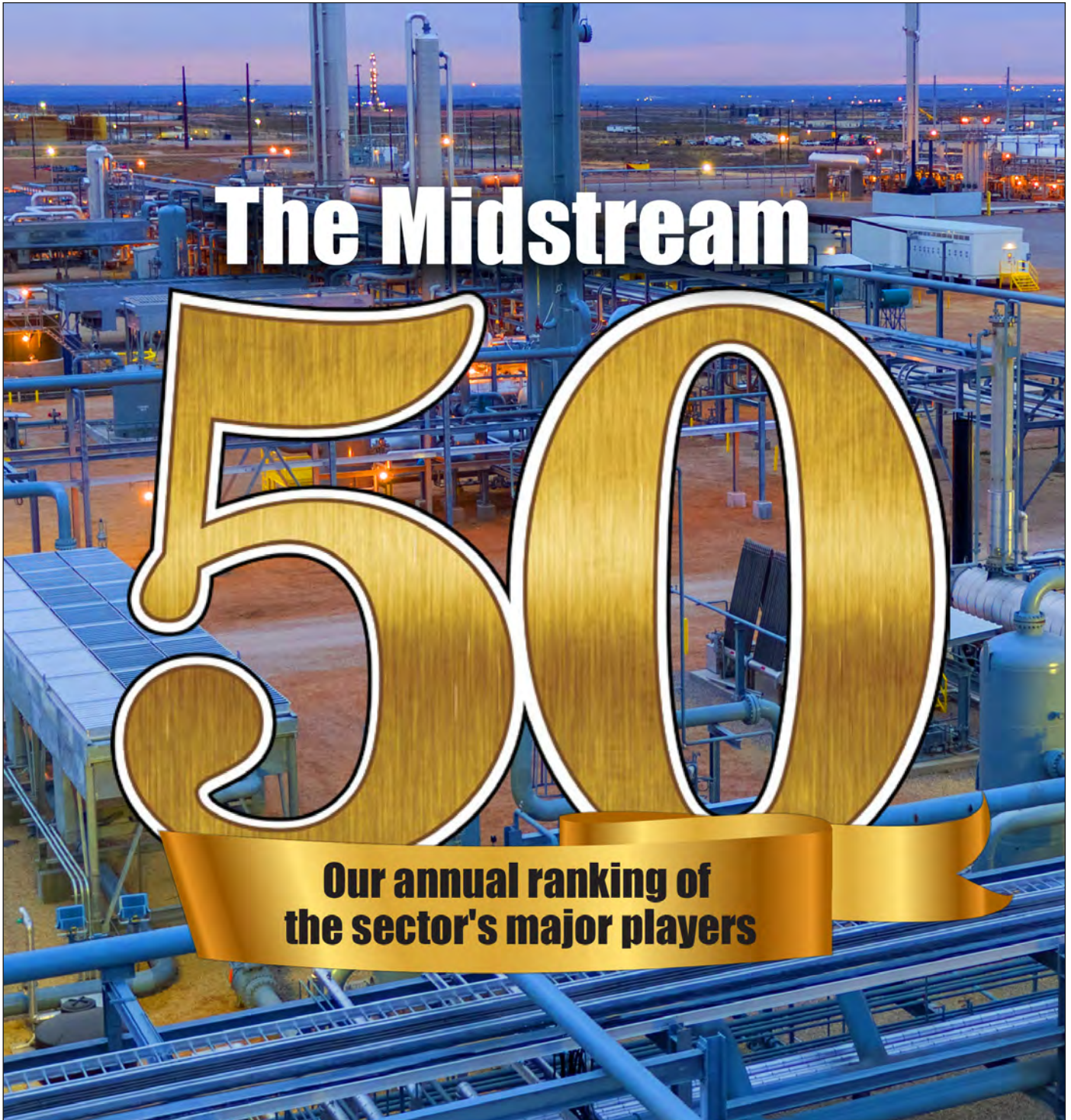


MIDSTREAM

Business



The Midstream

50

**Our annual ranking of
the sector's major players**

JUNE 2020

A supplement to
**Oil and Gas
Investor**

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On the cover: Natural gas shows promise in this difficult market, which means the midstream's natural gas pipelines and processing plants, such as this Delaware Basin facility operated by Jasper Ventures Inc., remain essential. (Source: Jasper Ventures Inc.)



These are unusual times in our world and our industry. Jasper Ventures remains more committed than ever to fulfill our vision of being a Christ-centered family of companies, creating unparalleled value for our employees, clients and communities.

We pray for the families and communities that have been and will continue to be impacted by this global pandemic. Jasper Ventures recognizes that we are all in this together and we look forward to partnering with you however we can.

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Terra Incognita

By Paul Hart, Midstream Editor-At-Large

I'm pleased to present our popular Midstream 50 feature again within this issue, listing the top, publicly held firms in the sector, based on financial results for the prior year. This article in years past proved a great way to benchmark change and get a sense of where things will go for the midstream. Will it prove so useful again in 2020?

Hardly.

We all know everything changed in the latter weeks of the first quarter and further developments continue as we go to press. It is hard to predict where things will go in 2020, given that the entire energy industry finds itself lost in a Terra Incognita as we wait for the compass needle to stop its jiggle and point north again. Meanwhile, some of our partners on this sojourn have disappeared over the far hill, sadly.

We try to provide some cognizant predictions of what lies ahead in other articles, but it is tough to determine where you are going when you don't know where you are.

In and around babysitting my 4-year-old granddaughter while our son and daughter-in-law struggle to keep their day jobs functioning from the dining room table, I've had the opportunity to read the newly published "A Question of Power: Electricity and the Wealth of Nations" by Robert Bryce. Midstream Business profiled Bryce in the December 2019 issue, and his latest book adds to his reputation as a deep thinker about energy and economics.

The point of his new work is that electricity is the foundation of the lifestyle we enjoy in the modern world. He also reminds us that a billion of the people on this earth, roughly one in eight, still do not have electricity—even today—and live by the sun as they cook with gathered twigs and dried dung. More than that have only enough juice to, say, run one light bulb and maybe a fan. Forget a microwave and A/C.

Free electrons can't be gathered off trees or dug out of a mine, of course, so we must first employ some sort of thermal or mechanical energy to herd them along in usable streams that make televisions glow and keep refrigerators cold.

Thus, Bryce has a lot to say about natural gas. Its role in generating power is big and continues to grow.

"It appears counterintuitive, but the more natural gas we find, the more we find," Bryce wrote. "Global gas reserves now stand at some 193 trillion cubic meters (6.8 quadrillion cubic feet)."

How much is that?

"That's enough to last for 52 years at current rates of production. The shale revolution has made the United States into the dominant player in the global natural gas business," he said.

Bryce pointed out that, of course, the energy business will need to add and modify infrastructure to process and pipe all that methane to power plants, or LNG liquefaction operations that chill it before it goes in tankers for use abroad, to make electricity someplace else.

That midstream investment will take a lot of capital, but that's relatively inexpensive compared to what it would cost to swap out gas or other fossil fuels for renewables. Most of the gas-moving infrastructure we need is in place and has been for years. That's not so for renewables, and renewable proponents lose sight of that, he said.

Also, consider that "making solar and storage work at the [world's] terawatt scale will require billions of tons of material to be mined, transported and recycled," according to the book. "Mining and smelting all that stuff will have significant impacts on people and the environment."

Given the gas infrastructure in place and methane's comparative low-carbon environmental impact, can there be a meaningful alternative? Well, yes, according to Bryce. Consider nuclear, but that power generation source seems even less politically correct than natural gas.

Bryce's thought piece is a reminder that the long-term oil and gas business has a promising future. The world's population grows, and everyone wants the electrically powered conveniences most of us enjoy. I highly recommend the book for its big-picture view of what the future holds for the energy industry, in particular, and civilization, in general.

The current crises required Hart Energy to postpone its popular conferences for the first half of 2020. I had planned to be at the annual Midstream Texas event about the time you read this. That event has been rescheduled for November, and we hope to see you there. ■

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For more coverage, visit HartEnergy.com.



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Cloudy, With A Chance Of Free Falls

The March market meltdown may have unnerved some investors, but plenty of projects either opened or moved forward.

By Joseph Markman

The paradox of projects in the time of COVID-19 is that as virtually the entire industry pulled back, plans for TC Energy Corp.'s long, long, long-awaited Keystone XL Pipeline (KXL) leapt forward. Stranger still, while one of the downcycle's root causes was the lightning-fast collapse of global oil prices, the market price of the Canadian crude that KXL will carry has been in worse shape than most, closing at an anemic \$7.52/bbl on April 1 (no joke), though it quickly bounced back.

The sunny KXL outlook clouded in mid-April, though, when a Montana judge ruled that the U.S. Army Corps of Engineers violated federal law in the way that it approved a permit for the pipeline to cross bodies of water.

Many but not all of the project the first two months of the quarter. KXL's short-lived triumph, for example, was announced on March 31. The near term, however, is uncertain. Prior to the crash, a slew of plants were under construction, and the Gulf Coast was awaiting another 1.4 MMbbl/d of fractionation capacity to come online.

"There are midstream projects that were put in place well before the coronavirus happened, and many of these projects are still progressing," Peter Fasullo, co-founder and principal of En*Vantage Inc., told Midstream Business.

"Everything that's under construction now was based on the expectation that the big supply push would continue," he said. "We were in a supply-push story up until just recently,

and we were in a major export mode because of the supply push."

Hit the brakes

The momentum of the industry, Fasullo said, was akin to that of a supertanker: difficult to put on the brakes quickly.

"There are things that were put in place well before [the downcycle] happened, and they're still going on," Fasullo said. "It's kind of like having a big leak in your house and you can't find the main water line to shut it off yet."

That same type of momentum applies to the construction of LNG export facilities. Not all of the news on the table is positive, but a fair number of the projects are moving forward.

"When it comes to planned LNG terminals, some of them may not realize, given lower prices and a lower demand environment," Anna Mikulska and Steven Miles, nonresident fellows in the Baker Institute's Center for Energy Studies at Rice University, told Midstream Business in an email. "That being said, the investment is made for the future and not current conditions."

Gulf Coast

As the first quarter ended, Energy Transfer LP's announcement that it will take over development of the Lake Charles, La., LNG export project couldn't hide the \$7 billion elephant in the room—Shell's market-based decision to pull out of its 50% equity investment in the \$12 billion to \$16 billion project.

"We continue to believe that Lake Charles is the most competitive and credible LNG project on the Gulf Coast," Tom Mason, executive vice

president and president of LNG for Energy Transfer, said in the announcement. "Having the ability to capitalize on our existing regasification infrastructure at Lake Charles provides a cost advantage over other proposed LNG projects on the Gulf Coast."

If the company cannot find another equity partner, it may reduce the project from three trains to two, cutting capacity from 16.45 million tonnes per annum (mtpa) to 11 mtpa.

Just one week before the commodity market crash, on March 2, Sempra LNG, a subsidiary of Sempra Energy, announced that the second train of its Cameron LNG export facility had launched commercial operations.

The company said that Train 3 was on track to start initial LNG production in the second quarter, with commercial operations to follow in the third quarter. The facility's first liquefaction train started commercial operations in August 2019. The three trains will boast a capacity of 12 mtpa of LNG, or about 1.7 Bcf/d.

Early in the year, Enterprise Products Partners LP began operations at its new Bulldog cryogenic natural gas processing plant in Panola County, Texas. Previously known as Panola 3, Bulldog adds 200 MMcf/d of gas processing and 12,000 bbl/d of NGL capacity to the Panola cryogenic facility, resulting in a total of 320 MMcf/d and 18,000 bbl/d for the plant, which handles gas from Cotton Valley and the Haynesville. NGL produced at the plant will move on the Panola Pipeline to the big Mont Belvieu, Texas, NGL hub for fractionation.

Projects

Selected Recent Midstream Construction Projects				
Operator/Developer	Project	Location	Added Capacity	Status/Completion
GULF COAST				
Energy Transfer LP	Lake Charles LNG	Lake Charles, La.	16.45 mtpa	Shell withdrew from the project on March 30. ETP took over as developer and is evaluating whether to seek new equity partners or reduce capacity to 11 mtpa.
Sempra Energy	Port Arthur LNG	Port Arthur, Texas	45 mtpa	Sempra pulled back from committing to a decision in the third quarter about whether to proceed with the project.
Sempra Energy	Cameron LNG	Hackberry, La.	12 mtpa	Sempra announced in early March that the second train of the project began commercial operations.
Energy Transfer LP	Bayou Bridge Pipeline System	Nederland, Texas, to Lake Charles, La.	N/A	A binding supplemental open season began in late February.
Enterprise Products Partners LP	Bulldog gas plant	Panola County, Texas	200 MMcf/d of gas, 12,000 bbl/d of NGL	Enterprise announced in late January that operations at the cryogenic natural gas processing plant had started.
PERMIAN BASIN				
Kinder Morgan Inc.	Permian Pass	Permian Basin to Gulf Coast	2 Bcf/d	Kinder Morgan said the project is in doubt because of a lack of customers in the low price environment.
EPIC Crude Holdings LP	EPIC Crude Oil Pipeline	Crane, Texas, to Corpus Christi, Texas	600,000 bbl/d	Pipeline began operational startup in late February.
Enterprise Products Partners LP	Mentone gas processing plant	Loving County, Texas	300 MMcf/d of gas, 40,000 bbl/d of NGL	Enterprise announced Jan. 21 that the plant had gone into service.
NORTHEAST				
Energy Transfer LP	Mariner East Pipeline	Pennsylvania	70,000 bbl/d	New construction was suspended in late March as part of the state's coronavirus shutdown. Ongoing work was allowed to continue.
Dominion Energy Inc.	Atlantic Coast Pipeline	West Virginia to North Carolina	1.5 Bcf/d	The Supreme Court appeared to favor approval of a permit for the pipeline to cross under the Appalachian Trail. A ruling is due in June.
The Williams Cos. Inc.	Constitution Pipeline	Pennsylvania to New York State	3.5 Bcf/d	Williams withdrew its investment in the project, citing financial loss of \$145 million in 2019.
CANADA				
TC Energy Corp.	Keystone XL Pipeline	Hardisty, Alberta, to Steel City, Neb.	830,000 bbl/d	TC Energy announced March 31 that it would proceed with the 1,210-mile pipeline, and work began in Montana. On April 15, a U.S. judge ruled that a permit for the pipeline to cross water bodies was not valid.
Enbridge Inc.	Line 3	Alberta, Canada, to Superior, Wis.	380,000 bbl/d	Minnesota Public Utilities Commission ruled that an environmental impact statement was adequate, clearing a regulatory hurdle for the project.
ALASKA				
Alaska Gasline Development Corp.	Alaska LNG	Nikiski, Alaska	3.5 Bcf/d	A FERC environmental impact study was completed in March, with a final order expected in June.
MEXICO				
Sempra Energy	Costa Azul LNG	Baja California	2.4 mtpa	Sempra committed to a second-quarter decision on whether to sanction the project in late March.
GULF OF MEXICO				
Shell Midstream Partners LP	Mars crude oil pipeline system	Gulf of Mexico	N/A	Shell expects a final investment decision on the expansion of Mars pipeline capacity in the first half of 2020.
EAST COAST				
Kinder Morgan Inc.	Elba Island LNG export plant	Elba Island, Ga.	0.3 mtpa	The fourth liquefaction train went online in January.

(Source: Hart Energy)

Permian Basin

The EPIC Crude Oil Pipeline began operational startup in the first quarter, transporting crude from Crane, Texas, to Corpus Christi, Texas. The 30-inch pipeline has an initial capacity of about 600,000 bbl/d and will eventually add 200,000 bbl/d to the Permian's takeaway capacity. EPIC had been offering interim crude service on its converted Y-grade NGL pipeline, which was halted when the new line began operations.

Analysts at Tudor, Pickering, Holt & Co. noted that the incremental capacity supports Midland Basin pricing.

Enterprise's Mentone cryogenic natural gas processing plant in Loving County, Texas, joined EPIC in launching operations in the first quarter. The plant's capacity is 300 MMcf/d of natural gas and 40,000 bbl/d of NGL. Mentone is located in the Delaware Basin and is supported by a long-term acreage dedication agreement, the company said.

"Mentone is our seventh natural gas processing plant in the Delaware Basin and increases our total capacity in the Permian Basin to more than 1.6 MMcf/d of natural gas processing and more than 250,000 bbl/d of NGL extraction," Brent Secrest, executive vice president and chief commercial officer of Enterprise's general partner, said in a statement.

Mentone is linked to Enterprise's NGL and Texas Intrastate pipeline networks by 66 miles of new large-diameter gathering and residue pipelines and expanded compression capabilities.

Kinder Morgan Inc., however, expressed less confidence in its proposed Permian Pass natural gas pipeline, intended to connect 2 Bcf/d of associated gas from the Permian to East Texas pipelines and LNG terminals in Louisiana. The problem, the company said, was that low prices for natural gas discouraged customers.

"We don't have anybody signed up yet," Kinder Morgan Chief Strategy Officer Dax Sanders told analysts. "If it comes together, it does. If it doesn't, it doesn't."

Permian Pass will be needed around 2023, Sanders said, based on market



"Everything that's under construction now was based on the expectation that the big supply push would continue. We were in a supply-push story up until just recently, and we were in a major export mode because of the supply push."

—Peter Fasullo, En*Vantage Inc.

projections. But given the difficulty in pursuing a pipeline project, it's unlikely that the company will commit funds to it now.

Northeast

Northeast projects have experienced better quarters, but some promising news popped up in the first quarter regarding construction of Dominion Energy Inc.'s Atlantic Coast Pipeline.

Based on questions the justices asked, observers believe the U.S. Supreme Court will favor the federal government's argument that it had the authority to approve the pipeline's path under the Appalachian Trail in Virginia. The Fourth U.S. Court of Appeals in Richmond, Va., had ruled that the U.S. Forest Service did not have the authority to allow the pipeline to cross the trail on federal forest land. The suit was brought by environmental groups including the Sierra Club and Southern Environmental Law Center.

Though the court will not issue a ruling until June, the chances for continued construction look promising. The proposed \$7.5 billion pipeline would be 600 ft below a section of the 2,200-mile trail, which stretches from Maine to Georgia. Dominion leads a consortium of companies.

New construction on the Mariner East pipeline project, however, was temporarily halted when Pennsylvania Gov. Tom Wolf instituted a statewide shutdown in March in response to the

COVID-19 pandemic. Ongoing work on the pipeline system and facilities continued, having been defined as a "life-saving" activity.

Mariner East was not alone. Royal Dutch Shell Plc also temporarily suspended construction on its multibillion-dollar ethane cracker along the Ohio River in Beaver County, Pa. Local officials called for construction to stop, concerned about the spread of the coronavirus among the large number of workers on the project.

Temporary was not the term connected with the Constitution Pipeline project, a 125-mile line proposed to move natural gas from the Marcellus Shale in Pennsylvania to New York State. The Williams Cos. Inc. pulled its investment in the project in late February. Constitution did not make financial sense for the Tulsa, Okla.-based giant.

