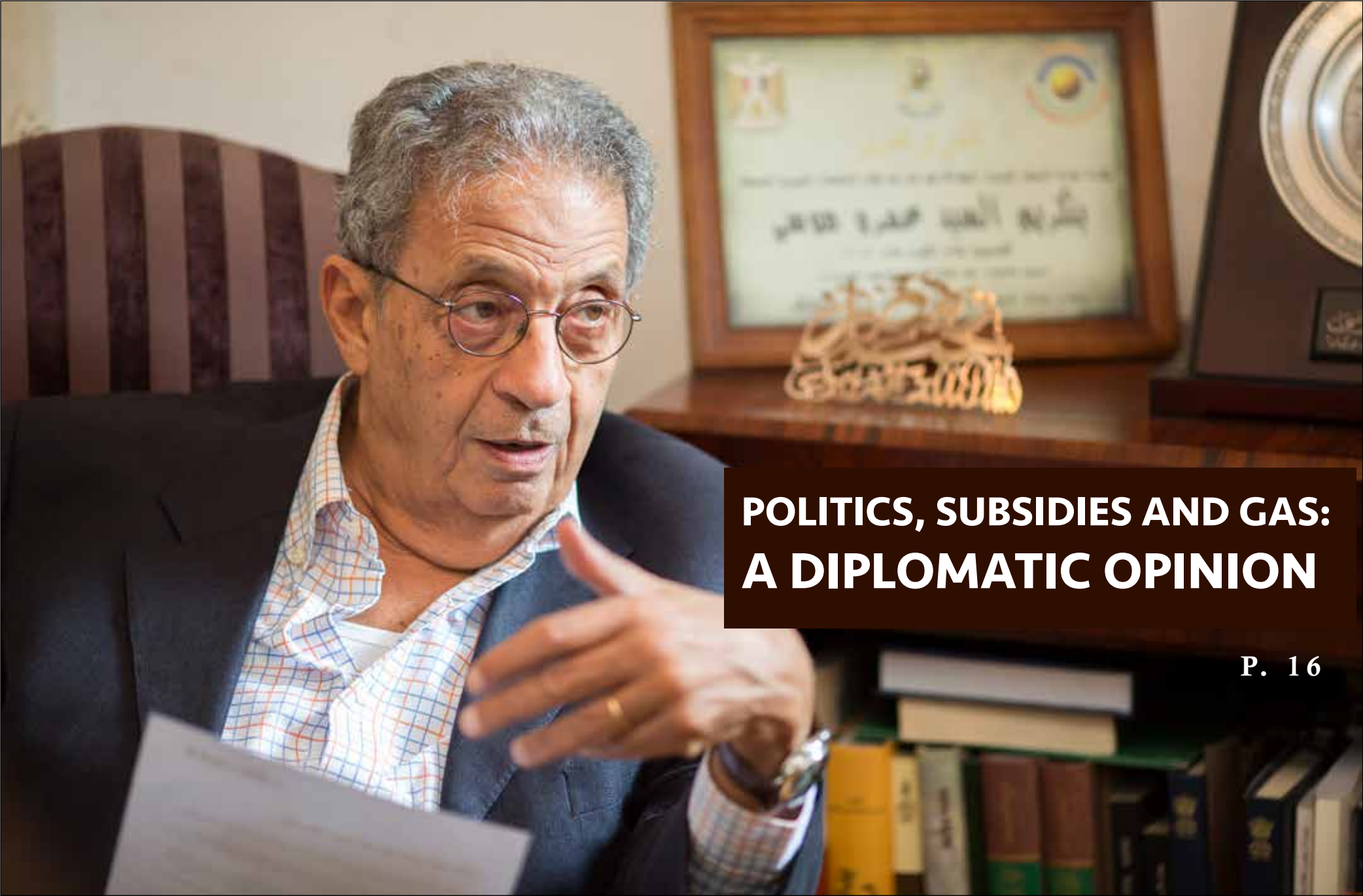


EGYPT OIL & GAS NEWSPAPER

EGYPT'S LEADING OIL AND GAS MONTHLY PUBLICATION - November 2015 - 32 PAGES - ISSUE 107



ENERGY FINANCE





**BRIDGING THE GAP:
2015 ANNUAL GLOBAL WORKING CAPITAL
SURVEY OF THE OIL & GAS SECTOR**

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AS A PUBLIC GOOD
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EGYPT'S IMPORT SOLUTION: FSRUS
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IMPROVING HYDROCARBON
PRODUCTIVITY IN GULF OF SUEZ

25 years of energy partnership

BG Egypt is a subsidiary of BG Group, one of the principal foreign investors in Egypt. It is a leading player in the development of the local natural gas industry with investments spanning the gas chain from exploration through development and production to LNG.

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EOG COMMITTEE 3RD TECHNICAL CONVENTION

EOR / WATER FLOODING CONVENTION

MARCH 2016

ROUNDTABLE



WORKSHOP



TRAINING



TECHNICAL EXHIBITION



CALL FOR ABSTRACTS

ENHANCED OIL RECOVERY (EOR)

MODELLING EOR

- Reservoir characterization for EOR Modeling
- Reservoir uncertainty and the impact on EOR
- EOR in naturally fractured reservoirs
- EOR in non-fractured reservoirs
- EOR in heavy oil reservoirs

EOR CASE STUDIES

- Pilot studies
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- Project execution
- HSE considerations
- EOR screening criteria

TECHNOLOGY FOR EOR

- Solar thermal EOR
- Low salinity EOR
- Technology options (Polymers, ASP, CO₂....)
- Emerging technologies
- Smart water – economics and applications
- New era EOR – Well placement,

OPERATING EOR

- Surveillance and monitoring
- Optimization

WATER FLOODING

MODELLING WATER FLOOD

- Water flood process and design
- Prediction of water flood performance
- Geological considerations
- Field reconnaissance to simulation output

CASE STUDIES

Combined aquifer and water flood drive management

TECHNOLOGY

- Optimisation using polymers
- Smart water

OPERATING WATER FLOOD

- Surveillance, optimization, monitoring and management
- Reservoir souring mechanisms, corrective actions and mitigation measures
- Performance evaluation within multi-flow unit formation
- Management of IVRRs

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This month things have settled a bit in the Egyptian energy sector. This comes as a bit of a relief after all the changes and news of the last several months. Of course there has been some major news; Mohamed El Masry was appointed the new chairman of the EGPC, a very important post that has often proved a stepping-stone to becoming petroleum minister. Tarek El Molla was the perfect example of this just last month!

In non-sector news, the first round of parliamentary elections were held in late October in Giza and the West Nile Delta. The new parliament, once fully elected in November, will have an important role to play in the Egyptian economy—especially as it relates to oil and gas. The parliament will be tasked with reviewing and overseeing all the deals signed over the period that President Sisi ruled in absence of a parliament. This newspaper wishes the best to the legislature, and has high hopes for their contributions to the sector.

This month our newspaper features an extended interview with one of the most important figures on the Egyptian—and global—political scene: Amre Moussa. In the interview we ask Moussa about his

opinion on subsidies, the role of the new parliament, and how new gas discoveries in the Mediterranean will affect Egypt.

We also have features this month about seismic data, both the current information for Eni's massive Zohr field in the Mediterranean, and an argument for changing the sharing process between the Egyptian state and IOCs. For our political section we take a look at Royal Dutch Shell's recent departure from the Arctic, and what the future may be for the region. We also explore the options Egypt has pursued to fill its gas shortage (read: FSRUs), and PwC fills us in on current investment and capital opportunities in for oil—and especially gas.

This month marks a milestone for me, as this is my final month—and indeed, as I'm writing this, my final day—at Egypt Oil & Gas. My time at this newspaper has been very challenging, but at the same time very rewarding. I'm proud of what my team and I have accomplished while here, and look forward to what the future may hold. As I return to the US this month, I will keep the memory of this role as one of my favorites while in Egypt. As always, thank you for your readership and support.

Editor in Chief

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Publisher **Mohamed Fouad**

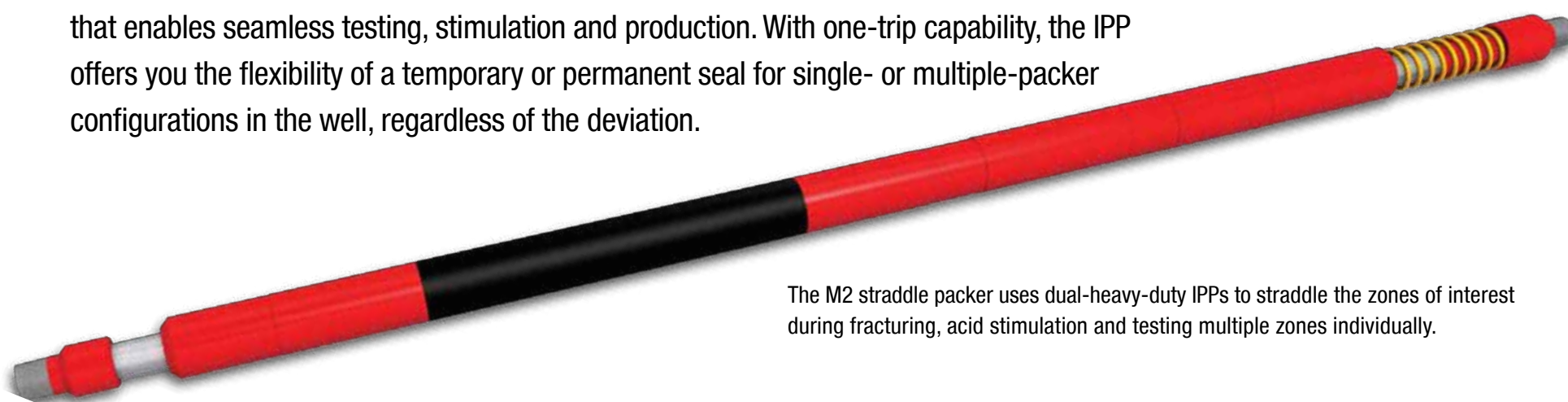
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Zonal Isolation for Drilling and Completions



