RESERVOIR SOLUTIONS

Published quarterly by Ryder Scott Co. LP July – September 2020 / Vol. 23, No. 3

Sixteenth Annual Reserves Conference slated for mid-September

The 16th Annual Ryder Scott Reserves Conference, originally scheduled for Sept. 17, will be a streaming webinar via the Zoom video platform. Organizers are deciding on the best date or dates for the virtual webinar, and have plans to stick with a mid-September go-live.

How to stream webinar

For those who want to sign up, the process is as follows:

In July, Ryder Scott will send "Save the Date" announcements via email to past attendees or to those requesting more information. Those who want invitations, but are not registered, should send business-card information to **RSCConfHouston@ryderscott.com**. Please put "Invite" in the subject line.

Organizers plan to send invitations through Zoom/Outlook in July or August.

Additionally, those wanting an invitation can register and view details on the Ryder Scott website page at **https://www.ryderscott.com/2020-reserves-conference-webinar/.**

For users who have not downloaded Zoom, the web-browser client will automatically do that when joining the webinar. Zoom is browser independent.

Plans are to stream each prerecorded video feed on a schedule followed by a live Q&A between the speaker and audience. Ryder Scott also plans to post on-demand presentations afterward.

Licensed petroleum engineers at the webinar will receive CEUs (Continuing Education Units) required annually to maintain licensing through continuing education.

The ethics presentation qualifies as a one-hour credit needed to fulfill the annual requirement of most states for licensed engineers. (See summary of the planned presentation later in this article.)

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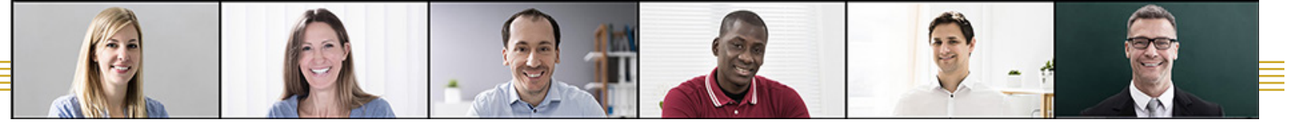

Sixteenth Annual Reserves Conference – Cont. from page 1

Covid-19 forces venue change, lineup still strong

Organizers decided to hold a virtual conference because of concerns about spreading the Covid-19 virus in a large crowd in September. They also anticipated the potential for restrictions on large gatherings by local and state authorities, because of Covid-19.

Meeting rooms at the downtown Houston Hyatt Regency hotel for the events have been at full-seating capacities. Recent conferences drew more than 375 attendees per event, and represented the largest single gatherings of reserves evaluators, a rather select group.

Reserves evaluations require analysis of subsurface geology and engineering by reservoir specialists.

"The event began more than 16 years ago, so over time, speakers and attendees have become a 'community' that gathers in Houston every fall," said **Dean Rietz**, CEO at Ryder Scott.

Organizers expect to exceed prior attendance numbers this year with the virtual conference.

The webinar makes it possible to lift all limits on audience attendance. Past conferences, for the most part, were by invitation, because of the selective audience appeal. Besides reserves evaluators, others regularly attend, including oil and gas executives and allied professionals in law, finance, accounting, academia and government.

"While attendees will miss the full day of hotel amenities and informal conversations among colleagues, the quality of the speakers and presentations will be at the same high level as in the past," said **Ali Porbandarwala**, conference chairman. "Unfortunately, this is a more impersonal way to hold a conference. Social distancing is the new normal, and still may be weeks or months from now."

Virtual conferences are most cost effective. "This year, we expect many of our friends and clients across the globe to attend the first time, because there will be no travel time or expenses," said Rietz.

Lineup Highlights

The planned lineup includes speakers and presentations 60 to 70 days out from the event. Speakers and agenda may change closer to the event dates. Updates will be posted at **https://www.ryderscott.com/2020-reserves-conference-webinar/** and sent through emails.

No reserves conference would be complete without **John Lee**, professor at Texas A&M University, former engineering fellow at the U.S. SEC and well-known reserves evaluation expert.

He will present, "How Can We Take Possible Well Interference into Account in Production Forecasting?" He will focus on new research and quicker evaluation methods to improve analyses of well interference, infills and "parent-child" issues in unconventional plays.

"Typical well-production profiles have failed to take well interference into account," said Lee. "That results in overestimates of future production."

Rigorous reservoir simulation, including coupling of geomechanical and flow models, will produce reliable forecasts, he added. However, those methods are too time consuming and expensive for routine application.

Dan DiLuzio, a reserves consultant at Chevron Corp., will present, "PRMS: Maintaining the Global Standard and Addressing Key Concerns." He will present an early history of petroleum resources definitions and why they were needed more than 100 years ago. He will trace their evolution, including the involvement of SPE beginning in 1962.

The most recent revision of the reserves evaluation standards was two years ago. They were ratified by sister societies WPC, AAPG, SPEE, SEG, SPWLA and EAGE.

"The PRMS is recognized as the globally referenced language of reserves and resources evaluations," said Diluzio.

He plans to review the SPE-PRMS fundamentals, including the resources classification framework and project-based approaches.

