EXCLUSIVE HOST

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# **DAY 3**DAILY 2020

### THE OFFICIAL SHOW DAILY OF THE INTERNATIONAL PETROLEUM TECHNOLOGY CONFERENCE

## Improving Industry's Carbon Footprint Will Build Trust John Donnelly, IPTC Daily Editor

The oil and gas industry is listening more to citizens about their environmental concerns but must do more to build trust, and must find a way to tell the story of the progress the industry has made over the past two decades

That was the consensus of a panel discussion Tuesday during the second day of IPTC that brought together representatives of Saudi Aramco, ADNOC, Shell, and two service providers. The session was titled, "Shaping the Upstream Ecosystem for a New Energy Era."

Both Mohammed Y. Al-Qahtani, Senior Vice President, Upstream, Saudi Aramco, and Yaser Saeed Al Mazrouei, Executive Director Upstream Directorate with ADNOC, said that their respective companies have made significant progress in reducing their carbon footprint.

A recent study that examined crude oil grades supplied to Asia from 20 countries concluded that Saudi



Panelists included moderator Eithne Treanor, left, Mohammed Al-Qahtani, Saudi Aramco, center, and Yaser Saeed Al Mazrouei, ADNOC.

Arabian crude has the lowest carbon intensity. And its Manifa field has won several environmental excellence awards. Aramco looks at the potential carbon footprint when assessing new projects, Al-Qahtani said.

ADNOC has greatly reduced offshore flaring and this week announced a set of comprehensive sustainability

# Think Tank Covers Practical Ways To Solve Climate Change

#### Trent Jacobs, Staff Writer

A sharp debate is playing out in today's global society, one that is pitting everyday consumers of energy against the producers of it.

One side says the world must move quickly to eliminate the use of all fossil fuels to curb the most harmful impacts of climate change. The other side argues that hydrocarbons are required to drive the world's economy each day, and improve the quality of life for its poorest people.

The idea that there is a middle ground, a way to bridge this divide

that addresses concerns of both sides, was the major theme of IPTC's Energy Think Tank panel discussion on Monday.

Adam Sieminski, the president of the King Abdullah Petroleum Studies and Research Center in Riyadh, said there is such a path. It is called the "carboncircular economy."

"The idea is that through closing the loop in how  $CO_2$  is produced, reused, recycled, renewed, or permanently stored if necessary, you can continue to use hydrocarbons," he said. The

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catch, he added, is that all of the above needs to be represented by solutions that are practical and affordable enough to implement.

Within Saudi Arabia, Sieminski gave examples of such programmes that are already under way, including ones aimed at improving the energy efficiency of air conditioning units and automobiles. Looking more broadly into the future, he said countries that embrace the carboncircular concept may find themselves embracing more nuclear power and

#### fuel switching.

But carbon-circular programmes also include projects to inject CO2 into "natural sinks," which could be spent oil reservoirs, or active ones for enhanced oil recovery—a practice that has been used on a limited basis around the globe. "In order to make this really work from a realistic point of view, you need enabling policies," said Sieminski, noting that scalable solutions require ample research funding along with fiscal incentives to offset the risks of trying to develop

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goals during Abu Dhabi Sustainability Week. The plan includes decreasing its greenhouse gas emissions intensity by 25% by 2030, limiting its freshwater consumption ratio to below 0.5% of total water use, and planting 10 million mangroves, which are particularly good at absorbing  $CO_2$ , in the Al Dhafra Region by the end of 2022.

Both companies pledged to continue these industry-leading efforts. "We will continue to drive that trend," said Al-Qahtani.

#### Improving the industry's

environmental record was part of a larger discussion on the energy transition and what form it should take. Katie Jackson, Shell's Executive Vice President of Commercial and New Business Development, said that her company will keep investing in hydrocarbons going forward but also in programmes that are lower in carbon intensity and particularly in cleaner electricity. "We need to make our upstream business as sustainable as possible," she said.

The energy transition may take much longer than most realise but is critical to the sector's survival. "Amid the multitude of challenges (the industry faces), the energy transition does rise to the top in terms of importance," she said.

Al-Qahtani said the word that will describe the successful company of the future is "smart." It will be a company that is seen by society as part of the solution, not part of a problem, and will have three main attributes:

- IQ—smart in how it uses technology and how it maximises efficiency.
- EQ—emotionally intelligent in caring about all of its stakeholders, not just its shareholders.
- CQ—cost-competitively intelligent in its focus on excellent quality and service.

The Aramco executive decried the current trend of looking at the short term in R&D, particularly by service companies. Research and development that offers significant improvement takes years, but much of the emphasis today is on incremental progress, he said. "This is extremely concerning for all of us," he said. "We want breakthroughs."

Aramco recently established its own research centres in the Middle East, Europe, Asia, and the US.

Al Mazrouei said ADNOC is also doing more R&D. "We are looking for technology that really makes a difference," he said.

ADNOC began a transformation in 2016, looking at ways to optimise operations, agreeing to several partnerships spanning both the upstream and downstream, and conducting more research. The idea was to take a comprehensive look at all of its operations to try to understand how to make the company more efficient, resilient, and competitive.

Environmental progress across the industry is not uniform. Sherif Foda, CEO of NESR, says flaring in the Permian Basin has increased because small operators want to produce as much oil as quickly as possible. There would be a cost for that company to reduce flaring.

But the industry "must get its house in order" if it wants to improve public perception, Jackson said. "This is a reputational challenge for the industry."