Reduce rig time with versatile inflatable-packer technology

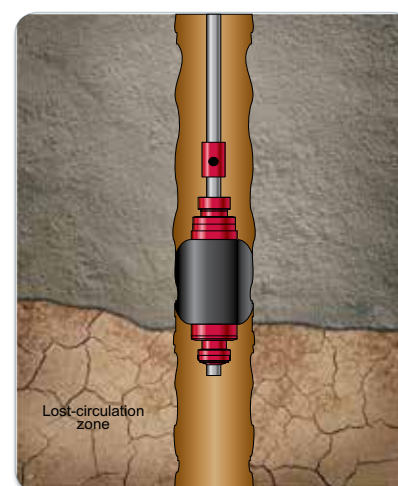
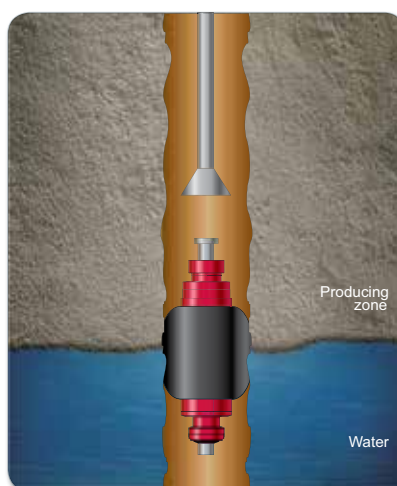
Weatherford's inflatable production packer (IPP) provides a versatile workover isolation system that enables seamless testing, stimulation and production. With one-trip capability, the IPP offers you the flexibility of a temporary or permanent seal for single- or multiple-packer configurations in the well, regardless of the deviation.



The M2 straddle packer uses dual-heavy-duty IPPs to straddle the zones of interest during fracturing, acid stimulation and testing multiple zones individually.

IPP Advantages

- Slim run-in OD allows for drifting through existing restrictions
- Largest available hole-setting capability
- Ability to test below or between elements
- Multiple sets in one trip
- Cased-hole and openhole capabilities



IPP Applications

- Cement retainer
- Casing-integrity testing
- Testing of casing patches (above or below)
- Permanent bridge plug
- Water shutoff
- Scab liner
- Openhole testing and stimulation
- Selective production testing of particular zones



Mohamed El Masry Appointed Head of EGPC

Egypt Oil & Gas learned that Petroleum Minister Tarek El Molla appointed Mohamed Al-Masry as Head of the Egyptian General Petroleum Corporation (EGPC).

Al-Masry has served as Vice Chairman of Operations for the Egyptian Natural Gas Holding Company (EGAS) since last February.

Sherif Ismail: Gas Shortage in Egypt to End This November

Chairman of the Federation of Egyptian Industries Mohamed El Sewedy said that the Egyptian Prime Minister, Sherif Ismail, has pledged to end the gas shortage suffered by factories by this November, reported the Cairo

Post. El Sewedy said that Ismail held an urgent meeting with the FEI to discuss a number of topics, including developing exports and countering smuggling.

Cyprus Proposes Connecting Aphrodite to Egypt's Zohr

Cyprus Mail quoted Cypriot Energy Minister Giorgos Lakkotrypis recommending building a pipeline to connect Cyprus' Aphrodite to Egypt's newly-discovered Zohr gas field, instead of extending a pipeline from the Aphrodite reservoir all the way to Egypt. The distance between the Aphrodite and Zohr fields is approximately

90km, making this "Plan B" according to Lakkotrypis both "faster and cheaper." Under this scenario, the facilities will be built on top of the Zohr site to receive the imported gas, and combine it with Zohr's production, transferring them via a single pipeline to onshore Egypt.

Sisi Meets with Eni's CEO

According to a press release by Italian energy giant Eni, President Abdel Fattah El Sisi, and Eni's Chief Executive Officer—Claudio Descalzi—met in Cairo to discuss Eni's activities in the country. During the meeting Descalzi presented to Sisi the development plan for the Zohr field, where both parties confirmed their joint commitment to accelerate the production start-up of the field. Furthermore, they discussed the possibility of setting up a gas hub in the eastern Mediterranean Sea aimed at making the Egyptian transport and export facilities also avail-

able for the nearby discoveries. Both parties previously met last month, a few hours prior to the announcement of the mega gas discovery.



Depreciating Pound Value May Reduce Egypt's Ability to Pay IOCs

A state official told Egypt Oil & Gas that higher dollar exchange rates in the local market are threatening the ability of the Egyptian government to pay debt installments to international oil companies (IOCs), especially as many IOCs reject payment of dues in Egyptian Pounds and insist on payment in foreign currency. The source also explains that the more the dollar price gets further higher than EGP 8:\$1, the more susceptible Egypt will be to a currency crisis.



Third FSRU to Arrive in March 2016

Sources at EGAS told Egypt Oil & Gas that the third floating Storage and Reclassification Unit (FSRU) ship is planned to arrive to Egypt the coming March of 2016. The second FSRU ar-

rived in the port of Ain Sokhna at the end of September but is yet to begin operations as the pier it will dock at is still under construction.

Egypt Announces Results of LNG Tender

Tarek El Molla, Minister of Petroleum and Mineral Resources, received a report from Khaled Abdel Badie, Head of the Egyptian Natural Gas Holding Company (EGAS) regarding the outcome of the tender issued by the com-

pany for the supply of LNG, reported Egypt Oil & Gas. Abdel Badie noted that 7 companies have been selected from a total of 12 to supply 55 shipments of LNG, beginning November 2015 and ending in December 2016.

Apache Finalizes Studies on Obayyed Shale Gas Reserves

Apache has completed the necessary studies to research and explore shale gas in the Obayyed field in the Western Desert for the first time in Egypt, reported Egypt Daily News. The company is also working on an evaluation of the layers and calculations of the gas reserves. An official in the Egyptian General Petroleum Corporation (EGPC) noted that Apache has completed the studies and sent them to its head office in the US for revision, to put together a work plan for drilling its first exploratory well. The official added that oil major Shell's subsidiary Baptetco and Apache are working together on the project in the upper layers of the land, called the Safa layers. These layers have a high-quality thickness, but require irregular operation methods; however, Apache will be responsible for implementing the work due to its expertise. On a similar note,

Shell requested from the EGPC to agree on the price of the shale gas that will be produced from the area for the first time in Egypt, as the cost of the project will be high and the process of extraction is significantly different than regular sources. Currently Egypt pays \$2.65 per million Btu in most of its agreements, with the exception of some deepwater Mediterranean fields.



Petroleum Products Imports to Increase to \$1.3b/Month

Sources at EGPC revealed that the rise in the dollar value will increase the crude oil and petroleum derivatives import bill to reach \$1.3b a month in comparison to the previous range of \$1.1b-1.2b, reported Al-Mal. A crisis is expected in the supply of petroleum products during the coming few months, namely in LPG and gasoline. This will occur if dollar prices continue to rise, making the greenback scarce and delaying the entry of shipments. The contract with Saudi Aramco, to provide a large part of the petroleum derivatives needed for the domestic market could alleviate the anticipated crises until the expiration of the contract, at the end of November. Sources explained that this also poses difficulties in reimbursing foreign companies, while increasing the quantities required of the local currency, which

is then converted to dollars to settle those dues. Hisham Ramez, former Governor of the Central Bank, had said in a statement that the petroleum sector paying its debts would affect the dollar. Sources pointed out that the petroleum sector has had to resort to the Central Bank and Ministry of Finance to pay its dues, which further reduces the country's foreign reserves.