Williams' 41% stake in the pipeline accounted for \$145 million of the company's \$354 million loss in 2019.

"Our existing pipeline network and expansions offer much better risk-adjusted returns than greenfield opportunities, which can be impacted by an ambiguous and vulnerable regulatory framework," Williams said in a statement. ■

Joseph Markman can be reached at jmarkman@hartenergy.com or 713-260-5208.



The Midstream

50

**Our annual ranking of
the sector's major players**

(Source: Jasper Ventures Inc.)

Consolidation

The long-running contraction in the number of midstream players accelerated in 2019.

By Paul Hart

Industry observers have maintained for some time that the sector needs fewer firms. They cite multiple reasons, among them the shale boom's maturity, harder to find capital and the fact that—as in all industries—bigger players enjoy a natural advantage over time.

That advantage proves crucial in downturns such as the double whammy that hit the energy business in the first quarter of 2020. (*See the accompanying story for insights on what may lie ahead for midstream players.*)

Consolidation's not a new trend, but it accelerated last year. The tune behind the midstream's corporate musical chairs just got louder and faster.

So, what is the most significant year-over-year change in the new Midstream Business Midstream 50? No surprise: Some 10% of the companies on last year's list disappeared. Those names remain on the 2020 Midstream 50 list to provide something of an apples-to-apples comparison with the prior year.

What it is

The Midstream 50 ranks the largest publicly held midstream sector players, whether MLPs or conventional corporations, by EBITDA, as compiled by Barclays. Interpretation of and reporting on the rankings is done by Midstream Business editors. The 2020 list's rankings are based on 2019 full-year data, either fiscal or calendar, depending on which a company reports and which Barclays deemed to be most appropriate in comparison.

Changes shown in the accompanying tables are against the 2019 Midstream 50 rankings, which were based on comparable 2018 financials. All financials are in U.S. dollars.

“Consolidation and acquisition by the infrastructure firms—large private equity versus being bought by other publics or going public—is definitely the story for 2019,” Josh Sherman, partner with Opportune LLP, told Midstream Business. Last year “was a little more stable, I guess” than the painful 2014 to 2015 industry retrenchment, he added. Never mind what happened in early 2020.

Sherman had an up-close and personal view of that period when he served as chair of the board of directors' audit committee with midstream player JP Energy Partners LP. In 2016, JP Energy merged with American Midstream Partners LP, which in turn was taken private by their collective sponsor, ArcLight Energy Partners LP, in July 2019.

Chicken versus egg

Consolidation nudged along last year but not necessarily because of a commodity freefall, Sherman said. In general, the long-running midstream buildout to support the big shale plays had been completed or was nearing completion in the major plays. That created a “chicken or the egg game” for midstream firms, he said. In other words, should companies build ahead of production increases, or wait for the production and then build? Either way, getting bigger helps in decision-making.

The sector ended 2019 on a fairly positive note, which included continuing expansion. In a January research report, RBN Energy wrote that midstream capex soared to a record \$37 billion in 2019 and is “forecast to steeply decline over the next few years as the lion's share of the infrastructure needed to gather, transport, process and store current and expected hydrocarbon volumes has already been built or is nearing completion.”

Alerian benchmarked 2019 in an early 2020 study that saw a “positive outlook,” based on stable or increasing distribution yields.

“Overall, the vast majority of midstream MLPs either maintained or grew their distributions on a sequential basis,” Alerian said. However, it noted four distribution cuts in the year's final quarter, led by EnLink Midstream LLC's 33.7% sequential reduction, which “came as little surprise given its lofty yield of over 18% at the end of December, even after a 29.1% increase in price performance for the month.”

EnLink ranks No. 18 on the 2020 Midstream 50, the same spot it held on last year's list.

Executives of smaller, privately financed startups that once dreamed of ringing a stock market's opening bell as they did an IPO found the going tough once again in 2019.

“In the midstream sector, private companies that were traditionally either targets for publicly traded MLPs or IPO candidates themselves now needed to find a new exit strategy less reliant on public energy equity markets,” Simmons Energy said in its 2019 review, published in January.

THE MIDSTREAM 50 FOR 2020, RANKED BY EBITDA (\$MM)

Rank	Ticker	Company Name	2018 EBITDA	2019 EBITDA	% Change	2018 Revenues	2019 Revenues	% Change	12/31/18 Assets
1.	ET	Energy Transfer LP	\$9,510	\$11,214	18%	\$54,087	\$54,213	0%	\$88,246
2.	ENB	Enbridge Inc.	\$9,918	\$10,001	1%	\$35,797	\$37,733	5%	\$128,827
3.	EPD	Enterprise Products Partners LP	\$7,223	\$8,117	12%	\$36,534	\$32,789	(10%)	\$56,970
4.	KMI	Kinder Morgan Inc.	\$7,568	\$7,618	1%	\$14,144	\$13,209	(7%)	\$78,866
5.	TRP	TC Energy Corp.	\$6,609	\$7,058	7%	\$10,558	\$9,989	(5%)	\$76,352
6.	WMB	Williams Cos. Inc.	\$4,638	\$5,015	8%	\$8,686	\$8,201	(6%)	\$45,302
7.	MPLX	MPLX LP	\$3,475	\$4,334	25%	\$6,049	\$8,625	43%	\$22,779
8.	PAA	Plains All American LP	\$2,684	\$3,237	21%	\$34,055	\$33,669	(1%)	\$25,511
9.	LNG	Cheniere Energy Inc.	\$2,641	\$2,946	12%	\$7,987	\$7,987	0%	\$31,987
10.	OKE	ONEOK Inc.	\$2,448	\$2,580	5%	\$12,593	\$10,164	(19%)	\$18,232
11.	WES	Western Midstream Partners LP	\$1,206	\$1,719	43%	\$1,990	\$2,746	38%	\$9,236
12.	MMP	Magellan Midstream Partners LP	\$1,396	\$1,581	13%	\$2,827	\$2,728	(3%)	\$7,748
13.	TRGP	Targa Resources Corp.	\$1,366	\$1,436	5%	\$10,484	\$8,671	(17%)	\$16,938
14.	EQM	EQM Midstream Partners LP	\$998	\$1,338	34%	\$1,495	\$1,630	9%	\$9,456
15.	PSXP	Phillips 66 Partners LP	\$1,137	\$1,268	12%	\$1,045	\$1,126	8%	\$5,819
16.	DCP	DCP Midstream LP	\$1,092	\$1,200	10%	\$9,822	\$9,822	0%	\$14,266
17.	ENBL	Enable Midstream Partners LP	\$1,074	\$1,147	7%	\$3,431	\$2,960	(14%)	\$12,444
18.	ENLC	EnLink Midstream LLC	\$1,042	\$1,080	4%	\$7,699	\$6,053	(21%)	\$10,694
19.	TGE	Tallgrass Energy LP	\$654	\$996	52%	\$793	\$869	9%	\$5,894
20.	AM	Antero Midstream Corp.	\$709	\$830	17%	\$1,029	\$793	(23%)	\$3,546
21.	SHLX	Shell Midstream Partners LP	\$616	\$730	19%	\$525	\$503	(4%)	\$1,914
22.	NS	NuStar Energy LP	\$666	\$704	6%	\$1,520	\$1,498	(1%)	\$6,349
23.	GEL	Genesis Energy LP	\$716	\$669	(7%)	\$2,913	\$2,481	(15%)	\$6,479
24.	SXL	Sunoco Logistics LP	\$732	\$665	(9%)	\$11,723	\$16,596	42%	\$4,879
25.	NGL	NGL Energy Partners LP	\$464	\$564	21%	\$8,304	\$8,326	0%	\$5,956
26.	HESM	Hess Midstream Partners LP	\$505	\$551	9%	\$713	\$848	19%	\$2,991
27.	CEQP	Crestwood Equity Partners LP	\$420	\$527	25%	\$3,654	\$3,182	(13%)	\$4,295
28.	USAC	USA Compression Partners LP	\$320	\$420	31%	\$584	\$698	20%	\$3,775
29.	AROC	Archrock Inc.	\$352	\$417	18%	\$904	\$965	7%	\$2,553
30.	HEP	Holly Energy Partners LP	\$347	\$359	4%	\$506	\$533	5%	\$2,103
31.	SMLP	Summit Midstream Partners LP	\$294	\$287	(2%)	\$507	\$444	(12%)	\$3,021
32.	OMP	Oasis Midstream Partners LP	\$178	\$270	52%	\$272	\$410	51%	\$964
33.	SPH	Suburban Propane Partners LP	\$283	\$267	(6%)	\$1,348	\$1,224	(9%)	\$2,152
34.	NBLX	Noble Midstream Partners LP	\$223	\$255	14%	\$559	\$704	26%	\$2,192
35.	CNXM	CNX Midstream Partners LP	\$189	\$239	26%	\$257	\$306	19%	\$925
36.	GLP	Global Partners LP	\$311	\$234	(25%)	\$12,673	\$13,082	3%	\$2,424
37.	BPMP	BP Midstream Partners LP	\$196	\$219	12%	\$116	\$128	10%	\$693
38.	PBFX	PBF Logistics LP	\$152	\$185	21%	\$283	\$340	20%	\$956
39.	DKL	Delek Logistics Partners LP	\$164	\$179	9%	\$658	\$584	(11%)	\$625
40.	TLP	TransMontaigne Partners LP	\$133	\$147	10%	\$232	\$263	13%	\$1,002
41.	CCLP	CSI Compressco LP	\$99	\$128	29%	\$439	\$477	9%	\$827
42.	MMLP	Martin Midstream Partners LP	\$107	\$108	1%	\$1,020	\$847	(17%)	\$1,074
43.	SRLP	Sprague Resources LP	\$102	\$106	3%	\$3,771	\$3,425	(9%)	\$1,245
44.	BKEP	Blueknight Energy Partners LP	\$60	\$64	6%	\$385	\$371	(4%)	\$323
45.	GPP	Green Plains Partners LP	\$66	\$54	(18%)	\$101	\$82	(18%)	\$81
46.	USDP	USD Partners LP	\$57	\$50	(11%)	\$119	\$114	(5%)	\$287
47.	ANDX	Andeavor Logistics LP	\$1,201	N/A	N/A	\$2,380	N/A	N/A	\$10,295
48.	BPL	Buckeye Partners LP	\$1,005	N/A	N/A	\$4,108	N/A	N/A	\$9,356
49.	APU	AmeriGas Partners LP	\$622	N/A	N/A	\$2,856	N/A	N/A	\$4,006
50.	SEMG	SemGroup Corp.	\$394	N/A	N/A	\$2,503	N/A	N/A	\$5,210

12/31/19 Assets	% Change	12/31/18 Dist. Yield	12/31/19 Dist. Yield	% Change	12/31/18 Price	12/31/19 Price	% Change	Annualized Distribution at 12/31/18	Annualized Distribution at 12/31/19
\$98,880	12%	9.24%	9.51%	(3%)	\$13.21	\$12.83	(3%)	\$1.22	\$1.22
\$123,042	(4%)	6.67%	5.59%	16%	\$31.08	\$39.77	28%	\$2.07	\$2.22
\$61,733	8%	7.08%	6.32%	11%	\$24.59	\$28.16	15%	\$1.74	\$1.78
\$74,157	(6%)	5.20%	4.72%	9%	\$15.38	\$21.17	38%	\$0.80	\$1
\$74,818	(2%)	5.97%	4.24%	29%	\$35.70	\$53.31	49%	\$2.13	\$2.26
\$46,040	2%	6.89%	6.41%	7%	\$22.05	\$23.72	8%	\$1.52	\$1.52
\$40,430	77%	8.55%	10.80%	(26%)	\$30.30	\$25.46	(16%)	\$2.59	\$2.75
\$28,677	12%	5.99%	7.83%	(31%)	\$20.04	\$18.39	(8%)	\$1.20	\$1.44
\$35,492	11%	N/A	N/A	N/A	\$59.19	\$61.07	3%	N/A	N/A
\$21,812	20%	6.34%	4.84%	24%	\$53.95	\$75.67	40%	\$3.42	\$3.66
\$12,346	34%	14.14%	12.64%	11%	\$27.73	\$19.69	(29%)	\$3.92	\$2.49
\$8,438	9%	6.99%	6.49%	7%	\$57.06	\$62.87	10%	\$3.99	\$4.08
\$18,815	11%	10.11%	8.92%	12%	\$36.02	\$40.83	13%	\$3.64	\$3.64
\$11,815	25%	10.45%	15.51%	(48%)	\$43.25	\$29.91	(31%)	\$4.52	\$4.64
\$6,961	20%	7.93%	5.68%	28%	\$42.11	\$61.64	46%	\$3.34	\$3.50
\$14,127	(1%)	11.78%	12.74%	(8%)	\$26.49	\$24.49	(8%)	\$3.12	\$3.12
\$12,266	(1%)	9.40%	13.18%	(40%)	\$13.53	\$10.03	(26%)	\$1.27	\$1.32
\$9,336	(13%)	11.59%	12.23%	(6%)	\$9.49	\$6.13	(35%)	\$1.10	\$0.75
\$6,214	5%	8.55%	N/A	N/A	\$24.34	\$22.12	(9%)	\$2.08	N/A
\$6,283	77%	5.87%	16.21%	(176%)	\$11.18	\$7.59	(32%)	\$0.66	\$1.23
\$2,019	6%	9.75%	9.10%	7%	\$16.41	\$20.21	23%	\$1.60	\$1.84
\$6,186	(3%)	11.47%	9.28%	19%	\$20.93	\$25.85	24%	\$2.40	\$2.40
\$6,598	2%	11.91%	10.74%	10%	\$18.47	\$20.48	11%	\$2.20	\$2.20
\$5,438	11%	12.14%	10.79%	11%	\$27.19	\$30.60	13%	\$3.30	\$3.30
\$7,243	22%	16.27%	13.76%	15%	\$9.59	\$11.34	18%	\$1.56	\$1.56
\$3,278	10%	8.72%	7.51%	14%	\$16.98	\$22.68	34%	\$1.48	\$1.70
\$5,349	25%	8.60%	7.79%	9%	\$27.91	\$30.82	10%	\$2.40	\$2.40
\$3,730	(1%)	16.18%	11.58%	28%	\$12.98	\$18.14	40%	\$2.10	\$2.10
\$3,110	22%	7.05%	5.78%	18%	\$7.49	\$10.04	34%	\$0.53	\$0.58
\$2,199	5%	9.35%	12.14%	(30%)	\$28.56	\$22.15	(22%)	\$2.67	\$2.69
\$2,573	(15%)	22.89%	15.11%	34%	\$10.05	\$3.31	(67%)	\$2.30	\$0.50
\$1,155	20%	11.26%	13.02%	(16%)	\$15.99	\$16.59	4%	\$1.80	\$2.16
\$2,184	2%	12.45%	10.98%	12%	\$19.27	\$21.85	13%	\$2.40	\$2.40
\$2,926	33%	8.12%	10.36%	(27%)	\$28.84	\$26.56	(8%)	\$2.34	\$2.75
\$1,235	33%	8.55%	10.07%	(18%)	\$16.28	\$16.46	1%	\$1.39	\$1.66
\$2,808	16%	12.27%	10.42%	15%	\$16.30	\$20.16	24%	\$2	\$2.10
\$722	4%	7.76%	8.90%	(15%)	\$15.54	\$15.61	0%	\$1.21	\$1.39
\$973	2%	10.05%	10.27%	(2%)	\$20.10	\$20.25	1%	\$2.02	\$2.08
\$744	19%	11.08%	11.08%	0%	\$29.25	\$31.96	9%	\$3.24	\$3.54
\$1,072	7%	7.93%	N/A	N/A	\$40.58	N/A	N/A	\$3.22	N/A
\$822	(1%)	1.72%	1.47%	15%	\$2.32	\$2.71	17%	\$0.04	\$0.04
\$667	(38%)	19.46%	6.20%	68%	\$10.28	\$4.03	(61%)	\$2	\$0.25
\$1,276	2%	18.43%	15.78%	14%	\$14.49	\$16.92	17%	\$2.67	\$2.67
\$302	(7%)	27.83%	18.80%	(32%)	\$1.15	\$1.13	(2%)	\$0.32	\$0.16
\$106	30%	14%	13.75%	2%	\$13.57	\$13.82	2%	\$1.90	\$1.90
\$299	4%	13.78%	14.93%	(8%)	\$10.45	\$9.91	(5%)	\$1.44	\$1.48
N/A	N/A	8.19%	N/A	N/A	\$50.32	\$50.81	1%	\$4.12	N/A
N/A	N/A	10.35%	N/A	N/A	\$28.99	N/A	N/A	\$3	N/A
N/A	N/A	15.02%	N/A	N/A	\$25.30	N/A	N/A	\$3.80	N/A
N/A	N/A	13.72%	N/A	N/A	\$13.78	N/A	N/A	\$1.89	N/A

(Source: Barclays)

“Large, infrastructure-oriented private-equity funds filled this void, attracted by long-term contracted cash flow and fueled by access to low cost debt capital,” Simmons added. “Additionally, we have worked with several upstream operators seeking to monetize their midstream infrastructure assets as a source of capital.”

Top 10

The 2020 list sports a new name at the top: Energy Transfer LP. It jumped Enbridge Inc. to assume the No. 1 position. Energy Transfer’s EBITDA rose 18% year over and year, largely due to one of the bigger consolidations in 2019—its acquisition of Tulsa, Okla.-based SemGroup Corp. SemGroup ranked No. 31 on last year’s Midstream 50.

THE MIDSTREAM 50 PERFORMANCE FOR 2019

	EBITDA	Revenue	Assets	Distribution Yield	Stock Price
Average	12%	3%	11%	4%	4%
Median	10%	0%	8%	10%	6%

Dallas-based Energy Transfer’s EBITDA climbed by more than \$1 billion in 2019 to \$11.2 billion, while Enbridge saw a 1% increase in the key financial metric to \$10 billion. Otherwise, the list’s top 10 showed minimal change as Enterprise Products Partners LP and Kinder Morgan Inc. swapped the Nos. 3 and 4 slots.

The other large players returned in the same order as 2019—TC Energy Corp. (formerly TransCanada), Williams Cos. Inc., MPLX LP, Plains All

American LP, Cheniere Energy Inc. and ONEOK Inc. Stability at the top seems to be a trend. The last big switch in the top 10 list came in 2018 as Cheniere rocketed up an astounding 30 points on that year’s Midstream 50 as its long-promised Sabine Pass LNG operation in Cameron Parish, La., started up.

Combined EBITDA for the Midstream 50 members rose to \$83 billion, a 6% increase from the \$78.4 billion reported in the previous year.

Revenue rankings

Revenues for the list leaders were flat or declined overall. Energy Transfer maintained its top rank in revenues with 0.2% increase to \$54.2 billion. Enbridge showed a 5% increase to \$37.7 billion. MPLX scored the biggest jump, 43%, to \$8.6 billion, following—what else?—its consolidation with Andeavor Logistics LP, the biggest midstream deal in 2019.

