WORLD PIPELINES®
Volume 19 Number 4 - April 2019

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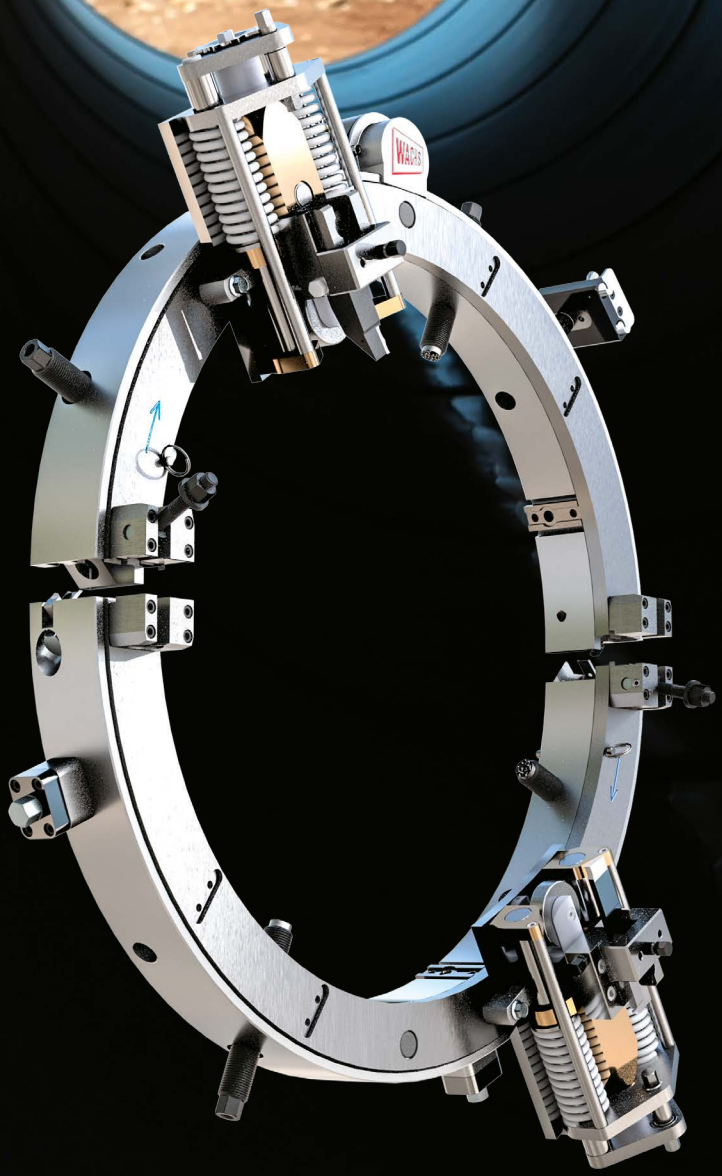


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WORLD PIPELINES

LEVERAGING NORD STREAM 2

In March, the German Economy Minister Peter Altmaier strongly suggested that two regasification terminals would be built on northern Germany's coastline in the foreseeable future, to enable LNG imports from the US and elsewhere in the world. He stated that three sites in Germany are vying for the terminals and the decision will be made by the end of the year. Through his comments, Altmaier sought to reassure US doubters that Germany is serious about building LNG infrastructure to supplement its burgeoning gas demand.

US President Donald Trump has been outspoken in his distaste towards Germany's support for, and pursuance of, the Nord Stream 2 pipeline project, which would cater to a large portion of Germany and the EU's gas needs. He views the pipeline as a danger to EU energy security of supply and an affront to America's strong policy on Russia. He'd much prefer to be supplying gas – in the form of LNG – to Europe himself, with Russia sidelined.

> "TRUMP AND HIS GOVERNMENT HAVE THREATENED SANCTIONS AGAINST NORD STREAM 2"

The trans-Atlantic alliance is fragile in this respect: Trump and his government have threatened sanctions against Nord Stream 2 and against the contractors involved in the project, including Allseas Group and Saipem. US Energy Secretary Rick Perry only recently confirmed that sanctions are still a possibility.

Reports have surfaced in the press that Nord Stream AG, the Gazprom-owned group building Nord Stream 2, may be planning to fence off a 50 km section of the pipeline so that a new company owns and manages this section (the subsea part in Germany) under EU jurisdiction. The remainder of the pipe, travelling under the Baltic Sea, would then be outside EU control. This would echo the ownership structure of other pipeline projects such as OPAL, but would really concern US officials keen to wrestle control of energy supply from Russia.

In the last ten years or so, the EU has collectively striven to defend itself against a monopolistic gas supply situation, making moves to expand its LNG infrastructure, to build and boost gas storage, to factor in pipeline reversal strategies for pipeline projects and to open up a transparent internal gas market. The EU passed gas supply regulations in 2010 that made many of these things mandatory, with the aim of making certain European countries (and Europe as a whole) more resilient towards the gas cut-offs and disruptions from Russia that have hampered the market in the past.

As a result, approximately 50 billion m^3 of LNG import capacity is planned or being considered in the EU currently, with EU members building new terminals and expanding current assets. Rising import needs in the EU due to slowing domestic production to some extent justify this investment. Germany, in particular, will need more gas, as it closes coal and nuclear plants in efforts to meet its climate commitments and shift towards cleaner fuels. The EU focus on securing gas supply diversity is sensible in the circumstances, but LNG pricing is not typically competitive when compared to piped natural gas and LNG utilisation is low at present. Even without the proposed new LNG terminals, Germany is already well connected to about 30 European terminals, where import capacity is already underutilised.