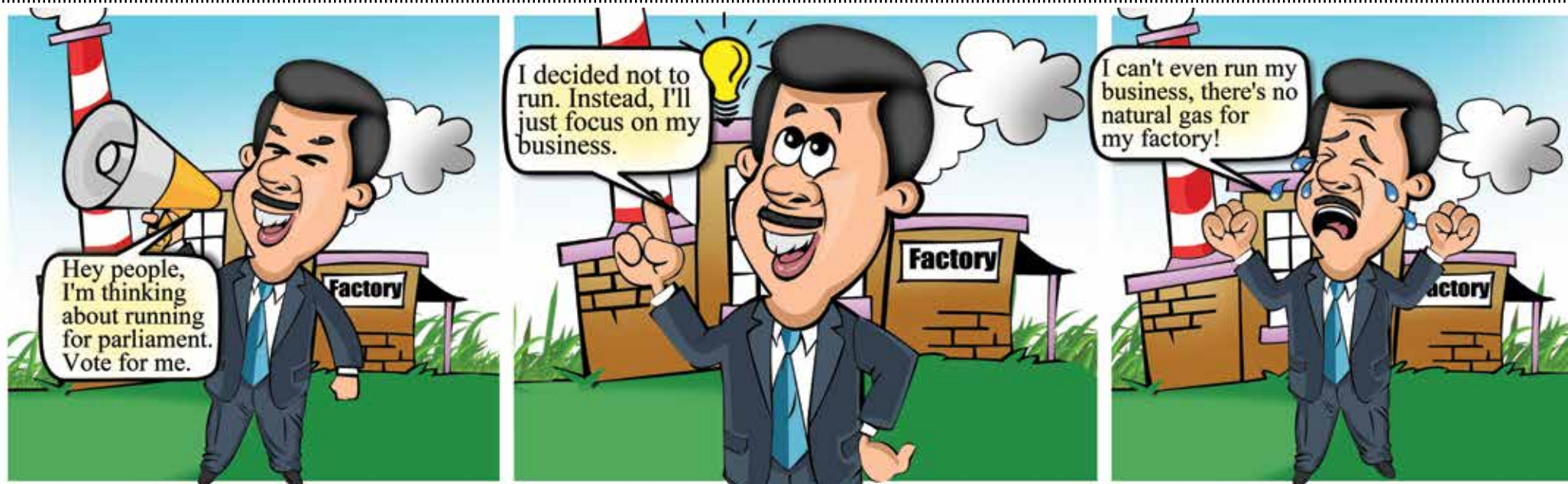


Egypt Borrows More Dollars to Pay International Oil Firms

Minister of Petroleum and Mineral Resources Tarek El Molla told Daily News Egypt that discussions are ongoing with the Ministry of International Cooperation to obtain part of that agency's dollar loan. El Molla explained that the amount will be allocated towards the repayment of foreign partners' dues. This is in order to fulfill the ministry's promise to pay down at least part of the remaining \$2.9b by the end of the year. Minister of International Cooperation Sahar Nasr said in a statement Friday that negotiations are ongoing with the World Bank to obtain an additional \$3b, as well as \$1.5b from the African Development Fund (ADF) in order to support development programs. She explained that this kind of financing is usually provided immediately; however, the government must decide which programs and development projects to allocate it to. She added that a joint delegation from the World Bank and the ADF was currently visiting Egypt.

EGAS Announces Results of Mediterranean Bid Round

EGAS announced the result of the 2015 international exploration Mediterranean bid round, reported Egypt Oil & Gas. The results include four bids for four blocks in the Mediterranean, with a total investment of \$306m and a signing bonus of \$10.5m to drill eight wells, and conduct 3D seismic surveys. These details came in a report received by Tarek El Molla, Minister of Petroleum and Mineral Resources, from EGAS Chairman Khalid Abdel Badie. In an official statement Abdel Badie explained that the block 4 North Ras El Esh was awarded to BP and IEOC. In addition, IEOC, BP, and Total were awarded Block 7—in the North El Hammad area. Italy's Edison was awarded block 12, Northeast Haphi, and BP was awarded block 12, North El Tabia. The EGAS Chairman added that the offers made represent a good turnout in light of the challenges posed by declining crude oil prices worldwide in the current period.



TAQA Arabia, EGB Strike Deal to Finance National Gas Project

TAQA Arabia announced in a press release that it has reached an agreement with the Egyptian Gulf Bank (EGB) over financing a project to connect household units to the national gas grid. The agreement was made in cooperation with the Egyptian government, and is worth EGP 700m. The agreement includes covering the cost of installation and delivery to citizens provided that they repay the amount in installments for periods extending up to 7 years. The average cost of delivery of gas per homes is EGP 1,500, compared to EGP 25,000 for commercial customers. Pakinam Kafafy, CEO of TAQA, said that her company plans to connect more than a million customers by the end of this year—homes, factories and business—in 11 provinces. The current number stands at 450,000 customers. She insisted that the increase in gas supply in the coming years will reflect

directly on the company by increasing the delivery processes, including raising the total quantities being supplied and delivered to homes and factories, to reach about 6 bcm per year. She added that TAQA recently signed contracts with EGAS to deliver gas to about 330,000 clients, both homes and businesses. Dr. Sherif Farouk, head of accounts and deposits at the EGB, stated that with the signing of the agreement, the bank can cover the delivery costs for the 450,000 clients to the tune of EGP700m. “Participating in projects that directly benefit the Egyptian citizen is one of the most important priorities of EGB, serving the development goals and the economic policies of Egypt. We are on verge of concluding more agreements that will benefit consumers directly and on so many levels,” said Farouk.

Petroleum Ministry Secures LPG Supply for Winter

Tarek El Molla, Minister of Petroleum and Mineral Resources, met with the heads of Petrogas, Petrosafe, EPROM, Petroleum Pipeline Company, and MID TAP to discuss methods of ensuring a steady supply of LPG during the coming winter season, reported Egypt Oil & Gas. A number of officials from EGPC and the Petroleum Ministry attended the meeting, where El Molla reviewed developments on ongoing projects, including the 14km LPG pipeline being built by the Petroleum Pipeline Company to connect with the MIDOR pipeline in preparation for receiving LPG shipments through MIDTAP at

El Dekhela port in Alexandria. Other projects discussed included Petrogas storage warehouses pipelines at Wadi El Kamar in Alexandria, and Petrogas’ plan to increase LPG storage, which includes establishing 7 warehouses in Alexandria with a capacity of 8400 tons, and 4 warehouses in Souhag with a capacity of 6400 tons. During the meeting the progress of the 127km Assiut/Sohag pipeline was also reviewed. The project is worth EGP 350m, and will be linked to the Shukeir/Assuit pipeline to transfer LPG to the Sohag filling plant.

Fuel Trucks and Stations to Be Monitored Electronically

Egypt Oil & Gas has learned that Tarek El Molla, Minister of Petroleum and Mineral Resources, held an extended meeting with heads of fuel distribution companies in Egypt to put together an advanced strategy for distributing petroleum derivatives for the coming period and to eliminate outlying problems facing this key sector. The meeting comes as part of the government’s efforts to combat fuel smuggling in Egypt. The minister called on company executives to prepare a plan and comprehensive study to implement the ATC project, whereby electronic meters are installed at fuel depots and on storage tanks at fuel stations. All of these will be connected to the region-

al headquarters of each distribution company, as well as to the EGPC. This is to keep track of the distribution of petroleum products and to be updated on a second by second basis on the availability of fuel in every fuel port in the country, ensuring that subsidized fuel products reach citizens. He added that this project will be implemented in phases; beginning with Greater Cairo and Alexandria, before the same measures are taken for the rest of the country. Additionally, GPS trackers will monitor fuel trucks, whether owned by said companies or rented. El Molla also insisted that opening a new fuel station be conditional on installing ATCs and GPS units.

Egypt to Import 2m Tons of Crude from Iraq

A government source informed Egypt Oil & Gas that the Cabinet is considering fuel supplier offers to import oil from Iraq starting from January 2016. This was especially in light of the fuel crisis that has repeatedly been an issue over the past several months. The offers include importing 2m barrels of crude oil over a 12 month period, which would then be refined in Egypt. The official noted that Egyptian refineries are operating at only 60% of their full capacity. The source added that the resumption of negotiations came after the Iraqi side conceded one of its intransigent conditions, namely, to place \$1b in an international bank to ensure their financial arrears, which is the value of 3 months worth of shipments, in advance of the formal signing of the agreement. The Egyptian



Japan to Promote Energy Efficiency in Egypt



Japanese Ambassador to Cairo, Takahiro Kagawa, said that his country is ready to provide all the help that it can in relation to energy efficiency, especially in light of the energy crisis Egypt is facing. He made these remarks during the “Japanese-Egyptian Relations Conference and the Future of Sustainable Development: An Energy-Saving Model,” held by the Japanese Embassy in collaboration with the Al-Ahram Center for Strategic Studies. He added that Japan is one of the top developed countries in energy conservation, noting that Japan has recognized the importance of energy security and conservation since the seventies and has enacted laws and regulations necessary for the task. The Ambassador added that visits have been exchanged between both sides. The Energy Consumption 2020 conference will be held in Paris at the end of the year to confront the danger threatening the world, said Kagawa, stressing on the importance for developing countries to set their own goals in this regard, adding that Japan will cooperate in order to implement those goals. Pointing out the need for the community to take action and contribute to supporting the efforts of power conservation in Egypt. In attendance at the Egyptian-Japanese conference was Atwa Hussein, from the Environment Ministry, who said that Egypt is seeking to create a global center in the field of energy conservation in collaboration with the Japanese side, take advantage of their vast experience in providing technical and institutional support to this initiative. Hussein noted that the Japanese delegates had been invited to meet with officials from the ministries of electricity and the environment in April to learn about the Japanese experience in energy conservation. They discussed the establishment of mechanisms to rationalize the energy, such as the center that will be established under the supervision of the Japanese side. This conference comes in conjunction with the preparations now under way for President Sisi’s visit to Japan before the end of this year, accompanied by several ministers concerned in the field of efficiency and energy conservation in Egypt. There will also be representatives of Egyptian and Japanese business organizations, experts and specialists in this field.

CHOICE Words



“There are many projects that are beginning to be implemented to liberalize economic sectors and provide thousands of jobs. Detailed data on all projects and plans are underway to be submitted to the upcoming council of representative.”

Sherif Ismail. Prime Minister of Egypt.



