SHALE

MAGAZINE

JANUARY/FEBRAURY 2020

BIG GREEN, INC.: THE HEINZ ENDOWMENTS ASSAULT ON SHALE PROSPERITY

GLOBAL CHEMICAL SUPPLY, DEMAND THREATENED BY MIDDLE EAST ESCALATION

STATE OF THE OIL & GAS INDUSTRY: WHERE ARE WE GOING INTO THE 2020S?

LIFESTYLE: “FEEDING AMERICA”

BRAD BARRON

NuStar's Future is Bright

AMERICA'S ENERGY REVOLUTION SUPPORTS AND STRENGTHENS OUR ACTIONS IN THE MIDDLE EAST


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WELCOME TO 2020 WITH SHALE MAGAZINE!

We are very excited to bring you this first issue of SHALE in 2020. We have a great issue for you with a company that is doing amazing things, NuStar. And moving into 2020 we have a fantastic editorial calendar planned for the year with great covers, important focus topics and more.

We have recently completed a redesign of shalemag.com to make the site more appealing and user-friendly. We are committed to continuing to evolve and change as needed to meet our clients' needs and surpass our readers' expectations.

I encourage you all to visit shalemag.com to see the newly designed site. You may register for the e-newsletter which includes a FREE digital subscription to SHALE Magazine. You can also learn more about TEAC and see a calendar of our upcoming events as well.

In 2020, Texas Energy Advocates Coalition (TEAC) is increasing in activity. You'll see the organization holding more events and partnering with outside organizations to spread its advocacy message.

Thank you for following SHALE into another great year. We promise to be your best source for energy news in 2020 and for years to come!

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PHOTO BY MICHAEL GIORDANO


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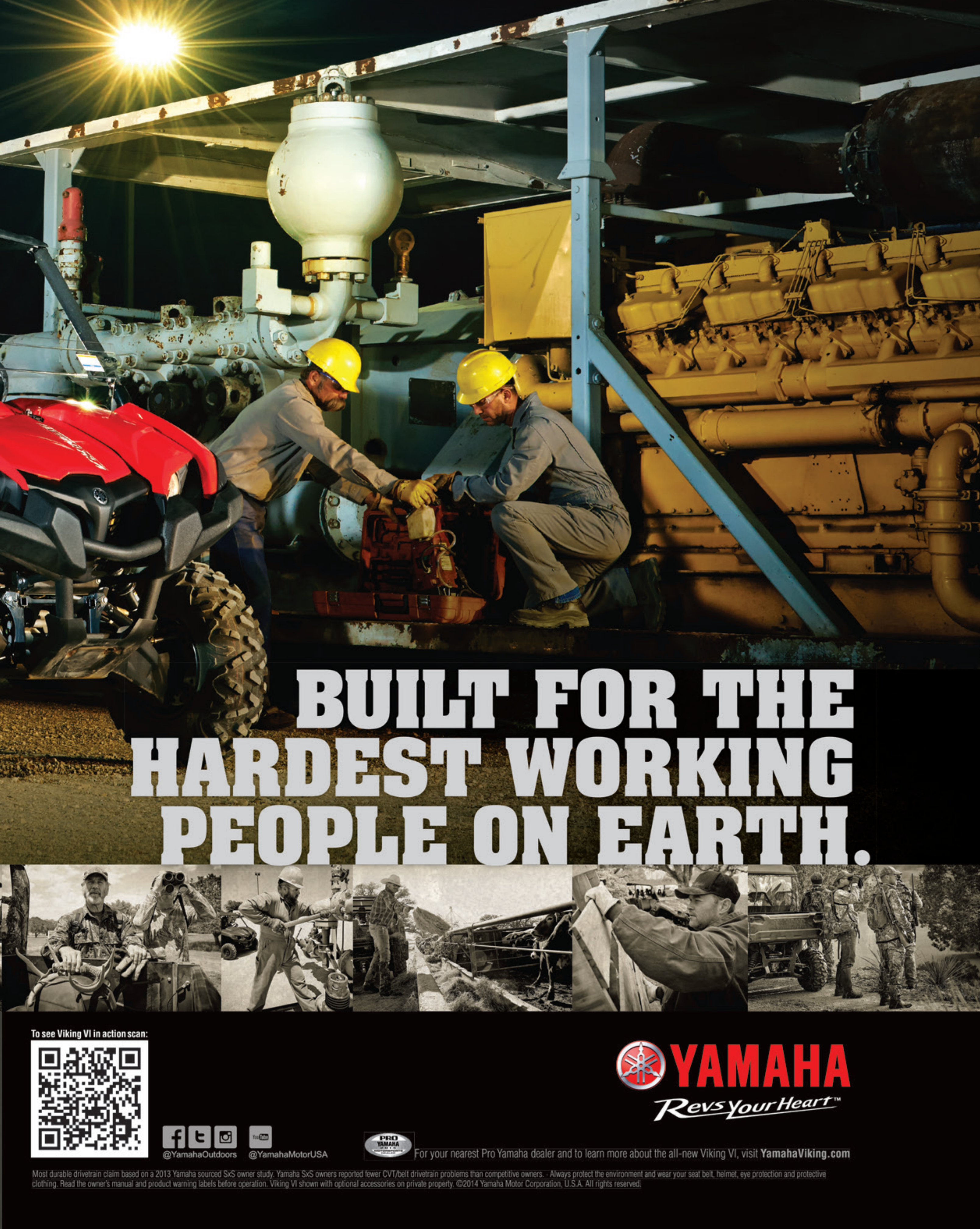
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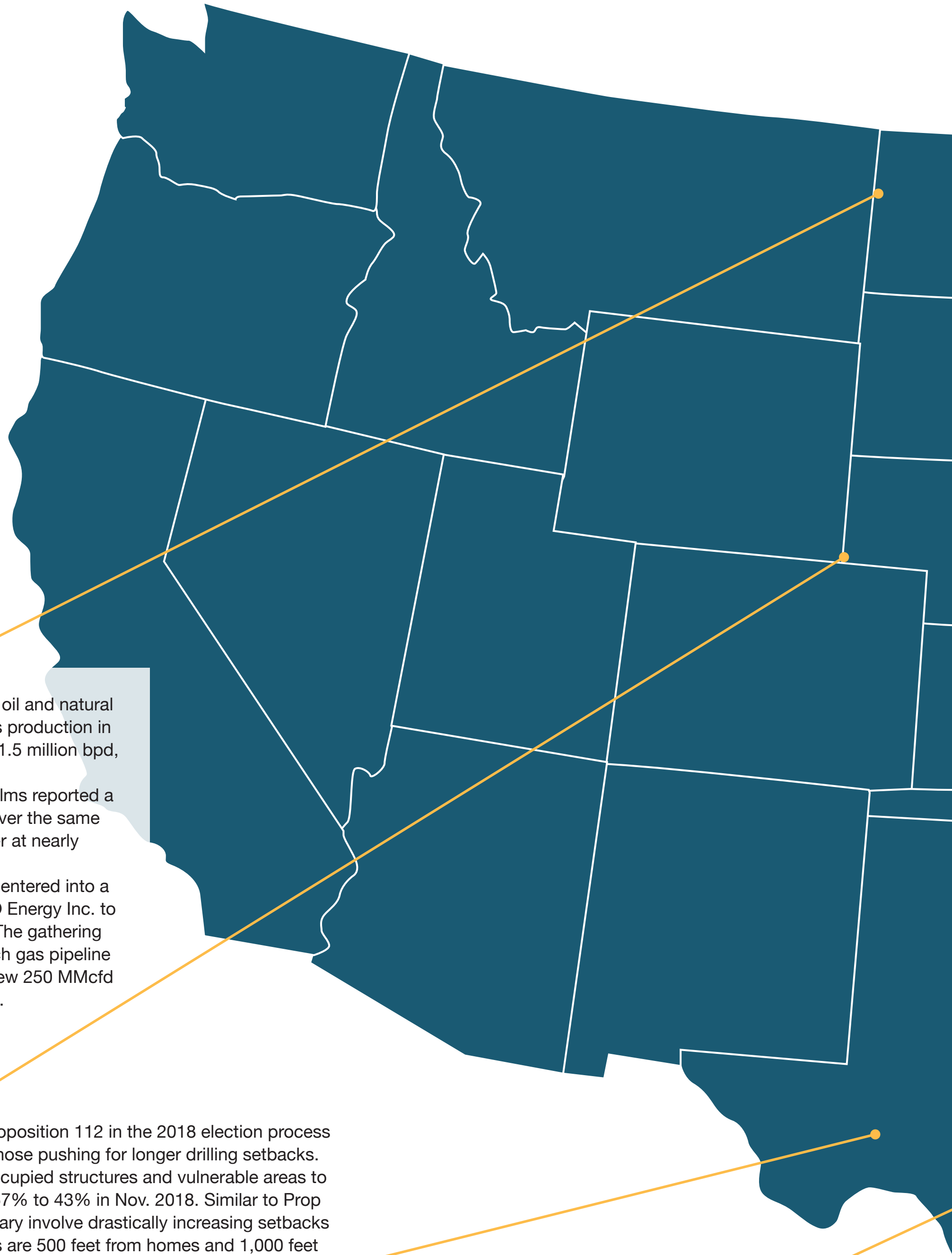
SHALE PLAY ENERGY UPDATES

By: **David Blackmon**



ARUNAS/BIGSTOCK.COM

Bakken Shale – North Dakota/Montana

The rich Bakken play set new production records for both oil and natural gas during the month of Oct. 2019. Bakken Shale natural gas production in North Dakota topped 3 Bcf/d in October, while oil exceeded 1.5 million bpd, setting new records in the state.

Department of Mineral Resources (DMR) Director Lynn Helms reported a month/month oil production increase of 5% and a 4% hike over the same time for gas. Oil prices exceeded estimates by 2% in October at nearly $42.00 a barrel for Bakken sweet crude.

Outrigger Energy II announced in early January that it has entered into a long-term gas gathering and processing agreement with XTO Energy Inc. to service XTO's production in Williams County, North Dakota. The gathering system will comprise a 70-mile, 20- and 24-inch diameter, rich gas pipeline originating in eastern Williams County and terminating at a new 250 MMcfd cryogenic gas processing plant located west of Williston, ND.

Denver/Julesberg (DJ) Basin - Colorado

It's déjà vu all over again: The same group that pushed Proposition 112 in the 2018 election process has filed six new ballot initiatives with the state, with five of those pushing for longer drilling setbacks.

Proposition 112, which called for drilling setbacks from occupied structures and vulnerable areas to increase from 500 feet to 2,500 feet, failed at the ballot box 57% to 43% in Nov. 2018. Similar to Prop 112, most of the proposed ballot initiatives filed in early January involve drastically increasing setbacks for all new oil and gas development. Current drilling setbacks are 500 feet from homes and 1,000 feet from schools, hospitals and playgrounds.

Permian Basin – Texas/New Mexico

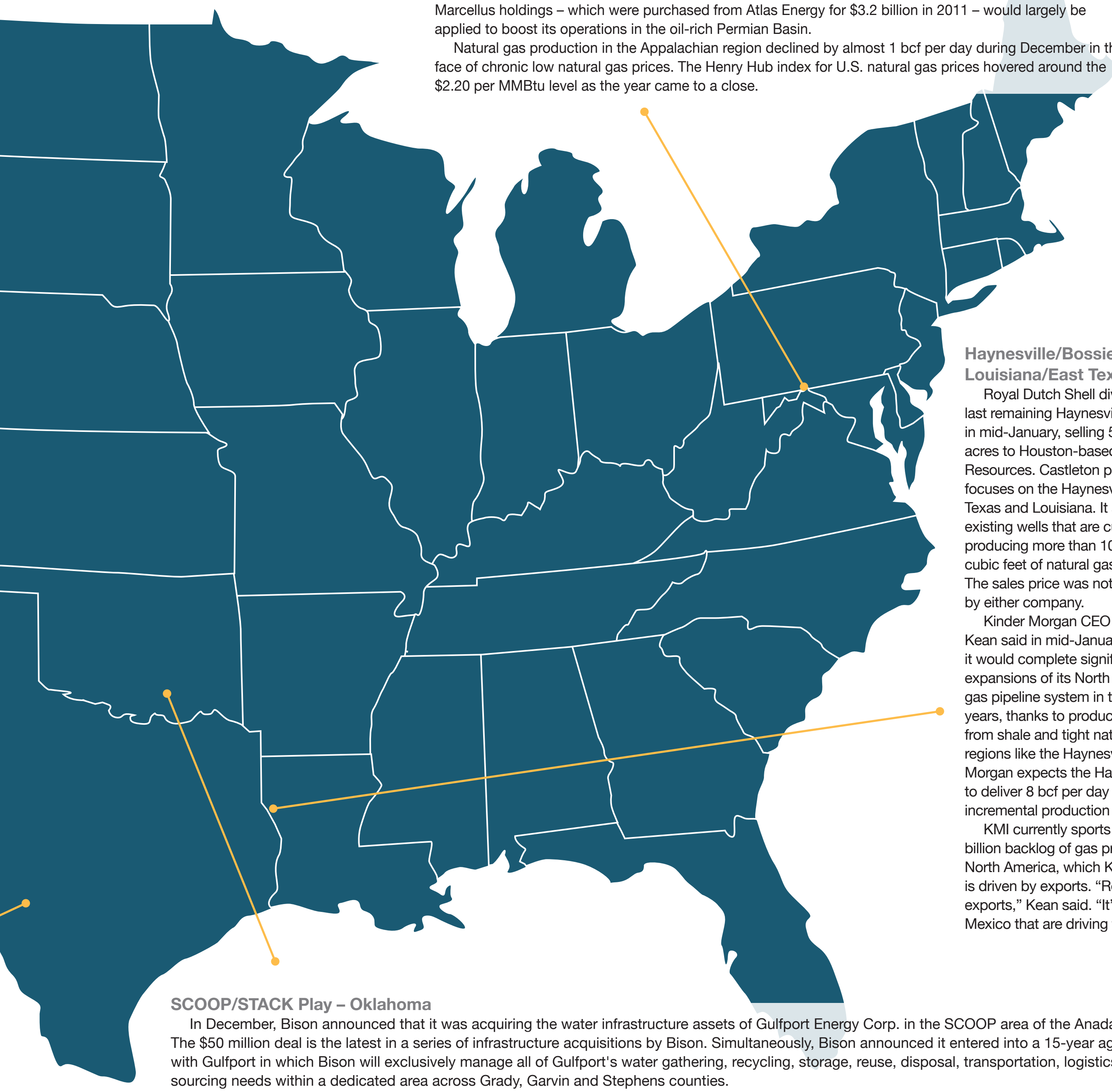
A new report issued in January by the Texas Independent Producers and Royalty Owners Association (TIPRO) finds that the oil and gas industry directly employs more than 87,000 people in the Texas portion of the Permian Basin. TIPRO's report said the upstream sector remained the top employer for oil and gas in the Permian basin last year. Support activities for oil and gas operations supported 54,507 positions, crude petroleum and natural gas extraction supported another 16,572 jobs and drilling oil and gas wells supported 6,554 jobs, according to the report.

Stage Completions (USA) Corporation announced a record-setting 221-stage Permian well completion on Jan. 14. The 5.5" Bowhead II Sliding Sleeve System becomes the largest interventionless hydraulic fracturing operation completed to date. Stage says the operation was accomplished in six days (41 stages per day), and it was part of a larger campaign where a total of 1,095 Bowhead II sliding sleeves across six wells were fractured.

Eagle Ford Shale – Texas

Houston-based Apache Corporation announced in early January that it would close its San Antonio office, and lay off many of the 270 employees located there. The office has served as a satellite headquarters for the management of the company's assets in both the Eagle Ford region and the Permian Basin. Some of the San Antonio employees will be asked to relocate to either Houston or the company's Permian Basin field offices.

