognizes that environmental issues, including climate change, are impacting our business, our clients and the communities in which we operate," Richard Bynum, PNC chief corporate responsibility officer, said in a statement.

"We acknowledge that the transition to a low-carbon economy presents both risks and opportunities, and we are committed to balancing financial priorities, responsible risk management and environmental considerations in ways that benefit our varied stakeholders."

In 2018, Michigan-based utility CMS Energy Corp. became the first U.S. company to enter an SLL, getting a reduced interest rate for $1.4 billion in credit facilities in exchange for hitting environment-related targets.

Earlier that year, the company said it planned to eliminate coal in its power generation operations, estimating this will reduce its carbon emissions 80% and result in more than 40% of renewable content—all by 2040.

"We are excited to be a trendsetter in the United States, entering an innovative credit facility where sustainability and financial results go hand in hand," said Patti Poppe, CMS Energy's CEO at the time.

Nomenclature

While "green loans" typically finance or refinance environmentally friendly projects, SLLs usually involve a borrower that isn't in the green space, setting performance targets that dictate whether the borrower will receive and continue to receive a lower interest rate.

In June 2021, Canada's Enbridge Inc. announced the closing of its first SLB. The $1 billion, 12-year senior note included goals: reducing greenhouse-gas (GHG) emissions, greater gender and ethnic diversity and more women on its board.

"Our sustainable financing framework provides transparency to our stakeholders and positions us well to succeed in leading our industry to a more sustainable and inclusive energy future," Enbridge CFO Colin Gruending said in a statement.

In April 2021, Singapore-headquartered energy trader Trafigura Group Pte. Ltd. raised $203.5 million in a privately placed sustainability-linked financing. The deal requires third-party assessment annually of Trafigura's carbon emissions.

"We were pleased to incorporate the sustainability-linked mechanism into the transaction [in 2021]," Christophe Salmon, Trafigura's CFO, said in a press release, "taking another opportunity to demonstrate leadership in this field, whilst our investors participate in this journey alongside us."

The company's first SLL closed in March 2021 for $1.85 billion, oversubscribed from a target of $1.5 billion. Among Trafigura's environmental goals is the use of green ammonia in marine shipping. Penalties or discounts kick in, depending on hitting targets.

RNG lending

North Carolina-based Live Oak Bank began reviewing renewable energy projects in 2015 and made its first loan to the sector in 2016.

"We felt like there was an opportunity to create jobs in rural America with infrastructure revitalization, and we can accomplish that by also building environmentally friendly technologies," said Max Vernier, Live Oak Bank vice president of bioenergy.

The company does not have an oil and gas loan desk but does work with oil and gas companies in their renewable portfolios. Among them are BP Plc, Chevron Corp. and other majors, as well as midstream and downstream operators.

"We see local and regional community benefits in the types of projects that we finance. And under current statutory framework, there's an economic incentive for the bank to do so."

—**Max Vernier,** *Live Oak Bank*

Of its $1.2 billion in loans to the solar and bioenergy industries to date, one is to an Arizona dairy farm that is collecting and selling the emitted methane into a local distribution pipeline. Opal Fuels uses the renewable natural gas (RNG) to fuel long-haul trucks, creating environmental credits that it then sells to Chevron and others.

"In that regard," Vernier said, "we're working directly with companies like Chevron because we are financing projects that produce RNG for use in the transportation sector, and Chevron is purchasing the carbon credits associated with that gas to fulfil annual compliance requirements."

Although the bank sees monetary benefits from such partnerships, that's not the only reason for the collaborations. "More strategically, and for brand and moral reasons, we feel that similar biorefineries that produce carbon-negative fuels can provide a number of ancillary benefits," he said.

Among them: improving watersheds and air quality in communities, sequestering and repurposing GHG, recycling nutrients back into soil and helping counterparties such as dairy farmers find a use for something that, like GHG, was seen as a societal waste with no value.

"We see local and regional community benefits in the types of projects that we finance. And under current

statutory framework, there's an economic incentive for the bank to do so."

Loan or PE?

Buddy Clark, who co-chairs law firm Haynes and Boone LLP's energy practice group, said green lending to the oil and gas industry has a hurdle: finding bankable loans.

"You could make the argument that it impairs the borrower's ability to repay the loan if you put structural provisions in a credit agreement to meet 'green criteria' that make it more expensive for a producer to do business," said Clark, author of "Oil Capital," a history of law in energy finance beginning with the Iron Age.

"If it makes it more expensive for the producer to conduct its business, does that make the bank more likely to be repaid—or less likely?"

Whereas bankers have fiduciary obligations to shareholders and regulatory obligations to depositors to make prudent loans, private equity firms have more flexibility to take a chance on green lending, especially if that is the stated purpose of their fund.

"You've got to differentiate between investors and bankers because bankers have a much lower tolerance for risk and require a higher assurance of getting repaid," Clark said. "With the potential for greater returns in excess of banks' interest rates, private investors can afford to be more willing to risk their capital.

"In the [oil and gas] lending work that I've been doing, I haven't seen banks imposing covenants to encourage reductions in CO_2 or methane emissions yet. I wouldn't be surprised to see it.

"But when you think about it, it doesn't guarantee that the producer is going to be able to repay the loan any faster or with greater certainty if they reduce their methane emissions at the cost of increasing production expenses."

It's not to say green desk loans are completely unheard of in Clark's circle. He has seen one private non-bank debt provider that included a decrease in pricing in connection with the borrower meeting certain ESG goals.

"With the potential for greater returns in excess of banks' interest rates, private investors can afford to be more willing to risk their capital."

—Buddy Clark,
Haynes and Boone LLP

The loan to an oil and gas producer was initially going to be prime plus 5%, but it offered a reduced rate to incentivize the producer to reduce flaring by a set amount.

"The borrower-producer could receive lower pricing if it met certain metrics that were to be evaluated by a third-party, green assessment company, [which provides] consultants who will certify whether or not a company is meeting thresholds on targets for reduction of emissions," Clark said.

Despite his concerns, Clark said green loans have potential under the right set of circumstances. Within the oil and gas industry, he said, there are companies working to reduce emissions or capture energy in a non-polluting, profitable way that might qualify.

For example, Austin, Texas-based startup Geothermix. Founded by a University of Texas petroleum engineering professor, Mukul Sharma, the company's idea is to inject water into deep, horizontal wells. The heated water and steam would then generate electricity at the surface.

(Source: Nomad_Soul/Shutterstock.com)

"That's a renewable use of oil and gas assets that would qualify as a green investment," Clark said. "That's the kind of example where a bank with exposure to the oil and gas industry can find ways to make green loans."

Oil and gas companies are working to minimize their environmental impact whether there's a financial incentive to do so or not, he has observed. But despite the industry's best efforts to operate in an environmentally sustainable fashion, producers still face hurdles in receiving green loans, he added.

"Fundamentally, I don't see how producers can overcome the fact that they're in the business of producing hydrocarbons which, when burned, are going to result in CO_2 emissions," he said. "Most oil and gas is sold as fuel for energy, and the byproduct is carbon dioxide.

"At the end of the day, it is a chemical reaction that isn't going to change." ■

(Source: PopTika/Shutterstock.com)

TOWN HALL

Accelerated Uptake

Investment is flowing into energy transition technologies, including a great interest in responsibly sourced gas. Picking what to back is better done with a rifle rather than a shotgun.

By Deon Daugherty, Contributing Editor

Low- and zero-carbon investors are not ruling out the potential benefits of coexistence of all forms of energy.

The world has come a long way from the earliest days of "Clean Tech 1.0" when the energy industry initially began chasing hydrogen options and electric vehicles, said Alex Rozenfeld, founder and managing director, Climate Impact Capital.

"I think certainly the industry has seen a lot of opportunity since that time and learned a lot of lessons," he said. "I believe this is the time that's going to happen."

Climate Impact Capital is determined to help. The firm focuses on ensuring that energy companies throughout the value chain can make the best out of the energy transition by understanding how to invest in technology.

Moreover, it's not just about investing, he said. It's also about learning how to make their organizations innovative and powerhouses that not only let them seamlessly transfer into the energy transition but to also profit and grow.

But first, those firms have to embrace the possibilities that exist in the future.

"We see a lot of opportunities, but often the companies are still hindered by looking at more of a Silicon Valley model or how they've done things in the past,

especially from a corporate culture," he said.

Careful of unicorns

The energy transition may benefit most from lessons learned by the fossil fuel sector, he added. The power created by integrating technologies had a profound impact on oil and gas, essentially allowing the shale revolution to take place, Rozenfeld said.