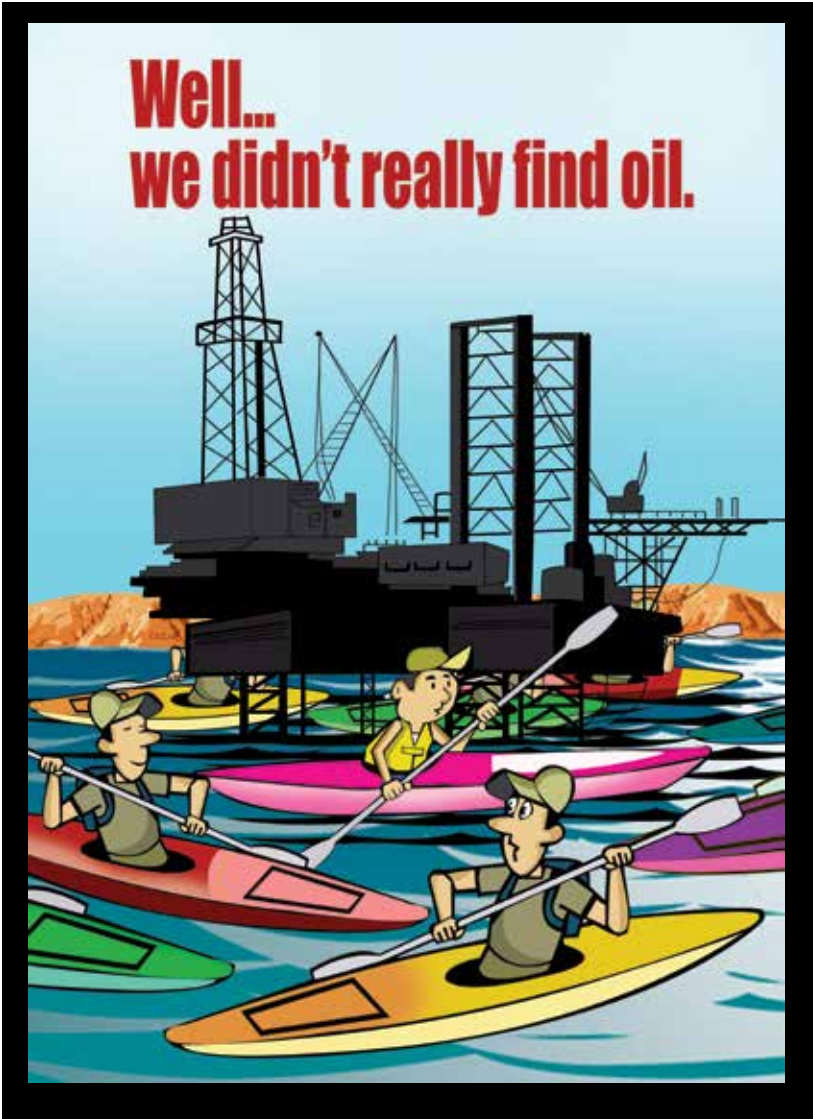
“This country will reach 100m people by 2020, and we are now in 2015. A government of 100m people has to have a plan. We have to deal with all the files pertaining to rebuilding the country. I believe that we have to put the country on the right track, and push the crate to move.”

Amre Moussa. Former Secretary General of the Arab League.



“Windows of opportunity open and close in a flash in the natural gas market. Look at the Zohr discovery in Egypt. At the moment we see the Egyptian market as an excellent opportunity for Aphrodite and Leviathan even after the Zohr discovery”

Georgios Lakkotrypis. Energy Minister of Cyprus.



Egypt and Cyprus in Energy Talks

Prime Minister Sherif Ismail, and Petroleum Minister Tarek El Molla met in mid-October with Giorgos Lakkotrypīs, Cyprus' Energy Minister, to discuss energy, reported the Cyprus Mail. According to an official announcement by the Cypriot energy ministry, Lakkotrypīs was on a one day visit to Cairo to "review ways of further strengthening cooperation between Cyprus

and Egypt on hydrocarbons issues." Lakkotrypīs has previously stated that Egypt's Zohr discovery may extend to the country's exclusive economic zone, and that the country is studying whether this is true. Even if proven incorrect, Cyprus is still concerned by the mega discovery, as Egypt may no longer need to import gas from its Aphrodite field.

Oil Ministry in Negotiations with IOCs for LNG

A source at EGPC revealed to Egypt Oil & Gas that the Ministry of Petroleum is in negotiations with a number of foreign oil companies to buy shipments of liquefied natural gas (LNG) to meet the growing needs of power plants and factories suffering shortages during the current fiscal year. The source added that the quantities being negotiated with foreign partners average about 300 mcf per shipment, with a volume of 3 shipments

per month. The plan is to direct 30% of the acquired LNG to the industrial sector, and 70% to power plants to avoid blackouts for citizens. The 30% going to factories are subsidized and the owners will have to import the remainder of their needs, after agreeing to the tariff charged for using the national gas grid. Energy intensive factories will receive gas currently at a price of \$7 per million BTUs, while Egypt imports at a cost of \$13 per million BTUs.

EBRD to Finance Renewable Energy Projects in Egypt

The European Bank for Reconstruction and Development (EBRD) aims to focus on financing renewable energy projects in Egypt in the coming period, said Philip Ter Woort, Director of EBRD Egypt, reported Daily News Egypt. According to Woort, 67 private companies operating in the field of renewable energy in Egypt have requested loans

from the EBRD, and the bank has allocated hundreds of millions for this purpose. Woort explained that EBRD is cooperating with banks in Egypt, such as the National Bank of Kuwait (NBK) to support small and medium-sized enterprises (SMEs) in Egypt, which is an important pillar of the EBRD's strategy in Egypt.

Sherif Ismail to Form Ministerial Committee

Prime Minister Sherif Ismail formed a ministerial economic committee under his chairmanship, reported Daily News Egypt. The committee will draw out the general framework for economic and monetary policies, as well methods of attracting investment opportunities to Egypt, according to

a statement released by the cabinet. Members of the committee include the Governor of the Central Bank of Egypt (CBE) and the Ministers of Planning and Logistics, Finance, Investment, Tourism, International Cooperation, Petroleum, and Foreign Trade and Industry.

Tarek El Molla in Energy Talks with Head of EDF

Egypt Oil & Gas has learned that Tarek El Molla, Minister of Petroleum and Mineral Resources, held extensive talks with Jean-Bernard, CEO of France's EDF—parent company of Italy's Edison. EDF was part of the delegation accompanying French Prime Minister during his visit to Egypt. The talks were also attended by Edison CEO Bruno Lescoeur. El Molla said the talks included promotion of bilateral relations, discussing investment opportunities and the future of the company's E&P operations in Egypt. Edison has signed a number of agreements with EGAS over the past two years for exploration in the Mediterranean, the Western Desert, and the Gulf of Suez. The latest agreement signed is in block 12 northeast Hapy offshore concession in the Mediterranean Sea. El Molla ad-

ressed the progress made by Edison's new Abu Qir project, with investments of \$220m for the production of more than 150 mcf of gas, 4,000 barrels of condensate and 1,500 oil b/d. A new offshore platform is currently being installed North of Abu Qir-3, encompassing 9 wells to be linked to new production facilities, El Molla said. For his part, Edison's CEO highlighted his company's continued investments in accordance with its planned schedule. He added that the company's growing participation in the international bids put forth by Egypt's petroleum sector underscores confidence in the attractiveness of investment opportunities in the sector. He also stressed that the company seeks to be one of the most important international companies operating in Egypt.

World Bank, AfDB to Loan Egypt \$1.5b

Reuters reported that the Egyptian Prime Minister said the country expects to receive \$1.5b in loans from the World Bank and African Development Bank (AfDB) by the end of 2015. The decision comes as part of the country's efforts to boost foreign currency reserves. Egypt has struggled to revive its economy since the 2011 revolt removed Hosni Mubarak from power. Foreign currency reserves, which stood at about \$36b before the 2011 uprising, have more than halved, standing at \$16.3b at the end of September.



Nostra Terra Acquires 50% of Transglobe Concession in Western Desert

A partnership between Nostra Terra and Independent Resources have announced the group's first North African acquisition, a 50% stake in Transglobe's East Ghazalat concession at a cost of \$3.5m, reported Energy Voice. Production at East Ghazalat is currently just under 900 b/d. US-based Nostra Terra announced its partnership with Independent Resources in September of this year. According to Director's

Talk, the partnership aims to invest in producing or near-producing assets in North Africa. The partnership is hoping to use advanced technology to provide higher profit margins. Stated goals include investing in "precision drilling technology, including horizontal drilling and multi-stage well stimulation, precise 3D seismic mapping, detailed log and technical evaluation, and multi-zone well completions."

El Molla Meets IOCs to Discuss Field Development

Tarek El Molla, Minister of Petroleum and Mineral Resources, held extensive meetings with a number of heads of Arab and foreign companies operating in Egypt including: Emirati Dana Gas, BG Group, Petronas, and Engie (recently renamed from GDF Suez). The meetings were to review the work programs and discuss schedules for exploration and development in concession areas, reported Egypt Oil & Gas. The meetings occurred while a delegation of the UAE's Dana Gas Company was in Egypt. Their delegation was headed by Sheikh Sultan bin Jassim, Mark Fenton—regional director of the company, Patrick Allman-Ward—CEO, and Saif Rashid—Vice President. During the meeting company heads affirmed their commitment to further investments in Egypt, in addition to accelerating the completion of projects in recently discovered oil fields to increase the production currently online. The minister also noted that they discussed the current state of operations specifically for Dana Gas and reviewed the

schedule for exploration and development, as well as progress made in the Ras Shuqayr gas derivatives project in the Gulf of Suez. The project is meant to bolster the production of butane and other high value derivatives. The current state of plans for concession areas in the Mediterranean were also discussed. The Phase 9b plan in the West Delta deepwater concession was reviewed, with an investment of \$1.4b and a capacity of 400 mcf/d of gas.