That is important if the industry wants to build trust with those outside the industry, she said, adding that the industry has the technology to limit its footprint in many areas. Other panelists noted that the industry's reputation was also critical when it comes to attracting new talent.

pupled with other<br/>ologies.fossil fuels would be "condemning"<br/>these countries to substandard<br/>environments.n of plants could<br/>ng new strains"Coal and oil in emerging economies

are still very critical," he said, noting that Vietnam is set to commission 50 or more coal-fired power plants in the next 15-20 years to support its growing electricity needs. "It's a narrow country that's about 1,000 miles long with jungle, and they don't have any solar or wind power available—and they're not going to cut down the jungle," he said. "These are the realities."

Tinker said the oil and gas industry has to engage in "an honest conversation" about such issues and represent itself as "the sensible voice in that space."



IPTC Daily is the official show daily of the 12th International Petroleum Technology Conference.

> IPTC Daily Editor John Donnelly

Show Daily Staff Trent Jacobs, staff writer Stephen Whitfield, staff writer Deborah Quinn Hensel, staff writer Rajiv Gopalan, page design David McCoy, page design Joy Isaiah, marketing

Published for the International Petroleum Technology Conference (IPTC). The opinions and content expressed in this publication do not necessarily reflect the opinions of IPTC or its sponsoring organisations.

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Participants in the session included Adam Sieminski, left, Neal Anderson, center, and Bassam Fattouh.

#### them.

Robert Armstrong, the Director of the Massachusetts Institute of Technology's (MIT) Energy Initiative, shared other "new and promising ideas" for negative emissions and  $CO_2$  sequestration technologies that are in the early stages of emerging. One that comes straight from MIT researchers is known as an electroswing battery that absorbs  $CO_2$ while charging, and then releases the  $CO_2$  back for other uses when it discharges.

"All you need is a slight voltage swing to go from capture to desorption," explained Armstrong. "That enables you to capture a wide range of concentrations—anywhere from air concentrations for direct capture, all the way up to the concentrations you see in flue gas from a typical power plant."

A largely unexplored territory for CO<sub>2</sub> sequestration is the building industry.

Armstrong said the building industry is often left out of discussions around emissions but that the sector should consider turning to the petroleum industry for alternatives to steel and concrete, which happen to be carbon intensive products.

Armstrong also highlighted the most natural of all options available to the world today for CO<sub>2</sub> sequestration: plants. "They require very little maintenance," he quipped, noting that from a holistic view, plants could be considered "energy crops" when used as feedstock for biomass power generation that is coupled with other sequestration technologies.

Genetic modification of plants could help, too, by delivering new strains of plants that grow deeper roots. Armstrong said these super-plants could be engineered to transform the  $CO_2$  into polymers that do not degrade easily.

Also on the panel was Scott Tinker, the Director of the Bureau of Economic Geology at The University of Texas at Austin, who has spent the past several years studying energy poverty and even made a documentary about the subject.

He explained that as people in industrialised nations become entrenched in their views on energy use and climate change, they should not forget that the paramount issues facing the peoples of poorer nations is not the state of the atmosphere it is the state of water quality, soil pollution, and access to cleanerburning fuels. "Cooking inside with biomass kills 3 million people each year—that's more than malaria and AIDS combined—just from the particulates in the smoke, " said Tinker.

The big point is that discussions around climate change, and what to do about it, must be balanced with nuance.

Richer nations have consumed as much fossil fuels as they wanted for a century to grow their economies. Only recently have those economies reached a tipping point where they can now afford to invest in alternatives. Tinker noted that holding the world's developing countries to the same standards when it comes to reducing their use of

# **Energy Companies Well Suited to Adapt to Industry 4.0**

#### Stephen Whitfield, Staff Writer

ndustry 4.0, the latest industrial revolution, has hit the manufacturing sector, building upon the adoption of computers and automation into industrial processes and adding smart, autonomous systems powered by data and machine learning algorithms.

The oil and gas industry is well suited to take advantage of Industry 4.0, so long as it can understand the drivers of this change, the convergence of new hyper-connected technologies, and the effects it may have on the existing workforce. A group of industry executives sat down on the first day of this year's IPTC to discuss how that might work.

Nabil Al-Nuaim, chief digital officer at Saudi Aramco, said the industry was going through an "extreme revolution," primarily in the connection between artificial intelligence (Al) and manufacturing. He called Al a "game changer" for the industry because of the possibilities it offers for companies, like Aramco, with massive amounts of data it needs to process. The question, he said, is whether companies are ready to scale up to a level needed to properly incorporate Al platforms into their operations.

Al-Nuaim discussed Aramco's work in this space during the panel. Last March, the company unveiled a 4IR Center at its premises in Dhahran that it said would play a pivotal role in uplifting the technical skills of its workforce. An Al Hub, focused on developing advanced analytics and machine learning solutions in hydrocarbon related applications, is at the heart of the center.

"We must improve the market," Al-Nuaim said. "It's all about value-driven digital transformation programs. It's all about how much value you can derive by implementing these programs, and what are the hidden costs? Aramco has a big volume of data, so there is potential to commercialize some of the applications and the IP (intellectual property) that we have created for our own operations."

Al-Nuaim said artificial intelligence gives industry a golden opportunity to leverage business units operating in different organisational siloes. Uma Sandilya, general manager of oil and gas at C3.ai, said the breakdown of those siloes—one of the biggest hurdles to full-scale implementation of digital platforms—starts at the executive level.

"The technology solutions exist today, but there is still the people aspect that has to be resolved. People still



A panel of industry leaders spoke about the ways oil and gas can best incorporate automation into the manufacturing process.

believe they own datasets, and that's where the executive oversight of the transformation comes in. You can have the CEO come in and say that all data is strategically enterprised within our platform. That's how you solve the siloed data problem," Sandilya said. mation that our industrial processes generate has grown in leaps and bounds. How can we flexibly apply our scarce resources in computing and analysis to take advantage of that? That's really around the cloud. The cloud is about technologies that

"How do you integrate all of this data into our platform? Which parts of the value chain will be most impacted in order for us to achieve our business objectives? You need the data and the AI to answer these questions," AI-Nuaim said.