The Eagle Ford region finished 2019 with 67 active drilling rigs, according to the Baker Hughes weekly rig count. That compares to 80 active rigs in the area at the end of 2018.



Marcellus/Utica Shale – Pennsylvania/West Virginia/Ohio

In its December earnings call, Chevron CEO Michael Wirth announced his company would begin the process of divesting its Marcellus Shale assets. Wirth indicated that proceeds from the sale of the company's Marcellus holdings – which were purchased from Atlas Energy for $3.2 billion in 2011 – would largely be applied to boost its operations in the oil-rich Permian Basin.

Natural gas production in the Appalachian region declined by almost 1 bcf per day during December in the face of chronic low natural gas prices. The Henry Hub index for U.S. natural gas prices hovered around the $2.20 per MMBtu level as the year came to a close.

Haynesville/Bossier Play – Louisiana/East Texas

Royal Dutch Shell divested its last remaining Haynesville assets in mid-January, selling 55,000 net acres to Houston-based Castleton Resources. Castleton primarily focuses on the Haynesville in East Texas and Louisiana. It acquires existing wells that are currently producing more than 100,000 cubic feet of natural gas per day. The sales price was not disclosed by either company.

Kinder Morgan CEO Steven Kean said in mid-January that it would complete significant expansions of its North American gas pipeline system in the coming years, thanks to production growth from shale and tight natural gas regions like the Haynesville. Kinder Morgan expects the Haynesville to deliver 8 bcf per day of incremental production by 2030.

KMI currently sports $2.8 billion backlog of gas projects in North America, which Kean says is driven by exports. "Really, it's exports," Kean said. "It's LNG and Mexico that are driving this."

SCOOP/STACK Play – Oklahoma

In December, Bison announced that it was acquiring the water infrastructure assets of Gulfport Energy Corp. in the SCOOP area of the Anadarko Basin. The $50 million deal is the latest in a series of infrastructure acquisitions by Bison. Simultaneously, Bison announced it entered into a 15-year agreement with Gulfport in which Bison will exclusively manage all of Gulfport's water gathering, recycling, storage, reuse, disposal, transportation, logistics and sourcing needs within a dedicated area across Grady, Garvin and Stephens counties.

Houston-based Infrastructure Networks announced in early January that it had reached a deal with Nokia that will bring 5G cellular service to five major shale basins, including the SCOOP/STACK. "Operators, drillers and oilfield service companies can now embrace automation, artificial intelligence analytics and machine learning, only made accessible with next generation, high-bandwidth, low-latency connectivity," Infrastructure Networks CEO Mark Slaughter said in a statement.

About the author: *David Blackmon is the Editor of SHALE Oil & Gas Business Magazine. He previously spent 37 years in the oil and natural gas industry in a variety of roles — the last 22 years engaging in public policy issues at the state and national levels. Contact David Blackmon at editor@shalemag.com.*

Big Green, Inc.: The Heinz Endowments Assault on Shale Prosperity

By: **Jordan McGillis and Paige Lambermont, Institute for Energy Research**

In American energy politics today, there is an alleged David vs. Goliath battle underway. As this narrative tells it, the scrappy, grassroots environmental movement is bravely aiming its sling at behemoths that pursue profits from their oil and gas enterprises with no regard for the Earth or its inhabitants. This narrative holds that while the oil and gas industry deploys armies of slick lobbyists in Washington, the environmental movement rounds up any support it can get: from Main Street, from family farms, from mom-and-pops, from the folks next door.

Big Green, Inc., a project of the Institute for Energy Research (IER), shatters this David vs. Goliath myth. The project reveals that the environmental movement is a multi-billion dollar industry that has turned Americans' desire for clean air and water into a political juggernaut that leverages government to block access to affordable, reliable energy. Far from being a proverbial David, the environmental movement is a well-oiled lobbying machine with as many hidden income streams and amorphous front groups as it claims prop up the energy industry. While reaping all the benefits of our modern industrialized world, this parasitical class besieges the energy producers who provide for our economic lifeblood and makes Americans, who want simply to live happier, healthier, more prosperous lives, worse off. IER has dubbed this machine Big Green, Inc.

In 2018, IER made public its first tranche of research into Big Green, Inc., detailing 8,821 environmental grants from 2008-2016 adding up to $3.7 billion. This money flowed from ten left-leaning foundations to over 1,500 environmental activist groups spanning all 50 states. IER's searchable database enables users to see precisely who gives, who receives and for what purposes the money is granted.

The Heinz Endowments

In its 2019 update, IER added three new grantmaking organizations to the Big Green, Inc. database. This update covers 1,583 grants originating from the Heinz Endowments, the Bloomberg Family Foundation and the Kresge Foundation. Between 2008 and 2016, these three foundations funded 513 environmental groups — many of which hold anti-energy biases — across the United States with grants totaling $473,207,264.

The Heinz Endowments deserves special attention. Based in Pittsburgh, Pennsylvania, the Heinz Endowments focuses much of its environmental grantmaking effort on projects opposing the development of its home region's abundant shale resources. If the name Heinz sticks out, it is indeed the same name likely affixed to your ketchup bottle. And yes, this is the same Heinz affiliated with former U.S. Secretary of State, longtime U.S. Senator, and 2004 Democratic presidential nominee John Kerry. In the period from 2008 to 2016, the Heinz Endowments contributed over $120 million in environmental grants. While some of the grants went toward meaningful environmental progress, tens of millions of dollars went to organizations intent upon shutting down the industries that comprise the regional backbone. Shale development has become a primary target of Heinz partners.

The Marcellus Shale boom has been a display of Pennsylvania at its best, and has exemplified the creativity, learning, and sustainability Heinz deems its "priority strategic funding areas." Innovation, hard work, and stewardship of resources have been the shale boom's hallmarks as it has elevated many heretofore-struggling locales in the region. Pennsylvania's natural gas resources and the companies working to develop them have created thousands of high-paying jobs and invested millions in regional economic growth. With the boom, new businesses have sprung up, landowners have gained a new income source and energy has gotten cleaner and cheaper for all.

Heinz Grant Activities

Despite these benefits, the Heinz Endowments, true to Big Green, Inc. form, has granted funds to promote cumbersome laws designed to crowd out energy producers, to stimulate public anxiety and to spread disinformation, as when it explicitly funded an expansion of the website Fractracker.org, a notoriously dishonest broker.

The endowments have also funded numerous grants in recent years around air quality concerns in Pennsylvania. But what this work fails to take into account is that Pennsylvania air quality today is better by far than it was before widespread natural gas extraction in the state began. In the period of evaluation, the Heinz Endowments donated more than $15 million to hinder hydraulic fracturing in particular.

The purposes of many of their grants are internally inconsistent. For example, a $120,000 grant to PennEnvironment Research and Policy Center in 2015 was "(t)o augment public education and civic engagement to address air pollution and shale development in the region." This framing insinuates that shale development is an air quality issue when, in reality, it is an air quality solution. Natural gas is one of the cleanest burning and least air polluting heating sources available, and its widespread use has contributed to bettering air quality in Pennsylvania and elsewhere.

Grants to Netcentric Campaigns "support community networks in shale-impacted regions in Pennsylvania." This grant language suggests shale development has been some sort of detriment to communities, when in fact, shale development brings new economic dynamism to small towns and cities across the state, fostering a renaissance of small businesses on numerous Main Streets. Organizations like Netcentric Campaigns appeal to the mainstream with terms like "support community networks," but speak to their base of donors about a "fight against the gas industry," making clear their intentions.

Many of the Heinz Endowments' energy and environment-related grants are for political purposes that are nakedly at odds with the region's prosperity. In 2015, a Heinz grant supported a so-called climate justice rally, run by Pittsburgh 350, a local chapter of 350.org, the far-left group that advocates for the total abolition of natural gas, coal and oil use in the immediate future. The Heinz Endowments has also funded EarthJustice, the Environmental Defense Fund and other national groups advocating for a near term full abandonment of reliable energy resources. Closer to home, Heinz has funneled millions of dollars to deceitful groups like the Center for Coalfield Justice. The Center for Coalfield Justice demonizes both coal and gas development, describing hydraulic fracturing as "destructive," "extremely invasive" and "threatening public health and the environment." Another Pennsylvania-based organization on the Heinz payroll is the Clean Air Council, which received over $1.3 million from the Heinz Endowments to harass the shale gas industry in western Pennsylvania.

Local Political Influence

While some leaders in the state choose to lean into the benefits of natural gas and see the good it can bring to communities, some, including Pittsburgh Mayor Bill Peduto, remain inexplicably opposed to them. At the 2019 Climate Action Summit co-sponsored by the Heinz Endowments and featuring climate apocalypse monger David Wallace-Wells, Mayor Peduto voiced his opposition to new petrochemical facilities. In that speech, Mayor Peduto said he also plans to send a letter to Pennsylvania Governor Tom Wolf, expressing that "the expansion of this industry is an impediment to the region's growth." He could not be more wrong, and Wolf knows this. In a KDKA radio interview at the end of November, Wolf was asked about his view of Peduto's comments on the future of petrochemicals in the region, and his response was that "these are exactly what we need in that energy efficient future." Politicians like Peduto sometimes fail to see what the people they serve actually care about, like infrastructure problems and ensuring that energy is available affordably and reliably. It is heartening to see that Wolf, at the very least, understands some of the benefits of natural gas and related industries in the region.

Philanthropic Malpractice

While the region's transition to natural gas has improved local air quality and reduced greenhouse gas emissions, the region's most tangible environmental crisis has only grown more acute. Each year, nine billion gallons of raw sewage and stormwater leak into the Allegheny, Ohio and Monongahela rivers. One is left to wonder why more Heinz dollars are not allocated toward resolving this genuine, pressing local crisis. While the Heinz Endowments has made some contributions to organizations working to solve the region's water treatment issues, such as the six-figure totals it has given regularly to 3 Rivers Wet Weather, the response to this real threat has been weakened by disproportionate expenditures intended to hamstring safe energy development practices. Every dollar the Heinz Endowments grants to radical, anti-energy activists is a dollar that will not work to improve quality of life and health for Pennsylvanians, but instead do just the opposite.

Meantime, a second water crisis has emerged. Since 2016, the Pittsburgh Water and Sewer Authority (PWSA) has failed consistently to comply with federal lead thresholds. In all but one six-month period since the lead issue became known, PWSA's water samples have tested above the 15 parts per billion mark established by the Environmental Protection Agency. Lead exposure, according to the World Health Organization, can have serious consequences for the health of children by attacking their brains and central nervous systems, resulting in reduced intelligence quotient and attention span. While the Heinz Endowments has fomented hostility to energy producers, Pittsburgh has become a second Flint.

The Heinz Endowments' funding of a systematic vilification of natural gas costs the region dearly. By working to limit the natural gas industry in Pennsylvania, the Heinz Endowments has shown itself to be at odds with its purported values. Its pecuniary resources could be better allocated toward the region's genuine environmental crises and toward enriching the area through the funding of endeavors that improve its quality of life, express its values and create meaningful good for the community rather than try to undo all of the progress that energy abundance has created for Pennsylvania.

The energy resources held in the Marcellus Shale are inextricably linked to the region's flourishing. Further, the oil and gas industry and other wealth creators represent exactly what Heinz claims to value: creative, community-enhancing solutions to the challenges we all face. The Heinz Endowments' funding of anti-energy outfits like Pittsburgh 350, EarthJustice and Fractracker does nothing but detract from opportunity and prosperity in Pennsylvania and represent the worst aspects of Big Green, Inc.

BY WORKING TO LIMIT THE NATURAL GAS INDUSTRY IN PENNSYLVANIA, THE HEINZ ENDOWMENTS HAS SHOWN ITSELF TO BE AT ODDS WITH ITS PURPORTED VALUES

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About the author: *Paige Lambermont is a policy associate at the Institute for Energy Research focusing on nuclear energy policy, hydroelectric energy policy, tax credits and subsidies in the energy sphere, and Renewable Portfolio Standards. She has a degree in political science from American University*

COVER STORY

BRAD BARRON:

NuStar's Future is Bright

By: **David Blackmon**
Photography by: **Michael Giordano**

BRAD BARRON BECAME THE CEO OF NUSTAR IN JANUARY OF 2014, WHERE HE HAD PREVIOUSLY SERVED AS THE COMPANY'S EXECUTIVE VICE PRESIDENT AND GENERAL COUNSEL. BARRON HAD BEEN A PART OF THE VALERO EXECUTIVE TEAM WHEN NUSTAR WAS SPUN OFF IN 2006.

PHOTO COURTESY OF BRAD BARRON


NuStar
TK 7300-001

BARRON TOOK OVER THE CEO POSITION DURING ONE OF THE COMPANY'S MOST DIFFICULT FINANCIAL PERIODS. AS A PARTNERSHIP, NUSTAR IS OBLIGATED TO DISTRIBUTE ALL OF ITS "EXCESS CASH" TO ITS PARTNERS, BUT THE COMPANY HAD NOT BEEN ABLE TO MEET ITS PAYOUT OBLIGATIONS FOR MORE THAN TWO YEARS. BARRON WAS ABLE TO QUICKLY GET THE COMPANY BACK ON TRACK TO MEET ITS OBLIGATIONS, IN PART BY BEING UP-FRONT AND BLUNTLY HONEST WITH HIS EMPLOYEES.

As he told the San Antonio Express-News in a June 2017 interview:

"Shortly after I took over, we had a management meeting and showed employees: This is what our financial situation is, this is where we need to go, this is what distribution coverage means. I laid out how much we need to make, and we communicated that to every single employee in the company. Then we set the employees' bonus on that distribution number, which was $392 million.

"What I told the employees was we will make $392 million, and that goes to the unit holders. Every dollar above that goes to your bonus until we get 100% bonus and then we will split the remainder between the employees and the unit holders. The employees immediately got it." Indeed, the company was soon back on schedule with its distribution coverage and has been ever since.

NuStar Energy was created in 2001 under the initial name of Shamrock Logistics LP. The partnership was renamed Valero LP later that year when it was acquired by Valero.

Upon its acquisition from Ultramar Diamond Shamrock, Valero Chairman and CEO Bill Greehey said, "We plan to aggressively grow the L.P. to benefit the shareholders of both companies." In the intervening 18 years, the company has certainly fulfilled Greehey's vision.

Initially, the company owned and operated 2,800 miles of refined product pipelines, 11 refined product terminals, 800 miles of crude oil pipelines and crude oil storage facilities with a capacity of 3.3 million barrels. In 2005, Valero LP executed a $2.8 billion acquisition of Kaneb Pipeline Partners LP, making the company one of the largest petroleum liquids pipeline and terminal operators in the United States.

By 2006, the company was ready to separate completely from Valero, a friendly parting of the ways that was accomplished by taking the company public in a pair of public offerings. The new, completely independent company was renamed NuStar Energy LP, a name that Greehey said was chosen for a specific reason: "Our new name says it all." "We are the new star in the energy business, and because of our employees' contributions to our success, we are at a very important turning point in the history of our company. With our newfound independence, we are now in a better position to continue growing and achieving even greater success in the years ahead."

The company continued its aggressive growth program in the coming years, making an initial entry into the Eagle Ford Shale region with an acquisition in 2012. In 2015, NuStar loaded the first load of U.S. light sweet crude for export at its Corpus Christi North Beach Terminal following the repeal of the 1970s-era ban on crude exports.

In 2017, NuStar made its entry into the Permian Basin by acquiring Navigator Energy Services, LLC and its extensive Permian Crude Gathering System for $1.5 billion. As we will see later in this piece, that acquisition has been very successful for the company, and an integral driver of its continuing growth.

The last few years have been a time of significant expansion for NuStar as the company has positioned itself as one of the country's largest pipeline and storage companies. Along the way, NuStar has also been recognized by Fortune Magazine as one of the country's 100 Best Places to Work and has received much praise for its myriad contributions to community service.