It is understandably difficult to entice countries to fund energy infrastructure projects that lack immediate justification, even if they make sense in the long-term. Germany is working on a new domestic law to support the construction of LNG terminals: the new rule would oblige gas network operators to connect LNG terminals to the German gas grid. More widely, the EU has the unique means to effect change by coaxing member countries to put collective security over short-term financial gain, but commercial realities must also be acknowledged.

Former US ambassador Richard Morningstar recently gave a speech at the University of Piraeus (Greece) in which he made the case for including LNG in the energy mix, despite its current lack of price competitiveness. He said "it doesn't even matter how much [LNG] is sold. The key point from an energy security aspect is simply that the LNG is available, because if it is available...it will keep prices down." He went on to argue that this availability of supply would prevent monopolistic pricing on gas from Russia. Trump would no doubt agree, but will Germany be able to leverage its willingness to buy LNG from the US into increased US acceptance for the pipeline?

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World News

Finalisation of Nord Stream 2 technical design

Nord Stream 2 AG has published an updated draft environmental impact assessment (EIA) report following finalisation of detail design, as well as optimisation of engineering solutions and construction methods for the Russian section. Technical solutions and construction methods have been optimised to accommodate ground conditions, further enhance reliability and reduce impacts on the environment.

Russian legislation requires all modifications, including improvements, to be reflected in the updated project documentation and approved in line with the established procedure by competent authorities prior to the commissioning of the gas pipeline. In accordance with Russian law, the updated draft EIA report has been disclosed on the Nord Stream 2 website and at public liaison offices in Kingisepp, Bolshoye Kuzyomkino, Kingiseppsky and Ust-Luga.

The update of the project documentation is technical in nature. Key developments are related to the onshore facilities and include: changes in the plot plan, such as the positioning and layout of buildings; changes in foundation design to accommodate ground conditions and reduce dewatering; changes to the vent stack design at the pipeline inspection gauge area; changes in the water management system; and extension of temporary accommodation camp for construction personnel. Also included are: for the linear section, partial replacement of trench boxes by sheet piles to maintain the hydrological regime and avoid the potential for scour and flowing sand; and modified design and construction method of the temporary access road to accommodate environmental conditions.

Construction activities are being monitored by the authorities and independent watchdogs. Project activities within the Kurgalsky reserve are being audited by VNII Ecology, a prominent Russian research institute with special expertise on the management of protected areas. Royal Haskoning DHV, a leading international engineering and environmental consultancy, is retained as a watchdog to ensure compliance with international standards. ERM, a global provider of environmental, health, safety, risk, and social consulting services, regularly audits the works against the project's Environmental and Social Management System.

Above water tie-in for TurkStream completed

The final weld that connects the offshore and the nearshore sections of TurkStream has been completed, marking the finalisation of the entire pipeline system in the Black Sea.

The procedure, known technically as 'above water tie-in', involved retrieving the nearshore pipeline and offshore pipeline from the seabed, lifting them above water and welding them together. The total weight that had to be lifted for the operation was approximately 409 t. After a thorough inspection of the weld, the pipe was carefully lowered to the seabed at a depth of 32 m. This operation was carried out on both lines in Russian waters in January and February this year, and near the Turkish coast in March.

The pipelaying in deep waters was carried out by *Pioneering Spirit*, the world's biggest construction vessel, while the shallow-water pipelaying was conducted by *Lorelay*. With the completion of the above water tie-in procedure, a physical connection between the landfall facility near the Russian city of Anapa and the receiving terminal near Kiyikoy in Turkish Thrace was realised.

Russkaya Compressor Station, which will provide the necessary pressure for the gas to traverse through the Black Sea, and the Anapa landfall facility of the TurkStream pipeline system are already complete and on stand-by.

With the completion of the receiving terminal in Kiyikoy later this year, TurkStream will be ready to commence operations. Natural gas flow through TurkStream is planned to start by the end of 2019.

TurkStream is the project for a gas pipeline stretching across the Black Sea from Russia to Turkey and further to Turkey's border with neighbouring countries. The first line of the gas pipeline is intended for the Turkish consumers, while the second line is designated for Southern and South-Eastern Europe. Each line will have the throughput capacity of 15.75 billion m^3/y of gas. South Stream Transport B.V. is responsible for the construction of the gas pipeline's offshore section.

NEB releases report on pipeline and rail capacity

The National Energy Board (NEB) has released its report examining short and long-term options to optimise oil pipeline capacity from Western Canada. The report states that any notable increase in pipeline or rail capacity would need to come from new major infrastructure projects as current pipeline capacity is fully utilised and rail infrastructure is operating at, or near, capacity.

Minister Sohi, Minister of Natural Resources, asked the NEB to look at the current monthly nomination process to assess available capacity on oil pipelines; examine ways to optimise oil pipeline capacity out of Western Canada; and explore if there are short-term steps to further maximise rail capacity.

In the short-term, market issues could be improved by: creating predictable timelines and clear policies related to pipeline capacity to help market participants make more informed decisions; and developing better market data to help market participants and policy makers make investment decisions.

Potential long-term solutions in the absence of new pipeline capacity could include: upgrading bitumen to a higher quality product to reduce the volume of diluent needed and open up space on existing pipelines; reversing pipelines currently importing diluent to export more crude oil; shipping undiluted bitumen in rail cars to increase the volume of bitumen exported by rail.

Long-term investment and large infrastructure changes would be needed to implement some of these solutions.



World News

IN BRIEF

UK

INEOS will invest £500 million in the Forties Pipeline System, prolonging the life of the North Sea's main oil and gas artery into the 2040s.

INDIA

Siemens is to install state-of-the-art Remote Diagnostic Services (RDS) for GAIL (India) Ltd, covering 29 gas turbines operating across the Hazira-Vijaipur-Jagdishpur (HVJ) cross-country pipeline and the Vijaipur C2/C3 Plant.