ADIB and Banque Misr Partner for \$105m EGPC Loan

Abu Dhabi Islamic Bank is spearheading an effort with Banque Misr to lend the Egyptian General Petroleum Corporation (EGPC) \$105m, reported Al Mal News. The loan was previously reported by Egypt Oil & Gas when it was announced to be roughly \$100m. The final amount is now said to be just over that amount. The loan is being made to the EGPC to help the gov-

ernment pay for imports of LNG, and is being backed by six banks. The Suez Canal Bank, United Bank, Misr Iran Development Bank, and Emirates NBD Egypt are the other stakeholders. At a news conference held last August the Egyptian government announced it planned to import nearly 8m tons of natural gas, and about 6.4m tons of crude oil in the current fiscal year.

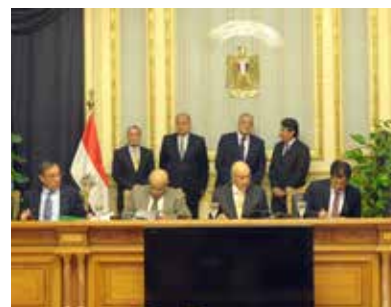
44 Companies to Bid on Tender for 200 MW Solar Plant

Daily News Egypt reported that 44 companies have met the tender conditions for the establishment of a 200 MW solar power plant. The government has proposed the project in a build-own-operate (BOO) model. The companies that are applying for the tender include Sterling and Wilson, Enel Energy, FAS, Abdul Latif Jameel, ACWA Power, Orascom, SunEdison, First Solar, Lekela Power, Al Tawakol, Elsewedy Electric, Gigawatt Global, Terra Sola, Sun Power, and Scatec So-

lar, among others. The Egyptian Electricity Transmission Company (EETC) has set a number of requirements that must be met by proposing companies, including prior experience in establishing at least three solar power plants of no less than 50MW. A source at the ministry of electricity added that officials at the EETC held a meeting with the proposing companies to agree on the final framework for implementing the project.

Ministry of Petroleum to Prioritize Exploration Activity in WD and Delta

Minister of Petroleum and Mineral Resources, Tarek El Molla, said that a current key priority is to boost exploration activities in the Western Desert and Nile Delta areas, both onshore and offshore, reported Al Borsa. The ministry is also prioritizing exploration in Upper Egypt, in addition to the development of unconventional resources.



Petroleum Minister Inspects Ethylene Project in Alexandria

Minister of Petroleum and Mineral Resources Tarek El Molla visited the ethylene production project in Alexandria to inspect its implementation, reported Egypt's State Information Service. The project is worth \$1.9b, and SIS stated that it represents a model of successful partnership between the petroleum sector and Egyptian banks.

Egypt to Connect 2m Households to the National Gas Grid by 2017

A source in the petroleum ministry revealed to Egypt Oil & Gas that the national plan for delivering natural gas to households by the end of 2017 includes connecting 2m households in 26 governorates to the national gas grid. The national scheme for delivering gas to households will decrease pressures on LPG subsidies, currently estimated at EGP 19m, thus, saving more than \$7m annually. The source added that 30% of the plan is focused on small suburbs in each governorate, suburbs that suffer from an LPG crisis in winter, as the price in the black market for the fuel reaches EGP 50 per LPG cylinder.

TOGY- Back to Egypt for a New 2016 Edition



The most up-to-date country energy report, The Oil & Gas Year, is back in Egypt for their latest edition. Following the 30 tcf offshore gas discovery at Zohr field by Eni, The Oil & Gas Year is back in Egypt for its 2016 edition. Along with regaining its status as a net exporter of energy, Egypt is attracting international investments more than ever before. With supermajors such as BP committing \$12b in March to produce 3m boe and 55m barrels of condensates in conjunction with the government, Egypt's upstream sector is set to expand in the coming years.

TOGY Egypt 2016 is an internationally-recognized publication prepared in collaboration with the Ministry of Petroleum, EGPC and AmCham, to profile the energy future of Egypt and further attract investments in the country. Continuing the success of last year's strategic roundtable on downstream revival, TOGY Egypt 2016's new roundtable topic will be offshore development. Audited by the same firm as the Wall Street Journal, TOGY Egypt 2016 will be the most up-to-date report on the country's energy industry, and is annually distributed to a global readership of 69,000 oil, gas and finance executives and top government agencies. It will feature discussions with Egypt's most influential companies and provide in-depth articles to highlight the entire value chain of the country's hydrocarbons industry, from exploration and production, oilfield services, project

DRILLING

QARUN

QARUN, a joint venture company between EGPC and Apache, has completed drilling two new oil-development wells in its concession area in the Western Desert. The production rate of QARUN was 1,172,952 barrels of oil as of September 2015.

AZHAR-13

The new well was drilled at a depth of 8,850ft. utilizing the EDC-49 rig. Investments surrounding the project are estimated to be \$700,000.

KHALDA

KHALDA, a joint venture company between EGPC and Apache, has completed drilling a new oil-development well and a new oil-exploration well in its concession area in the Western Desert. The production rate of KHALDA was 4,792,858 barrels of oil as of September 2015.

FALAK NW-3

The new development well was drilled at a depth of 13,500ft. utilizing the EDC-19 rig. Investments surrounding the project are estimated to be \$1.452m. It is worth noting that the well has already been put into production.

GPC/SCIMITAR

GPC/SCIMITAR, a joint venture company between EGPC and Russia's Lukoil, has completed drilling a new oil-development well in its concession area in the Eastern Desert. The production rate of GPC/SCIMITAR was 1,266,440 barrels of oil as of September 2015.

ZS-56

The new well was drilled at a depth of 982ft. utilizing the SHAMS-1 rig. Investments surrounding the project are estimated to be \$500,000.

ments surrounding the project are estimated to be \$1.030m. It is worth noting that the well is still being put into production.

ED-76

The new well was drilled at a depth of 6,230ft. utilizing the EDC-64 rig. Investments surrounding the project are estimated to be \$700,000.

project are estimated to be \$1.452m. It is worth noting that the well has already been put into production.

GALTON-1X

The new exploration well was drilled at a depth of 16,500ft. utilizing the EDC-16 rig. Investments surrounding the project are estimated to be \$1.194m. It is worth noting that the well is still being put into production.



GPC

GPC, a public sector company, has completed drilling a new oil-development well in its concession area in the Eastern Desert. The production rate of GPC was 1,266,440 barrels of oil as of September 2015.

AGIBA

AGIBA, a joint venture company between EGPC and IEOC, has completed drilling new oil-development well in its concession area in the Western Desert. The production rate of AGIBA was 2,040,975 barrels of oil as of September 2015.

PETROSILAH

PETROSILAH, a joint venture between EGPC and MERLON, has completed drilling a new oil-development well in its concession area in the Western Desert. The production rate of PETROBEL was 269,964 barrels of oil as of September 2015. It is worth noting that the well has

BAPETCO

BAPETCO, a joint venture company between EGPC and Shell, has completed drilling two new oil-development wells in its concession area in the Western Desert. The production rate of BAPETCO was 1,437,385 barrels of oil as of September 2015.

SITRA 8-BA

The new well was drilled at a depth of 11,007ft. utilizing the EDC-51 rig. Investments surrounding the project are estimated to be \$2.636 million.

SITRA 8-BC

The new well was drilled at a depth of

AMER-72

The new well was drilled at a depth of 4,363ft. utilizing the ST-9 rig. Investments surrounding the project are estimated to be \$1.02m.

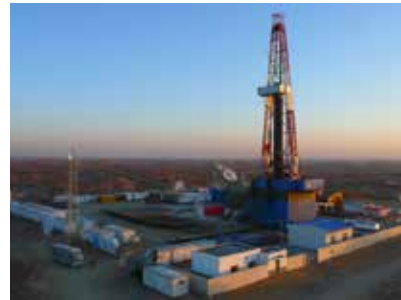
FALAK-24

The new well was drilled at a depth of 10,015ft. utilizing the ST-8 rig. Investments surrounding the project are estimated to be \$886,000. It is worth noting that the well has already been put into production.

still not been put into production.

N.SILAH D2-4

The well was drilled at the depth of 8,790ft. utilizing the TANMIA-1 rig. Investments surrounding the project are estimated at \$1.190 million.



GUPCO

GUPCO, a joint venture between EGPC and BP, has completed drilling a new oil-development well in its concession area in the Gulf of Suez. The production rate of GUPCO was 2,321,508 barrels of oil as of September 2015. It is worth noting that the well took 94 days to drill.

HILAL B-2

The new well was drilled at a depth of 11,950ft. utilizing the ADMARINE - 4 rig. Investments surrounding the project are estimated to be \$8.533 million.



E.A.SANNAN

E.A.SANNAN has completed drilling a new oil-development well in its concession area in the Western Desert.

ASA-3(ST)

The new well was drilled at a depth of 10,046ft. utilizing the ST-11 rig. Investments surrounding the project are estimated to be \$3.460million.



AFRICA

Libya Resumes Oil Exports from Zueitina Port

Libya has begun exporting oil again from the eastern terminal of Zueitina after production restarted at a nearby oil field, Libyan oil officials said—in a rare sign of progress in that country's embattled industry—The Wall Street Journal reported. Oil flow from the country with Africa's largest oil reserves has plunged for five months for a host of reasons including a conflict between two rival governments, strikes, protests, and attacks by the terrorist network Islamic State. Loading began at the Zueitina port with 600,000 barrels of crude put on the Sea Faith tanker, the port's workers union president, Ramadan Lefkaih, said to Bloomberg. The shipment, bound for Italy, is

the first since May, when protesters seeking jobs at state-run National Oil Corp. shut the pipeline that supplies Zueitina with crude. The protesters agreed to reopen the export route after being promised jobs, Lefkaih said. Zueitina receives crude from fields including the NOC-operated Nafoora, Wintershall AG's concession C96, also known as As-Sarah, and Amal, operated by Harouge Oil Operations. It has 2m barrels in storage and its current supply rate from the fields stands at 30,000 b/d, said Lefkaih. It has an installed export capacity of 70,000 b/d, according to the oil ministry.