"We will cover a few commonly encountered issues in resources evaluations with examples to clarify everyday application of the PRMS," said Diluzio, who also plans to discuss hot topics.

Ron Harrell, Ryder Scott chairman emeritus, plans to moderate a panel discussion on CO_2 carbon capture. Scheduled panelists include **Logan Burt**, managing director at Morgan Stanley; **Christine Ehlig-Economides**, professor at the University of Houston and **John Hessenbruch**, retired and a former manager of technical resources at Occidental Petroleum Corp.

"Engineers and earth scientists have extensive opportunities to study hundreds, even thousands of unique oil and gas reservoirs. Some may have rock and fluid properties where CO_2 injection offers the likelihood of enhanced oil and gas recovery," said Harrell. "They may offer underground storage, sequestration or aquifer-disposal opportunities as well."

The panel discussion will focus on the operational, financial and research sides of carbon capture in the mid- and downstream sectors. The International Energy Agency estimates that carbon capture/storage and other energy efficiencies will have a greater "impact" on reducing CO_2 than renewables by 2040. Carbon reduction is a major component of the environmental, social governance (ESG) programs.

The discussion also will focus on private equity-funded producers, which are managing investor concerns about carbon emissions. Other challenges include gaining more technical know-how in handling CO_2.

The U.S. Treasury Department released rules on May 25 that guide companies in claiming a 45Q federal tax credit designed to spur investment in carbon capture and sequestration projects. The panel will discuss planning projects to capture and inject sufficient CO_2 to meet federal guidelines.

Jamie Jost, founder and managing shareholder of Jost Energy Law PC will make the ethics presentation, which focuses on oil and gas development that supports ESG criteria in regulations.

Using Colorado as an example, her presentation will explore environmental stewardship in the administrative law context. Included are key components of establishing and maintaining relationships with local governments, ENGOs (environmental non-governmental organizations) and citizen groups.

Jost plans to offer practical considerations for avoiding conflicts of interest.

Sandeep Khurana, head advisor of upstream and midstream integrated services at Ryder Scott, will make a presentation on deepwater-development enablers. He will outline the process of "promoting" oil and gas volumes from contingent resources to reserves.

"The presentation will cover best practices, cost-reduction strategies, new technologies and creative commercial solutions that have made deepwater profitable and sustainable in this wildly fluctuating, rather depressed commodity pricing environment," he said.

Khurana will provide attendees with insights in evaluation, assessment and development planning to generate value in deepwater. The presentation will cover industry best practices in development planning, cost-reduction strategies, new technologies and trends and creative commercial arrangements in deepwater infrastructure financing.

See article, "OTC paper: Private equity, third-party infrastructure will grow GOM," on Page 8.

Dan Olds, managing senior vice president at Ryder Scott, will present, "Practical Applications of Total Recoverable Resources (TRR)."

TRR, a new term in the 2018 SPE-PRMS, are those quantities of petroleum producible by using current technology and industry practices.

TRRs indicate oil and gas recovery potential regardless of commercial considerations. TRRs are reported on projects, groups of projects or geographically, for instance, by basin.

Olds said, "TRR is a way to show the expected maximum volume associated with a particular projection. The term was meant to clearly convey that the projection has not been truncated by an economic limit."

"TRR was intended to be an acceptable substitute for the often-heard, but always incorrect term, 'technical reserves,'" added Olds.

Lehi Woodrome, vice president at Ryder Scott, will present the "Supply and Demand Imbalance Leading into Oil Price Volatility." He said, "With storage capacities at recent highs, rig counts falling, and investors wary about the future of oil and gas, how long will it be before the demand returns and supply remains limited? Will price volatility be our new normal? "

Full Lineup

The following speakers and titles for all presentations at the webinar are as follows:

- **Dan DiLuzio**, reserves consultant at Chevron Corp., "PRMS: Maintaining the Global Standard and Addressing Key Concerns"
- **Jamie Jost**, managing shareholder at Jost Energy Law PC, "Ethics – Environmental, Societal, Governance"
- **Sandeep Khurana**, head advisor upstream and midstream integrated services at Ryder Scott, "Deepwater Development Enablers – Promoting From Contingent to Reserves"
- **John Lee**, professor at Texas A&M University, "How Can We Take Possible Well Interference into Account in Production Forecasting?"
- **Dan Olds**, managing senior vice president at Ryder Scott, "Practical Applications of Total Recoverable Resources"
- **Miles Palke**, managing senior vice president at Ryder Scott, "Latest Themes in SEC Comment Letters – What to Expect"
- **Sal Patoli**, managing director at Energy Group of Societe Generale Group, "Capital Solutions – Where Do We Go From Here?"
- **Lehi Woodrome**, vice president at Ryder Scott, "The Supply and Demand Imbalance Leading Into Oil Price Volatility"

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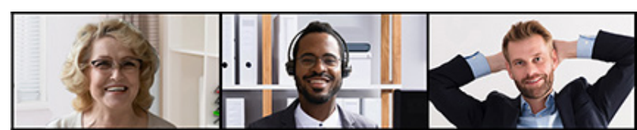


