EGYPT OIL&GAS NEWSPAPER

Egypt's Leading Oil And Gas Monthly Publication

June 2016 - 40 Pages - Issue 114

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3RD EGYPT OIL AND GAS TECHNICAL CONVENTION

EOR / WATER FLOODING

BOOSTING JVs' PERFORMANCE

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EGYPS
EGYPT PETROLEUM SHOW
16 - 14 February 2017

EDITOR'S NOTE

Global low oil prices dominated multiple high profile debates in the oil and gas sector last month. Egypt Oil&Gas Newspaper held the 3rd Annual Technical Convention – EOR/Waterflooding – covering secondary and tertiary oil recovery methods. The three day event was held under the patronage of Minister of Petroleum and Mineral Resources, H.E. Eng. Tarek El Molla.
The Convention roundtable hosted prominent leaders in the oil and gas sector. The discussion aspired to formulate practical solutions to the most crucial issues that the players in the market are currently facing. The debate about efficiency and performance of JVs was the key point that guided deliberations of participants.
In an interview with Transglobe Energy Country Manager & Director and Co-Chair of the Brownfields Committee, EOG had an opportunity to enquire about future steps that Egypt's energy sector may choose to take in attempt to enhance its overall performance.
The Convention training introduced expert audience to recent innovations in the waterflooding methods and presented a series of success stories achieved by oil and gas majors in Egypt. The Convention workshop brought together geologists, reservoir engineers, and other industry professionals, who shared their progress in EOR and waterflooding, and presented most recent technologies they apply in the fields.
Further, The Oil & Gas Year (TOGY), in collaboration with Egyptian Gas Association (EGA), organized a strategic roundtable for industry chiefs to debate potential of natural gas in Egypt. Under the theme - Unlocking Egypt's Energy Potential – participants were searching for solutions with regard to upstream investments, taxation, and optimization of oil and gas services. The ongoing efforts in the sector in the context of gas market liberalization and modernizing reforms in infrastructure focused also on an urgent need to secure international financing to develop Egypt's deep offshore hydrocarbon reserves.
In line with the events, EOG team further examined challenges and prospects of the investment environment in the country. In an overview article, we outlined reforms that had occurred in the Egyptian legal framework, enabling the state to introduce incentives for foreign investors. In another article, we looked at an estimated increase in energy investments in the MENA region despite the global energy downturn. Given the challenges in the future, the article discussing investments in digital technology convincingly states that future achievements in the industry are strongly tied to strategic investment planning.
We hope you will enjoy this issue and we are wishing you a nice summer.

Thank you for your support and readership.

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Egypt Launches International Bid Round

The Egyptian General Petroleum Corporation (EGPC) announced launching a new international bid round for oil research and exploration in 2016, according to a press release received by Egypt Oil&Gas.

The bid includes 11 blocks in the sedimentary basins, of which five blocks are in the Gulf of Suez – North-East of October, North-East of Al Hamd, North-East of Ramadan, East Badri, North Maritime Esran, and the remaining six blocks are to be offered in the Western Desert – North-West Razak, South-East Maleeha, North Um Baraka, South Allam Al Shaweesh, West Badr Eddin, and South-East Siwa.

Minister of Petroleum and Mineral Resources, Tarek El Molla, said that launching the bid comes within the framework of the government's strategy to insure energy supply. International bid rounds and signing new oil agreements are a cornerstone of the strategy and the main motive for operations in the oil sector aiming at increasing production, intensifying research and exploration, and encouraging foreign investments.

The minister also noted that there are more bid rounds planned to be announced later in the year. The bids include new areas affiliated with the Egyptian Natural Gas Holding Company and Ganoub El Wady Holding Petroleum Company (Ganope), both onshore and offshore.

El Molla added that Egypt has rich potential to attract foreign investors as the government's exerted efforts to create a supportive investment climate, to develop the infrastructure, and to establish developmental projects focusing on bettering the living conditions and raising growth rates.

It was reported that Egypt intends to offer 28 blocks in total to foreign oil and gas companies in a series of bid

rounds planned to take place in 2016, according to earlier statement by Tarek El Molla at the Offshore Technology Conference (OTC) in Houston, RigZone reported. "We are going to call a new bid round for 28 blocks in the coming few weeks," the minister indicated prior to the announcement of 11 blocks bid round. He also told Rigzone after the conference session that the blocks are located in the Gulf of Suez, Red Sea, Desert Western, Desert Eastern, and Desert Mediterranean.

Egypt has over the last two and a half years signed 66 agreements for new upstream oil and gas blocks, securing a minimum commitment of $14b.

Egypt Approves Russia's $25b Nuclear Loan

Russia will loan Egypt $25b to finance building and operating a nuclear power plant in the country, Reuters reported. Egypt's President, Abdel Fattah Al Sisi, who has approved the agreement in a decree, said the loan would be paid off over the next 35 years.

It will finance 85% of the value of each contract for work, services, and equipment shipping, while the remaining 15% will be financed by Egypt. The interest rate will reach 3% annually and the installment payments are to begin in 2029 and continue for the next 22 years. According to the Energy Business Review, the loan will be used by the Egyptian side for a 13-year period between 2016 and 2028.

The plant, which is to house four 1,200 MW nuclear reactors, is due to be completed in 2022, and the first of its reactors is expected to begin producing power in 2024, informed Press TV.

In November 2015, Cairo and Moscow signed an agreement for Russia to build Egypt's first nuclear power plant in Dabaa and to extend a loan to cover the cost of construction, wrote Ahram Online. The site is located in the north of the country, in Marsa Matrouh governorate.

Egypt's President asserted that nuclear energy plays a vital strategic role for the country in terms of increasing its power generation capacity necessary for accomplishing social and economic development plans, the State Information Service informed in a press release. Egypt is seeking to diversify its energy sources by also building solar and wind energy facilities in the coming three years to generate around 4,300 MW of power in total.

Egypt Receives Rosneft's LNG Cargo

Russian oil giant Rosneft delivered its first liquefied natural gas (LNG) cargo to Egypt in May, according to Reuters. Russia and India Report quoted Rosneft's statement as saying that "the delivery of the cargo was made by the GOLAR ICE tanker to the Ain Sokhna port within the Master LNG Supply and Purchase Agreement signed in August 2015." The delivered cargo of LNG is the first one in Rosneft's operational history.

Egypt will receive further eight agreed shipments of LNG, an official at the state gas board Egyptian Natural Gas Holding Company (EGAS) told Reuters.

Rosneft and EGAS had initially signed a Term Sheet for Rosneft's future supplies of petroleum products and 24 LNG cargoes, however, only nine of the 24 originally agreed cargoes were later inked into a final deal, wrote Aswat Masriya.

The cooperation with EGAS marks Rosneft Group's entry into the global LNG trading market. The Russian company said that the implementation of the terms will allow Rosneft "to access the high growth potential Egyptian gas market and deepen broader cooperation between the two companies."

Egypt relies heavily on natural gas to operate power plants used in homes and factories. Rosneft, Russia's biggest oil producer, does not produce its own LNG yet, but plans to launch production jointly with Exxon Mobil after 2018.

NREA to Attract $13.7b Green Investments

Egypt's New and Renewable Energy Authority (NREA) aims to attract investments worth $13.7b to establish renewable energy projects with a capacity of 9,520 MW over the next seven years through tenders, direct contracts, or the feed-in tariff, NREA Chairman, Mohamed Salah El Sobky, told Daily News Egypt in an interview. El Sobky added that NREA thus targets boosting renewable energy contribution to national energy mix by around 20% by 2020, in line with the country's strategy, informed Amwal Al Ghad. NREA is thus set to finalize a number of MoUs that have been signed recently with a number of international energy firms and start implementing them within the coming period to boost efficiency of national electricity grid as well as power plants capacities.

SDX's North West Gemsa Flows Oil

SDX Energy, an international oil & gas exploration and production company with assets in Egypt and Cameroon, brings a new oil production well at the North West Gemsa concession of Egypt's Eastern Desert in operation, Proactive Investors reported. The well, Al Amir SE 24, has now been connected to existing facilities and production will begin immediately. The well was completed as a producer in the Shagar formation and flowed on test light 43.6 degree API oil at an average rate of 1,714 bbl/d with 3.062 mscf/d of associated gas, according to E&P. Meanwhile, SDX had launched work on the seismic acquisition of 3D data on the South Disouq concession located onshore Nile Delta Egypt, Oil Voice reported.

Eni, BP Up Nooros Production

The Italian energy company Eni and British Petroleum (BP) announced that the Nidoco North 1X and Nidoco North West 4 development wells had brought the level of production in the Nooros oil field in Egypt to around 65,000 boe/d, wrote ANSAmed.

In light of the announcement, the Ministry of Petroleum and Mineral Resources has released a report, which stated that placing four Nidoco exploratory wells on production line has increased country's overall output levels to more than 300mcf/d of natural gas and 300,000bl/d of condensates, Egypt Oil&Gas reported.

Eni noted in a statement that the objective had been met in only 10 months and that it showed the usefulness of Eni's strategy of 'near field' exploration, focusing on high-value activities to make it possible to rapidly develop discoveries through existing infrastructure.

The oil field is in the Abu Madi West concessionary bloc in the Nile Delta zone, some 120 km northeast of Alexandria.

The Nidoco W-2 exploration well was expected to be spud later in May and test a western segment of the field. Development wells, including Nidoco North West 5 well spud in May, are expected to further increase production over the course of 2016.

Discovered in July 2015, the field is now producing around 305mscf of gas, 3,000 barrels of condensates and 1,500 barrels of NGL per day from four wells. This has been achieved after facility de-bottlenecking and enhancing existing production facilities, informed Oil Voice.

Eni's next objective is to increase production up to 140,000 boe/d by the end of 2016 through drilling additional wells. Eni will also continue its exploration activities in areas seen as having the most potential.

BP holds a 25% stake in the concession of Abu Madi West, and Eni, through its subsidiary IEOC, holds 75%. The field is operated by Petrobel, a joint venture between IEOC and the State partner Egyptian General Petroleum Corporation (EGPC).

In addition, Eni has started linking the extracted gas from Zohr field to the national grid in order for production to reach 1bcf/d by 2018 and to double to 2bcf/d by the end 2019, said a senior official at the company, reported Daily News Egypt.

Eni plans to develop Zohr field within the Shorouk concession in the deep Mediterranean waters increasing the rates of production to 2.7bcf/d by 2020, which is subsequently expected to decline to 1bcf after 2037.

The company completed drilling the third well, the results of which are promising. Calculation of reserves volumes is underway as it was discovered that there is a gas carrier layer which is larger than those found in the first and second wells. Therefore, the gas reserves are estimated to stand at about 30tcf.

Egypt Adds 3,600MW to National Grid

Egypt's President Abdel-Fattah El-Sisi inaugurated eight power stations, adding more than 3,600 MW to the national electricity grid at a total cost of $2.7b, reported Ahram Online. The projects, several of which entered service throughout the past year, include the Upper Egypt West Assiut power station that has a production capacity amounting to 1,000 MW. In addition, according to Daily News Egypt, the Minister of Electricity and Renewable Energy, Mohamed Shaker, said that the energy sector is now seeking to achieve an electricity surplus of up to 25% in the coming summer period with high demand in order to avoid any blackouts.

Apache CEO Praises Assets in Egypt

Apache CEO, John Christmann, told Houston's Offshore Technology Conference that he was glad the company held onto its assets in Egypt, while it has been selling most of its international holdings, Fuel Fix reported. He cited the better cash margins Apache is getting in Egypt compared to the US. Christmann added that the company expects to drill 60-70 wells in its concession area. Egypt now accounts for 27% of Apache's oil and gas production. Apache remains Egypt's largest oil and gas producer, although BP and Eni are moving forward with major deepwater gas discoveries offshore Egypt, Seeking Alpha website added.

Egypt to Settle $400m in Dues to Shell, BG

Shell and British Gas (BG) have reached an agreement with the Egyptian Petroleum Ministry to obtain $400m of their financial dues by the end of June, in exchange for renting a driller and resuming work in the 9B phase of the project in the Mediterranean, Daily News Egypt informed. In addition, it was reported that the Oil Ministry is to complete the repayment of their full dues by the end of 2016. A source close to the negotiations said that the deal would accelerate the work and link wells of stage 9-B by Q4 of 2017, adding that the entire project can be completed in the second half of 2018, Al Bawaba wrote. BG's dues are estimated at $1b, and they represent 30% of the government's total debt to the foreign petroleum company working in Egypt that currently amount to $3.2b. Further, the agreement was preceded by negotiations between BG and the Egyptian General Petroleum Corporation to raise the price of gas.

Saudi Acwa Power to Invest $12b in Egypt

ACWA POWER

Saudi company Acwa Power intends to invest $12b in the Egyptian energy market over the next five years, the company's Regional Director, Hassan Amin, told Daily News Egypt.

Amin said that the projects Acwa Power intends to implement include Dayrout power plant which will have a 2,250 MW capacity, as well as three solar and wind plants with a 150 MW capacity factor. He concluded that of the four agreements related to the Dayrout project, 90% of the agreed-upon items have been completed.

The company aims to activate the Memoranda of Understanding (MoUs) that were signed at the Economic Development Conference to establish a power plant fueled by coal, while the competitive tenders are to establish renewable energy plants in the western Nile area.

Acwa Power is also qualified to establish new and renewable energy projects according to the feed-in tariff system approved by the cabinet. According to Acwa's Regional Director, the company will launch a solar energy plant with a capacity factor of 50 MW in Banban in Aswan, and two wind energy plants with a capacity of 100 MW in the Gulf of Suez.

The Egyptian Ministry of Electricity and Renewable Energy has plans to establish solar and wind power plants with a total capacity of 4,200 MW and with investments worth $7.5b, according to the feed-in tariff.

Siemens Places Gas Turbines at Beni Suef Power Plant

Siemens has placed first two of the four 400 MW H-class gas turbines on the foundations alongside six 500 kV generator transformers at the Beni Suef power plant in Egypt, reported Trade Arabia. Ahram Online further informed that the power plant will see other six turbines installed, and it is expected to supply around 21.6m people with electricity. The Beni Suef power plant will enter the service by the end of 2016 with 2,400 MW. 400 MW will be added through 2017, before becoming fully operational in April 2018 with additional capacity of 2,000 MW at that stage. The German engineering company stated that the Beni Suef plant is set to become the world's biggest gas-fired combined-cycle power plant complex when completed, according to ME Construction News.

Egypt Attracts Solar Investments

Egypt has attracted massive interest in solar energy investments from international companies, reported Daily News Egypt.

Norwegian Scatec Solar company seeks to pump $650m in renewable energy investments in Egypt to establish five solar energy projects with a capacity of 250 MW, according to the company's CEO, Raymond Carlsen, said. The company will launch three solar energy plants in Banban area in Aswan with a capacity of 150 MW. In addition, Scatec Solar will co-establish two solar energy projects with a capacity of 100 MW with a number of companies that have qualified for the feed-in tariff projects in Zafarana.

In addition, Germany's Kaco New Energy plans to boost investments in the Egyptian market by $500m in the next four years, reported Daily News Egypt quoting company's CEO, Kaddour Essersi as saying. Kaco wants to participate in 10 out of 36 new and renewable energy projects in Banban, investing in solar panels. Kaco New Energy has partnerships with Italian and Chinese companies, in addition to Orascom Construction Industries SAE.

Moreover, Orascom Telecom Media and Technology Holding (OTMT) plans to establish a $100m solar energy plant that will further bolster Egypt's energy production by adding a capacity factor of 50MW.

Lastly, Lekela Power, a pan-African renewable energy generation platform will begin construction of a solar energy plant with a 50 MW capacity in Banban, Aswan, with a $90m investment in total. Construction will begin in October and is expected to be completed after nine months, with two wind power plants built in the Gulf of Suez under the feed-in tariff scheme.

Egypt's New and Renewable Energy Authority (NREA) is cooperating with the Aswan governorate, solar energy investors, and the residents of Banban area to facilitate the implementation of the projects.

Bahrain to Increase Investments in Egypt

Egypt signed 11 Memoranda of Understanding (MoUs) with Bahrain during the Bahraini-Egyptian Business Forum marking a two-day visit of Bahrain's King Hamad bin Issa al-Khalifa to Cairo, informed Ahram Online. MoUs include agreements to cooperate in the fields of energy, medicine, entrepreneurship and construction, reported Al Mal News. Further, an agreement between Bahrain's Gulf Chemicals and Industrial Oils Company and Abu Qir Fertilizers Company was signed to exchange expertise, maintenance and safety. According to Daily News Egypt, business negotiations will likely raise bilateral trade volume of $340m in 2015, and boost Bahraini investments in Egypt currently amounting to $1.7b, said Chairman of the Bahraini Chamber of Commerce and Industry, Khalid El-Moayyed.

Engie to Invest $490m in Renewables

Engie, a French energy company, is planning to set up two power plants – wind and solar – in Egypt, an investment worth $490m, according to the company's Regional Director for North Africa, Amin Homan Lodi, Al Mal News reported. The first $110m plant is due to be completed in 2017, while second $380m plant is scheduled to be operational in 2018. The announcement follows previous news according to which Engie had signed a cooperation agreement on developing renewable energies with Egypt's National Renewable Energy Association and the Egyptian Electricity Transport Company during a visit by French President, Francois Hollande, in Cairo, Reuters informed.

Egypt's EFG Hermes to Rise Investments

Egypt-based investment bank EFG Hermes is planning to increase investments it manages in renewable energy from the current $831m to between $1.7 and $2.3b in the next two years, Zawya reported citing company's MD of Infrastructure Private Equity, Bakr Abdel-Wahab.

EFG-Hermes, one of the Middle East's largest investment banks, has a renewable energy portfolio concentrated in Europe and Egypt. "We are initially targeting projects of around 500 MW of solar and wind energy in Egypt," Abdel-Wahab said. According to SeeNews Renewables, EFG aims to have a renewables portfolio of 1 GW in total by 2018.

DRILLING

KHALDA

KHALDA, a joint venture between EGPC and Apache, has completed drilling new oil exploration and development wells in its concession area in the Western Desert. The production rate of Khalda in April 2016 was 4,576,050 barrels of oil.

IMHOTEP-W-1X

The exploration well was drilled at a depth of 15,700ft utilizing the EDC-54 rig. Investments surrounding the project are estimated at $2.124m.

SIWA-3-R4

The development well was drilled at a depth of 14,900ft utilizing the EDC-59 rig. Investments surrounding the project are estimated at $3.248m.

KHALDA-89

The development well was drilled at a depth of 6,800ft utilizing the EDC-61 rig. Investments surrounding the project are estimated to be $2m.

PTAH-1X

The exploration well was drilled at a depth of 13,800ft utilizing the EDC-8 rig. Investments surrounding the project are estimated to be $1.848m.

AGIBA

AGIBA, a joint venture company between EGPC and IEOC, has completed drilling a new crude oil development well in its concession area in the Western Desert. The production rate of AGIBA in April 2016 was 1,800,273 barrels of oil.

FARAS-53

The development well was drilled at a depth of 3,300ft utilizing the WF-161 rig. Investments surrounding the project are estimated at $1m.

AMAN-59

The development well was drilled at a depth of 5,465ft utilizing the EMESCO-605 rig. Investments surrounding the project are estimated at $1.2m.

PETROBEL

PETROBEL, a joint venture between EGPC and ENI, has recently completed drilling new oil development wells in its concession area in Sinai. The production rate of PETROBEL was 2,790,117 barrels of oil in April 2016.

ARM-21

The development well was drilled at the depth of 12,156ft utilizing the ST-1 rig. Investments surrounding the project are estimated at $3.630m. It is worth noting that the well is being placed on production.

BAPETCO

BAPETCO, a joint venture between EGPC and Shell, has completed drilling a new exploration gas well in its concession area in the Western Desert. The oil production rate of GPC in April was 1,569,244 barrels/month, while the natural gas production was 233,714 barrels/month.

QADR-13

The development well was drilled at a depth of 5,078ft utilizing the EDC-72 rig. Investments surrounding the project are estimated at $1m.

PETROSILAH

PETROSILAH, a joint venture between EGPC and MERLON, has completed drilling new oil development wells in its concession area in the Western Desert. The production rate of Petrosilah in April 2016 was 299,362 in barrels of oil.

SILAH-15

The exploration well was drilled at a depth of 7,250ft utilizing the TANMIA-1 rig. Investments surrounding the project are estimated at $1.2m

GPC/SCIMITAR

GPC/SCIMITAR has completed drilling a new crude oil development well in its concession area in the Eastern Desert. The production rate of GPC in April 2016 was1,255,228 barrels of oil.

ZS-51

The development well was drilled at a depth of 3,927ft utilizing the SHAMS-1 rig. Investments surrounding the project are estimated at $2m.

QARUN

QARUN, a joint venture between EGPC and Apache, has completed drilling a new oil development well in its concession area in the Western Desert. The production rate of Qarun-in April 2016 was 1,197,956 barrels of oil/month.

NED-48

The development well was drilled at a depth of 6,200ft utilizing the PD-1rig. Investments surrounding the project are estimated at $800,000.

HAMRA-26

The development well was drilled at a depth of 5,900ft utilizing the EDC-64rig. Investments surrounding the project are estimated at $900,000.

SAMRA-85

The development well was drilled at a depth of 5,850ft utilizing the EDC-17rig. Investments surrounding the project are estimated at $1m.