We sat down with Barron in September to talk about the company's growth, its future and his personal management style and philosophy.

SHALE MAG: YOU'VE HAD OBVIOUSLY A PHENOMENAL AMOUNT OF GROWTH SINCE THE COMPANY WENT PUBLIC IN 2001, AND ONE THING WE TRY TO DO FOR OUR READERS IS TO TRY TO EXPLAIN TO THEM IN TERMS EVERYONE CAN UNDERSTAND THE IMPACTS THAT VARIOUS ASPECTS OF THE BUSINESS REALLY ARE. IT WOULD BE VERY INTERESTING FOR OUR READERS FOR YOU TO EXPLAIN HOW BECOMING A PUBLIC COMPANY HELPED TO ENABLE THE RAPID GROWTH THAT YOUR COMPANY HAS HAD.

BARRON: We really couldn't grow the way we've grown without access to public capital. The reason anybody becomes public is to access the public markets, both equity and debt. So, that's how a lot of our growth has been funded. Up until these last few years when the public equity market has dried up for energy, particularly it dried up for MLP's, now it's drying up for E&P producers, as you know.

Access to public equity actually allowed us to build the projects that we needed to build. The way I think about our growth, sort of the NuStar elevator pitch, is we're a large publicly traded partnership, a master limited partnership. We have operations in 27 states, we have close to 10,000 miles of pipe. In terms of storage capacity, we have approximately 74 million barrels of storage capacity.

SHALE MAG: WOW.

BARRON: Yeah, we have quite a bit of storage. In terms of how we're divided up, we used to be about 50/50 between storage and pipelines. But in these recent years, we've trended more towards pipeline, so now pipeline is about 2/3 and storage is about 1/3. That's about what you would expect in a backwardated market.

(Note: A "backwardated" market is a market in which the current price — the spot price — of oil is higher than prices trading in the futures market. The opposite of backwardation is "contango," where the futures contract price is higher than the expected price at some future expiration. Backwardation can occur as a result of a higher demand for an asset currently than the contracts maturing in the future through the futures market.)

We have also had these huge opportunities in the Eagle Ford and the Permian, so we've seen a lot of our growth there. Within our pipeline segment, crude is about 2/3 of our capacity and refined products is now about 1/3. That gives you a little bit of an idea about how we're set up.

SHALE MAG: TALKING ABOUT THE PERMIAN AND EAGLE FORD MARKETS, DO YOU ANTICIPATE ANY FURTHER OPPORTUNITIES FOR EXPANSION RELATED TO CRUDE COMING OUT OF THOSE TWO MAJOR BASINS?

BARRON: Absolutely. The reason we moved into the Permian — we talk about it here internally in terms of "dislocations." Midstream logistics companies exist to solve a dislocation in the market, and the biggest dislocation, at least in my career, has been the Permian Basin. But for the benefit of readers, a dislocation occurs when you have a product or commodity in one place, and it needs to get to another place. The fact that the product can't get there results in an economic dislocation.

So that is the issue that midstream companies exist to resolve. We saw the Permian Basin rising as a real power about three years before we jumped into it. We watched it for quite a while, we did our own projections as to what it can do and then we began looking for the perfect way to have a foothold in that. Our belief was if you're going to be a midstream company you have to have a presence in the Permian.

So, we looked at probably 16 different gathering systems because we think gathering is the best way for us to participate at that particular dislocation, or one way. We looked at about 16 different systems and we chose the Permian Crude System based on a couple of things.

THE LAST FEW YEARS HAVE BEEN A TIME OF SIGNIFICANT EXPANSION FOR NUSTAR AS THE COMPANY HAS POSITIONED ITSELF AS ONE OF THE COUNTRY'S LARGEST PIPELINE AND STORAGE COMPANIES

One was its location. As you know, not all acreage in the Permian is created equal, so we wanted to get something that's the heart of the Midland Basin. There's been a lot of heat around the Delaware Basin, but our view was that the Midland Basin would be able to sustain itself in a challenged price environment more than the peripheral basin would, and I think we're seeing that play out. So, we're really happy. We're in five of the six most prolific counties in the Permian.

You asked about future growth. We think that system can grow probably another 200,000 barrels a day, maybe even more, and we expect to see that pattern of growth over the next five years or so.

(Note: Indeed, on Nov. 19, 2019, NuStar announced an open season on a 200,000 barrel per day expansion of its Permian Crude Gathering System.)

I mentioned there are multiple ways to participate in a dislocation like the Permian. The three big ways are: Infield gathering, or intrabasin gathering, which is what we have in the Permian Crude System. The middle part is the long-haul pipeline, long haul take-aways. Those are your big 30-inch pipelines coming down to Corpus Christi and over to Houston. And then the third way is the exports. Most of this crude is trying to get to the water for export, or a lot of it is trying to get to the water for export.

We chose to participate in the basin, and chose not to participate in the long-haul pipelines for a couple of reasons: One, the long-haul systems are extraordinarily capital intensive. Unless you have a marketing arm it's very difficult, I think, to make those make sense. If you look at the people who are building them, they have in-house marketing. So, we made the affirmative decision to not build one of those pipelines. Also, in order to make money, you really have to fill them up. From our perspective, it just wasn't the right fit for us.

What is the right fit for us, though, is the Port of Corpus Christi. And part of the reason that's a great fit for us is we already had assets on the ground, we had expanded those assets during the shale boom in the Eagle Ford. So, we built another dock to handle some of our Eagle Ford volumes, and we overbuilt the dock so that now we have the capacity to handle Permian crude as well.

Tying that all together, if you look at our system now, we've got a big gathering system that can handle 560,000 barrels a day in the Permian, and it's connected to every major outbound pipeline out of the Permian. And then we're connected to those same pipelines down in Corpus Christi, and the first part of that was a big connection we did for Trafigura. That was a 16-inch pipeline we had going to Oakville. So, the very first Permian barrels that were exported came out over our docks. We're really proud of that.

We also signed a deal with Trafigura though where we are moving crude off of the Cactus 2 Pipeline, which is a Plains pipeline that comes out of Taft. So, we built a 30-inch pipeline from Taft over to our North Beach docks to handle all of Trafigura's volumes.

I get this question sometimes at investor conferences, they say "Well, what gives you an advantage in Corpus Christi over some-one else?" The kind of flippant answer that we sometimes give is because you can go and actually use our docks. You can come touch them, see them, they're moving crude today, you know they're not blueprints, they're actually built and functioning.

SHALE MAG: SEAN STRAWBRIDGE RECENTLY SAID THAT HE ENVISIONS HIS PORT BECOMING THE "CUSHING OF THE COAST" WITH ALL THE NEW STORAGE CAPACITY BEING INSTALLED, AND YOUR COMPANY OBVIOUSLY IS PLAYING A HUGE ROLE IN THAT. TALK ABOUT THE FACTORS THAT LED NUSTAR TO BE-COME A BIG PLAYER AT PORT CC.

BARRON: We think that's (Strawbridge's projections about the growth of PortCC stor-age) true as well.

You know, we're big supporters of the Port of Corpus Christi, we've had a great relationship with them for a long time — it goes all the way back to Bill Greehey's rela-tionship with the port when he was at Valero, and NuStar sort of inherited that goodwill. We think the port is very well positioned to become the dominant export port over the Port of Houston for several reasons:

One, it has fewer fog days, less conges-tion, and it is a dedicated energy port. So, they don't do container ships in and out of Corpus Christi, and that allows it to be a dedicated port.

They're also investing in what's called deepening and widening projects, which I'm sure you're aware of, and that will benefit all the folks like us.

Finally, there is just a tremendous amount of infrastructure there already. So, you take our docks along with some others, and we should be able to handle the 2.3 million bar-rels per day of pipeline capacity pointed at Corpus Christi.

We also believe that Taft will develop into a big hub. It's right outside of Corpus, and so those big pipelines are coming into Taft and then we're connecting there in Taft and bringing it over to our dock facilities. We just built the 30-inch pipeline I mentioned earlier, and the standard capacity is 600,000 barrels a day on that line. It can do a million per day fully powered up, but 600,000 should do for now.

SHALE MAG: SO, ALL OF THIS, OF COURSE WITH THE PORT OF CORPUS CHRISTI AND ALL THE EXPANSION TAKING PLACE THERE, WAS ENABLED BY THE REPEAL OF THE BAN ON THE EXPORT OF U.S. CRUDE OIL THAT WAS IMPLEMENTED DURING THE 1970S. TALK ABOUT HOW CRUCIAL THAT REPEAL WAS IN FACILITATING THE DEVELOPMENT OF U.S. EXPORTS.

BARRON: You can call it crucial; you can call it transformative, really any superlative adjective you want to add to it. It's key, and I think it's key in America's energy independence and dominance.

It's kind of a counterintuitive thing. You would think that, ok you can export oil, that doesn't allow you to be dominant. But what it has done, the fact that you can export the excess oil, is encouraged investment in the infrastructure it takes to develop the oil. So, now the United States could have a much bigger impact on the world's stage. I actually wish we could go a little bit further with our energy policy, but that's a whole other topic.

I'm looking at a slide here that we have that shows crude exports going from zero in 2014, and the projection is 6 million barrels a day in 2024.

SHALE MAG: ONE OF THE FASCINATING THINGS ABOUT YOUR COMPANY IS THIS 2,000-MILE PIPELINE SYSTEM THAT TRANSPORTS ANHYDROUS AMMONIA THROUGH THE MIDDLE OF THE COUNTRY TO AN ARRAY OF DELIVERY POINTS, AND OUR READERS WOULD REALLY ENJOY LEARNING ABOUT THAT. WHERE DOES ANHYDROUS AMMONIA ORIGINATE, FOR EXAMPLE?

BARRON: Well, it is an interesting story. Most ammonia used to be created or manufactured overseas, and it came in, if you notice where that pipeline came down it goes all the way down and heads at the mouth of the Mississippi River. The United States used to bring in foreign cargos of ammonia.

One of the things that comes from hydraulic fracturing for oil is you get a lot of natural gas. As a result, the United States is awash in natural gas, and natural gas is the feedstock for ammonia. Today, the supplies of anhydrous ammonia are almost all domestic.

Most of the ammonia that goes on our pipeline is being sourced domestically up and down that pipeline — that's been one of the big shifts we've seen on that line. The other thing about the line is the use of the ammonia. Some of it is used industrially, so there's different plants along the line that's used for different industrial processes. But probably the biggest use is as fertilizer on the farm fields of the U.S. If you look where this thing goes, it goes right out into corn country, soybean country, Iowa, Nebraska, all those great states.

SHALE MAG: WHAT OTHER PARTS OF THE NUSTAR SYSTEM WOULD YOU LIKE TO TALK ABOUT TODAY?

BARRON: You know, what I would tell you is that we are focused on solving dislocations. So, our focus in recent years has been on crude first in the Eagle Ford then in the Permian.

However, we do have terminals all around the country, particularly a lot of marine terminals. And one of our big success stories has been moving biofuels on the West Coast. That was an opportunity that our team on the West Coast saw — they saw an increasing demand for that in California, Washington, Oregon, and we began making the investments in order to handle biofuels. We have a relationship with the two largest biofuels manufacturers in the world to handle their biofuels on the West Coast. It's been a really successful part of our business, something we're real pleased about.

SHALE MAG: YES, THAT'S A REAL GROWTH INDUSTRY TOO, ISN'T IT?

BARRON: Mmhmm. That's a growth industry, and I think there's an increasing focus on what people perceive to be more environmentally friendly fuels, so we're happy to participate in that as well.

WE HAVE OPERATIONS IN 27 STATES, WE HAVE CLOSE TO 10,000 MILES OF PIPE. IN TERMS OF STORAGE CAPACITY, WE HAVE APPROXIMATELY 74 MILLION BARRELS OF STORAGE CAPACITY

SHALE MAG: YOU MENTIONED A LITTLE BIT AGO THAT NUSTAR CURRENTLY OPERATES 74 MILLION BARRELS OF STORAGE. THAT'S GETTING FAIRLY CLOSE TO THE TOTAL STORAGE AT CUSHING, OKLAHOMA, ISN'T IT?

BARRON: You know, I don't know how much is at Cushing, because we don't have anything there. (Note: The EIA estimates that current storage capacity at Cushing is 85 million barrels of crude oil.) Plus, you've got to remember that some of ours is divided between refined products and crude. So, the biggest crude hub we have is Saint James, Louisiana. We've got 12 million barrels of storage at Saint James. And then we have 3 or 4 million barrels in Point Tupper, which is in Nova Scotia. We have almost 4 million barrels of crude storage in Corpus Christi. And then a lot of the terminals are refined products, like in the New York Harbor where we have a substantial terminal there of all refined products.

SHALE MAG: ONE THING ABOUT THE STORAGE PART OF THE BUSINESS THAT WE HEAR A LOT ABOUT IS THE IMPACT THAT WEEKLY CHANGES IN CRUDE INVENTORY HAVE ON SHORT-TERM CHANGES IN OIL PRICES. CAN YOU CLARIFY FOR OUR READERS WHY THESE CHANGES IN THE INVENTORY LEVELS PLAY SUCH AN IMPORTANT ROLE IN THE DETERMINATION OF OIL PRICES?

BARRON: That's a hard question to answer. It's a hard question to pontificate about. What we see more is, rather than trying to look at the fluctuation in crude prices, I try to look more at the longer-term trends, and we're more focused on the global supply and demand balance. I think those fluctuations you see in storage are sort of a marker of that. Sort of like taking someone's temperature, it's one little marker, you take someone's blood pressure, it's a marker maybe of overall health or a direction that it's headed.

I think that maybe people use that as a marker of where the supply and demand balance actually is. But if you notice, it's very volatile. It goes up and down overnight, so a lot of that is just traders making money, you know, trading back and forth. It's not really that dialed in.

But we don't take title to any of the barrels. We don't own the commodity at all and most of our contracts for storage are long-term contracts. The average term of our contracts is three, five, seven years. So, for us, we're agnostic as to what the price is.

SHALE MAG: ARE THOSE FIXED-FEE CONTRACTS?

BARRON: They are. These are fixed-fee contracts, so you know it's like a storage warehouse. What we do watch pretty carefully with regard to crude prices is how they affect oil production in the basins. Permian, Eagle Ford. There's a healthy band, as you know, that the price needs to be in: If it gets too low, it affects production. If it gets too high it affects the economy, and again begins to affect production. So, there's a sweet spot in there where producers make money, the economy thrives, everybody does well. That's where we really want to see crude prices.

SHALE MAG: LET'S TALK ABOUT SAFETY BECAUSE WE KNOW WHAT A PRIORITY THAT IS FOR THE MIDSTREAM BUSINESS. TALK ABOUT WHAT THE TYPICAL DAILY SAFE-

TY BRIEFING THAT WOULD TAKE PLACE AT ONE OF YOUR STORAGE FACILITIES OR ONE OF YOUR BIG INSTALLATIONS WOULD LOOK LIKE

BARRON: Safety is a very, very important topic for us. It's something that we spend a lot of time and a lot of resources on. I'm proud to say, it wasn't this last year, but the year before, we had zero lost-time injuries, and we had zero recordable injuries. So that's huge….

SHALE MAG: THAT'S AN INCREDIBLE TRACK RECORD…

BARRON: Yeah, that's a great track record for us. One of the reasons is that safety culture is top of mind here for everyone. One of the things we participate in is OSHA's VPP program, the Voluntary Protection Program, which is an employee-led initiative. So, it's not pushed from management going down, it's from employees coming up.

We provide the resources for them to do it, and it's a very rigorous training that the employees go through. Then, OSHA inspectors come through, they quiz the employees on the basics of safety, they look at the facility, and then you pass, you get certified. We have 31 facilities now that are VPP certified, which is roughly 80% of all of our sites. We have about five big areas that we need to continue to get certified. So, that's been a tremendous boost for safety for us.