The day oil went to *minus $37 and some change*

The WTI oil futures price collapse on April 20 *had never happened in global market history let alone for the most heavily traded benchmark crude oil contract in the world. The close of NYMEX trading that day was -$37.63 a barrel.*

"What took place was 20 minutes of unalloyed chaos, followed by another 24 hours of teeth gnashing, confusion, and bewilderment as the market collapsed in the face of the global Covid-19 pandemic and arguably the swiftest economic downturn the world has ever seen," wrote ***Leah McGrath Goodman*** *in her article, "Inside the Biggest Oil Meltdown in History," published by Institutional Investor LLC, May 06, 2020.*

The 2,500-word article is the most comprehensive chronology of that day, with numerous interviews and background peppering the story behind the plunge. It is posted at https://www.institutionalinvestor.com/article/b1lhy2h328jhpt/Inside-the-Biggest-Oil-Meltdown-in-History.

According to the timeline of the article, the first-ever zero oil trade happened at 2:08 p.m. ET on April 20, during what is typically a "sleepy hour" leading to the daily market settlement. She wrote, "On paper, 83,000 barrels — or 3.5 million gallons of oil — effectively went off the market for free."

The article continues, "At 2:29 p.m. , one minute before settlement, a single May crude futures contract traded at the jaw-dropping price of -$40.32 a barrel, marking the lowest handle ever witnessed in the most liquid crude oil contract in the world — a previously unimaginable nadir."

One of the interviewees during the descent said, "No one really knows what's going on. The screen was just going nuts."

Traders hurried to sell off positions in the near-term May crude oil futures contract because it was expiring the next day and set to mature, Tuesday, April 21.

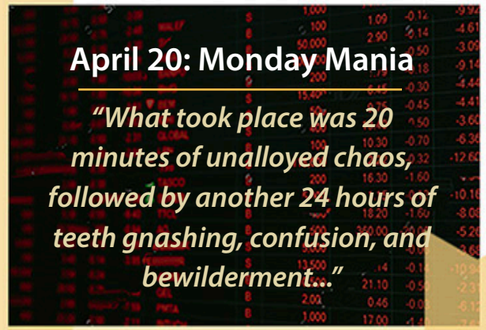
At the same time, Cushing storage facilities had no spare capacity, so sellers had to pay buyers to store the oil, causing the May WTI contract to plummet into negative territory.

In all, 14,913 crude oil contracts exchanged hands at negative prices on April 20, according to data from CME Group, a derivatives marketplace. "In other words, on average, sellers were paying buyers to take oil off their hands at a rate of more than 31 million gallons a minute," wrote McGrath Goodman.

On April 21, WTI closed at $10.01. "In the end, the total amount won — and lost — by oil traders active in the negative price range on April 20 came to well over half a billion dollars," stated the article.

One interviewee said the "futures market demonstrated no convergence with the physical market that day. It demonstrated no convergence with reality."

Some are calling for immediate reforms by the U.S. SEC and the Commodity Futures Trading Commission.



$17.73
8 a.m. (Tokyo)
Price of May forward WTI contract on Monday morning as NYMEX market opens

$15
8:10 a.m. (Tokyo)
NYMEX futures traders start following price drop

<$11
9 a.m. (NY)
The contract price was down 37%, the biggest intra-day drop since the WTI futures started trading in 1982

<$10.35
11 a.m. (NY)
WTI crude passed the low set in the oil bust of 1998

<$10
12:01 p.m. (NY)
Prices slide. By this time, they're already in uncharted territory

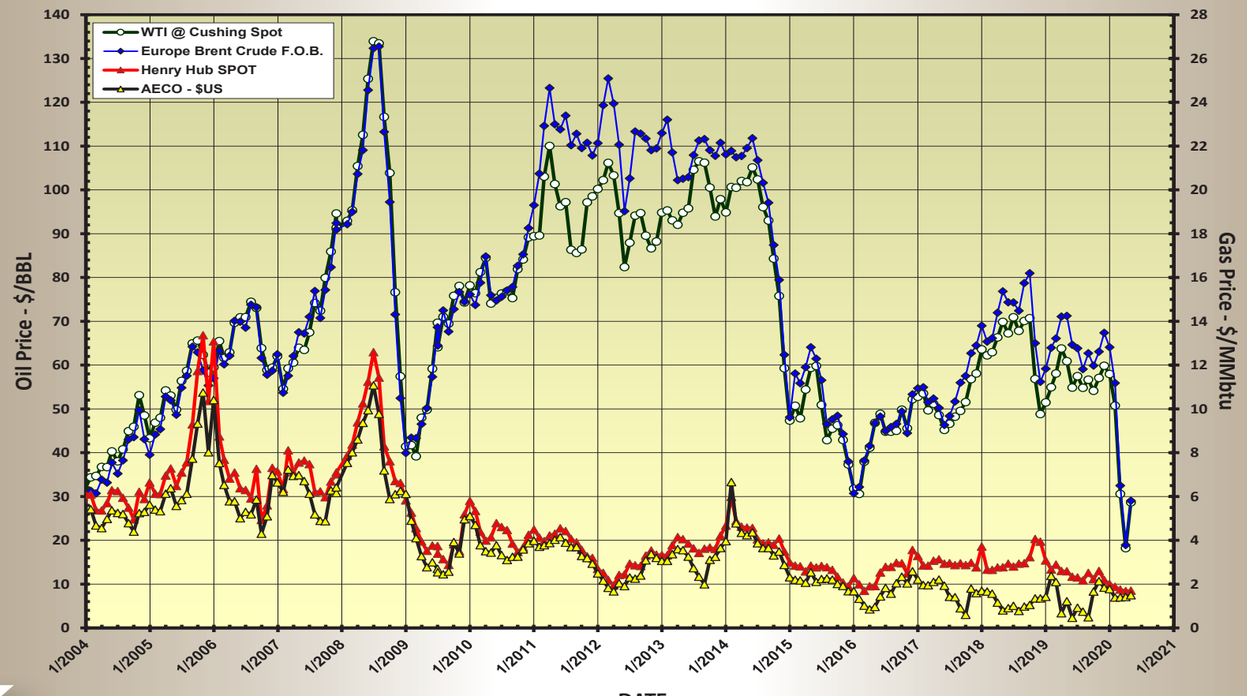
<$1
1:50 p.m. (NY)