Non-OPEC Countries Cut Oil Output

Oil output from producers outside the Organization of Petroleum Exporting Countries (OPEC) is falling faster than expected, helping the market to rebalance, according to The Telegraph. Non-OPEC oil producers are expected to lower their supply by 740,000b/d in 2016, to an average of 56.40mb/d, which is less than forecast, OPEC's latest market data showed. "There have been consistent signs of declines in non-OPEC production which should likely flip the global oil market into a net deficit in 2017," GMA News Online quoted the OPEC report as stating.
OPEC members failed to agree on a production freeze earlier this year, and both Saudi Arabia and Iran are expected to boost output in the coming months in a bid to retain their respective market share. But oil prices have nonetheless continued to creep higher from record lows in January. The OPEC reference price for oil averaged $37.86 a barrel in April, up 9.3% from the month before and 40% higher than the lows reached in the beginning of the year, "buoyed by expectations for an improving market situation," according to OPEC's May report.
Following the dismissal of Saudi Oil Minister, Ali Al-Naimi, and the appointment of Khalid el Falih instead, the latter has explicitly stated, in his first remarks, that the country would "remain committed to maintaining our role in international energy markets and strengthening our position as the world's most reliable supplier of energy," the Wall Street Journal reported. According to the Financial Times, the replacement of Al-Naimi makes oil freeze plan unlikely as the lift of the previously imposed sanctions allowed Iran to spark a competition with Saudi Arabia.
Similarly, Iran's Oil Minister, Bijan Zanganeh, said the country is still determined to increase its oil production to as high as 4mb/d, stressing that Tehran will only negotiate over joining the oil freeze plan when that target has been achieved, Press TV reported. Zanganeh rejected a self-sanctioning oil freeze plan saying: "We cannot cooperate with them to freeze our own output, and in other words impose sanctions on ourselves."
A production freeze was an idea that had helped send prices rallying more than 50% from 12-year lows last winter, but OPEC members and other oil exporters failed in a meeting in the Qatari capital Doha last April to reach an agreement on it.

Saudi Aramco Raises Output

Saudi Arabia's state oil company, Aramco, is raising output levels to capture more customers as it pushes ahead with Initial Public Offerings (IPOs), the Financial Times reported. Aramco's CEO, Nassir Amin, emphasized the company's willingness to compete with rivals on oil production, saying: "Whatever the call on Saudi Aramco, we will meet it," informed Reuters.
According to Amin, the proposals for the partial privatization will be presented soon to the Supreme Council, Reuters wrote.
Moreover, he explained that Saudi Aramco is also looking to expand globally via joint ventures in Asia and North America. "We are looking at the current market status that, even though challenging, is an excellent opportunity for growth," Amin said, adding that he was looking at opportunities in the US, India, Indonesia, Vietnam, and China.
In line with the expansion strategy, Saudi Aramco has started to send liquefied petroleum gas (LPG) to the Chinese chemical producer Wanhua Chemical Group, entering a first annual supply contract worth about $200m, Gulf Today reported. Saudi Arabia seeks to boost its sales to the world's top LPG consuming nation as output of the fuel climbs at home. Wanhua confirmed they received the first Saudi LPG cargo at Yantai port, Shadong province.
Iran Mulls Europe Gas Export
Iran is currently considering the most convenient way to export its gas, especially to the EU following the uplift of the international sanctions. According to the Ministry of Petroleum, Iran prefers to export Liquefied Natural Gas (LNG) to the distant markets due to financial and security reasons. However, it favors pipelines for transporting the gas to the neighboring countries, Trend News Agency reported. Tehran's further plan is to purchase a vessel for LNG transportation.
Meanwhile, Today.AZ noted that Federica Mogherini, the EU's High Representative for Foreign Affairs and Security Policy, emphasized the importance of Iran's hydrocarbon reserves in Europe's energy mix, and its role in increasing energy security of the member states.
Iran's strategic position offers its government several options to build pipelines. It may build a gas pipeline through Turkey, or to Oman where it can use the already existing LNG facilities to transport the gas to global markets. Experts consider using the Southern Gas Corridor and building a connection pipeline to TANAP, as a plausible option, instead of building a separate pipeline.
Although, some of the sanctions have been lifted, others still remain in place. Iran's purchase of US technologies is prohibited currently.

UAE's Masdar Completes Solar Plant

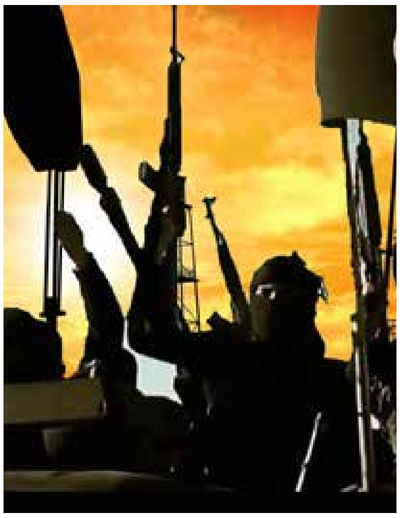
The United Arab Emirates and New Zealand inaugurated a solar power plant in Solomon Islands, developed and deployed by Masdar, Abu Dhabi's renewable energy company. The plant will provide the islands with 7% of its electricity needs, The National reported.
As Emirates News Agency wrote, it "represents an innovative approach to development assistance, merging strong government-to-government partnership with commercial innovation. The 1MW photo-voltaic solar plant was built with a $50m grant as part of the UAE-Pacific Partnership Fund, supported by the Abu Dhabi Fund for Development. It is expected to offset 1,254 tons of carbon dioxide emissions yearly.

Dana Gas Records 50% Profit Decline

Abu Dhabi-listed company Dana Gas reported a 50% decline in profit in Q1 as sales slumped due to lower hydrocarbon prices and 12% output reduction, Bloomberg reported. The company's net income dropped to $6m in the first three months, compared to $12m in the same period of 2015. Production drop in Egypt and the Kurdish region of Iraq due to the field decline in Egypt and re-rating of production output in Iraq, equals around 60,500 boe/d, according to The National.
In addition, Dana Gas is reported to continue cutting its capital expenditure, which fell under 30% compared with Q1 in 2015.

IS Oil Revenue Halved

The Islamic State (IS) oil revenue has been cut down 50% to about $250m per year as a result of air strikes, drop in oil prices, and counter-smuggling efforts by neighboring countries, Reuters reported. A senior US treasury official explained that the difficulties that the IS has in transporting its oil across battle lines contributed to the effect that halved its oil revenues. Previously in January, a US military official said that the air campaigns had reduced IS' oil revenue already then by about 30%. The US military has intensified its efforts to go after IS oil infrastructure in hopes of cutting funding to the group.



Algeria Commissions Photovoltaic Power Plant

Algerian Minister of Interior and Local Authorities, Noureddine Bedoui, has commissioned a photovoltaic power plant with a production capacity of 9 MW in the southern province of Tindouf, All Africa reported. The project is to contribute to increasing the power production, meeting 40% of power needs of the southwestern province. Meanwhile, Minister of Energy, Salah Khebri, said that a partnership with national investors is under preparation to create an industrial base for production of photovoltaic panels in the province of Saida, Algerian Press Service informed. Algeria and Morocco are taking steps towards solar energy, promoting the widespread of renewable energy exploitation.

Libya Resumes Oil Shipment

Libya will resume oil shipments from the port of Marsa El Hariga after an agreement was reached in Vienna between rival oil officials representing the east and west of the country, Reuters reported. Eastern National Oil Corporation (NOC) Chairman, Nagi El Magrabi, said, according to Bloomberg, that crude export from the eastern port of Hariga was due to restart before the end of May, and the shipments were to ease an export bottleneck and allow for a revival of the nation's crude production.

The rapprochement between the two factions could help Libya quickly increase its oil production back to more than 300,000b/d as it was producing before the blockade, which halved output from two major eastern oil fields.

Sources close to the negotiations said the two sides agreed to resume crude oil shipments from Hariga to "avoid damage to pipelines, avert a financial crisis, and ensure power supplies are not interrupted further."

Rival factions settled on joining forces to form a single oil authority operating throughout the country following the conflict between the internationally recognized Tripoli-based NOC, and the national corporation in the east.

Libya's Foreign Minister of the UN-backed unity government, Mohamed Siyala, announced that "these institutions can only be managed centrally. That is why it was agreed that both institutions from east and west be united, so that there is only one oil company, one investment company, and one central bank."

The east-west standoff initially started when an Indian-flagged tanker was added to a UN blacklist of "vessels under sanctions" preventing it from shipping 650,000 barrels of oil for the rival eastern NOC. The Tripoli based NOC called the tanker's shipment illegal. The conflict exacerbated when

eastern officials, in turn, told state-owned Arabian Gulf Oil not to allow any tankers to depart without its approval. They then barred the Seachance tanker, belonging to the Anglo-Swiss trading company Glencore, from exporting 1m barrels of crude from the port of Hariga saying that it did not have relevant official documentation.

Later in May, the United Nations Security Council lifted the sanctions imposed on the eastern parallel company in response to the Libyan UN mission's request.

Jordan Seeks Energy Deals with Egypt, Algeria, Palestine

In efforts to boost cooperation and allow more investments in the energy and mineral resources industry, Jordan signed multiple agreements with Egypt, Algeria, and Palestine, Jordanian Minister of Energy and Mineral Resources, Ibrahim Seif, said, according to ANSAmed.

The agreement with a joint Jordanian-Egyptian company was concluded by the Jordanian Energy Ministry to provide the kingdom with natural gas. The gas would be utilized in generating electricity, said officials on the sideline of an international conference on energy held in Amman.

An additional agreement with Algeria involves the fields of oil and natural gas, whereby the two countries will conduct bilateral training programs and exchange expertise in the field of raising electricity capacity. A Jordanian official said that a memorandum of understanding signed "aims at giving the Algerian companies access to the Jordanian market through calls of invitation which will be launched shortly by Jordan willing to buy gas."

"We agreed with the Algerian party to develop a program in this regard at the least before the end of 2016," Seif concluded.

The deal with the Palestinian authority involves amendments to an existing agreement by which Jordan provides the West Bank with electricity supply.

Morocco's Oil Refinery Resumes Operation

Morocco's oil refinery Samir will resume operating in mid-June after financial difficulties halted its production since August 2015, Morocco World News wrote.

Morocco's tax administration seized Samir's bank accounts in pursuit of a \$1.35b tax claim. A court ruling last March placed the company in liquidation and named an independent trustee to run it. However, the trustee controlling the company said recently that the Commercial Court of Casablanca and the tax administration had lifted the freeze on its assets while it was working to restart production as quickly as possible, Reuters reported.

According to the court, restarting production would lead the value of the company to rise and ease its sale in the near future

Saudi billionaire, Mohammed Al-Amoudi, Corral Petroleum Holdings owner, is committed to injecting \$680m into its refiner Samir, to try to reverse a decision placing it in liquidation, Reuters reported.

Morocco would become reliant on energy imports should the refinery shut down, just at a time the North African kingdom is getting its finances back on track by tackling huge deficits.

Iran, Oman to Establish LNG Firm

Iran and Oman plan to establish a joint company to market liquefied natural gas (LNG). It is expected to be registered in Oman, and will have the responsibility of market natural gas to other parts of the world, Trade Arabia News reported. Iran's Oil Minister, Bijan Zanganeh, and his Omani counterpart, discussed different issues including the Iran's gas pipeline to Oman project. An engineering and marine installations company is conducting some studies and will provide Iran with its reports without delay to prepare tender documents, according to ISNA reported. The gas pipeline will allow Iran to export 28mcm of gas to Oman.

Sound Energy Spuds First Tendrara Well

The European and Mediterranean focused upstream oil and gas company, Sound Energy, announced that it commenced drilling the first well at Tendrara, onshore Morocco. In its statement, the company said that the first casing point at a measured vertical depth (MVD) of 496 meters had been successfully set and cemented. As Your Oil and Gas News reported, drilling is expected to reach a total measured depth of 2,640m with the drilling program anticipated to include coring, logging, completion, and testing. Sound Energy CEO, James Parsons, said: "This well is a significant milestone for our Company" as they expect it to unlock Eastern Morocco's regional gas play.

Israel Stepping Up Leviathan Gas Field Development

After months of negotiations, Israel has reached a deal with the Texas-based Noble Energy and Israel's Delek Group that will finally allow the firms to move forward with development of the huge Leviathan natural gas field, Israel's Finance Minister said, according to Reuters. It will allow gas exports to Egypt and Turkey, Israeli Energy Minister, Yuval Steinitz, told Bloomberg in an interview.

Steinitz added that the new agreement will be brought to the government for final approval which gives the state more leeway to change policies if needed.

The proposal would be a 'softer' version of the government's offer to promise the energy explorers regulatory stability for 10 years, according to Steinitz.

The Leviathan project hit a major obstacle in March when Israel's Supreme Court blocked a previous agreement that bound the state to the terms of the deal for 10 years. The agreement had meant the government would be committed not to change taxes, export quotas or other regulation. The court's objection also rattled the broader exploration sector where companies have been waiting to see how the saga plays out before investing in new offshore drilling, Daily Mail wrote.

The absence of a regulatory framework has held up the development of Leviathan, Israel's largest gas reserve, discovered in 2010, and hindered production at the smaller Tamar field. It has also blocked export deals.

As In Cyprus informed citing the interview, although the drop in crude oil prices has cut into global spending on oil and gas projects, Israel is betting Noble and Delek will move forward with Leviathan because gas prices in Israel and elsewhere in the region remain relatively high, Steinitz concluded. He also noted that "the prices they will get in Jordan, Egypt, and hopefully in Turkey - because we are very close to resuming a diplomatic relationship with Turkey - are high."

Algeria to Increase Gas Exports to Europe

Algeria expects to increase its natural gas exports to Europe by 15% to over 50bcm this year, which is more than just recovering from the drop since 2013, Reuters reported.

An official at Sonatrach informed that Algerian pipeline and LNG exports recorded a growth of more than 30% compared to the same period in 2015. He added that growth in hydrocarbon production is expected. The fifth-largest supplier of gas to Europe held talks with European Union officials and oil companies in May on future gas supplies; as current contracts are due to expire in 2019-2021.

Algeria Moves Ahead with Energy Reforms

Algeria is moving ahead with reforms in the energy, oil, and gas sector amid the fall of international oil prices. In a global competitive atmosphere, the North African country is attempting to attract foreign companies and introduce bilateral agreements.

State oil company, Sonatrach, has awarded a $75m contract for the US oil service firm, Schlumberger, and an $11m contract for Weatherford, both of them for cementing and pumping services.

According to Ennahar, Baker Hughes has secured a $50m contract through its Algerian unit BJSP, in which Sonatrach owns 51%. The Emirati firm NPS has been awarded the fourth contract worth $44m.

Additionally, Iran and Algeria will launch a partnership project to assist the latter in the field of energy efficiency, notably in the conversion of vehicles to run on compressed natural gas (CNG), Nam News Network reported. The Islamic Republic is to transfer its experience from its national energy efficiency program by creating a partnership with Algeria, which has succeeded in converting 1.7m vehicles to run on CNG.

With regard to its domestic production, Algeria is expected to meet its demand by 2024 as the production of oil by-products will reach 45m tons with the new refineries of Hassi Messaoud, Tiaret, and Biskra going into operation.

Iran, China Conclude Energy Deal

Iranian Deputy Oil Minister for International and Commercial Affairs, Amir Zamaninia, and Deputy Director of China's National Energy Administration, Zhang Yuqing, signed a Memorandum of Understanding (MoU) on long-term cooperation in the energy sector, Financial Tribune reported. The MoU includes the promotion of Abadan Refinery in southwestern Iran.

According to Zamaninia, the agreement calls for increasing the extraction of oil and condensates by Chinese operators. Zamaninia also said that Tehran is open to partner with reliable Chinese companies under a competitive atmosphere to develop its crude oil and natural gas fields.

Zhang Yuqing noted that Chinese refineries purchase nearly half of Iran's total crude exports, adding that Chinese firms provide oil equipment at a reasonable price and quality.

Meanwhile, National Iranian Oil Company (NIOC) inked another crude and condensate sales agreement with Chinese Petrochemical Corporation (Sinopec Group), in which crude oil is agreed to be supplied to four or five subsidiaries of Chinese Sinopec.

In addition, both companies are put in charge of developing the second phase of North Azadegan and Yadavaran oil fields within a buyback contract according to the Iranian Oil Minister.

China is the world's second-largest oil consumer and one of the most important crude customers of Iran.

Niger Delta Attacks Jeopardize Oil Output

Nigeria's President, Muhammadu Buhari, ordered a heightened military presence in the restive Niger Delta region after a new militant group, the Niger Delta Avengers (NDA), claimed responsibility for several attacks on oil and gas facilities, Reuters reported.

The NDA warned international companies that "the Nigerian military cannot protect your facilities." In a statement, it added: "This is what we promised the Nigerian government. Since they have refused to listen to us, we are going to bring the country's economy to zero," informed Leadership. The group issued a two-week ultimatum to owners and operators of oil blocks in the area to shut down their business operations and evacuate all their staff or face a 'bloody' attack.

Meanwhile, Shell workers at Nigeria's Bonga oilfield in the southern Niger Delta were evacuated following a militant threat, while other recent attacks forced Chevron to shut its Okan offshore facility, taking out 35,000b/d of oil. While Shell said the latest unrest had not yet impacted production, its Forcados field is still closed and under force majeure following a February subsea pipeline attack, taking out 250,000b/d of oil. Chevron's Escravos operation has also been breached, while Eni and Exxon Mobil declared "force majeure".

Nigeria's Vice President, Yemi Osinbajo, met executives from Shell, France's Total, and Italy's Agip, and Chevron, agreeing to work together to ensure that production is not disrupted, according to the latest reports.

The militants, some of whom had being arrested by the Nigerian army, as BBC informed, want a greater share of oil profits for communities whose fishing and agricultural grounds have been ravaged by oil pollution. They also object to the government winding down a 2009 amnesty program for 30,000 former militants, informed AP.

As a consequence of the attacks, the Nigerian oil output dropped to a more than 22-year low of 1.65mb/d, down from 2.2mb/d at the start of the year, putting intense pressure on country's finances. Nigeria exports almost all of its production. The country was due to export around 217,000b/d of Bonny Light Crude in June, out of a total of 1.7mb/d, which would decrease output to below 1.5mb/d, first time low since September 1994.

Shell Spills Oil in Gulf of Mexico

An oil spill from Royal Dutch Shell's offshore Brutus platform has released around 2,100 barrels of crude oil into the US Gulf of Mexico, Global Research reported. The accident occurred near Shell's Glider field, an underwater pipe system that connects four subsea oil wells to the Brutus platform, which floats on top of the water with a depth of 2,900 feet. The platform is located around 156km south of Port Fourchon in Louisiana.

There has been no reported impact on the coastline or fisheries so far, as The Guardian wrote. Shell said the oil is not expected to reach the shoreline. "The trajectory is in a westerly direction with no shoreline impacts anticipated at this time," Shell said in a statement.

Meanwhile, the US federal government has tightened up drilling regulations following the Deepwater Horizon disaster in 2010, which resulted in the deaths of 11 people, and coated thousands of seabirds and marine animals in oil. In addition, the Obama administration outlined further measures to help prevent 'blowouts' that result in oil spills, as well as requirements for operators to put in place several back-ups in case something goes wrong.

India Moving to Gas-Based Economy

India plans to shift to a gas-based economy by boosting domestic production and buying cheap liquefied natural gas (LNG), as the world's third-biggest oil importer seeks to curb its greenhouse emissions, Oil Minister, Dharmendra Pradhan said, Reuters reported.

India's gas supply deficit is expected to widen from 78mscm/d this fiscal year to 117mscm/d in 2021-22, according to government's estimates. New Delhi has promised to shave a third of its emissions rate by 2030, partly by boosting the use of cleaner burning fuels. The country recently negotiated better terms for a long-term LNG deal with Qatar, and importer Petronet LNG is in talks with Exxon to renegotiate pricing for gas from Australia's Gorgon project.

"The price should be affordable to us. We respect long-term contracts but everybody has to appreciate the changing scenario," said Pradhan, according to Arab News.

Meanwhile, the Indian oil minister visited Saudi Arabia, the UAE, and Iran to deepen ties with its main oil suppliers. "We want to move beyond a buyer-seller relationship," he said, adding that India was offering stakes in its pipelines, petrochemical complexes, and refineries.

Halliburton, Schlumberger Cut Venezuelan Activity

Halliburton, the world's second-largest oil services provider, has joined its rival Schlumberger in curbing activity in Venezuela due to lack of payment during the oil industry's worst financial crisis in the Latin American country, according to Bloomberg. "We have experienced delays in collecting payment on our receivables from our primary customer in Venezuela. These receivables are not disputed, and we have not historically had material write-offs relating to this customer," the company said. The company's receivables in Venezuela rose 7.4% in Q1 to $756m, compared to the end of 2015.

Statoil to Explore Shale Gas in Turkey

Turkey is seeking local and foreign partners for joint exploration and development of shale gas fields in order to reduce its dependence on foreign supplies. The Norwegian energy company Statoil has recently signed an agreement with Valeura Energy, a Canadian exploration company, to help explore the shale gas potential in the European north-western part of the country. The terms of agreement, published by United Press International, state that Statoil will own a 50% stake in the Barnali license, while Valeura Energy will keep the remaining shares and will continue to be the operator.

Petrobras Renews Two Offshore Leases

The Brazilian petroleum regulator ANP has extended the state-run oil company Petrobras' concessions to explore and produce oil from the Marlim and Voador offshore fields for 27 years, to 2052, Reuters reported. The extensions were made to help facilitate new investments in the fields that will require work to help maintain their declining output. The ANP pressured Petrobras to use more of its shrinking investment budget to improve output offshore. The company is struggling with low oil prices and nearly $130b of debt. To cut debt and to increase its investment budget, Petrobras is seeking to sell $14b of its assets this year.