In terms of a typical briefing, we have a program called Take 2 for Safety. For example, say there's work to be done on any given day: We'll gather everybody together, and we'll talk about the work to be performed. They talk about who's going to perform the work, what equipment it's going to take to perform it, what the work actually entails, and then what could possibly go wrong. And they spend as long as they need to talk about that, planning out the job before anyone's released to actually go do work.

Then, at any point, we have what's called "pull the chain to stop the train." Anyone has the right and the responsibility to pull the chain and stop work — pull the chain figuratively if they see anything that gives them a concern. So, that's what a typical safety briefing would entail.

That actually reminds me of one other thing. You know, we talked about dislocations and what a big dislocation the Permian has been, so that has actually resulted in the highest capital spend in our history this last year.

You'd expect that if you're having the highest capital spending, safety would slip, and so we spent a lot of time being focused on safety, and we have not seen our safety slip during that time, and that's something we are very proud of.

SHALE MAG: WHAT ABOUT WHEN YOU HAVE A PIPELINE RIGHT OF WAY THAT GOES THROUGH A POPULATED AREA, WHERE A NEIGHBORHOOD MAY BE FAIRLY CLOSE TO YOUR RIGHT OF WAY. ARE THERE SPECIAL SAFETY PRECAUTIONS NUSTAR TAKES IN THOSE SITUATIONS?

BARRON: We do. In general, we have a mailing once a year to everyone who has property nearby to let them know that there is a pipeline there, to let them know that they need to call, make one call, call 811 before they dig or anyone digs around them. So, we try to advertise that.

We do a lot of signage along our pipelines. We have a policy where you need to be able to see — its called "line of sight" — whenever you're standing at a sign, you need to be able to see the next sign on the pipeline, so no matter where you are looking on the pipe, you should be able to see one ahead of you and one behind you.

We do have a pipeline in a heavily populated area where it was hard to put signs like that, so what we did instead was to put markers on the pavement. So, there are markers on the pavement saying, "NuStar pipeline — call this number if you need to know more."

The other thing we encourage our guys in the field to do, and this may be getting a little bit more rural, but we encourage them to get to know the landowners where the pipelines go and talk to the landowners frequently, and encourage them to give us a call if they see anything that gives them a concern.

SHALE MAG: WHAT ABOUT CRISIS RESPONSE? TALK ABOUT HOW NUSTAR PREPARES ITS EMPLOYEES TO RESPOND TO EMERGENCY EVENTS.

BARRON: We have an emergency operations center at our headquarters, and each one of our major departments within the company has a representative that sits on what we call the EOC (Emergency Operations Committee). For example, you'll have representatives from operations, strategic sourcing, communications, legal, accounting, all those people, and they come together and they give reports from the field. There's an EOC in the field as well, and we help them manage the crisis. I think that's not uncommon — most companies have that kind of response plan.

What's more uncommon, or I think it is, is the way that we work with our employees during a crisis. I'll give you an example: When Hurricane Harvey was coming to Houston, or any hurricane, what would happen then is our HR department would work with the regional HR folks to build an evacuation plan for every employee and their family.

So, we would go ahead and book hotel rooms that are out of the storm's path, so those employees could evacuate their families, get them out. Then we would track every single employee during the course of the storm to make sure that they are safe. Then, when the storm's over, the first thing that we do is rather than get the facility back up and running, we check on all the employees to see what kind of issues they have at their homes, to see what kind of help that they need.

After Harvey passed, we sent crews from up here. I don't know how many crews we sent, but there were several. We have a Strategic Sourcing Group that puts together necessary items - you know, right after the storm, you couldn't get certain kinds of food and water. They're putting together truckloads of water, milk, and supplies. And other things that people needed, like generators, toilet paper, chainsaws. All that sort of stuff, they put it on trucks, and we drove it to Houston and took it to the people.

Next, we send a crew to everybody's house, so a person can't come back to work and function fully if they're worried about their family at home dealing with downed power lines, flooding, major things like that. They just can't focus on their work. So we sent people out to everybody's house, we tore out sheetrock, we tore out carpet, swept out the water, got the trees off the driveway, got them individually back up and running, so that they and their families were safe, and that allowed them to go ahead and come on back to work.

We also have a program that Mr. Greehey started years

ago called the Safe Fund, which provides a grant for people who wind up with a problem. So, it's not a loan, it's just a grant, you never have to repay it. It can be up to $10,000, depending on need.

To give you an example, we had a hail storm come through here, and some of our employees had parked on top of the parking garage on the top floor, and the storm literally broke every window in their car. Some of them had a high deductible on their insurance policy, and that became stressing for them, so we authorized the Safe Fund to cover the deductible on their insurance policy. And we did that during the hurricane for people's home insurance deductibles, stuff like that.

One thing that Mr. Greehey's always believed, and we believe in, is that our employees are our number one asset. And he's always believed that if you take care of the employees, the employees will take care of the company, and take care

of the community, and ultimately the investors. So, that's something that we try to practice every day.

SHALE MAG: YOUR COMPANY HAS BEEN NAMED ONE OF FORTUNE MAGAZINE'S 100 BEST WORKPLACES IN TEXAS. OBVIOUSLY, YOUR FOCUS ON YOUR EMPLOYEES' WELL-BEING IS ONE OF THE BIG FACTORS THAT WENT INTO RECEIVING THOSE AWARDS. DO YOU WANT TO TALK ABOUT OTHER THINGS, OTHER PARTS OF THE WAY YOU DO BUSINESS, THAT HAS MADE YOUR COMPANY SUCH A GREAT PLACE FOR PEOPLE TO WORK?

BARRON: I think giving people the opportunity to contribute in their community is really important, and it's particularly important to the millennial generation — we hear that a lot from those guys. I think the other thing is, we just have a culture of respect at our company, and again, that comes from Bill Greehey. Everybody has an important role to play here, and we treat everybody that way.

Another thing that NuStar does, is we make volunteering easy. We have a pretty much full-time volunteer coordinator, and our volunteer events are run by a volunteer council. Those are people elected throughout the company. They come together and meet to decide these are going to be our volunteer initiatives for the year. And we encourage all employees to give at least 25 hours of community service. We try to make that happen — we give people time off from work to do that.

SHALE MAG: ANOTHER THING THAT IS INTERESTING IS YOUR PROFESSIONAL BACKGROUND AS AN ATTORNEY. IT IS NOT ALL THAT COMMON TO SEE ATTORNEYS BECOME CEOS IN THE ENERGY BUSINESS, SO IT IS AN INTERESTING PROGRESSION. TALK ABOUT HOW THAT ALL CAME ABOUT, AND YOUR PHILOSOPHY OF MANAGEMENT THAT HELPED YOU MOVE UP INTO THE CEO SLOT OF A MAJOR COMPANY LIKE THAT.

BARRON: I would say probably a big reason that I had this opportunity to be the CEO, is because when we split off from Valero we were a very small company, and everybody had to wear a whole lot of hats. So, I had the opportunity during that time to wear a whole bunch of different hats and interface with a lot of different groups. Over the years I've had the law and tax departments report to me, real estate and right of way report to me, HR reported to me, and health safety and environmental at one point — a whole lot of different groups. So, I think when it came time to consider a new CEO, I wasn't part of the deliberations, but I'm sure the board talked about and looked at it and said here's the person who knows the most elements of the company and how to have everybody working together.

SHALE MAG: YES, A HIGH DEGREE OF VERSATILITY, OBVIOUSLY. DO YOU HAVE ANY PERSONAL MENTORS WHO YOU KNOW IN YOUR BUSINESS LIFE THAT YOU WOULD LIKE TO RECOGNIZE AS HELPING TO PREPARE YOU TO MAKE THAT MOVE?

BARRON: Oh, of course, the most obvious one Bill Greehey. What a great mentor. I don't know if you know Bill's background, but at one point, Bill Greehey was responsible for creating five publicly traded companies. Just the things that he has accomplished in the energy business are incomparable — there are only a handful of people who have done anything like that.

And then to add on top of that, what's really unique about Bill is his philanthropy. He's done so much for the city of San Antonio, and he has created I don't know how many millionaires in the city of San Antonio through Valero, and through NuStar. And he's also created a group of philanthropists in the city. A lot of people who give here are people who have been associated with Bill in some way. So, he's a great example, a great mentor in pretty much every way.

SHALE MAG: WHAT WOULD YOU SAY A TYPICAL WORKING DAY LOOKS LIKE FOR YOU THESE DAYS?

BARRON: Hah! A lot of meetings. I wouldn't say there's a day that's typical — every one is very, very different. The one thing we do have, we have an executive committee meeting every Tuesday that lasts several hours. But the thing we do here is we talk a lot. I believe a lot in collaboration and communication. I feel like that a big part of my job is to make sure that people with information are getting that information to the people who need to know it.

One of the things that Bill used to do that we have continued is to travel a lot to our other locations, go to the employees and actually talk to them. They're the ones who actually know what's going on. And so we have these roundtables in the field; they're actually a lot of fun; it's good to sit down with the employees, just get to hear what's on their mind, and share with them what our plans are and hear from them what their individual concerns are.

SHALE MAG: YOU ARE CURRENTLY THE CHAIRMAN OF THE BOARD OF THE ALAMO BOWL. HOW LONG HAVE YOU BEEN DOING THAT? AND WHAT IS THAT LIKE IN TERMS OF HAVING TO HELP ORGANIZE SUCH A HUGE EVENT LIKE THAT?

BARRON: I've been on the board there probably 10 or 12 years, and this year I'm the chair of the board. It's a great organization. It has a huge economic impact on the city of San Antonio. I think it brings in something like $56 million each year in tourism dollars to the city. The bowl, again, that's one of those things that Bill was instrumental in getting set up, and I'm so happy to follow in his footsteps there. But the bowl is very well run. I get to meet with the teams, we work with team selections things like that, just make sure it runs smoothly, but it's a well-run operation.

SHALE MAG: SPEAKING OF SPORTS, WHAT DO YOU DO IN YOUR SPARE TIME, WHEN YOU ACTUALLY HAVE SOME SPARE TIME? YOU KNOW, DO YOU HAVE HOBBIES, EXERCISE, OTHER ACTIVITIES?

BARRON: I like to spend a lot of time outdoors. I grew up in South Texas, in the town of Bishop. I grew up outside with my mom and dad hunting and fishing, and so I really like to do that when I get the opportunity. I try to stay in shape, so that takes up time during the week. But on the weekends, I actually like to spend time on our place west of here — a little ranch in the Hill Country. So, a lot of that, the weekend is spent filling feeders and fixing fences and just things that have to be done around a ranch.

SHALE MAG: IN CLOSING, TELL US ABOUT ONE OF YOUR FAVORITE WAYS OF GIVING BACK TO THE COMMUNITY.

BARRON: I counsel a lot of college students through various organizations I'm involved with, and I get asked a lot about choosing a first job. And the thing I tell college students all the time is don't choose your first job based on pay. And typically, I was always surprised, you know people come into an interview, and they never ask the right questions they should've asked in the interview. Like they should've asked "What's it like to work here? What's the culture like?" They should be trying to figure out "does this align with my personal beliefs?"

So, I tell these students all the time "Don't pick your first job based on pay. Pick your job based on something that fits you."

Because if you find a job that you love and the culture fits you, you'll be there early, you'll stay there late, you'll rise faster through the organization, and you'll have a bigger impact than you would if you're in a job where you're paid well, but you're miserable every day.

It's a huge difference.

About the author: *David Blackmon is the Editor of SHALE Oil & Gas Business Magazine. He previously spent 37 years in the oil and natural gas industry in a variety of roles — the last 22 years engaging in public policy issues at the state and national levels. Contact David Blackmon at editor@shalemag.com.*

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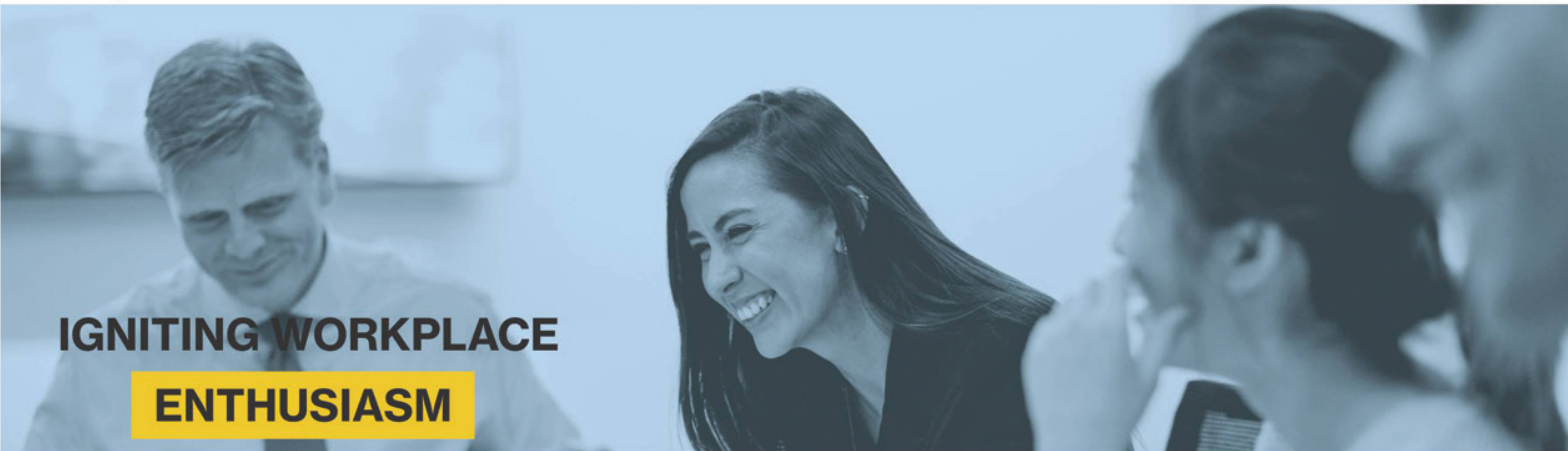

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Pipelines Are Economic Lifelines

By: **Bill Keffer**

The U.S. Energy Information Administration announced that the U.S. has set yet another new record for proved reserves of both crude oil and natural gas. "Proved reserves" are those volumes that are believed to be recoverable in the future from known reservoirs under current economic and technological conditions. Crude oil reserves now stand at 43.8 billion barrels; natural gas reserves stand at 504.5 trillion cubic feet. Those numbers are 12% and 9%, respectively, over last year's record numbers.

September was the first full month since 1949 (when government records for these statistics first began) for the U.S. to be a net exporter of crude oil and petroleum products. We are very close to becoming a net exporter on a continuous basis — an achievement every U.S. president since Richard Nixon has specifically declared to be an essential strategic objective for our national security. That was always political rhetoric; it has now become a physical reality.

Cause for celebration? Cause for relief that we are becoming energy independent, no longer held hostage by the volatile geopolitics of the world? Cause for gratitude that we live in a country blessed with abundant natural resources and the freedom of entrepreneurialism and capitalism that encourages and rewards ingenuity and innovation?

If one were to base his conclusion on a survey of news articles and opinion columns in the New York Times and Washington Post or from the incessant talking heads on CNN, instead of celebration, relief and gratitude, the only politically correct responses to news of our ever-increasing reserves of crude oil and natural gas would be panic, depression and economic, if not political revolution.

Those who believe climate change is an "existential threat" (which, by the way, means they believe climate change is a threat to our very existence — i.e., the end of civilization) have oil and gas clearly in their crosshairs and will seemingly stop at nothing to remove these essential resources from our economic equation. Their Luddite strategies (the "Luddites" were English textile workers who protested the advent of textile machinery at the beginning of the Industrial Revolution by breaking the new equipment they feared would put them out of work) include a mass effort to stop the drilling of new oil and gas wells and access to our limitless reserves under the catchy slogan, "Keep It In the Ground."