Ronald Raffensperger, chief technology officer at Huawei Data Center Solutions, said that companies must transform digitally in order to meet rapidly changing customer needs. Like Al-Nuaim, Raffensperger said this transformation requires them to utilise artificial intelligence with cloud computing platforms and their data to make the production, distribution, and utilisation of their products more efficient processes, to the point where those processes may be automated.

One key to making Industry 4.0 a reality, Raffensperger said, is taking advantage of the amount of data that companies are able to gather. Cloud platforms may play a significant role in this regard.

"A few years ago we were talking about disks on our PCs that maybe had 100 GB of storage, and now we have more than that by far inside of our phones. So, the amount of inforalso automate. It's about being able to have your computing, your storage capabilities, and your networks that are pools of resources being flexibly applied to whatever problem you're trying to solve at the moment, and having something that can do that automatically," he said.

The word "automation" might induce anxiety for some in industry, but Raffensberger said that it should be a net positive for workers.

"As we move from the automation into intelligence, what we hope will happen for the workers is that their jobs will stop being completely, repetitively mindless. I'm not going to spend four hours going to a remote site, writing down a bunch of numbers that I got off of a bunch of analog meters, and then get back into the office to spend another four hours logging it. There's not a lot of value in that as a person. The opportunity with AI is to really unlock the human potential, to allow people to have a much better feeling that they're actually controlling things," Raffensperger said.

Derek Mathieson, chief marketing and technology officer at Baker Hughes, said that, while the push to Industry 4.0 requires the buy-in from the workers who will be affected, it also dovetails with the crew change the industry has undergone in recent years. He said the demand for data scientists from its university graduate and recruitment programs has gone from "almost nothing" to a fairly significant percentage. As a different type of worker enters the business, he said companies may have to "retool on the innovation side" and reconfigure how these people fit into the design and creation of their businesses.

"We need to rethink how we think about the creation of real value," Mathieson said. "The whole nature of competition is starting to change. For the first time in as long as I can remember, as many of our customers are working with Microsoft and Amazon as they are with Baker Hughes and Schlumberger. We're living through the industrial revolution today. We're seeing some of the ordering in the supply chain. We're seeing the arrangement of partnerships with a range of tech suppliers."

Also speaking at the panel were Omar Saleh, head of energy and manufacturing for the Middle East and Africa at Microsoft, and Arja Talakar, CFO of Siemens Oil and Gas. ■

## How Will Natural Gas Factor Into the Future Energy Mix?

#### Stephen Whitfield, Staff Writer

With the future of energy still very much in flux, natural gas has emerged as a potentially major player, with production levels trending upwards despite signs of moderation in the US shale boom. A panel of industry leaders discussed the role natural gas could play in the energy mix in the short and long term during a session (The Future of Gas: From Wellhead to Market) held Tuesday afternoon at IPTC.

Saudi Aramco has made strides in the LNG space over the past year as production soars with the startup of multiple liquefaction plants globally. Last May, the company agreed to purchase a 25% stake in Sempra Energy's Port Arthur LNG terminal, its first move into producing hydrocarbons outside of Saudi Arabia. Early in the year, the company was looking for additional gas projects in the Arctic and Australia to supply global markets.

Nabeel I. Al-Afaleg, General Manager of International Gas at Saudi Aramco, said at the IPTC panel that the company is embarking on a network of commercially viable gas supply projects around the world, with the object of creating further value for the company.

"We see a very positive future for gas as a reliable, economic, and efficient performer in the global energy mix," Al-Afaleg said. "LNG will continue to be the primary carrier for globally created gas. As a global LNG supply network develops, the natural solution is for gas to become more economised, supporting the development of future gas supply projects."

Despite his optimism on the future of gas, Al-Afaleg also warned about the potential near-term challenge gas price pressures may present in sanctioning gas supply projects. Nathan Meehan, President of Gaffney, Cline and Associates and 2016 SPE President, said that various strong market drives could underpin longer-term prospects for gas development. The global LNG market is experiencing significant oversupply. US LNG exports continue to increase, and new Australian and Russian projects have only added to global supply. Earlier this month, the US Energy Information Administration (EIA) said natural gas prices reached their lowest point in three years in 2019.

Meehan said this oversupply, combined with the larger quantity of LNG being traded on a gas index basis rather than an oil index, has created downward price pressure over the last 3–4 years. Contract lengths have become shorter, buyers are securing greater flexibility, and as a result any new market—even those of limited size—can be expected to create interest for suppliers.

Even so, Meehan said these were short-term pressures, and there is still plenty of opportunity for long-term success with natural gas.

"I'm pretty excited about the longterm here. Every place where they're using diesel to make electricity, those people are going to LNG. Even smaller and short-term buyers of LNG are attracting the attention of relatively large providers of LNG. We have another few years to determine how LNG is going to be priced to the world," Meehan said.

Emanuele Calviello, vice president of business development and equity projects at Eni, spoke about the role natural gas might play in a less carbon-intensive energy mix moving forward, touting the idea of natural gas as a bridge fuel. He said "the clock is ticking" on reducing global carbon emissions, and absent any one clearcut solution, pairing natural gas with increased use of renewable energy would be a realistic alternative.