South Africa Develops Gas-to-Power

As South Africa is trying to reduce its dependence on coal and spur the development of infrastructure to support domestic gas supplies, it has created a Gas Industrialization Unit to implement a 3,726MW gas-to-power program, Bloomberg reported. After a series of managed blackouts last year curbed growth in an economy that is at risk of slipping into recession, Energy Minister said that a preliminary information memo on the gas-to-power program will be available this year. The ministry has plans to procure a new 600 MW gas-fired power generation project to be developed as a public-private partnership.

Nord Stream-2 Threatens EU Energy Security

The Nord Stream-2 project aimed at doubling the volume of gas shipped directly from Russia to Germany has triggered strong opposition by EU officials as it increases countries' dependency on Russia's Gazprom, which currently supplies more than 30% of EU's gas demand.

The European Parliament's parties have launched a scathing attack on the $11b project, Financial Times wrote. Manfred Weber, the Chairman of the centre-right European People's Party (EPP), said the proposed pipeline would undermine the EU's foreign and security goals. "The EU risks creating detrimental consequences for the gas supply in Central and Eastern Europe, including Ukraine, in particular against the background of Gazprom's announcement to stop gas delivery through Ukraine once Nord Stream-2 is finalized," the head of the largest party in EP wrote in a letter to Sigmar Gabriel, German Economy Minister, and to Miguel Arias Cañete, EU Energy Commissioner.

For some, Nord Stream-2 also represents a threat to the awaited 'Energy Union', an initiative launched by the European Commission (EC) with the intention to secure energy for consumers at affordable prices, competitive market opportunities for suppliers, and strengthened solidarity and trust between EU member states.

Moreover, Maroš Šefčovič, European Vice President for Energy, said the pipeline plans raised questions over its business case in light of the EU's own gas demand estimates, wrote Reuters. In his opinion, Europe may end up with more gas than it needs if the Nord Stream-2 pipeline, designed to double the amount of gas pumped via the Baltic Sea, is built.

In addition, a senior US Energy envoy at the EU-US energy council stated that the US is "deeply" concerned about the Nord Stream-2 gas pipeline project as a threat to national security" that would endanger the economic viability of Ukraine. It would also lead to 'deepening' the rift between East and West, RigZone informed.

The project aims to deliver 55bcm of Russian gas per year to Europe across the Baltic Sea. In September 2015, Russia's Gazprom, E.On, Shell, OMV, BASF, and Engie signed a shareholders agreement on the project, Trend News Agency wrote.

Halliburton, Baker Hughes $28b Merger Fails

The oilfield services provider Halliburton and its smaller rival Baker Hughes announced the termination of their $28b merger deal after opposition from US and European antitrust regulators, reported Reuters.

The contract governing Halliburton's cash-and-stock acquisition of Baker Hughes, which was valued at $34.6b at the time it was announced in November 2014, and is now worth about $28b, expired without an agreement by the companies to extend it. Hence, Halliburton will pay Baker Hughes a $3.5b breakup fee. The Financial Times informed that the US administration's tough stance raised questions over Halliburton's pursuit of Baker Hughes, and in particular over the cited $3.5b fee.

Meanwhile, Baker Hughes sought to reassure investors by announcing a $2.5b plan to buy back stock and pay down debt, using the breakup fee, wrote Reuters in a related report. Houston-based Baker Hughes will buy back shares totaling $1.5b and pay off its debt totaling $1b, the company stated. It will also refinance its $2.5b credit facility, which expires in September 2016, explained Bloomberg.

The tie-up would have brought together the world's No. 2 and No. 3 oil services companies, raising concerns it would result in higher prices in the sector.

Total Launches Offshore Project in Shetlands

French energy giant Total has officially launched a new huge gas project in Britain's remote Shetland Islands, which cost $5b and has been hailed by London as a "vote of confidence" in the flagging North Sea oil and gas industry, Yahoo News reported.

The development should provide 8% of Britain's daily gas requirements and open the potential for further enhancements in the area. It began processing gas from the Laggan-Tormore fields on February, and since then it has been ramped up to its full capacity of 500,000cf/d of gas, according to EurActiv. The fields are expected to last for about 20 years.

Laggan-Tormore is operated by Total with junior partners Denmark-headquartered DONG Energy and British energy company SSE, with each having a 20% share. Located in up to 600 meters of water, the five wells tap reservoirs that lie 3,500 to 3,900 meters beneath the sea floor. The gas is treated at the Shetland plant before the processed gas is piped into Britain's main grid, around 165 km northeast of the Scottish mainland.

Total claimed that the plant was Britain's biggest construction project since the London 2012 Olympics, employing 2,500 people at the peak of construction.

Kenya Creates 17 New Oil Exploration Blocks

Kenya has created 17 new oil exploration blocks, bringing its total number to 63, and aims to auction them in a licensing round in 2017, as the Ministry of Energy and Petroleum informed, Reuters reported. The country recoverable reserves are estimated at 750m barrels of crude. In 2012, British explorer Tullow Oil with its partner Africa Oil first struck oil in Lokichar in northwest Kenya. Africa Oil has since sold a 25% stake in those blocks to A.P. Moller-Maersk. The partners aim to announce a final investment decision for production in early 2017.

Nigeria Defends Subsidy Removal

Nigeria's trade unions threatened to paralyze the country with a general strike after the country's government removed a fuel subsidy, increasing petrol prices by 66%. Nigeria's Petroleum Minister, Emmanuel Kachikwu, announced the removal of the subsidy saying that there was "no provision" for it in the 2016 budget, Newsweek reported. The minister said that the new price would encourage foreign investors to focus on the big tickets, such as pipelines and refineries for the development of the upstream oil and gas sectors. Kachikwu added that it would enable the government to focus on funding in the upstream sector, which represented less than 30% of finances.

Engie Ordered to Raise Prices

The French competition authority has ordered Engie to raise its natural gas prices for companies, saying that in some cases the utility was engaging in "predatory pricing" to the detriment of competitors, the Financial Times reported. The measure against the former monopoly, which still has about 80% of the residential French gas market and more than 60% of the non-residential, comes after its competitor argued that some of Engie's market offers were anti-competitive. Moreover, the antitrust body is investigating the group's residential gas operations, asking if the company is using regulated gas prices in some areas to offer overly cheap rates in others.

Wildfire Disrupts Canada's Oil Production

A massive wildfire ravaged the Canadian oil town of Fort McMurray during a week, forcing many oil companies in the heart of Canada's oil sands region to reduce or cease production as a precaution. As The Wall Street Journal wrote, the town of Fort McMurray became the symbol of Canada's oil boom in the last decade, attracting some of the world's biggest energy producers amid a rush to build mega projects to extract nearby oil sands. The fire forced the evacuation of about 90,000 people, and roughly 1mb/d of output were shut down, about 50% of the oil sands' usual daily production.

Eni Unveils 420 MW Renewables Plan

The Italian multinational oil and gas company Eni revealed its plans to develop 420 MW of renewable energy projects, predominantly solar PV, close to its existing industrial gas plants across Italy, Egypt, and Pakistan, PV-Tech reported.

As part of a divestment plan into the renewables sector, the company has identified "synergistic" benefits of locating solar PV close to activities from its traditional business to bring in "industrial, logistic, contractual, and commercial" benefits.

In Italy, Eni will install 220 MW of renewables by 2022, requiring an investment of between $228m to $285m, under an initiative called Progetto Italia as Renewables See News wrote. As part of that project, Eni has initially identified 400 hectares of land in the regions of Liguria, Sardinia, Sicily, Calabria, Puglia, and Basilicata.

In Egypt, the company plans to construct an up to 150 MW solar park near the Belaiym field by the end of 2017. Eni wants a portion of the electricity generated by the plant to be used in the field and the rest to be fed into the national grid.

In Pakistan, it intends to build a 50 MW solar power facility near the Kadanwari gas field, a plant that is expected to be completed by the end of next year.

Southern Gas Corridor 'On Time'

The Southern Gas Corridor, a project of pipelines which will transport gas from the Shah Deniz field in Azerbaijan to European markets for the first time in history, is running on time and on budget, Peter Mather, BP's UK Country Head and Vice President of Europe said, Reuters reported.

Around 10bcm per year of Azeri gas should reach Europe by 2020 at the latest via the Trans-Adriatic Pipeline as well as the South Caucasus Pipeline through Georgia, and the Trans-Anatolian Pipeline (TANAP) through Turkey.

The first gas is expected to be transported to Turkey at the end of 2018, with supply to Europe expected by 2020. BP is developing the Shah Deniz II field and has stakes in the pipelines, along with other companies. "We do see it as very scalable. It is a $45b project and we have already awarded contracts for about a third of that. It is moving ahead on time and on budget," the BP senior executive noted.

However, EurActiv reported that the Trans-Adriatic Pipeline (TAP), the pipeline representing the final stretch from the Turkey-Greece border to Santa Foca in southern Italy faces difficulties because of protests by Italian citizens against the project.

Recovered Investments Make Egypt Attractive

BY AZIZ EFFAT, INTERNATIONAL OIL EXPERT

Oil investment is full of risks, which makes Egypt depend on foreign partnerships in fear of wasting money in any oil field in the concession areas. However, the investment climate in Egypt is very good for foreign oil companies, which always seek profit margin. These companies have already succeeded in getting the margin for a period of 30 years working in Egypt.

Privileges given to these oil projects are an important factor in attracting foreign investments. In line with the privileges, investors have freedom of choice in defining their area of interest. There is an absence of restrictions on the nationality of the capital, so that Egyptian, Arab, or foreign investments can equally invest - alone or in partnerships - in free zone projects. Privileges also include limitless volumes of capital, as the law has allowed project owners to freely decide about the scope of investments, the nature of the project, and its estimated capacity. In addition, the law allows freedom of choice in terms of the legal form of projects - be it a sole proprietorship, individual company, stock corporation, or a foreign company. Furthermore, the law allows setting the price of products, and the rate of earnings before the project is launched. Lastly, foreign investors are granted facilitation in residency permits for their workers.

These are the factors that helped Egypt become more successful in attracting foreign investments in the region.

Egypt has always had infrastructure that attracted foreign and Arab companies on both administrative and technical levels. Egyptian workers represent over 90% of employees in all oil fields, but some foreigners assist in the deep wells, especially in the Mediterranean Sea, because of huge risks and their very high investments, accounting to some $150 million in one well.

Investments in oil fields in Egypt are one of the most significant ways for the state to attract foreign and Arab funding. It is considered a national strategic goal for the state, as it is the most important factor for it to bolster up the Egyptian economy via any oil project executed in the country. There must be a significant return on investment, and these projects must provide new direct and indirect job opportunities, whether during their implementation phase or the operation phase.

Oil investments help in providing foreign currencies from any projects in the oil sector. This comes in addition to the export of high-quality petrochemical and oil products, as well as natural gas. Investments have thus helped expand the list of exported items from previously limited shipments of only crude oil and some low-quality oil products.

Bids, Energy Distributions, Dues

BY ENGINEER OSAMA KAMAL, FORMER MINISTER OF PETROLEUM AND MINERAL RESOURCES

Investment in the oil sector is one of the strategic plans for the state to improve the economic conditions of the country. However, investment in the Egyptian oil depends on three important factors that the state must implement and abide by. This will help ensure an increase in foreign investments in the sector in the next years despite difficult times that Egypt is currently going through on the domestic and international levels.

The first factor for ensuring oil investments in the coming period is the intensification of international bid offerings by the Egyptian General Petroleum Corporation (EGPC), the Egyptian Natural Gas Holding Company (EGAS), and Ganoub El Wady Holding Petroleum Company (Ganope) for research and exploration in order to increase reserves and production of crude oil and natural gas. This will contribute to meeting local demand in line with the start of production at the mega field of Zohr, east of the Mediterranean Sea, and with total reserves of 30tfc of gas, by the end of 2017. Meanwhile, old oil fields are being developed, which will make Egypt a regional center for energy strategy. This will be further enhanced by the fact that Egypt has 28 different oil and gas concession areas to offer.

The second factor that the state should implement is the equal distribution of energy resources and their proper management in the local market. While taking an advantage of low oil prices globally, Egypt still depends mainly on oil and gas in meeting its energy demand, therefore it must seek to ensure that investments are being pumped in research, exploration, and development operations. This is in the context of the new strategies that the Ministry of Petroleum and Mineral Resources has launched in order to attract new investments. The strategy is being implemented with the support and commitment of the state seeking to complete overhaul economic reforms and establish a climate prone for investments.

The third and last factor is the commitment to pay off the debts to the foreign oil companies which are currently worth $3.1 billion. The payment will be conducted through monthly installments. The provision is set to enable the oil sector to complete necessary development projects, and to increase production of crude oil and natural gas in the different concession areas.

The expansion of local refineries is also another important objective for the oil sector in the upcoming period. It is to be in line with the steady rise of local demand for oil products. The refineries tactic is aimed to reduce the oil products import bill. In addition, refineries will help boosting the manufacturing of petrochemicals, which contribute to increasing added value.

To conclude, the diversification of the energy mix is yet another important investment method in the oil sector. In doing so, the industry is taking an advantage of the country's strategic location amid major energy producers, and international marine trade passes.

PROMISING INVESTMENT OUTLOOK FOR MENA

By Ahnie Litecky

Despite the challenges of low oil prices, uncertain economic outlooks, and regional instability, the Middle East and North Africa (MENA) energy sector boasts many exciting investment projects.The region can anticipate almost $900 billion in energy sector investments over the next five years, according to the Arab Petroleum Investments Corporation (APICORP).

The multilateral development bank APICORP recently released its 2016 MENA Energy Investment Outlook. Currently, the bank estimates $289 billion worth of investments in ongoing MENA energy projects over the next five years. APICORP reports that the oil sector has the largest share of investments with $110 billion, with the majority of funds invested in upstream projects. Total gas investments stand at $76 billion.

APICORP anticipates an additional $611 billion in planned MENA energy sector investments over the next five years. The oil and gas sector can expect investments of $190 billion and $149 billion, respectively. The high rate of investments seems surprising when one examines the global oil and gas industry outlook. Continuing conflicts in Syria, Iraq, Yemen, and Libya have made investors wary of spill-over into neighboring countries. Industry revenue is projected to decline this year. Again. Global energy companies have reduced dividends, capital spending, and staffing, and made other reforms to cope with low oil prices and slowed growth. Last year, the decline in oil prices cost MENA oil exporters $360 billion, according to the IMF. Losses are expected to deepen this year. Several MENA oil exporting countries have incurred large budget deficits and face difficult choices about cutting expenditures and increasing non-oil revenues.

Nevertheless, countries in the MENA region have prioritized energy projects and international energy companies are investing billions to develop promising resources in the region. "Global investments in oil and gas fell by 20% in 2015 compared with 2014, one of the biggest drops in history," said Dr. Raed Al-Rayes, Deputy Chief Executive and General Manager of APICORP, commenting on the report. "However, against this trend, we expect the MENA region to continue investing heavily as major energy-exporting countries expand the size of their energy sectors and strengthen their positions within global markets."

Egypt Increases Oil and Gas Production

Investments in Egypt will focus on meeting the country's growing energy needs. The Ministry of Petroleum expects the demand for oil and gas to increase by 22% over the next five years, according to Daily News Egypt. This demand is magnified by the fact that most Egyptian oil and gas wells are at maturity or declining. Given these issues, oil and gas development projects in Egypt are extremely significant. Planned investments in Egypt's energy sector will amount to $60 billion over the next five years, with the power sector representing 75% of this total, according to APICORP.

The Egyptian government is aggressively courting foreign investment. The Ministry of Petroleum aims to achieve about $8.5 billion in drilling and exploration investments by the end of the 2015-16 fiscal year. Last year, these investments reached about $7.5 billion. In January, the Ministry of Petroleum announced expected 2016 investments worth $16 billion in research, exploration, development, refinement, petrochemicals, infrastructure, pipeline expansion, and natural gas delivery, according to Daily News Egypt.

The major gas finds of recent years dominate the investment outlook for Egypt. Developing these fields will help Egypt ease some of the demand for gas. Production of the offshore Zohr gas field by the Italian company Eni is anticipated at the end of 2017, with full production capacity expected by the end of 2019. Eni project production rates of 2.7 bcf/d by 2020. The Zohr project has already swallowed $12 billion in investments. Eni's Nooros field is currently producing 65,000 boe/d and the company hopes to increase that to 140,000 boe/d by the end of 2016. The Italian giant also plans to build two natural gas plants in Egypt to increase processing capacity from Zohr gas. Construction of one processing plant is already underway in Port Said.

Other significant gas fields are being developed by the British company BP. The West Nile Delta projects in Taurus and Libra gas fields will begin production next year. Facilities are about half complete. BP's Atoll natural gas field has been fast tracked for development, making it another investment to watch. GlobalData, a global analysis firm, estimates that a $945 million investment will be necessary to develop Atoll's first phase, which should be online by 2018. The field has estimated gas reserves of 1.5 tcf and 31 million barrels of condensates.

Another exploration project to follow is the Apache Corp. and Royal Dutch Shell Plc joint venture in the Western Desert. The two companies plan to begin producing unconventional gas by the end of June. Apache and Shell have an agreement with the Egyptian government to drill three horizontal wells and then discuss full field development by horizontal drilling and fracking. Shell is operating the project with a 52% interest, while Apache Corp. owns the remainder.

Egypt's oil and gas infrastructure will soon see major upgrades. The Egyptian company Sonker received a $341 million loan to build a bulk-liquids terminal at the Ain Sokhna port, as well as to upgrade environmental and safety standards. "The Sonker Project will ensure a constant supply of energy to our burgeoning economy and will certainly transform the Red Sea area into a regional hub for trading petroleum products, not only for the Egyptian market, but also for East Africa and Europe," Ossama Al Sharif, Sonker's Managing Director, told the European Bank for Reconstruction and Development in early February.

Recent investments in refineries will boost the production capacity of petroleum derivatives. The Egyptian refineries in Alexandria, Suez, Assiut, and Mostorod require investments of $7.3 billion. The most important project is the expansion of the Middle East Oil Refinery (MIDOR) processing facility in Alexandria, according to Tarek El Molla, Minister of Petroleum and Mineral Resources, in a 2015 interview with Oxford Business Group. The expansion will increase production capacity by 60% to a capacity of 160,000 b/d at an estimated cost of $1.4 billion. MIDOR is also planning to establish new hydrocracking oil units that will require $7.5 billion in investments. The Cairo Oil Refining Company is working on a new plant to refine about 4.2 million tons of crude oil annually.

Other MENA countries are also sinking significant resources into oil and gas investments and hoping to meet domestic energy demands. Three countries to watch are Saudi Arabia, United Arab Emirates (UAE), and Iran. Saudi Arabia and Iran together represent nearly 30% of planned MENA investments over the next five years, according to APICORP.

Saudi Arabia Diversifies Energy Spending

Saudi Arabia has prioritized the development of unconventional gas resources and offshore oil and gas as it aims to move away from dependence on crude oil. In spite of low oil prices, the state-owned oil company Saudi Aramco continues to invest in oil and gas production. The country aims to increase the role of gas for its domestic power and industrial sectors, so has heavily emphasized gas exploration. Saudi Aramco's former Chairman, Khalid al-Falih, said recently at a business conference, "Our investments in capacity of oil and gas have not slowed down - we have been able to do a lot of cuts in spending by simply driving down costs," according to Reuters. At the same time, Riyadh is looking to diversify its economy and increase investment in renewable energy. Under the King Salman Renewable Energy Initiative, the country aims to produce 9.5 GW of renewable energy by 2023. According to APICORP, Saudi Arabia currently has $53 billion in committed investments and $102 billion in planned investments. Major projects in Saudi Arabia include the Hasbah sour gas field expansion. Saudi Aramco began producing gas from the Hasbah field in March of this year. The Hasbah expansion will eventually supply the proposed Fadhili plant with 2 bscf/d of gas, while another field, Khur-

“We expect the MENA region to continue investing heavily.”

Dr. Raed Al-Rayes, Deputy Chief Executive and General Manager of APICORP

saniyah, will add 500 mscf/d to the plant. In September of last year, Aramco awarded $4.7 billion in contracts to Spain’s TecnicasReunidas and Britain’s Petrofac for the Fadhili plant, with expected completion in 2019. Other gas plants are also in the works, including the Midyan and Wasit projects. In total, the three new gas plants will be able to process more than 5 bscf/d.

The Jazan oil refinery is scheduled to begin operations in 2017 and will process 400,000 b/d of crude oil. The refinery is part of a $20 billion plan to develop an industrial city in southwestern Saudi Arabia.

Iran: Goodbye Sanctions, Hello Investments

In Iran, investments in oil and gas projects highlight the country’s interest in boosting its oil and gas sectors. The removal of sanctions has allowed the Iranian government to push for foreign investments. Iran can expect to see $71 billion in planned energy sector investments over the next five years, according to APICORP, and has $28 billion in committed investments. With its ‘Iranian Petroleum Contract’ program, the country plans to offer 18 E & P blocks and 50 oil and gas projects worth an estimated $185 billion. According to Reuters, contracts will be ready for bidding this summer.

Despite these ambitious plans, several factors could hinder foreign investments. In an article on Iranian oil and gas production that appeared in the February 2016 issue of Oil and Gas Facilities, Katy Smith notes that Iran faces challenges to investment, including the potential for sanctions to be reintroduced if the country fails to meet nuclear monitoring commitments, and continued US sanctions concerning terrorism and human rights abuses. Despite some uncertainty, Smith anticipates a rise in both onshore and offshore drilling activity over the next few years, which will lead to increasing demand for rigs and impact oilfield services expenditures.

One of the highest budget energy projects in the Middle East right now is Iran’s $8.5 billion IGAT Gas Trunkline expansion. The pipeline is a top priority project for the country, said Planning Director of National Iranian Gas Company, Mohammad Reza Qodsizadeh, in early April, as reported by the Iranian news agency.