"I think it took most of the major companies off guard," he said, noting the speed with which several different pieces of technology came together because different teams tested and adopted them.

Moreover, it drove down the learning curve in terms of capital and cost savings. "We see that as an opportunity to kind of build into that model of pulling technologies together," he said.

"Rather than identifying and hoping for one or two unicorns in a portfolio, we've been working with upstream, midstream, downstream or power to find the biggest issues around the energy transition."

"When you look at solar, wind, hydrogen, potentially nuclear … that exact mix and how it transpires is a big unknown. And it is the big risk to us."

—**Sanjay Bhatia,** *Evolve Collective*

Climate Impact finds companies to integrate various technologies early and, in doing so, craft an integrated solution. "Rather than corporate clients, private equity clients or the consumers having to find four or five different technologies, and then try to figure out how to make them work together, we say, 'Let's decide what that is beforehand,'" he said.

"And so we create portfolios for the utilities and then really try to make sure that those portfolios evolve and are deployed much faster than you would in any single technology or investment."

'Win no matter what'

Sanjay Bhatia, co-founder of the Evolve Collective energy consultancy, said, "We take the perspective that we don't know exactly how this is going to turn out in 10 or 15 years."

Bhatia's team firmly believe natural gas will persist, and probably oil too, but he stops short of picking winners.

"When you look at solar, wind, hydrogen, potentially nuclear … that exact mix and how it transpires is a big unknown. And it is the big risk to us," he said.

"Therefore, we're looking for technologies that could win no matter what this world looks like."

"All you'd have to do is collect the data, use AI to figure out how to use it and use it to predict what's going to go down or start to flare."

—**Patti Melcher,** *EIV Capital*

The U.S. has an opportunity to be the responsibly sourced gas supplier to the world, he said. "The world is hungry for natural gas as part of the energy transition."

When Evolve formed two years ago, "there was just kind of crickets coming from the traditional players," Bhatia said. Now there is a chorus. "Almost every player we talk to, from oilfield services to the E&P side, has a group or a venue [where] we can start to introduce these startups."

The uptake is exciting. And the investment interest is too. Smaller investors' appetite is very revealing, he added.

Among these, "it seems that investing in technologies that help oil and gas, particularly gas, is a little bit less risky than betting on something that's [for example] in the hydrogen area or the battery because it's hard as a smaller investor to bet on what's going to work."

'Low-hanging fruit'

2020 marked a turning point for energy in several ways. The pandemic forced a decrease in Scope 3 emissions, said Emily Easley, CEO of Novus Energy Advisers.

Patti Melcher, managing partner and co-founder of EIV Capital, added that new people with different expertise are entering the energy space via the transition.

Five years ago, Melcher's firm had invested in a company to reduce oilfield emissions. At the time, few other investors were interested. "Now, everybody is coming onboard," Melcher said.

Moreover, the simple application of some technology that already exists could assist traditional firms interested in reducing their emissions and appealing to investors.

"All you'd have to do is collect the data, use AI [artificial intelligence] to figure out how to use it and use it to predict what's going to go down or start to flare," she said.

"I think there's a lot of low-hanging fruit that people are really focused on now in the industry. And I think that's the very best thing that we can do.

"Not only new technology or hydrogen and all this, but let's fix our current problems while we're investing [in new projects]." ■

PRIVATE EQUITY

Transition & 'Tweeners'

Private equity investors in traditional energy are finding profit opportunities in the alt-energy value chain. But they're not departing from oil and gas. They're doing "all of the above."

By Deon Daugherty, Contributing Editor

(Source: StunningArt/Shutterstock.com)

Arguably, energy has been in transition since the time of the caveman, said Justin Stolte, a partner in the Houston office of Latham & Watkins LLP and chairman of its energy infrastructure practice.

It's the whiplash pace of change that newly challenges the energy industry and those who finance it, he said at Hart Energy's Energy Transition Capital Conference.

There is little difference in the fundamentals of private equity investments regardless of whether profits are driven by pure economics or environmental aspirations.

Much of the energy transition-focused funds are managed by professionals who have built their careers around oil and gas investment. Hydrocarbons are legacy fuels, while many clean technologies have yet to mature.

NGP Energy Capital partner James Wallis said that, regardless of how individual private equity funds answer the public mandate, energy investments must be grounded in the reality.

"The world is also demanding clean, cheap, affordable, abundant energy," he said. "But we have to keep the economy moving at the same time that we're trying to transition the primary energy supply."

As such, NGP's management maintains an "all of the above" investment strategy. Its large, traditional oil and gas portfolio remains active and profitable, but there is tremendous opportunity in the transition space, he said.

Longtime oil and gas private equity investor White Deer continues to invest across the upstream oil and gas, midstream and services sectors. In 12 years, the firm has raised $2.7 billion, said Joe Bob Edwards, managing partner.

"We're taking a pretty pragmatic approach to the whole energy transition discussion," he said.

White Deer is structured to manage the uncomfortable realities ahead in which demand remains in place for hydrocarbons. But society is confronted by the growing call for a rapid adoption of new forms of power production, renewable fuels and grid hardening.

"It's really the intersection of both that we're focused on," he said, adding that the firm does not want to take on venture capital risk in the process.

Rather, he said, White Deer's clientele may best be described as "tweener" companies: traditional energy supply chain participants with exposure to emerging energy transition trends.

"We had to dig pretty deep to kind of find that specific opportunity," Edwards said.

"It's the companies that have a really good base business that understand project delivery, hitting a budget, responding to customer demands for product quality and service, but also have exposure to increasing, positive energy transition trends."

"We're taking a pretty pragmatic approach to the whole energy transition discussion."

—**Joe Bob Edwards,** *White Deer*

Diversified portfolio

EnCap Investments LP has a smorgasbord of offerings that include a 30-year-old upstream private equity business and a midstream unit that started about 12 years ago. A dedicated energy transition fund came to life two years ago.

And while this phase of the energy transition may be relatively new, EnCap's Kellie Metcalf has been immersed in the renewables space for 20 years.

Much of the rhetoric around renewables questions its profitability without the assistance of government subsidies, but "it is a growing space," said Metcalf, managing partner, energy transition.

"A bit counter to what [others] say, there are definitely investment opportunities that can make money. We have significant positive returns in the energy transition space."

A different outcome could be most likely at a fund in which the investment professionals are focused on investing in transition exclusively, she said.

Faster than expected

GreenFront Energy Partners co-founders Robert Birdsey, Adam Hahn and Whit Wall were key players in BB&T's energy i-banking group when a trend began to emerge in which end users began to openly prefer cleaner energy.

The trio formed GreenFront with a singular focus on alternative energy, including solar, wind, storage, renewable natural gas (RNG), carbon capture and clean technology. But their background in oil and gas gives them a broad perspective on resources.

"I certainly have a lot of appreciation for the coexistence that needs to take place," Birdsey said.

User demand followed user preference, setting the scene for socio-political structures to evolve and adapt to accommodate the public, he said.

That gave rise to government intervention that would enable growth within the transition, including the U.S.' 45Q renewable credits and, in California, low carbon fuel standard (LCFS) credits.

Success via subsidy is showing the possibilities of cleaner energy, and mature capital is going to flow in that direction, Birdsey said.

"We're starting to see many new technologies become competitive very, very quickly. It has happened first with wind, most recently with solar, and it is happening now with battery storage.

"I think it will also happen with carbon capture and RNG. Once you take that into consideration, I would argue that the transition will probably take place more quickly than what has been seen in history."

$4T/year—or more

EnCap's transition fund reviewed 170 opportunities in 2021, and the returns are staying in place, Metcalf said. "There is a lot of money coming into the space.

"A lot of investors are interested in traditional energy or oil and gas investors who are coming into the transition space," she said. "We're at the beginning of a huge incline in the slope of what we're going to look at in investment in transition."

Projections are that $4 trillion a year globally will be spent on transition, but Metcalf suspects the real numbers could go higher.

"It's critical that such investments are managed from a fund perspective by people who understand the business," Metcalf said, agreeing with Birdsey that moving from oil and gas into solar, wind and battery storage would be a stretch.

But carbon capture and sequestration (CCS) has space for both types of investors. "We're also doing CCS and renewable gasoline.

"Those are things that oil and gas professionals have experience with, and we'll transition well to that," she said. "It's a competitive market, but I think there are still a lot of opportunities."

"A lot of investors are interested in traditional energy or oil and gas investors who are coming into the transition space."