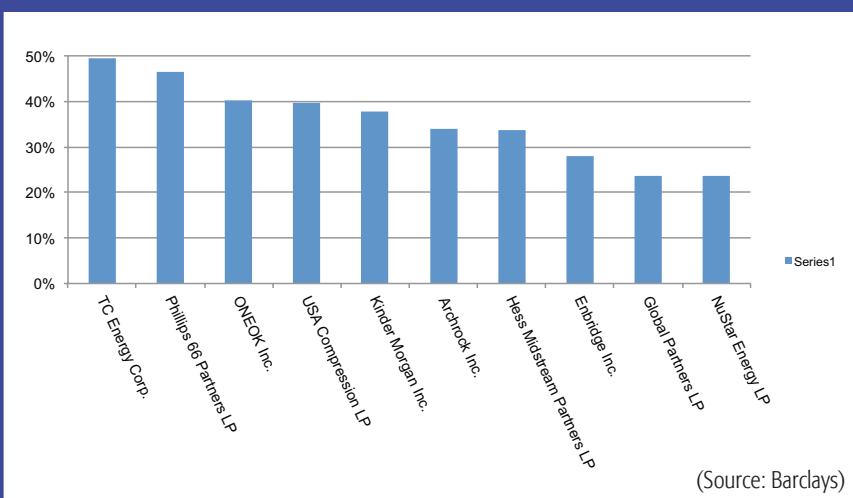
Oasis Midstream Partners LP reported the largest gain in revenue, a 51% increase to \$410 million from \$272 million. Half the list members reported flat or lower earnings.

Combined revenues for the list members declined 4% in 2019 to \$312 billion from \$326 billion.

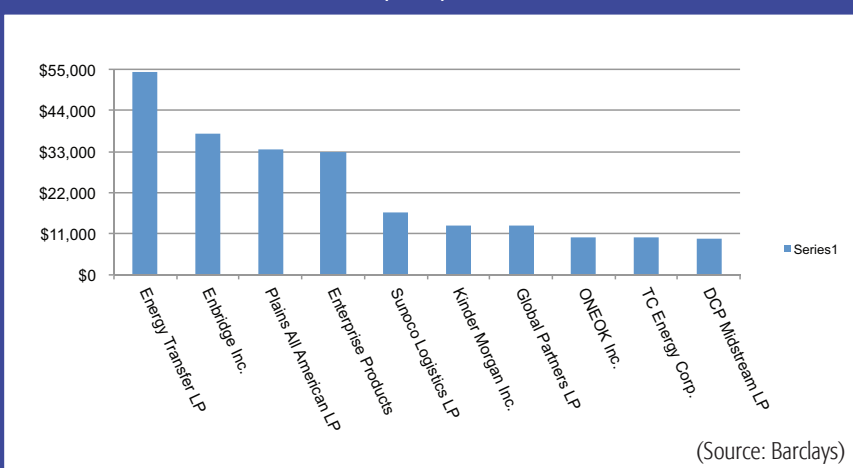
Wall Street’s disaffection with all things energy showed in midstream share and unit prices. Two firms, TC Energy and Phillips 66 Partners LP, scored healthy increases of 49% and 46%, respectively. Yet 16 firms reported flat or lower share/unit prices from year-end to year-end.

Given indifferent pricing, it’s no surprise that distribution yields were very good, overall, for 2019. Antero Midstream Corp. sported a 16.21% yield for the year to top the list, with Sprague Resources LP close behind at 15.78%. Half the list members marked double-digit distributions for the year.

The Midstream 50 Stock Price Leaders



The Midstream 50 Revenue Leaders (\$MM)



THE MIDSTREAM 50 BY DISTRIBUTION YIELD

Rank	Company Name	12/31/18 Dist. Yield	12/31/19 Dist. Yield	% Change	12/31/18 Price	12/31/19 Price	% Change	Annualized Distribution at 12/31/18	Annualized Distribution at 12/31/19
1.	Blueknight Energy Partners LP	27.83%	18.80%	(32%)	\$1.15	\$1.13	(2%)	\$0.32	\$0.16
2.	Antero Midstream Corp.	5.87%	16.21%	(176%)	\$11.18	\$7.59	(32%)	\$0.66	\$1.23
3.	Sprague Resources LP	18.43%	15.78%	14%	\$14.49	\$16.92	17%	\$2.67	\$2.67
4.	EQM Midstream Partners LP	10.45%	15.51%	(48%)	\$43.25	\$29.91	(31%)	\$4.52	\$4.64
5.	Summit Midstream Partners LP	22.89%	15.11%	34%	\$10.05	\$3.31	(67%)	\$2.30	\$0.50
6.	USD Partners	13.78%	14.93%	(8%)	\$10.45	\$9.91	(5%)	\$1.44	\$1.48
7.	NGL Energy Partners LP	16.27%	13.76%	15%	\$9.59	\$11.34	18%	\$1.56	\$1.56
8.	Green Plains Partners LP	14%	13.75%	2%	\$13.57	\$13.82	2%	\$1.90	\$1.90
9.	Enable Midstream Partners LP	9.40%	13.18%	(40%)	\$13.53	\$10.03	(26%)	\$1.27	\$1.32
10.	Oasis Midstream Partners LP	11.26%	13.02%	(16%)	\$15.99	\$16.59	4%	\$1.80	\$2.16
11.	DCP Midstream	11.78%	12.74%	(8%)	\$26.49	\$24.49	(8%)	\$3.12	\$3.12
12.	Western Midstream Partners LP	14.14%	12.64%	11%	\$27.73	\$19.69	(29%)	\$3.92	\$2.49
13.	EnLink Midstream LLC	11.59%	12.23%	(6%)	\$9.49	\$6.13	(35%)	\$1.10	\$0.75
14.	Holly Energy Partners LP	9.35%	12.14%	(30%)	\$28.56	\$22.15	(22%)	\$2.67	\$2.69
15.	USA Compression Partners LP	16.18%	11.58%	28%	\$12.98	\$18.14	40%	\$2.10	\$2.10
16.	Delek Logistics Partners LP	11.08%	11.08%	0%	\$29.25	\$31.96	9%	\$3.24	\$3.54
17.	Suburban Propane Partners LP	12.45%	10.98%	12%	\$19.27	\$21.85	13%	\$2.40	\$2.40
18.	MPLX LP	8.55%	10.80%	(26%)	\$30.30	\$25.46	(16%)	\$2.59	\$2.75
19.	Sunoco Logistics LP	12.14%	10.79%	11%	\$27.19	\$30.60	13%	\$3.30	\$3.30
20.	Genesis Energy LP	11.91%	10.74%	10%	\$18.47	\$20.48	11%	\$2.20	\$2.20
21.	Global Partners LP	12.27%	10.42%	15%	\$16.30	\$20.16	24%	\$2	\$2.10
22.	Noble Midstream Partners LP	8.12%	10.36%	(27%)	\$28.84	\$26.56	(8%)	\$2.34	\$2.75
23.	PBF Logistics LP	10.05%	10.27%	(2%)	\$20.10	\$20.25	1%	\$2.02	\$2.08
24.	CNX Midstream Partners LP	8.55%	10.07%	(18%)	\$16.28	\$16.46	1%	\$1.39	\$1.66
25.	Energy Transfer LP	9.24%	9.51%	(3%)	\$13.21	\$12.83	(3%)	\$1.22	\$1.22
26.	NuStar Energy LP	11.47%	9.28%	19%	\$20.93	\$25.85	24%	\$2.40	\$2.40
27.	Shell Midstream Partners LP	9.75%	9.10%	7%	\$16.41	\$20.21	23%	\$1.60	\$1.84
28.	Targa Resources Corp.	10.11%	8.92%	12%	\$36.02	\$40.83	13%	\$3.64	\$3.64
29.	BP Midstream Partners LP	7.76%	8.90%	(15%)	\$15.54	\$15.61	0%	\$1.21	\$1.39
30.	Plains All American LP	5.99%	7.83%	(31%)	\$20.04	\$18.39	(8%)	\$1.20	\$1.44
31.	Crestwood Equity Partners LP	8.60%	7.79%	9%	\$27.91	\$30.82	10%	\$2.40	\$2.40
32.	Hess Midstream Partners LP	8.72%	7.51%	14%	\$16.98	\$22.68	34%	\$1.48	\$1.70
33.	Magellan Midstream Partners LP	6.99%	6.49%	7%	\$57.06	\$62.87	10%	\$3.99	\$4.08
34.	Williams Cos. Inc.	6.89%	6.41%	7%	\$22.05	\$23.72	8%	\$1.52	\$1.52
35.	Enterprise Products Partners LP	7.08%	6.32%	11%	\$24.59	\$28.16	15%	\$1.74	\$1.78
36.	Martin Midstream Partners LP	19.46%	6.20%	68%	\$10.28	\$4.03	(61%)	\$2	\$0.25
37.	Archrock Inc.	7.05%	5.78%	18%	\$7.49	\$10.04	34%	\$0.53	\$0.58
38.	Phillips 66 Partners LP	7.93%	5.68%	28%	\$42.11	\$61.64	46%	\$3.34	\$3.50
39.	Enbridge Inc.	6.67%	5.59%	16%	\$31.08	\$39.77	28%	\$2.07	\$2.22
40.	ONEOK Inc.	6.34%	4.84%	24%	\$53.95	\$75.67	40%	\$3.42	\$3.66
41.	Kinder Morgan Inc.	5.20%	4.72%	9%	\$15.38	\$21.17	38%	\$1	\$1
42.	TC Energy Corp.	5.97%	4.24%	29%	\$35.70	\$53.31	49%	\$2.13	\$2.26
43.	CSI Compressco LP	1.72%	1.47%	15%	\$2.32	\$2.71	17%	\$0.04	\$0.04
44.	Cheniere Energy Inc.	N/A	N/A	N/A	\$59.19	\$61.07	3%	N/A	N/A
45.	Tallgrass Energy LP	8.55%	N/A	N/A	\$24.34	\$22.12	(9%)	\$2.08	N/A
46.	TransMontaigne Partners LP	7.93%	N/A	N/A	\$40.58	\$0	NA	\$3.22	N/A
47.	Andeavor Logistics LP	8.19%	N/A	N/A	\$50.32	\$50.81	1%	\$4.12	N/A
48.	Buckeye Partners LP	10.35%	N/A	N/A	\$28.99	N/A	N/A	\$3	N/A
49.	AmeriGas Partners LP	15.02%	N/A	N/A	\$25.30	N/A	N/A	\$3.80	N/A
50.	SemGroup Corp.	13.72%	N/A	N/A	\$13.78	N/A	N/A	\$1.89	N/A

THE MIDSTREAM 50 BY CHANGE IN ASSETS (\$MM)

Rank	Company Name	12/31/18 Assets	12/31/19 Assets	% Change
1.	MPLX LP	\$22,779	\$40,430	77%
2.	Antero Midstream Corp.	\$3,546	\$6,283	77%
3.	Western Midstream Partners LP	\$9,236	\$12,346	34%
4.	Noble Midstream Partners LP	\$2,192	\$2,926	33%
5.	CNX Midstream Partners LP	\$925	\$1,235	33%
6.	Green Plains Partners LP	\$81	\$106	30%
7.	EQM Midstream Partners LP	\$9,456	\$11,815	25%
8.	Crestwood Equity Partners LP	\$4,295	\$5,349	25%
9.	Archrock Inc.	\$2,553	\$3,110	22%
10.	NGL Energy Partners LP	\$5,956	\$7,243	22%
11.	Oasis Midstream Partners LP	\$964	\$1,155	20%
12.	ONEOK Inc.	\$18,232	\$21,812	20%
13.	Phillips 66 Partners LP	\$5,819	\$6,961	20%
14.	Delek Logistics Partners LP	\$625	\$744	19%
15.	Global Partners LP	\$2,424	\$2,808	16%
16.	Plains All American LP	\$25,511	\$28,677	12%
17.	Energy Transfer LP	\$88,246	\$98,880	12%
18.	Sunoco Logistics LP	\$4,879	\$5,438	11%
19.	Targa Resources Corp.	\$16,938	\$18,815	11%
20.	Cheniere Energy Inc.	\$31,987	\$35,492	11%
21.	Hess Midstream Partners LP	\$2,991	\$3,278	10%
22.	Magellan Midstream Partners LP	\$7,748	\$8,438	9%
23.	Enterprise Products Partners LP	\$56,970	\$61,733	8%
24.	TransMontaigne Partners LP	\$1,002	\$1,072	7%
25.	Shell Midstream Partners LP	\$1,914	\$2,019	6%
26.	Tallgrass Energy LP	\$5,894	\$6,214	5%
27.	Holly Energy Partners LP	\$2,103	\$2,199	5%
28.	BP Midstream Partners LP	\$693	\$722	4%
29.	USD Partners LP	\$287	\$299	4%
30.	Sprague Resources LP	\$1,245	\$1,276	2%
31.	Genesis Energy LP	\$6,479	\$6,598	2%
32.	PBF Logistics LP	\$956	\$973	2%
33.	Williams Cos. Inc.	\$45,302	\$46,040	2%
34.	Suburban Propane Partners LP	\$2,152	\$2,184	2%
35.	CSI Compressco LP	\$827	\$822	(1%)
36.	DCP Midstream LP	\$14,266	\$14,127	(1%)
38.	USA Compression Partners LP	\$3,775	\$3,730	(1%)
38.	Enable Midstream Partners LP	\$12,444	\$12,266	(1%)
39.	TC Energy Corp.	\$76,352	\$74,818	(2%)
40.	NuStar Energy LP	\$6,349	\$6,186	(3%)
41.	Enbridge Inc.	\$128,827	\$123,042	(4%)
42.	Kinder Morgan Inc.	\$78,866	\$74,157	(6%)
43.	Blueknight Energy Partners LP	\$323	\$302	(7%)
44.	EnLink Midstream LLC	\$10,694	\$9,336	(13%)
45.	Summit Midstream Partners LP	\$3,021	\$2,573	(15%)
46.	Martin Midstream Partners LP	\$1,074	\$667	(38%)
47.	Andeavor Logistics LP	\$10,295	N/A	N/A
48.	Buckeye Partners LP	\$9,356	N/A	N/A
49.	SemGroup Corp.	\$5,210	N/A	N/A
50.	AmeriGas Partners LP	\$4,006	N/A	N/A

Au revoir, Andeavor

Andeavor Logistics, ranked No. 14 a year ago, was the largest midstream name to vaporize in 2019's M&A wave. That came as part of the overall merger between two downstream heavyweights, Marathon Petroleum Corp. and Andeavor Corp., formerly San Antonio-based Tesoro Corp. Andeavor Logistics, the acquired firm's midstream operation, became a part of Marathon's MPLX midstream subsidiary.

Under the terms of the merger agreement, Andeavor Logistics unitholders received 1.135 times MPLX units for each Andeavor unit, a 7.3% premium. Marathon Petroleum received 1.0328 times MPLX common units for each Andeavor Corp. unit held. The blended exchange ratio of 1.07 times represents a 1% premium to market, MPLX said in announcing the agreement.

Energy Transfer acquired SemGroup in another round of musical chairs. The \$5 billion deal, announced in September 2019, valued SemGroup at \$17/unit.

The increase in energy exports provided an important inducement for Energy Transfer, given SemGroup's interest in the sprawling Houston Fuel Oil Terminal, which has some 18.2 MMbbl of storage and dockage on the Houston Ship Channel. To enhance that asset, Energy Transfer announced plans for the Ted Collins Pipeline to connect the SemGroup operation with its existing Nederland, Texas, terminal.

Meanwhile, Pennsylvania gas and electric utility UGI Corp. acquired AmeriGas, the nation's largest LP gas distributor, which held significant midstream assets to support its sprawling retail operations. AmeriGas announced a strategic operational review in late 2018, which culminated in the UGI merger in April 2019.

AmeriGas units were delisted in August 2019 following closure. Units were converted into \$7.63/unit of cash and UGI shares at an exchange ratio of 0.5 share of UGI per AmeriGas unit.

Buckeye deal

One of the sector's biggest petroleum product operators, Buckeye Partners LP, announced in May 2019 a \$10.3 billion, all-cash acquisition deal with IFM Global Infrastructure Fund that took Buckeye private. The deal valued Buckeye units at \$41.50/unit, a 27.5% premium.

Buckeye's assets included 6,000 miles of pipeline with more than 100 delivery locations and 115 liquid petroleum product terminals with a combined storage capacity of 118 MMbbl. It also had a network of marine terminals, primarily along the East and Gulf coasts and in the Caribbean.

Terminals have growing value in the sector, and one of the first 2019 deals involved TransMontaigne Partners LP, which operated a major terminal network east of the Mississippi. It disappeared as a

public company in early 2019 following the \$536 million, year-end 2018 announcement of a cash deal with ArcLight Energy Partners Fund VI LP for the TransMontaigne units it did not already hold. ArcLight paid \$41/unit, a 12.6% premium to what TransMontaigne units traded at when the parties announced the deal.

The wheeling and dealing represents a growing trend in the midstream: private ownership. Privately held Koch Industries Inc. and its Flint Hills Resources LLC unit, for example, hold significant pipeline and terminal operations. The Wichita, Kan.-based Koch conglomerate is believed to be the largest privately held firm in the U.S. behind agribusiness-focused Cargill Inc.

“Consolidation and acquisition by the infrastructure firms—large private equity versus being bought by other publics or going public—is definitely the story for 2019.”

—Josh Sherman, *Opportune LLP*

But wait, there's more to the private-ownership trend. As 2019 ended, Tallgrass Energy LP, No. 19 on the Midstream 50, announced that it had accepted a sweetened buyout offer from a group led by private-equity heavyweight Blackstone Group Inc., which valued the company at about \$6.3 billion. An earlier, take-private offer triggered a dispute with investors over a provision that gave Tallgrass executives a 30% premium for their shares. That dispute led former CEO David Dehaemers to criticize institutional shareholders for driving down the value of the company.

Blackstone and its affiliates held some 44% of Tallgrass units at the time of the agreement. The deal was approved at a special shareholder meeting in April.

In the same month, a unit of Axle Johnson Inc. announced plans to purchase the units that it did not already own of terminal operator Sprague Resources, No. 43 on the list. Axle Johnson's Sprague Resources Holdings LLC subsidiary offered to acquire all of the outstanding Sprague common units that it did not hold for \$13/unit, a 14% premium. Axle Johnson held 53.3% of the outstanding Sprague units at the time of the offer.

Sprague had a terminal network in New York State, New England and Quebec.