Iran has already commenced construction on the second part of the Iran Gas Trunkline-6, a 600 km long line, costing $2.2 billion. When completed, this pipeline will transport gas to Iraq. Further, the South Korean state-owned energy giant Korean Gas Corporation (KOGAS) recently agreed to provide engineering services for constructing two key pipelines, the Iran Gas Trunk-Line 7 (IGAT 7) and Iran Gas Trunk-Line 9 (IGAT 9). IGAT 7 will cross southern Iran, and IGAT 9 will take gas to Iran’s border with Turkey. KOGAS has also signed a memorandum of understanding to develop Iran Gas Trunk-Line 11 and to lay a subsea pipeline through the Persian Gulf to bring gas to Oman. This $1 billion, 260 km long project will be completed by 2019 and supply 10 bcm/year of natural gas to Oman.

Iran also aims to boost crude oil production from its southwestern oilfields, particularly the Azadegan, Yadavaran, and Yaran fields, which are all shared with Iraq. The government is currently working with foreign investors to develop the various fields. Expansion of the Kish gas field is another significant upcoming project for the country. This mega field likely contains up to 5 bcf/d of recoverable gas, an extraction target that Iran hopes to achieve over three planned phases of development. Phase 1 involves drilling 12 production wells, laying subsea pipeline, and building multiple onshore installations, with a goal of producing 1 bcf/d of gas for domestic consumption and 11,300 barrels of gas condensate for export.

UAE’s Major Investments in Gas

UAE can count on approximately $43 billion in committed energy investments and $49 billion in planned investments over the next few years, states APICORP. And approximately $20 billion of that planned investment figure is currently at the contract-bidding phase. BMI Research predicts significant growth in oil production over the next three to five years, but expects UAE to grow more dependent on imports of pipeline gas and LNG. The country is seeking a bigger gas supply to run power plants and industries. While UAE waits for the completion of four nuclear power plants, the first of which is supposed to come online in 2017, the country needs to meet a high demand for gas supplies.

UAE has several major investment projects. UAE’s $3.5 billion Fujairah refinery project, with an expected completion date of 2018, would process 200,000 b/d. Abu Dhabi is also targeting the Upper Zakum oilfield, currently the second largest offshore oilfield in the world, for expansion. Currently, the field produces about 590,000 b/d of oil. The Emirates are assessing bids for two projects to increase capacity of the field to 1 mb/d by 2020. Abu Dhabi also announced a huge sour gas project in late April. The Al Hosn sour gas development project is expected to cost $10 billion and extract more than 1 bcf/d of ultra sour gas from the Shah gas field.

“Our investments in capacity of oil and gas have not slowed down.”

Saudi Aramco’s former Chairman, Khalid al-Falih

Challenges Ahead

Egypt’s investments in the oil and gas sector should help support the country’s economic rebound and meet the country’s growing energy demands. Foreign investors are optimistic about exploration activities and willing to invest in the country’s energy future. Other countries in the region also have major oil and gas development plans that will require significant investments in the next few years. Whether investments in the region meet expectations will be determined, at least in part, by oil prices, political and economic concerns, and regional conflicts. These unstable and unpredictable factors will likely set the tone for investments in the region for many years to come.

EYES ON DIGITAL TECHNOLOGY. THE FUTURE IS NOW.

By Amanda Figueras

Investment is somehow one of the most controversial aspects in companies' lives. Through in-vestments, companies are expanding something tangible without quite knowing what the result will be, trying to make an educated bet, with the hope of eventually collecting a payout. But how much will a company receive in return, and when?

For most, digital technology represents a quintessential mystery in terms of investments to be made. In the context of the oil and gas industry, the challenge for decision makers becomes in-creasingly difficult due to the pressing characteristics of this results-driven environment. Is the industry on the right path in the midst of the information revolution? Which digital technology is ripe for investments, and which one is on the way out? How can one assess what each course of action is worth? How can one measure its potential impact?

For years, investments in information technology within the oil and gas industry have lagged be-hind. While the delay has not been as evident as in other industries, an acute lack of investment in this segment has resulted in weak Information Technology (IT) departments, as Chief Information Executives (CIOs) are struggling to keep up with the business horizon increasingly revolutionized by the latest digital advances. Fortune favors the bold. However, there are few industries where this classical dictum materializes. Companies that have yet to adapt to new technological advanc-es are those that are suffering the most today, weighed down by outdated work methods. For when it comes to digital technology, one is not talking about future aspirations, but rather about urgent demands of the present.

Digital Technology Is Essential

Digital technologies – in addition to seismic imaging – have the potential to make radical changes to how energy resources are found, extracted, and used, providing opportunities for more efficient operations through unparalleled levels of data analysis. As BP stated in its Technology Outlook Report released in November 2015 regarding the oil and gas industry, sensor technologies in equipment such as pumps, wells, and appliances are increasingly being employed by leading play-ers in the field.

"When connected to data collection mechanisms, they provide real-time information on field ac-tivities. Intelligent wells – providing updates on well condition from top to bottom – are now be-coming a reality, a development that reduces both non-productive time and cost," the report stat-ed.

Together with the rapid development of data analytics and management techniques, the industry can find oil and gas resources faster and more effectively, while operating refineries and manu-facturing plants more efficiently. Therefore, digital technologies provide a road to a faster and better decision-making process, boost safety, productivity, and efficiency, which ultimately means considerable savings. Specifically, the BP study estimated that digital technologies have the po-tential to increase production volumes by 4% and reduce costs by 13% by 2050.

"Technology is likely to have the most impact on resources that are difficult to produce or those that are sparsely exploited today, such as ultra-deepwater and unconventionals. At a time of low-er prices, revenues, and capital spending, digital technologies – including sensors, data analytics, and automated systems – stand out as the leading contributors for reducing costs," according to the report.

As Jarrod Bassan, a Senior Consultant at the Computer Sciences Corporation (CSC) – a global lead-er in providing technology enabled business solutions and services, with its headquarters in Ty-sons, Virginia, USA – explained in an email interview with Egypt Oil&Gas: "Operational efficiency is a key driver, and every initiative needs to show a return on investment in 6-12 months or less. Companies with a longer-term focus are investing now in piloting technology and new ways of working to drive efficiencies that make them hyper-competitive – both in terms of improved labor productivity and quality of work. Even when labor costs are low, the poor-quality work execution causes massive inefficiencies, unnecessary costs, and increased operational risk. Mature compa-nies understand this, and are working to dramatically

“By 2050, digital technologies have the potential to increase production volumes by 4% and reduce costs by 13%.”
BP Technology Outlook Report

improve the quality of work and productivity rates so they can reduce their operating costs.”

In this context, baseline technologies, but also new areas such as Outage Management Systems, Distribution Management Systems, and a wealth of other technology platforms are aimed at providing greater levels of insight, according to the experts from the CIO Energy Summit.

Digital Oil Field

A great example of the sort of technology directly applied to the so called digital oil field (DOF), which focuses on leveraging the benefits of modern IT, automation, and communications to en-hance all the conventional aspects of oil and gas operations, from exploration and production to environmental monitoring and safety, was recently highlighted by the Offshore Technology web-site.

More than just simply deploying digital and data management technologies, the DOF implies uni-fying disparate oil field processes into a more easily digestible stream of information, making it possible to get the big picture on an operation and thus optimize productivity in a real time, while minimizing the industry’s labor-intensive, hard-copy related hassle. “You can be seated here and do whatever you want there,” Douglas Brown, Project Superintendent for Offshore Operations at Oceaneering, told Egypt Oil&Gas in an interview.

“Things that used to be sacred, such as keeping ‘data within our walls,’ are now on the table, and it is time to take it to the next level”.
Brian Richards, Senior Manager and Energy Innovation Lead, Accenture

Costly and risk-intensive deepwater wells are the ones that most require investing in modern in-formation technologies. It is undoubtedly becoming an increasingly worthwhile trade-off for safer, more efficient, and better-managed operations.

In this respect, the digitization of the oil industry has been ongoing for more than a decade, but industry CIOs say that the slump in oil prices has accelerated the process. Archana Deskus, Vice President and CIO for Baker Hughes, told CIO.com: “I definitely think the current downturn has caused us to start to look at doing things differently.”

Wearable Computing

Other technologies are becoming prominent in the industry. Brian Richards, Senior Manager and Energy Innovation Lead at Accenture bets on wearable computing such as head mounted devices, smart watches, and smart clothing. But how could this technology add value to the oil and gas industry?

According to analyses recently published by Accenture Energy Blog, there are three main ad-vantages.

First, wearable computing permits ‘shoulder coaching’, allowing a manager to see what a worker in a remote location sees, hear what he hears, and so forth. It is thus aiding in maintenance, training, safety issues etc. To put it in simple words, wearable computing helps oil and gas com-panies make better decisions faster.

Second, heads-up displays allow workers to process information in a real time as location infor-mation enables a manager to follow a process or procedure as they are actually being im-ple-mented.

Third, full-augmented reality allows the company to look at a piece of equipment, a dial or gauge, and overlay real-time information in order to make better decisions at a faster pace.

In Richards’ opinion, this technology “will change how field work is done, and represents the next evolution of mobility.”

Nevertheless, there is still a long way to go. One of the main challenges is that most of the devic-es on the market today are not intrinsically safe. Battery life is still limited, which raises even more questions.

Augmented Worker Technology

Accenture’s Senior Manager, Richards, is not alone in emphasizing the advantages of employing augmented reality (AR) that have been assessed for the mining industry, but can also apply for the oil and gas sector.

While more effective use of data combined with advanced analytics offers opportunities for im-provement, according to CSC, providing this information to the worker in the field in a real time has proven expensive, and cumbersome. New capabilities are therefore emerging, which address some of the limitations experienced to date. AR provides a means to overlay interactive digital information on top of the physical world.

“Augmented Worker technology allows video collaboration with remote experts, hands-free work instructions, and better condition monitoring of assets. For instance, this allows a remote worker to call up a remote maintenance expert, who can see a problem in a live video broadcast. This can reduce fault diagnosis, shorten diagnosing time, which in many cases means that the expert does not have to actually go out in the field,” Senior Consultant, Bassan, said for Egypt Oil&Gas.

In a white paper about the use of AR in the mining industry, Jarrod Bassan, who co-authored the piece, added that the benefits would manifest themselves through “better maintenance out-comes, more effective training, better collaboration and knowledge transfer, and enhanced situa-tional awareness for improved safety.”

The expert states that applying AR would allow a mobile worker to ‘see’ all relevant information for a given task, as well as read the physical environment, exactly at the moment when he can make the greatest use of the data. “These methods have been proven to be more effective than traditional text-based work instructions. The worker can also capture photo, video, and even thermal imaging data to more accurately describe a problem in the field, which allows planners to make more informed decisions,” he concluded.

Demonstrating the Value

The advantages of digital technology seem to be clear, however, one of the challenges that CIOs of the oil and gas sector face in this respect is to demonstrate the value of this kind of investment within such a production-driven industry. Indeed, a study conducted by the consultancy firm Ernst & Young in 2014 made it evident to see that the energy industry leaders feel that their sugges-tions are less respected, in the oil and gas sector in particular. They have revealed that they were dissatisfied with their remit, ability to influence broader company strategy, and with prevalent perceptions about the role of the CIO within different companies.

In addition to this, the reputation of IT departments has been damaged in recent years because of their inability to deliver on the monetary gains promised in business case documents for IT pro-jects, according to Marco van Staden, an operations subject matter expert, oil, gas, and energy at Ajilon, an Australian consulting firm, cited by CIO.com. “This is especially apparent in the oil and gas industry where IT projects are compared to equipment improvement projects that deliver immediate benefits like increased production,” he was quoted as saying.

In his opinion, there are three steps to be made to achieve the objective. First, there needs for a better understanding of how production impacts the bottom line, and it is essential to select the business drivers in which IT can provide a substantial improvement. “Throughout operations, costs, particularly maintenance costs, are usually the main drivers in the oil and gas industry with product prices [being] the major uncontrollable variable,” van Staden said.

Second, it is necessary to analyze these impacts and identify opportunities –equipment opportuni-ties and process/system opportunities – where the organization can be more efficient. “The main area where IT can deliver value is with identifying and exploiting opportunities related to business processes and systems, such as operating rounds and routine maintenance planning,” added van Staden.

And last, but not least, it is crucial to construct a portfolio of initiatives where IT plans are plotted along two axes: ease of implementation and impact.

Productivity Transformation

As Brian Richards wrote on Accenture Energy Blog: “For the oil and gas industry, the last 10 years were more about production than cost. The next 10 years will be about implementing digital technology to drive significant cost efficiencies.”

Given current oil prices, which are below $50 per barrel, energy companies are battling amongst themselves in a hard-fought price war, aiming to prove that they are capable of producing oil and gas at the best price. It is essential to analyze the operating model from top to bottom, from scheduling to training to production surveillance. “Things that used to be sacred, such as keeping ‘data within our walls,’ are now on the table, and it is time to take it to the next level,” wrote Richards on Accenture Energy Blog.

In other words, the oil and gas industry is facing a new productivity transformation, where digital technologies are the key to help companies discover new ways to move towards increased effi-ciency. There is no doubt left that in digital technologies, the future is happening already now.

“The current downturn has caused us to start to look at doing things differently.”
Archana Deskus, Vice President and CIO, Baker Hughes

Optimism in Egypt's Investment Environment

By Ghada A. Abdallah

In the global low oil prices environment, oil and gas companies are facing a decline. Costs for field exploration and development are higher than generated profit. Major oil producing companies in the region are reported to have slashed their budgets by 40% to 50%, and cancelled as much as 50% of their planned operations.

The issues that the oil and gas industry in Egypt is currently facing are strongly linked to the recent devaluation of the Egyptian pound against the US dollar. The Egyptian oil and gas industry is highly dependent on US foreign currency as all agreements are concluded in US dollars. Most of the equipment required for the drilling is imported from foreign countries and the method of payment is also stated in the foreign currency, which became harder to obtain.

Different exploration companies buy and deal with foreign suppliers using lacking US dollars reserves, which has become detrimental to firms' economics after the devaluation, Asia El Khouly, Tendering & Contracting Manager and Business Development Manager at Ava Newpark for Drilling Fluids & Services told Egypt Oil&Gas.

Counterbalancing the Decline

In response to the currency crisis, some exploration companies paused or stopped their drilling projects at an unprecedented level. "Those with 6 rigs reduced their activities to one rig only," estimated El Khouly.

The oil sector has also suffered from liquidity threats, as did Shelf Drilling, company's Rig Manager and Marine Superintendent, Engineer Ahmed El Shazly, told Egypt Oil&Gas.

Further, the Egyptian major corporations in the field of oil research and exploration took other measures to counterbalance the decline. Some of them started reducing labor costs with some 25% to 40%, Egypt's ex-Minister of Petroleum and Mineral Resources, Osama Kamal mentioned in a statement to the Egyptian press earlier this year.

In the wake of financial difficulties, El Khouly suggested as a temporary solution to convince contractors to deal officially with the Egyptian pound. In line with that, El Khouly adds that the focus should also shift more to gas drilling as gas prices were not severely affected.

In the midst of the ongoing decline, international oil companies (IOCs) face further complications in Egypt. Eng. El Shazly said that obtaining an approval by different governmental authorities can be a time consuming endeavor. It is one of the main obstacles hindering fast implementation of various energy projects in the country, he added. As a solution, El Shazly suggested that if a special government representative was assigned to work closely with investors, it might help to guide IOCs through the entire bureaucratic process to acquire all approvals and enable a smooth process in launching different projects.

In addition, El Khouly addressed the issues that emerge when a foreign firm wished to establish a branch in Egypt. She pointed to the difficulty in finding an empty space within the free zone system in the country regulated by the Investment Law No. 8/1997. According to her analysis, the government should "focus on further legal amendments related to free zones in order to allow the international companies to open their branches and conclude all official requirements within a certain validation period of up to a month or two." The government has recently addressed these questions.

Investment Law Amendments

In light of the challenges, the Egyptian government has undertaken active steps towards a solution. One of the key aspects is legislative reform. The Investment Law has been revisited and has introduced regulations and procedures that would allow larger investments flow into the country.

Law No. 117/2015 issued in March last year proposes a series of non-tax incentives for oil and gas companies. The incentives include granting residency to foreign workers, flexibility in choosing the area of investment and projects' legal forms, and cancellation of limits to capital spending.

Projects, which are deemed to be able to contribute to Egypt's overall economic development, can benefit from further incentives such as payment facilities, total or partial refunding for utilities costs to investors, reduction of the unified custom rate on machinery and equipment from 5% to 2%, and decrease of the sales tax on imported tools and equipment to 5% instead of 10%.

Another incentive comes in the form of low cost land. It enables the government to allocate lands to investors for exploration and production for lower prices, and further allows investors to pay the price for the land first after they have launched the project.

One of the features of the law is to facilitate incorporation procedures through a single governmental authority, the General Authority for Investments and Free Zones (GAFI), as PwC Middle East Tax and Legal explained in a brief. GAFI can grant lands and real estate for projects free of charge for the period of five years starting from 2015 based on certain technical and financial capabilities of investors that are assessed by the cabinet as highly profitable to the development of the country's industry.

In addition, projects that are established as free zones are no longer subjected to import and export rules regarding the purchase of the necessary components from the domestic market, according to the law.

"GAFI has also established an economic program to attract foreign investors, along with an average reduction of 35% on customs duty and tariff simplification," as Eng. Ahmed El Shazly, said in his statement to Egypt Oil&Gas.

The Investment Law amendments were also accompanied by further modified Executive Regulations adopted in July 2015.

Government Strategy Shapes Positive Prospect

In the last two years, and despite the foreign currency and devaluation crises that Egypt has been struggling with, the Ministry of Petroleum has adopted a viable strategy to achieve significant growth in the field of energy.

In this period, Egypt signed 66 agreements for new upstream oil and gas blocks, securing a minimum commitment of $14 billion.

Eng. Tarek El Molla, the Oil Minister stressed on numerous occasions that the Egyptian General Petroleum Authority (EGPC) was preparing new international bid rounds to invite investors for projects in the Nile Delta and Western Desert. The minister informed that 28 blocks in total will be open for bidding in the Mediterranean, Gulf of Suez, Red Sea, and south of Egypt. Most recently, 11 blocks were offered for IOCs to bid on, with more blocks scheduled to be open in this year.

International oil companies praised the exerted effort by the Egyptian government. In her statement to Egypt Oil & Gas, El Khouly further emphasized that the plan to link eight projects to the national gas network with total investments worth more than $1 billion will contribute to increasing gas production, expanding gas pipelines, and delivering natural gas to homes. There is also a plan to convert cars to operate on gas that can generate further benefits in the environment of the devalued Egyptian pound, added El Khouly.

In close negotiations with foreign partners, Egypt's Oil Ministry has succeeded in decreasing foreign oil companies' dues regardless of the Egyptian pound devaluation. It was recently reported that Shell and British Gas (BG) have reached an agreement with the Egyptian Petroleum Ministry to obtain $400m of their financial dues by the end of June with a goal to straighten trade balance with the two majors by the end of 2016.

Speaking at the Offshore Mediterranean Conference in Alexandria in April, Minister of Petroleum and Mineral Resources expressed broad support to international energy partners in the country and stated that the ministry is pleased with mutual understanding that defines cooperation in the oil and gas sector between the Egyptian authorities and IOCs. Openness and flexibility that guard the development of the Egyptian energy sector are shaping positive prospects for all involved actors in the future.

As the Egyptian government has pursued a purposeful strategy to attract foreign investments enhancing the oil and gas environment in the country, the Oil Ministry is thus confident to resolve the remaining challenges ahead.

The aim is to boost domestic supply for exponentially increasing energy demand and secure competitive environment despite temporary lack of foreign currencies. In trying to satisfy international partnerships' needs, the country has also embarked upon green energy investment strategy that will allow diversification of capital burden and thus further boost prospect for economic development and self-sustainability of the country.



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CONVENTION TRAINING: OIL RECOVERY THROUGH WATERFLOODING

By Nataša Kubíková Amanda Figueras, Salma Essam

The training session provided participants with an opportunity to acquire extensive knowledge about the most recent technologies in the area of secondary and tertiary recovery methods.

The training consisted of three major blocks. In the first, Hassan Salem, EGPC, presented an overview of waterflooding impact on the oil sector in Egypt, and Dr. Ahmed El-Banbi, Cairo University, provided an in-depth analysis of waterflooding fundamentals. The second sitting discussed four major case studies conducted by the Egyptian companies - GUPCO, Petrobel, Khalda, and Qarun. The final round of presentations focused on IOR and EOR technologies as implemented by international oil companies (IOCs) - Apache, Baker Hughes, Halliburton, and Schlumberger.

Enhancing Recovery Factor

In his opening study, Hassan Salem, Reservoir Studies Assistant General Manager at the Egyptian General Petroleum Corporation (EGPC) said that Egypt has seen a 40% decrease in oil production since 1996; the year recorded production levels of 920,000b/d. Production decline is one of the major challenges that the oil sector is determined to overcome.

According to the statistics, there are almost 90 fields with decreasing outputs. Egypt has been searching for solutions, aiming at increasing oil production from massive reserves and exploiting country's natural resources. If this goal is accomplished, Egypt will succeed in eliminating dependence on energy imports, and in achieving energy self-sustainability, a long-term aspiration of the country.

As liquids production started declining sharply in 2015, the Egyptian oil sector has been expanding primary recovery mechanisms with secondary methods – waterflooding and pressure maintenance, and tertiary recovery schemes – enhanced oil recovery (EOR) such as thermal, gas injection, chemical, and more advanced technologies.