—Kellie Metcalf,
EnCap Investments LP

'Up in flames'

Billions of dollars went up in flames roughly 15 years ago as sudden demand emerged for clean tech investment, Edwards said. "Many of those were venture capital bets parading as growth equity investments.

"We're trying to learn from the industry's history of making those sorts of bad decisions and applying that through the lens of what we think we do best."

White Deer's portfolio includes some service companies that will benefit from that intersection, which currently joins rising activity levels in the North American market and increasing ESG pressures.

One portfolio firm is relying on its legacy technology to actually capture methane that would otherwise be vented or flared. The process keeps the methane greenhouse gases out of the atmosphere, and the company can commoditize methane's Btu content.

"There are some things in energy transition that don't make a ton of sense for oil and gas professionals to start pursuing."

—Robert Birdsey,
GreenFront Energy Partners

"That's one example of something that's benefiting from both trends at the moment," Edwards said.

Consider CCS & RNG

Given the entirety of the energy market landscape today, Birdsey said higher commodity prices are basically signaling that all of the capital withdrawn from traditional sectors will come home to roost.

"On the transition side, the world's really just getting started," he said. "There's trillions of dollars that are needed to be invested over the next few decades. But it needs to be done very responsibly."

While there are intersections to exploit, some parts of the energy transition would be a tight fit for oil and gas investors. "There are some things in energy transition that don't make a ton of sense for oil and gas professionals to start pursuing," Birdsey said.

"When I started in 2006, frankly, I admit we kind of scoffed at solar and wind. Now those are the two cheapest forms of energy production that we know of at scale."

While that opportunity for traditional oil and gas professions has passed, there are other options, he added. "Carbon capture and RNG are ripe for oil and gas professionals."

CCS relies on some work that oil and gas has been doing for years: geology, reservoir engineering and transport. Oilfield service and midstream companies are beginning to see that there is real money in CCS and how to further efficiencies to drive down costs.

"It just kind of plays to the strengths of oil and gas. I mean, there is the capture component of that value chain, which is kind of new.

"There are plenty of companies who have capture equipment and understand that technology like Koch Industries and Mitsubishi. But everything else is right up oil and gas' alley," he said.

CCS is still in its earliest stages, Birdsey added. "You can do two months of intensive study and get up to the top of the learning curve in carbon capture. But you'll realize when you're at the top of that learning curve, you're still in just the first or second inning of what is a very embryonic industry." ■

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Joining 'Em

Oil and gas producers have an opportunity in the low-carbon future. And there's capital—and returns—ready.

By Deon Daugherty, Contributing Editor

(Source: NicoElNino/Shutterstock.com)

The energy transition is gaining momentum from a global push to achieve Paris Accord goals, and investors' ESG sensibilities are pressuring traditional energy companies to decarbonize.

That doesn't mean fossil fuels will go the way of the dinosaur. In fact, many of the industry's top analysts and investors say oil and gas can coexist with renewables.

Indeed, if the stars align, traditional energy companies may not only become cleaner firms, they could also find new streams of revenue in the process.

But first, energy companies of all stripes need cash.

An infusion of investment worth trillions of dollars is critical to investors' apparent mandate that oil and gas companies work to cap global warming at less than 2 C relative to pre-industrial temperatures.

And bankers say the money will flow to those companies willing to evolve.

"One out of every three professionally managed investment dollars in the United States is in an ESG fund. That's $16 trillion debt plus equity."

—**Pavel Molchanov,** *Raymond James*

"One out of every three professionally managed investment dollars in the United States is in an ESG fund. That's $16 trillion debt plus equity," said Raymond James senior vice president and energy analyst Pavel Molchanov.

The figure was about half that four years ago, Molchanov added in Hart Energy's Energy Transition Capital Conference.

"It's not a matter of whether there was a Democrat in the White House or oil prices were high. It has nothing to do with any of that. It's just a secular trend that there's more money flowing into ESG funds," he said.

"And believe me, you do not want to be on the wrong side of ESG funds."

$7 trillion every year

Meeting the Paris Accord's greater goal of capping at 1.5 C by 2050 requires massive change in the capital base, said Kassia Yanosek, a partner at McKinsey & Co.

She leads the firm's practice that helps oil and gas clients develop viable decarbonization strategies. Yanosek led a billion-dollar private equity fund focused on solar and wind. At the time, more than 70% of the returns were generated from public support.

"Today, we're in a much different space with costs having come down," she said.

More than 70% of current oil and gas demand will be replaced by renewables, she added. To make that a reality, investment on the order of $225 trillion is required, she said. That's about $7 trillion every year between now and 2050.

"Meeting the Paris Accord's greater goal of capping at 1.5 C by 2050 requires massive change in the capital base."

—**Kassia Yanosek,** *McKinsey & Co.*

Companies are taking a variety of different strategies. ConocoPhillips Co. is doubling down on low-cost, low-carbon intensity oil and gas. And it is being rewarded by the market for taking that strategy.

While it has been making significant growth purchases—acquiring Concho Resources Inc. in early 2021 and, more recently, Royal Dutch Shell Plc's assets in the Permian Basin—the net effect is lower cost supply and lower carbon intensity, she said.

Meanwhile, BP Plc and Shell are transitioning their portfolios via select divestment and nonoperated joint ventures.

And Occidental Petroleum Corp. is focused on a wholesale change in its business model. In effect, it is betting on its prowess in carbon capture utilization and sequestration (CCUS) to become the carbon management business of the future, she said.

"It starts with their competitive advantages and creating a business around that," Yanosek said.

'Win the game'

Molchanov listed myriad options that oil and gas companies can tap to gain ESG fund appeal. Some firms diversify their revenue sources beyond oil and gas by investing in solar and wind farms, building electric vehicle charging infrastructure, constructing hydrogen plants, investing directly in clean energy startups or simply tweaking legacy oil and gas operations to operate more cleanly.

And in the case of CCUS, companies such as Occidental, Denbury Inc. and Talos Energy Inc. are finding ways to make money by selling the carbon or storing it for other industries.

"You do not have to put your head into your hands and cry because ESG funds don't like you," Molchanov said.

"As long as you don't fight them—at least not too publicly—and you have a coherent decarbonization strategy for your business … you're going to win the game."

Capital providers, both public and private, are seizing the opportunity to finance decarbonization strategies, both within and beyond the fossil fuels industries.

But within the $16 trillion number, Molchanov noted, the biggest chunk of roughly $4 trillion is invested in climate funds devoted to reducing the risk of climate change and avoiding transactions that make it worse.

"Does that mean they will never own an oil and gas stock? No," he said, adding that oil and gas companies have opportunities to benefit their own bottom lines when they work with climate-minded investors instead of against them.

"In general, it would be a moot point to fight this mega trend," Molchanov said.

"The global footprint on decarbonization is not going anywhere."

—**Nick Woodruff,** *RBC Capital Markets*

20% of U.S. GDP

Traditional energy clients need the assistance of finance experts to navigate the energy transition, said RBC Capital Markets managing director Nick Woodruff. About a third of his time is in helping them swim in a stream awash with ideas that run the gamut of clean technologies; wind, solar, biodiesel, renewables and even lithium projects are on the table.

About $3 billion was invested in carbon capture in 2021, which is triple the amount that was invested in 2020, Woodruff said.

He estimates another $1 trillion in private money, in addition to government credits, is needed for carbon capture's full contribution to meeting the Paris Accord. All told, it would be $5 trillion for carbon capture.

"That's 20% of the U.S. GDP that needs to get invested in carbon capture," he said. "One thing that needs to really accelerate is subsidies and credits.

"A lot of the economics alone right now are not standalone strong enough to get projects off."

ESG-focused exchange-traded funds are outperforming the broader S&P 500, and cash invested in solar is expected to double capacity through 2030, he said. Battery storage, CCUS and other strategies are important parts of Woodruff's discussions with oil and gas clients.

"The global footprint on decarbonization is not going anywhere," he said, noting that 75 countries (as of mid-October 2021) have announced zero-carbon ambitions, and others were expected to follow.

"Renewables are going to be complementary to oil and gas. There's no decoupling the two."

—**Andrew Chen,** *CIT Group Inc.*

'No decoupling'

If the options seem endless, so are the questions of how to finance them. Some industry players and companies with first-mover advantages are effusive about technologies such as CCUS. But much of CCUS' success can depend on federal 45Q tax credits.

"We don't know how well that is going to evolve," said Andrew Chen, CIT Group Inc. managing director.

Similarly, biodiesel is generating excitement among his clients, but Chen said RIN credits in renewable fuels are important in that mix too. "We don't know how that's going to interplay," he said.