<$0
2:08 p.m. (NY)

- $40.32
2:29 p.m. (NY)
Session low

- $37.63
2:30 p.m. (NY)
WTI crude price @ close

Price history of benchmark oil and gas in U.S. dollars



Published, monthly-average, cash market prices for WTI crude at Cushing (NYMEX), Brent crude and Henry Hub and AECO gas.

Industry bracing for mid-year impairments, reserves writedowns

U.S. shale companies expect a spate of asset impairments in balance sheets this year. Accounting firm Deloitte in June reported that companies could write off as much as $300 billion, which will trigger insolvencies and restructuring.

Analysts, however, may not completely trust those numbers, because oil and gas companies do not report under a single "standardized measure" for impairment testing, which makes use of forward-price assumptions and discounted net present values from oil and gas production forecasts. Lower forecasts result in reserves writedowns.

Accounting and Reserves Evaluations

Companies have the flexibility to handle balance-sheet asset impairments differently. Therefore, company-to-company results are not comparable.

That is the status quo. Oil and gas accountants say the most reliable numbers in financial statements are cash and short-term payables.

Dan Olds, managing senior vice president at Ryder Scott, believes impairment in the oil and gas industry is subject to allowable variances used by reporting companies.

"Some companies use only proved reserves while others use the 2P reserves case, which adds another level of complexity," he said. "When the process allows companies so much discretion in picking a forecast case from which to base estimated future values, inconsistencies are the result."

Dan Olds

Olds is author of SPE technical paper, "Basic Petroleum Accounting for Petroleum Engineers," Society of Petroleum Engineers, No. 162907-MS, 2012.

If the reserves report's values—typically, discounted future cash flows—are less than the net book value of the assets, which is an accounting metric, then the property is impaired, said Olds.

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Industry Bracing – Cont. from page 5

Q1 and Q2: Pay me now or pay me later

Keith Myers, president of research at Westwood Global Energy Group (WGEG), wrote an insightful analysis of big differences in recording impairments within the oil and gas industry.

"A significant fall in oil prices would typically trigger an impairment test, but there is considerable management discretion allowed as to the timing, forward oil prices, and discount rates used," he wrote in an article published by *Offshore Engineer* magazine June 16.

At that time, oil prices used in Q1 impairment tests were all over the board.

Some companies recognized the fall in prices while others used year-end 2019 oil price assumptions, as shown in a table accompanying the *OE* article at www.oedigital.com/news/479383-e-p-players-widely-differing-views-on-oil-price-future.

Some companies did not impair their assets in Q1, and are likely to write down asset values in mid-year financial statements, wrote Myers.

Q1 short-term price forecasts for the Brent crude benchmark varied widely, stated the WGEG survey. Gran Tierra Energy Inc. and Talos Energy Inc. used the SEC ceiling-test methodology based on an average price over the previous 12 months, which was $67.50 a barrel, stated Meyers, while Repsol SA was using $65 for 2020.

Bearish companies in 2020 include Equinor ASA, Aker BP ASA, Africa Oil Corp. and Hess Corp. with short-term forecasts ranging from $31 to $33 a barrel based on the forward curve at end-March.

Many long-term oil price forecasts remain unchanged, the *OE* article stated.

Royal Dutch Shell assumes $60 a barrel unescalated while Total SA was at $70 a barrel. Repsol was at $74 a barrel by 2025 while Equinor was at $77 a barrel that year.

Hess Corp. had the lowest long-term Brent oil price assumption at $55 a barrel. BP Plc reduced its long-term oil price assumption for 2021-2050 from $70 a barrel to $55, the lowest in its peer group.

Book value, accounting methods and impairment

To understand how impairments are calculated, understanding book value and full cost (FC) vs. successful efforts (SE) accounting methods is essential.