Fortunately, one of the principal reasons for the United States' success in the oil and gas industry — the private ownership of our minerals — is also one of the principal reasons climate change protesters have largely failed to "keep it in the ground." Private mineral owners think more rationally than your average protester. In fact, the only places where these protesters have gained any traction is where the government owns the minerals. Any lesson you would like to draw from that simple comparison?

The next battleground climate change protesters have chosen, in their all-out effort to artificially create a world in their own image, is to shut off the ability to transport the oil and gas they have been unable to keep in the ground. In other words, if they can't stop the production, then they'll make it so that production is stranded on location and has no way to get to the marketplace. Since oil can be transported by truck from the production site, this particular strategy typically pertains only to natural gas, which has to be put into a pipeline immediately upon production because there's no good way to store it onsite or to transport it any other way.

This strategy of protesting new pipelines came into its own during the widely-publicized Keystone XL pipeline, which was to carry heavy oil from the oil sands in Northern Alberta to the refineries along the Texas Gulf Coast. Despite the fact that the XL pipeline was a twin to the already-existing Keystone pipeline, that similar pipelines crossing the U.S.-Canada border were approved without objection on many previous occasions, and that the alleged concern about the XL crossing the Ogallala aquifer in Nebraska was being raised by Nebraskans living in a state already looking like a thousand spider webs

from the existing pipelines crisscrossing the state, the protesters decided they were going to use this particular pipeline as their line in the sand. Ten years later, it still hasn't been built.

Pipeline protesters were so encouraged by their success in delaying the Keystone XL pipeline they have taken their act on tour, and now regularly appear at locations where new pipelines are being proposed in an effort to shut down the only realistic way to transport natural gas to market. Even fashionable politicians are getting into the act. New York Governor Andrew Cuomo has not only banned hydraulic fracturing statewide in New York (depriving New York mineral owners sitting atop the Marcellus shale from enjoying the same economic opportunities as their Pennsylvania counterparts), but he has also stopped the construction of any new pipelines carrying natural gas from other states to New Yorkers desperately in need of the energy and electricity it can provide. Cuomo's contrived interference resulted in the tragically ironic scene in 2017, when New York chose to buy the natural gas it needed from a Russian tanker docked in Boston Harbor, rather than from their neighbors in Pennsylvania.

Other anti-market, anti-consumer policies being adopted by local governments include passing ordinances banning natural gas in all new construction. It's not surprising, of course, that this trend started in California. Berkeley, San Jose, Mountain View, Santa Rosa and Brisbane are some of the dozen cities in California that have already enacted these laws. Other U.S. cities from Brookline, Massachusetts to Seattle, Washington have joined this parade.

Several years ago, climate change protesters clamored for Americans to switch from coal to natural gas to fuel our power plants, asserting that natural gas is much cleaner and would be the perfect "bridge" fuel to whatever the next innovation might provide. However, now that it has become clear that innovation has blessed us with a seemingly endless supply of natural gas, those same protesters no longer have any patience for it. American affluence, and the leisure it affords, has created a class of protesters whose ability to protest at all is fueled by the energy they oppose. They demand a world that can't exist without the energy they want to eliminate. Unfortunately, misery loves company, so the climate change protesters require that everyone should suffer along with them. Maybe instead of demanding that the rest of us keep it in the ground, they could just keep it to themselves.

MAYBE INSTEAD OF DEMANDING THAT THE REST OF US KEEP IT IN THE GROUND, THEY COULD JUST KEEP IT TO THEMSELVES

__About the author:__ Bill Keffer is a contributing columnist to SHALE Oil & Gas Business Magazine. He teaches at the Texas Tech University School of Law and continues to consult. He also served in the Texas Legislature from 2003 to 2007.

Oil and Gas Provides Chain of Employment

By: **David Porter**

One of the many reasons I find the oil and gas industry so fascinating is the amount of opportunity and the many different facets it has available for jobs and investments: everything from the roughneck on the drilling rig to the convenience store clerk that takes payment from those folks who don't use the pay at the pump option. There are literally millions of jobs in thousands of occupations involved with getting oil and gas out of the ground, transported and processed into its final state as the energy used to power our economy.

Quite often the oil and gas industry is divided into three major components: upstream, midstream and downstream. Upstream, also referred to as exploration and production (E&P), is what I first think about when I think about the oil and gas industry. Geologists, seismic hands, landmen, lawyers and many others are involved in exploring for oil and/or gas and then putting the prospect together so the finance people can raise money to drill wells — and hopefully produce hydrocarbons. The drilling rig hands, company men and many oil field service contractors involved in drilling and completing a well comprise a highly-skilled workforce that engages in the most labor-intensive part of the entire oil and gas industry. The lifespan of a typical well drilling and completion phase provides far more jobs than the longer production phase.

Midstream is the storing and transportation of oil, natural gas and natural gas liquids. You need to be cognizant of the fact that many midstream companies are moving into processing and marketing, especially of natural gas and natural gas liquids. This change is starting to blur the dividing line between midstream and downstream firms. It is important to realize that while upstream firms can range from extremely large to rather small in size, almost all midstream companies are large because of the capital required to fund the infrastructure needed to provide the facilities for transportation and storage of hydrocarbons.

Downstream is usually defined as the refining of petroleum crude oil as well as the marketing and distribution of products made from hydrocarbons. However, different commentators have differences of opinion on how far down the retailing, distribution and processing trail they want to go and still call it part of the downstream industry. The downstream industry — if you define it as primarily refining — will, of course, be made up of large capital-intensive companies. If you expand the definition to include more of the marketing and distribution chain, you will include many small and medium-sized companies.

This article can only give you a quick taste, nevertheless, we have learned there are many jobs and many different types and sizes of companies involved in the oil and natural gas industry. They range from large publicly held companies operating in many different countries and many different facets of the industry to small, one or two-person shops that only operate in one small geographic area and only do one thing. These small companies are typically privately owned, but in many cases, they still provide a good living to their owners and employees.

The 2020s have the potential to be a great decade for the oil and natural gas industry. The industry can still provide many high paying jobs and play a major role in the Texas and U.S. economy. However, for this to happen we must continue to pay attention to common sense and not be overcome by emotional blackmail. We should not let government mandates require the use of renewable electricity or electric cars in an effort to destroy the oil and gas industry. However, if we continue to subsidize renewables and slash the availability to the market of hydrocarbons through these mandates all we will have accomplished is great harm to our economy for, at best, a negligible net benefit to the environment.

THE INDUSTRY CAN STILL PROVIDE MANY HIGH PAYING JOBS AND PLAY A MAJOR ROLE IN THE TEXAS AND U.S. ECONOMY

__About the author:__ David Porter has served as a Railroad Commissioner (2011–17) and Chairman (2015–16), as well as Vice Chairman of the Interstate Oil and Gas Compact Commission (2016). Prior to service on the Commission, Porter spent 30 years in Midland, Texas, as a CPA working with oil and gas producers, service companies and royalty owners. Since leaving the Commission, Porter works as a consultant for oil and gas companies. He also serves as Chairman of the 98th Meridian Foundation, a nonprofit concerned with water, energy and land issues.

America's Energy Revolution Supports and Strengthens Our Actions in the Middle East

By: **Ryan Zinke**

The President's decision to target and kill General Soleimani does not represent "a new war" but rather a substantial counter punch to Iran's undisputed support of terrorism.

Militarily, the President had earlier showed remarkable restraint when Iran violated UN sanctions and launched ballistic missiles, downed two U.S. drones, aided in the attack of Saudi oil facilities at Abqaiq and Khurais and disrupted oil tanker shipments in international waters. When Soleimani's surrogates attacked U.S. assets in Iraq and killed a U.S. contractor, the gloves came off. Make no mistake, when U.S. intelligence concluded that further attacks directed against the United States by Soleimani and his thugs were imminent, the President had little choice other than to act. For any President, whether Republican or Democrat, to knowingly allow the U.S. to be harmed would be tantamount to treason.

The killing of the principal architect behind much of the targeted violence against the U.S., to include the deaths of some 600 U.S. soldiers, is perhaps the most lethal strike against terrorism in the last decade. I strongly agree with General Petraeus' assessment that as important as the demise of Bin Laden or al-Bagdadi was, the end of Soleimani's reign of terror saved more American lives and delivered a greater blow to terrorism.

The message to Iran is clear and unambiguous: The days of U.S. capitulation are over. We will no longer turn a blind eye to Iran's support of terrorism, and those who plan and conduct acts of terrorism against the U.S. and our allies are subject to being targeted and killed. President Trump made it clear that America desires peace, but is prepared for war. The choice is Iran's to make.

Economically, if the U.S. were to take such action even a decade ago, there is little doubt global oil markets would have soared well above $100 a barrel, and the U.S. consumer would have faced significantly higher energy costs, and the economy itself risked a recession. To a degree, America's economy was being held at gunpoint by Middle Eastern and foreign energy. For reference, one just has to remember the effects of the Oil Embargo in the mid-1970s and President Carter's limited options to effectively respond.

THE MESSAGE TO IRAN IS CLEAR AND UNAMBIGUOUS: THE DAYS OF U.S. CAPITULATION ARE OVER

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Today, the U.S. stands as the world's largest producer of oil at 12.5 million barrels a day (bpd) and has the capacity to go higher. When I took office as Secretary of Interior, America's production was around 8.3 million bpd and struggling. In just two short years, President Trump eliminated many of the regulatory penalties on domestic energy production and America was once again allowed to innovate and use advanced technology to wean ourselves from foreign influence – all while achieving record safety and reducing our overall carbon footprint. America's energy is cleaner, more reliable, more abundant and more cost-effective than any time in our history.

The net result of America's new energy revolution is that we are no longer held hostage by foreign interests and our National Security policy is no longer bound by foreign oil. Our energy abundance has emerged as perhaps one of Trump's greatest weapons in his arsenal to fight terrorism.

About the author: served as U.S. Secretary of the Interior, U.S. Representative for Montana, and was a decorated U.S. Navy SEAL Commander serving in Iraq.

Hidden Gold - A Crossroads in the Energy Industry

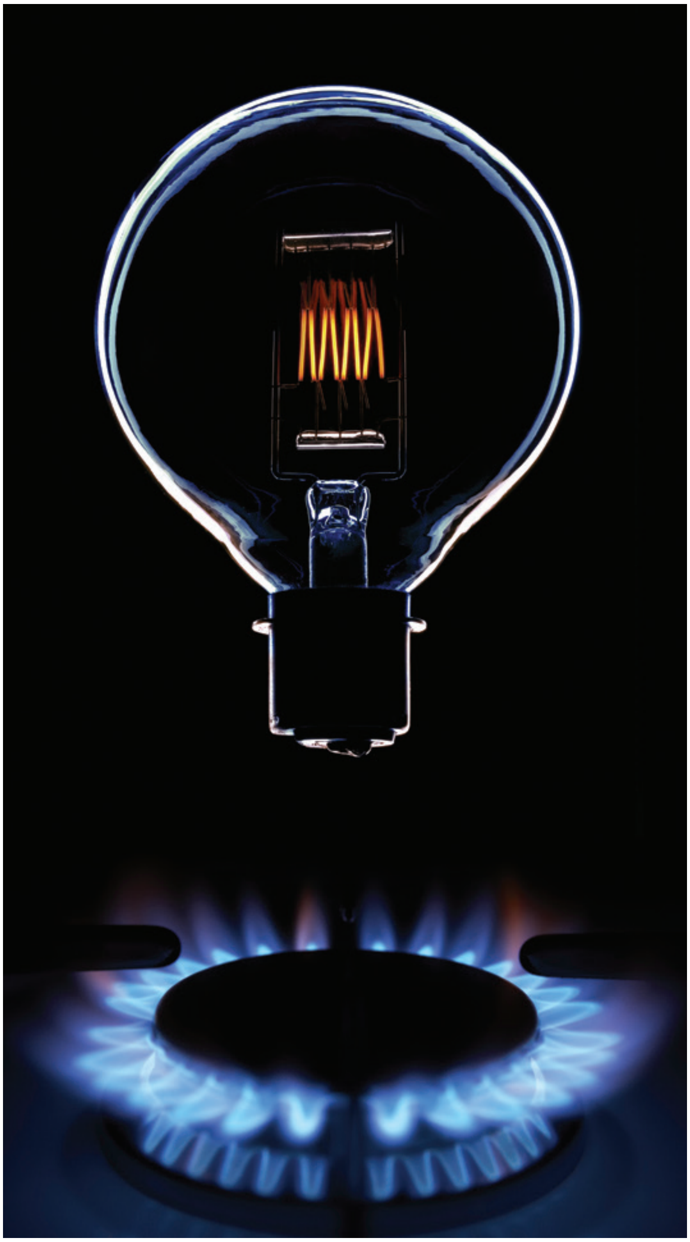
By: Joseph Janczak

Our country is at a crossroads. Many states with immense natural resources of oil and natural gas are, in some instances, ignoring or prohibiting the great power of natural resources resting beneath their own feet. It's a sort of modern-day gold rush. To clear up and point out these uncertainties, President Donald J. Trump has made quite a few speeches punctuating the somewhat perplexing contradictions in those anti-energy states. A good example is the state of New York, whose governor and leftist legislature refuse to allow any pipelines to cross the state border. Instead, these areas must import liquefied natural gas (LNG) from Russia for their winter heating and household or business needs. However, it's widely known that our own pipelines would bring safe, clean natural gas to not only New York state but to the entire New England area. Energy costs could be cut in half, even with those huge state taxes on the power bills of their citizens.

As winter now arrives, tense memories of last winter's shortages and rationing of energy come to mind. People in those areas remember how the wind turbines and solar panels failed as polar vortex after polar vortex attacked the region. Surprisingly, even with these facts in front of them, the state of Pennsylvania, through their governor and their own leftists in the legislature, appears to be going along the same track of heavily taxing, and in some instances, denying future development of, the oil and natural gas industry. It's an industry that has brought jobs and a better economy to many regions because of President Trump's focus on the industry.

Due to the Trump administration, the United States has become energy independent, no longer needing the imports of crude from the Mideast and other regions, which have been a powder keg of problems for the United States and the rest of the world. In previous administrations, the U.S. energy industry was under relentless assault by federal bureaucrats. Pipelines were blocked for virtually no reason, and fracking, drilling and even exploration were denied. The previous administrations also said the United States was going to fulfill the Paris Climate Accord. Apparently, we would not only fulfill the stipulations — but fill the coffers of other nations with U.S. dollars.

The Accord was completely unfair to the United States, and President Trump officially withdrew the U.S. from that document. It was noted that while other countries were allowed to violate the environment in ways the U.S. would never have done in its worst nightmares, the U.S. bore the brunt of the restrictions. Those countries and their outright pollution were, for the most part, ignored by the Paris Climate Accord and its ancestor, the Kyoto Protocol. Those two agreements laid the foundation for the leftists' Green New Deal, also known as high tax socialism, where absolutely no oil or natural gas would be produced, and all energy would be of "green" sources such as wind and solar. These have already been proven failures in inclement weather. They've also been proven, ironi-



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cally, to be heavily dependent upon the oil and natural gas industry for their own production.

Starting with the Kyoto Protocol, which in its original form was basically a guideline, the Paris Accord and Green New Deal built on themselves to push forward the carbon tax. This is a tax that each consumer would pay on their energy and fuel bills, even if they somehow only used "green energy." The carbon tax would also be hidden in everyday purchases, such as groceries and clothes, because, undoubtedly, these items would get to the stores via some form of transportation. The cost of transportation would include a carbon tax, and thus the cost of the item would increase.

In some nations, the carbon tax would be alleviated with a carbon credit where the users of green energy would receive a tax credit on their energy bills. In these countries, the credit hasn't matched up to the tax that was paid. This reveals that the green industry cannot produce enough energy and must be subsidized by the oil and natural gas industry. Even if some country or state is actually able to remove oil and natural gas from its borders completely, the green industry would still have to be subsidized in some form.