Still, lending portfolios that were once weighted 80% toward oil and gas are flipping. Especially on the lending side, many banks are evolving into ESG roles.

Still, Chen said, bankers cannot dismiss oil and gas completely. "Renewables are going to be complementary to oil and gas," he said. "There's no decoupling the two."

Senior secured debt

Debt markets have seen funding from government policy, credit subsidies and private investment. But the broader market dictates the terms, Chen said.

For example, early wind projects were generally financed by production tax credits. Without that assistance, the massive buildout of wind capacity, especially in Texas, likely would not have happened, he said.

Now that the wind projects are more mature, solar technology is growing in appeal. "But we're also seeing that, without the tax equity markets interplaying with the debt markets, that also would have never come to fruition," he said.

Essentially, government policy and credit assistance are critical to early stage technology development.

"If that goes forward, then we'll see a lot more of these projects getting financed."

Moreover, mature technology is more likely to appeal to lenders, Chen said. Without tax equity, senior secured debt is hard to access. But debt markets are evolving, and lenders want to use creative but stable methods of financing new and important technology.

"Banks are like big elephants," he said. "They follow each other into the space."

CIT was among the first to finance solar, but that worked only when there were accompanying power purchase agreements.

Banks look at "the downside risk. Equity always looks at the upside risk," he said. These counterbalances are "always key to getting a lot of these projects financed." ■

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energycapital CONFERENCE	**October 25, 2022** Dallas, TX *Fairmont Hotel in Dallas*
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Energy ESG CONFERENCE	**October 2022** Houston, TX
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CHARGEPOINT INC.

CAPITAL OPTIONS 2022

THE TRANSITION SPAC

From the Permian to EV

These oil and gas leaders who created a $9.7 billion Permian Basin producer in just a few years are now finding opportunity in the energy transition, beginning with electric transportation.

By Deon Daugherty, Contributing Editor

Success for the special purpose acquisition company (SPAC) structure has been mixed in the energy space, as well as in all industries. But two oil and gas veterans may have found the right approach: using the vehicle to drive energy transition firms into the public sphere.

Switchback II Corp. co-CEOs Scott McNeill and Jim Mutrie have bottled lightning for a second time in less than two years.

The pair is on the precipice of combining their second SPAC venture, Switchback II, with Bird Rides Inc., a firm focused on shared short-range electric transportation. The transaction will expose Bird to public trading with an implied value near $2.3 billion. At press time, shareholders were voting on the deal.

The Bird combination comes one year after the first SPAC, Switchback Energy Acquisition Corp., made its acquisition,

Oil & Gas Executives' And PE's Decarbon SPACs*

Status	Name	Affiliates	Raised/ Raising ($MM)
Trading	Switchback Energy Acquisition Corp. (now ChargePoint Holdings Inc.)	NGP (sponsor) w/ex-RSP Permian Inc.'s Scott McNeill and Jim Mutrie (bought **ChargePoint Inc.**)	$300
Trading	Switchback II Corp. (now Bird Global Inc.)	NGP (sponsor) w/McNeill and Mutrie (bought **Bird Rides Inc.**)	$275
Filed	Switchback III Corp.	NGP (sponsor) w/McNeill and Mutrie	$275
Trading	Decarbonization Plus Acquisition Corp. (now Hyzon Motors Inc.)	Riverstone (sponsor) (bought **Hyzon Motors USA Inc.**)	$200
Trading	Decarbonization Plus II	Riverstone (sponsor) (buying **Tritium DCFC Ltd.**)	$350
Trading	Decarbonization Plus III	Riverstone (sponsor) (buying **Solid Power Inc.**)	$350
Trading	Decarbonization Plus IV	Riverstone (sponsor)	$275
Filed	Decarbonization Plus V	Riverstone (sponsor)	$275
Trading	Peridot Acquisition Corp. (now Li-Cycle Holdings Corp.)	Carnelian Energy Capital (sponsor) w/Alan Levande, founder, Covey Park (bought **Li-Cycle**)	$300
Trading	Peridot II	Carnelian (sponsor) w/Levande	$360
Filed	Peridot III	Carnelian (sponsor) w/Levande	$300
Trading	Spring Valley Acquisition Corp.	Pearl Energy Investment (sponsor) (deal for aero-farmer **Dream Holdings Inc.** canceled)	$200
Filed	Spring Valley II	Pearl Energy Investment (sponsor)	$200
Trading	Rice Acquisition Corp. (now Archaea Energy Inc.)	Rice Investment Group (sponsor) (the Rice family) (bought **Aria Renewable Energy Systems LLC**)	$215
Trading	Rice II	Rice Investment Group	$300
Trading	ArcLight Clean Transition Corp. (now Proterra Inc.)	ArcLight Capital Partners (sponsor) (bought **Proterra Inc.**)	$250
Trading	ArcLight Clean II	ArcLight Capital Partners (sponsor)	$275
Trading	Spartan Acquisition Corp. (now Fisker Inc.)	Apollo (sponsor) (bought **Fisker Inc.**)	$480
Trading	Spartan II (now Sunlight Financial Holdings Inc.)	Apollo (sponsor) (bought **Sunlight Financial Holdings Inc.**)	$300
Trading	Spartan III	Apollo (sponsor); BOD includes (John) Mike Stice, ex-Chesapeake (buying **Allegro**)	$480
Filed	Spartan IV	Apollo (sponsor); BOD includes (John) Mike Stice, ex-Chesapeake	$300
Trading	Star Peak Energy Transition Corp. (now Stem Inc.)	Magnetar (sponsor); BOD includes Park Shaper, ex-pres, Kinder Morgan (bought **Stem Inc.**)	$350
Trading	Star Peak Corp. II (now Benson Hill Inc.)	Magnetar (sponsor); BOD includes Shaper (bought **Benson Hill Inc.**)	$350
Trading	Broadscale Acquisition Corp.	The Cohen brothers (sponsor), founders, Atlas Energy/Marcellus and Falcon Minerals)	$300
Trading	First Reserve Sustainable Growth Corp.	First Reserve Corp. (sponsor) (buying **EO Charging**)	$200
Trading	Warrior Technologies Acquisition Corp.	Tripp Wommack III (Southwest Royalties et al.); BOD includes Jim Benson/Energy Spectrum; Marc Rowland/IOG and ex-Chesapeake; Todd Overbergen/Stellus Capital	$240
Filed	Denham Sustainable Performance Acquisition Corp.	Denham Capital (sponsor)	$200
Filed	Integrated Energy Transition Acquisition Corp.	Ex-preferred Sands Inc. CFO + former Exxon Mobil Gorgon LNG JV rep; BOD includes ex-DCP Midstream CFO	$150
Filed	Freestone Acquisition Corp.	Tailwater (sponsor) w/ex-Southcross Holdings' Alan Boswell; John Schaufele/Energy & Minerals Group; Ellen Wilkirson/Kayne Anderson	$200
Trading	Nabors Energy Transition Corp.	Nabors Industries Ltd. (sponsor)	$240
Trading	Esgen Acquisition Corp.	Energy Spectrum (sponsor) w/Andrea Bernatova, ex-CFO, Goodnight Midstream; Nader Daylami, ex-Bruin E&P; et al. from oil and gas	$240

*As of Nov. 17, 2021

Source: Oil and Gas Investor, *using* EdgarPro

which took electric vehicle charging network ChargePoint Inc. to public markets as a $2.4 billion enterprise.

McNeill said at the time that the overall charging infrastructure investment business could be valued at $190 billion by 2030.

McNeill and Mutrie have been working together for more than two decades. Most recently, the pair were part of the executive team at Permian Basin-focused RSP Permian Inc. that Concho Resources Inc. bought in 2018 for $9.5 billion.

'Disruptive technology'

They modeled their business thesis largely on what they learned at RSP Permian, which was the value of disruptive technology, Mutrie said. "We started looking more into energy transition and saw the investor sentiment, the popular sentiment, shifting."

Technological advances in the energy transition have transformed projects that were uneconomic a decade ago into suddenly economic propositions.

"We saw the kind of the future there that—with the right company—could really have some upside potential," Mutrie said.

RSP Permian was a $250 million firm when it filed its IPO in 2013. "The IPO was an opportunity to really utilize this disruptive technology to exploit the [Permian] asset base and to continue to build it," McNeill said.

The pair went from investment banking and law to corporate managers. "That's what really gave us this nice skill set, alongside [private equity partner] NGP, to form a SPAC and go after the energy transition opportunities that were out there," McNeill said.

Real, not 'science projects'

Switchback's investment criteria were developed before the SPAC decided to fully shift to the energy transition space. Initially, outsiders may have thought Switchback I would buy in the traditional energy space.