THE MIDSTREAM 50 BY CHANGE IN EBITDA (\$MM)

Rank	Company Name	2018 EBITDA	2019 EBITDA	% Change
1.	Tallgrass Energy LP	\$654	\$996	52%
2.	Oasis Midstream Partners LP	\$178	\$270	52%
3.	Western Midstream Partners LP	\$1,206	\$1,719	43%
4.	EQM Midstream Partners LP	\$998	\$1,338	34%
5.	USA Compression Partners LP	\$320	\$420	31%
6.	CSI Compressco	\$99	\$128	29%
7.	CNX Midstream Partners LP	\$189	\$239	26%
8.	Crestwood Equity Partners LP	\$420	\$527	25%
9.	MPLX LP	\$3,475	\$4,334	25%
10.	NGL Energy Partners LP	\$464	\$564	21%
11.	PBF Logistics LP	\$152	\$185	21%
12.	Plains All American LP	\$2,684	\$3,237	21%
13.	Shell Midstream Partners LP	\$616	\$730	19%
14.	Archrock Inc.	\$352	\$417	18%
15.	Energy Transfer LP	\$9,510	\$11,214	18%
16.	Antero Midstream Corp.	\$709	\$830	17%
17.	Noble Midstream Partners LP	\$223	\$255	14%
18.	Magellan Midstream Partners LP	\$1,396	\$1,581	13%
19.	Enterprise Products Partners LP	\$7,223	\$8,117	12%
20.	BP Midstream Partners LP	\$196	\$219	12%
21.	Cheniere Energy Inc.	\$2,641	\$2,946	12%
22.	Phillips 66 Partners LP	\$1,137	\$1,268	12%
23.	TransMontaigne Partners LP	\$133	\$147	10%
24.	DCP Midstream LP	\$1,092	\$1,200	10%
25.	Delek Logistics Partners LP	\$164	\$179	9%
26.	Hess Midstream Partners LP	\$505	\$551	9%
27.	Williams Cos. Inc.	\$4,638	\$5,015	8%
28.	Enable Midstream Partners LP	\$1,074	\$1,147	7%
29.	TC Energy Corp.	\$6,609	\$7,058	7%
30.	Blueknight Energy Partners LP	\$60	\$64	6%
31.	NuStar Energy LP	\$666	\$704	6%
32.	ONEOK Inc.	\$2,448	\$2,580	5%
33.	Targa Resources Corp.	\$1,366	\$1,436	5%
34.	EnLink Midstream LLC	\$1,042	\$1,080	4%
35.	Holly Energy Partners LP	\$347	\$359	4%
36.	Sprague Resources LP	\$102	\$106	3%
37.	Martin Midstream Partners LP	\$107	\$108	1%
38.	Enbridge Inc.	\$9,918	\$10,001	1%
39.	Kinder Morgan Inc.	\$7,568	\$7,618	1%
40.	Summit Midstream Partners LP	\$294	\$287	(2%)
41.	Suburban Propane Partners LP	\$283	\$267	(6%)
42.	Genesis Energy LP	\$716	\$669	(7%)
43.	Sunoco Logistics LP	\$732	\$665	(9%)
44.	USD Partners LP	\$57	\$50	(11%)
45.	Green Plains Partners LP	\$66	\$54	(18%)
46.	Global Partners LP	\$311	\$234	(25%)
47.	Andeavor Logistics LP	\$1,201	N/A	N/A
48.	Buckeye Partners LP	\$1,005	N/A	N/A
49.	AmeriGas Partners LP	\$622	N/A	N/A
50.	SemGroup Corp.	\$394	N/A	N/A

THE MIDSTREAM 50 BY STOCK PRICE CHANGE

Rank	Company Name	12/31/18 Price	12/31/19 Price	% Change
1.	TC Energy Corp.	\$35.70	\$53.31	49%
2.	Phillips 66 Partners LP	\$42.11	\$61.64	46%
3.	ONEOK Inc.	\$53.95	\$75.67	40%
4.	USA Compression Partners LP	\$12.98	\$18.14	40%
5.	Kinder Morgan Inc.	\$15.38	\$21.17	38%
6.	Archrock Inc.	\$7.49	\$10.04	34%
7.	Hess Midstream Partners LP	\$16.98	\$22.68	34%
8.	Enbridge Inc.	\$31.08	\$39.77	28%
9.	Global Partners LP	\$16.30	\$20.16	24%
10.	NuStar Energy LP	\$20.93	\$25.85	24%
11.	Shell Midstream Partners LP	\$16.41	\$20.21	23%
12.	NGL Energy Partners LP	\$9.59	\$11.34	18%
13.	CSI Compressco	\$2.32	\$2.71	17%
14.	Sprague Resources LP	\$14.49	\$16.92	17%
15.	Enterprise Products Partners LP	\$24.59	\$28.16	15%
16.	Suburban Propane Partners LP	\$19.27	\$21.85	13%
17.	Targa Resources Corp.	\$36.02	\$40.83	13%
18.	Sunoco Partners LP	\$27.19	\$30.60	13%
19.	Genesis Energy LP	\$18.47	\$20.48	11%
20.	Crestwood Equity Partners LP	\$27.91	\$30.82	10%
21.	Magellan Midstream Partners LP	\$57.06	\$62.87	10%
22.	Delek Logistics Partners LP	\$29.25	\$31.96	9%
23.	Williams Cos. Inc.	\$22.05	\$23.72	8%
24.	Oasis Midstream Partners LP	\$15.99	\$16.59	4%
25.	Cheniere Energy Inc.	\$59.19	\$61.07	3%
26.	Green Plains Partners LP	\$13.57	\$13.82	2%
27.	CNX Midstream Partners LP	\$16.28	\$16.46	1%
28.	Andeavor Logistics LP	\$50.32	\$50.81	1%
29.	PBF Logistics LP	\$20.10	\$20.25	1%
30.	BP Midstream Partners LP	\$15.54	\$15.61	0%
31.	Blueknight Energy Partners LP	\$1.15	\$1.13	(2%)
32.	Energy Transfer LP	\$13.21	\$12.83	(3%)
33.	USD Partners LP	\$10.45	\$9.91	(5%)
34.	DCP Midstream LP	\$26.49	\$24.49	(8%)
35.	Noble Midstream Partners LP	\$28.84	\$26.56	(8%)
36.	Plains All American LP	\$20.04	\$18.39	(8%)
37.	Tallgrass Energy LP	\$24.34	\$22.12	(9%)
38.	MPLX LP	\$30.30	\$25.46	(16%)
39.	Holly Energy Partners LP	\$28.56	\$22.15	(22%)
40.	Enable Midstream Partners LP	\$13.53	\$10.03	(26%)
41.	Western Midstream Partners LP	\$27.73	\$19.69	(29%)
42.	EQM Midstream Partners LP	\$43.25	\$29.91	(31%)
43.	Antero Midstream Corp.	\$11.18	\$7.59	(32%)
44.	EnLink Midstream LLC	\$9.49	\$6.13	(35%)
45.	Martin Midstream Partners LP	\$10.28	\$4.03	(61%)
46.	Summit Midstream Partners LP	\$10.05	\$3.31	(67%)
47.	TransMontaigne Partners LP	\$40.58	N/A	N/A
48.	Buckeye Partners LP	\$28.99	N/A	N/A
49.	AmeriGas Partners LP	\$25.30	N/A	N/A
50.	SemGroup Corp.	\$13.78	N/A	N/A



Demand for products downstream may help the midstream remain stable. (Source: Marathon Petroleum)

More to come

Given this year's business disruptions, industry observers say the consolidation trend will continue and likely will accelerate.

A frequently mentioned name that may end up short a place to sit the next time the music plays is No. 11, Western Midstream Partners LP, the affiliate of former big upstream player Anadarko Petroleum Corp. Anadarko merged into Occidental Petroleum Corp. in a giant, \$38 billion deal last year.

What is the most significant year-over-year change in the new Midstream Business Midstream 50? No surprise: Some 10% of the companies on last year's list disappeared.

It seemed like a good idea at the time. However, the timing proved way off as crude prices went into freefall in the first quarter. That gave now debt-heavy Occidental a financial stomachache following the merger. It has since announced multiple deals to spin off noncore E&P assets.

THE MIDSTREAM 50 BY CHANGE IN REVENUE (\$MM)

Rank	Company Name	2018 Revenues	2019 Revenues	% Change
1.	Oasis Midstream Partners LP	\$272	\$410	51%
2.	MPLX LP	\$6,049	\$8,625	43%
3.	Sunoco Logistics LP	\$11,723	\$16,596	42%
4.	Western Midstream Partners LP	\$1,990	\$2,746	38%
5.	Noble Midstream Partners LP	\$559	\$704	26%
6.	PBF Logistics LP	\$283	\$340	20%
7.	USA Compression Partners LP	\$584	\$698	20%
8.	CNX Midstream Partners LP	\$257	\$306	19%
9.	Hess Midstream Partners LP	\$713	\$848	19%
10.	TransMontaigne Partners LP	\$232	\$263	13%
11.	BP Midstream Partners LP	\$116	\$128	10%
12.	Tallgrass Energy LP	\$793	\$869	9%
13.	EQM Midstream Partners LP	\$1,495	\$1,630	9%
14.	CSI Compressco LP	\$439	\$477	9%
15.	Phillips 66 Partners LP	\$1,045	\$1,126	8%
16.	Archrock Inc.	\$904	\$965	7%
17.	Enbridge Inc.	\$35,797	\$37,733	5%
18.	Holly Energy Partners LP	\$506	\$533	5%
19.	Global Partners LP	\$12,673	\$13,082	3%
20.	NGL Energy Partners LP	\$8,304	\$8,326	0%
21.	Energy Transfer LP	\$54,087	\$54,213	0%
22.	Cheniere Energy Inc	\$7,987	\$7,987	0%
23.	DCP Midstream LP	\$9,822	\$9,822	0%
24.	Plains All American LP	\$34,055	\$33,669	(1%)
25.	NuStar Energy LP	\$1,520	\$1,498	(1%)
26.	Magellan Midstream Partners LP	\$2,827	\$2,728	(3%)
27.	Blueknight Energy Partners LP	\$385	\$371	(4%)
28.	Shell Midstream Partners LP	\$525	\$503	(4%)
29.	USD Partners LP	\$119	\$114	(5%)
30.	TC Energy Corp.	\$10,558	\$9,989	(5%)
31.	Williams Cos. Inc.	\$8,686	\$8,201	(6%)
32.	Kinder Morgan Inc.	\$14,144	\$13,209	(7%)
33.	Sprague Resources LP	\$3,771	\$3,425	(9%)
34.	Suburban Propane Partners LP	\$1,348	\$1,224	(9%)
35.	Enterprise Products Partners LP	\$36,534	\$32,789	(10%)
36.	Delek Logistics Partners LP	\$658	\$584	(11%)
37.	Summit Midstream Partners LP	\$507	\$444	(12%)
38.	Crestwood Equity Partners LP	\$3,654	\$3,182	(13%)
39.	Enable Midstream Partners LP	\$3,431	\$2,960	(14%)
40.	Genesis Energy LP	\$2,913	\$2,481	(15%)
41.	Martin Midstream Partners LP	\$1,020	\$847	(17%)
42.	Targa Resources Corp.	\$10,484	\$8,671	(17%)
43.	Green Plains Partners LP	\$101	\$82	(18%)
44.	ONEOK Inc.	\$12,593	\$10,164	(19%)
45.	EnLink Midstream LLC	\$7,699	\$6,053	(21%)
46.	Antero Midstream Corp.	\$1,029	\$793	(23%)
47.	Buckeye Partners LP	\$4,108	N/A	N/A
48.	AmeriGas Partners LP	\$2,856	N/A	N/A
49.	SemGroup Corp.	\$2,503	N/A	N/A
50.	Andeavor Logistics LP	\$2,380	N/A	N/A



(Source: Deny Prykhodov/Shutterstock.com)

To date, it appears Occidental is content to keep Western as a standalone organization, but rumors persist. The firm holds approximately 55% of Western's outstanding units.

Water ways

There were other notable trends in 2019, Opportune's Sherman said. In particular, he mentioned water. "That was the bright spot for midstream," he said. "Water logistics was a midstream growth area. That's the part of the infrastructure that has not been built out. We saw a lot of small [water-focused] companies that were growing."

Could a significant, and publicly held, water midstream emerge? It's possible, Sherman said. But overall, he expects the consolidation trend to continue.

"I think there are still some unique opportunities out there," Sherman said. "It's going to take companies like [private-equity providers] Tailwater and EnCap Flatrock, that really know the space and have a ton of data, and experts in the midstream to capitalize on it."

"I know that there are always opportunities," he said. "They may be fewer and further in between for other players, but they are there." ■

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An Unwelcome Bird

The North American midstream may prove to be the energy industry's best story as the global oil and gas business scrambles to respond to 2020's unexpected shocks.

By Paul Hart

(Source: Michelangelo/Shutterstock.com)

Dan Pickering, founder and chief investment officer of Pickering Energy Partners LP, may have summed it up best when he tweeted as the second quarter began: “Toughest three months of the decade coming up. Sigh.”

The double whammy of the COVID-19 pandemic and an ill-timed oil price war between Saudi Arabia and Russia virtually embodies a “black swan,” which Investopedia defines as “an unpredictable event that is beyond what is normally expected of a situation and has potentially severe consequences.”

Freefall commodity prices left the upstream sector scrambling (blame overproduction), while downstream firms cut back refining runs as travel and trade dropped through significant demand destruction (blame the virus quarantines). Midstream got caught in the middle.

This may sound like the plot of a William R. Forstchen disaster novel, but it's real. So what does the landing of this unwelcome bird on the energy pond

mean for the midstream going forward?

“I have never experienced anything like what we are going through today,” Robert (Bob) G. Phillips, chairman, president and CEO of Crestwood Equity Partners LP, told *Midstream Business* as he reflected on an energy-business career of more than 40 years. “It will be interesting to see how all this plays out over the next two years.”

That two-year time frame Phillips mentioned is significant; it may take that long to set some sort of new normal. Midstream observers see a number of options as midyear-2020 nears, but first it's important to assess the damage. In the long term, midstream may prove the more stable segment of the energy business, some believe.

Where to put it?

The abrupt change in supply and demand left product sloshing around the system. Terminalling scored a business uptick. Storage went into tight supply and rates doubled, Reuters reported as the second quarter began. That trend was “breathing

new life” into the Cushing, Okla., crude pipeline and storage hub, the report added. The 2019 M&A deals mentioned in the adjoining *Midstream 50* article focused on terminal capacity, and they may prove to be wise moves.

“One of the near-term winners from the combination of higher production and lower oil consumption is the need for storage,” Stifel said in a report, noting the crude glut has brought tankers into a storage role. “Land-based storage is typically cheaper than using ships, but tankers offer flexibility to deliver opportunistically into several markets,” it added.

Trading house Glencore chartered the behemoth *TI Europe*, one of only two ultralarge crude carriers currently in service, simply to store some 3 MMbbl l at anchor offshore Singapore. The fundamental supply/demand equation works once again, RBN Energy said in an analysis of the crude storage challenge, noting tanker day rates had rocketed six times in the first quarter.

Black Swan

Stifel said climbing day rates will make waterborne storage uneconomic soon; much of that crude could be dumped on the market as traders cut losses. That would impede a crude price recovery later this year and throw markets into a second-act tailspin in late 2020/early 2021.

“Not only is traditional storage almost full, the contango in the oil markets has put a tremendous amount of oil in floating storage waiting to be delivered. That pushes oil optimism into 2022 at the earliest,” said James Wicklund, managing director of investment banking at Stephens Inc., in a client report.

Baking cookies

Will the OPEC-plus crude production cuts negotiated in April help? Maybe.

“It is like someone dropping fresh-baked cookies off to your house during isolation,” Wicklund said, “a very nice gesture that doesn’t really change the situation. Cutting 9.7 million barrels per day in a market that was oversupplied by about 20 million barrels per day last month [March] is better than nothing, but not by much.”

Furthermore, OPEC members’ cheating on past production cuts is the stuff of legend, so a significant portion of the promised cuts likely will never occur.

The crisis led some producers to seek production limits from the Texas and Oklahoma regulatory bodies, though the Texas Railroad Commission voted down its state’s proposal on May 5.

It’s no surprise that producers plan cutbacks, both in drilling and existing output. Lee Tillman, CEO of Marathon

Oil Corp., said his firm plans to take “frac holidays” during the second quarter in the Delaware Basin and Midcontinent as it optimizes development plans for the Bakken and Eagle Ford.

Tillman made his comments as the firm announced it had more than halved its 2020 capex to \$1.3 billion, down from an initial \$3 billion 2020 capital budget.

Cost cutting

Capex cuts also proved a first move for many midstream operators as they looked ahead to lower production rates and sought to maintain their firms’ financial health.

“We expect midstream companies to reduce capex spending in response to slowing E&P activity and protect balance sheets while trying to maintain distributions,” Stifel said in a second-quarter midstream analysis. “Also, we believe E&Ps may seek relief from midstream in the form of reduced transportation and processing rates, but [we] believe any agreements reached must be mutually beneficial.

“While volumes for crude oil, NGL and natural gas will be reduced, we believe companies anchored with long-haul natural gas pipelines based on take-or-pay contracts and those that have minimum volume contracts are best positioned to weather the downturn.”

“Leverage and liquidity will be more important than ever given the current macroenvironment,” Raymond James said in a report. It added, “Midstream does not appear to be on the brink of ‘busting’ covenants ... assuming spending cuts and eventually dividend/distribution cuts.”

Some well-financed midstream executives see sector investment opportunities now.

“With MLP index yields at all-time highs, several management teams are utilizing this downturn as a buying opportunity, reflecting confidence in their underlying businesses,” Stacey Morris, director of research at Alerian, said in a midstream analysis.

Looking downstream

The most promising prospect for midstream may continue to lie at the terminal/city gate end of the business. The U.S. entered the second quarter behind the global coronavirus curve, and that delay offers bright spots for exports as foreign markets are the first to pull out of the tailspin.

“Management teams we’re talking to have suggested that the flow-through to petrochemical derivatives will take some time and be dependent on how long crude oil prices remain depressed,” Michael Harrison, analyst with Seaport Global Securities LLC, said in a report. “For most companies, we wouldn’t expect raw material relief until [third quarter] at the earliest, though this could provide a nice offset to lower demand and create some margin tailwind if demand has normalized by that time.

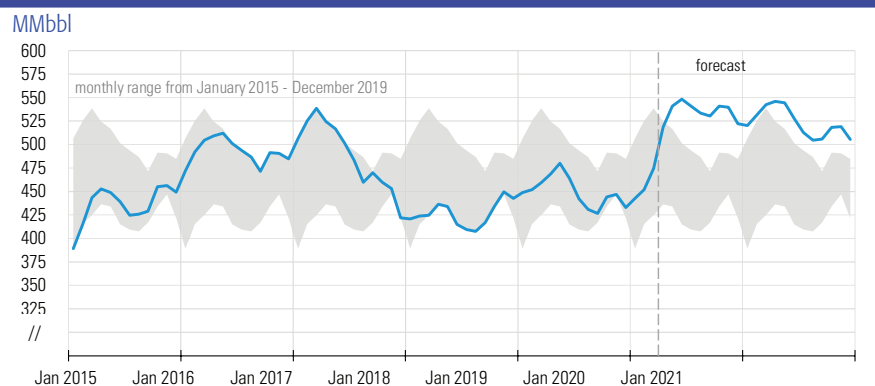
“China is recovering faster than anticipated,” he said. “Most plants have resumed operation and are ramping up to more normal utilization rates. While this could be a positive sign for Europe and the U.S. as steps are taken to contain the virus, it remains to be seen if the activity in China is related to demand growth or just some rebuilding of inventories.”