Surprisingly, some oil and natural gas companies are actually supporting a carbon tax in some form in order to receive funding for their start-up green departments. These companies that have started these green incentives are realizing that green is not self-funding, and it needs outside sources of funding for production.

So why would some oil companies not just focus on keeping their oil and natural gas successful? Investments should be made to improve the industry supporting our modern-day energy needs. For example, it's known that pipelines are important to the infrastructure of the U.S. energy industry. Pipelines support high paying jobs and are a safe and economical means of transporting oil and natural gas. Pipelines assure families have safe, low-cost energy and help to produce above-average salaries for American families across the nation.

On the other hand, the green industry has not fueled economic growth, as it is heavily subsidized. Oppressive regulations or removing the oil and natural gas industry actually hurts the green industry and the economy.

President Trump says, and the economic data backs up his claims, that the U.S. is having its best economic times in decades, if not in its history. Energy independence has led to an economic boom in the areas where it has lifted up all aspects of trade. This includes areas that were severely depressed just a few years ago. More jobs lead to higher wages, which leads to a better infrastructure of roads, bridges, homes, better schools, a stronger community and prosperity.

DUE TO THE TRUMP ADMINISTRATION, THE UNITED STATES HAS BECOME ENERGY INDEPENDENT, NO LONGER NEEDING THE IMPORTS OF CRUDE FROM THE MIDEAST AND OTHER REGIONS, WHICH HAVE BEEN A POWDER KEG OF PROBLEMS FOR THE UNITED STATES AND THE REST OF THE WORLD

Congressman Kevin Brady, of the United States House of Representatives' powerful House Ways and Means Committee, explained to me during a conference in The Woodlands, Texas, "It's transformational, not only for the U.S. economy but for the entire world. You've noticed that there are other countries in addition to ours who no longer have to rely on unstable regions of the world nor Russia for their energy supply. And American energy is clean, such as natural gas, shale, low emissions energy. And some of us might recall the economic instability caused by the oil embargoes and threats of embargoes against the United States in the not too distant past, but with the Trump administration - no more! Today in this conference we are having the students here who will benefit immensely from all this in their lives, as they and their schools, universities have already. They won't have to worry about energy insecurity as this administration continues. None of us will have to worry."

These facts were echoed by freshman Congressman Dan Crenshaw who said, "Last year alone, the Texas oil and natural gas industry paid the equivalent of $38 million a day to fund our schools, roads, universities and first responders. Not to mention the natural gas revolution was a top factor in reducing CO2 emissions. This is good news not just for Texas, a global energy leader, but for the whole country. Energy independence means cleaner and cheaper energy for all of us."

Just then, it started to make me wonder, if just for a brief nightmarish moment, what the outcome would have been had the other party won the election three years ago. Quickly the coffee kicked in, and I realized we were not in that nightmare, but a dream come true.

And as the President said many times, the U.S. is now the number one producer of energy, "not by a little bit, but by far. Way ahead of Saudi Arabia. Way ahead of Russia. But we can do even much better than that." The President adds that we have to work on getting a pipeline through New York. "We have to do that." The export of U.S. oil and natural gas is at a high. Savings at the gas pump and lower energy bills lead to more money in a family's pocket, which leads to more economic expansion. It's basic economics.

The Trump administration made this a goal from day one, for the U.S. to export more oil than it imports. This achievement is directly the result of his administration's efforts. It's very clear: Last year, the United States exported more crude oil and fuel than it imported for the first time ever. And a stronger economy in the United States means a stronger world economy also.

As the president has often said, "I was elected to be the President of the United States, not the President of the World."

But as the President keeps a laser focus on the economy and the energy industry, the leftists in Congress along with their state and local cohorts have begun a push for "environmental justice" which is clearly just a half-baked attempt at weakening the United States' economy for their own political gain. It's a sad state of affairs when a political party attempts to weaken a strong economy, hurting their own constituents, just for a few cheap votes. That's not "justice," that's just being a sore loser, and it speaks volumes of that ideology. So far, their attempts are not being bought into by mainstream America — thankfully so. Our country has reached that crossroads, and chosen the correct path to a bright future.

State of the Oil & Gas Industry: Where are We Going into the 2020s?

By: Jack Belcher & Brent Greenfield, Cornerstone

"It was the best of times, it was the worst of times…" Just as in Charles Dickens' classic "A Tale of Two Cities" describing life in Paris and London during the French Revolution, the statement also reflects perspectives of the U.S. oil and gas industry over the past ten years depending upon one's vantage point.

As we leave the 2010s in the rearview mirror and accelerate into the 2020s, the past decade will be forever known as the decade of the "shale boom." Origins of the boom started in 2005 when natural gas was first developed from the Barnett Shale and grew rapidly to shale plays around the country, where crude oil and natural gas production skyrocketed. The abundant gas supply reversed the industry's focus from an LNG importing model to an LNG exporting model. Booming crude oil production, primarily from the Permian Basin, Eagle Ford, DJ Basin and Bakken inspired Congress and the Obama administration to reverse a decades-old policy by lifting the ban on crude oil exports.

Fast forward to Sept. 2019, when the U.S. officially became a net exporter of crude oil and refined products on a monthly basis for the first time since monthly records started in 1973, according to the U.S. Energy Information Administration (EIA). What seemed impossible a decade ago is now real, and with huge benefits for the U.S. economy, balance of trade and geopolitical position, with even more potential milestones ahead. For example, EIA last year predicted that the U.S. would become a net energy exporter in 2020, with natural gas and natural gas liquids added to the calculation. This is a feat that hasn't been accomplished since 1953.

Yet, while the shale boom has created the "best of times" for the nation, the economy and consumers, the same cannot be said for the industry itself. The 2010s have been dubbed the "lost decade" for oil and gas companies who have suffered from volatile (mostly low) commodity prices, high supply, low margins, poor financial performance and a growing lack of favor from the investment community.

As we move into the 2020s, the outlook for oil and gas is, at best, mixed. Virtually all exploration budgets will be down in 2020, while most producers expect production to stay flat or even increase. This presents a dilemma for oil and gas producers in the U.S., who need less supply on the market to bring prices up. Something will have to give.

A round of mergers and acquisitions in the U.S. upstream and midstream sectors is highly anticipated and, to some degree, has commenced. Many operators have been producing for months without a real profit — a trend that cannot last forever. Thus, larger and more profitable producers are expected to start acquiring smaller, less-profitable ones. This should provide some relief on the supply side. The same is expected for the oil services sector.

Eroding Investor Confidence

Investors have increasingly lost their appetite for oil and gas, especially the shale plays, as debt-driven growth has fallen out of favor. Returns for the sector have been less than stellar. According to Reuters, the S&P 500 Energy Sector Index gained only six percent for the decade, while the broader S&P stock index rose 180%. Total earnings for the sector during the 2010s fell by 14.8%, compared to growth of at least 28% in all other major sectors. The energy sector's relevance to the entire stock market has declined as well.

Investment capital flight from the oil and gas industry is occurring for other reasons as well, with institutional funds increasingly reducing their fossil energy investments as certain investors react to the climate change-led divestiture movement and sour to the sector. This attitude has also begun to bleed into the broader investor community, with some private equity funds now eliminating or reducing fossil energy investments. Investors also increasingly view oil and gas as having a finite future, with peak demand imminent in upcoming decades. There is also concern over a shrinking availability of talent.

Investors, especially private equity investors,

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AS WE LEAVE THE 2010S IN THE REARVIEW MIRROR AND ACCELERATE INTO THE 2020S, THE PAST DECADE WILL BE FOREVER KNOWN AS THE DECADE OF THE "SHALE BOOM"

are demanding that the oil and gas sector focus on performance and are seeking returns over growth. Against that backdrop, the industry is expected to increase efficiencies, generate more free cash flow, strengthen the balance sheet, monetize inventory and improve environmental, social, governance (ESG) factors.

Global Factors

Global supply and demand present significant challenges to the oil and gas industry as we move into 2020. Simply put, oil and gas production is outpacing global demand. While recessionary threats have subsided in the United States, economic growth has slowed in Asia, where the energy industry is depending on future demand growth.

At the same time, OPEC's December announcement to cut another half million bpd through March has slowed a slide in commodity prices. Saudi Arabia has borne the brunt of the cuts. In addition to its portion of the production cuts announced in December, the Saudis have agreed to keep in place the 400,000 bpd voluntary cuts it has been maintaining. In addition, nations with political instability such as Venezuela have kept their production curbed as well. Amid all these developments, OPEC has revised downward its global demand estimates, stating that it is expecting its output to decline by about seven percent over the next four years, falling to an average of 32.7 million bpd in 2023.

Meanwhile, U.S. production is expected to increase as a share of global production, overtaking OPEC production by 2024. While one might think that this would make the United States the new swing producer, the nature of the private market does not enable the country to rapidly adjust production up and down the way the Saudis are capable of doing. To further illustrate, Saudi Arabia's production was at an eight-year low when its largest crude processing plant was attacked in September. Within one month, its production increased by 1.1 million bpd, preventing an anticipated global price spike.

Public Policy Factors

While the U.S. industry faces its share of challenges in terms of commodity prices, performance and access to investment capital, it also faces a host of global and domestic public policy challenges.

The policy implications of climate change are a dominating factor. Globally, nations are being judged by their adherence to the Paris Agreement goals. Few countries are meeting their goals. Even in Europe, where public support for taking action to address climate change goals is highest, efforts to actually implement policies such as hikes in fuel taxes have led to public unrest.

While the U.S. began the process of withdrawing from the Paris Agreement in November, it has proven to be one of the few nations globally that has actually been lowering greenhouse gas (GHG) emissions, largely due to the successful displacement of coal-fired power plants with power plants fueled by natural gas and renewable energy.

Despite the environmental benefits of natural gas, natural gas faces growing challenges by activists and public utility commissions (PUCs). In general, activists and NGOs are vilifying natural gas, labeling it as a climate change contributor on a similar level as coal. That activism is increasingly thwarting energy projects such as pipelines, power plants and transmission lines. Activists are reacting to specific projects while also becoming more involved in formal processes like FERC approvals and PUC hearings. Utilizing knowledge and tactics that are proving to be more effective, sophisticated and coordinated, they are making their voices heard in the boardroom through shareholder proxies, in the investment community, in statehouses and at regulatory agencies.

In reality, natural gas is increasingly needed globally, including in places like Europe and Asia in order to achieve climate change goals, displace retiring nuclear facilities, meet energy supply and growth needs and reduce air pollution. Reflecting that reality, the United States, Russia, the Middle East and Australia are competing globally to supply gas markets around the world. Russia, which is embarking on the Nordstream II gas pipeline to Germany, is now claiming that its gas is cleaner than what it deems "dirty, fracked U.S. gas," thus setting a stage for labelling their gas as "greener."

At the same time, the U.S. gas industry finds itself disadvantaged from a public perception perspective, as the spotlight is cast on the flaring occurring in the Permian Basin, Eagle Ford and Bakken shale. The Environmental Defense Fund's recent announcement that it began using advanced emissions monitoring in the Permian to map methane emissions and will use satellite data to identify and report flaring will only further highlight the fact that flaring and venting of natural gas in the Permian Basin reached a new all-time high in the third quarter of 2019, averaging more than 750 million cubic feet per day (MMcfd). While a lack of pipeline takeaway capacity has been a significant reason behind the flaring situation, new capacity should help the industry make important progress toward reducing emissions.

Meanwhile, the 2020 U.S. Presidential Campaign is well underway, with a slew of Democratic candidates vying for their party's nomination. Through the early stages of the campaign, Democratic candidates have been more than forthcoming in their opposition to fossil energy. Their proposals include a ban on hydraulic fracturing, federal oil and gas leasing and fossil fuel exports, 100% carbon neutrality

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by 2030, 100% renewables by 2035 and various carbon pricing and taxing scenarios. The discourse has been largely dismissive of any benefits derived from the shale boom, and candidates acknowledged the resulting job losses from these policy proposals as necessary "sacrifice."

Legislatively, Congress has and will continue to weigh in strongly on energy and climate policy. Under Democratic control, the House of Representatives has focused its attention on climate change and public policies to address it. The House established the Select Committee on the Climate Crisis to highlight the impacts of climate change, review policies to address climate change and support the Green New Deal (GND), a proposed package of legislative initiatives that aim to address climate change and economic inequality. Elements of the GND include a plan for 100% renewable energy by 2030, a carbon tax, major changes to the transportation system and eliminating GHGs from agriculture.

The Republican-controlled Senate took an early vote on a GND resolution that unanimously rejected it, with most Democrats voting "present." While little action is expected in the Senate on major energy policy, a change in the makeup of the Senate and a Democratic victory in the presidential elections would likely result in a paradigm shift in U.S. energy policy, from one that embraces fossil energy production and export to one that does not. Under the current makeup, one area of potential progress on Capitol Hill is the reauthorization of pipeline safety legislation.

Much of the recent energy policy developments in the United States have involved administrative actions to support President Trump's goal of "energy dominance." To that end, the Trump administration has:

- Opened up more Bureau of Land Management acreage and proposed opening up more offshore oil and gas acreage to oil and gas leasing;
- Lifted federal lands moratoria;
- Withdrawn the Obama administration methane rule;
- Signed orders to make it more difficult to thwart pipeline construction under the Clean Water Act;
- Pushed for expedited permitting for offshore seismic studies;
- Moved to open the Arctic National Wildlife Refuge to oil and gas development; and
- Expedited permitting for LNG exports.

Although Trump's trade negotiations with China have caused uncertainty for the oil and gas industry and especially for U.S. LNG projects, progress in December on a Phase One trade deal with China and agreement on the U.S.-Mexico-Canada trade deal are positive signs on the trade front going into the new decade.

ESG and Sustainability

Notwithstanding all the headwinds, there are ways that the oil and gas industry can effectively fight back. First, it can act collectively to identify vulnerabilities and address them. These include flaring, water management and GHG emissions. While several organizations and working groups have been established to address these issues, the industry needs to go further and establish goals and metrics for itself and demonstrate progress on these issues. In addition, individual companies need to pursue ambitious ESG programs and goals to create value and reduce risk. This will improve individual companies' attractiveness to investors and reduce their vulnerability to NGO attacks and the vulnerability of the industry as a whole. Finally, the industry needs to lead by telling its own story that highlights its contributions to society. In the U.S., natural gas is reducing GHG emissions and helping to lift millions of people out of energy poverty. It can do the same for the world, as evidenced by how U.S. natural gas exports to developing nations like China and India are improving their air quality and reducing pollution-linked mortality.

As we begin the 2020s, there are positive developments that the oil and gas industry should embrace. Oil prices ended 2019 roughly 30% higher than they started the year. Producers continue to increase efficiencies and lower costs. Mergers and acquisitions on the horizon will create more efficiency and more opportunities for improved margins. To build on this positive momentum, it is important for the industry to identify and adhere to industry standards and best practices for sustainable shale development, improve ESG performance amongst companies individually and industry collectively and tell its positive story to important stakeholders around the world.

By taking these proactive measures, the industry can help ensure that at the end of 2029, it exits the current decade on a higher note than it did the last one.