Olds explained that book values are adjusted to account for capital spending for field development and production of associated reserves through an annual DD&A (depreciation, depletion and amortization) process. Typically, an accountant uses the net book value and a reserves report to calculate a depletion rate and then applies it to annual production to determine book value that was lost because of production.

Olds cited the formula for adjusting book values through a depletion rate calculated as follows:
Depletion rate = book value/reserves; Annual DD&A = depletion rate x annual production.

He also examined how DD&A is treated under both FC and SE accounting methods. Under FC, all exploration and drilling costs are capitalized into a single, full-cost pool for each country. That approach dilutes the financial impact of a discovery or dry hole during the reporting period and results in more stable financial results.

SE companies capitalize drilling costs for discoveries or development wells, but expense exploration dry holes. The pool concept is limited to a single well, reservoir or field. Under SE, a significant discovery or dry hole is more immediately reflected in the financial reporting period.

FC companies factor in all categories of proved reserves in the depletion-rate calculation. SE companies adjust the book value of producing properties using proved developed reserves only, but consider the total proved reserves for amortizing acquisition costs, such as bonus payments or lease acquisitions.

Impairment

Impairment and reserves de-booking processes are different between FC and SE accounting as follows:

- **FC impairment**—Discounted net present values in the reserves report are compared to the net book value (full-cost pool). If the ceiling test finds that the net book value is higher, then it is written down to the discounted NPV. Impairment is more likely for FC companies, because the FC pool may include unsuccessful wells that would be expensed under SE accounting.
- **SE impairment**—Net book value is compared to the reserve report as in full cost, but adjustments can be made. A public issuer can consider changes to expected future prices and costs. An appropriate discount rate can be used. Companies also make adjustments for income taxes.

Early Signs, Future Warnings

Out of the gate first in Q4 was Royal Dutch Shell, which wrote down more than $2 billion on a weaker economic outlook months before the price plunge April 20. Chevron Corp. took a non-cash, after-tax impairment charge of $10 billion in its Q4, which surprised some analysts.

The list of companies taking their lumps for Q1 included Chesapeake Energy Corp., which recognized an $8.3-billion non-cash impairment because the carrying value exceeded the market value as of March 31.

Oasis Petroleum Inc., reported non-cash impairment losses of $4.8 billion for Q1 associated with the plunge in commodity prices. Harvest Oil & Gas Corp. reported $1.6 million of impairment primarily related to the writedown of properties in Michigan to their fair value for Q1.

Zargon Oil & Gas Ltd. announced an $8.54 million impairment loss on its Williston Basin properties.

On June 15, BP Plc warned that it will write off "exploration intangibles in the range of $8 billion to $10 billion" at end of Q2. Others will follow.

For a detailed analysis of petroleum accounting, reserves and impairments, please reference Olds' SPE paper for purchase at www.onepetro.org.

For more information on book values and reserves, please see presentation by Olds at https://www.ryderscott.com/wp-content/uploads/2014/03/RSC-2012-Reserves-Conference_4BookValue_Olds.pdf.

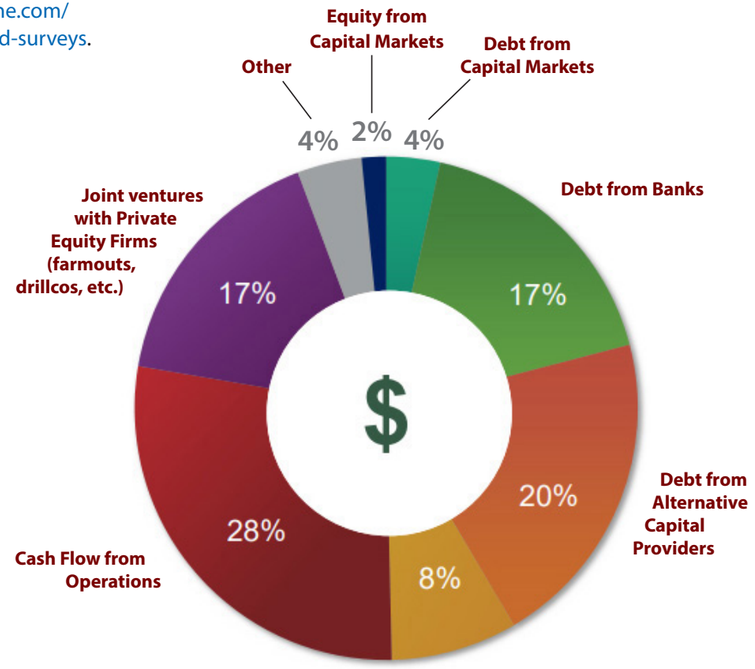
Reserves-based lending survey shows "deep pessimism," says Haynes and Boone

Results of the spring borrowing-base redeterminations survey of Haynes and Boone LLP yielded the following expectations for reserves-based lending:

- Most respondents — comprising producers, oilfield service companies, energy lenders, private equity firms and others — indicated deep pessimism for the spring 2020 borrowing base outlook. This was attributable to "a rapid deterioration in market conditions that started on March 8," stated Haynes and Boone.
- Respondents expect producers to see downward adjustments of 20 percent or more in their upcoming redeterminations.
- Oil and gas companies remain well hedged, which generates a key question for banks and borrowers — what should producers do with these highly "in the money" hedges?
- When compared to the fall 2019 responses, survey participants who see private equity as a source of E&P capital have dropped by nearly 50 percent. They plan to make up the difference with debt from alternative capital providers.
- A growing focus on ESG will be impactful on producers' future access to capital, but the respondents are mixed on the depth of that impact.