However, exports remain a question for Simmons analysts. “Previous worry—will there be enough export capacity? New worry—will there be stranded export capacity?” Simmons asked in a report. Enbridge Inc.’s move out of the proposed Crude Offshore Loading Facility offshore Texas will slow capacity growth, Simmons said, and other export-focused projects now look iffy. So, the export side of things may self-balance.

Gas glut

Any drop in crude production will have a significant impact on gas output as well,

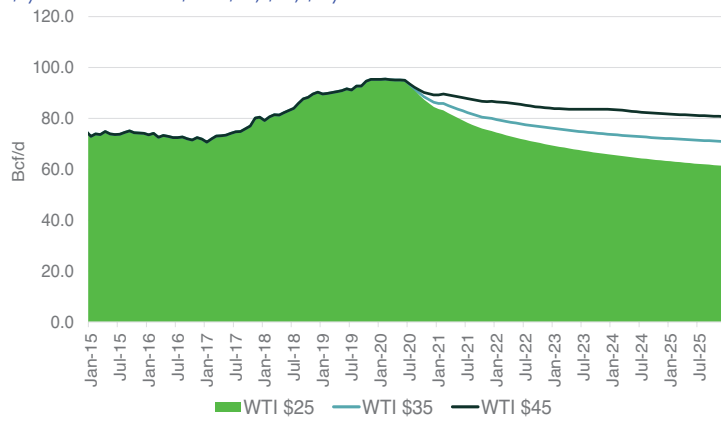
US Commercial Crude Oil Inventories



(Source: U.S. Energy Information Administration)

Dry Natural Gas Production Forecasts

@HHS\$/MMBtu and WTI \$WTI \$25, \$35, \$45/Bbl



(Source: Enverus)

given the large amount of associated gas flowing out of Permian Basin, Bakken Shale and other unconventional plays.

“Even at \$45 [crude oil] and \$2 [natural gas], gas production can still see a drop of 14 Bcf/d [billion cubic feet per day], which will still leave the gas market short,” Enverus said in an industry analysis, entitled “The Dark Side of the Boom.” That could cause more problems if next winter proves to be nasty.

“The oversupplied oil market will keep crude prices low, depressing natural gas production,” the data analytics firm said. “Enverus expects dry gas production to decline by over 6 Bcf/d by December 2020 compared to 2019. This will cause the gas market to go from being long during the summer months to being very short by the winter 2020 to 2021.

“A sharp increase in natural gas prices is needed to incentivize natural gas production growth from gas directed plays, namely the Marcellus, Utica and Haynesville. Enverus forecasts prices will exceed \$4/MMBtu and could reach \$4.50/MMBtu as early as the coming winter. Longer term, natural gas prices are expected to average \$2.80/MMBtu; this level allows gas production growth to meet expected demand gains.”

Natural gas prices remained weak throughout the 2019 to 2020 winter, thanks to abundant supply and comparatively warm weather. Things won’t change for gas soon, Stifel said.

“Regarding natural gas, we believe investors underappreciate the impact COVID-19 will have on global LNG and natural gas demand given the rapid reduction in business activity. Recovery in natural gas prices could be prolonged despite the expectation of lower associated gas in the U.S. in 2021+,” it said.

Still, when compared to the oil and gas industry’s other sectors, midstream operations look more stable. Many operators have fee-for-service agreements or take-or-pay contracts. And as cash flow becomes a top priority, the sector might increase in relative importance to investors.

However, financially struggling customers could trouble midstream providers as bills get slow-paid or unpaid entirely due bankruptcy.

from the Hardisty, Alberta, pipeline hub to the existing Keystone Pipeline system at Steele City, Neb.

Another bright spot may be growing gas demand for power generation, which could continue to ramp up as the economy stabilizes. “Although demand has fallen, U.S. natural gas-fired plants are generating roughly 12% more power this year than they did at the same time in 2019,” Baker Hostetler said in a report. “Gas-fired generation was 301,100 gigawatt hours (GWh) through March 18—a double-digit increase—though overall power production fell by 5%. Coal-fired power has dropped by an average of 965 GWh per day this year.”

The Marcellus-Utica play could see an important new power market in New York State. Utility Entergy Corp. announced it will shut in its big Indian Point reactor, located up the Hudson River from New York City, by April 2021. That follows state regulatory orders dating from 2017. Shutting down the plants two reactors will



“I have never experienced anything like what we are going through today. It will be interesting to see how all this plays out over the next two years.”

—Robert (Bob) G. Phillips,
Crestwood Equity Partners LP

Keystone XL

One future bright spot for North America’s midstream appeared in April as construction finally began on TC Energy Corp.’s long-suffering Keystone XL project. Montana Gov. Steve Bullock waived the state’s stay-at-home order so construction crews could start work at the U.S.-Canadian border.

The \$8 billion project is expected to move 830,000 bbl/d when it enters service by 2023. It will provide a badly needed outlet for Canadian crude, extending

cause a significant drop in generation capacity, 2,069 megawatts—equal to roughly 15% of New York City’s peak power demand.

State regulators moved to close the plant to boost wind power, but that would require construction of more than 2,000 windmills at a time with public opposition to more windmills grows.

The immediate and most viable alternative is clear: gas-fired power generation. ■

The Interview



Dr. J. Mike Stice

The University of Oklahoma (OU) campus sat unusually quiet for an early spring day. OU's spring break had come and gone; the sidewalks should have been swarming.

But OU, like other educational institutions, closed its physical operations as the first quarter ended due to the COVID-19 crisis and turned to the internet to continue instruction. Dr. J. Mike Stice, dean of the Mewbourne College of Earth

and Energy, apologized as the conversation began for cutting the meeting short; he had to prepare videos for two of his classes that he now teaches remotely. Work goes on, pandemic or no pandemic.

Stice knows energy in general—and the midstream in particular—very well. He was in corporate senior management in the U.S. and abroad for more than 30 years before moving to his education role in 2015. He held senior posts at ConocoPhillips

Co. and Chesapeake Energy Corp. before serving as CEO of Access Midstream LP prior to its acquisition by The Williams Cos. Inc. Currently, he is on the board of directors of Marathon Petroleum Co. and MPLX, among other business and charitable functions.

He took time from his schedule to share with Midstream Business what he sees occurring now in the oil and gas business and what may lie ahead.



'The Perfect Storm'

An industry veteran says current commodity price shocks and the new coronavirus pandemic may change the fundamentals of the sector.

By Paul Hart

MIDSTREAM BUSINESS The oil and gas industry has been through downturns before, but this one feels different. Is it, and if so, why?

STICE I don't think it's typical. What we might normally see in a downturn is that there's some event or economic shock that basically reduces both supply and demand. Or we'll see something that causes a boom, then we'll see increases in both supply and demand as the markets try to find the new equilibrium.

But in this case, it's kind of the perfect storm. We have simultaneous supply and demand shocks—oversupply and loss of demand at the same time.

Normally, supply and demand shocks tend to be congruent. In other words, whatever the shock is to the economic environment, it will be driven from either supply or demand but rarely both. As an example, an increase in supply will create downward pressure on price, resulting in the demand absorbing the

incremental supply. In today's case, you have this very unique circumstance where you have an oversupply driven by the shale boom, the Saudi response and the Russian response, and at the same time we are experiencing a demand reduction related to the coronavirus. The huge reduction in activity, which has refineries down 30% because there's no refined product consumption, is just one example of further downward pressure on global commodity prices.

(Source: wavebreakmedia/Shutterstock.com)

The Interview

You can talk about the other commodities—natural gas and NGL—a little differently, but there are challenges there, too.

MIDSTREAM BUSINESS Is this just part of the industry's usual cycle, or has the industry fundamentally changed?

STICE I believe the energy industry has fundamentally changed. There has been a regional supply picture shift, geopolitics, disappearing capital, stressed balance sheets—truly that perfect storm. It remains to be seen how all this will work out.

MIDSTREAM BUSINESS What will bring the turnaround?

STICE Mostly, a psychological acceptance that we can survive the health threats associated with COVID-19 [and] once there is hope either through a vaccine or a reduction of positive cases, resulting in some containment of the virus. The market will be quick to embrace this hope and will begin to mend the substantial damage done to the market.

Market sentiment follows the psyche of the investor, which follows the psyche of the general public. When I was a trader, I would watch this oftentimes, and I would find myself surprised that, regardless of the fundamentals or the technical drivers in any one commodity, if the psychological impact is overwhelmingly negative (bearish) or overwhelmingly positive (bullish), then the market would operate irrationally for a period of time. That would occur until the bottom was defined or, in the case of a boom, the top was defined. That would mean that people had settled down and realized this was not the end of the world and that there would be life on the other side of a crisis event.

People are afraid of the unknown, so we can't expect the markets to operate rationally until the psychology is recovered.

MIDSTREAM BUSINESS Is the shale boom over?

STICE The shale resource remains abundant, but the immediate boom is over. However, the shale supply will

return once the math works again—and it will at some point.

Where does the industry go from here? The oil and gas industry must completely restructure its balance sheet to prepare for reinvestment opportunities that will result. The industry will experience a significant consolidation as a result of this shock.

MIDSTREAM BUSINESS The U.S. has emerged as a major exporter of crude oil, petroleum products and natural gas via LNG. How will that role change coming out of the present downturn?

“The energy industry has fundamentally changed. There has been a regional supply picture shift, geopolitics, disappearing capital, stressed balance sheets—truly that perfect storm. It remains to be seen how all this will work out.”

STICE I see the market continuing to need affordable and abundant fossil fuels long term, and the U.S. is well positioned to meet this demand. The fundamentals that people everywhere need energy have not changed. This current crisis will end, and we will be required to meet a growing, worldwide energy demand once again.

MIDSTREAM BUSINESS Does the U.S. have a strategic advantage in comparison to other major energy exporters, and how can it exploit that advantage?

STICE Well, if you think about three different levels of advantages or disadvantages, the U.S. is clearly

advantaged when it comes to the abundance of commercially viable resources available.

First, we have a lot of oil and gas, and we have the technology it takes to commercially develop those reserves. It's important to note that this strategic advantage is not going away. In fact, I anticipate that the technology will continue to improve. The second advantage is we have a currency and a political system that are viewed as stable. As a result, people want to partner with U.S. businesses as we tend to be a source of abundant and reliable supply.

Third—to our disadvantage—is the cost basis. If the cost of the incremental barrel is going to be defined by the difference between U.S. shale and Russia, they will beat us, and so will Saudi Arabia. So, to the extent that they want to exert pain on U.S. shale producers, they can. Their net production costs at the marginal barrel are much lower than our costs to produce an equivalent shale barrel.

However, I feel that both Russia and Saudi Arabia have incentives to maintain prices at a level that would allow them to pay their bills and grow their economies. At the end of the day, long term, there will be discipline by both Russia and Saudi Arabia to reach a reasonable price level that will allow all the players to play.

Now that means that if you're the high-cost barrel in the U.S., if you're sitting in a particular basin where you have no gas outlet or too much NGL content—too much ethane, for example, in North Dakota is one regional issue—you're going to find yourself at a competitive disadvantage. I think the right answer to the question is, 'It depends.'

I believe that over time we will find a price that allows for a healthy U.S. shale industry, a healthy production level from Russia and Saudi Arabia, and that number will be well north of where we are today. I don't know if that number will be \$40 [per barrel] or \$55, or somewhere in between, but that feels like it's about the right range. There will be some production that can't compete at \$40 here in the U.S., but there will be a lot that can compete at \$55.

MIDSTREAM BUSINESS What do producers need from midstream operators that they're not getting?

STICE Midstream operators appear to be delivering on the requirements of producers. The requirements are continuous delivery of existing production and revised configurations to adapt to the dislocated requirements by region.

I'm an engineer by training, and I was involved as a midstream operator, so I'd like to answer by outlining three steps. At the end of the day, the midstream sector has served both its upstream and downstream producers and consumers very well, and I think job one is to continue to do that. That is not a statement of the status quo.

First, there are multiple changes to the business right now. Among them are associated gas production going up; oil wells not necessarily producing as much or being deemphasized in this price environment, taking additional associated gas off the market; and the rise in additional dry gas on the market. All of this requires change to the configuration of gathering systems, the compressors and related equipment that it takes to get things done.

So in order for the midstream sector to deliver that same reliable service—safe, reliable service that they've been giving—the operators have to be out in the field making relatively major changes. So job one is to adapt to the new fundamentals and the new requirements that producers and consumers have demanded, given the changes in commodity prices.

Step two would be to go beyond these kinds of operations to ask where do we want to go with the market? Where do we go beyond compressor stations and operations? What can we do to help facilitate producers' development needs? Producers are going to be a higher credit risk in this environment. Many of them are going to have balance sheets that can no longer afford to pay in a timely manner or, worse, to pay at all.

There's going to have to be some cooperation between the upstream producer and the midstream operator to get through these difficult times. And midstream companies are going to be called on more than ever to provide services that might not necessarily be paid

with the same timing, or contract terms, as in the past. They will have to be flexible enough to keep business rolling. And so that conversation is going to take place, and that's more of a near-term issue, to shore up everybody's balance sheet and make sure that we have the cash flow managed, doing favors to the extent you can to help people out and stay afloat. But it also means being disciplined enough to ensure that your own cash flow is not impaired.

That leads to the third step. I don't think it's all doom and gloom right now. I think that management teams can handle the first two things readily and successfully, and then the third thing will be to get ready for lots of opportunity for organic growth projects because of the reshaping of portfolios due to the commodity price impact.

Also, there will be consolidation in the industry. What's happening now, I believe, will result in a large amount of consolidation. Frankly, some of that consolidation is quite needed, and some of it will result from unintended consequences—fallout of a perfect storm.

MIDSTREAM BUSINESS Given recent capex cuts, what should midstream executives be doing now to ready their businesses for the future?

STICE The opportunity to prepare for the future, again, includes three parts: business continuity [and] continued safe and reliable operations; management of cash flow to maintain healthy balance sheets and receiving revenue to pay bills in a timely manner; [and] then opportunistically evaluating targeted business development opportunities to consolidate operations and grow organically.

MIDSTREAM BUSINESS Wall Street seems to have lost interest in all energy stocks, including midstream operators. Yet the midstream is a fundamentally different business than E&P. What can midstream executives do to differentiate the sector in the minds of investors?

STICE Unfortunately, the midstream sector is an extension of the value chain

from producers, and many producers are becoming a credit risk. Investors have lost faith in the entire value chain and will likely limit investment until the bottom is defined. Midstream executives can differentiate themselves by working with their producers and customers to offer customized solutions during this difficult time.

MIDSTREAM BUSINESS What remains to be done in the midstream buildout, and will the capital be there?

STICE Capital will be limited to high-return, organic-growth projects. Management will need to be creative in securing the capital needed to ensure the buildout continues.


MIDSTREAM BUSINESS There hasn't been a lot of talk about "the big crew change lately," given that the industry is once again in the throes of staff cuts. You're in education now, so what should the industry be doing to encourage a new generation to enter the business?

STICE It's a difficult issue right now, but clearly something that needs to be addressed. This fall, new students will choose careers once again.

As the dean of OU's College of Earth and Energy, I have seniors that are graduating with petroleum geology degrees and petroleum engineering degrees, and the prospects are pretty bleak. I mean, what will they have to do for a while? Now, that is not a unique question. We've had this occur five or six times before just during my career. In the past, it has always been relatively short-term, maybe 12 to 24 months.

However, we were already in a downturn prior to these new challenges, so I think that the period of time that a new graduate might have to pursue something different before finding a meaningful role in his or her degreed profession could be longer. I don't know if that's two years or three years, but it could be even longer.

I would not be discouraged if I were a freshman right now. But if I were a junior or senior, this is going to be a tough time to find a job, especially a meaningful job in your area of expertise, something that you want to do right away. ■



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Midstream Private-Equity Marriages

An emphasis on relationships backed by operational expertise and experience has helped these two private-equity-backed midstream operators continue to perform.

By David Klaassen



Taproot now has more than 200,000 dedicated acres, and its pipeline network serves producers in the core of the D-J Basin. (Source: Taproot Energy Partners)

Jean Paul Getty's formula for success was to "rise early, work late and strike oil," and while hard work and good rock are critical ingredients of top performance in this industry, relationships also play a key role in achieving success.

This is evident more than ever in today's private-equity midstream space. In recent years, as export markets have opened up and capital markets have tightened, private equity has aggressively targeted the midstream.

Putting the right companies with the right private-equity backers is as much art as it is economics. The differentiating factor can be the relationships between the potential partners. Private-equity firms look for experienced management teams with

strong track records that they can trust to execute their business plans and deliver returns to investors. Startup midstream companies look for equity providers that invest money and resources and offer strategic guidance and complementary operations expertise.

"Personalities and values have to align," Edgewater Midstream LLC CEO Stephen Smith said. "At the end of the day, your management team is marrying the financial sponsor."

That sentiment was echoed by Gregory King, managing partner at EnCap Flatrock Midstream (EFM), whose private-equity firm made an initial commitment of \$400 million to Edgewater.

"The quality of the relationships we have with our management teams

is paramount," he said. "It's easy when times are good and everything's working right, but you have to be able to work through the tough times together. Can you make difficult decisions and move forward? Can you navigate your way through challenging price cycles like this one? These are some of the things we all think about before we form a new partnership."

Two recent startups backed by veteran private-equity groups—a pair of "marriages" built on the backbone of geological formations and rock-solid relationships—offer a model of how the industry continues to evolve.

Taproot Energy Partners

Taproot Energy Partners CEO Kevin Sullivan had already founded at least half a dozen energy companies in his



“[A midstream partnership is] about the people. It’s not about what you have done for me today. It’s about being partners and being in it for the long haul.”

—Ben Davis, *Energy Spectrum Capital*

42 years in the industry, but his call with Ben Davis, partner with Energy Spectrum Capital, in early 2018 was unlike any of his previous experiences.

“This one was totally different than what I had ever done in the past,” Sullivan said. “All of those deals were started by the management team. Whereas this time the relationship was actually developed by the private-equity people. Ben had a relationship with Carnelian Energy Capital [Management LP] that was solely involved in the upstream side. He was the instigator of bringing all the parties together: the producer, the midstream company and the money. He said, ‘We’ve got this

opportunity, and let’s see if we can put it together.”

Energy Spectrum had a prime opportunity in the Denver-Julesburg (D-J) Basin, and Davis wanted primetime partners to develop it.

“We have made it a priority in our 25 years to find good people and stick with them,” Davis said, adding that Energy Spectrum has backed some CEOs three or four times. “That’s our MO. We find good people who are smart, honest, positive to work with and know what they’re doing. We want to keep going back to the well. It was an easy call to reach out to Kevin, and I’m thankful he wanted to do it.”