It found new opportunity in alternative energy, instead.

"The first one is there is a large, addressable market. You need to have the right public company and the right management team," Mutrie said. "We don't like to fund science projects."

The pair wants to work with real companies with real revenues that are nearing a real inflection point, he said. Many companies get close to meeting the criteria, but they lack the right infrastructure.

McNeill said, "They're just a little bit early before hitting the public markets. And I think that's where, being public company executives, I think we can help identify those companies that are really viable public market candidates."

The partners understand firsthand that, from start to finish, these transactions are not easy. The elements need to align with the right assets, the right opportunity, the right valuation and the right audience of investors, McNeill said.

Relationships are also important, and as such, the pair partnered with NGP, a 33-year investor in traditional energy and 15-year investor in alternative energy.

Mutrie said, "Very few private equity firms have been in the energy transition space for that long."

Investing in the transition is a growth model. McNeill said, "[Oil and gas] investors have been looking for a return of capital, and they're not really in a growth mode. They're more in harvest mode.

"What we're really providing in a SPAC is growth capital. And I think from the energy transition space, obviously there's going to be a lot of capital that's going to be spent in a lot of these companies that are on their growth ramp."

Sticking to the plan

There is room in the SPAC space for traditional energy companies as well as energy transition endeavors, Mutrie added. Both can coexist and each has the potential to grow over time.

Investors are demanding that companies adopt a return of capital mindset, regardless of the resource focus.

Still, the SPAC market is evolving, and it has changed since Switchback's first filing in 2019, he said. "It seems like in the SPAC world that the space gets so hot and, frankly, probably a little overheated.

"I think the pendulum swung too far into 'the SPACs are the greatest thing in the world, and everyone should be successful,'" Mutrie said. "Maybe it's somewhere in the middle now."

Switchback's early insistence that it wasn't funding science projects is "what every SPAC should be looking at: businesses that are established, generating cash."

Like ChargePoint fit Switchback I's model, McNeill said Bird Rides made a good candidate for Switchback II in several ways. Its solid management team found a large, addressable market and quickly became a market leader in a category that, in Bird's case, it had essentially created.

Bird operates in 350 different cities and consistently introduces new products.

"It's a pretty new sort of sector in the economy, and they did $150 million of revenue in Year Two. The next year, it was about $400 million in revenue," McNeill said.

"If a company is at that point in time where they are in the inflection, and they've got a very defensible business plan and a management team that's going to be successful in the public markets, those are the things that we're going to be interested in," he said.

"Bird very much fit." ■

"We started looking more into energy transition and saw the investor sentiment, the popular sentiment, shifting."

—**Jim Mutrie,** *Switchback II Corp.*

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CAPITAL OPTIONS 2022

CCS & CCUS

The Carbon Burial Option

What if the world could make excess CO_2 just disappear? Forever? As efforts seek to reduce adding CO_2 to the climate, burying it makes a tremendous dent in what remains.

By Deon Daugherty, Contributing Editor

Oil producers have long used CO_2 in EOR to revive existing oil fields. Denbury Inc. and Talos Energy Inc. are now exploring using captured, atmospheric carbon in the energy transition, both onshore and in the Gulf of Mexico.

Energy economists, policymakers and global thought leaders are wrangling with the major challenge of how to access enough offsets to account for a net-zero emissions world by 2050.

Among the top potential pathways to emerge at the International Energy Agency and the Intergovernmental Panel on Climate Change is carbon capture, utilization and sequestration (CCUS), particularly sequestration.

Emissions math supports the idea that CCUS can play an important role in emissions reductions, said Chris Kendall, president and CEO of Denbury, an onshore user of CO_2 in EOR.

Global carbon emissions today amount to some 34 billion tons annually, Kendall said at Hart Energy's Energy Transition Capital Conference. In a net-zero scenario, CCUS could cut 8 billion tons from the total each year by 2050.

Only wind and solar pose greater potential for reduction, he said.

For now, CCUS applications reduce emissions worth 40 million tons annually. But Kendall said the scale and scope of the technology could ratchet up onshore quickly.

Denbury specializes in EOR, or tertiary recovery, using the principles of CCUS. EOR is a process in which CO_2 is injected into mature wells, adding the pressure needed to push additional oil to the surface for extraction.

An expansion would make it a carbon burial company as well.

"The great geology that we have right here in the Gulf Coast in particular, right underneath us, I think could make the U.S. a center for carbon capture going forward," Kendall said.

90 million acres of seismic

Indeed, it is not only the onshore Gulf Coast that presents an opportunity for additional CCUS development, said Tim Duncan, CEO of Talos.

Having drilled in the shallows of the Gulf of Mexico as well as its deep water, Talos has developed a massive 90 million acres' worth of seismic data that gives a glimpse of the geologic framework underfoot.

"We haven't given up on any [drilling] ideas," Duncan said. "But then we looked at CCS [carbon capture and storage] and said, 'It may take a little while for this to make, but there's no doubt we can play in this space today.'"

He added that CCUS is an opportunity for oil and gas companies to participate in the low-carbon economy. "I absolutely think there almost *has* to be our participation," he said. "But we've got to build out the credibility of what we're trying to do."

Kendall said public and regulatory confidence in what CCUS can achieve is critical.

"I hear a lot of concern from people who don't understand that we can take this gas, compress it into a liquid, pump it safely underground and have full confidence that it will stay there—not just for hundreds of years, but for millions of years," he said.

"We have to keep [public] confidence, and that requires a high level of expertise, great execution and communication from the operators."

Such dialog is critical to obtaining and maintaining the support needed to bring the promise of the CCUS model to fruition, Kendall said.

"You have to have policy support to incentivize the emitters, to make the capital investments to build and then to operate these capture facilities and everything that goes along with that, including transportation, storage and monitoring," Kendall said. "We need a stable policy to let CCUS be as big as it needs to be."

The federal 45Q tax credit is largely responsible for the development of CCUS. The current rate is $50 per ton, but that only captures a sliver of the whole cost curve of U.S. emissions, Kendall said.

"The great geology that we have right here in the Gulf Coast in particular, right underneath us, I think could make the U.S. a center for carbon capture going forward."

—Chris Kendall, *Denbury Inc.*

"We need a stable policy to let CCUS be as big as it needs to be."

—Tim Duncan, *Talos Energy Inc.*

Congressional action to raise the credit from $50 to $85 per ton would benefit the environment and the industry, he said.

Extremes could find agreement

From Duncan's perspective at Talos, the time for industry to act on CCUS' potential is now.

"We have a couple of choices. We can wait for the environment to be perfect. We can wait for the perfect 45Q tax regulation. We can wait for the right tech to come out that meets an industrial partners' needs to think about capturing carbon," Duncan said.

"Or we can move right now and figure out how to get into the space today with the competitive nature and the urgency in the organization we have in place."

As such, Talos is moving to "add another leg to the stool" of its business with CCUS. The firm is working with the Texas General Land Office to develop a 40,000-acre tract as the first offshore carbon sequestration site.

The business opportunity of essentially managing carbon storage makes CCUS more of a new link in the industry's chain of operations than a singular project.