For the full survey results, which include charts and graphs, please go to https://www.haynesboone.com/publications/energy-bankruptcy-monitors-and-surveys.

Planned sources of capital for 2020



Source: Haynes and Boone LLP

OTC paper: Private equity, third-party infrastructure will grow GOM

Sandeep Khurana

A head advisor at Ryder Scott, **Sandeep Khurana**, said private equity (PE) firms will continue to turn to creative financing models to increase investments in infrastructure, including tiebacks, in the U.S. Gulf of Mexico.

He helped develop a chart that shows PE taking a bigger bite of facilities costs historically and over the next five years. Khurana was on a team that conducted an in-depth survey and analysis of the evolution of ownership and financing for upstream and midstream infrastructure in deepwater provinces worldwide.

"Whatever may come, there are a lot of opportunities and a foundation here to leap forward in this fluctuating market and rather depressed oil prices," said the leader of the Ryder Scott midstream services group.

He had planned to present at the 2020 Offshore Technology Conference (OTC) in Houston in early May. However, organizers canceled the event for the first time because of the Covid-19 pandemic and health and travel concerns.

By posting a video of Khurana's slides and commentary, OTC 2020 organizers sidestepped the philosophical question, "If a tree falls in a forest and no one is around to hear it, does it make a sound?" OTC videos and associated technical papers are available at www.onepetro.org by searching by paper number, author, subject, etc.

Khurana, with **Justin Rostant** and **Julie Wilson** at Wood Mackenzie, wrote the posted paper, OTC-30806-MS, "Private Equity Financing and Third-party Infrastructure: Future Enabler."

They wrote it before the collapse of oil prices April 20 and the current aftermath. However, Khurana had the benefit of weighing recent events in his video, indicating little had changed in the conclusions of the paper.

The paper and others in the OTC technical-session series took into account historical perspective in keeping with the theme, "Floating Memories – Look Back to Leap Forward."

In his OTC video, Khurana showed since 2014, industry has steadily reduced development capital costs. Innovations, such as digitalization leading to unmanned facilities, are poised to lower breakeven oil prices to below $30 per BOE for life-cycle deepwater developments.

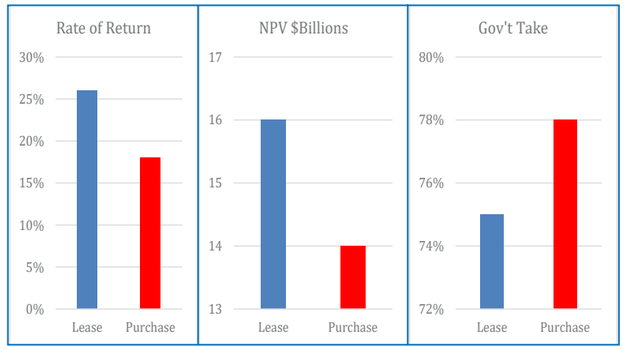
Khurana traced the history of ownership and financing beginning in the late 1980s, when oil companies began building offshore facilities in deeper waters. For deployment in the Campos Basin in Brazil, companies designed and built FPSO (floating production storage and offloading) facilities under contracts with shipyards.

In the 1990s, the model shifted to leasing. Shell was the first operator to start leasing FPSOs then.

"The trend has grown stronger over time, especially among majors," said Khurana. "The decision criterion for an oil company to lease vs. purchase is usually a financial one based on fiscal regime and incentives."

Khurana took a deep dive into financial drivers behind build-or-lease decisions, including balance-sheet impacts, ring fencing, low cost recovery and high value-added taxes. The paper detailed fiscal metrics in Brazil, and concluded that incentives to lease outweigh ownership, considering the low cost recovery and high taxes.

Two of the highest project-cost items are drilling and facility outlays. Khurana analyzed the economics for the Mero field project in Brazil, and identified the ownership structure of the facility that generates the biggest returns to field owners. The authors of the paper also conducted a sensitivity analysis of the field to evaluate returns to the field owner based on either purchasing or

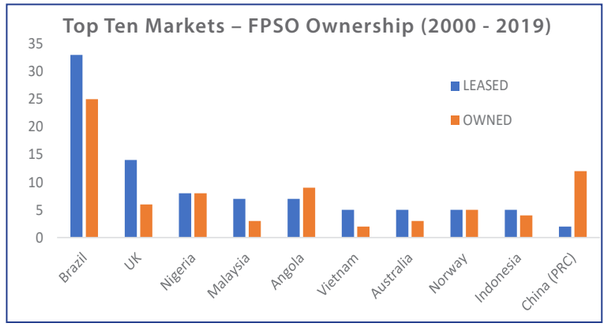


Economic indicators for field owners of FPSO leases vs. purchases (Source: Wood Mackenzie Global Economic Model)

leasing the FPSO, as shown in the above chart.