“As long as we have very patient money, which we do, and producers get back to actively developing their leaseholds, we can come out of this unscathed.”

—Kevin Sullivan, *Taproot Energy Partners*

Sullivan’s first step was to fill out his management team, and he knew exactly whom he would call. Rod Donovan, COO of Taproot, had worked with Sullivan when they formed Costar Midstream LLC in 2011. His 36 years of midstream experience and his familiarity with Sullivan and Energy Spectrum made him an easy choice to be the executive in charge of Taproot’s day-to-day operations.

Denver-based Taproot was officially formed in April 2018 with \$18 million in backing from Energy Spectrum and an initial contract with Carnelian Energy Capital-backed Bison Oil and Gas LLC to develop 50,000 acres in and around northeast Weld County, Colo., near the Buckingham Terminal on the Pony Express Pipeline. Its multiproduct Baja gathering system, consisting of 30 miles of pipe to gather crude oil, produced water and fresh water, began operation in late 2018.

Bison has been key to Taproot’s initial success. “What really helps our business is when producers drill great wells, and those guys have been drilling great wells,” Davis said, noting the high quality of the rock in the northeast corner of the most active portion of the D-J.

“To Bison’s credit, it rushed up there and started leasing. It took them a handful of wells to crack the code, but it has really figured out how to drill good wells,” he said. “When you analyze the data, you find that the area where it is drilling has wellhead economics similar to the sweeter spots of the Permian Basin. That’s exciting.”

Taproot’s early growth has been brisk. It signed a second deal in August 2018 with Verdad Resources LLC, which provided additional acreage in the play. The Verdad deal was followed in September 2019 by an agreement with Bonanza Creek Energy Inc. for the dedication of more than 69,000 acres. Its new Rattlesnake Extension will add about 35 miles of mostly 10-inch pipe for transporting crude from Bonanza Creek’s wells to the Buckingham Terminal, with ultimate delivery to the Cushing, Okla., crude hub. In addition to the Rattlesnake Extension, Taproot also intends to construct a truck unloading and storage facility in Weld County.

Additionally, just announced in April, Taproot has acquired the dedication of roughly 60,000 acres with Mallard Exploration, a deal that pushes the company's total dedicated acres over 200,000.

Even with his company's early success, Taproot's Sullivan said the D-J Basin is not without challenges in the current economic environment. "Most of our challenges arise from the upstream side," he said. "It's not difficult to put pipe in the ground, to operate crude gathering systems or produced water systems or freshwater systems. The challenging part is having the industry be receptive to what we're providing."

Sullivan said, in this case, the upstream and E&P companies struggled to get financing to drill. "Many of the startups on the upstream side are backed by private-equity companies. They get the initial funding to buy leasehold and to drill some initial wells. The theory is that after they drill those initial wells, then other types of financing will be available for them to continue their development program," he said.

"Traditional lending sources were not open, but alternative financing methods were, and many of our producers were entering into sizable drillcos. All our producers had significant hedge positions for 2020 and 2021 production that add additional staying power. But then prices fell dramatically, and the industry slowed down. Producers have said they are laying their rigs down in this price environment. That is the challenge for us."

As a result, Sullivan said Taproot is delaying or slowing expenditures of capex during the downturn. For example, the Rattlesnake Extension was originally expected to have between 3,000 bbl/d and 7,000 bb/d flowing by June, but now that the producer has released its rig, the volumes will not be there. Sullivan said Taproot will wait an additional six months to have the pipeline ready for operation.

"One of the great things about private equity is that it's very patient money," Sullivan said. "We don't have any debt as a company, and that

provides breathing room. We can wait this out. We are simply slowing down the buildout of certain sections of our pipe based on the volumes we are estimating."

The uncertainty on the upstream side leads to difficult infrastructural decisions—such as the size of pipe on new construction—when a company is trying to estimate its volumes for the next three to five years.

"If you have the assumption that crude prices are good and you may have 100 wells per year added to your system, you would design a different system than one that you would build with interim flow where they drill 30 to 50 wells when prices are good, then shut down for 10 months when prices drop,

then prices go back up and they drill another 30 to 50 wells," Sullivan said.

"Then you've got an intermittent type of operation, and that's when you start thinking about your economics. It's cheaper to have a 6-inch pipe in the ground than it is to have a 12-inch pipe. Those are all the unknowns and the challenges you have when you're trying to make decisions," he explained.

Sullivan said that while the private-equity model is being tested by the current industry conditions, it is structured to withstand pricing downturns. He considers companies like Taproot as incubators.

"We are an entity that is funded to find and grow assets," he said. "Then sometime in a four- to seven-year



Since forming in 2018, Taproot has signed agreements with multiple producers and continued to build out its operations. (Source: Taproot Energy Partners)



Taproot and Energy Spectrum both emphasize the importance of people and relationships in day-to-day operations. (Source: Taproot Energy Partners)

time frame, you're going to monetize, liquidate and give the return back to the investors. They are patient and know that this takes time."

Sullivan said Taproot has "accomplished quite a bit" in the past two years since the company was formed. "We've entered into 15-year

contracts with producers that have combined to dedicate to us over 200,000 acres," he said. "As long as we have very patient money, which we do, and producers get back to actively developing their leaseholds, we can come out of this unscathed. The producers we are dealing with basically

have very low or no debt. Some of them have debt that is structured so they don't have to worry about it until 2024."

Energy Spectrum's Davis said the firm utilizes a low-leverage model, avoiding the trap of companies encumbered with large debt. "The primary reason we do that is so we don't lose control in a price downturn like this," he said. "We are cycle-tested. We are in our 25th year as a firm, and our founders experienced the crash in the '80s. We are not experiencing this for the first time."

Davis explained that one of the structural advantages of private equity is that it can be patient capital.

"We certainly have investors concerned about IRR. Getting back money sooner is better than getting money back later. But they understand that this is a cyclical business and we are in it for the long haul," he said. "When you couple that with the fact that we are relationship-driven, it makes us more patient as well. It's about the people. It's not about what you have done for me today. It's about being partners and being in it for the long haul."



"At EnCap Flatrock it all begins with people. We back outstanding teams with a demonstrated ability to execute, exceptional track records, a clear vision, great reputations and contacts, and values that are aligned with ours."

—Gregory King, EnCap Flatrock Midstream

Edgewater Midstream

Edgewater Midstream CEO Stephen Smith has formed a number of relationships over his many years in the industry, including a strong bond with Rob Wingo, EFM's managing director. Their relationship began 15 years ago when Smith was an investment banker at Bank of America and Wingo worked for Copano Energy LLC. The pair reunited after Smith joined Genesis Energy LP. After Smith left Genesis in 2018, Wingo and the EFM team helped Smith assemble a management team to form what became Edgewater.

The two parties shared a common vision of the midstream sector. EFM had been expanding its scope beyond gathering and processing, and Smith's nascent company could fit into that evolution. Smith founded Edgewater in late 2019 with chief commercial officer Brian Thompson and COO Mike Truby, and they landed an initial capital commitment of \$400 million from EFM in January 2020.

"Upfront, there was a lot of socialization," Smith said. "We wanted to understand each other's views and be mutually aligned on value creation, strategy and overall operating philosophy. EFM's desire to invest capital in demand-oriented midstream assets and businesses was a strategic fit for Edgewater."

He said EFM's managing partners have an enormous amount of midstream experience. "EFM is the premier private-equity firm in the midstream space. There isn't a lot in midstream they haven't seen or experienced. We didn't have to spend a lot of time explaining the businesses we're looking at because they understand it and have such a deep bench," he said.

Smith added that the partners understand the challenges and opportunities and bring a host of technical and financial experience that complements the team's experience.

EnCap's King said the decision to partner with Smith and the Edgewater team was easy when they considered the skill sets the team brought in the areas of commercial and business development, recruiting, finance, and engineering and operations.

"At EnCap Flatrock, it all begins with



"We wanted to understand each other's views and be mutually aligned on value creation, strategy and overall operating philosophy."

—Stephen Smith, Edgewater Midstream

people. We back outstanding teams with a demonstrated ability to execute, exceptional track records, a clear vision, great reputations and contacts, and values that are aligned with ours," King said. "We also want to be sure that we look at midstream, risk management, value creation and overall objectives the same way. Stephen and his team brought all of these things to the table. That was very appealing to us."

Edgewater, based in Houston, is building its business on the demand end of the midstream value chain. It focuses on the acquisition, development and operation of pipeline and terminal solutions between and in proximity to major North American petroleum trading hubs and demand centers. In particular, Edgewater aims to provide independent midstream logistics solutions to refiners, producers and marketers of crude oil, refined products and other bulk liquids.

"Our goal is to build an independent midstream logistics business that delivers value-added, integrated services to refineries, marketers of crude oil and refined products as well as other midstream companies," Smith said.

King said those opportunities fit perfectly with how EFM's scope has expanded since its launch in 2008.

"Gathering and processing remains an important part of our portfolio, but over the years the market has presented different midstream opportunities

focused closer to demand centers. We've been fortunate to build relationships with seasoned industry professionals on this side of the market," he said. "We believe the Edgewater team's background and current strategy is well positioned to pursue a variety of these types of assets, such as transportation, storage and terminals."

Smith said another commonality between Edgewater and its private-equity partner is its approach to embracing new technologies and environmentally sustainable practices.

"We have dedicated ourselves to going above and beyond from a social responsibility perspective," Smith said, adding that EFM has long had an ESG policy in place. "For us, social responsibility means not only operating safely but [also] looking at new technologies that we can utilize to protect the environment. We recognize how important it is both now and in the future. It is front and center for us no matter what we do."

Even amid the current downturn, Smith said the company is pressing forward. "It's an exciting period for Edgewater," he said. "We have the right team and financial partner to execute our strategy and build a successful business." ■

David Klaassen is an Oklahoma City-based writer specializing in energy topics.

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The ESG Pieces

Growing investor interest offers midstream companies the opportunity to highlight positive practices that have become corporate priorities.

By Bryce Bingham, Michael Laitkep, Caroline Mahavier and Stacey Morris

Environmental, social and governance (ESG) factors comprise the criteria used by investors in a holistic approach to analyze an investment. Formerly a niche concept, ESG has moved toward the mainstream of finance in recent years as a result of investor demand, regulatory influence and demographics.

As ESG has gained traction broadly among the investment community, the midstream space has discussed ESG considerations with more regularity and depth. The concept has received increased attention at recent industry conferences, and several companies have released sustainability reports highlighting ESG initiatives.

ESG can be evaluated using a number of metrics, which can vary widely by industry and degree of disclosure. This analysis is tailored specifically to midstream and the top 30

companies by weighting in the Alerian Midstream Energy Index (AMNA), excluding Plains GP Holdings to avoid redundancy given the inclusion of Plains All American Pipeline LP.

Intangibles

ESG's role in financial analysis has become more pronounced in recent years. ESG investing has grown significantly in assets under management (AUM) since 2005, when a frequently cited United Nations report suggested that companies that manage ESG factors can potentially perform better by mitigating risks, anticipating and responding effectively to regulations and operating sustainably. ESG issues can also impact intangibles like reputation and branding, which matter for risk management and, increasingly, in the analysis of a potential investment.

In general, the inclusion of ESG factors into the investment process has grown significantly in the past decade and is being driven by younger investors. The Global Sustainable Investment Alliance said in a 2018 report that ESG integration accounted for \$17.5 trillion of investment dollars globally in 2018, up 69% from 2016. In the U.S., sustainable investing accounts for just over one-fourth of total managed assets.

In addition to growing AUM dedicated to ESG, demographics and increased regulations have played a part in the ESG space. In Europe, there has been a significant commitment to sustainable finance and ESG, with a push toward including ESG in multiple parts of the investment process through regulations. Both international investors and younger investors alike are increasingly interested in ESG

Environmental, Social and Governance

investing and see it as a way to express values, which is a shift from how other generations have viewed investing. MSCI Inc. projected that millennials could invest \$15 to \$20 trillion in U.S. ESG investments over the next 20 to 30 years.

Even if investors merely incorporate ESG issues into a traditional investment analysis to provide a more holistic view of a company and assess certain risk factors, ESG and related areas such as sustainable investing will likely continue to grow.

Midstream introduction

Although not typically considered an ESG investment, the oil and gas industry is not immune to the shift toward ESG. As a vital piece of both the U.S. and global economies, the energy sector cannot be ignored by investors, but energy companies, including midstream names, must also adapt to address the priorities of shareholders. Investors' interest in ESG plus its inclusion in presentations shows that management teams recognize the increasing relevance of ESG. Finally, the general increase in data disclosures by companies on ESG issues has made more in-depth analysis possible.

ESG considerations for midstream are generally evaluated on metrics that are most applicable to midstream operations and investment considerations. When considering the environmental category, midstream is primarily concerned with land management, biodiversity, limiting spills, investing in clean technology and other ways of limiting its environmental impact. Social factors are those that impact stakeholders, namely issues such as workplace safety, diversity and community engagement. Finally, governance issues encompass the rights and responsibilities of a company and its shareholders and the alignment between shareholders, the board of directors and management.

In general, the amount of disclosure on ESG issues by midstream companies is bifurcated between companies that have provided detailed reports on the topic and companies that have hardly acknowledged ESG concerns. The varied degree of transparency and relative lack of uniformity prevalent with the sector's

ESG disclosures make comparison among companies more difficult.

However, several companies have taken steps to release an annual sustainability report containing information on how companies monitor and integrate ESG issues into their operations as well as long-term initiatives and goals. These reports also contain detailed data that was previously only tracked internally and not commonly disclosed. For example, companies may report greenhouse gas and carbon emissions from assets, total recordable incident rates and detailed employee diversity data. In 2019, Crestwood Equity Partners LP, Targa Resources Corp. and Williams Cos. Inc.

released their inaugural sustainability reports. Other companies have not released full sustainability reports but have engaged with investors on ESG topics during investor days and have increased the amount of disclosures on their websites.

Inclusion in broader indexes is another potential benefit to ESG efforts. For example, ONEOK Inc. announced that it has been included for the first time in the Dow Jones Sustainability North America Index.

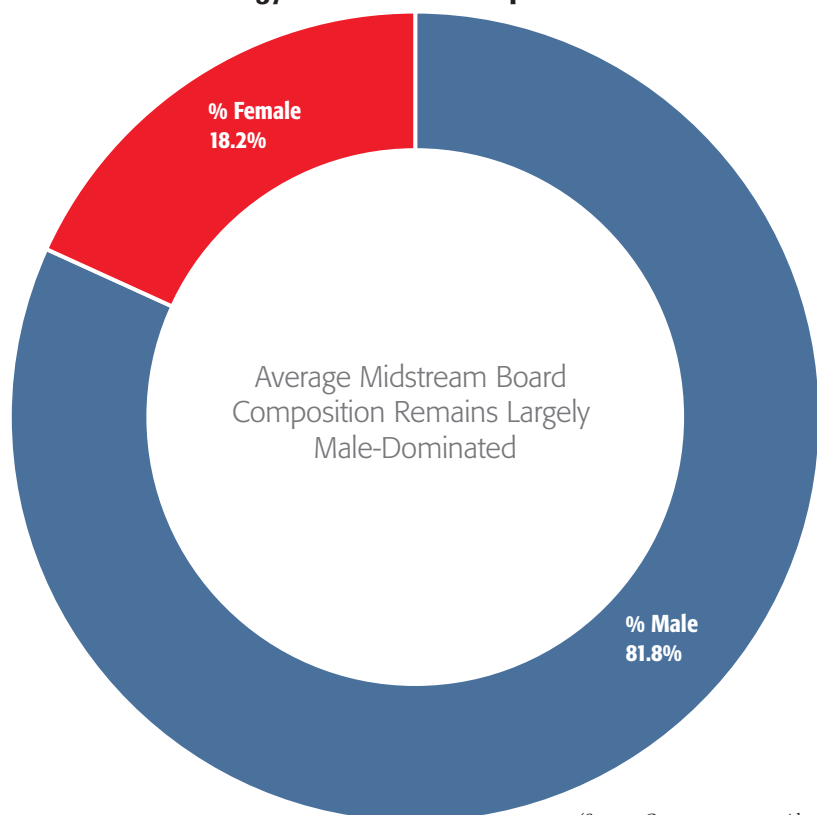
Alerian compiled and analyzed government data and company disclosures in U.S. Securities and Exchange Commission (SEC) filings and company websites. For the more

Alerian Midstream Energy Index ESG First Steps

Company	Ability to Vote on Board Members	Skin in the Game*	IDRs	Board Independence	Sustainability Report
Cheniere Energy	Yes	0.6%	No	55%	No
Crestwood Equity Partners	No	6.3%	No	67%	Yes
DCP Midstream	No	0.1%	Yes	80%	No
Enbridge	Yes	0.2%	No	73%	Yes
Energy Transfer	No	13.8%	No	30%	No
EnLink Midstream	No	0.7%	No	33%	No
Enterprise Products Partners	No	0.3%	No	56%	No
EQM Midstream Partners	No	0.0%	No	43%	No
Equitrans Midstream	Yes	0.0%	No	71%	No
Genesis Energy	No	8.9%	No	100%	No
Gibson Energy	Yes	0.3%	No	88%	No
Inter Pipeline	Yes	0.3%	No	90%	Yes
Keyera	Yes	1.1%	No	78%	No
Kinder Morgan	Yes	14.0%	No	75%	Yes
Macquarie Infrastructure	Yes	0.2%	No	78%	Yes
Magellan Midstream Partners	Yes	0.3%	No	89%	No
MPLX	No	0.2%	No	57%	No
NuStar Energy	Yes	7.4%	No	89%	No
ONEOK	Yes	0.6%	No	64%	Yes
Pembina Pipeline	Yes	0.2%	No	82%	Yes
Phillips 66 Partners	No	0.1%	No	43%	No
Plains All American Partners	Mixed	0.6%	No	69%	No
Shell Midstream Partners	No	0.0%	Yes	33%	No
Tallgrass Energy	No	2.0%	No	44%	No
Targa Resources	Yes	1.9%	No	70%	Yes
TC Energy	Yes	0.1%	No	92%	No
TC Pipelines	No	0.1%	Yes	43%	No
The Williams Cos.	Yes	0.1%	No	92%	Yes
Western Midstream Partners	No	0.1%	No	75%	No

*Measure of insider ownership of common units as a percentage of total shares outstanding. (Source: Company reports, Alerian)

Alerian Midstream Energy Index ESG First Steps



(Source: Company reports, Alerian)

granular ESG disclosures, the data presented by midstream companies varied significantly. Some companies, especially those that have published sustainability reports, offered details including emissions data that are difficult or impossible to track without company disclosure.

The degree of transparency with ESG metrics is one area for improvement among midstream companies, especially in the MLP space. MLP investors would benefit from greater transparency with ESG data and in other areas, like project-level details, that could be used to evaluate returns, for example.

Over the past year, a portion of midstream has moved in the right direction to improve the availability of ESG data, but further participation is necessary.