USA

Cheniere Energy, Inc. and funds and accounts managed by EIG Global Energy Partners have announced that Midship Pipeline Company, LLC has issued Notice to Proceed to Strike, LLC, M.G. Dyess, Inc., TRC Pipeline Services, LLC, and Cenergy, LLC to construct the Midship natural gas pipeline and related compression and interconnect facilities.

SWEDEN

The heavy lift and pipelay vessel *Pioneering Spirit* will temporarily lay pipe in the Swedish Exclusive Economic Zone to carry out a long-term planned platform lift work in the North Sea. *Pioneering Spirit* will return to the Baltic Sea to continue laying the Nord Stream 2 pipeline within approximately one month.

NORWAY

DNV GL, author of the Energy Transition Outlook, has made the large forecast data set available for free.

USA

The US Gulf Coast became a net crude exporter in late 2018. In the last two months of 2018, the US Gulf Coast exported more crude oil than it imported. Several continuing trends pushed crude oil exports higher and imports lower. US crude oil production, particularly in the US Gulf Coast region, has increased in recent years.

API applauds bill focused on protecting critical energy infrastructure

On 15 March, API's Minnesota Petroleum Council Director Erin Roth released the following statement applauding the passage of SF 2011, an important bill focused on protecting critical energy infrastructure in Minnesota following the recent attempts of sabotage on Line 3.

"...the Minnesota Senate Judiciary and Public Finance Committee recognised, with no opposition votes, the need to be proactive in an attempt to hopefully deter those persons who want to cause future damage and interrupt oil pipeline operations in Minnesota from attempting these crimes," said Roth.

"The natural gas and oil industry takes sabotage attempts of pipelines extremely seriously, as the safety of our communities, the environment, and our workers is our number one priority. In addition, we also want to ensure that there is no service interruption to those who rely on reliable and affordable energy to heat their homes.

"The recent incidents in northern Minnesota where out of state perpetrators attempted to disrupt Enbridge Line 3 operations, shows that this is a real threat to pipeline operations in Minnesota as we move closer to getting the Enbridge Line 3 Replacement Project constructed.

"We are optimistic about this important step in the right direction and continue to work on the bill with the MN Building Trades who build and modernise our infrastructure to make sure our operations are safe around the clock."

Pakistan signs TAPI Host Government Agreement

Pakistan and Turkmenistan inked the finalised version of the Host Government Agreement (HGA) on the Turkmenistan Afghanistan Pakistan India (TAPI) Gas Pipeline network in Islamabad on Tuesday 12 March.

The agreement was signed by the Federal Secretary Petroleum, Mian Asad Hayauddin from the Pakistani side, and CEO of TPCL Mr. Amanov. Federal Minister for Petroleum and Natural Resources, Mr. Ghulam Sarwar Khan and Mr. R. Meredov, Foreign Minister of Turkmenistan were also present on the occasion.

Mr. Ghulam Sarwar Khan welcomed the signing of the HGA as an important event in the history of the TAPI gas pipeline project. The Federal Minister reiterated the government's complete commitment towards the early and successful implementation of the project and remained hopeful that the ground breaking of the project can be held in Pakistan this year. The Turkmen Foreign Minister appraised the Minster of his Government's initiatives in ensuring that the timelines of the project are being met.

The Turkmen Minister discussed with the Pakistani delegation his Government's plan to make a transport and energy corridor between Pakistan and Turkmenistan via Afghanistan, and to lay a fibre optic network parallel to the route of the pipeline and see its possible extension to China.

The TAPI gas pipeline project aims to bring natural gas from the Galkynysh and adjacent gas fields in Turkmenistan to Afghanistan, Pakistan and India.

Permitting timeline for Line 3 pipeline

Enbridge Inc. has announced that the State of Minnesota has provided Enbridge the permitting timeline for its agencies' remaining environmental permits for the Line 3 Replacement Project.

The permitting timeline indicates that the certifications on all remaining State permits required for the construction of Line 3 will be provided by November 2019. Enbridge anticipates that the remaining Federal permits will be finalised approximately 30 to 60 days thereafter.

"We now have a firm schedule from the State on the timing of the remaining permits for our Line 3 Replacement project," said Al Monaco, President and Chief Executive Officer of Enbridge.

This new permitting schedule updates the company's prior expectation for the receipt of final State permits in the 2Q19, which underpinned an expected in-service date before the end of this year. In light of this permitting timeline, the company is developing a revised construction schedule for the Line 3 Replacement Project, but now expects an in-service date during the second half of 2020. More specific timing on the in-service date, as well as any potential impacts on the 2020 financial outlook, will be provided once the revised construction schedule is finalised.

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World News

EVENTS DIARY

8 - 14 April 2019
BAUMA 2019
Munich, Germany
https://www.bauma.de

24 - 27 April 2019
NAPCA
Coronado, USA
http://www.napca.com/events.html

6 - 9 May 2019
OTC 2019
Houston, USA
http://2019.otcnet.org/

8 - 10 May 2019
34th International Scientific & Expert Meeting of Gas Professionals
Opatija, Croatia
https://susret.hsup.hr/en/

12 - 16 May 2019
PLCAC
Ottawa, Canada
https://pipeline.ca

21 - 24 May 2019
CeoCor 2019
Copenhagen, Denmark
http://www.ceocor2019.com/

11 - 13 June 2019
Global Petroleum Show 2019
Calgary, Canada
https://globalpetroleumshow.com/

3 - 6 September 2019
Offshore Europe
Aberdeen, UK
https://www.offshore-europe.co.uk/

17 - 19 September 2019
GASTECH 2019
Houston, USA
https://www.gastechevent.com/

30 September - 4 October 2019
IPLOCA Convention
Bangkok, Thailand
http://www.iploca.com

TransCanada's Mountaineer XPress project placed into service

TransCanada Corporation has announced that FERC has approved the full in-service of its Mountaineer XPress (MXP) project, allowing the company to increase the flow of gas on MXP and begin operating its Gulf XPress (GXP) project. The projects are a vital link between Appalachian natural gas supplies and growing markets in the US and beyond.