Studies show that, "globally, waterflooding processes, or Water Injection (WI) intensified by 5-10% resulted in cumulative oil production levels that represent 40% of recovered original oil in place," explained Salem. The output grew further thanks to the low-salinity effect of oil enhanced recovery. In the case of GPC's Asran field, production rates upped from 600bl/d to 7,000bl/d over steam injection technique, which was implemented as of 2002, noted EGPC Assistant GM.

In light of these enhancements, Egypt embarked upon a road to introduce new projects that would further contribute to efficient exploitation of country's reservoirs. The existing studies and calculation strongly indicate that as of 2016/2017, the Egyptian oil sector will likely record a rise in added reserves to the production line through water flooding and EOR projects, said Salem. By 2028/2029 oil output is expected to rise by more than 1,000mbl/d, he concluded.

For future prospects, polymer injection projects are under evaluation at Petrobel, Agiba, and Petrodara. Hassan Salem also added that GUPCO is evaluating low salinity water (LoSal) injection projects. Further, CO2 immiscible flooding to be applied in Western Desert and Alkane Surfactant Polymer (ASP) flooding pilot project in Bed-1 field, are both undergoing a study phase and are being assessed for utilization.

Waterflooding Fundamentals

In a two-hour detailed lecture on waterflooding fundamentals, Dr. Ahmed El-Banbi presented to the audience the key findings from main components of a typical waterflooding project to questions guiding the design of such projects to environmental impact. He also detailed additional costs incurred over waterflooding projects as opposed to primary recovery methods.

"The main goal of waterflooding is to achieve efficient oil displacement by water," said Dr. El-Banbi. "In present, waterflooding represents the most reliable and economic oil recovery technique," yet, as he noted further, water flood economics is problematic. "The projects involve high capital investment, much higher than primary flooding; high operating costs due to more power requirements; high risk that comes from the reservoirs themselves; whereas in return they usually generate lower profit margin than primary recovery," El-Banbi emphasized.

The main components of water flood projects are water source, injection water treatment, injection wells, reservoir, production wells, processing of production streams, and water disposal; each of which present a challenge on its own. In relation to water treatment plant, oil companies are to focus on a series of difficulties such as filtration, de-oxygenation, chemicals or pumping. Similarly, the reservoir brings forward critical thresholds, because waterflooding projects depend on reservoir characterization, lateral pay continuity, compartmentalization, fluid distribution and saturations, natural fractures, uneven vertical fluid distribution, or lateral fluid movement.

As he explained, "managing these components in the secondary recovery processes generates higher costs than in the case of primary oil recovery projects." In addition to structural aspects, El-Banbi further addressed key questions to be considered for designing waterflooding projects. This depends on external configuration of the reservoir and its heterogeneity, present oil saturation, wettability, oil and water viscosity, as well as optimum timing for flood.

According to scientific analysis, El-Banbi summarized that an optimized waterflooding project maintains high reservoir pressure, displaces oil towards the producers efficiently, contacts most of the displaceable oil, minimizes water production and associated water handling costs, and inevitably minimizes the impact on environment.

In addition, given the hard economics, it is important to calculate profitability of waterflooding projects in terms of how much incremental oil can be produced based on oil, water, and gas rate profiles, with respect to environmental issues.

Waterflooding Implementations

Introducing cases of successful application of secondary oil recovery methods, the companies - GUPCO, Petrobel, Khalda, and Qarun presented their achievements in the field.

Senior Reservoir Engineer, Noureldien Darhim M., from GUPCO highlighted company's problem with waterflooding techniques in the case of mature Morgan field, which is the poor sweeping efficiency, especially in presence of high-perm layers. He further explained that the Thermally-Activated Particles (TAP) technique can be used for in directing water into lower-perm layers. "This technique, commercially known as 'BrightWater', improves both areal and vertical sweep efficiencies," he added.

Another technique in maximizing oil recovery from a mature field is implemented by Petrobel, in its Belayim Land field. Mostafa Kortam from Petrobel introduced Low Salinity Waterflooding method, which can be deployed by wettability modification towards more water-wet condition. Based on a series of experiments that the company conducted, Mostafa Kortam concluded that "the chemical mechanism for using 'Smart Water' for wettability alteration to enhance oil recovery is different for carbonates and sandstones.

Analysing Khalda Petroleum Company's (KPC) experience on water flooding, Reservoir Engineer, Fathi Abokashik, revealed that "peripheral injection pattern is preferable for relatively small fields with high permeability." Khalda's case also showed that "focusing all wells on the field to waterflood zone maximizes benefits from the project." Eng. Abokashik concluded that "direct injection is one of the best solutions for remote areas." Further, KPC's Section Head, Magdy Said, disclosed Khepri field waterflooding experience in the Western Desert. He stated that "reservoir stimulation methods contribute to improving well's productivity/injectivity, yet close production, injection, and pressure monitoring are very critical to ensure effectiveness of the project."

Qarun Petroleum Company is also working to boost its output from the mature Hamra field. In a comparative study on ESP Power Injection and WON Water Injection, Senior Reservoir Engineer, Sherif Mostafa, and Production Engineer, Ahmed Nasr, concluded that the importance to integrate geological and engineering understandings is the key for the success of water injection projects. Qarun thus showed that WON developments can ensure sustainable production growth and system costs are greatly lower than ESP Surface/Powered Injection.

Technological Advances

In the final session, Production Integrity Manager from Apache/Qarun, Mike Smith, presented water clarification (WC) theory and introduced equipment types used to minimize oil/TSS (Total Suspended Solids) in produced water (PW) for injection (water/steam), disposal, and offshore overboard disposal. According to Smith's analysis, "more often than not, the use of both cationic and anionic WC types in combination yields the most cost effective treatment and lowest TSS. "It is really important to work with reservoir production engineers and lab personnel to help identify what chemistry is needed," said Smith.

"GLOBALLY, WATERFLOODING PROCESSES, OR WATER INJECTION (WI) INTENSIFIED BY 5-10% RESULTED IN CUMULATIVE OIL PRODUCTION LEVELS THAT REPRESENT 40% OF RECOVERED ORIGINAL OIL IN PLACE."

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Reservoir Studies Assistant General Manager, EGPC

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MIKE SMITH
Production Integrity Manager, Apache/Qarun

Moving on to the tertiary recovery method – EOR – Baker Hughes' application of chemical EOR was the subject of another presentation introduced by Colin Cranfield, the company's Principle Reservoir Engineer. Cranfield highlighted the importance of sweep and displacement efficiency in oil mobilization as two different ways for improving chemical oil recovery. He concluded that EOR is highly desirable as 'easy oil' becomes depleted. However, surfactant injection is challenging, particularly in high salinity, high temperature environment; Alkalis is cheap, but brings associated operational problems; and polymer floods can be implemented in sandstones.

Halliburton presented its polymer injection well project the involved permanent reliable monitoring for downhole conditions. Ahmed Magdy and Khaled El Ashkar, Technical Professional Associates revealed the ways in which reservoir monitoring should be managed.

In the last presentation, Schlumberger engineers presented on water flood management, reservoir monitoring and control technologies.

As Dr. El-Banbi explained, recovery efficiency for most waterflooding projects ranges from 35% to 65 % of original oil in place (OOIP). Lower values come from heterogeneous reservoirs with high contrast layers, flat and thin reservoirs, high viscosity oils, poorly designed projects, and badly managed operations.

Based on the existing analysis, he recommended improvements in two areas: development and operations. In developing waterflooding techniques, companies are to understand the reservoir well, start waterflooding early, infill drill to reduce effects of lateral pay discontinuities, develop field on pattern waterflood, open all of the pay in all wells, and finally, investigate the utilization of smart water (pilot). In the area of operations, Dr. El-Banbi recommends keeping producing wells pumped off, injecting below formation parting pressure, injecting clean water, managing waterflood by injection well tests, and conducting a surveillance program.

EOR & WATERFLOODING ROUNDTABLE:

Boosting JVs Performance

By Nataša Kubíková, Amanda Figueras, Salma Essam

Egypt Oil & Gas Newspaper held the third technical convention in Cairo in May, bringing together key representatives of the oil and gas industry to debate one of the timeliest themes of common interest – Enhanced Oil Recovery (EOR) and Waterflooding. On 23rd May, leaders in the oil sector gathered at a roundtable to search for ways forward through enhancement of the economics of Joint Venture companies (JVs).

Managing Director of Egypt Oil & Gas, Eng. Mohamed Fouad, opened the session stressing the significance of discussions about integrated practical solutions for the challenges in the sector. The way to do so, said Eng. Fouad, is to provide "a platform that incorporates all elements of the solution," which events such as EOG Convention offer. He also expressed gratitude to the 27-member Brownfields Technical Committee and to Egypt's Minister of Petroleum and Mineral Resources, H.E. Eng. Tarek El Molla, for taking the event under his patronage and for his remarkable role in driving the oil sector forward.

In light of the ongoing efforts in the industry, Country Manager & Director of TransGlobe Energy & Chairman of the Brownfields Technical Committee, Brian Twaddle, who chaired the roundtable, stressed that "within the economic and social constraints in Egypt, it is important and critical to find ways to compete for capital that IOCs allocate on the global basis." In exploiting the investment opportunity, a focus on consolidating JVs and enhancing their performance necessarily emerges, and if handled well, it could bring about substantial improvements in the economic environment in Egypt in the future.

The discussion thus addressed four areas of interest that can affect prospects of Egypt's oil sector as a whole: The efficiency and performance of JVs; Flexibility with the current Production Sharing Agreements (PSAs); Concession terms for conventional, unconventional, and EOR investments; Partnership with service sector using risk sharing agreements.

Consolidating JVs

In attempt to consolidate JVs, Tranglobe Energy Head, Brian Twaddle, affirmed benefits of the process. Although "consolidating JVs is every bit as challenging as consolidating companies in the private sector," said Brian Twaddle, "rewards are immediate" in comparison to what the private sector practice may offer.

Benchmarking by JVs, as Bini Vallassery, Deputy Operations General Manager, Qarun Petroleum Company said, may be another important path to take."We need to understand what JVs are good at and how we can leverage of each other," he explained.

One way of approaching this is through audit. Eng. Sayed Rezk, General Manager of Enap Sipetrol noted that regularly conducted "auditing reports by EGPC need to be improved by sharing the process with IOCs seeking to enhance JVs performance and efficiency."

Investing in People Development

In order to maximize the value from JVs, Bini Vallassery, Deputy Operations General Manager, Qarun Petroleum Company, and the discussion leader at the roundtable, emphasized the need for tailored training schemes. "Tooling our people to do the right thing" through training can "enhance" people's daily performance, said Vallassery. He added that the challenge arises with attempts to form a training scheme beneficial to identified three employment levels: technical, operational, and managerial. In his view, it is crucial for "field people getting the right amount of training and [learn] proper ways to execute projects." "We need IOCs and the national companies to come together and create a development center" for the purposes of a more focused and effective training structures, concluded Vallassery.

The idea of a more complex approach to the development of human resources in JVs in the oil and gas sector was further supported by Dr. Ahmed El-Banbi, from Cairo University. He proposed to establish "a development plan" as opposed to a single-minded concept of training. The development plan would consist of three pillars, of which training is just one, accompanied by on-job training as the second and mentoring as the third pillar. Reflecting on the limitations in human resources management within JVs, El-Banbi said that "the only solution is to have a development plan that is pioneered by EGPC" and that will be fully adopted by JVs, with promising benefits for smaller companies.

In agreement with the need to differentiate across disciplinary level, as proposed by Bini Vallassery, Eng. Abed Ezz El Regal, Chairman and Managing Director of GUPCO, said that in addition to the technical skills development, training should "build up managerial, leadership, planning, and negotiation skills [of employees] from early stage."

In order to use financial resources efficiently, Samir Abdel Moaty, Country Manager of Beach Energy emphasized the need to develop a "Young Professionals program especially in JVs," that would be elaborated in a similar manner as those offered to employees by most of the IOCs. Furthermore, "the training should start early on, already within the universities," Moaty stated.

In the discussion, Geol. Mostafa El Bahr, Former Chairman of Agiba Petroleum Company, expressed confidence that in Egypt "there [already] is a system [of training], but it may not be working efficiently." This is happening most likely due to the existing internal training structures and processes within JVs that are on many occasions executed in an unsatisfactory way. They thus fail to appropriately reflect on "the [present] needs of the industry," said El Bahr.

Similarly, EGPC Vice Chairman for Production, Eng. Diaa Kassem, affirmed that Egypt's oil sector "provides training courses locally as well as overseas." The training model, he added, will be further evaluated in the upcoming period as the oil minister has recently called upon "EGPC, EGAS, and GANOPE to make a committee for [assessing] training courses for the leaders of the future."

"The training is very important as it is part of the investment and is crucial both for the young professional and for the leaders," summarized Geol. Adel Fahmy, Vice Chairman for Exploration in EGPC, adding that "the EGPC has also launched a leadership training scheme.

Before 'a development center' is established or 'a development plan' is newly formulated, it is imperative to look into the ways in which allocated budgets for training are spent in line with the agreements with partners, Mahmoud Shawkat, Director Sales & Marketing NAF at Baker Hughes, noted.

In terms of the oil companies' hierarchies, Eng. El Regal explained that while "some companies have a plan for the career path requirements" qualifying candidates for promotion, this is being viewed as an obstacle to the companies rather than an advantage; the obstacle being that promotion requirements would allegedly delay employees from taking over responsible posts. In attempt to counteract this perception, El Regal suggested that these requirements are to be defined clearly, as this is in fact "essential" for the development process of young professionals, as well as for "planning for the future, and analyzing the existing problems," and eventually for searching for solutions.

Geol. Mostafa El Bahr, Former Chairman of Agiba, also agreed with the concept saying that the key is to define "a set of competencies [to be achieved via training] for each level of technical and non-technical employees," which should then be linked to the promotion scheme and for the time being "enforced" efficiently.

As "benefits packages are a part of the whole discussion about the efficiency in JVs," said Dr. Hany El Sharkawi, International Oil &Gas Advisor, Member of the PICO/Cheiron Board of Directors, "these should be revisited especially in the times of low oil prices to make them more effective, and more efficient." In a realistic scenario, "we have to look at how we utilize our financial resources and the cost of running our operations from the labor point of view to ensure incentives for people to improve their performance and thus further enhance the efficiency of the companies," explained El Sharkawi. He recommended that "JVs and IOCs collectively sit together to re-structure benefits packages to make them more efficient in the service of the companies."

Furthermore, on the side of individual competencies, collaborative competencies are also to be developed, argued James Pendergrass, Deputy Exploration Manager and Board Member in Petrosilah, where "geologists, geophysicists, and reservoir engineers are trained in a team to resolve issues together." In line with this proposal, Pendergrass emphasized that "interdisciplinary team training needs to be designed" in the future, as it is the safest bet that will eventually "improve Egypt's competencies" in the industry.

On the notion of collaborative approach in people's development, Brian Twaddle commented that while "we often talk about seconding people in IOCs," other parallel paths are also available. One of them lies within the service companies. "The service sector has a huge amount to offer, which is often underestimated," noted Transglobe Energy's Country Manager.

Given the current climate, it was aptly noted that the timing of training also remains crucial. "It is incorrect" to save on training costs in times of financial slow-down, added Mahmoud Shawkat. He thus stressed that "at the time of the downturn there should be a focus on the training more than ever" as it is then, when employees are actually available for training sessions, unlike during the periods of high activities. "It is now the time for us to develop our industry employees" exploiting on the existing education schemes that need to be adopted by JVs, concluded Shawkat.

In the final note on the subject, Brian Twaddle eloquently expressed his belief that the notion according to which

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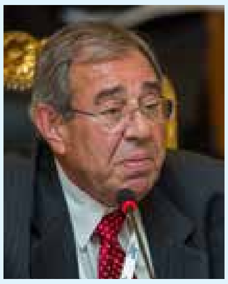
BRIAN TWADDLE
Country Manager & Director, TransGlobe Energy & Co-Chair of the Brownfields Technical Committee

"WE NEED TO UNDERSTAND WHAT JVS ARE GOOD AT AND HOW WE CAN LEVERAGE OF EACH OTHER."

BINI VALLASSERY
Deputy Operations General Manager, Qarun Petroleum Company



"JVS AND IOCS COLLECTIVELY SHOULD SIT TOGETHER TO RE-STRUCTURE BENEFITS PACKAGES TO MAKE THEM MORE EFFICIENT IN THE SERVICE OF THE COMPANIES."

DR. HANY EL SHARKAWI
International Oil &Gas Advisor,
Member of the PICO/Cheiron Board of Directors

"A NEED FOR TRANSPARENCY WITHIN THE TENDERING PROCEDURES IS NEEDED IN BOTH THE EXPLORATION AND DEVELOPMENT PHASES, WHICH SHOULD RELY ON A CLEAR SCOPE OF CONDITIONS AND ITEMS, AND SIMPLIFIED RULES TO SPEED UP THE TENDERING PROCES."

GEOL. ADEL FAHMY
EGPC Vice Chairman for Exploration

"WE ARE DISCUSSING HOW TO REVISIT THE PSAS AND ANY NEW MODEL OF AGREEMENT FOR THE BENEFIT OF EGPC AND OUR PARTNERS."

ENG. DIAA KASSEM
EGPC Vice Chairman for Production

"IOCs OFTEN OPT FOR AN EXTENSION OF THE AGREEMENT AT THE LAST MOMENT, IN SOME CASES DURING THE LAST SIX MONTHS, WHICH DOES NOT GIVE ENOUGH ROOM FOR NEGOTIATIONS TO EGPC AND THE CONTRACTORS TO AGREE ON AN OPTIONAL EXTENSION."

ENG. ABED EZZ EL-REGAL
Chairman & Managing Director, GUPCO

"AUDITING REPORTS BY EGPC NEED TO BE IMPROVED BY SHARING THE PROCESS WITH IOCS SEEKING TO ENHANCE JVS PERFORMANCE AND EFFICIENCY."

ENG. SAYED REZK
General Manager of Enap Sipetrol

"SOME OF THE CURRENT CONCESSION AGREEMENTS MAY NEED TO BE AMENDED NOW TO HELP ENHANCE THE PRODUCTION, BOOST OPERATORS' ECONOMICS, AND TO INVEST MORE MONEY IN THE REMAINING PERIOD OF THE CONCESSION AGREEMENTS."

SAMIR ABDEL MOATY
Country Manager, Beach Energy

"PRE-ISSUING ANY TENDER, THE TERMS AND THE CONDITIONS SHOULD BE AGREED UPON IN ORDER TO SHORTEN THE CYCLE OF DISCUSSIONS ON THE CONTRACTUAL OBLIGATIONS BETWEEN THE TWO PARTIES."

MAHMOUD SHAWKAT
Director Sales & Marketing NAF, Baker Hughes

"SERVICE AGREEMENTS GIVE US FREEDOM TO APPLY THE STANDARDS WE NEED, AND TO APPROACH SERVICE COMPANIES DIRECTLY IN ORDER TO APPLY THE BEST TECHNOLOGY TO RECOVER MORE OIL."

ENG. KAMEL EL SAWI
Kuwait Energy President.

"THERE IS NO ONLY ONE SOLUTION FOR THE AGREEMENTS, AND THE MINISTRY OF PETROLEUM HAS BEEN OPEN TO ALL SOLUTIONS OVER THE LAST FEW YEARS."

GEOL. ABU BAKR IBRAHIM
Former Chairman, GANOPE

"One important factor in the PSAs emerges in the late stage where it is not easy for investors to recover the costs"

GEOL. MOSTAFA EL BAHR
Former Chairman, AGIBA

IOCs were reluctant to train people within JVs as they may be then moved to a competitor beyond the control of IOCs, should no longer be applicable, and the prevalent protective approach should be omitted. "If all of the IOCs funding JVs contribute to training in competence development and fulfill development plans, the total competence level rises," and the industry will benefit from competent leaders in a collective way, Chairman of the Brownfields Committee, Brian Twaddle, concluded.

Access to Central Inventories

Moving from the human resources development, the roundtable focused also on material resources of JVs in inventories. Participants agreed that access to central inventories plays a major role in JVs' performance.

Commenting on the EGPC's role in the facilitation and control of material resources, Eng. El Regal pointed out that the central body provides an online database of surplus and left-over material and items owned by EGPC for all the JVs. They then have a direct access to them and are able to bid for resources they need. Eng. Nabil Salah added that while the database is available on the EGPC website, "it still needs to be itemized."

Moreover, as Eng. Sayed Rezk, General Manager of Enap Sipetrol, emphasized, "there needs to be a differentiation between surpluses owned by EGPC and surpluses of IOCs." In agreement with the measure, Geol. Abu Bakr Ibrahim, Former Chairman of GANOPE proposed to establish a parallel database of inventories by JVs themselves.

In a final touch, according to Dr. El-Banbi, "the supply chain for all the JVs should be consolidated further" which will provide more benefits to the tendering companies.

As a solution to the consolidation requirements, Mahmoud Shawkat from Baker Hughes, recommended using practices of service providers that employ "a 'filter system' that blocks processing orders once required inventory is available, located in another country, with another JV company." He further explained that "this system can only be executed if it is connected to the JVs, and controlled by the EGPC."

In this way, "there will also be a gate in the SAP system that drops all surpluses or excess inventory, making them visible to all the JVs before these go off to manufacturing and processing," Shawkat added.

JVs in Tendering Processes

In the debates about organization and availability of inventories, an important issue emerges that relates to the ways in which tendering processes are executed, for these majorly affect performance of JVs.

The issue of efficiency of tendering processes is important. Eng. Sayed Rezk, General Manager of Enap Sipetrol, said that "the tendering process often takes longer than the project itself," and this needs to be addressed.