"Gas coupled with renewable energy makes a really strong reduction in carbon emissions. Let's keep in mind, in the world today there is a lot of energy still being produced by coal, so there is still a big gap in moving from coal to gas and reducing emissions. The space for gas is still huge."

Also speaking at the panel were Hazli Sham Kassim, President of the Malaysia Gas Association, and Bader AbdulHameed AlBugaishi, Head of Production Systems Modeling at Tatweer Petroleum.



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## Wafra Restart Requires Collaboration Across Disciplines

#### Stephen Whitfield, Staff Writer

A fter four-and-a-half years out of service, the Wafra oil field is set to resume production sometime soon, and ensuring a smooth restart is no small order. Speaking at a technical session on the second day of IPTC, Ed Colina, an Operations Advisor at Chevron, outlined the approach the company took to assess its readiness for the task.

Located within the Saudi-Kuwaiti Onshore Partitioned Neutral Zone, Wafra is a joint venture of Saudi Arabian Chevron and Kuwait Gulf Oil Company (KGOC). The field was shut down in May 2015 as part of a dispute between the two nations. Reuters reported at the time that Saudi Chevron's disputes with KGOC mainly focused on the right to operate.

The Saudi Ministry of Energy and KGOC announced on 24 December that it had reached an agreement with Kuwait to resume production from Wafra and other fields in the neutral zone, which can reportedly produce as much as 500,000 BOPD. Neither country gave a specific timeline for the restart at that time, but Chevron said in a statement that it expected full production to be restored within 12 months.

Colina's presentation did not touch on the geopolitics of the area, but rather the operational readiness review (ORR) done to enable the restart of the asset's production. An ORR includes an assessment of the quality and completeness of critical base business processes, as well as an assessment of organizational capability, ensuring that Saudi Arabia Chevron had the right people properly trained to do all the procedures needed to ensure a proper and reliable operational restart.

Saudi Arabia Chevron applied the ORR to the Wafra field operations and the terminal plants servicing the area. It involved people going out into the field and subjecting personnel to a thorough questioning process. After a couple of weeks, the business unit received findings from those interviews along with some recommendations on how to address potential gaps in the overall operational framework.

"You had facility engineering, drilling engineering, global upstream, base businesses, and operations, working across divisional lines to ensure everything was set up for restart," Colina said. "What about asset integrity? Were our facilities in a good state? How were we managing throughout these four-and-a-half years? Do we have proper startup plans properly communicated? You have questions about the supply chain. Are our contracts in place to address operations and restart, and then immediately post restart?"

Colina described the process as a systematic approach, primarily because it was not focused on an individual function or division, but rather the entire organization.

"We saw it from a holistic view as an integrated approach, not necessarily well by well, but as a whole. The communication has to be wide open. You can't start up the field alone without communicating with the terminal, and vice versa. It's different divisions talking to each other once we start up to ensure things go smoothly and reliably," he said.

Once the area was assessed and the findings presented, the business unit developed what Colina called a "robust action plan" to address potential gaps. Findings that could change the outcome of the field's startup mode by more than 20% of expected levels were given high priority.

Colina did not specifically list all of those issues, but he referenced a main facility with an asset integrity problem as an example of something that would require immediate attention. Post restart, he said there will be significant opportunities to improve base business approach.

Colina presented a paper (IPTC 20140) he co-wrote with other Saudi Arabia Chevron colleagues on the ORR. ■



# New Technology Will Drive Upstream Forward, But Not Without Young Talent

Trent Jacobs, Staff Writer



**Trey Clark** 

The scope of emerging technology for the oil and gas industry could be summed up in just three areas: advanced computer programming, new physical toolsets, and alternative applications of upstream systems.

An executive panel session on Tuesday, "Emerging Technologies and Challenges from Exploration to Development," featured examples of each category from several of the industry's most technologicallycapable firms along with candid thoughts on how they might be impacted by the industry's people problem.

Nasir Al-Naimi, Vice President of Petroleum Engineering and Development for Saudi Aramco, highlighted a number of ambitious technology initiatives that are poised to "revolutionise" his company's core exploration operations.

Among them is a recently launched digital programme called GeoDrive, which is an integrated geophysical imaging and modeling program designed for intensive exascale computing—considered to be one of the next major milestones for highperformance computing.

"This platform improves image processing efficiency by 90%, pushing the limits of image resolution," said Al-Naimi. "It is especially helpful in areas with challenging and complex geology."

In 2016, Aramco debuted another inhouse digital feat called TerraPowers that represents the industry's first trillion-cell reservoir simulation and hydrocarbon migration algorithm.

"This will allow our engineers to visualise the entire Arabian Peninsula and Red Sea," added Al-Naimi.

One frontier area where Aramco is using its new suite of geophysical technologies is at its budding unconventional programme that is targeting the Kingdom's tight gas



Nasir Al-Naimi

formations. The advanced wares are already lowering drilling costs, "while increasing our productivity several times over," said Al-Naimi.

Al-Naimi also highlighted the growing use of ocean-bottom nodes, but with the added feature of robotics, which he said represents a "disruptive technology" for the seismic sector. Known as the "Spice Rack" programme, Aramco has been developing autonomous robotic nodes for subsea seismic acquisition for the past several years with its partner Seabed GeoSolutions.

Sophie Zurquiyah, chief executive



Sophie Zurquiyah

applications—especially when it comes to the industry's growing role in decarbonisation initiatives. "Since we have to look ahead, simulation with supercomputing is starting to be used also for nuclear fusion, which we are testing with MIT in Boston," said Giuseppe Valenti, the Executive Vice President of Geology and Geophysics for Eni. He said that Eni is also lending its simulation technology to the developers of technology that seeks to harness the energy of sea waves and use it to someday help power the company's offshore platforms.