"Mountaineer XPress and Gulf XPress are extremely important to TransCanada as they provide much-needed takeaway capacity for our customers, while also growing our extensive footprint in the Appalachian Basin," said TransCanada President and Chief Executive Officer Russ Girling. "Both projects will also deliver attractive long-term returns and stable cash flow for our shareholders."

Designed to deliver clean, affordable, domestically produced natural gas, MXP is comprised of 170 miles of 36 in. diameter pipeline, three new compressor stations, and modifications to three existing compressor stations – representing an investment of approximately US$3.2 billion. The pipeline is capable of transporting 2.7 billion ft^3/d of natural gas to the TCO Pool and Leach markets on the Columbia Gas Transmission System. MXP is underpinned by long-term contracts with customers.

Partial in-service of the approximately US$600 million GXP project includes placing into service four new compressor stations located in Kentucky, Tennessee and Mississippi. Together, these facilities will provide additional capacity of 530 000 million ft^3/d of natural gas on the Columbia Gulf Transmission System, which equates to approximately 60% of the project's total capacity. GXP is also underpinned by long-term contracts with customers and is expected to be placed into full service in the coming weeks.

New chair for Pipeline Safety Management System Industry Team

Colonial Pipeline's Vice President of Operations Services and Chief Risk Officer, Angela Kolar, has been selected to chair the Pipeline Safety Management System (SMS) Industry Team.

The Pipeline SMS Industry Team represents oil and gas industry pipeline operators and trade associations in their drive toward zero pipeline incidents. The team plays a critical role in helping operators understand, manage, and continuously improve safety performance.

NACE and SSPC explore unified efforts

NACE International, The Corrosion Society and SSPC: The Society for Protective Coatings, two non-profit professional associations in the field of corrosion and coating standards, training, and certification, have initiated exploratory discussions about synergistic opportunities that may exist between the two organisations.

The discussions were initiated by the board officers of each organisation who recognise the complementary nature of each respective organisation's mission, products and services. Both boards have approved further evaluation of the concept, and preliminary discussions have been started.

"NACE and SSPC have a long history together going back to 1950 when SSPC was founded," says Garry Manous, President of the SSPC Board of Governors. "NACE was part of the initial group, along with AISC and others, that established the original charter for SSPC. Although we've competed in some areas in recent years, overall, we share a common goal of bettering society through the development and delivery of education and information that makes the professionals we serve the best they can be. It only makes sense that we explore whether we can better serve our mutual constituencies as partners than as separate organisations."

Web Highlights



- Enterprise to offer crude oil for export
- Nord Stream 2 AG participates in international environmental forum
- GlobalData: limited risk to oil majors' investments from energy transition in medium term
- Report claims project delays will lower Canadian oilsands output in 2019

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Contract News

Subsea 7 awarded three contracts by Woodside

Subsea 7 has announced the award of three contracts by Woodside since December 2018. Each contract is for engineering studies and includes an option for Woodside to proceed to the execute phase with an engineering, procurement, construction and installation (EPCI) contract.

The contracts are for: SNE Field Development-Phase 1, offshore Senegal (SNE); Scarborough Project, offshore Australia (Scarborough); and Julimar Development Phase 2, offshore Australia (Julimar).

The awarded work is for engineering activities required to finalise the technical definition of the proposed developments prior to Woodside and its joint venture partners making final investment decisions (FID), which Woodside is targeting for between mid 2019 and early 2020 depending on the project. Subsea 7 has already recognised the value of the engineering studies in its Order Backlog. The value of the EPCI contracts will be recognised after FID, following exercise of the relevant option. Assuming FID is reached on all three projects, they would in aggregate be equivalent to a major project award for Subsea 7.

The Julimar field is located approximately 200 km offshore North West Australia. The full scope of work will be to design, procure, install and commission a 22 km, 18 in. corrosion resistant alloy (CRA) gas transmission flowline and an umbilical system. The Julimar project was awarded to Subsea 7 as a stand-alone SURF contract and will be led from Subsea 7's Perth office, with support from other Subsea 7 offices.

The SNE and Scarborough projects were awarded to Subsea Integration Alliance, a global partnership between Subsea 7 and OneSubsea, with integrated SPS (subsea production systems) and SURF (subsea umbilicals, risers and flowlines) project teams.

SNE is a deepwater oilfield discovery located offshore, 100 km south of Dakar, Senegal. The proposed development scope includes up to 23 wells with in excess of 90 km of rigid pipelines, featuring Subsea 7's Swagelining pipeline and BuBi pipeline technologies. The SNE subsea integrated project will be led from Subsea 7's London office, with support from other Subsea 7 and OneSubsea offices.

The Scarborough Field is located approximately 380 km offshore North West Australia. Subject to FID by the Scarborough joint venture, the full integrated project scope of work would include the engineering, procurement, construction and installation of subsea rigid pipelines, flexible risers, umbilicals and associated infrastructure. The Scarborough integrated project will be led from OneSubsea's Perth office, with support from other Subsea 7 and OneSubsea offices.

All three projects will be executed using reeled pipelay and heavy construction vessels from Subsea 7's fleet, with offshore campaigns scheduled between 2021 and 2023.