In the current setting of lengthy tendering processes, JVs tend to tender for larger amounts of inventories in order to minimize the time spent on repetitive procedures, and stock up purchased items in high quantities, which at times of low oil prices is hurtful to companies' economics. Therefore, Bini Vallassery, Deputy Operations General Manager, Qarun Petroleum Company, suggested ending the cycle in a way that "EGPC would take a lead on setting the directives and the terms to the JVs" in order to restructure the entire business, which would eventually make economic sense to all actors.

Geol. Adel Fahmy, Vice Chairman for Exploration in EGPC also pointed out that there is "a need for transparency within the tendering procedures that should rely on a clear scope of conditions and items, and simplified rules to speed up the tendering process" in both the exploration and development phases.

In efforts to identify a constructive solution, Mahmoud Shawkat proposed to imitate already established practices, according to which "pre-issuing any tender, the terms and the conditions should be agreed upon in order to shorten the cycle of discussions on the contractual obligations between the two parties. By the time the tender is issued, the terms will have already been approved and incorporated in the call for tender, hence these cannot be disputed. The contract will therefore be ready for signature and the execution will thus be very fast."

PSAs to Be Modified

With a goal to balloon up investments in Egypt's oil and gas sector, the existing Production Sharing Agreements (PSA) should gain more attention.

According to Geol. Mostafa El Bahr, ex-Chairman of Agiba, PSAs should be modified in order to incentivize further inflow of investments into the country.

EGPC, which seeks to reflect on industry's needs, is studying the issue, confirmed Eng. Diaa Kassem, EGPC Vice Chairman for Production. "We are discussing how to revisit the PSAs and any new model of agreement for the benefit of EGPC and our partners. We are preparing a high committee to discuss the model agreements so any suggestion on the PSA in the existing fields from any partner will be welcome," clarified Eng. Kassem.

In attempts to boost performance of the sector, "JVs have done creative things and have exploited flexibilities within the current contracts as ways to improve their business," Brian Twaddle noted, adding that "in the current climate, these are great times to be sharing those ideas so that we, as a sector, can attract the capital back to Egypt and move forward."

In pondering changes to the existing PSAs, there are elements that need to be assessed especially in regard to the mature fields, as Geol. Mostafa El Bahr mentioned. "One important factor in the PSAs emerges in the late stage where it is not easy for investors to recover the costs" when the fields become mature, noted the ex-chairman. Therefore, their interest in investments is constrained, which can be "overcome by introducing service agreements or modifying the terms of cost recovery as in providing a guarantee for extension or amending the percentage of recovery" with a goal to ensure "the continuity [of investments] when the fields turn brown," as El Bahr elaborated.

As outlined by Mahmoud Shawkat, PSAs represent a percentage of cost-recovery of a project for investors, whereas with the alternative model applying "tax and royalties the government has no hands on the expenditure of assets, and gets only the privilege of price.

On the other hand, service agreements may propose a viable alternative. "Service Agreements (SAs) in Egypt were applied with a successful example of the Kuwait Energy company." However, even in the comparative perspective, SAs may pose some challenges on investors if they opt to copy Kuwait Energy's case. The challenges relate to the fact that "EGPC will have its hands on part of the mature fields, on which it can issue bid rounds," said Shawkat.

Service Contracts

As Shawkat further explained, "service contracts can be divided into pure service contracts – flat fee, or risk service contracts – reward a percentage of production over expenditure. The risk is represented by the pre-studies, analyses, equipment cost, operational problems, and maintenance of production level at no return. Rewards for the risk are either a percentage of production in cash or percentage cash pay over the spent efforts, which is called the R-factor."

R-factor represents "an equation that limits the benefit for the investor, and gives him only an incentive over the expansion in the field," said Shawkat. Hence, "the R-factor is a dynamic approach where both production rates and expenditures are considered tied to each other," he added.

The R-factor application "proved very effective in other countries – with Petronas in Malaysia – and beneficial for both the government and the investor, where service provider offered his technology in studies and equipment to withdraw more oil or gas from prospects that were producing zero oil before. The government agreed on a certain profile of incentives over expenditure and the agreement was successful," argued Shawkat.

"While the R-factor is not implemented in Egypt, given the appetite of lots of small players including service providers to apply it, the potential is high for Egypt to withdraw more oil by giving a chance to those small players and service providers," clarified Shawkat.

In the discussion, Samir Abdel Moaty, Beach Energy's Country Manager, further developed the idea to introduce new models that will not be determined and constrained by the phased production line, as it proves less viable. He said that instead the agreement model of Kuwait Energy should be adapted, nonetheless, this "technical service agreement needs to be further modified to make it economic for the newcomers," concluded Moaty.

The debated experience of Kuwait Energy with the service agreement is that while "a baseline production was agreed by the EGPC, production costs exceeding the baseline will be shared by both partners with benefits going to both the government and the contractor," said Eng. Kamel El Sawi, the company's President.

In favor of service agreements, Eng. El Sawi stressed that this model allows flexibility for an operator to run the field according to his standards, unlike "PSAs that put a burden on IOCs due to the joint-venture framework of cooperation."

"Service agreements give us freedom to apply the standards we need, and to approach service companies directly in order to apply the best technology to recover more oil," which in effect leaves out the EGPC from the relations, explained El Sawi. This will then allow IOCs to "build their own economics" with a positive outlook for EGPC itself. The arrangement will eventually generate benefits for the Egyptian oil sector in terms of continuous oil production at a promising level and active, engaged development of mature fields, instead of a scenario of a standstill, when a field is left unexploited, he said.

Proposed structural modifications through agreements would lead to a more competitive environment with larger benefits involved, Mahmoud Shawkat emphasized. With smaller service companies coming into the field, "larger companies would become very conscious of their costs, and this would bring more technology in, with optimized price," he added. With a target to "heat up the competition," Shawkat argued that this would "shake the big charts, and the big companies will reconsider their position in the country and will conduct more investments to protect their assets."

Some of the recommended solutions have already been adopted and included in the new 2016 model agreement put forward by the EGPC, noted Samir Abdel Moaty, Beach Energy's Country Manager, and the effect of this new agreement will be visible in the scope of 10 to 15 years. However, Moaty expressed hopes that benefits would materialize sooner, within a year or two. Therefore, as he proposed, "some of the current concession agreements may need to be amended now to help enhance the production, boost operators' economics, and to invest more money in the remaining period of the concession agreements."

On that note, Geol. Abu Bakr Ibrahim, Former Chairman of GANOPE stressed that "there is no only one solution for the agreements, and the Ministry of Petroleum has been open to all solutions over the last few years." "Tax and royalties can be applied in Egypt," assessed Eng. Ibrahim. On the other hand, he noted, "service agreements are suit-

"GUPCO HAS ALMOST FINISHED ALL STUDIES FOR LOW SALINITY (LOSAL) WATER INJECTION, WHICH WILL FREEZE AROUND 25% OF THE RESIDUAL OIL."

ENG. NABIL SALAH
Operations Manager, GUPCO

"IN ORDER TO INCREASE RF AND MAKE EOR PROJECTS ECONOMICALLY VIABLE, EGYPT'S OIL SECTOR IS TO UNDERTAKE SPECIFIC LEGISLATION REVIEWS AND DEAL WITH NEW FLEXIBLE PETROLEUM AGREEMENTS TO ACHIEVE A SUCCESSFUL DEVELOPMENT OF THE MARGINAL RESERVES."

SHAHEEN SHAHEEN
IPR Vice President

"THE ONLY SOLUTION IS TO HAVE A DEVELOPMENT PLAN THAT IS PIONEERED BY EGPC."

DR. AHMED EL-BANBI
Cairo University

"HAVING ONLY 3% OR 4% OF ADDITIONAL RF THROUGH EOR WILL BE A VERY GOOD RESULT FROM THE ECONOMIC POINT OF VIEW," ADDED GIANNONE.

SANTO GIANNONE
Petrobel Deputy Reservoir General Manager and Board Member

"INTERDISCIPLINARY TEAM TRAINING NEEDS TO BE DESIGNED TO IMPROVE EGYPT'S COMPETENCIES IN THE INDUSTRY."

JAMES PENDERGRASS
Deputy Exploration Manager and Board Member, Petrosilah

able only for certain companies, for which PSAs are not, because they are not allowed to have equity. Although service agreements can be applied, they cannot be used during the exploration period, because all the major companies prefer another option in this timeframe. They need SAs first in the production phase with a set baseline."

According to Eng. Kassem, EGPC has expressed commitment to explore alternatives to PSAs. In doing so, PSAs, tax and royalties, and Service Agreements (SAs) that IOCs sign with the Egyptian government are to be weighed against one another.

In fact, "the Ministry of Petroleum through EGPC and other holding companies tried to enhance the PSAs model [already] by introducing amortization, which in fact started at GANOPE three years ago," ex-Chairman Ibrahim said. "It was stated in the model agreement that the contractor can get cost recovery at the end of the development phase. In case of the extension of the development lease, the cost recovery pool will be extended too, according to EGPC, unlike the previous practice. This was introduced as a continuous pool to encourage the expenditure and avoid defer in production," detailed Eng. Ibrahim.

The extension of the agreements with partners depends on the contractors' timing. Eng. Abed Ezz El-Regal, Chairman & Managing Director at GUPCO, commented saying that "IOCs often opt for an extension of the agreement at the last moment, in some cases during the last six months, which does not give enough room for negotiations to EGPC and the contractors to agree on an optional extension." He, therefore, recommended launching the negotiating process at least five years before the expiry date of the agreement.

In order to face the challenges that the oil and gas companies in Egypt is dealing with, leaders in the sector called for flexibility to stabilize JVs economics that would help to boost oil industry's overall performance.

Importance of JVs Economics

Further debating the viability of proposed alternative agreements models, Geol. El Bahr pointed to the fact that regardless of the form of an agreement, "as long as there is economic balance and there is a value coming to both parties," mutual cooperation will make sense. "This has to be carefully evaluated and studied case by case," El Bahr continued, adding that "we cannot apply one model to all the fields because the cost of production will be different."

In his opinion, the framework of the PSAs works good in the 'green' phase', however, there is still a gap to examine a model suitable for 'brown' fields, drawing on the example of Agiba's 1987 concession in the Western Desert that is still exploring within a larger location that offer possibilities for additional oil. Based on this case, El Bahr proposed that the way to "identify a development lease is to expand the focus beyond a single block, as there are many other potential blocks around the original discovery." According to his recommendations, "having a bigger development lease around the discovery would allow investors to spend more and find more hydrocarbon."

In later stages, however, "the economics [as defined by the agreements] need to be revisited versus the remaining reserves in order to come up with the best scenario for both partners," the former chairman added.

EOR Investments

The aim of the roundtable was also "to broaden the discussion out to look at how we can make investments in mature assets economic in Egypt," said Brian Twaddle. He added that "the brownfield assets in Egypt are predominantly onshore and in shallow water," both of which "should be economic for investment in the current climate, and that is an opportunity."

In relation to this, Shaheen Shaheen, IPR Vice President, said that "finding new oil is risky and costly, and even when oil is found we still need to construct production facilities, which also requires large investments."

Hence, "almost 70% of oil production in Egypt comes from mature fields, which can be developed with modern enhanced oil recovery methods that require huge investments for both reservoir studies and pilot testing," Shaheen noted. Currently, "the common recovery factor (RF) in Egypt is an average of 34%," which would entail that "about 30 billion barrels of residual oil will be abandoned in the Egyptian reservoirs after recovery by all the conventional production techniques," according to IPR Vice President.

"In order to increase RF and make EOR projects economically viable, Egypt's oil sector is to undertake specific legislation reviews and deal with new flexible petroleum agreements to achieve a successful development of the marginal reserves," added Shaheen. Equally important, "new incentives are needed for highly expensive and risky model of the EOR in the coming decades; we need unconventional solutions to develop proper EOR methods for each reservoir to develop the fields and reduce expenses," he elaborated.

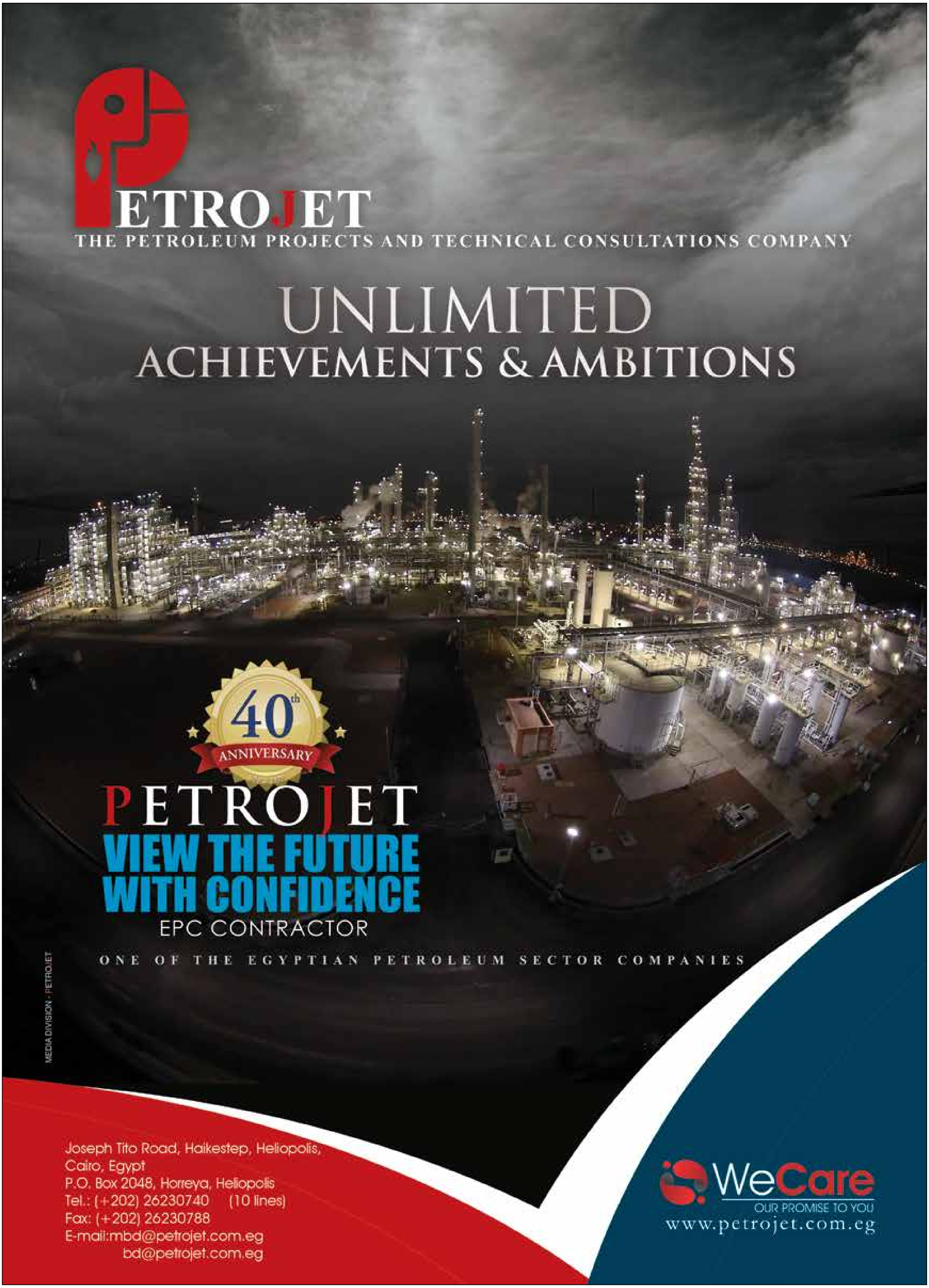
In this way, "legislative amendments may help convert currently marginal fields into attractive projects," according to Shaheen. Similarly, "partnerships with the service sector and JVs under the Risk Sharing Agreements (RSA) will encourage investors to apply modern EOR in order to maximize RF and mutual revenues for both the government and the investor," he concluded.

In tackling oil recovery from mature fields in an economic way, Eng. Nabil Salah, Operations Manager at GUPCO, said that his company has recovered 57% of oil from the original site in the Morgan field with primary and secondary methods. "We need to make more engineering reservoir studies in mature fields," for which IOCs are requested to send proposals to EGPC not only at the end of the concession, but also during the life of the reservoir. This will then allow EGPC to be more flexible with companies' needs.

Companies such as GUPCO have already initiated waterflooding and EOR processes, with 'very good results' in the Morgan field. "GUPCO has almost finished all studies for low salinity (LoSal) water injection, which will freeze around 25% of the residual oil," added Eng. Salah, scheduling the execution of the project with EOR methods in 2017.

Also "Petrobel started working in EOR about five years ago with a series of trials and tests in chemical EOR and low salinity water injection methods expected to be applied in July 2016," said Santo Giannone, Petrobel Deputy Reservoir General Manager and Board Member. He added that Petrobel is now testing the method of polymer injection in the Belayim Land Field, as a pilot project launched in 2015, with first results expected by the end of 2016. "Having only 3% or 4% of additional RF through EOR will be a very good result from the economic point of view," added Giannone.

The vivid debate at the roundtable succeeded in shedding light on possible practical solutions in the oil and gas industry that may impact different policies in the future. The Brownfields Committee thus hopes for opportunities to help advance the tackled issues in order to enhance performance of the Egyptian oil sector.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CONVENTION WORKSHOP: MAXIMIZING OIL RECOVERY POTENTIAL

By Nataša Kubíková, Amanda Figueras, Salma Essam

The EOR/ Water Flooding Technical Convention dedicated a day to a series of technical workshops bringing together experts in the oil and gas field to discuss new ideas and newly implemented techniques, as well as to learn from success stories.

While the first two days of the technical convention provided a unique opportunity to hold a dis-cussion about EOR investments, the workshops was an opportunity for audience to divide into smaller groups for evaluation of innovative ideas.

The workshops focused on well stimulation, water management, surveillance, extending technol-ogy, reservoir characterization, integrated studies, water flooding, and chemical enhanced oil re-covery (EOR).

Well Stimulation

Well stimulation techniques are designed to restore and enhance well productivity. Introducing the techniques, which include acid or solvent jobs, and hydro fracturing, Ahmed Abdel Hamid, Pe-troleum Engineer at Qarun Petroleum Company (QPC), explained the benefits. According to Abdel Hamid, having applied re-fracking technologies, QPC has improved waterflood performance as it successfully increased well productivity by 25% and doubled water injection. "Re-fracking is proved to be one of the effective and economical solutions to enhance or regain well's producti-vi-ty or injectivity, and to considerably prolong well's life," Abdel Hamid concluded.

In another presentation on fractured reservoirs, Saber Moustafa Selim, Former Exploration Gen-eral Manager at SUCO, talked about the role and contribution of 3D fracture trends of basement on EOR. On the case of the Zeit Bay field, located at southwest offshore part of Gulf of Suez, Moustafa Selim stressed that fractured basement is included in the category of un-conventional reservoirs and its performance needs better understanding and characterization to optimize the drainage and EOR. The most important issue is to define fracture trends, where 3D fracture trends can be built and calibrated against fracture density or well test permeability values.

Addressing the issue of cross flow in a multilayer producing well, which is a common problem of highly depleted mature fields, Colin Cranfield, Principal Reservoir Engineer, Baker Hughes pointed to the challenge of the communication between injectors and producers. Cranfield introduced ad-vanced communication analysis technology, provided by the company that serves to optimize wa-terflooding. The Sweep-SCAN™ technology is "based on mathematical analysis that matches the similarity in shape between different signals about oil rate, water rate, and applied pressure."

Another strategy related to the stimulation is the zonal isolation of depleted zone by using organic crosslinked polymer, Alaa Epead, Coiled Tubing & Stimulation Engineer, Technical Advisor in Halli-burton, explained. He mentioned some of the most common well problems such as the cross flow, the flow behind pipe and casing leaks, or the coning/cusping, that the company encountered in the Meleiha field. Epead then introduced Halliburton's Organic Cross-Linked Polymer Technolo-gy (OCP) as a solution to tackle these difficulties, which has proven to maximize production from high pressure zone and prevent cross flow. The OCP allows to "permanently seal the target zone by forming a three dimensional rigid gel which is proven to be stable up to 400 degree Fahren-heit," Halliburton's Engineer added.

Eslam Hamed and Mohamed Abass, Senior Reservoir Engineers, Qarun Petroleum Company (QPC), presented hard challenges and proper solutions that have been implemented during the company's Western Desert field development phases. They introduced the stimulation technique deployed in the El Diyur mature black oil field to unlock the reservoir oil potentials. The engineers said that after a decline in the oil production in 2007, a water-flooding project was implemented, and hydraulic fracturing was identified as the optimum stimulation technique in this case.

Water Management

The majority of mature fields in Egypt are operating under water flood to maintain reservoir pres-sure and enhance hydrocarbon production. In mature water floods, oil is usually co-produced with large volumes of water - water cut larger than 75%; however, a significant amount of unswept oil remains in the reservoir as floods are operated at less optimal conditions over many years, partic-ularly as the oil production gradually declines over time and the incentives for investments wane.

Mohammed Ismael, Enap Sipetrol International, Senior Simulation Engineer, presented a water management method – streamline-based flow simulation. The technique is to manage water and miscible flooding, which requires an understanding of how injectors displace the fluid to the pro-ducers. A key element to a successful flood is good sweep efficiency, which can be significantly impacted by reservoir heterogeneity resulting in areas of water cycling and poor sweep as flood become mature. Case studies on areas in which the technology has proved valuable show that the method provides "a very quick tool to study and evaluate the connectivity any group of wells," he said.