Environmental impact

While climate change may be the first environmental issue that comes to mind when ESG is mentioned, the environmental category comprises more than just greenhouse gas or carbon emissions. It includes operating effectively and encouraging best

practices to minimize the impact on the environment. In general, carbon and greenhouse gas emissions issues are relatively less significant for midstream compared to other energy sectors, given the containment of hydrocarbons within assets, with the exception being natural gas processing and fractionation of natural gas liquids.

Instead, midstream companies are more concerned with preventing spills and addressing pipeline routing and land usage. Pipelines have been criticized by opposition groups as unsafe and hazardous to the environment, but extensive research has found the opposite to be true—pipelines are the safest mode of transportation for oil and natural gas.

One study determined that crude transportation by rail was 4.5 times more likely to result in an accident than pipelines, and the majority of pipeline accidents occurred in facilities with secondary containment measures. Pipeline spills are expensive from a cleanup and regulatory standpoint and can cause significant damage to a company's reputation. As a result, companies have incentive to mitigate

any spills through active monitoring of their assets and investment in technology that reduces risk.

In general, environmental data are not commonly reported by companies without a sustainability report, and there is little uniformity among the companies that do disclose environmental metrics. As a result, environmental metrics are mostly sourced from government data, such as U.S. Environmental Protection Agency (EPA) violations and related fines and U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA) enforcement actions.

Within sustainability reports, some companies highlighted qualitative issues like biodiversity. Midstream operations teams plan pipeline routes to mitigate risks to conservation projects or endangered species, working with government agencies and local communities to meet or exceed regulatory expectations. There is not a set industry benchmark for EPA violations or PHMSA enforcement actions, but these should be as close to zero as possible given the paramount importance of safety and environmental stewardship.

PHMSA notices range from warning letter cases that do not result in actual violations to corrective action orders requiring immediate action by the company. The average number of probable violations cases for the companies included was slightly over two per company in the study period from January 2015 through August 2019.

In general, one would expect companies with a more extensive asset base to have greater enforcement actions than smaller companies. Separately, for crude and refined products pipelines in general, the 5-year average accident rate per 1,000 miles was 0.72 according to PHMSA data. Despite an increase in pipeline miles, liquids pipeline incidents impacting people and the environment fell by 20% from 2014 and late 2019.

Social relationships

The social category of ESG refers to how a company manages its relationships with its employees and the community it operates within. Social includes issues such as diversity, workplace safety,

community engagement and the pay gap within a company.

Across energy, safety has been and will remain a priority for every company. Many midstream companies begin every meeting with a safety-related discussion, which could cover anything from a review of procedures to a talk on how to prepare for contingency events. These safety discussions provide an opportunity for every employee to get into the mindset of operating safely, which is paramount when handling and processing hydrocarbons.

Companies also constantly review safety training and drills for the sake of their employees and to ensure compliance with regulations. Companies disclosed varying metrics for safety, including safety training hours and the number of safety courses, exercises and drills undertaken by employees during a given year. Notably, several Canadian companies were among a small group that disclosed the number of safety exercises and drills performed each year.

In addition to safety, the social category also encompasses metrics like board diversity and the intracorporate pay gap. These two metrics that have drawn greater interest in recent years. In 2015, the U.S. Securities and Exchange Commission implemented a rule requiring most public companies meeting certain size and other requirements to disclose the ratio of CEO pay to the pay of the median employee, with companies allowed some flexibility in determining how the ratio is calculated.

The mandated disclosure of pay ratios has increased transparency in executive compensation and reveals what the median employee is paid at each company. Among the companies analyzed that reported their pay ratio, the median salary of the median employee was \$111,341.

At a glance, pay ratios for the midstream space compare favorably on a relative basis to other industries. Per a 2018 report, the midstream would rank among the industries with the lowest pay gaps, with a median of approximately 67:1, and slightly below the broader energy industry at 72:1. For context, sectors such as health care and

financial services typically have ratios of 150:1, given the high number of low-paid employees.

Board diversity and independence is another social issue that has been in focus. Board diversity refers to the composition of the board by gender (although other factors can be considered), and independent board members are defined as those that do not have a position within the company.

In general, the inclusion of ESG factors into the investment process has grown significantly in the past decade and is being driven by younger investors.

Midstream boards of directors are mostly composed of male members, with 81.8% of midstream boards represented by the AMNA top 30 being male. All six Canadian companies finished in the top 10 of the analysis in terms of gender diversity on their boards, with each company having at least 25% female members. Enbridge Inc. led the constituents with a nearly even split of male and female members.

For many midstream companies, community engagement is an important piece of company culture, and most companies touted accomplishments related to charitable work and monetary donations. Given the public nature of some energy infrastructure projects, community engagement also includes how companies communicate with landowners, local governments, native people groups and the general public. While these elements of the social category are difficult to quantify, they remain an important part of the outreach performed by midstream companies.

Governance issues

Governance is defined as the actions taken by management and the board

of directors to ensure accountability, fairness and transparency in a company's relationship with its stakeholders.

Rather than simply meeting regulatory or stock exchange requirements, effective corporate governance involves taking active steps to align executive and shareholder interests through consideration of economic interests, board independence and shareholder voting rights.

Historically for MLPs, incentive distribution rights (IDRs) have been detrimental to governance and therefore a concern for investors. Although the initial goal of IDRs was to align the interests of the MLP and its general partner (GP) early in the life of the partnership, the structure lacks sustainability as an MLP matures, and IDRs become a burden on cost of equity. Additionally, the elimination of IDRs can better align the financial interests of the GP and individual unitholders by increasing the parent's ownership in the MLP and by putting the two groups on equal footing regarding distributions.

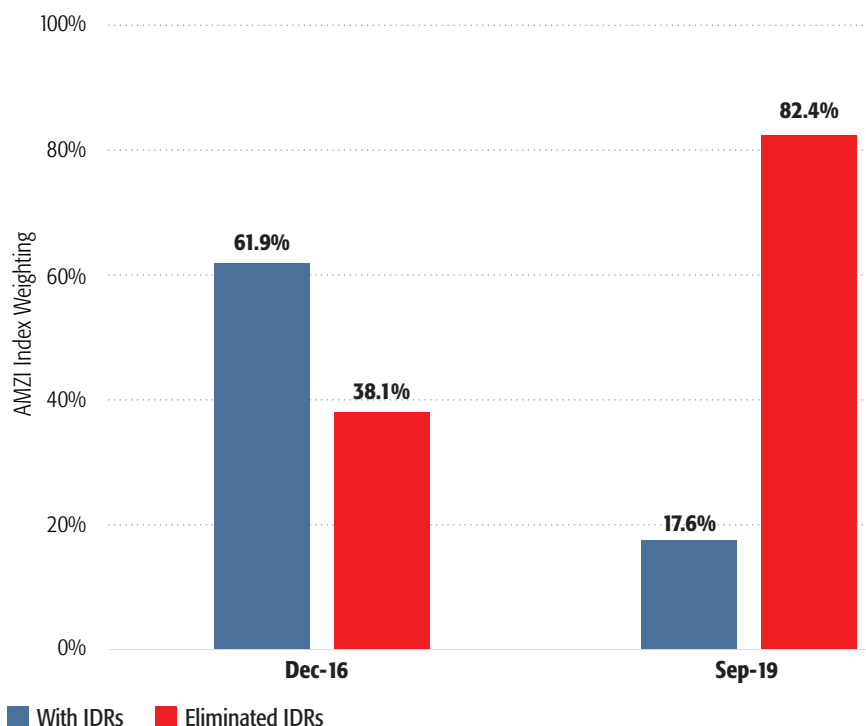
After IDR eliminations were recently announced by Shell Midstream Partners LP and DCP Midstream LLC, only two of the top 30 AMNA constituents, Cheniere Energy Partners LP and TC PipeLines LP still possess IDRs. The widespread elimination of IDRs is the clearest example of improving corporate governance in the MLP space.

Governance metrics

While MLP unitholders typically do not have the right to vote in board elections, there are a few exceptions to the rule. Common unitholders of Magellan Midstream Partners LP and NuStar Energy LP are allowed to vote for members of the board. Plains All American unitholders can also vote for seven members of the board, but the remaining six are designated or appointed by the GP.

A board of directors with a high percentage of independent directors is positive for corporate governance; recent research suggests that board diversity and independence can improve governance by providing different viewpoints and expertise to key decisions. The average midstream board of directors based

Most AMZI* Constituents Have Eliminated IDRs



(Source: Company reports, Alerian)

on the top 30 AMNA constituents is made up of nearly 70% independent directors. Out of the 30 boards, seven MLP boards consist of less than 50% independent directors.

In addition to unitholder voting rights and board independence, a “skin in the game” metric within governance focuses on alignment between executives and equity owners. It measures insider ownership of common units as a percentage of total shares outstanding. Average insider ownership is a low 2.1% for the top 30 AMNA constituents, but insiders of two midstream operators—Energy Transfer LP and Kinder Morgan Inc.—own more than 10% of outstanding units/shares.

Executive compensation is often discussed in tandem with skin in the game. Executive compensation should align the interests of company management with those of shareholders. Additionally, executive compensation should not be tied too much to a single metric such as distribution growth.

What's next?

As generalists and international investors alike continue to show further interest in ESG, the onus will

be on midstream management teams to increase the information provided to allow for thoughtful decisions by investors. In many cases, midstream companies may already have extensive ESG data available as a result of risk management and monitoring practices, and the burden rests mostly in packaging these data into a report.

For companies that have already released sustainability reports, one challenge for investor analysis has been the variety of metrics used by each company. Because not every aspect of ESG is quantifiable, one management team may prefer to measure a factor a certain way, while a different management team prefers another standard. Eventually, the ideal would be a midstream space with uniform metrics that allow for efficient comparability between companies, but investors would likely settle for simply having more data available in any form.

In a review of the data available from companies, significant gaps and inconsistencies exist in what was disclosed. For example, in the environment category, disclosure of environmental metrics by companies varies between limited

or no information to granular data in sustainability reports that include details on emissions profiles, spills and other environmental compliance information.

Sustainability reports included additional commentary on biodiversity, pipeline routing and water management, among other topics. The difference is clear for companies that currently lag on ESG reporting, and those companies should make a conscious effort to make more data and information available as a next step.

ESG and beyond

Energy infrastructure companies should report any metrics that would give investors a clearer picture of how the entity operates. It is also important to note that ESG goes beyond environmental, safety and social reporting. Governance issues are just as important as environmental and social issues, if not more so as far as shareholders are concerned. Bringing these issues into focus could also help bring about an improvement in how investors view the industry in general.

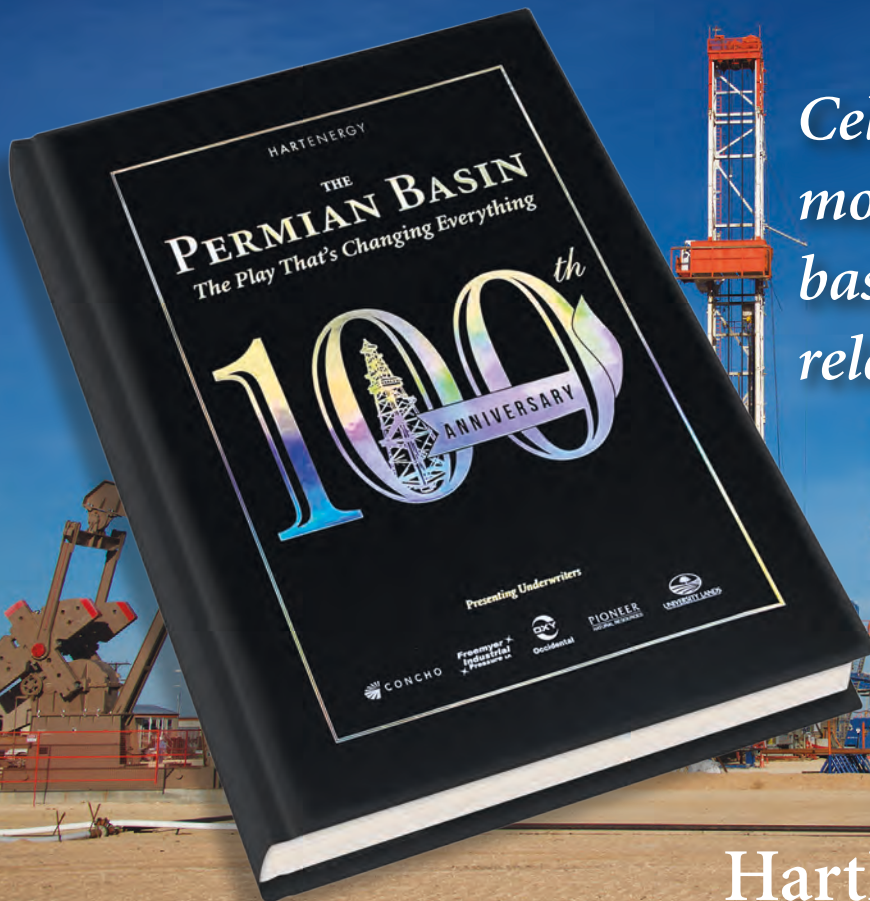
The growing investor interest in ESG is an opportunity for midstream companies to highlight some of the risk management and safety practices that have long been a priority in the space. The indirect benefits of ESG are plentiful, including greater anticipation of risks, increased investor engagement and transparency and a public emphasis on important priorities like safety, which have typically been a more internal focus. Greater transparency and engagement on ESG issues may increase investor comfort that management is considering risks and opportunities appropriately.

Going forward, the first steps for midstream companies should be to make an effort to listen and engage on issues important to investors; increase disclosure of ESG metrics, including releasing a sustainability report; and promote uniformity and transparency on ESG data. ■

The authors are with Alerian. Bryce Bingham and Michael Laitkep are research analysts, Caroline Mahavier is a data analyst and Stacey Morris is director of research.



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Powering The Permian

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Onsite generation by midstream operators cuts costs and boosts revenues in the sprawling, electricity-hungry play.

By Sanjeev Daruka

If the Permian Basin were an independent country, it would be the eighth largest oil and gas producer in the world. The sheer volume of production coming from the shale play—more than 17 Bcf/d of gas and 4 MMbbl/d of oil as of December 2019—represents a tremendous opportunity for operators and suppliers alike.

However, it has also given rise to some unique challenges. Including pipeline capacity, transportation and skilled labor, the logistical and infrastructural constraints that have resulted from the region's rapid growth are well documented. And now, as production continues to increase, another bottleneck looms on the horizon: the availability of power.

Power from emissions

Unprecedented production growth in sparsely populated West Texas puts

significant strain on an electric grid that was designed to handle only a fraction of the power that is being consumed by the region today. While many producers and oilfield service companies are operating in remote areas with no access to transmission lines, those that do have access are increasingly electing to use cheap grid electricity to drive power-intensive process oilfield equipment, such as compressors and pumps.

The spike in electricity consumption, coupled with inadequate infrastructure, has slowed the development of new projects that support growth in the Permian. Excessive demand also threatens the overall reliability of the grid in West Texas by increasing the risk of blackouts.

Finding ways to ensure the availability of power and avoid grid disruptions is not the only issue that producers in West Texas must address. The industry is also coming under

increased scrutiny for its gas flaring practices. With limited export capacity, many producers have no outlet for their produced gas. Flaring limits in Texas are less stringent than in many other states; however, it is widely accepted that this leniency will not last indefinitely. Some problems are already emerging, as there have been recent reports of producers that have had to ramp down production because they are exceeding the limits outlined in their flaring permits.

Overall, in 2018, the amount of gas flared in the Permian rose by roughly 85% to 553 MMcf/d, which was enough to meet residential demand across the entire state of Texas.

As regulations surrounding flaring tighten, producers will be forced to find ways to utilize produced gas sustainably. An increasing number of Permian operators are addressing both power and environmental concerns by

Power Generation

capturing the gas, treating it and using it to drive onsite gas turbines, ultimately resulting in increased revenue.

Driving electrification

The trend of oilfield service providers in the Permian bringing power under their supply base should come as no surprise, as many have engaged in long-term agreements with operators that are based on performance guarantees.

A loss of power results in nonproductive time, which translates into significant penalties and loss of revenue. With an already-strained electrical grid, the only solution for these companies to ensure uptime is to bring in onsite power-generating assets as either a primary source of generation or as a backup.

The task at hand in regions like the Permian is to deploy efficient generating capacity that can be brought online rapidly. In some cases, the need is temporary, and after some time the power plant may need to be relocated to perform a similar duty.

To achieve this, companies have any number of power-generating options at their disposal, including gas reciprocating engine-driven generators,

mobile industrial and aeroderivative gas turbine-driven generators, and full-scale microgrids. Central to these microgrids are mobile gas turbine packages that can burn a range of natural gases, including wellhead gas (or liquid fuels), which enable operators to generate valuable power using a cheap source of fuel from nearby pipeline infrastructure. This gas would otherwise be flared, wasting energy and creating emissions with no associated benefit.

In the case of wellhead gas, once enough fuel is being produced from the wellheads on the pad or from nearby gathering infrastructure, there is no need to transport fuel on site from third parties. This saves costs and relieves road congestion and stress on the public and road infrastructure.