Panelists from Halliburton and Schlumberger emphasised their

"We must work together to dispel this misconception, emphasise our renewed focus on cutting-edge technology, and prepare our companies for these younger employees who will carry this 'Industry 4.0' forward," said Al-Naimi.

at the geoscience giant CGG, also highlighted the expanding use of ocean-bottom node technology that delivers more precise seismic data which in turn puts the subsurface into sharper focus. Better images, she said, are translating into better-placed wells and giving operators more confidence in deciding the optimal number of wells needed to develop an asset.

"If you look at the Gulf of Mexico, which has a particularly complex subsurface with lots of salt, all of the projects that have been approved by our clients there have had oceanbottom node surveys," said Sophie Zurquiyah, Chief Executive Officer of CGG.

As the industry's modeling, simulation, and processing power all ramp up, some companies are looking for outside-the-box company's recent decisions to move away from the closed, proprietary model that has been used by the service companies since the dawn of the oil and gas software business.

"To drive the next industry revolution, we need more than just incremental change—we need to develop a common operating system, an open architecture, a system that allows all companies to plug in and contribute to our understanding of the well, the reservoir, and the field," said Trey Clark, Vice President of Wireline and Perforating Services at Halliburton.

When they looked at the challenges of implementing this new wave of technology, the panelists shared the view that the biggest obstacle involves the industry's access to young and skilled workers.

Al-Naimi said that while about 70% of Aramco's upstream workforce

is under the age of 35, attracting young people to oil and gas remains a top concern for the world's largest company. A chief hurdle are widespread beliefs in the public arena that the industry is in decline, which he said "exert a negative influence on recruitment."

An idea floated by Clark was for the industry to invest more in connecting with young people at universities. "Not the same old universities—the ones that we've been investing in research grants and football suites for years," he said. "No, we need to reach out to the new universities, those other universities where we don't have a presence. Let's build relationships with them."

Zurquiyah is also concerned about recruiting, noting that all of the industry's new and powerful technologies will have diminished impact going forward without the ability to recruit a new generation of subsurface expertise. "We need to recognize that it's becoming more difficult," she said. "Certainly it is true that at CGG we're competing for talent with the likes of Google, Amazon, Microsoft, and IBM."

The market size of tech firms is expanding faster than the upstream business, and is often seen by young people as more exciting, she said. "As well, we have a deficit of image—so we need to work as an industry to try and address that."

She said one way the industry can turn this situation around is by modernising its work environments, making career advancement opportunities more transparent and available, and by embracing the concept of work-life balance. "There are expectations from this group of people—and we need to make sure we listen to that."



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# **TAQA, AlMansoori Petroleum Services Announce Agreement**

Saudi Arabia's Industrialisation and Energy Services Company TAQA announced the signing of an agreement with AlMansoori Petroleum Services to provide fracturing and stimulation services in Saudi Arabia.

The announcement was made during the International Petroleum Technology Conference.

The agreement establishes an alliance between TAQA and UAE-based AlMansoori Petroleum Services to provide high-end, fully-integrated fracturing and stimulation solutions by combining both companies' expertise and capabilities in geoscience and engineering, wellsite management, well testing and flowback, fracturing, stimulation, slickline, coiled tubing, and perforation services and equipment.

This will allow both companies access to the growing hydraulic fracturing market in the region, which is forecast at a value of more than SAR2.0BN in



Khalid Nouh, CEO, TAQA

2020, the companies said.

Commenting on the new agreements, Khalid M. Nouh, Chief Executive Officer of TAQA, said: "The alliance with a world class OFS company such as AlMansoori will expand TAQA's capabilities and allow us access into the integrated

stimulation fracturing market of Saudi Aramco, and will provide our customers with world-class capabilities from a new supplier."

Nabil Al Alawi, AlMansoori Petroleum Services CEO, commented: "Partnering with TAQA will allow us to extend our offerings into the hydraulic fracturing and stimulation market of the Kingdom of Saudi Arabia. As a leading home-grown company in our field founded in the UAE, we are delighted to be working with a national Saudi champion company such as TAQA. We look forward to working together to create a triple win: for us, for TAQA, but, most importantly, for Saudi Aramco."

TAQA provides end-to-end oilfield solutions for the region's energy industry, delivering products and equipment across the entire upstream value chain in Saudi Arabia

Established in 2003 with a broad mandate to localise the dynamic energy goods and services sector, TAQA is a Saudi Arabian joint stock company with the Public Investment Fund owning 45.70% and 54.21% owned collectively by government agencies, joint stock companies and several private and industrial investors representing a cross section of the Saudi industrial community.

AlMansoori Petroleum Services was established in 1977 as AlMansoori Specialized Engineering to provide oilfield services in Abu Dhabi.

Since then, the company has grown to a leading regional provider of oilfield services in the Middle East and North Africa.

The company has nearly 2,000 employees working in 24 countries providing a variety of oilfield services including production testing, coiled tubing and stimulation, drill-stem testing, and slickline and completion.



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# Offshore Investment to Bolster Middle East Oil and Gas Supply Ambition

#### Taiyab Zain Shariff, Upstream Analyst, Rystad Energy

he most bountiful petroleum plays in the Middle East may no longer be storied aushers from the past but more technical offshore areas. The most recent hydrocarbon production boom is under way in the Middle East, and this time, the race is spilling into offshore waters. In this particular analysis, Rystad Energy takes a granular look at up and coming offshore exploration projects, and the region's major gas producers. Increased production of oil and gas will not only help the region meet domestic demand as well as notch up exports, it will entice sizeable capital into the region.