Algeria Postpones Major Bid Round, Oil Prices Blamed

A senior Algerian energy official told Reuters that his country had cancelled a planned bid round for oil and gas exploration rights due to low oil prices. "This is not the right period to launch it," he said. "Many major international oil companies have dropped investment plans because of the fall in prices." "We will launch it when the market conditions become favorable." According to E&P magazine, Sontrach had originally announced that a bidding round was planned for the third quarter of this year, to compensate for a disappointing auction in 2011. In fact, only four of 31 blocks on offer were awarded to foreign companies in 2014. Energy output makes up 95% of the state budget and 60% of Algeria's exports. A presidential statement had also revealed that energy output has been declining in recent years; peaking at 233m tons of oil equivalent in 2007, but declining to 187m tons by 2012. Sonatrach head Amine Mazouzi also announced that his

company would reduce planned investments, focusing instead on lowering costs in existing operations.



Ethiopia to Export Natural Gas Within 3 to 5 Years

Ethiopia will begin exporting natural gas within the next three to five years, the government's Mines Minister Tolossa Shagi told the Associated Press. Chinese upstream operator China Poly Technology has invested almost \$5b in the country, following its discovery of about 4.7 tcf of natural gas. The company is building a pipeline connecting the feedstock in the southeastern region of Ogaden to port of Djibouti, where the gas can then be exported. In September, the Chinese company stated that it expects to produce 40b gallons of gasoline after three years, Ethiopia News Agency reported. President Mulatu Teshome held talks with Huang Geming,

Vice President of China Poly Technology Company at the National Palace. During the discussion, President Teshome said the relationship between Ethiopia and China would help attract more major companies into Ethiopia. Huang Geming added that the pipeline that connects Ogaden to port of Djibouti will export the gas to Europe and other nations. Minister Shagi projects the country will earn more than \$1b annually from gas exports, once on line. Additionally, US contractor Black Rhino announced a deal to build a \$1.5b pipeline to import fuel from Djibouti into Ethiopia, the company said.

Moroccan Oil Refiner Samir Gets Backing for Key Capital Increase

Moroccan oil refiner Samir said it has won the backing of its extraordinary general assembly for a capital increase of \$1.04b in an effort to end the company's financial difficulties. The country's only refinery is controlled by Saudi's Corral Petroleum Holdings, and has suspended production at its 200,000 b/d Mohammedia plant since August. It said it has been working on a plan to resume production, without giving details, Reuters reported. Morocco's tax administration has since seized the company's bank accounts in pursuit of a \$1.3b tax claim. Its closure

would make the country entirely reliant on imports. At just under 300,000 b/d, Morocco's petroleum consumption is Africa's fifth largest, according to data from the US EIA. The closure could also impact Moroccan banks exposed to Samir's debt, analysts have said. Corral, owned by Saudi billionaire Mohammed Al-Amoudi, will provide \$672m of the capital increase before November 15, and more if minority stakeholders do not subscribe to the increase, Samir said.

Sudan, Algeria Agree to Cooperate on Oil and Gas

Sudan and Algeria have agreed to cooperate in areas of oil, gas, training, and scientific research, the Sudan News Agency reported. Minister of Oil and Gas, Dr. Mohammed Zayed said during a meeting with his Algerian counterpart on the sidelines of the Al-Bashir-Boutaflika Summit that he forwarded a number of ideas in the domains of oil, gas, and development of fields, besides cooperation in areas of training and scientific research, studies, and laboratories. The Minister said Algeria has experience in areas of oil and gas that will enable the two countries to create partnerships for boosting bi-

lateral cooperation. The President of Sudan, Omar Bashir, has described his visit to Algeria as "successful, fruitful, and achieved huge leap in pushing forward economic cooperation" between the two states, according to AllAfrica.



Russia to Build Massive Pipeline in Pakistan

Russia has agreed to construct a 1,100km-long pipeline in Pakistan, RT reported. The pipeline will stretch over nearly the entire length of Pakistan to carry natural gas from LNG terminals in the port city of Karachi to the northern city of Lahore, on the border with India. "The construction of the North-South gas pipeline is bringing economic cooperation between Russia and Pakistan to a new level," stated Russian energy minister Aleksandr Novak. According to NDTV, the pipeline will have a capacity of about 438 bcf per year, and will cost at least \$2b to construct.

Iraq Regains Control of Key Refinery

Iraqi security forces recaptured a key oil refinery from IS militants in the city of Baiji, Reuters reported. The refinery has been the focus of intense fighting between security forces and IS militants. Control of the facility has changed several times over the past year as IS seeks to cement its rule over broad swathes of Iraq and Syria. The refinery is vital to the Iraqi government, both due to its size and its proximity to the capital Baghdad. The refinery is the largest in Iraq. Al Arabi-

Russia plans to begin construction in early 2016. "Currently there's an acute shortage of energy in the densely populated regions of Pakistan, specifically in the center and north of the country. It limits economic growth. The pipeline construction will be an important step towards solving this problem and will serve as the basis for cooperation with our Russian partners," noted Pakistan's Minister for Petroleum and Natural Resources Shahid Khaqan Abbasi. The project is slated for completion in 2020.

ya noted that before the conflict the refinery was producing about 300,000 b/d of petroleum derivatives—half of Iraq's daily consumption. The newspaper also reported that the current facilities appear to be damaged beyond repair, likely sabotaged by IS forces. Fierce fighting is still raging around the city of Baiji, where the refinery is located on the northern outskirts. The city has observed virtually constant fighting since the rise of Islamic State in 2014.

Uganda, Tanzania Agree to Study Possibility of Crude Oil Pipeline

Uganda and Tanzania have signed an agreement to explore the possibility of building a crude oil pipeline between the two countries, Uganda's Ministry of Energy and Mineral Development said, The Star reported. The Tanzanian Petroleum Development Corp., and Total E&P Uganda, signed a memorandum of understanding on "development principles" for a crude oil pipeline between Hoima, Uganda, and Tanga Port, Tanzania, Oil & Gas Journal explained. Production has yet to start from any of several oil discoveries made in Uganda since 2006. Total, Tullow Oil PLC,

and CNOOC Ltd. have development proposals in various stages of negotiation. The Ugandan government also is considering two export-pipeline routes through Kenya. "The (agreement) creates a working framework for the potential development of a crude export pipeline from Hoima to Tanga Port of Tanzania," the ministry added. "The objective is to select a route that will result in the lowest unit transportation cost that constitutes the most viable option for the crude export pipeline," the statement said according to Citizen Digital.

Chevron: South Africa Does Not Need New Refinery

South Africa does not need another oil refinery because the slowing economy has curbed demand and the country has ample petrol production, said Shash Rabbipal, the new chairman at the local unit of Chevron, the second-largest US energy company. "Should another refinery be built, it would mean that the country would have to increase its exports of products and this would mean a change from the current practice of ensuring that supply catered mainly for local demand," Mr Rabbipal said Bloomberg reported. The six South African refineries, including—Chevron's own Cape Town facility—process a combined 703,000 barrels of crude a day, exceeding demand, according to Mr

Rabbipal, who has worked for Chevron for 25 years and was recently appointed to the post. State-owned Petro SA has proposed a new plant on the south coast that would be the biggest on the continent and add 43% to fuel production capacity. The government contends the country needs local sources of additional diesel and petrol.



Senegal to Turn Waste Into Energy

Senegal is exploring unconventional ways to deal with two of its biggest infrastructure challenges; sanitation and energy generation, Reuters reported. With unsanitary conditions widespread even in the capital city—Dakar—the Senegalese government has launched a program to convert toilets unconnected to any systems to be self-composting, thus reducing overall waste and health risks. Toilets that are connected to septic systems will be supplied with small pumps to make sure the waste actually ends up where it belongs. "If we want to have a healthy and productive society, we need better sanitation for everyone," said Sarah Nehrling, research manager for Innovations for Poverty Action, a partner for the program. The eventual goal is to use the solid waste to power an electricity station, noted The Institute of Engineering and Technology. The plant would be designed to generate 1,000MW every year, as well as produce drinkable water from the

liquid inputs. The initial plant would produce enough electricity to supply about 5,000 people, but the planners have hopes that the technology could be scaled up to cover even more people. Electricity costs in Senegal are high, and many residents are unable to afford access. The government hopes that the waste-to-energy plant could someday employ locals as well as supply them with electricity.



Singapore's Gas Hub Ambitions Awaits Second LNG Terminal

Planning for Singapore's second liquefied natural gas (LNG) terminal is still moving forward, reported Rigzone, as government agencies continue to explore sites for consideration on the eastern part of the country. "You would recall when the Prime Minister officially opened the first terminal (on Jurong Island in February 2014) he announced we are studying plans for a second terminal in (the) eastern part (of Singapore). So at this point, the agencies are involved in looking at where ... (are) the appropriate sites ... for consideration," announced Minister for Trade and Industry, Lim Hng Kiang on the sidelines of the Singapore International Energy Week 2015. "It is a process that has to run its course because there are various technical and other issues to be addressed. So we have to wait for that to come about," he explained. He also said that so far a firm timeline for the project has not been fixed, while noting that "the preference would be to have the plans firmed up so that when the appropriate window opens up we can move on this as part of the enhancement of Singapore's LNG infrastructure." According to Interfax Global Energy, the project for the second terminal is part of the larger policy goal of transforming Singapore into Asia's main gas hub. Singapore is already getting advice from Belgium and the UK on establishing a domestic gas trading market on the European model. Singapore's original LNG terminal has been run by Singapore LNG Corp since May of 2013. It currently has three tanks, with a planned fourth tank to be built by Samsung C&T. With this planned expansion the terminal will enjoy a throughput capacity of 11m tons per annum by 2017, from the existing figure of about 6m per year. There is potential for a further expansion to 15m tons by the early 2020's.