Another challenge of waterflooding in offshore fields related to the question about the location for water injection in the wells. This requires constructing long pipelines, drilling water source wells - aquifer water, and using the sea water which needs a pumping system on the platform. All of the mentioned methods are time and cost demanding. The dumpflooding, or gravity water-flooding was presented as a viable solution, as Mahmoud Hamdy, and Ibrahim Ali, Reservoir Engi-neers in GUPCO presented. The engineers said that the technique is also "economically attractive" as there is no need for injection surface facilities and injection fluid costs.

Surveillance & Monitoring

Surveillance and Monitoring is the key to understand the reservoir performance and identify the opportunities that will improve the ultimate oil recovery and make it more efficient with less

as-sociated cost. Surveillance includes surveys related to injection wells - SRT, PFOT, injectivity moni-toring, injection logging.
GUPCO's Reservoir Engineer, Peter Magdy, emphasized the importance of surveillance for water flooding pro-jects. Surveillance tools such as chem-ical tracer surveys, saturation logs, and step rate tests help in taking corrective decisions and actions, he explained. In addition, they can be used to identify poorly swept regions, less supported regions, optimize injection targets to maximize the recovery efficiency, and detect early water breakthrough. As a reliable monitoring tool, Magdy fur-ther clarified the importance of the step rate test, explaining that its objective is to obtain for-mation fracture pressure. "Surveillance is the key to understand reservoir performance," he add-ed. Magdy further presented the "Hall Plot" analysis for assessing the performance of the injector through detecting water injectivity changes that occur over the injection period.

Extending Technology

Reservoir engineers presented their case studies on technologies used for power injections and for maximizing oil recovery. Eng. Mohamed Mostafa, ESP Team Leader at Qarun Petroleum Com-pany (QCP), introduced Egypt's West of Nile success story using ad-vanced ESP well completion technolo-gy. Qarun has succeeded in expanding the application of this methodology to several fields. "It is proved to be a non-complex power injection technolo-gy, and its design takes into considera-tion all the injection zone capabilities," said Eng. Mostafa.
Also from QCP, Eng. Hussein Abu Lei-la, Surface Facility General Manager, presented on Microbiol-ogy Influenced Corrosion (MIC) mechanisms and monitoring techniques. Eng. Abu Leila said that corrosion and reservoir risk base analysis in addition to economic analysis could be included as tactics to control bacteria growth. The pres-entation revealed that when applying MIC technique, loss of injectivity and environmental impacts should also be considered.
Petrobel shared its experience in max-imizing oil recovery in mature fields through integrated studies. Alberto Boccardi, company's Production Man-ager, revealed progress of Petrobel in maximizing oil recovery in Belayim Land field when all three EOR Pilots will be completed during 2016 to produce first results for assessment next year. Boccardi added that on-going develop-ment of Real Time Data Acquisition and Monitoring system is to help introduce new technology in the field. "The suc-cess was mainly achieved due to the accurate and continuous monitoring of field performances," Boccardi noted.

Reservoir Characterization

Several companies presented their ex-perience and achievements on reser-voir characterization.
Saber Mostafa Selim, Former Explora-tion General Manager at Suez Oil Com-pany (SUCO), dis-cussed the impor-tance of the reservoir characterization model used to enhance oil recovery from Nubian Sandstone Reservoir and Ras Budran Field. As he said, it requires a multi-disciplinary ap-proach and ef-fective management of a large amount of data. The results revealed that res-ervoir and non-reservoir zones should be separated from sedimentary cycles as mappable micro-zones, but some of the thicker micro-zones require further subdivisions.
Similarly, Osama Ahmed Nour, Senior Reservoir Engineer, EGPC, shared the company's experience on five oil fields in the Kharita formation, in the Western Desert. Eng. Nour explained that de-ter-mining the best EOR method for the mature fields was the real challenge, and he gave some rec-ommendations for future EOR technology application. In addition, he recommended starting the EOR techniques in Kharita as early as possible, since reservoirs of this for-mation are almost de-pleted and suffer from sharp decline in oil production.
The final presentation disclosed reju-venation mechanism in mature fields through STOIIP valida-tion for mul-ti-layered reservoirs, with reference to the complex reservoirs of the Nezza-zat group in the Gulf of Suez, Mostafa Mamdouh, Reservoir Engineer in GUP-CO showed. The Big Loop simu-lation approach was used to cover all the ex-isting geological uncertainties over re-viewing the Nezzazzat Field through a competent model. The history matched model in layer basis has suc-cessful-ly proved that the dynamic STOIIP is higher than the pre-Study volumetric STOIIP with ± 5 MMBO, which opened a room for a new drill. This has increased the current recovery factor.

Integrated Studies

The theme of integrated studies was launched with a presentation by Mo-hamed Fahmy, Senior Reservoir Engi-neer at Bapetco, who talked about the integrated petrophysical geological approach to model water injection split in multi layering water injection. The case study of the Bahariya formation in NEAG-1 Field, in the Western Desert started in 2010 with the development of a split ration - water injection allo-cation factor. As of today, as the engi-neer explained, its margin error is less than 10% and by using this calculation method, a total of expected cost saving is about $500,000.
Colin Cranfield from Baker Hughes also stressed the importance of having an integrated approach to deliver success-ful EOR projects. He said that "collabo-ration between oil companies, govern-ment, and the service sector through shared logistics and facilities, and com-mercial alignment is needed."

Chemical EOR

Several chemical EOR (CEOR) pro-cesses were investigated to increase oil production and maximize ultimate recovery. Among them, Nano-fluid technique, Thermally Activated Parti-cles (TAP), and polymer flooding ap-plications were introduced in the last session of the workshop to increase oil recovery.
Eng. Mohamed Tarek from Cairo Uni-versity, conducted a comparative study on the application of the Nano-fluid mixture and the conventional EOR. Na-no-fluid is the technique, in which Na-no-particles are suspended in tradition-al heat and transfer fluid as water and oil. In this study, Eng. Tarek found out that Nano increases oil recovery factor. In addition, Iron Oxide can increase the injected water viscosity, while Alumi-num Oxide and Nickel (II) Nitrates can decrease oil viscosity.
The TAP technique used for improving sweep efficiency in mature fields such as the Belayim Land field of Eni/Petro-bel was explored. Massimiliano Mattei presented positive results indicated in the 2009 pilot. In addition, five promis-ing candidates have been selected for a new TAP theory implementation to ad-vance the technology.
Eng. Mostafa Kortam from Petrobel, discussed the polymer flooding appli-cation. He explained that key factors that may influence polymer stability and performance such as high reservoir temperature, high brine salinity, and hardness, mechanical degradation and absorption, were all considered. Ter-tiary corefloods with polymer solution were executed to assess the EOR effect at the core-scale. In the presentation, the results showed a significant addi-tional oil recovery, up to 8% compared to seawater injection.

Water flooding

Waterflooding was discussed by Kuwait Energy, GUPCO, and Petrosilah. Ahmed Rabie, Kuwait En-ergy's Reservoir En-gineer, described a successful appli-cation of water injection in the Rudeis IB Reservoir, in the Umm El Yusr Field, Area "A", in the Eastern Desert. As he explained, the field was producing for over 40 years without pressure support, until April 2013, when after rented a water flood facility the company start-ed the pilot water injection flood with incremental oil gains.
In the case of Morgan field, Islam Ze-wain, GUPCO Reservoir Engineer, spoke about a 40-year wa-ter management success story since 1974, when water-flooding using seawater started.
Petrosilah's Senior Reservoir Engineers, Omer Badawy, and Youssuf Kamal, showed the results of their water flood projects in two major fields – N. Silah and N. Silah Deep. – in the El Fayum con-cession, and their effect on the production profile. PetroSilah's engi-neers highlighted cost optimi-zation and a cross-disciplinary cooperation between engineers and geologists, as a key to positive achievements.
Lastly, the challenge of economic trade-offs during the design phase of a waterflooding project was raised. Indeed, often the most impactful and difficult of these decisions involve the modifica-tion of the composition of wa-ter injection.
In relation to CEOR, Paul Choules, Con-sultant at Water Standard, explained how a unified screen-ing tool merging mechanic reservoir simulation and modeling of produced water treatment strat-egies allows users to compare var-ious options on the basis of Net Present Value (NPV).

"THE SWEEPSCAN™ TECHNOLOGY IS BASED ON MATHEMATICAL ANALYSIS THAT MATCHES THE SIMILARITY IN SHAPE BETWEEN DIFFERENT SIGNALS ABOUT OIL RATE, WATER RATE, AND APPLIED PRESSURE."

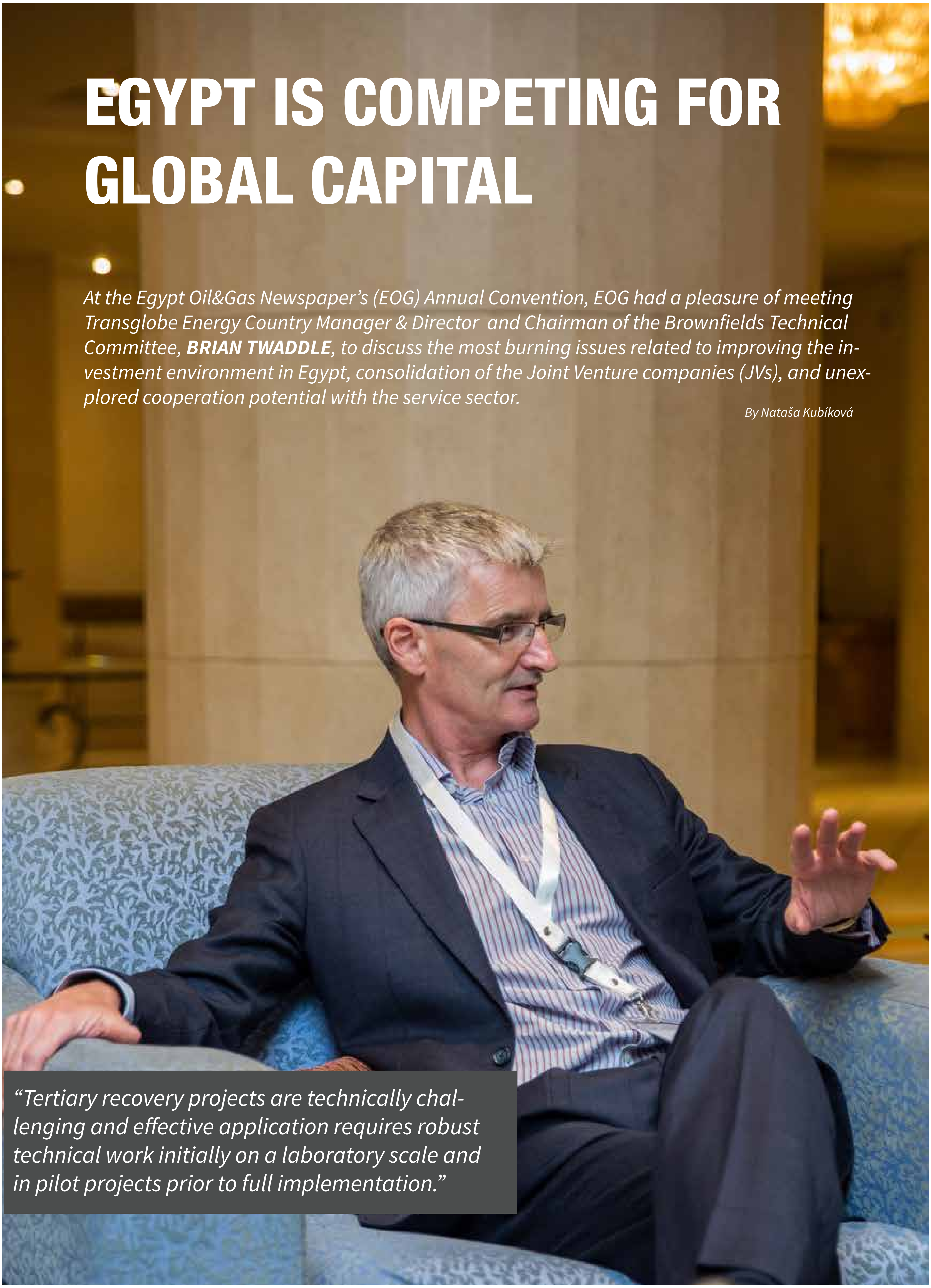
COLIN CRANFIELD
Principal Reservoir Engineer, Baker Hughes

"SURVEILLANCE IS THE KEY TO UNDERSTAND RESERVOIR PERFORMANCE"

PETER MAGDY
Reservoir Engineer, GUPCO

"THE SUCCESS WAS MAINLY ACHIEVED DUE TO THE ACCURATE AND CONTINUOUS MONITORING OF FIELD PERFORMANCES."

ALBERTO BOCCARDI
Production Manager, Petrobel



EGYPT IS COMPETING FOR GLOBAL CAPITAL

*At the Egypt Oil&Gas Newspaper's (EOG) Annual Convention, EOG had a pleasure of meeting Transglobe Energy Country Manager & Director and Chairman of the Brownfields Technical Committee, **BRIAN TWADDLE**, to discuss the most burning issues related to improving the investment environment in Egypt, consolidation of the Joint Venture companies (JVs), and unexplored cooperation potential with the service sector.*

By Nataša Kubíková

"Tertiary recovery projects are technically challenging and effective application requires robust technical work initially on a laboratory scale and in pilot projects prior to full implementation."

The investment environment in Egypt is facing various challenges. In attempts to attract global capital to the country, the Brownfields Committee is searching for ways to improve investment conditions in line with the efforts exerted by the Egyptian government.

Investment Incentives Matrix

While there is no one-size-fits-all solution in terms of investment incentives that a country may offer to attract foreign funds, the key parameters remain unchanged. The core is undoubtedly that "investors need to be confident they can be paid," as Brian Twaddle put it. Therefore, payment of dues to international oil companies (IOCs) has stood on top of the oil ministry's priority list since the era of former Oil Minister and current PM, Sherif Ismail, and it is now being pursued equally persistently by the current head of the oil sector, Tarek El Molla.

"Egypt has challenging currency constraints at the moment," and that challenges the timeline for addressing the unpaid arrears. On a positive note Brian Twaddle added that "the government has been aware of the issues and has been trying to address them for a long time."

Talking about investment opportunities in Egypt goes beyond the government's obligations. Investors, who are already present in the country, have commitments that must be met and are working hard to meet those obligations. "TransGlobe have just mobilized one drilling rig to the Eastern Desert and expects to mobilize a second rig in the Q3. In total, a program of 20-25 exploration and development wells will be drilled," said the company's Head.

> *"Capital budgets are allocated on a global basis and Egypt has to compete to win its share of investment funds."*

The global economic environment is also playing a major role in energy sector. "Capital budgets are allocated on a global basis and Egypt has to compete to win its share of investment funds. While the global perception of Egypt as an investment location remains positive, cost structures which have inflated over the high oil price period have become a barrier to investment in the 'lower for longer' oil price scenario," according to the Committee Chairman.

Investments in Tertiary Recovery

Investment in secondary and tertiary recovery projects was one of the key themes discussed by experts and business leaders during the Egypt Oil&Gas Convention on EOR and water flooding. Brian Twaddle explained that while "waterflooding to boost recovery is fairly well established in Egypt, it is technically understood, and applied quite widely, EOR or tertiary recovery projects are posing a bigger challenge." As "EOR come typically later in a fields' life, there is a much shorter period of time to recover the costs and make a return on the investment within the concessional agreement terms," he added. There is also "a higher degree of risk" implied in EOR investments.

Mature Fields Challenge

According to Transglobe's Country Manager, "within standard PSA terms, capital investment costs are recovered over a period of four or five years. EOR projects typically arise in mature fields. Application risks not only the ability to recover the costs, but the uncertainty on earning a return on the investment within the available time remaining on the concession."

"Tertiary recovery projects are technically challenging and effective application requires robust technical work initially on a laboratory scale and in pilot projects prior to full implementation," explained Brian Twaddle. The technical uncertainty and the early stage work make it "more difficult for both the IOCs to invest and EGPC to agree to an EOR investment proposition," he noted. Even though "some investors may be eager to test new technologies, EGPC is cautious about the risk involved," which calls for closer cooperation in the industry.

Prospects for targeted investments can increase if we find a way for "IOCs and EGPC to execute relevant studies together and further negotiate cost recovery model in a fashion that would enable investment in EOR projects," he concluded.

New Model Agreements as Structural Solution

Speaking of practicalities in designing incentives for tertiary recovery projects, Brian Twaddle revealed that to "assess EOR projects on case by case basis appears to make sense, however, the amount of projects outnumbers senior people at the ministry or EGPC, which causes delays." Large projects are evaluated and flexible arrangements agreed but smaller projects get lost in the queue.

Therefore, the Brownfields Committee calls for "a structural solution" instead. As he explained, "looking at possible modifications in the concession agreements would allow a larger number of projects to proceed on acceptable terms." "The Brownfields Committee has representatives from the government, IOCs, and the service sector, and is well placed to help to find solutions," he noted.

In simple words, "incentivizing that [EOR] investment is challenging and that is why the roundtable discussion at the Convention about risk sharing models and service agreement models are helpful," emphasized Brian Twaddle.

The Committee has sought a way to boost its leverage to introduce proposals for improvements through formal letters of intent and request for official meetings with the Oil Ministry. Brian Twaddle believes, however, that "a focused discussion with ministry's representatives may be more fruitful." He has therefore expressed interest, on behalf of the Brownfields Committee, to "sit down with Eng. Tarek El Hadidy from the EGPC and His Excellency Tarek El Molla to hold a discussion about how the Committee can help." In regard to the Egypt Oil&Gas' EOR&Waterflooding Convention, the idea is to bring the key points from the roundtable debate forward and think jointly about how to make them applicable.

Potential of Service Sector

In searching for solutions and seeking to boost EOR investments, some suggested turning the attention to the service companies. The Brownfields Committee Chairman contended that "the service sector has many technologies available that never gets implemented, because of the way the relationship between contractor companies, JV companies, and service sector companies works."

The difficulties that emerge are rather complex. According to Brian Twaddle, "part of it is the perception of the risk that contractors and JVs are willing to take on, and part of it is the tendering process." As he continued: "The tender process focuses on procurement of single services for minimum cost. Considering a risk sharing model, where the service company takes some of the implementation risk in return for a share of upside profit within the tendering process, may be a viable alternative to explore and apply. A shift of focus from cost alone to value add materializes." As we heard in the Round Table discussions the Service Sector firmly believe they can add more value by changing the approach.

JVs Consolidated under Umbrella Structures

Transglobe Energy has been working closely with the EGPC and Ministry of Petroleum to improve efficiency in JVs. The company has two JVs operating neighboring development licenses. Over the past six months, the two JVs have been consolidated under a single board of directors and all staff has moved into a single office building.

As Transglobe's Country Manager stated, "one of the biggest challenges that the government in Egypt has, is that there are many people working in the JVs and they cannot be laid off." "This means that cost reduction to survive in the 'lower-for-longer' oil price scenario must come from increasing efficiency in contracting services and execution of work. The challenge has been to achieve this in West Bakr and Petro Dara without harming the people," he added. Alignment under a single board of directors is key. Once that alignment is achieved, contracts can be tendered across the whole business bringing economies of scale, and services can be shared between development leases and inventory managed more efficiently," he said.

There are, however, many challenges left to overcome. Each JV has its own culture, work practices, and benefits system and consolidation requires all of these to be unified. "We are still on the journey, but have already seen significant gains," the company's Head shared positive outlook.

Efficiency Boosts JVs Performance

Additional efficiency improvements in JVs are dependent on performance and that requires contracting strategies, competence, and work processes to advance.

"The key to boost performance of JVs is to improve the competence of the people," said Brian Twaddle, adding: "I think it is fair to say that training of JV staff has been inconsistent for a long time. Clearly some companies have invested in training of technical staff but there has been no single consistent approach."

Recently the government in partnership with Oil&Gas Skills (OGS) has been working hard on leadership development program for the most senior levels. "Investments in competences require a cross-spectral approach that tackles technical, leadership, management, commercial, and business skills. Competence development has to be applied across the entire business scope including field specific skills in operations, maintenance, HSE, and construction management," according to Brian Twaddle's recommendations.

It is important that the training bonuses applied in the concession agreements are suitably directed to effective competence development. TransGlobe's Head added that the company "has been working with OGS and EGPC to look at ways the bonuses could be directed to building an internationally recognized training centre for field operations staff in the Eastern Desert."

In the past, training has been hampered in JVs because there was no control over the retention of people and companies were reluctant to spend money on people who could be transferred. "It is probably time to let go of that concern and focus on increasing competence across the whole sector," stated Brian Twaddle.

In similar veins, the concept of benefits packages should be exploited in a purposeful way. As he explained, "in Egypt, the use of financial incentives to drive performance has to be done sensitively and in cooperation with people." These steps are undoubtedly essential if the sector is to prosper.

Transglobe in JV

Transglobe Energy has always worked to be a constructive partner in Egypt. Working with the Egyptian government and participating in the Brownfields Committee are the ways through which the company is seeking to contribute to the ongoing debates on enhancements in Egypt's oil sector.

"Transglobe Energy is in a far better shape than most companies," confidently stated the company's Country Manager. "We have grown our business in Egypt within the Eastern and Western Desert areas over the past five years and will continue to do so through development optimization, exploration, participating in bid rounds, and new acquisitions that make sense for us."

Even though Transglobe's "focus is to optimize producing assets, drill exploration wells, and find new discoveries in Egypt at the moment," as Brian Twaddle explained, "the company is also evaluating other investments internationally.