In Angola, field owners opted for owning over leasing to amortize all pre-investments before paying taxes.

The following chart shows the top ten markets for leased vs. owned FPSOs by country over the past 20 years. A cumulative count for that duration shows 50 percent owned and 50 percent leased.



Ownership decisions during 2000 to 2019
Brazil had more leased vs. Angola with more owned.

In case of early lease terminations or contract non-extensions, service companies may have to deal with minimal residual values of facilities and the potential for high abandonment liabilities. To avoid demobilizations and lay ups, service companies redeploy FPSOs, but this requires field matching with, at times, high capital costs to upgrade.

BW Offshore Ltd. has a successful model to ensure it redeploys its FPSOs to offshore projects. The company becomes the operator. BWO says it looks for opportunities to buy marginal properties from majors and develop them more efficiently at reduced costs.

"This is a total paradigm shift where the oil company turnkeys the project, controls and manages capex and derisks the reservoirs with appraisal wells," said Khurana.

The model worked for redeploying BW's Murphy Azurite FPSO as the Adolo FPSO in 2018 for Dussafu field offshore Gabon. BW Energy is the E&P operator of the field. No oil and gas operations are immune to the market crash of 2020, however.

In late May, BWO recorded a non-cash impairment to the book value of its FPSO fleet and other assets of $233 million for Q1 because of uncertainty on redeployment amid market turmoil and pressure on oil prices.

Of the 15 owned FPSOs, BW impaired six. IPO spinoff BW Energy Ltd. more than halved its 2020 capital-spending program from $250 million to $115 million, of which $49 million was spent in the first quarter.

Last year, BW Offshore planned to use its "repeatable model" after receiving approvals by Brazil to assume participating interests in the Maromba field as the operator. The company also planned to redeploy the Berge Helene to Maromba.

U.S. GOM: Innovation over 20 years

The U.S. Gulf of Mexico (GOM) has been at the forefront of ownership and financing innovation for more than 50 sanctioned FPS (floating production storage) facilities since 1993.

Major oil companies in the U.S. GOM deepwater — a royalty tax fiscal regime — normally purchase facilities rather than lease.

Drivers for decisions to purchase are no ring-fencing, lower costs of capital and accelerated depreciation. With less favorable credit ratings, service companies typically pass on higher capital costs to oil companies.

Leasing may be the only viable option for smaller, capital-constrained oil companies. In the early 2000s, several GOM deepwater developments stalled because of low commodity prices and high upfront capital costs, the paper stated. That was particularly financially distressing to independents and smaller private companies, so to ameliorate that, a new model emerged — the multi-operator approach.

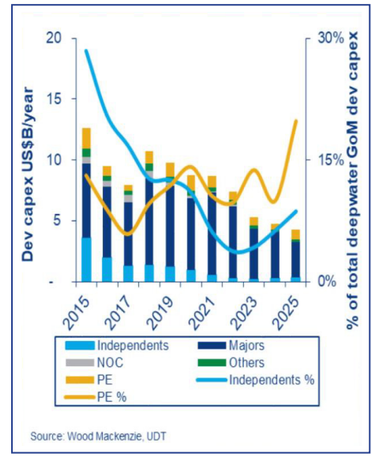
At the same time, third parties invested upfront capital to become owners of the infrastructure and collect monthly fixed fees operators. That reduced risks and freed up capital for independents to focus on core E&P activities.

In 2005, Anadarko Corp. pioneered the multi-operator, third-party FPS approach in the GOM with Independence Hub project. Five independent E&P companies and a midstream energy company collaborated to facilitate the development of six gas fields in the Atwater Valley, DeSoto Canyon and Lloyd Ridge GOM blocks.

Immediate followers with partnering groups contracted third-party FPS facilities in the Marco Polo, Devil's Tower, and Thunder Hawk offshore projects. The repeatable model in 2014 was the Tubular Bells project. Hess Corp. and its partners had a facilities agreement with Williams Partners to construct and operate Gulfstar1 FPS and related export pipeline system.

Private equity and the future

While the annual capital expenditure in the U.S. GOM from PE-backed companies is less than 15 percent, as seen in the chart below, their strategy is to focus on subsea tiebacks with opportunities for higher returns, providing a good fit for PE capital, the paper states.