Indigenous owned company wins major pipeline construction contract

Steel River Group Inc. (SRG) has announced that its subsidiary, Steel River Solutions (SRS), was named as the prime contractor for 'Spread B', a 65 km section of Tidewater Midstream and Infrastructure's 120 km Pioneer Natural Gas Pipeline Project in Canada. The project kicked off in December and is expected to employ up to 300 people at its peak, which is scheduled to continue through 1Q19.

The 20 in. diameter pipeline construction project was awarded through a competitive bidding process, where SRS demonstrated its technical capabilities and aptitudes in all areas of project execution. Steel River Group also credits its unique Indigenous inclusion ecosystem model as an important factor that led to the success of the bid.

"SRG uses its expertise in construction as a vessel to empower indigenous communities and individuals," said indigenous entrepreneur Trent Fequet, Steel River Group's Founder & CEO. "The goal of our approach is to build capacity and strengthen competency within Indigenous alliances and communities. The success of our bid shows that our model works."

"Steel River Group is an Indigenous owned and operated company that has gained the support of progressive Nations and the patronage of a forward-thinking midstream producer," added Fequet. "We are encouraged by the success of this recent contract award and believe that our relationship-based Indigenous inclusion ecosystem model will lead to securing more opportunities into the future."

Wood awarded major pipeline construction contract

Wood has been awarded a US$34 million contract from RH energytrans LLC to construct 28 miles of new pipeline designed to carry natural gas from Pennsylvania to Ohio, USA.

Awarded through a competitive tender process, Wood's scope also includes the construction of the North Kingsville meter station in Ashtabula County, Ohio.

The project is underway and is expected to be completed in summer 2019.

Andrew Stewart, CEO of Wood's Asset Solutions Americas business, said: "We're delighted to be playing a key role in this strategic project, helping to support the supply of domestic energy to Northeast Ohio communities and industries who have had limited access to natural gas sources.

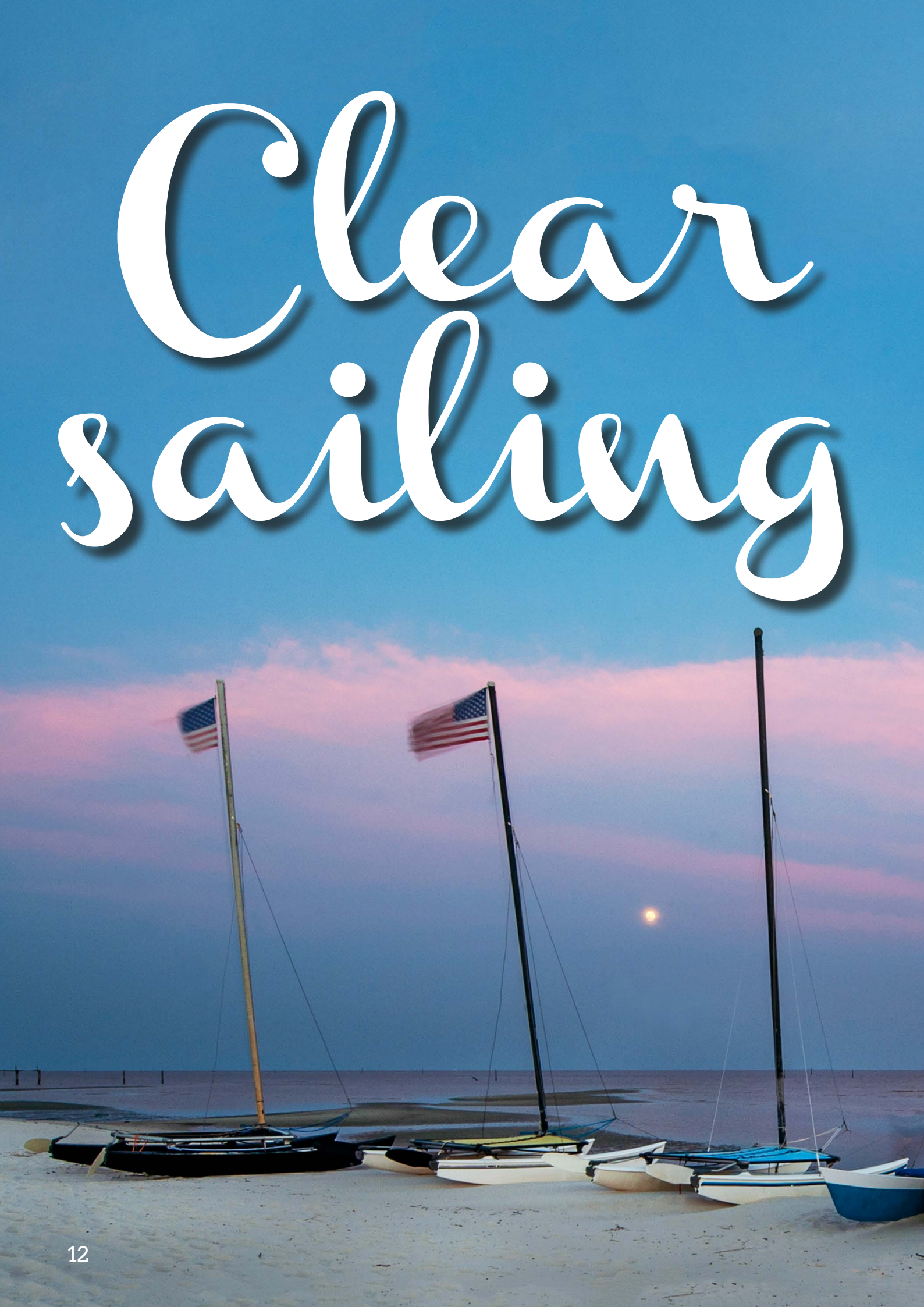
"This award strengthens our leading position in the North America market, where we have the largest and most vertically integrated pipeline project offering. We will fully leverage our broad capability to deliver this project, bringing together the strength of Wood's expertise to maximise value for our customer. Wood provided the initial technical, environmental consulting and engineering services on this project. We now look forward to progressing that support to the construction phase."