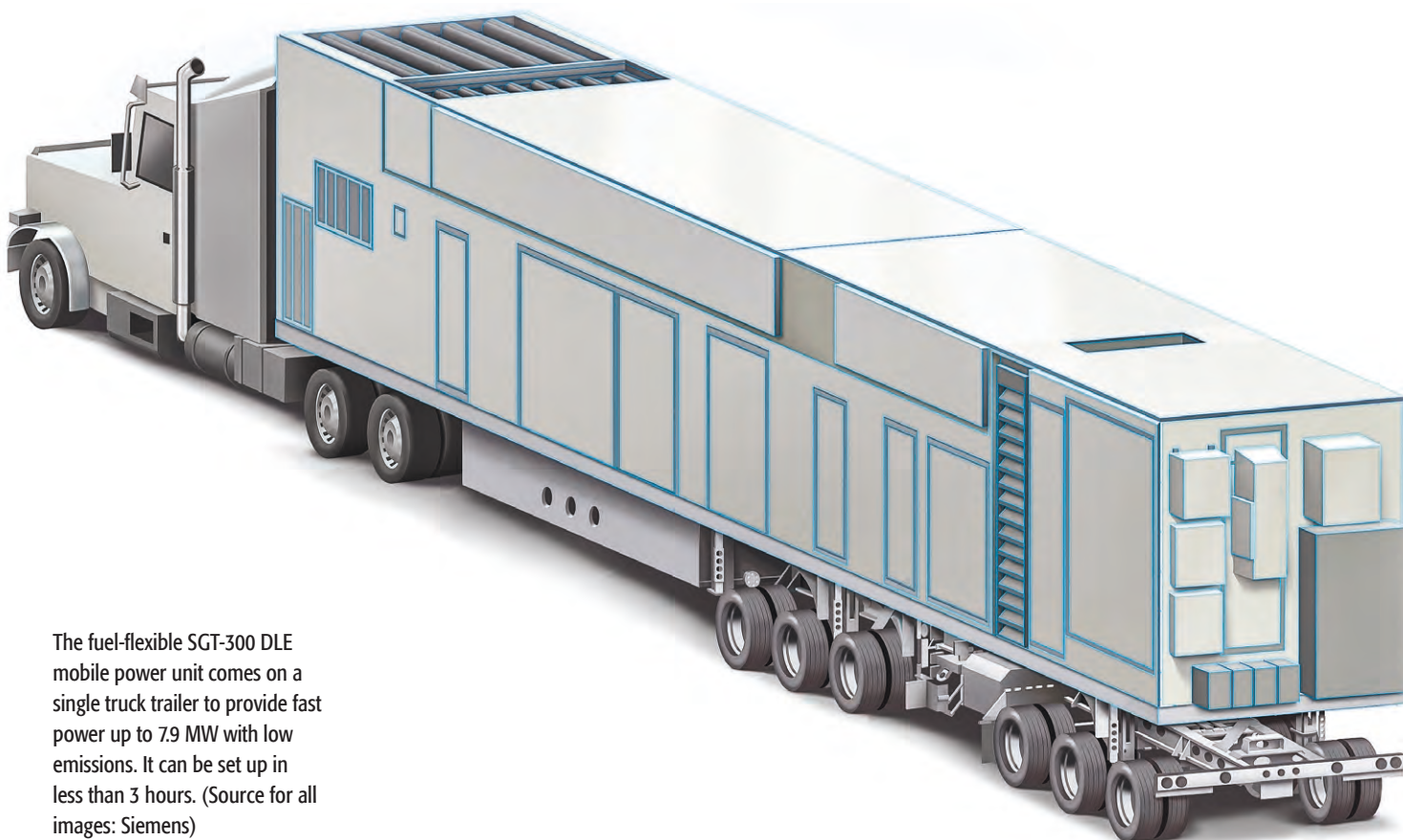
Natural gas processing plants are also experiencing a rapid transformation toward electrification. While many gas plants in the planning stages in West Texas are opting to purchase power from the grid, others are choosing to build their own dedicated power islands. These power islands allow the operators to realize

greater plant reliability and long-term electricity cost savings while retaining greater control of the time line for building their gas plants.

Two primary models have emerged for the operation of the plants. The first model entails the operator maintaining ownership of the plant and operating it using excess gas from the plant, which is essentially free fuel. This option requires a high upfront investment but generally represents the lowest cost approach over the long term. The second model involves allowing an independent power producer to build a power plant near the gas processing plant. In such cases, the independent power producer buys the gas from processors/operators and sells the produced electricity back to them. The advantage of this approach is that it minimizes the upfront investment required by the operator.

Optimizing assets

In addition to grid power constraints and flaring regulations, Permian producers also must contend with rising production costs. The costs of acreage



The fuel-flexible SGT-300 DLE mobile power unit comes on a single truck trailer to provide fast power up to 7.9 MW with low emissions. It can be set up in less than 3 hours. (Source for all images: Siemens)

and labor have risen in recent years. Coupled with the fact that most of the low-hanging fruit has been picked in terms of cost cutting, operators are now being forced to find new and innovative ways to improve efficiency and increase production value.

One specific area they can do that is in compression.

As the Permian and Delaware basins mature, better planning for the drilling and development of wells has given operators the ability to take a more optimized approach—leading to the strategic positioning of centralized compression gathering systems rather than multiple wellhead compressors, combined storage facilities and larger centralized delivery points. While this reduces the number of assets in operation and enables development on a larger, more efficient scale, it also requires operators to move to larger power blocks of compression and power generation.

Many existing (i.e., older) gas treatment plants in the Permian have flow capacities ranging from 20 MMcf/d to 80 MMcf/d. However, as the demand for both gas and NGL has risen, much larger plants are being constructed, many in the range of 200-plus MMcf/d, with power requirements of up to 60 MW.

Natural gas engine-driven reciprocating compressors have historically been the most widely used option for meeting compression requirements at gas gathering and gas treatment facilities. However, operators have faced significant issues with this choice due to the frequent maintenance requirements at intervals as short as 2,000 hours and the lack of skilled operation and maintenance personnel available in these remote locations.

Powering compression

As a result, electrical motor-driven compression packages powered by the grid (if available) or an onsite gas-turbine generator, which uses excess gas as fuel, are gaining popularity. That said, reciprocating compressors are no longer the economical solution for larger-flow facilities, and centrifugal compressors driven by electric motors, or in some cases gas turbines,



are emerging as a more optimum and lower-cost solution to meet requirements for gas gathering and gas processing operations.

Centrifugal compressors' high-power density, coupled with their reliability, which eliminates the need for standby units, enables plant operators to lower plant capex by upward of 40%. For a 250-MMcf/d gas plant, for example, the entire inlet and residue gas compression duty can often be met by one or two centrifugal compressors. This contrasts with the upward of 10 reciprocating units that would be required to perform the same plant duty.

Additionally, because the need for plot space and the associated infrastructure (i.e., foundations, piping, wiring, cabling, electrical systems, etc.) is reduced with fewer units, site installation costs for the centrifugal solution are significantly lower.

The fact that centrifugal compressors are essentially maintenance-free has added to their attractiveness. These units often run uninterrupted for five to seven years between inspections. As a result, maintenance costs can be reduced by as much as 90% when compared with multiple gas engines. This can be an advantage in places like

Centrifugal compressors deliver more gas using fewer moving parts and can significantly reduce gas gathering and processing costs.

the Permian, where the availability of skilled service personnel is limited.

Another key factor that operators must consider when deciding between the compression driver solution is emissions. A gas turbine-powered generator unit replacing multiple engines can reduce NO_x emissions by three to six times and CO₂ emissions by 15 to 20 times—without the use of an oxidation catalyst. This can be significant when it comes to meeting permitting requirements.

Ultimately, choosing the type of compressor and associated driver for a gas gathering or gas treatment facility is not a one-size-fits-all situation. Many project-specific factors must be considered that can tip the scale in favor of one solution or another, including capex, opex, operating profile, delivery time, maintenance, emissions and downtime.

The road ahead

Reliable power enables development in unconventional shale plays. The Permian Basin is currently the largest source of supply growth in the world; however,



Early engagement with a solutions partner allows customers to evaluate multiple concepts before selecting the optimal system that lowers execution risk and improves return on investment over the life of a gas processing facility.

to engage early with a solutions provider that can handle a significant portion of the supply and service scope. From delivery of compressors, drivers and electrification equipment to engineering, construction, commissioning and service, having a single point of responsibility for a project can generate wide-ranging benefits. These benefits include streamlined project execution, shorter delivery times, reduced schedule risk and greater uptime and availability, resulting in lower capex and opex over the life of the facility. ■

that growth risks being hampered by infrastructural constraints and bottlenecks.

As the region's rig count continues to increase and operators build out the necessary infrastructure to power their oilfield operations, the need for

companies to offset rising production costs and land prices through further cost reductions and efficiency gains will become increasingly important.

One strategy resource owners can adopt to help achieve those goals is

Sanjeev Daruka is head of midstream business development for Siemens Gas and Power.

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Pipeline Health

Quickly visualizing a system's operating status depends on remote monitoring.

By Dr. Toku Ito

New technologies enter the market each year, raising awareness of the need for innovation in an industry viewed by some as reliant on legacy systems and traditional work methods. When it comes to pipeline operations, midstream and upstream companies are focused on creating efficiencies in daily work methods to maximize uptime and minimize the risk of interruptions.

Field service technologies offer significant upside opportunities to ensure reliable operations for companies with extensive assets. In terms of monitoring, current methods are laborious and unreliable, and history shows the costly impact of leaks and ruptures to operations.

As the size of the workforce continues to decline and the industry loses expertise due to demographic

shifts, the need for greater business efficiencies in oil and gas operations increases. This need, along with the problems of aging pipeline infrastructure, creates an immediate need for companies to improve their monitoring capabilities.

Costs of incidents

Past incidents show that the implications of a pipeline breach can



Ease of installation and service enhances the ability of a midstream operator to quickly add remote data monitoring. (Source for all photos: TOKU Systems)

Remote Monitoring

last months—from detection of the leak to conducting the cleanup effort, reclaiming the land and paying the fine. Industry failures have become costlier, with reports of eight- and nine-figure cleanups and some companies losing the ability to be insured for future events.

Companies cannot afford to go weeks to months without knowing about a problem with their pipelines. Manual or noncontinuous methods of conducting pipeline checkups, such as deploying an operations team via helicopter or capturing video with a drone, are time-intensive, burdensome and unreliable.

As companies look to streamline operations and reduce costs, it is critical to evaluate opportunities for regular and continuous monitoring made available via a remote monitoring system. Having complete visibility into a pipeline will not only mitigate financial risks but also shelter a company from vulnerabilities and potential long-term setbacks.

Manual monitoring

According to estimates, if a sizeable leak or rupture is not caught within 48 hours, a company is subject to cleanup costs averaging \$100,000 per day. This adds up quickly, depending on the size of the pipeline breach, and the longer it takes to detect the leak, the more the company stands to lose. It may take months to clean contaminated soil and reclaim the land—and even longer to restore the company's losses.

Whether the liquid leak is oil emulsion or produced water, each rupture has varying consequences. For example, oil emulsions tend to collect on the surface, while produced water, along with its chlorides and other contaminants, will be absorbed into the soil. Therefore, cleanup procedures vary greatly and can often result in widespread sterilization of vegetation and natural surface water bodies. The result can be an altered landscape that impacts wildlife, vegetation and livestock.

When monitoring manually, companies must factor in the equipment and associated labor, which can force the operations team to divide resources between production and

monitoring. Sometimes, it compels companies to hire additional staff for both areas. Additional monitoring costs, which may include canine inspections, vehicle-based visual surveillance and static pressure tests, can add up.

Additionally, winter and rainy seasons can add access challenges to in-person inspections, forcing the operations to consider more costly monitoring alternatives.

Businesses can also face significant fines and regulatory penalties if issues go undetected for a duration of time. These costs compound the loss of revenue associated with the facility not being permitted to flow again until the regulatory body releases it.

Pipelines run across thousands of acres—usually land that is not owned by the company—which means if the land is damaged because of the leak, the company is subject to facing lawsuits from landowners. If the land is crown land (government owned) or in watershed areas, downstream parties also will be eligible for compensation or reclamation.

If the product is marketable, the associated profit loss will impact the bottomline. It is up to the company to take the necessary operational steps to prevent a large-scale accident from happening in the future. When it comes to pipelines, leaks may be inevitable, but a quick response and thorough planning can prevent it from causing severe financial loss.

The risks associated with ruptures and leaks extend beyond the operational, material, environmental and public arenas. Negative press from a poorly managed leak detection strategy will impact the organization at the shareholder level. This results in loss of investor confidence, personal liability and long-term consequences to the reputation of the organization and its directors.

Digital monitoring

Reliable, continuous and detailed pressure monitoring provides an effective way to avoid the risks and the additional costs associated with traditional monitoring. While such monitoring requires an upfront investment, new technologies have

lowered the initial investment needed to begin remote digital monitoring of assets.

These new monitoring technologies allow companies to remotely and efficiently visualize how their pipelines are operating and remain aware of any potential issues. By investing in digital monitoring systems, operators can accurately know what is happening within their pipelines and create a more efficient and cost-effective practice that will save money at the back end.

Through continuous remote digital monitoring, a company's operations team no longer must record data collected through dated, noncontinuous methods and instead can look for trends or patterns in the data themselves that could help identify a potential issue. The time it takes to collect and analyze the data is significantly reduced as the digital system captures it in real time, allowing operators to streamline the entire monitoring process and spend time and resources elsewhere on other critical operations.

The smartphone has become an indispensable tool in the hands of any field operator. A monitoring system that provides detailed pressure data direct to a smartphone allows an operations team to check on pipeline performance throughout the day without the extra travel or scheduling to get to a computer at a field office and assess alarms. Real-time monitoring via smartphones allows teams to take prompt action.

Additionally, the analytics that a digitalized system can provide not only creates efficiencies in monitoring but also can enhance business operations. By having detailed data readily at hand through the monitoring system, machine learning or artificial intelligence can be applied so that companies rapidly gain information on trends and insights, such as the pipeline's week-over-week, month-over-month or year-over-year health. Without quality data, companies obtain no value from the numbers received from traditional monitoring processes.

Having detailed and continuous pressure monitoring of a pipeline can provide insight into the performance of a system's equipment. Whether it is

a downhole pump, a surface injection pump or some form of automated valve control, all parts will have performance characterized by the pressure changes that are produced in the pipelines to which the pieces are connected.

Reactive versus proactive

When they shift from reactive to proactive monitoring, companies can visualize ongoing changes in pumping equipment, have insights into operational efficiency and

gain information on performance degradation. Companies can practice proactive maintenance, which avoids the higher costs of an unexpected failure and associated downtime, by identifying when a pump begins to fail.

Furthermore, when an operator covers the remote operations, field and pipeline systems with a network of remote sensors connected to a single platform, they can visualize the entire pipeline operation. This networked visibility enables operators to see and

track pigs, catch valve failures and know when, where and how slugs are forming. With new technologies, companies can implement this type in a few days and at a fraction of the cost.

If a monitoring system detects a change in pipeline pressure, it sends alerts and notifications immediately to an operations team. The team can then quickly investigate the specific location within the pipeline to identify if there is an issue and, if a problem is found, address it early, thereby preventing a significant leak, blockage or other costly problem.

An example of a remote digital monitoring system is the TOKU device, an intelligent plug and play service that informs operators of their pipeline operations' health from a cloud-based digital platform, available on any device, including web and mobile applications. The TOKU device can be implemented without an engineering and installation specialist or a design fabrication team. It sends operators high-resolution, per-second data on the changes in pipeline pressure, alerting them of any conditions that could jeopardize safety, efficiency or performance.

With its own battery, solar cell and a built-in cell antenna, the device has autonomous operational capabilities that allow it to automatically update and stay connected to the user. It facilitates significant cost savings and efficiencies, and it mitigates operational risk—creating new growth possibilities for companies.

Given that current market conditions have created significant challenges in the oil and gas industry, companies must make an effort, now more than ever, to adopt new technologies that reduce costs and create efficiencies. Continuous monitoring can be part of that effort, and remote digital monitoring systems reduce uncertainty by allowing companies to maintain awareness of their operations virtually and in real time. ■

Dr. Toku Ito is CEO and founder of TOKU Systems, a Calgary, Alberta-based developer of remote monitoring systems for oil and gas companies.



The solar-powered TOKU device screws into an existing gauge location and can then provide reliable operating data from a remote location.

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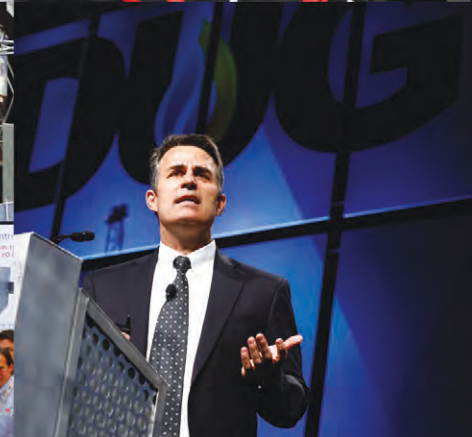
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Midstream Matters To Watch Amid COVID-19

By Matthew Hite

Hopefully, as you are reading this, we are in the process of reopening the economy and the government from the COVID-19 pandemic. COVID-19 has had a far-reaching impact on our world, and it poses new legislative and regulatory issues for the midstream sector.

As of the end of April, more than 60,000 people have died from COVID-19 in the U.S. with at least 1 million Americans infected. Those numbers will continue to grow as the oil and gas industry suffers a one-two punch from the public health situation and the consequences of the oil price war between Russia and Saudi Arabia, which tanked the price of oil in roughly a mere month's time. The industry will not be the same for some time, especially since demand will remain slumped after Americans start to emerge from lockdown.

However, the industry is resilient, and we will bounce back. People will be flying and driving again. The big question is how long this recovery will take because the industry cannot start and stop at the flip of a switch.

In addition, the U.S. is in a presidential campaign year and has a number of unresolved issues in Congress and on the regulatory front to which industry members should pay attention.

Legislative issues

On the legislative front, Congress has moved into emergency or stimulus funding mode. It is trying to shore up the economy as best it can through direct spending that either stimulates or invests in the economy. Normal legislating has taken a back seat to this emergency work. In addition, Congress is not meeting regularly due to COVID-19 and most likely won't for some time. It appears Congress will only return to Washington, D.C., to vote on emergency spending or stimulus packages. Nonetheless, important legislative issues remain for the midstream sector.

Of them, the most important is the Pipeline Safety Reauthorization, which expired in September 2019. It is important to note that neither the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) nor industry will grind to a halt, absent Congress passing a new Pipeline Safety Reauthorization legislation because it's not required to keep the PHMSA operating. While this has not always been the case, reauthorization has become a very partisan issue, which has delayed its progress during this session of Congress.

As the congressional calendar shortens due to COVID-19, election campaigning and the fact that there will be very little

legislation outside of emergency/stimulus spending packages, it does not appear that Congress will make much progress on Pipeline Safety Reauthorization.

Regulatory challenges

Major unresolved issues that the midstream faces on the regulatory front are the U.S. EPA methane rule, PHMSA's Gas Mega Rule, EPA and the Army Corps' Waters of the United States (WOTUS) rule, and issues surrounding Nationwide Permit 12 (NWP-12).

- **EPA methane regulations**—We heard that EPA was focused on releasing its methane regulations in May. Since EPA staff have been working remotely in response to COVID-19, we anticipate this final rule slipping to some time in June. This has been a campaign pillar of the Trump administration, and the failure to release this rule will pose problems for the midstream because it would provide regulatory certainty for GPA Midstream members.

- **NWP-12**—In mid-April, the District Court of Montana handed down a troubling decision that impacts NWP-12 across the country. The court decided that an Endangered Species Act consultation was needed. The midstream industry uses NWP-12 for a number of projects, most notably installing gathering lines. The

new NWP-12 situation has upended the industry at a painful time. With markets not operating in a favorable fashion and the demand for midstream products declining, the court's decision creates uncertainties that will directly impact the ability to develop the midstream.

- **WOTUS rule**—Last, the Trump administration finally rolled out its version of a regulation defining WOTUS. This impacts the midstream because it determines the need to obtain a Clean Water Act permit to build or install a project. This final rule will become effective in June and surely will be litigated. This litigation, to be expected given the controversial nature of the rule, will create some uncertainty in the immediate future.

While we all struggle to ensure the health and strength of the industry, we face many challenges and unresolved issues this year in Congress and on the regulatory front. The staff and committees of GPA Midstream Association are watching these issues and working to find the best outcomes for the industry. ■

**Normal
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emergency work.**

Matthew Hite is vice president of government affairs for the GPA Midstream Association.

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