UNCONVENTIONAL

Canada's Oil Sands Synthetic Crude Recovers from Regulatory Delays

Canada's National Energy Board's announced that Enbridge's Line 9B reversal has received final regulatory approval to carry crude from Alberta's oil sands to refineries in Quebec, reported Platts. Prices for the regional light crude benchmark—Syn crude Sweet Premium—rose once upon announcement of the decision. Quebec refineries make up about 20% of Canada's overall refining capacity. "They'll be pulling crude to Eastern Canada for line fill first," a Canadian crude analyst said. The Line 9 project is meant to provide refineries in Eastern Canada with 250,000 b/d of light oil and 50,000 b/d of heavy crude. Eastern Canada nor-

mally relies on crude from the North Sea and West Africa, hence the importance of the decision, facilitating the transportation of cheaper feedstock crude from Alberta. Previously, according to Rigzone, Canadian Oil Sands Ltd – the biggest shareholder in the Syncrude oil sands project – was forced to halt its synthetic crude oil production. This was after a fire damaged equipment at its processing facility in northern Alberta. Syncrude is a 326,000 b/d operation, where mined oil sands bitumen is upgraded into refinery-ready synthetic crude.

\$75 Ideal Price for US Shale or Production Will Decline

US oil production will drop this month, and continue to decline early next year due to low oil prices, Reuters quoted Mark Papa of Riverstone Holdings LLC as saying. He explained that—in his opinion—the US shale oil industry needs oil prices at \$80 a barrel to resume production growth. In the current price environment, however, banks would be reluctant to finance new shale developments. Pricing American crude at \$75 a barrel would resume production at around 500,000 b/d, half the growth rate observed in the past few years. At the same time he insisted that the US had tremendous potential. "I see the United States as a long-term growth producer," he said. "If low oil prices prevail - then the correction in oil prices will be much more severe. The former head of oil firm EOG Resources, one of the pioneers of the shale oil industry from 1999 to 2013, was speaking at the Oil and Money industry conference in London, according to Gulf News. Papa joined private equity firm Riverstone earlier this year. He also warned that too high of a price, from \$90 to \$95, would bring too much shale oil onto the market. \$75, it emerges, is his preferred price.



China Expands with Shale Gas Finds

China has nearly tripled the size of proven reserves at its Fuling project, by far the country's largest shale gas find, reported Reuters. The Jiaoshiba block of the project alone has 273.8 bcm of newly proven reserves, taking total reserves to 380.6 bcm, with a potential annual production capacity of 10 bcm by the end of 2017. The latest reserve appraisal was conducted on the Jiaoye-4 and Jiaoye-5 wells, bringing the total number of wells tested to 142 at the Jiaoshiba block. Sinopec told Reuters last month that the company was sticking by its investment pledge on shale gas despite it being more costly and technically more challenging than its conventional fields such as Puguang. According to the Mail and Globe, however, China's national targets have been cut several times over the past two years, with speculation that even the

2015 goal may now be out of reach, according to officials. Speaking at a shale gas conference in Shanghai, Zhang Dawei, a director and researcher at the Mineral Reserve Review Centre in China's Ministry of Land and Resources, said that "revolutionary action" needs to be taken to reverse the tide. President Xi Jinping himself called for a Chinese "energy revolution." Mr. Zhang's remedy is the creation of special demonstration zones for shale gas exploration and development that would newly expand the land available for drilling, and provide new openings for foreign private investment. Such areas did exist in the recent past, leading to the first initial shale production in 2011, with subsidies as an incentive for such costly investments. But subsidies were removed recently, to the chagrin of business investors.

EOR Innovations Battle US Shale Oil Price Glut

E&P companies in the US are increasingly relying on enhanced oil recovery (EOR) techniques, in addition to cost cutting, to survive the oil glut and price decline caused by their rivals in the shale industry. This emerged during presentations made at the 2015 Independent Petroleum Association of America (IPAA) Oil and Gas Investment Symposium held in San Francisco on October 5-6, reported Platts. Glori Energy Inc. said it relies on its Activated Environment for Recovery of Oil (AERO) system in water-flooded oil fields specifically to activate and sustain indigenous reservoir microbial life—which then loosens and frees trapped oil. "Two-thirds of all oil that has ever

been discovered remains trapped in the rock," explained Glori's CFO Victor Perez. He insisted that by employing AERO technology operators can increase the recovery of crude from mature oilfields by between 9% and 12% of the field's original crude oil resource. According to Your Oil and Gas News, Glori Energy is a Houston-based energy technology and oil production company specializing in EOR. It owns and operates onshore oil fields in the US and licenses its proprietary AERO technique to third-party producers in the US and globally. It also buys mature oilfields from operators unwilling to invest in EOR techniques.

Saudi-Russia Oil Price War Extends to Europe

Oil refiners in Europe are cutting their longstanding use of Russian crude in favor of Saudi grades thanks to aggressive price discounting, reported Reuters. "I'm buying less and less Russian crude for my refineries in Europe simply because Saudi barrels are looking more attractive. It is a no brainer for me as Saudi crude is just cheaper," revealed a trading source with one major, someone who is not allowed to speak to the media. Seth Kleinman, the head of energy research at Citigroup, said that Russian competition has become so intense in Asian markets in recent months that Saudi Arabia had to reduce supplies there in the face of growing deliveries from

rivals such as Russia, Kuwait and Angola. "There is a perception that because Russia has been pushed from the West, they have been turning to the East. In fact, Russia has been actively locking market share in Asia for a long time," he added. "The Saudis want to secure the market share before Iran comes back," said a trading source with another oil major. Rosneft chief Igor Sechin had complained before about Saudi Arabia's decision to begin supplying ex-communist Poland at what he called "dumping" prices. In related news, Russian Energy Minister Alexander Novak has described the Saudi entry into eastern European markets as its "toughest competition."

Yemen Refinery Resumes Operations as Conflict Continues

Yemen's 150,000 b/d Aden refinery resumed operations after being shut for more than five months, reported Reuters. "The refinery is back online and is refining crude it had in storage from before," a source at the refinery said, adding that the refinery was now operating at half of its processing capacity. The plant, in the southern city of Aden, was shut in April due to the worsening conflict between the Houthis and

a coalition of Arab States led by Saudi Arabia. In other developments, Yemeni forces backed by a Saudi Arabia-led coalition recaptured several strategic sites from Houthi rebels in the oil-rich Marib province, according to Bloomberg. Yemen, while poor in oil itself, sits astride the Bab-el-Mandeb which controls access to the Red Sea and Suez Canal, one of the most important routes for oil tankers in the world.

Omani Offshore Company Sells Engineering Unit at Loss

Oman's Renaissance Services plans to sell its Topaz Engineering unit, reported The National, and at a loss of \$5.5m to Chalmers Holdings, a Dubai-based marine and offshore outfit. This is part of a strategy to sell non-core assets that started three years ago, a Renaissance spokesman explained, adding that this way the company can "focus on offshore support vessels and contract services." The marine engineering and shipbuilding company will be sold for \$18.5m, a sale prompted by the

decline in oil prices, with Renaissance shares losing their value by 66% in the past year. According to Trade Arabia, Renaissance also hopes to develop "its contract services business based in Oman," a company statement explained. Topaz Energy and Marine operates a fleet of more than 95 offshore support vessels and, despite the sale to Chalmers, has purchased two subsea vessels from Vard Brattvaag of Norway for about \$115m.

Oil and Renewables at Top of UAE-Japan Agenda

The United Arab Emirates is open to meeting any demand for oil from Japan, announced the UAE Minister of Economy Sultan bin Saeed Al Mansouri, reported Zawya. The UAE ranks as the second-biggest crude oil exporter to Japan after Saudi Arabia, providing 24.4% of Japan's total imports. Al Mansouri made these remarks in Tokyo after a meeting with Japan's Minister of Economy, Trade and Industry, Yoichi Miyazawa. This was on the sidelines of the visit of the UAE delegation to Japan to review the prospects of bilateral relations, according

to the Khaleej Times. Al Mansouri extended an invitation to Japanese businessmen and investors to visit the UAE and explore the promising investment opportunities in various sectors. For his part, Miyazawa said that Japanese firms were eager to invest in the UAE and use it as a springboard to the entire Middle East, especially in the areas of technology and renewable energy. He described the UAE as one of Japan's top strategic partners and praised the strong relations between his country and the UAE in various sectors.

Iran Attracts Foreign Investors with Electricity Exports

Iran's Deputy Energy Minister Alireza Daemi announced that the Iranian government will now allow foreign companies to export part of the electricity they generate in the country, reported Press TV. Daemi is speaking to representatives of Korean companies, saying that the Iranian government has drawn up very attractive terms for cooperation with foreign investors, including guaranteed purchases of electricity from producers and allowing them to export to Iran's neighbors. "Joint projects in the third countries can be part of the agreement because Iran has suitable grounds for execu-

tion of various projects in neighboring countries such as Turkmenistan and Tajikistan," he said. The deputy minister added that at the moment, 80 projects are being carried out around the world together with Iranian companies, said Trend News Agency. The implementation of new joint projects with South Korea will benefit both sides, as Iran has great potential in the field of wind and solar energy, while South Korea has advanced technologies and expertise in this area, he explained. Germany, Italy and South Korea have expressed interest in the construction of power plants in Iran.