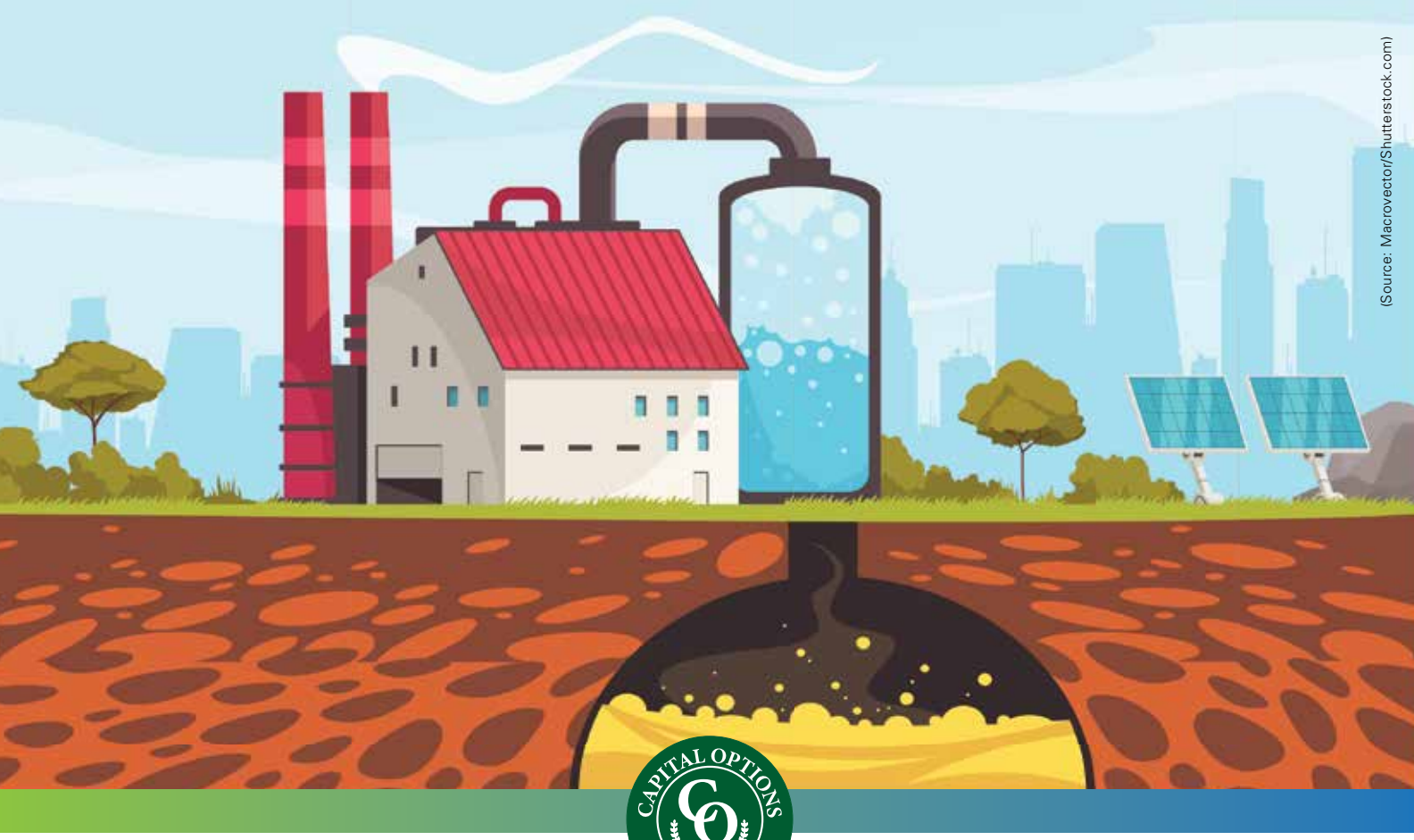
"The question is, 'Can you build a portfolio of multiple projects around the Gulf Coast?' And you've got to think of this like a midstream project," he said.

It's a market opportunity, but it also represents one that could, over the course of a few years, prove Talos' expertise with Gulf Coast geology and an opportunity for the U.S. to lead the way toward cutting emissions via CCUS.

"There's a lot more that has to happen to meet various Paris goals," he said. "If I think about the political environment today, we see 'I want to electrify everything I see' is maybe one extreme. And 'I want to do absolutely nothing because I don't care' is another extreme. Unfortunately, we have too many extremes."

Rather, Duncan believes that the industry and the public could find that doing a better job of lowering emissions broadly across all industrial sectors is a place where the extremes could fade into agreement.

"CCS, I think, fits into that place," he said. "And that's why we're hopeful that, even in this world of polarization, there can be reasonable policy around how we think about this particular business." ■



(Source: Macrovector/Shutterstock.com)

CAPITAL OPTIONS 2022

ALL OF THE ABOVE

Made With Oil & Gas —And CCUS

The world needs more energy going forward, and renewables alone can't do the job. The answer: oil and gas. Just add carbon capture and storage.

By Joseph Markman, Senior Editor

Wil VanLoh of Quantum Energy Partners is (figuratively, at least) the guy jumping up and down in the middle of Wall Street, waving his arms and shouting, "You're going the wrong way!

"I tell investors this all the time," said VanLoh at Hart Energy's inaugural Energy Transition Capital Conference. "If you really care about climate change, you should be doubling down on investment in North American oil and gas companies.

"You shouldn't be divesting of them; you should be investing in them."

Quantum is invested across the energy spectrum from oil and gas to renewables to electric vehicle charging. VanLoh, CEO and founder of the private equity firm, conceded that most investors are backward-looking, focusing more on the lack of capital discipline within the oil and gas industry of recent years than what is happening now.

"Today, investors are starving the oil and gas sector for capital when some of the best returns we've seen in several decades are available," he said.

"Oil and gas equities and assets are continually undervalued, in our opinion, and they also provide a very strong

hedge against inflation. Inflation is a topic that is being talked about today more than it's been talked about, probably, in two decades."

VanLoh is bullish on a sustainable energy transition, citing estimates that it will require between $100 trillion and $200 trillion of capital over the next 30 years. That creates a lot of opportunity for investment but some pitfalls too.

"I really think that the industry that's been vilified the most—oil and gas—is going to be the industry that saves the world from its carbon problems."

—S. Wil VanLoh,
Quantum Energy Partners

Transition No. 5

VanLoh referred to the writings of Czech-Canadian economic analyst Vaclav Smil, who addressed energy transitions in one of his recent works. Smil makes it clear that these things take time.

The first energy transition took place at the advent of the industrial revolution when coal came into play as a fuel source. Coal took about 50 years to reach about a 35% market share.

Oil in the early 1900s took about 50 years to get to 25%. When natural gas entered the market, it similarly took 50 years to get to 25%.

Nuclear took 30 years to get to 5%. And renewables, which manifested in earnest 10 years ago, have only made it to a 3% market penetration.

"These transitions take a long time; they don't happen overnight," VanLoh said. "And more importantly, they never replace the former type of energy that was in use.

"Most forms of energy today, even though their market share is lower than their peak, we still use more in absolute terms than we've ever used before. I don't think this energy transition is going to be different."

What will be different is population change. The world will gain about 2 billion people in the next 20 years, he said, more than at any time period of that duration in history.

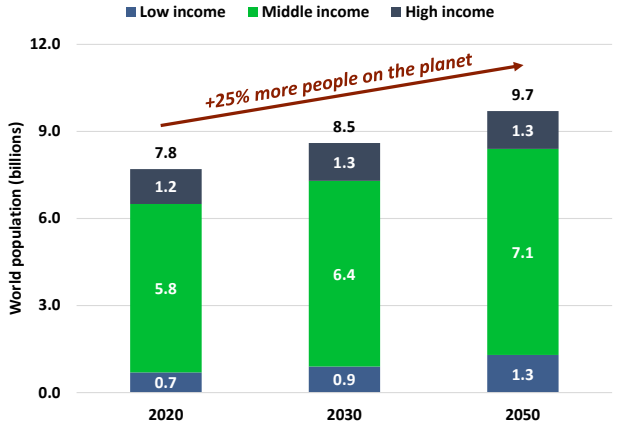
Reconciling population growth with an energy transition away from fossil fuels can get tricky. If the world stops drilling wells today, oil production will fall from about 100 million barrels per day (MMbbl/d) to about 30 MMbbl/d. Natural gas production would dive from about 400 billion cubic feet per day (Bcf/d) to about 180 Bcf/d.

"To put that in context," VanLoh said, "if demand stays flat for oil, we basically have to find about six new Saudi Arabias or about six new U.S. shale revolutions over the next 20 years."

POPULATION & ENERGY DEMAND

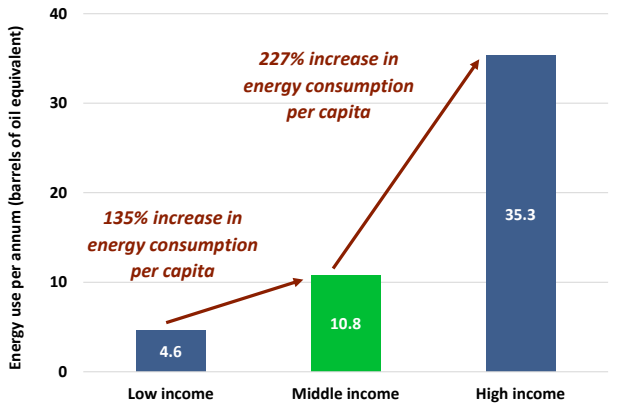
We face an enormous energy challenge over the next 30 years as billions of people consume more energy as they move up the economic ladder.

The world's population is continuing to grow ...



Through 2050, the world's population will grow by ~2 billion, with ~98% of the growth occurring in developing regions (e.g., Asia, Africa).

... and billions seek to use more energy to improve their quality of life



~87% of the world's population in 2050 will be categorized as low/middle income, and these people want, and have a right to, the modern luxuries afforded by energy consumption.