Abiut the author: *Brent Greenfield serves as Vice President and Counsel at Cornerstone Energy Solutions. He provides clients with strategic policy and management guidance, research, analysis and communications support across the upstream, midstream, and downstream segments of the energy industry. In addition, Brent serves as executive director of the National Ocean Policy Coalition, an organization comprised of members representing sectors including energy, fishing, waterborne transportation, construction, agriculture, and critical infrastructure.*

Abiut the author: *Jack Belcher joins Cornerstone in 2019 with over 25 years of experience in energy and energy policy. As senior vice president of Cornerstone Energy Solutions, he provides strategic and tactical advice to energy and transportation companies and financial institutions, focusing on government relations, regulatory affairs, public policy, strategical communications, situational risk management, and Environmental, Social, and Governance (ESG) performance. Jack also serves as managing director of the National Ocean Policy Coalition.*

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Sen. Toomey: Proactively Protecting American Energy Independence

Special to SHALE

On Nov. 7, Pennsylvania Senator Pat Toomey introduced a resolution in the Senate reaffirming that a president may not unilaterally impose a moratorium on fracking on federal lands. This resolution would most likely not have been needed except for threats made by Democratic presidential hopefuls Sen. Elizabeth Warren, Bernie Sanders and Kamala Harris. They and a few others have vowed to completely ban fracking if they are elected president in 2020. They would sacrifice America's energy independence for the sake of getting a good sound bite. And a monumental sacrifice it would be. Perhaps it should be pointed out to them that 24% of all U.S. oil and 13% of all U.S. natural gas are produced on federal land.

A fracking Ban Would Take Us Ten Steps Back

In defense of the resolution Sen. Toomey said:

> Natural gas has been a game changer for our country and our commonwealth. It is our top source for electricity generation, reduces the cost of home heating for tens of millions of Americans, supports our vast manufacturing sector, cuts CO2 emissions, and diminishes our reliance on foreign sources of energy. It's hard to overstate the benefits of natural gas. But now the top Democratic presidential candidates are competing with each other over who can be more hostile to this tremendous source of economic growth and national security. If enacted, their policies would abruptly end new natural gas extraction, drive up the cost of energy, cost many tens of thousands of jobs in Pennsylvania, create big holes in state and local government budgets, and increase our dependence on foreign energy sources once again. It is essential we push back on these ideas that threaten the prosperity and security of Pennsylvanians and Americans. I urge all of my colleagues to support this resolution.

Making Deals with Russia

Sen. Toomey is also supporting legislation introduced by Sen. John Barrasso (R-Wyo.), chairman of the U.S. Senate Committee on Environmental and Public Works and an original co-sponsor of Toomey's resolution, to end New York Gov. Cuomo's blockade of interstate pipelines. This blockade has been forcing New York and New England to import natural gas from Russia.

We, as a nation, have so much natural gas we have begun exporting it, but because some higher-ups hate to admit that natural gas is a good thing, they are importing it from other countries — whose environmental standards are nowhere near as stringent as our own. America is the world's poster child on how to protect the environment.

Sen. Toomey is correct. It is time to push back. Any kind of ban on fracking would be very bad for the economy and for the environment. Federal Reserve Chair Jerome Powel tried to put it kindly, "To shut down the shale industry, yeah, that would probably not be a good thing for the economy."

IF ENACTED, THEIR POLICIES WOULD ABRUPTLY END NEW NATURAL GAS EXTRACTION, DRIVE UP THE COST OF ENERGY, COST MANY TENS OF THOUSANDS OF JOBS IN PENNSYLVANIA, CREATE BIG HOLES IN STATE AND LOCAL GOVERNMENT BUDGETS, AND INCREASE OUR DEPENDENCE ON FOREIGN ENERGY SOURCES ONCE AGAIN

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The Stark Reality Facing the Oil and Gas Industry in the 2020 Elections

By: **David Blackmon**

The time has come for people in the oil and gas business — especially its senior executives and those who do government affairs work within the larger companies — to wake up to the reality of the Democratic Party as it exists today, as exemplified by its current crop of presidential contenders and caucuses in both houses of Congress.

Simply put, this is not your father's Democratic Party.

Gone are the days when there existed a subset of fairly moderate Democratic members of Congress in both the House and Senate who could be classified as strong supporters of the oil and gas industry. There are no more Mary Landrieu's in today's United States Senate, nor even a Heidi Heitkamp to be found. In the House, you still have one identifiable Democrat — Texas Rep. Henry Cuellar, who can be said to be a real supporter of the oil and gas industry, but that's pretty much it. And even Rep. Cuellar was so cowed by Speaker Nancy Pelosi that he cast a "yes" vote to impeach the most pro-oil and gas president in U.S. history on the flimsiest grounds imaginable in December.

Gone are the days when a startup industry trade association, America's Natural Gas Alliance (ANGA), could be effective by hiring a former Clinton operative to be its president and hiring a raft of pro-Democrat contractors to shape its messaging. ANGA, created at the outset of the Obama Administration in early 2009, was able to quickly become a force for promoting the benefits of natural gas using that model a decade ago. A decade later, pretty much none of the Democrat senators and congressmen with whom ANGA formed effective working relationships remain in Congress. All have been replaced by Republicans, or by more radical left-wing, anti-oil and gas members.

While ANGA and other industry trade associations were able to form working relationships with many Democrats of the time — even in those years, those Democrats could not be counted on for industry support on the truly big votes. ANGA and the rest of the industry, for example, were unable to secure a single Democratic vote during the battle over the national carbon cap-and-trade bill that barely failed in 2010.

I know all of this to be true because I was intimately involved in ANGA's work during those years when I was Director of Government Affairs at El Paso Corporation. Working to form those relationships with Democrats in Congress made sense at the time since a number of them really were pro-oil and gas, at least to some extent, and because there was a Democratic administration in place that was decidedly hostile to the industry's interests.

For example, relationships with key Democrat members of the House Ways and Means Committee helped prevent Congress from acting on President Obama's worst impulses, such as eliminating every oil and gas-related tax treatment from the IRS Code. Obama proposed to do that in every State of the Union message he delivered, and every year the proposal was killed within the Ways and Means Committee with tacit support from several Democratic members.

Likewise, the industry's relationship with Senator Landrieu was critical in preventing a complete shutdown of drilling and production in the Gulf of Mexico in the wake of the tragic Deepwater Horizon spill in 2010. Today, there is only a single Democratic Senator representing a Gulf Coast state — Alabama's Doug Jones — and no one would characterize Sen. Jones as a friend or real supporter of the oil and gas business.

Thus, while industry's trade associations and government affairs professionals continue their efforts to form positive relationships with Democratic members of Congress, the thought that any Democrat member other than Rep. Cuellar can be relied upon to defy either Speaker Pelosi or Senate Minority Leader Chuck Schumer on any crucial vote is specious at best, and really just a fantasy thought process.

2020 Presidential Politics

The stark reality in Congress today makes the 2020 race for the presidency even more crucial for the oil and gas business than it normally is. The presence of the most pro-oil and gas President in U.S. history along with GOP majorities in both houses of Congress made 2017-18 very good years for the industry from a public policy standpoint. The subsequent takeover of the House by the Democrats following the 2018 elections produced gridlock on energy-related issues within congress, which the industry has always viewed as a positive situation.

2020 will no doubt be another gridlock year as the Democrats have promised to make their impeachment process a permanent feature of their majority in the House. So, the maintenance of this status quo would likely produce a positive situation for the industry from the standpoint of regulation and legislation.

But what if the status quo changes following the Nov. 2020 election? Depending on how the equation shifts, things could suddenly become very bleak for those in the energy sector, at least the part of the energy sector that produces real, truly sustainable energy for the nation and the world.

Throughout 2015 and 2016, I was employed at a different company, LINN Energy. During that time, I became pretty much a social outcast among the industry's government affairs community, as I had concluded in Oct. 2015 that Donald Trump would certainly be the GOP's presidential nominee and would most likely win the general election against Hillary Clinton as well. Indeed, when I laid out my thoughts on the coming election before one of the industry's major trade association's board of directors in June 2016, I could hear snickering around the table. Which, to be fair, was justifiable since every major poll at the time indicated Clinton would easily win.

During those months, my CEO at LINN, Mark Ellis, repeatedly came to me for advice on whether to participate in fundraisers sponsored by many of his industry peers, first for GOP candidates competing against Trump for the nomination and then — to my amazement, frankly — for Clinton in the general election. In every case, I advised him to not participate given my strong belief that Trump would end up in the Oval Office. After the election, Mark thanked me for helping to save him many thousands of what would have been ill-spent dollars.

Indeed, company PACs and senior executives in the oil and gas business poured hundreds of thousands of dollars into the Clinton campaign and its various supporting PACS and issues advocacy groups during that general election campaign. At the same time, the industry contributed almost nothing to the Trump campaign. As things worked out, these companies and executives were very fortunate that the new president didn't hold a personal grudge against them.

A Clinton victory in 2016 may or may not have produced a policy disaster for the industry — fortunately, we will never have to find out. But there is simply no question that a win by any of the current leading candidates for the 2020 Democratic Party's presidential nomination would produce a calamity of epic proportions for America's energy sector.

Biden, Sanders and Warren Aren't Joking

Start with the fact that both Massachusetts Senator Elizabeth Warren and Vermont Senator Bernie Sanders have pledged to make hydraulic fracturing — or "fracking" as they refer to it — illegal, not just on federal lands, but throughout the depth and breadth of the United States of America. Many observers scoff at Warren's pledge to make that happen on her "first day in office," correctly noting that no President can achieve that outcome via executive order.

But that does not make the threat any less real, given that there are myriad ways for any presidential administration to eat away at the industry's license to perform fracking operations via regulations, environmental reviews, permitting processes and more narrowly-focused executive orders. Even without congressional cooperation in passing a statute making fracking illegal, a Warren or Sanders administration could quickly render hydraulic fracturing operations so costly that they become uneconomic to deploy, even on private and state-owned lands.

THE STARK REALITY IN CONGRESS TODAY MAKES THE 2020 RACE FOR THE PRESIDENCY EVEN MORE CRUCIAL FOR THE OIL AND GAS BUSINESS THAN IT NORMALLY IS

Then there's former Vice President Joe Biden, considered to be the most "moderate" and "electable" of the current slate of candidates. At the Dec.19 Democratic debate, the "moderate" Biden — currently the leader in the national polls — gave the following answer when one of the moderators, Politico's Tim Alberta, asked if he would be willing to sacrifice "hundreds of thousands" of oil and gas jobs in his efforts to adapt portions of Alexandria Ocasio Cortez's "Green New Deal" proposal:

> The answer is yes. We should, in fact, be making sure right now that every new building built is energy contained, that it doesn't leak energy, that in fact, we should be providing tax credits for people to be able to make their homes turn to solar power. They're all kinds of folks — right here in California, we're now on the verge of having batteries that are about the size of the top of this podium that you can store energy when in fact the wind isn't blowing and the sun isn't shining. We have enormous opportunities.

There is nothing ambiguous about that answer, is there? Biden went on to say that all the oil and gas workers he would put out of jobs could be "retrained" to take jobs in the renewable energy sector, similar to then-President Obama's 2012 statement that all the coal workers he planned to put out of jobs should "learn to code." And that answer — again, from the "moderate" among the Party's leading candidates — follows onto Biden's pledge to "eliminate" the use of fossil fuels, including coal, oil and yes, even natural gas.

But things have only gone downhill from there. A few weeks later, in late December, Biden told a town hall audience in Peterborough, New Hampshire that he would go so far as to throw energy company executives in prison. "We have to set sort of guide rails down now, so between the years 2021 and 2030, it's irreversible — the path we set ourselves on. And one of which is doing away with any substance for fossil fuels — number one," Biden said. "Number two, holding them liable for what they have done," he said of fossil fuel executives, "particularly in those cases where your underserved neighborhoods and — you know the deal, okay. And by the way, when they don't want to deliver, put them in jail. I'm not joking about this."

The choice facing the oil and gas industry, its PACs, its government affairs professionals and its senior executives in 2020 could not be more stark: Either you support candidates who are in favor of preserving the amazing contributions oil and natural gas make to the modern world, or you support candidates who don't. Anyone in the oil and gas industry who sponsors fundraisers for the 2020 Democrat nominee as so many CEOs and PACs did in 2016 for Clinton should immediately be asked by their boards of directors how they could possibly justify supporting a candidate who favors putting their company out of business and throwing the company's executives in prison.

This time around, things really are that simple.

About the author: David Blackmon is the Editor of SHALE Oil & Gas Business Magazine. He previously spent 37 years in the oil and natural gas industry in a variety of roles — the last 22 years engaging in public policy issues at the state and national levels. Contact David Blackmon at editor@shalemag.com

UTSA Honors College Promotes Interdisciplinary Learning

By: Thomas Tunstall, Ph.D.

In one instance highlighting The University of Texas at San Antonio's goal of offering experiential learning, the Honors College is now in its second year requiring students to take a tutorial sequence designed around in-depth, interdisciplinary exploration of a particular theme. Topic areas include salient issues facing society such as well being, economy, environment and justice.

Tutorial I begins by familiarizing students – typically freshmen – with current public intellectual discourse surrounding the section's theme, identifying commonly assumed background knowledge across sources and evaluating their validity. Public intellectual discourse refers to writing by intellectuals aimed not at other academics, but rather the community at large. Sample outlets include The Wall Street Journal, New York Times and other news media where intellectual experts write for a diverse, non-specialist audience about relevant current events in the public sphere.

At the end of the Tutorial I course, students must pass written and oral examinations based on the semester's materials. Students are expected to be conversant with the manner in which intellectuals and academics from multiple disciplines write for the public and contribute to our understanding of policy decisions at all levels of government.

The approach relies on a seminar-style learning community to develop experience participating in meaningful and consequential discourse with other students, informed by interdisciplinary researchers and scholars. Practical application includes the ability to locate credible, evidence-based knowledge and facts that inform public debate.

Tutorial I equips students to synthesize and critically analyze information from both reputable sources as well as those that may not be so reputable, and then to construct valid, supportable conclusions. Students leave with the ability to defend more confidently and credibly their positions, both verbally and in writing.

THE INTERACTIVE AND RIGOROUS APPROACH TAKEN IN THE UTSA HONORS COLLEGE'S TUTORIAL I ENCOURAGES CRITICAL THINKING ON THE PART OF STUDENTS REGARDING TIMELY AND RELEVANT TOPICS CONFRONTING SOCIETY

Readings derive from a large cross-section of media, with new articles and items added throughout the course by the professor and students. Although the class begins with material selected by the instructor, students become increasingly responsible for identifying news and academic articles as the semester progresses. Practice and final written exam questions prompt students not simply to summarize but also to analyze current issues facing society by developing individual insight.

The written exams also improve a student's ability to explain positions in a coherent and concise fashion. The questions encourage elaboration on ideas that emerge during the semester. Quality and depth of writing manifest in the form of clear, logical, convincing thought and cogent analysis. Students must reconcile often-conflicting concepts that characterize the current socio-political climate. Students learn to address important questions, challenges faced and areas ripe for further research.

Oral exams further evaluate dexterity of thought, critical thinking and analytical capacity. The Socratic give-and-take encourages creative development of innovative lines of reasoning backed up by supporting evidence across several disciplines from popular intellectual literature.

The interactive and rigorous approach taken in the UTSA Honors College's Tutorial I encourages critical thinking on the part of students regarding timely and relevant topics confronting society. Not only do students leave with practical skills applicable to the workplace, they also become better, more informed citizens in the process.

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***About the author:** Thomas Tunstall, Ph.D. is the senior research director at the Institute for Economic Development at the University of Texas at San Antonio. He is the principal investigator for numerous economic and community development studies and has published extensively. Dr. Tunstall recently completed a novel entitled "The Entropy Model."*


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Global Chemical Supply, Demand Threatened by Middle East Escalation

By: **Will Beacham, Deputy Editor, ICIS Chemical Business**

Military action leading to closure of the Strait of Hormuz between Iran and Saudi Arabia could seriously disrupt global trade in chemicals and oil products, with a knock-on effect for the world's already fragile manufacturing economy.

The U.S. killing of General Qasem Soleimani, head of the Iranian Revolutionary Guards' overseas forces, on Jan. 3 threatens to further stoke up tensions in the Middle East. Iran retaliated on Jan. 8 with missile strikes against U.S. forces in Iraq.

The Strait of Hormuz is an important shipping lane, linking Middle East oil and chemical exporters to the rest of the world. More than 20% of global petroleum liquids and a significant proportion of chemicals are transported through the Strait.