The figure shows the dramatic increase Rystad Energy expects to see in Middle East offshore exploration spending, led first and foremost by the UAE, which will see upstream investments reach an estimate of close to USD1 billion by 2025. Our calculation is based on current commitments, upcoming license awards, and potentially viable future awards. The UAE is followed by Turkey, which could attract an estimated USD350 million in spend. Saudi Arabia also could see a sizeable surge with investment reaching USD300 million or more based on the results of the feasibility study from their Red Sea and other offshore areas. Bahrain could also potentially see a cosmic rise from just USD10 million in 2020 to USD230 million in 2025. Investment in Lebanon and Israel will come in waves with up and down years, but still see material gains in upstream spending

The investment upsurge in the coming years will be driven by new drilling contracts, licensing awards, and future bid rounds.

#### **Kuwait Explores Offshore**

In July 2019, Kuwait signed a USD600 million offshore exploration contract with Halliburton to drill six high-pressure/high-temperature (HP/ HT) exploration wells in the next 2-3 years, restarting the country's offshore legacy after a more than 30-year hiatus. This new offshore exploration project with Halliburton could help to add around 100,000 B/D of oil in the future.

Kuwait Oil Company (KOC) was able to fast-track this contract with government support, most importantly with the introduction of a new tenders law. According to the law, foreign investors are now allowed to bid on projects directly without a



Kuwaiti partner company. The new law is aimed to debottleneck the significant delays from the obstacles of appointing an agent and registering agencies that allowed foreign entities to participate in project tenders.

The offshore exploration work is expected to start in mid-2020 with the first rig expected to come by July 2020 and the second rig by January 2021. With this program, KOC hopes to complement ongoing onshore activity to support long-term domestic gas needs and oil exports. Kuwait has long been targeting to reach production of 4 million B/D (up from current production capacity of about 3.1 million B/D) but so far has fallen short in attaining this lofty goal, especially as production declines at large maturing fields, notably Burgan.

#### **UAE Licensing Rounds**

The UAE has recently seen a series of successful licensing rounds with close to 31,000 sq km of acreage being awarded, both offshore and onshore. A large portion of offshore acreage awarded is located in the Abu Dhabi and Ras Al Khaima regions.

Abu Dhabi National Oil Company (ADNOC) launched its first-ever competitive bid round, awarding five blocks and securing more than USD 800 million in exploration spend. Out of the five blocks, the two offshore blocks have been awarded to a consortium of Eni and PTTEP and the three onshore blocks have been awarded to Occidental, Inpex, and a consortium of Indian Oil and Bharat Petroleum.

Following the success of the first bidding round, ADNOC has launched a second competitive bidding phase, which would offer unconventional blocks for the first time. The round would offer three offshore blocks and two onshore blocks and cover a total area of 32,000 sq km. The area contains existing discoveries and 290 targeted reservoirs from 92 prospects. The licensing opportunities of onshore Block 2, onshore Block 5, offshore Block 4, and offshore Block 5 will be awarded in concessions to successful bidders, under terms that will be set out in the bid package. Offshore Block 3, which overlaps, in certain geographical areas, with existing concessions already granted to international oil companies, will be awarded to explore exclusively for potential gas in deep geological formations and potential oil in various formations outside the existing concession areas

Elsewhere in Ras Al Khaima, the shallow offshore Block A was awarded to Eni and a partly onshore/offshore Block 5 to PGNiG. Exploration activity will be carried out in three 2-year phases.The exploration block awards

#### UAE upcoming and recent awards overview



Source: Rystad Energy ECube

are expected to help the country achieve its 2030 strategy to ramp up oil production capacity from 3.5 million B/D to 5 million B/D and to become a net exporter of gas. The UAE currently imports 2 Bcfd of natural gas from Qatar via the Dolphin pipeline, for which the contract ends in 2032.

#### Bahrain on Lookout for E&P Companies

Bahrain's largest oil and gas discovery in the shallow waters of the Khalij

#### by Cyprus.

The upcoming license rounds in Lebanon, the UAE, and Kuwait come at a time as the region is in the midst of ramping up local production to cover domestic energy. As onshore resources mature and become more numbered, offshore exploration is again in the focus. In some cases, we expect the quest to even shift from the mature onshore areas to offshore deep and frontier areas.

Al-Bahrain Basin in 2018 has prompt-

ed the National Oil and Gas Authority

(NOGA) to consider US F&P com-

panies with shale expertise to help

explore and develop the huge pro-

spective area. Reported discovered

volumes are estimated at 80 billion

bbl of tight oil and 10 to 20 trillion

cubic feet of gas (Tcf), according to

the energy ministry. Further appraisal

drilling is planned to test the extent of

commerciality. Only a fraction of the

resources can likely be economically

exploited, but given the magnitude,

this may result in a significant produc-

tion boost for Bahrain. Going forward,

the next 2 years will be spent evaluat-

ing the commerciality of the discov-

ered resources. One project already

well under way kicked off in January

2019 when Eni signed an exploration

memorandum of understanding with

Bahrain's energy ministry for an off-

shore conventional oil block, where

drilling is expected to commence by

the end of this year.

**Red Sea Potential** 

In Saudi Arabia, Saudi Aramco is

conducting an investment feasibility

study in the Red Sea after unearthing

large quantities of gas. To the north in

the Mediterranean, state-owned Turk-

ish Petroleum has recently completed

controversially lies in waters claimed

the Karpaz-1 wildcat well, which

## **Artificial Intelligence Empowering Saudi Energy Sector**

#### Contributed by Microsoft

As the world seamlessly advances ambitions, artificial intelligence (AI) stands as a useful tool that eases the business flow in the energy sector. Microsoft's AI integration in the cloud provides simplified ways with which data analysis, predictions, and decision making have become optimised and easily controlled by employees.