The Risberg pipeline will connect to approximately 32 miles of existing pipeline, originating in the Meadville, Pennsylvania area, extending in a northwest direction and terminating at the North Kingsville meter station.

Approximately 16 miles of new pipeline will be installed in Pennsylvania and 12 miles in Ohio.


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Clear sailing



Gordon Cope addresses the Gulf of Mexico and how the economic outlook for the region's oil and gas sector is clear and balmy.

The Gulf of Mexico, both offshore and onshore, is going through a boom period. Unconventional basins are reporting record volumes of production, and major new fields in offshore regions are coming online.

Offshore

In late 2018, Chevron officially commissioned its Big Foot deepwater project. Located 360 km south of New Orleans, the field is at a water depth of 5200 ft. It contains approximately 200 million boe/d, and the production platform, a tension-leg design, is the deepest of its kind in the world. Big Foot is designed to produce 75 000 bpd and 25 million ft^3/d of gas.



In October 2018, BP began production from its Thunder Horse Northwest Expansion project ahead of schedule and 15% under budget. The addition will contribute approximately 30 000 bpd more to the Thunder Horse complex, boosting output to over 200 000 bpd.

In the Mexican portion of the Gulf, ENI has been following up on the Mizton discovery in the Bay of Campeche. The Italian company, which drilled a delineation well in 2017, estimates that the field holds around 350 million boe. The company's total holdings in the Bay of Campeche's Contractual Area 1 now amount to over 2 billion bbls, primarily light crude. In late 2018, Qatar Petroleum purchased a stake in the block for an undisclosed sum. The Amoca, Mizton and Tecoalli fields are on track to produce 90 000 bpd by the end of 2021.

Onshore

Over the last decade, shale drilling in the Permian basin in Texas has caused crude output to more than triple, to 3.8 million bpd. IHS Markit, a consultancy, predicts Permian basin production will reach 5.4 million bpd by 2023. It also forecasts natural gas production will double to 15 billion ft^3/d, and NGLs to 1.7 million bpd.

The growth has surpassed pipeline takeaway capacity, and midstream companies are scrambling to supply new lines. By mid 2018, Plains All American Pipeline brought the first sections of its Sunrise expansion project online. The expansion will add 500 000 bpd to the line running from Midland to Colorado City and Wichita Falls, Texas. In addition, the company is expediting work on the Cactus II line from the Permian basin to Corpus Christi, Texas; when completed, it will have 670 000 bpd capacity.

Kansas-based Tallgrass Energy plans to build the Seahorse Pipeline, a 950 km, 30 in. crude line linking the Cushing, Oklahoma, storage hub with the 2.5 million bpd refinery complex situated in St James, Louisiana.

Marathon Petroleum, BP and Plains All American continue to explore opportunities to reverse flow on the Capline crude system. The 1.2 million bpd, 42 in. line was built to move imported crude from the St James, Louisiana area to the US Midwest. While there is no demand for northbound traffic, a reversal would be able to transport up to 300 000 bpd of Canadian and Dakota crude to the USGC. Operators estimate the line could be operational by 2020.

EPIC's crude pipeline running from the Permian basin to Corpus Christi is expected to transport up to 900 000 bpd to refineries and export terminals when it enters service in late 2019.

ExxonMobil and Plains All American have announced a JV to build a common carrier pipeline from several points in the Permian to the Texas Gulf Coast. The system would deliver over 1 million bpd of crude and condensate to the Beaumont, Texas region.

Gas production is also straining existing infrastructure. Kinder Morgan is partnering with EagleClaw Midstream to build the Permian Highway Pipeline (PHP). The US$2 billion system will deliver up to 2 billion ft^3/d from Waha, Texas, to the USGC and Mexico. Assuming timely approval, the 420 mile, 42 in. pipeline is expected to enter service in late 2020.

Kinder Morgan and DCP Midstream are proceeding with the Gulf Coast Express Pipeline project (GCX). The US$1.7 billion line will transport up to 1.92 billion ft^3/d of gas from the Permian basin to Agua Dulce, Texas. The 720 km line will be a mix of 36 in. and 43 in. pipe, and enter service in late 2019.

Mexico is modernising its utility infrastructure, converting bunker-fuel fired electricity plants to natural gas. Mexico itself produces approximately 3 billion ft^3/d, primarily gas associated with oil production. It uses over 7 billion ft^3/d, however, and demand is expected to grow at more than 3% annually.

US gas pipeline export capacity to Mexico is expanding at a brisk pace. In late 2018, Enbridge's Valley Crossing pipeline project entered service. The US$1.6 billion system can carry up to 2.6 billion ft^3/d from Texas to Mexico. The 266 km line carries shale gas to the Texas-Tuxpan pipeline system in the Gulf of Mexico. There is now approximately 11 billion ft^3/d capacity from Texas to Mexico. It is estimated that up to 14 billion ft^3/d capacity could be in place by late 2019.

Mexico also consumes far more refined fuels than it produces, and refined products pipeline networks are also

Hurricane season

In August 2017, Hurricane Harvey made landfall near the Houston Ship Channel and dumped more than 50 in. of rain. Although no platforms or pipelines were damaged, refineries and petrochemical plants suffered extensive damage – 34 storage tanks failed and spilled an estimated 2.2 million l. of petroleum crude, fuel and petrochemical products.