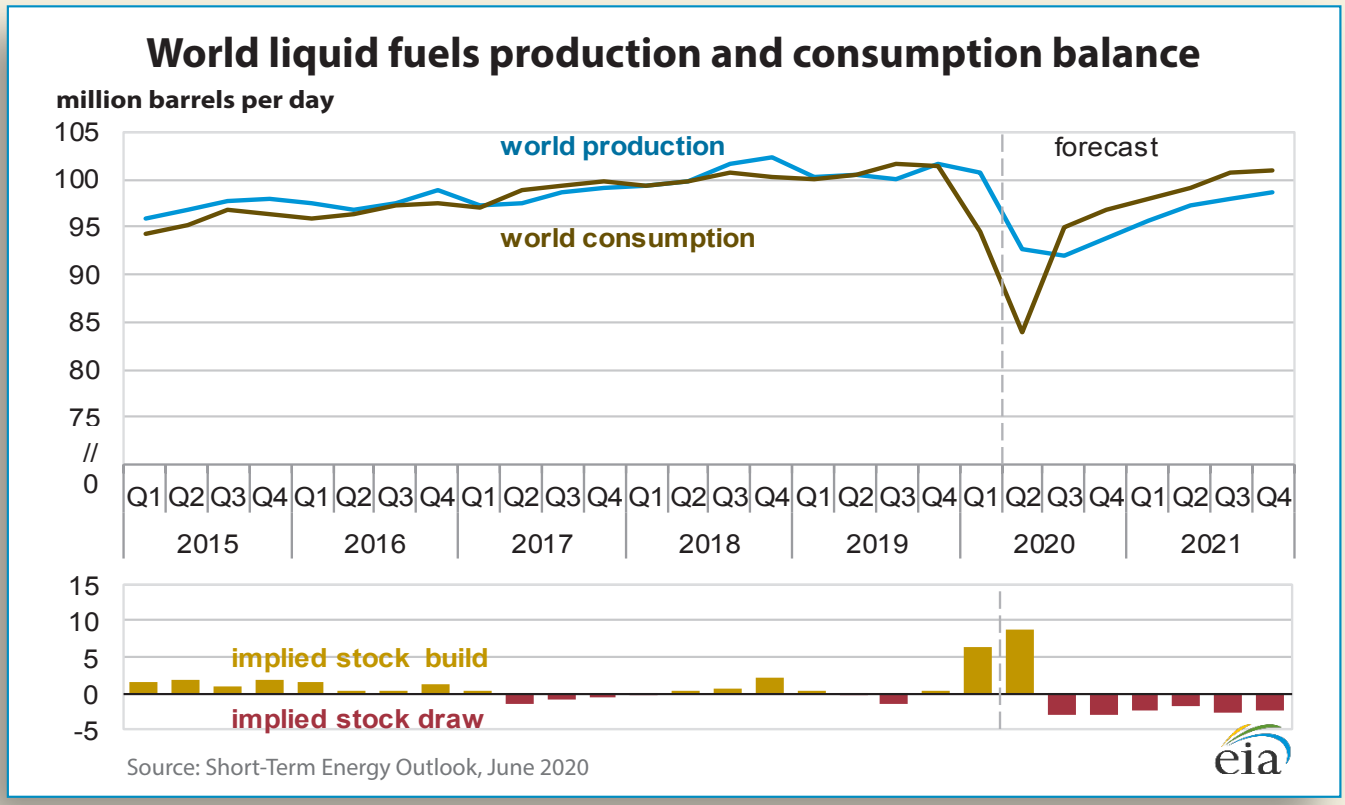
U.S. GOM development capex by company type

These smaller, infrastructure-led projects, usually immaterial to majors, fit very well with the PE model, which requires quick payback. The average cycle time for these subsea tieback projects from discovery to first production is only three years, with some fields able to come online within 12 months of discovery.

Financing of the FPS and export pipelines for the Delta House project four years ago involved PE firm Arclight Capital Partners LLC and LLOG Exploration Co. LLC, the operator. PE-backed infrastructure in the GOM became a repeatable model with the King's Quay FPS project, which is 50-percent owned by Arclight.

The schedule calls for the project to go into service in 2022. Murphy Oil Corp. is the E&P operator and owner of 50 percent, with Ridgewood King's Quay LLC owning the other 50 percent.

"The future could be PE taking both sides of E&P and infrastructure in the GOM to connect the dots — whatever it can for smaller, quick-turnaround developments," said Khurana. "Another possibility is to monetize existing infrastructures. Major oil companies and large independents may just bring in third parties to own the FPS facilities. That way, the FPS can be expanded by third parties and becomes a separate midstream business for them."



In the June Short Term Energy Outlook, the U.S. EIA said it expects that sharper declines in global oil production starting in June and higher-than-expected global oil demand will reduce global liquid fuels inventories an average of 2.5-million BD through the end of 2021.

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Herman Acuna, executive vice president at Ryder Scott, will make a presentation on "Greenhouse Gas (GHG) Management at an unspecified date after the live webinar." Acuna plans to discuss GHG initiatives in the United States, Canada, Europe and worldwide. Ryder Scott is planning to make his presentation the first on-demand one.

Ryder Scott Promotions

The following personnel at Ryder Scott received promotions: **Brett Gray** to senior vice president, **Gilly Rosen** to vice president, **Anton Siyatskiy** to vice president and **Andrew Wright** to economist.

Publisher's Statement

Reservoir Solutions newsletter is published quarterly by Ryder Scott Co. LP. Established in 1937, the reservoir evaluation consulting firm performs hundreds of oil and gas reserves studies a year. Ryder Scott multi-disciplinary studies incorporate geophysics, petrophysics, geology, petroleum engineering, reservoir simulation and economics. With 116 employees, including 76 engineers and geoscientists, Ryder Scott has the capability to complete the largest, most complex reservoir-evaluation projects in a timely manner.

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