Source: The World Bank DataBank

CCUS FORECAST

The CCUS market has the potential to rival today's oil and gas market in size, scale and importance.

IEA: "Reaching net zero will be virtually impossible without CCUS."

Investment rationale behind CCUS

- CCUS is not a technology play – this is proven technology already being used at industrial scale across the world
- Emerging regulatory framework and revenue model
- The oil and gas workforce is already trained for this (geology, reservoir engineering, midstream infrastructure, etc)
- Existing oil and gas and midstream companies will be the key players
- Execution-centric management teams with high-quality assets will be key to creating value
- Will CO_2 floods kickstart another U.S. production renaissance?
- Attractive return potential with well capitalized buyers

By 2050, the CCUS industry can be the size of today's oil industry

	Oil & gas in 2020	CO_2 removal in 2050?
Total annual revenue	$2.1 trillion *(95 mmbopd @ $60/bbl)*	$1.2 trillion *(15GTpa @ $75/tonne)*
% of global GDP	2.4%	0.9%
30-year capital deployment potential	$13.6 trillion *(trailing)*	$12.3 trillion *(projected)*
Key players today?	Mature sector with thousands of companies globally	Emerging sector with oil and gas supermajor interest

The large-scale buildout and operation of needed CCUS infrastructure will create a new trillion-dollar industry.

Source: World Bank, IPCC, Carbon Tracker, SNL, IHS and Schlumberger

Brother, can you spare $1 trillion?

The need for fossil fuels doesn't necessarily translate into funding for it. "We're in a world today where, basically, investors won't give oil and gas producers new equity," he said.

"They'll give them debt, but they're not going to give new equity. And in the private equity world, it's probably 25% of what it was four or five years ago."

For the energy transition to work, VanLoh said, the world will have to be aligned on solving the problem. Climate change is a major concern in the west, but not so much in the rest of the world that accounts for 80% of the planet's population.

If that other 80% is not on board, the energy transition will not come close to working.

Part of the problem that he pointed to is government support, i.e., there's too much of it. Much of the alternative energy investment has been fueled by massive government subsidies.

Now, there are proposals to increase that threefold, fourfold or fivefold. How is that going to play out?

"I don't think it's going to be possible," VanLoh said. "You're going to have to create a profit incentive. A lot of these energy transition things don't make money.

"Increasingly, investors are saying, you know, we're not sure we're going to invest in oil and gas anymore."

When he inquires about their energy transition investments, they admit that they aren't making any because those investments don't make money. That, he said, is something that needs to be figured out.

The problem oil and gas has is that investors have left the space because companies lost money year after year. Once that capital has left, it is tough to convince investors to bring it back, despite the industry's generation of some $50 billion in free cash flow in 2021, more than the previous 15 years combined.

Oil, gas to the rescue

So, why invest in oil and gas to fight climate change? Part of the problem in this transition is that oil majors are pulling away from fossil fuels.

When those assets, which are managed by companies attentive to environmental concerns, are sold, they are often bought by companies in other countries that are not as responsible.

So, on the surface, it might appear that a company's actions to shift to renewables would lower emissions, but the reality might be the opposite.

What sparks optimism for VanLoh and Quantum is the emergence of carbon capture, utilization and sequestration (CCUS) technology.

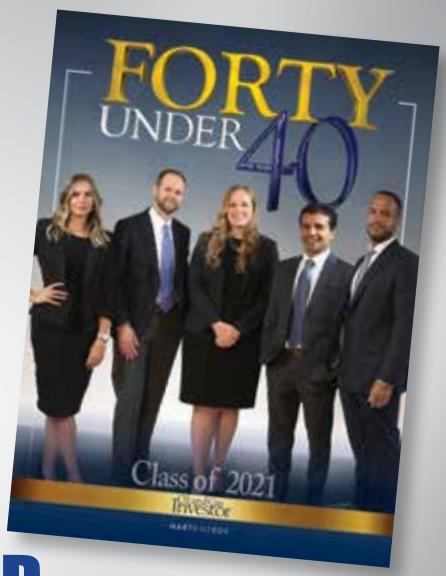
"I really think that the industry that's been vilified the most—oil and gas—is going to be the industry that saves the world from its carbon problems," he said. "That's going to be through CCUS.

"No industry is better situated to take advantage of this than the U.S., Canadian and, quite frankly, the European oil and gas industry."

CCUS is really the only way to make the transition work, VanLoh said, if the demand forecasts and supply projections are correct.

"If we don't decarbonize," he said, "we don't have a hope of hitting the Paris Accord targets." ■

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

In the Pipeline

The same fundamentals that identify risk and forecast earnings performance in the traditional midstream sector can also help investors get ahead in emerging energy markets.

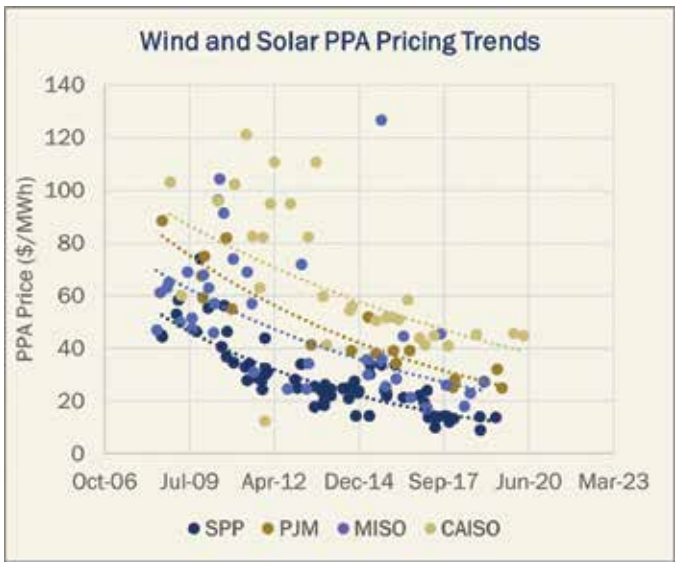
By Slade Rand

ESG and energy transition initiatives have come into greater focus for midstream companies as the global social, political and market environment continues to evolve.

In this environment, three potential verticals help categorize these initiatives: emissions reduction through technological improvements; offsetting or reducing emissions by signing power purchase agreements (PPAs) with clean sources; and investing in emerging renewable or low-carbon energy sources to ride the macro sustainability trend.

The focus here will be on the latter two methods.

As midstream companies explore entry into electric generation as either investors in or purchasers of renewable power, predicting future trends has become important. In September 2021, TC Energy Corp. (TRP) announced a partnership with EDP Renewables for a new wind farm in Alberta, Canada.



Since 2010, PPA prices have trended lower, according to an East Daley Capital analysis.
Source: East Daley Capital

The TRP-EDP Renewables partnership is an example of the global renewable power investment boom underway. TRP signed a 15-year PPA for 100% of the output of the 297-megawatt Sharp Hills wind farm, which the companies plan to bring online in 2023. Sharp Hills is EDP's third wind farm in Canada, according to a company announcement.

Meanwhile, Enterprise Product Partners LP and Energy Transfer LP have signed PPAs for renewables to offset emissions. Midstream opportunity in renewable generation is essentially limited to the PPA market, as we expect development or acquisition of power generation assets to be less common.

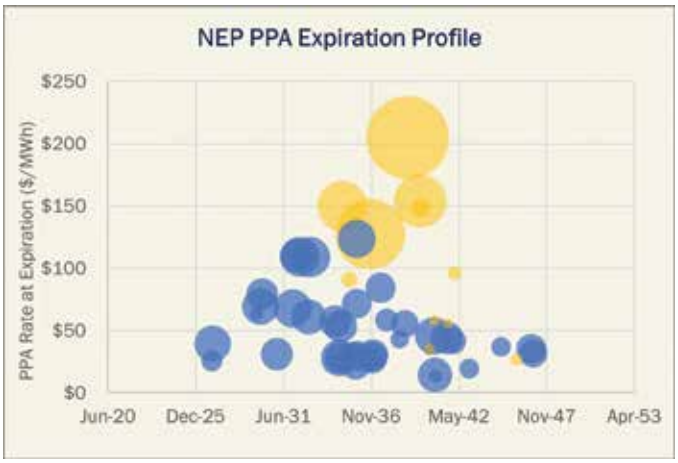
Power purchase agreements

As PPA deals become more common, both midstreamers and renewable power providers looking to get in on the action will need to monitor and adjust to changing electricity markets. Since 2010, PPA prices across all independent system operators and regional transmission organizations have trended lower.