A year after Hurricane Harvey hit the Houston area, Washington-based Environmental Integrity Project published a report; an estimated 8.3 million lb of air pollutants were released due to damage to plants and infrastructure. The NGO called for Texas environmental regulators to co-ordinate shutdowns of oil refineries and petrochemical plants during major storms in order to avoid large releases of pollution. The Texas Commission on Environmental Quality responded that each storm is unique, and developing a one-size-fits-all approach would be virtually impossible.

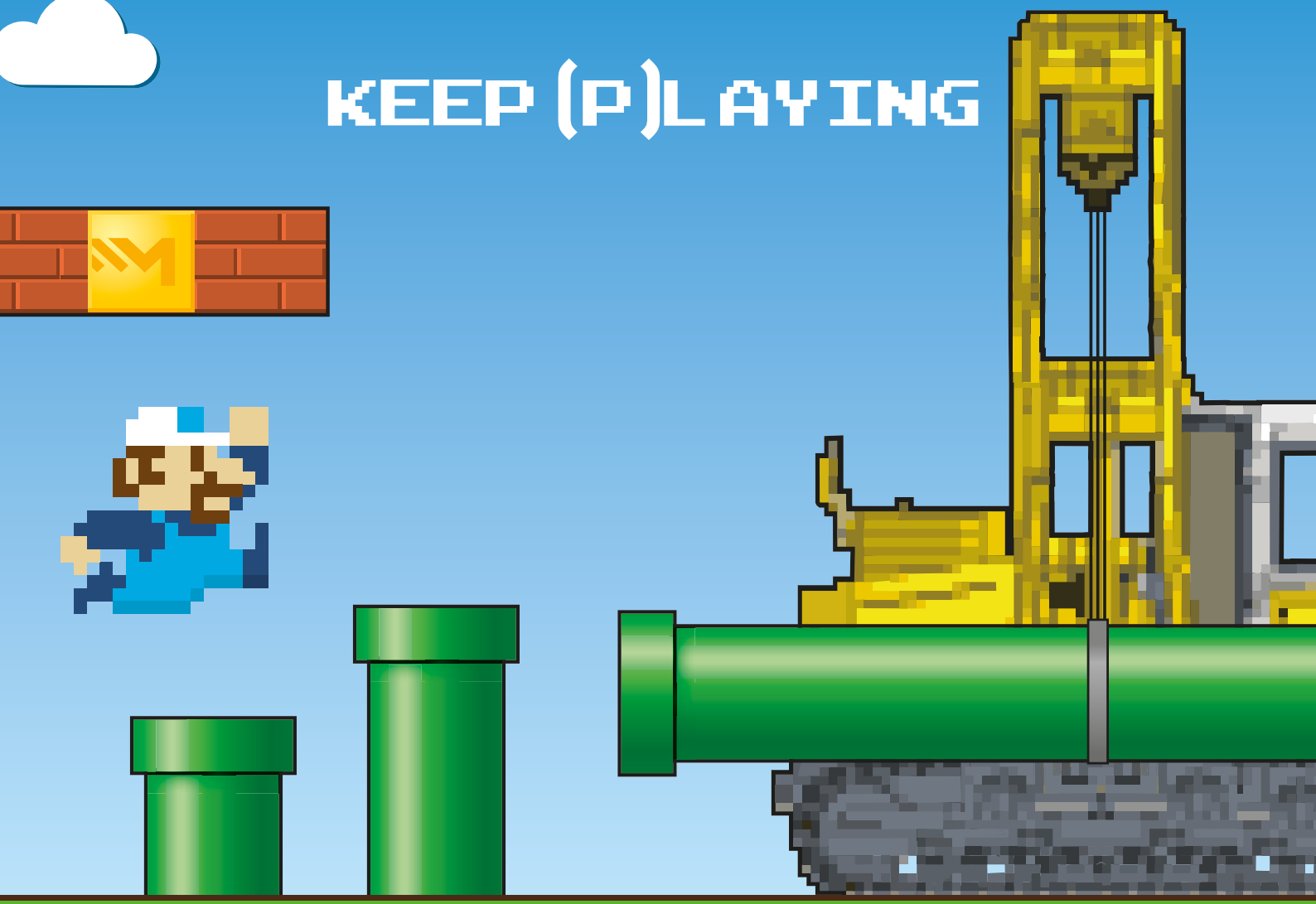
While the 2018 hurricane season was less destructive, intense storms did interfere with the oil and gas sector. In early October 2018, Hurricane Michael brought 20 ft waves and 155 mph winds as it transgressed the Gulf. Although the hurricane made landfall in the Florida Panhandle, well east of major production, ExxonMobil, Chevron, BP and other operators evacuated almost 90 platforms, shutting in 680 000 bpd and 744 million ft^3/d as a precaution.

Although Hurricane Michael also brought extensive flooding, thanks to the increased accuracy of the National Hurricane Centre's average 72 hour warning for the position of a hurricane, the majority of people in the destructive path were able to safely evacuate.

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growing. Dos Águilas Pipeline is building a 163 mile, open access network to transport refined products from the Laredo region in Texas to northern Mexico.

Natural gas liquids

The EIA recently reported that US production of natural gas liquids (primarily ethane, butane and propane), exceeded 4.8 million bpd, and is expected to grow by a further 10% in 2019. Lone Star Express Pipeline NGL system will add 352 miles of 24 in. OD pipe extending from Wink, Texas, to its existing line near Fort Worth. The expansion is expected to enter service early in 2020.

Enterprise Products Partners (EPP) is building its fourth NGL line from the Permian to its NGL fractionation and storage complex near Mont Belvieu, Texas. The 571 mile Shin Oak line, which is expected to enter service in 2019, will have an initial capacity of 250 000 bpd.