The oil and gas industry's adoption of the Microsoft's cloud, machine learning, and AI is characterised by a lucrative and business-oriented aspect. The overflow of data has been solved through these technologies as AI is now capable of glossing over an extensive amount of data and perfectly analysing it through advanced analytics methods and algorithms to come up with instant decisions that are effective and business-efficient.

Microsoft has been working on improving deep reinforcement

Al is now capable of glossing over an extensive amount of data and perfectly analysing it through advanced analytics methods and algorithms to come up with instant decisions that are effective and business-efficient.

learning, which is a machine-based learning system that learns from people rather than calculated data analysis. Through this cloud-based Al, responses from previously learned experiences emerge during inconveniences. In addition, deep learning also proposes the possible problems, consequences, and root causes and provides solutions based on the success rate of each option. Putting these new technologies into practice in the context of a remote gas field would prove to be costefficient by reducing downtime and preventing the reoccurring of technical problems. Microsoft is also

enabling machines to learn and implement complex tasks in order to deepen the knowledge of AI.

In light of simplification and maximising efficiency, the AI domain in oil and energy sector has seen the inclusion of smart buildings that are easy to optimise. The platforms are cost-effective, easy to manage, and effective for space utilisation and energy management. With the connectivity of hundreds of wells to a platform, the data can be easily accessed and modified. The AI in smart buildings is capable of identifying underperforming wells, moreover, be flexible, as a simple click can regulate the performance of an entire gas field.

Aside from the cost reduction features it provides, the AI integration allows users to manage their inventories, reduce risk factors and prevent structural damages, detect suspicious activities and frauds, process automation and optimisations, and perform preventive and predictive analysis in a simplified platform which appeals to oil and gas companies.

Microsoft's continuous efforts to drive digital transformation in Saudi Arabia through cloud and Al, is observable through the continuous upskilling and reskilling of the industry workforce.

Microsoft's ambitious efforts to instill these innovative technologies in Saudi Arabia reiterates the company's efforts to support Saudi Vision 2030 and encourage economic diversification, creation of jobs and human capital development in the country.



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## New Facilities Bring Growth to Saudi Arabia

#### Contributed by NOV

Development of new facilities has been on a rise as the oil and gas industry continues to see growth and demand for technically advanced products in the Middle East. Specifically, within Saudi Arabia, growth has been seen as companies are coming together to support Saudi Arabia's Vision 2030 and Saudi Aramco's In-Kingdom Total Value Added (IKTVA) goals.

NOV recently made two major announcements about how it is expanding its offerings within Saudi Arabia in addition to the local products and services it already provides. The first is the joint venture between NOV and Saudi Aramco to manufacture high-specification drilling rigs and advanced drilling equipment. The second is its new Fiber Glass Systems facility that is bringing composite solutions to the Middle East. NOV will be driving the proliferation of these solutions into the Middle East market while improving the lives of people within this region and around the world

The local rig manufacturing joint

venture, Arabian Rig Manufacturing (ARM), will enable the in-Kingdom production of high-specification land rigs, rig and drilling equipment, and offer certain aftermarket services. In addition, a new training center for customers and internal employees is being established to develop Saudi technicians to maintain and operate the market-leading and sophisticated drilling technology produced by the venture.

The facility is located in Ras Al-Khair, near the Jubail Industrial City on the Kingdom's east coast, and is set to open this year (2020), with the first rig being delivered in 2021. The facility will serve as a major hub for high-specification drilling rigs using cutting-edge technologies, and will have the capacity to manufacture 10 onshore rigs per year. It will also offer repair and recertification services for a large portfolio of oil and gas equipment and have the capability to supply drilling packages for offshore jack-up rigs. ARM will localise expertise in multiple disciplines related to

onshore rig manufacturing and is expected to create many hundreds of direct and indirect jobs in the Kingdom. Along with developing worldclass technologies, the training center will be equipped with state-of-the-art simulators and test benches.

The facility is currently under construction and is bigger than any other NOV facility in the world. When in full operation, the facility will employ more than 1,000 personnel. The primary products that will be developed at the facility will be the 1500, 2000, and 3000 desert moving rigs. However, it will also manufacture the following NOV product lines: masts, substructures, top drives, iron roughnecks, drawworks, mud pumps, traveling blocks, rotary tables, BOPs, stabilizers, fishing tools, roller reamers, and shaker screens.

NOV is eager to bring together its industry-leading technology, manufacturing expertise, and rig products with Saudi Aramco's E&P capabilities while supporting Saudi Aramco's supply chain integration initiative and strengthening NOV's drilling technology franchise.

The new Fiber Glass Systems facility in Dammam is the first local manufacturer of spoolable and jointed glass reinforced epoxy (GRE) pipe, GRE high-pressure line pipe, and downhole tubing and casing. With 24,000 m<sup>2</sup> manufacturing space, NOV will now be able to bring composite solutions from its Fiberspar and STAR product lines to the Kingdom. which will help customers eliminate corrosion in their applications, reduce installation and maintenance costs over their pipe's life cycle, and more cost-effectively transport higher-guality resources to the market. These modern, composite materials represent the latest advancements that drive higher levels of efficiency, safety, and environmental stewardship.