Increased competition entering the wind and solar market, decreased construction costs and technological improvements are the primary drivers for this price decline. But, while recent data does indicate prices for renewables are beginning to fall more slowly than the rate seen more than 10 years ago, this is not to say PPA prices are hitting a bottom anytime soon.

As PPA prices fall, developers of early wind and solar projects will eventually face expirations on older contracts. Many older PPA agreements signed some 10 years ago are set to expire in the mid-2030s, bringing potential risk for power providers. When these contracts are set to roll off, many will try to repower, which requires additional capital spend to add updated turbines or improve other infrastructure.

Providers could also seek to re-contract at the lower prevailing market price, challenging margins for these projects. Midstream companies experienced a similar crunch as rates



A contract-expiration profile for NextEra Energy Partners is shown here. Early players in the renewable space will need to make up in volume what they lose in margin.
Source: East Daley Capital

compressed in recent years. Eventually, early players in the renewable space will need to make up in volume what they lose in margin to grow EBITDA, either through expansions or acquisitions.

This will require capital.

As large-scale traditional energy providers get in on the wind-solar power market, increased competition will continue to drive down prices. This is the hot area of the renewables sector where midstreamers are deploying capital now by funding wind-solar projects and signing PPA agreements.

As the energy transition becomes more established and integrated into global energy supply, there will be more—and larger-scale—capital on the horizon. This trend is gaining steam.

The Biden administration's push for electrification of the grid bodes well for continued competition in this space. As President Biden's infrastructure bill has been adopted, another influx of capital and competition into the industry is expected, putting further pressure on contract rates.

This shift also means large-scale financing will likely be made more available and could be a more viable capital growth accelerator for companies actively investing in the energy transition and ESG movement.

Midstreamers, including EnLink Midstream, Pembina Pipeline and TRP, have taken steps along another route, developing early-stage CO_2 transportation infrastructure.

Midstream opportunity in this emerging market seems to be in repurposing existing legacy infrastructure, as more than 50% of announced projects use this for CO_2, hydrogen, renewable natural gas and biofuels.

But these industries are in the very early stages. Partnerships and research ventures prevail here currently rather than concrete projects, so capital costs remain low.

CO_2 transportation and utilization are tangible opportunities for midstreamers, though significant buildout is still needed. These projects would require connecting CO_2 capture hubs to existing oil fields.

Environmental regulations

A need is anticipated for regulatory changes to provide increased subsidies for carbon capture development and ease the permitting process before the industry truly takes hold.

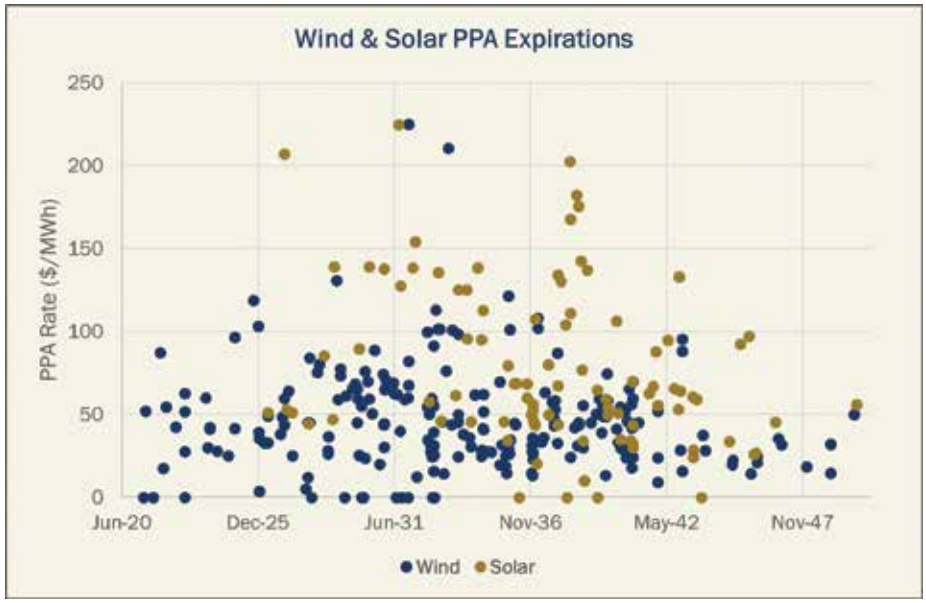
Emerging ventures such as hydrogen blending, renewables and carbon capture and storage represent potentially huge new market opportunities for midstream companies with natural synergies to existing operations, though more development is needed.

Differing from legacy hydrogen facilities, low-carbon infrastructure needs to have access to renewable energy or carbon capture markets. Hydrogen blending provides an already scaled demand market for hydrogen.

However, there are significant obstacles to hydrogen blending that vary by where in the natural gas market the blending occurs.

Investors are pressuring midstream companies to eliminate their emissions and adopt sustainability plans as environmental regulations tighten. In the background is the success of early adopters such as NextEra Energy Partners and NextEra Energy Inc. that are blazing a trail for other traditional energy companies to follow and win the affection of investors. ■

Slade Rand is a writer for East Daley Capital, which recently expanded upon its U.S. midstream database by applying its methodology to forecasting renewable electric generation earnings and other performance metrics. The firm can be reached at EastDaley.com.



Many older PPA agreements signed some 10 years ago are set to expire in the mid-2030s, bringing potential risk for power providers. *Source: East Daley Capital*

TRANSITION INFRASTRUCTURE

Here's the Alt-Infrastructure

Maps of the myriad types of energy transition infrastructure show the growth of wind, solar and additional resources to fuel a lower-carbon North America.

By Tyler Reitmeier and Rey Tagle

Energy transition is a hot topic in the boardrooms of traditional oil and gas companies, as the energy industry is being tasked with moving away from carbon-based fuels to renewable sources. Royal Dutch Shell Plc, BP Plc and a host of other oil majors have stated goals of achieving net-zero emissions by 2050.

Many are committing to specific carbon footprint-reduction goals by 2030.

The pathway to net zero being anything but clear, most view emission reductions in current operations as the logical first step, hence the 2030 intermediate goals. The first step has included replacing gas-fired equipment with alternative assets, utilizing electric power where possible.

This eliminates direct emissions from operations and reduces overall emissions in most cases. Since such "electrification" does not reduce emissions to zero, a logical second step is utilizing renewable sources for the energy needed for their operations.

For this, stranded gas and leaks can produce power that can be returned to the electric grid or used locally for power-intensive applications, even some outside of traditional oil and gas activity, such as crypto mining.

An estimated 25% of the world's proven gas reserves are stranded. To understand where this stranded gas is located, one must determine where gas midstream assets exist or are proposed, since gas is stranded because of the lack of pipeline capacity to ship it for processing.

Likewise, if pipeline capacity is not available to ship gas for processing, the next step would be to determine if electric grid assets are available to connect power generated from associated gas to the grid. In addition, opportunities for utilizing renewable resources near a company's assets can directly impact the carbon footprint.

For the future, organizations need to understand what planned renewable or electric grid-related projects are being developed that may present opportunities for them.

Using Hart Energy's Rextag platform, infrastructure intelligence assists companies focused on energy transition. By visualizing assets of different types on a map, opportunities to improve emissions performance can be identified efficiently and accurately.

The Rextag platform contains asset location and ownership for infrastructure across the hydrocarbon supply chain, from upstream, midstream to downstream, including electric power and renewable resources.

Looking at Pioneer Natural Resources Co.'s Delaware Basin assets, which were sold to Continental Resources Inc. at press time, the Rextag platform can quickly filter to these.

Next, the user can layer in the oil midstream infrastructure, both intrastate and interstate.

A potential buyer could determine what electrical infrastructure is available to support these wells by layering in power lines and power generation facilities in the area.

Related to energy transition, the user could then filter the electric power sources to show only the renewable energy assets, as well as adding wind turbines, electricity storage, biodiesel and landfill gas resources in the area to determine ownership and capacity of each.

The user can access reports about the renewable sources near the wells of interest to determine which may provide the needed lower-carbon-footprint power.

To source power from renewable resources, a midstream company could filter to see all renewable power generation and wind turbine sites that could be suitable for partnership and possible co-development.

As renewable energy sources become more cost competitive and as a lower carbon footprint is increasingly a requirement for investment, access to asset intelligence will be critical to success. Investors will look for qualified and scalable opportunities, and they will need data to assess the value of each opportunity.

The energy transition will challenge companies and stakeholders to find new ways of supplying needed products while meeting carbon-reduction targets. Access to accurate, continuously updated, map-based data and contacts is essential. ■

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