This includes 4.1m tonnes of Middle East high-density polyethylene (HDPE) production due to be exported via the Strait, according to ICIS senior consultant, Asia, John Richardson, quoting ICIS Supply & Demand database forecasts for polyolefins exports in 2020.

Additionally, this accounts for 38% of total global net exports amongst all the regions that are in net export positions – where exports are higher than imports.

Supply risk is greater in linear low density polyethylene (LLDPE) where 51% of global net exports – 4.7m tonnes – appears to be exposed. Low-density PE (LDPE) is most at risk, with Middle East exports via the Strait accounting for 3.1m tonnes of net exports, 68% of the global total.

Other important products heavily exposed to disruption to shipping in the Strait of Hormuz include monoethylene glycol (MEG), ethylene and methanol.

In an all-out war scenario the Strait could close completely, cutting off regional chemical exports for a prolonged period. A lesser conflict could lead to periodic disruption to traffic through the Strait.

For chemical markets already in oversupply, such as polyolefins, isocyanates and MEG, any supply shock from the Middle East will have less impact as capacities elsewhere can be ramped up in response. This happened after the attack on a Saudi Arabian oil processing facility in September 2019 which cut feedstock supplies to regional chemical facilities.

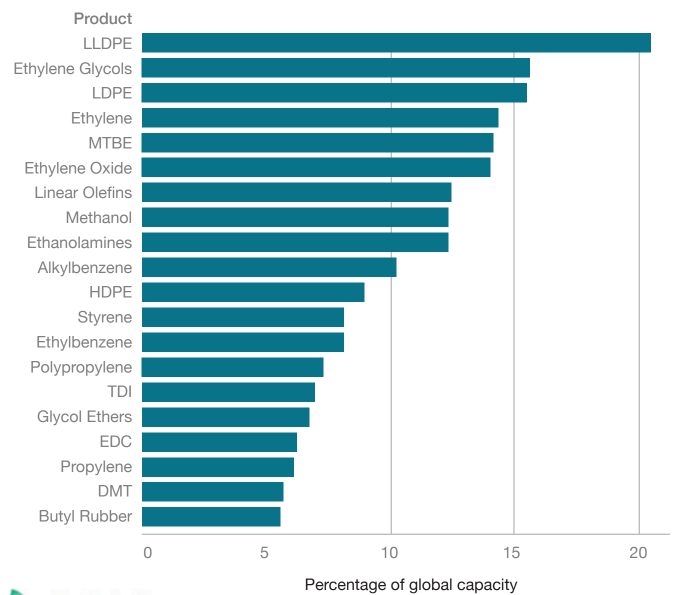
Oil prices spiked 5% to more than $70 a barrel following the U.S. attack and Iran's response before dropping back slightly. They remain well above levels prior to the incident.

Higher oil prices act as a brake on consumer spending, so any sustained hike is likely to hurt global economic growth. The manufacturing economy is already fragile, with purchasing managers indices in negative territory for the U.S. and Europe.

Business and consumer sentiment soured during 2019 as the U.S.-China trade war deepened and growth slowed in major economies. This

THIS CHART SHOWS THE MOST POTENTIALLY IMPACTED CHEMICALS IN TERMS OF PERCENTAGE OF GLOBAL PRODUCTION CAPACITY.

Top 20 global chemical markets most potentially disrupted by closure of Strait of Hormuz



Data from ICIS Supply & Demand Database

Note: assumes no chemicals can be exported from the Middle East by sea through the Strait of Hormuz. Model does not take into account the relatively small amount of product consumed locally or exported by train or road. Following sites excluded which would not be affected: Saudi Arabia - Yanbu, Rabigh, Jazan; Oman – Salalah, Sohar.

THE STRAIT OF HORMUZ IS AN IMPORTANT SHIPPING LANE, LINKING MIDDLE EAST OIL AND CHEMICAL EXPORTERS TO THE REST OF THE WORLD

is likely to be hurt further by any Middle East conflict.

For Rhian O'Connor, lead analyst, Market Demand Analytics, ICIS, the main impact on petrochemicals is sentiment.

"The demand side remains very weak for manufactured goods with pessimism high and investment low. The potential for conflict will further dampen global producers' desire to invest. Higher raw material prices will thin margins as producers struggle to pass this through the chain. Any consumer price increases could soften end market demand, at a fragile time."

Margins Under Threat

According to Richardson, ethylene and PE variable cost margins for naphtha-based crackers in Northeast Asia fell throughout 2019 and in December hit minus $90/tonne, the lowest since ICIS records began in 2000. Higher oil prices would squeeze these further whilst demand is suffering because of increased U.S. supply to the region.

Unusually, benzene spreads were also below $100/tonne for six months in 2019.

"Higher oil prices will act as a tax on the economy, reduce economic growth and make life worse for petrochemical producers. I think that is probably the bigger story than any interruption to supply," he added.

International eChem chairman Paul Hodges, is concerned about the additional uncertainty that this development will create for the chemical industry.

"Companies are already worried about the downturn in margins caused by the slowdown in the global economy, the rise of protectionism and the relatively high cost of oil," he said. The risk now is that worries over availability lead to a period of higher prices caused by panic buying, and that these can't then be passed through to end-users due to softening demand."

He believes that any threat to the Strait of Hormuz would almost certainly plunge the global economy into outright recession, given the likely impact on oil market supply and prices.

With the conflict unlikely to be resolved quickly, Hodges urges chief executives to focus on contingency planning rather than just assuming they can rely on 'business as usual,' particularly with the International Monetary Fund already warning that the global economy is in a "precarious" position.

About the author: Will Beacham is deputy editor on ICIS Chemical Business. He has been writing about global chemical industry trends for ICIS (Independent Commodity Intelligence Services) since 2000, as part of its 250-strong global editorial team.

FEEDING AMERICA

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THE LEGACY OF AMERICAN WOMEN IN AGRICULTURE

By: **Brian Philpot, CEO, AgAmerica**

For several generations, women have been key to American agriculture and food security. Recently, women have taken center stage in agricultural activities, and their role has evolved to include all areas of a farm's operation — maintaining a constant commitment to growing quality food and fiber for people across the United States and the world.

The Rise of Women in Farming

In colonial times, 90% of agriculture activities took place to support individual families. As the American population grew, so did the westward expansion of canals, which introduced new trade opportunities for farmers. With these new opportunities, the focus surrounding agriculture began to shift towards cash-crop production as a source of income for families. This boom in farming caused American farms to quadruple in 30 years. America went from having just over one million farms in 1850 to nearly four million in 1880.

By the mid-1950s, women had not only helped in the expansion of agriculture as an industry, but they maintained their families' farmland throughout two world wars and many domestic crises, including the 1930's Dust Bowl. The immeasurable impact that female leadership had in farming has only recently gained attention and recognition by farm statistics. According to the 2017 USDA census, principal female operators, which are identified as individuals with chief decision-making power, witnessed a 177% increase across the U.S. To put this into perspective, there were only 288,264 female respondents in 2012 but this number soared to 798,500 by 2017. This growth recognition was in part due to changes made by the USDA to better capture stakeholder data and female representation across the farming industry.

By accounting for the various roles within an operation, women's contributions were revealed to be much larger than originally accounted for. The increase in female farm operators has also empowered many female farmers to set out as trailblazers and become involved in activities centered on sustainable and organic farming, specialty crops and raising small livestock like chickens, goats and pigs.

Both female and male farmers face daily challenges like weather disturbances, commodity pricing, land accessibility, financing, markets, and advanced technology and tools. To provide peer support, there are several programs that cater to women farmers and provide resources, education and networking opportunities through grants, scholarships, workshops and online training. Access to these resources also increases the number of women turning to farming as a career.

Empowering the Next Generation of Farmers

AgAmerica believes in the vital role women play in agriculture and celebrates their historic contributions. Their strength and ingenuity is paving new paths in agriculture and increasing our nation's productivity. As an agricultural lender, it's our responsibility to understand and learn as much as we can about the farm and ranch operations that come to us for financing. Knowing the farmer is at our core and allows us to create flexible land loans that meet the long-term needs of the American farmer and rancher. We've observed that many farms and ranches across the country have at least one key female operator playing a significant role in the day-to-day operations. Women have been prevalent players on the operation as the demand for technology and financial sophistication has increased.

BY ACCOUNTING FOR THE VARIOUS ROLES WITHIN AN OPERATION, WOMEN'S CONTRIBUTIONS WERE REVEALED TO BE MUCH LARGER THAN ORIGINALLY ACCOUNTED FOR

Based on research performed by the American Farmland Trust, over the next 20 years, around 371 million acres of farmland are expected to change hands as farmers begin to pass down their land to the next generation. Today, more than 301 million acres are farmed by female operators, and industry experts agree that this figure will continue to rise along with the percentage of women in leadership roles.

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FOR SEVERAL GENERATIONS, WOMEN HAVE BEEN KEY TO AMERICAN AGRICULTURE AND FOOD SECURITY

About the author: *Brian Philpot, CEO of AgAmerica and Principal Owner of AgAmerica Lending, with headquarters located in Lakeland, FL. His background includes extensive experience in real estate investing, agriculture lending, real estate law, market analysis, and negotiation.*

About AgAmerica

AgAmerica Lending was founded with roots in agriculture and an entrepreneurial spirit, offering a spectrum of loan solutions that supports long-term production and success for farmers, ranchers, land owners, and investors. AgAmerica places its focus on agricultural real estate financing, aimed at reducing the friction of the nation's 2.1 million farmers by providing loan products designed with the American farmer in mind.

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INNOVATION IN AGRICULTURE: WHY IS IT SO SLOW?

By: **Harve Light, Managing Director, Conway MacKenzie**

Today, the agriculture economy in the United States is facing a host of game-changing issues. This includes a trend of low commodity prices over the last several years and the labor supply issue that the minimum wage is not addressing. Shifting customer preferences and regulatory changes are also having a big impact. Finally, we're fighting trade wars on several fronts and farmers are dealing with high debt levels, as well as flooding in the Midwest. Technology can play a major role in addressing several of these challenges.

Innovation is not a new concept in the agriculture industry. As an example, self-driving farm equipment has been around for years and well ahead of the auto industry. This has been a major factor in improving yields and reducing input costs as planting accuracy has improved. However, further automation is needed to improve operating efficiency along the supply chain. Both farmers and processors face significant labor cost increases due to minimum wage hikes that will continue for the next several years. These increases have little positive effect as both farmers and processors still struggle to find people willing to do the work. Robotics will play a significant role in addressing this issue. Whether it's picking crops in the field or automating functions at the processor, business owners are looking for ways to reduce their labor dependence.

Sensor technology via the Internet of Things has also made significant inroads. These sensors improve farmer visibility into what is going on with their land and crops. This allows them to focus their resources to address known issues. Sensors also help processors maintain quality standards throughout their facilities. Sensor technology is also a major component in addressing another industry challenge, traceability. Today, consumers want to easily determine where their food came from. They want to know that it came from companies that believe in and use sustainable practices. In addition, regulators want to be able to pinpoint sources when food safety issues arise. Sensor technology collects the data needed to meet this need. The second part of the issue is harnessing all that data.

There are several efforts in their infancy that work toward a data solution. One of the most advanced is blockchain technology. In simple terms, blockchain is a technology that allows for collection of data from all market participants in a single, secure repository. It will allow for an end to end supply chain trail of a single item. This technology will allow for better traceability by retailer, consumer and regulator which is being requested by the likes of Walmart. Eventually, it will also allow for better collaboration between all members of a particular supply chain. Today, the biggest hurdles to this innovation are the protocols or data formats. Companies in the industry need to know what data to collect and the form it should take. They will need a lot of help in putting these requirements all together.

So, what's holding innovation back? While there has been improvement, technological innovation remains slow compared to other industries. Two of the major causes are lack of connectivity and insufficient investment returns. Lack of connectivity is an issue based on the nature of the industry. Farming takes place in rural areas where internet access is spotty at best. This lack of connectivity hampers farmers from collecting data in the field. This results in an inability to make decisions in time to make a difference. Innovation is also inhibited by a lack of investment. Entrepreneurs and startups do not want to invest in developing solutions where they can't see a clear path to a return on their capital. In agriculture, they can't see an exit strategy which typically includes the sale of the company to a large industry supplier. For many years, the agriculture industry has been dominated by a few large input suppliers. These suppliers have been making good profit for years and see no reason to take on innovation investment risk. Without these large players, startups have no incentive to risk their capital on new solutions. This has led to a very slow rate of development and innovation.

There is a reason to be optimistic about what lies ahead as the technology environment in agriculture is changing rapidly. New large players such as Microsoft, Amazon and Google are bringing their data management muscle to the industry. Large end users, such as Walmart, are mandating solutions in order to buy product. We're beginning to see startups dip their toe into the agriculture industry. They are starting to develop solutions for specific needs. The hope is that these new large companies will spur the existing players to keep up and not be left behind. This should speed the rate of innovation and address some of the issues facing the agriculture industry today.

THERE IS A REASON TO BE OPTIMISTIC ABOUT WHAT LIES AHEAD AS THE TECHNOLOGY ENVIRONMENT IN AGRICULTURE IS CHANGING RAPIDLY

About the author: *Harve Light, Managing Director, Conway MacKenzie specializes in providing strategic and in-depth services including crisis management, strategic planning, financial analysis, and big data analytics. He is a member of the American Bankruptcy Institute, the Turnaround Management Association and the Association for Corporate Growth.*

WOMEN'S ENERGY NETWORK SOUTH TEXAS

Women's Energy Network South Texas held their annual end of the year mixer on Nov. 14 at Lupe Tortilla at the RIM in San Antonio. The 2019 board was acknowledged for their time and commitment to the organization. Additionally, the 2020 Board of Directors was announced, including SHALE Editor-in-Chie, Lauren Guerra, as Board President and SHALE CEO, Kym Bolado, a Co-Director of the Coastal Bend Expansion.

PHOTOS COURTESY OF SHALE

PORT CORPUS CHRISTI BUSY AS ALWAYS

The Port Corpus Christi has been bustling as 2019 comes to an end and 2020 gets underway. They've shared some recent photos to give us an update on their activity.

Port of Corpus Christi CEO Sean Strawbridge and Nueces County Judge Barbara Canales at the Nueces County Junior Livestock Show.

Port of Corpus Christi Police Department wins Best Overall First Place in the Harbor Lights Illuminated Boat Parade.

Port of Corpus Christi CEO Sean Strawbridge speaks at the Padre Island Business Association (PIBA) monthly luncheon. A good sport, Strawbridge encouraged the organizers to cut his tie in honor of the "No Tie Zone" rule.

PHOTOS COURTESY OF SHALE

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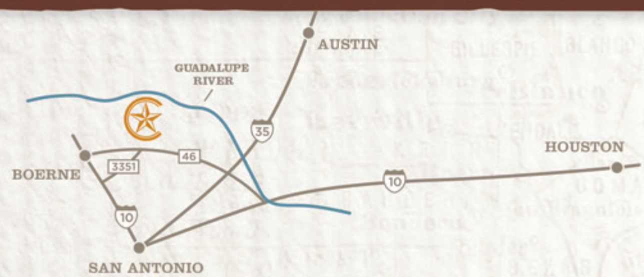
Cast your cares away along the spring-fed Panther creek.

A kaleidoscope of colors out your back window from the towering Cypress trees.

Unplug and reconnect with family at the new sports park.

The perfect place to catch a break.

Out here, when your energy runs low, you just plug into nature. Announcing The Springs of Cordillera Ranch—the newest addition to Cordillera Ranch. Extraordinary lots range from .75 acres to 3+ acres offering sweeping views of the Texas Hill Country, a network of hiking trails, the winding spring-fed Panther Creek, and lots of other reasons to check out early and come home.



Luxury Hill Country lots from the $100's-$300's+

THE SPRINGS of CORDILLERA RANCH

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