> *"Incentivizing that [EOR] investment is challenging and that is why the roundtable discussion at the Convention about risk sharing models and service agreement models are helpful."*

TO&GY STRATEGIC ROUNDTABLE

'UNLOCKING EGYPT'S ENERGY POTENTIAL'

By Amanda Figueras, Salma Essam

The Oil & Gas Year (TOGY), in collaboration with Egyptian Gas Association (EGA), organized the Second Strategic Roundtable, held on Sunday 15th of May. The discussion shed light on 'Unlocking Egypt's Energy Potential' in line with market liberalization, international financing, attracting foreign direct investments, and contracting philosophies. This fully interactive event which took place in the Royal Maxime Palace Kempinski, in New Cairo, attracted gas industry leaders and top delegates of major energy companies in Egypt to discuss the opportunities for the country, and the challenges ahead for Egypt to eventually become a natural gas hub.

In the greeting speech, Tamer Ismail, Country Editor of The Oil & Gas Year Egypt 2016 (TOGY) thanked the distinguished speakers, the sponsors of the event – Advance Energy Systems (ADES), Deloitte, and Andrews Kurth Law Firm. He also thanked their partners' at TOGY – American Chamber of Commerce and General Authority for Investment, and the media partners – Egypt Oil&Gas, and Daily News Egypt.

Moderator Eng. Khaled Abu Bakr, Chairman of Taqa Arabia and Chairman of Egyptian Gas Association (EGA) stressed recent "fantastic reforms and modernization" of the energy sector in Egypt. He noted, among other aspects that the country is closing the gap on power generation, and enhancing the power efficiency. "Since 2013, with the democratic process that has been put in place, we all have seen how serious the government is in doing the reforms on energy," he stated.

Further, he talked about "the remarkable efforts that have been done during the last two and a half years," and cited the ongoing liberalization process in the gas industry, and the construction of infrastructures. Eng. Abu Bakr concluded his introductory speech saying: "It is the right time for all of us to be involved and all of us to stand together; government, private sector, think tanks, and public opinion."

Encouraging Upstream Investments

Eng. Khaled Abu Bakr went straight on to discuss one of the most concerning issues in the industry. After commenting that in 2014 there were some adjustments on the concession agreements, he asked how to improve the terms and conditions to encourage more investments, and how to ease the process for foreign partners.

"With the market liberalization we are going in the right direction," Maurizio Coratella, Edison Vice President of Operations for Egypt and the Middle East, said. He was confident in stating that Egypt has a huge potential, however, added that it is necessary "to establish the right balance between the government and investors." As for Edison, he mentioned their wish to have more flexibility in the agreements in order to make the current position of the contractor more fluid to allow investments. Also, he asked for free market to have access to customers that eventually would pay in dollars, and in this way the company would be able to invest more in the upstream.

In his opinion, "the potential is there," especially after the finding of Zohr, therefore, it is now a matter of encountering a fine equilibrium between the government and investors.

Coratella emphasized the importance of flexible contracts that include cost recovery measures in order to incentivize upstream activity for Egypt's offshore natural gas reserves.

Tax Reforms

The effects of taxes on the Egyptian oil and gas sector dominated in the roundtable debate when Wafik Hanna, Partner and Energy Resources Leader at Deloitte, addressed possible measures that could lead to a sustainable policy on taxation. The expert on Legal, Finance & Consulting explained how taxes changed after the revolution in 2011 and how they impacted individuals and companies investing in subsidiaries, and how the branches are paying to their home companies. He stated that there has been "a reduction of corporate tax rate from 25% to 22.5% in addition to an abolishment of a surtax of 5%." The adopted tax reforms aim to incentivize IOCs to boost their exploration and production activity in Egypt.

More specifically in the oil and gas sector, he said that the main investors' problem is the lack of a stable tax scheme. "The investors are looking for an environment where the tax law remains unchanged, as they are coming to invest, they have money and plans for a couple of years, and they are calculating the interest based on fix rates so they want to see that the return of their investment will be achieve," added Hanna. In his opinion, although in Egypt the taxes are lower than in other European countries, stability of the tax structure is a key point.

Gas Market Liberalization

The discussion continued exploring the ways to enhance Egypt's oil and gas sectors in order to cope with the moderni-

zation and liberalization. Hugh Fraser, Partner at the Law Firm Andrews Kurth, firstly marked the importance of conducted steps, and later stated that what is still missing is to fast track the concession process. In his opinion, in order to fully realize the benefits of Egypt's natural gas market liberalization reforms, it is important to have "a well-balanced legal regime that ensures benefits for all stakeholders, including regulators, operators, and consumers."

Optimizing Oil & Gas Services

Searching for ways in which to optimize EGPC's services and deliver the best results in the oil and gas sector, Mohamed Farouk, CEO of Advanced Energy Systems (ADES), said that Egypt is facing a tough time amid the lack of foreign currency in the market. However, he stressed the importance of Zohr gas field describing it as a good opportunity to increase Egypt's share in the international market and achieve sustainability.

Farouk sees that Egypt has to be a productive and a competitive member in the oil and gas sector especially within the period of low oil prices. He said that Egypt has been giving a good example in the sector since fifty years and encouraged the decision makers in the sector to replace payments in foreign currency with the Egyptian pounds, which will eventually help the local companies to flourish and grow. He added that sponsoring small local companies will bring the best service out of it. "The more local content we have in our services accepting payments in the Egyptian pounds, the more international operators will be encouraged to participate in Egypt," he elaborated.

During the Q&A session, Eng. Tarek El Hadidy, Chairman & CEO of the Egyptian General Petroleum Corporation (EGPC), who was a member of the distinguished audience, highlighted the serious challenges that the Egyptian oil and gas sector is facing, including international operator receivables and an urgent need to secure international financing to develop Egypt's deep offshore hydrocarbon reserves. He has underscored the government's serious commitment to addressing such challenges in order to unlock the country's substantial energy potential.

The roundtable reflected on TOGY team's efforts in the sector. Tamer Ismail explained that they have interviewed a number of executives in the industry and learned about their insights, their activities, and their opinion about the Egyptian energy market. This is where the value of the publication lays, said Ismail, and he emphasized his gratitude to the interviewees for this year's outlet. The distribution of The Oil & Gas Year Egypt 2016 publication will start in September.

"Since 2013, with the democratic process that has been put in place, we all have seen how serious the government is in doing the reforms on energy."

ENG. KHALED ABU BAKR
Chairman of Taqa Arabia & Chairman of Egyptian Gas Association (EGA)

"Since 2013, with the democratic process that has been put in place, we all have seen how serious the government is in doing the reforms on energy."

MAURIZIO CORATELLA
Vice President of Operations for Egypt and the Middle East, Edison

"The investors are looking for an environment where the tax law remains unchanged, as they are coming to invest."

WAFIK HANNA
Partner and Energy Resources Leader, Deloitte

"[It is important to have] a well-balanced legal regime that ensures benefits for all stakeholders, including regulators, operators, and consumers."

HUGH FRASER
Partner at the Law Firm Andrews Kurth

"The more local content we have in our services accepting payments in the Egyptian pounds, the more international operators will be encouraged to participate in Egypt."

MOHAMED FAROUK
CEO of Advanced Energy Systems

Egypt - The Gateway to a New Energy Future

EGYPS
EGYPT PETROLEUM SHOW
14 - 16 February 2017

The Egypt Petroleum Show held under the Patronage of His Excellency President Abdel Fattah El Sisi, President of the Arab Republic of Egypt set to take place from February 14th to 16th, 2017 in Cairo, is gearing up to be the biggest oil and gas event of its kind in Egypt providing the most significant annual meeting place for the industry's key regional stakeholders and international oil and gas players looking to do business in North Africa.

Why Egypt?

Even in a period dominated by low oil prices and changing market dynamics, there is a great deal of industry interest and excitement across North Africa, following the discovery of the supergiant Zohr field offshore Egypt.

Egypt's strategic location makes it a perfect meeting place for Europe and the Middle East. With excellent infrastructure and a burgeoning energy industry, the eyes of the industry are closely watching Egypt as a nation to invest in.

Scan recent media and you will see high levels of interest, such as Saudi Arabia's recent decision to invest $8 billion in helping Egypt meet its petroleum needs in the next five years, along with another $4 billion in investment pledges from the nation's other Arab neighbors.

General Electric (GE) has revealed plans to invest $340m in the Egyptian market this year. In an interview with Daily News Egypt, GE President and CEO for North East Africa, Ayman Khattab, revealed that the company is in negotiations with another foreign oil company in Egypt to participate in developing an "oil field in the Mediterranean."

Eni's discovery of the supergiant Zohr field is a game-changing event, and one that will mould the face of Egypt's energy industry and allow greater security of supply. Total gas in place is around 850bcm (30tcf). If true, Zohr will almost double Egypt's gas reserves. Production is expected to begin in Q4, 2017, with Eni already disclosing plans to link four wells to Egypt's national grid in 2018.

There has never been a better time to launch an oil and gas event in the North African country, according to Nick Ornstien, Executive Director, dmg events, Energy Division, organizer of the new EGYPS 2017 Conference and Exhibition.

His Excellency Engineer Tarek El Molla, Minister of Petroleum & Mineral Resources, has also given his blessing and full support to ensure the success of this important event.

Ornstien said: "With EGYPS 2017, we hope to make Cairo a new global meeting place for the oil and gas industry. The event will become synonymous with setting the industry's future agenda; for revealing best practices, knowledge sharing, and unrivalled networking.

"The event also celebrates diversity, with a special focus each year on the growing role of women in the industry, and a dedicated program for graduates and job seekers, as well as fostering long-running close partnerships with key industry players, locally, regionally, and internationally," he added.

Developments

Meanwhile, the Egyptian General Petroleum Corporation (EGPC) has launched a new international bid round for oil research and exploration.

The bid includes 11 blocks in the sedimentary basins, of which five are in the Gulf of Suez – North-East of October, North-East of Al Hamd, North-East of Ramadan, East Badri, North Maritime Esran. The other six blocks are being offered in the Western Desert – North-West Razak, South-East Maleeha, North Um Baraka, South Allam Al Shaweesh, West Badr Eddin, and South-East Siwa.

The bid round comes within the framework of the government's strategy to insure energy supply. International bid rounds and signing new oil agreements are a cornerstone of the strategy and the main motive for operations in the oil sector aiming at increasing production, intensifying research and exploration, and encouraging foreign investments.

Sources reveal there are more bid rounds planned to be announced later in the year. The bids include new areas affiliated with the Egyptian Natural Gas Holding Company and Ganoub El Wady Holding Petroleum Company (Ganope), both onshore and offshore.

Sources added that Egypt has rich potential to attract foreign investors as the 'government exerted efforts to create a supportive investment climate, to develop the infrastructure, and to establish developmental projects focusing on improving living conditions and raising growth rates.'

Current infrastructure project investments for the receiving, transfer, and trading of petroleum products in Egypt stand at EGP 8.8 billion. Egypt has a growing population and industrial base hungry for energy. Analysts suggest Egypt is looking to invest more than $14.5 billion into its downstream refining and petrochemical sector in the next five years.

Egypt's overall gas output levels now stand at more than 300mcf/d of natural gas and 300,000bl/d of condensates, after rapid progression as exploratory wells in the Nidoco were brought into full production.

Work continues to assess the concession area's actual reserves through technical studies, based on which initial estimations of natural gas quantities in the area may exceed 1.7tcf of gas.

Eni proudly revealed the Nooros field, in the Abu Madi West concession that started production in May this year. Production stands at around 65,000 boe/d, just ten months after discovery, in July 2015.

Nooros' daily production comprises of about 10mcm of gas and 5,000 barrels of condensates. Contribution from the Nooros will help reduce Egypt's gas imports, and provide more low cost energy to assist Egypt's ambitious development plans.

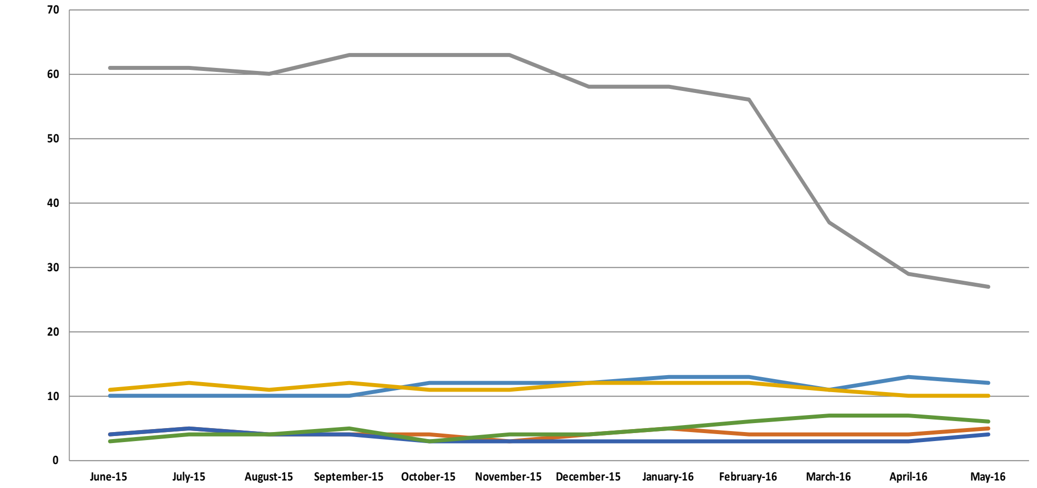
Eni plans to increase production to about 140,000 boe/d by year end, by drilling more wells and optimizing existing wells. Exploration activity within the license area will also continue.

Eni has a 75% stake in the Abu Madi West concession, in the Nile Delta, through its subsidiary IEOC. The other partner, BP, controls the remaining quarter. Petrobel, which is a joint venture between IEOC and state partner EGPC, is also conducting operations in the license.

To find out more about exhibiting or sponsoring the Egypt Petroleum Show 2017, visit www.egypt-petroleumshow.com or email egyps.sales@dmgeventsme.com

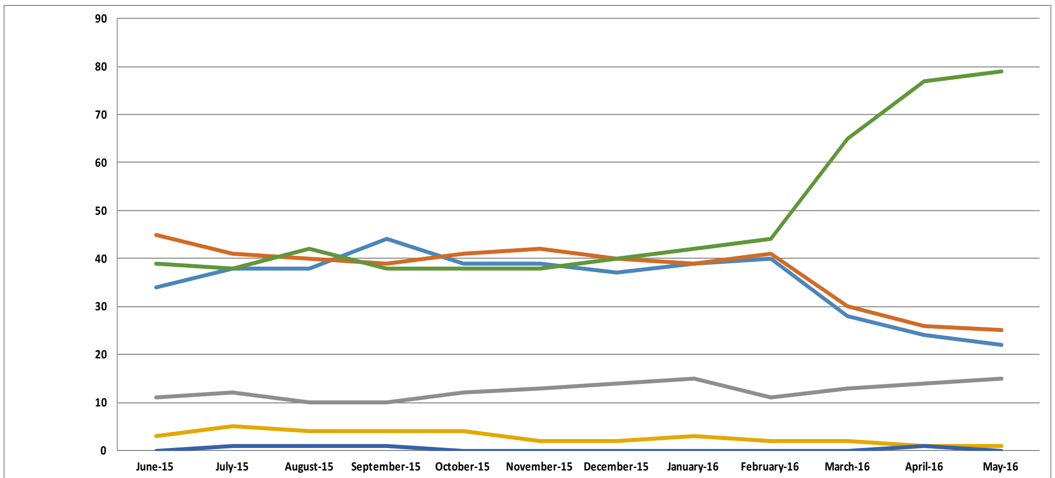

Torii

Changes in Rigs by Area- May 2015 to April 2016



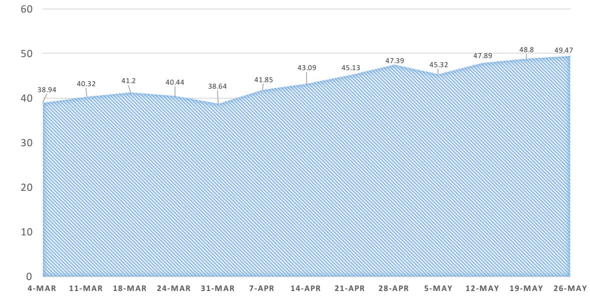
	June-15	July-15	August-15	September-15	October-15	November-15	December-15	January-16	February-16	March-16	April-16	May-16
G.O.S.	10	10	10	10	12	12	12	13	13	11	13	12
Med. Sea	4	5	4	4	4	3	4	5	4	4	4	5
W.D.	61	61	60	63	63	63	58	58	56	37	29	27
Sinai	11	12	11	12	11	11	12	12	12	11	10	10
E.D.	4	5	4	4	3	3	3	3	3	3	3	4
Delta	3	4	4	5	3	4	4	5	6	7	7	6

Changes in Rigs by Type - May 2015 - April 2016

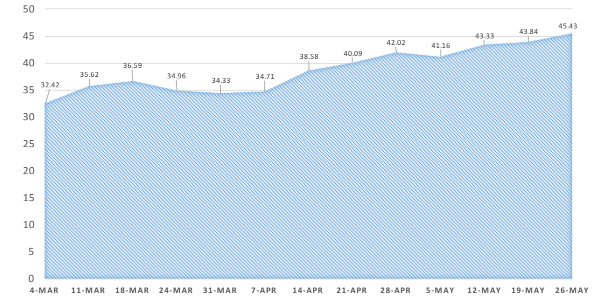


	June-15	July-15	August-15	September-15	October-15	November-15	December-15	January-16	February-16	March-16	April-16	May-16
Land-Drilling	34	38	38	44	39	39	37	39	40	28	24	22
Land Work-Over	45	41	40	39	41	42	40	39	41	30	26	25
Jack-Up	11	12	10	10	12	13	14	15	11	13	14	15
Semi Submersible	3	5	4	4	4	2	2	3	2	2	1	1
Fixed Platform	0	1	1	1	0	0	0	0	0	0	1	0
Standby/Stacking	39	38	42	38	38	38	40	42	44	65	77	79
Drillship												1

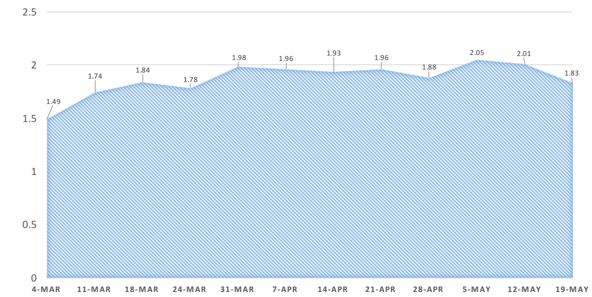
BRENT PRICES



OPEC BASKET PRICES



NATURAL GAS PRICES

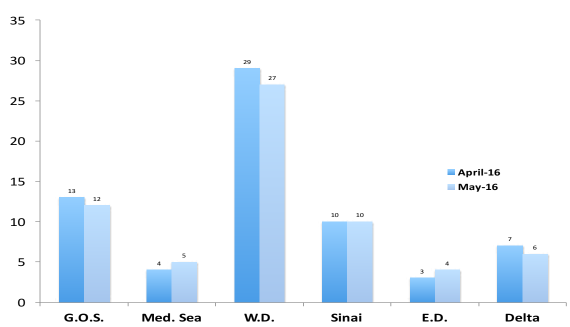


Production - April 2016

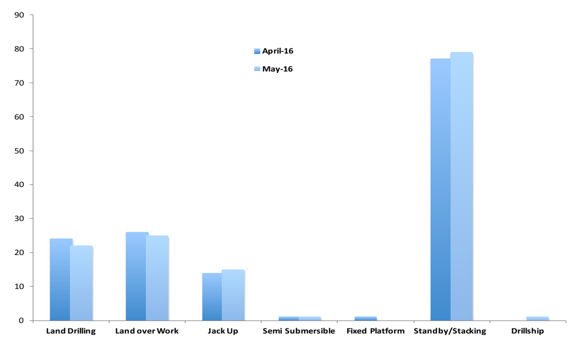
	Crude Oil	Equivalent Gas	Liquified Gas	Condensate
Med. Sea		9494643	194672	646044
E.D.	1881616	22321	3568	1575
W.D.	9719650	7240536	532769	1462398
GOS	4007086	539464	239277	70690
Delta	34113	2805179	130967	220005
Sinai	1900102	536	44971	23953
Total	17542567	20102679	1146224	2424665

Unit: Barrel

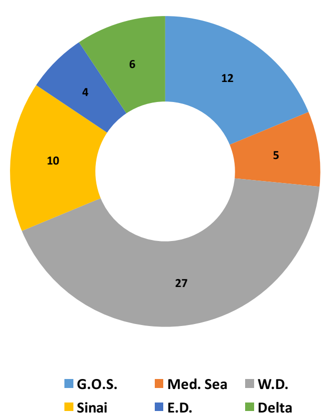
Rigs per Area April - May2016



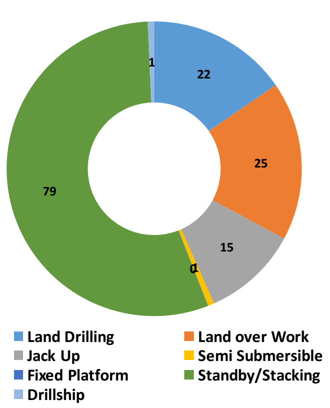
Rigs per Specification - April- May 2016



Rig Count per Area - May 2016



Rigs per Specification - May 2016



Rigs per Specification - May 2016

Location	April-16	May-16
Land Drilling	24	22
Land over Work	26	25
Jack Up	14	15
Semi Submersible	1	1
Fixed Platform	1	0
Standby/Stacking	77	79
Drillship	0	1
Total	143	143

Rig Count per Area - May 2016

Location	April-16	May-16
G.O.S.	13	12
Med. Sea	4	5
W.D.	29	27
Sinai	10	10
E.D.	3	4
Delta	7	6
Total	66	64

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