These two new developments along with NOV's already established facilities, including 24/7 technical support, will create jobs and economic growth in both the Kingdom and in operations around the globe. ■

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## Progressive Collaboration and Innovative Solutions: Shaping the Future of Energy



# **Diversity and Inclusion: Beyond the Buzzwords**

Ellen Chin, Weatherford Senior Vice President and Chief Human Resources Officer

Weatherford's diversity and inclusion (D&I) initiatives are comparable to the technological advancements that are rapidly expanding throughout our industry. Just as we move to digitalisation to keep pace with the energy shift, we are also investing in cultural initiatives that will drive our company, and our customers, into the future. If we think of D&I in the same way as technology adoption, we see its potential to make great strides and ensure we will thrive well into the future. Technology is also playing a pivotal role in enabling more D&I, thus opening the way for more opportunities for women in operations.

With a strong D&I foundation, Weatherford is setting the stage for more collaboration (with both our employees and customers), greater productivity, and higher profitability. It is not enough to say we are a diverse and inclusive organisation. We have tracked our D&I performance since we launched the initiative in 2017 and have moved beyond mere buzzwords to create a more varied talent mix.

We set the stage for the future of Weatherford in 2017 when we welcomed Mark McCollum as our President and CEO. Mark's first act as our leader was to transform our culture with a focus on mission and core values. It was the right first step. We looked closely at our organisational culture. Because of its importance, we blended our cultural transformation into our D&I programme. To that end, Weatherford created a culture that would support and sustain D&I initiatives for the long term.

Part of the culture is casting the right shadow. That is, employees typically take on the characteristics of their leaders. For that reason, rolling out a successful D&I program hinged heavily on its adoption from all the company's leaders, from the company's front line supervisors all the way to the C-Suite. We began leadership training and assessment, which equipped our leaders to cast the shadow required for our organisation to thrive. We also welcomed three new board members because we recognised the need for a board that better resembled the diverse makeup of the new culture.

Once we had the cultural structure and high-level buy-in to support our cultural transformation initiatives, we engaged our employees at all levels throughout the company. Internally, we developed a network to support our organisation in aspects of both visible and invisible diversity. We developed the Women of Weatherford network, Young Professionals, and Vet Net (supporting our veterans). We encourage participation from all employees so that they recognise, appreciate, and support the differences and similarities that make us a stronger organisation.

We also support the communities in which we operate, which includes investing in the education of our youth. We have a Worldwide Initiative

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Supporting Education, or WISE, that provides educational opportunities to students in STEM, with a strong focus on encouraging young girls and under-represented populations to pursue STEM. We do this by introducing them to industry professionals, hosting events, offering externships, providing guided tours through our state-of-the-art facilities, and more within the communities in which we

#### operate.

Diversity is not enough on its own inclusion must be a key priority for real success. As such, we are offering more inclusion training globally, especially for frontline managers. In 2017 and 2018, the company set a target to recruit 30% of total recruits into our NextGen program, a 5-year leadership development initiative for field engineers.

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# **Conference Stands Out as Truly Multidisciplinary Event**

The International Petroleum Technology Conference (IPTC) is the flagship multidisciplinary technical event in the Eastern Hemisphere. This is the 12th edition of the conference, and the first time that it has been held in Saudi Arabia.

The conference, founded in 2005, represents the growing multidisciplinary approach taken by oil and gas firms worldwide, combining petroleum engineering, geophysics, and geology to shed light on the industry's biggest challenges and breakthroughs.

IPTC is sponsored by four major industry organizations and societies: the American Association of Petroleum Geologists (AAPG); the European Association of Geoscientists and Engineers (EAGE); the Society of Exploration Geophysicists (SEG); and the Society of Petroleum Engineers (SPE). IPTC is governed by a Board of Directors made up of eight representatives from IPTCs four organizing societies.

• **AAPG**—Since its founding in 1917, AAPG has fostered scientific

research and advanced the science of geology and the professionalisation of its members through publications, conferences, and educational opportunities and disseminates the most current geological information available to the general public. Its membership includes about 40,000 members in 129 countries in the upstream energy industry.

• EAGE—A global professional, not-for-profit association for geoscientists and engineers with approximately 19,000 members worldwide, EAGE provides a global network of commercial and academic professionals to all members and is multidisciplinary and international in form and its pursuits. All members of EAGE are professionally involved in (or studying) geophysics, petroleum exploration, geology, reservoir engineering, mining and mineral exploration, civil engineering, tunneling, and environmental matters. EAGE operates two divisions: the Oil and Gas Geoscience Division and the Near Surface Geoscience Division.

• **SEG**—A global not-for-profit with a mission of connecting the world of applied geophysics, SEG strives to advance the science of exploration geophysics, foster common scientific interests, support humanitarian efforts, and accelerate geophysical innovation. It supports more than 14,000 members from 114 different countries.

• SPE—Its mission is to collect, disseminate, and exchange technical knowledge concerning the exploration, development, and production of oil and gas resources, and related technologies for the public benefit; and to provide opportunities for professionals to enhance their technical and professional competence. SPE has more than 84,000 professional members from 154 different counties.

The synergy of these four leading, individual-member societies provides the most comprehensive opportunity to form multidisciplinary committees and an outstanding technical program. That also accounts for the sweeping scope of the event, which examines operations from the upstream to the downstream, and covers such diverse topics as drilling, health and safety, digitalisation, unconventionals, and project excellence.

IPTC's mission statement states that its aim is to promote, aid, and encourage technology dissemination and collaboration among the multiple disciplines of the petroleum industry. That trains its focus on the dissemination of new and current technology, best practices, and multidisciplinary activities designed to emphasise the importance of the value chain and maximising asset value. The knowledge, capabilities, and strengths of the participating countries and the sponsoring societies are central to the success of the conference and the corresponding exhibition.

The conference is held every 1-2 years in leading oil cities in the Eastern Hemisphere. Previous events have taken place in Kuala Lumpur, Dubai, Beijing, Doha, and Bangkok. ■



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