Challenges

The election of Andrés Manuel López Obrador (AMLO) to the presidency of Mexico in 2018 has introduced uncertainty into the future of the privatisation of the country's oil and gas sector. AMLO ran on promises to suspend new auctions and to review all existing contracts for signs of corruption. Since taking office in late 2018, he has offered several initiatives, including refinery upgrades and increasing Pemex's discretionary budget, but has also cancelled two auctions that were set for February 2019.

As for offshore contracts, AMLO exhorted companies that have already won permits to hurry up pumping oil. "We can't keep on giving out territory for the extraction of hydrocarbons if there is no investment and there is no production," he said. "We want them to demonstrate that they are going to invest and produce oil. We will make a decision based on results," adding that there will be a three-year "truce," without specifying further details. While ENI has demonstrated that shallow offshore projects like its Mizton project can be expedited, most deepwater projects take a decade before first oil flows; Chevron's Big Foot was discovered in 2006 and is only just now entering production. Placing unrealistic deadlines on the industry compromises the sophisticated technologies and deep pockets necessary to operate in Mexico's deep waters.

The Trump administration's 25% tariff on imported steel is having an impact on some Gulf pipeline projects. Plains All American Pipeline had ordered pipe from Corinth Pipeworks in Greece for its Cactus II line prior to instigation of the tariff. It requested an exclusion, but was denied in mid 2018. The Commerce Department ruled that suitable material was available from domestic suppliers.

Industry response to recent BOEE auctions in the Gulf of Mexico continues to be tepid. In August 2018, ExxonMobil, BP, Talos Energy and others bid on less than 1% of the parcels being offered, spending a total of US$178 million – up slightly from the US$124 million bid in the March 2018 auction. (In contrast, the previous 10 sales in the 2012 - 2017 oil and gas leasing programme netted US$3 billion).

There are several reasons for waning interest. Deepwater royalty rates are 18.75%, compared to shallow water rates of 12.5%, discouraging exploration in deep waters; the Department of the Interior recently rejected lobbying efforts from the industry to equalise rates. The Gulf is facing increased competition for exploration dollars from other basins, as well as Mexico's portion of the Gulf. Onshore unconventionals offer good returns at a far faster rate, siphoning off exploration funds.

The future

In an effort to reverse the higher costs and longer timelines to payout, offshore companies have increased efficiencies and found ways to standardise. In May 2018, Shell began commissioning the Vito semi-submersible floating production unit. The field, which has an estimated recoverable resource of 300 million boe, is located approximately 150 miles southeast of New Orleans. The facility is designed to produce 100 000 boe/d. Prior to the FID, Shell went through an extensive redesign process to lower costs by 70%. The project now has a break-even threshold of US$35/bbl. It is expected to enter first production in 2021.

Other companies are using extended well lengths to facilitate tiebacks to existing infrastructure. LLOG Exploration, which made the Crown & Anchor discovery in the deepwater Viosca Knolls block, was able to tie two wells back to Anadarko's Marlin facility in mid 2018. The wells are flowing at a combined rate of 10 000 boe/d. In addition, LLOG will also tie back its LaFemme, Blue Wing Olive and Red Zinger discovery wells to its Delta House facility in the Mississippi Canyon region.

Finally, companies are doubling down on existing fields. Using the latest seismic interpretation technology, BP was able to add an additional 1 billion bbls of oil in place to the Thunder Horse field. The UK-based company used proprietary algorithms to enhance full waveform inversion, reducing the time for evaluation from one year to two weeks. BP will use the technology at other fields in order to increase reserves; the goal is to raise BP's current level of Gulf production from 300 000 boe/d to 400 000 boe/d by the next decade.

In August, Kosmos Energy purchased Deep Gulf Energy (DGE) for US$1.225 billion. Production includes 25 000 boe/d (85% of which is oil). Kosmos has doubled its production in the last four years, and aims to double it again in the next four. CEO Andrew Inglis notes that as companies leave offshore for onshore shale plays it creates a "huge opportunity", and that "the best deepwater assets can compete with the best of shale."

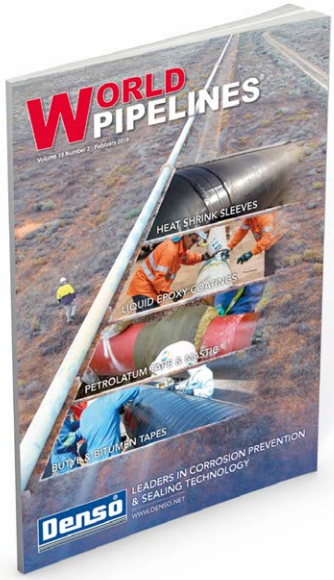
As for onshore unconventionals, the price of oil will largely dictate what happens over the next several years. The plunge in oil prices in late 2018 had an immediate effect; the rate of hydraulic fracturing declined in 4Q18, from an average of 50 per day to 44 per day. The rig count plateaued, and related equipment usage rates are static. While some players can break even at US$40/bbl, the industry average is closer to US$50/bbl.

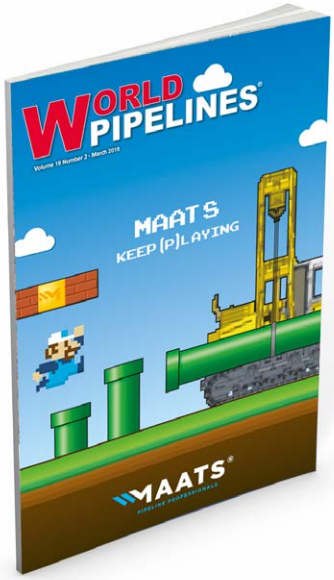
While challenges remain, the region has proven to be a winner both onshore and offshore. The EIA expects US production to achieve 12 million bpd in 2019, and for gas production to reach 100 billion ft^3/d in the next few years. The Gulf of Mexico remains an integral part of that goal.

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