Saudi PetroRabigh Issues Clean Fuel EPC Tenders

Saudi Arabia's PetroRabigh announced that it will launch a bid round to build new units, including one to produce clean fuel, at its petrochemical and refining complex in Rabigh, reported Reuters. For this purpose the company will launch engineering, procurement, and construction (EPC) tenders for a polyether polyols plant with a capacity of 220,000 tons per year, a 17,000 barrels per day naphtha treating unit to

produce clean fuel and a 106,000 tons per year sulphur recovery unit (SRU), it added in a statement. Work should begin in the second half 2016, although no monetary value has been assigned to the project, according to Construction Weekly. That is if the bids are approved, however. PetroRabigh is a joint venture between Saudi Aramco and Japan's Sumitomo Chemical.

Oman Preparing for Tough Round of Subsidy Cuts

Gulf News learned that the Sultanate of Oman will cut fuel subsidies beginning next year. An official from the Ministry of Finance confirmed the reduction will be gradual in order to ensure that the public will not suffer from the move. The savings from the cuts will go directly towards the establishment of economic projects as well as efforts to curb fuel smuggling, according to media reports. Oman's elected Shura Council was not notified of the move when it was in session, Ali Al Badi, the vice-president of the economic committee of the Shura Council, told Gulf News. Al Badi however insisted that most of the Shura members will support the government's drive to cut the fuel subsidy as oil prices have plummeting to around \$45 per barrel. He also stressed the need to take into

consideration social security of families who will get affected by the subsidy cut. According to Arabian Business, a study conducted by Oman's Chamber of Commerce found that up to 68.7% of professionals from various business and government sectors opposed the move, with only 18% in favor. Oman's Minister of Oil and Gas, Mohammad Al Ruhmi, had said that low oil prices are costing Oman up to \$55m per day. Darwish Al Beloushi, the minister responsible for financial affairs, explained that the Omani government is likely to start cutting fuel subsidies this year in reaction to low oil prices. Al Beloushi believes that people will be more understanding as the country's natural resources are being overused.

First Ever Commercial Scale Solar-EOR Project Developed in Oman

GlassPoint Solar Inc will shortly begin work on the IGW Miraah solar thermal park in Oman, reported See-News Renewables. Here solar power will be used to heat water into steam for injection into the Amal oilfield, extracting heavy and viscous oil in a process known as thermal enhanced oil recovery (EOR). The first production planned for late 2017. The Miraah project will use large, curved mirrors to focus sunlight on a boiler tube containing water to produce steam. According to Bloomberg, the thermal project is one of the largest solar parks in the world, and also the first time that solar energy will be used to produce oil at a commercial scale. GlassPoint's steam-making facility will be run on the sun's energy by day and natural gas at night. In Oman solar-powered steam is 28% cheaper compared to the export price for liquefied natural gas. CEO Rod MacGregor explained that oil companies can spend as much as 60% of the field's operating costs

on fuel for EOR, using five barrels of steam to make one barrel of oil, if using traditional methods of heating. "The global oil industry uses about 9 million barrels of the fossil fuel per day to power the production process, the equivalent of Western Europe's daily consumption," he added. A standard medium-sized oilfield would require 1-3GW of solar thermal power to make the right amount of steam. Some of the larger ones would need up to 30GW, he said. GlassPoint is a California-based company working with Petroleum Development Oman, which itself is a joint venture with Royal Dutch Shell, Total, and the government of Oman. MacGregor went on to say that GlassPoint is also considering ways to develop solar energy for new applications in oil and other industries, such as using thermal heat for desalination and desulfurization, which removes salt and sulfur from water, and to develop sun-powered plants.

Iran Inaugurates Region's First Emulsion Styrene Butadiene Rubber Plant

Sadaf Petrochemicals has broken ground on an emulsion styrene butadiene rubber (ESBR) production plant, reported European Rubber Journal. Ahmad Jazayeri, the Managing Director of Sadaf Petrochemicals Co., said the \$280m project will be completed in 29 months and will be an 'environmentally-friendly' ESBR production unit. The official said the plant is the first in Iran and the region, Jazayeri was quoted by Press TV as saying. "With the launch of this production line, 136,000 metric tons of finished products in five categories will be manufactured a year, two of which will be used in production of tires and the rest in the plastic industry," he

continued. "The technology license for production has been obtained from Italy's Versalis and Maire Tecnimont whose know-how is regarded among the world's advanced," he finished.



Iraqi Crude to Boost South African Energy Security

South Africa's Strategic Fuel Fund (SFF) is seeking to import 24m barrels of oil a year from Iraq to boost its reserves, reported Reuters. "As part of security of supply, SFF applied for an allocation with the Iraqi state-owned oil company SOMO and we are waiting for SOMO to respond," SFF's acting CEO Sibusiso Gamede said. "We are looking at importing 2m barrels per month. Approximately 24m a year," he told Reuters. According to BDLive an Iraqi diplomat in South Africa further revealed that SOMO was also deciding on two separate requests from private companies for a total of 24m barrels of oil a year. This is both for refineries in South Africa and the SADC region. All crude purchase requests are processed through Iraq's state oil marketing firm, he explained, although SOMO has declined to comment on these news reports. SADC, the Southern African Development Community, is made up of Angola, Botswana, Democratic Republic Of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic Of Tanzania, Zambia, and Zimbabwe. The last time South Africa imported crude oil from Iraq was in 2003, just before Saddam Hussein was toppled.

Jordanian Delegation Visits Russian Nuclear Power Facilities

A delegation headed by the chairman of the Jordan Atomic Energy Commission, Dr Khaled Toukan, visited the Rostov nuclear power plant in Russia, on October 14 and 15, revealed Trade Arabia. The program started with a visit to the Rostov nuclear power plant, with the delegation inspecting two power units—one fully operational, the other under construction—and visiting the control panel in the engine room. They were also introduced to the system for managing the design and construction of complex engineering objects based on the Multi-D technology. According to Al-Bawaba, commission representatives also visited the Volgogradsk branch of JSC AEM-technology unit called ATOMMASH and witnessed a shipment of the reactor vessel for the first unit of the Belarusian nuclear power plant. Dr. Khaled Toukan said he was impressed by what he described as the excellent work of Russian nuclear scientists and engineers. The tour was organized by JSC "Rusatom Overseas Inc." as part of the effort to build Jordan's first nuclear power plant with Russian help.

\$4b Worth of Turkish Energy Projects Looking for Finances

Turkey's Hattat Holding is trying to raise finances for more than \$4b worth of energy projects, the chairman of Hema Endustri group Ibrahim Hattat announced. Negotiations were being conducted with institutions on "partial" financing, reported Reuters. According to Trade Arabia, Ibrahim Hattat was speaking just after the signing of a long-term syndicated loan between Hema Endustri and Credit Suisse. The finances were to the tune of \$284m, directed at the group's automotive and industrial facilities.

Chemical Group INEOS Buys 12 North Sea Fields

The Swiss chemicals company INEOS has purchased 12 gas fields in the North Sea, Reuters reported. The fields were purchased from Russian billionaire Mikhail Fridman's investment fund LetterOne. The Russian businessman was forced to relinquish the fields within 6 months of obtaining them over disputes the British government faces with Russian actions in Ukraine. Fridman had acquired the fields from German energy firm RWE. The sale of the fields was for \$750m, well short of the stated price of \$1.2b announced by LetterOne, noted The Guardian. The sale puts INEOS in control

of a significant portion of the British gas industry; roughly 8-10%. "INEOS has been very open about its intention to make strategic investments in the North Sea and this acquisition is our first step in fulfilling this goal. It will also help our UK petrochemical assets to have ongoing access to competitive energy," INEOS Chairman Jim Ratcliffe said in a statement. Despite the downturn in North Sea assets, INEOS has previously announced its intentions to spend heavily in the industry, pledging to invest \$1b this year.

No Supply Disruptions Expected for Russian Gas This Winter

Eastern European countries—many of them heavily dependent on Russian natural gas supplies—are hopeful that improving security in Ukraine and low global prices will secure gas supplies from disruption, Reuters reported. Russia has long used natural gas as a political tool in negotiations with Eastern Europe, cutting or reducing supply in diplomatic spats. However, the Russian state relies on energy taxes for a major percentage of its revenue—and facing the current downturn—can ill afford to use the resource as a diplomatic tool. Thomson Reuters Point Carbon analyst Oliver Sanderson said that storage was heavily utilized last winter as buyers took less Russian gas, most of which is supplied by state-owned Gazprom, buying more during the summer at cheaper prices. "It's a buyers' market out there but Gazprom still has to sell gas and their recent auction underlined that," Sanderson said. "They are keen on keeping the European market." Gazprom in particular is under increasing pressure to keep pipelines flowing, as it faces increased competition as a European supplier.

The company is offering increasingly generous terms to consumers in an attempt to maintain market share, noted Trend News Agency. Recently the Russian government re-affirmed its commitment to the Russia-Turkey Turkish Stream pipeline, saying that it would offer gas to Asia Minor at a discounted rate if the project moves forward. Russia also wants an increase in supply volumes to Turkey.



Norway Mulls Withdrawals from Oil Fund

As its currency slumps, Norway is considering withdrawing from its massive sovereign wealth fund, reported Bloomberg. Long reliant on high energy prices, the Scandinavian country has seen government tax revenues from petroleum fall 42% from last year. "We have reached a point where we will from now on see that the oil-corrected balance will be above the cash flow—that's based on oil prices increasing slowly in the future," said Kyrre Aamdal, a senior econ-

omist at DNB ASA in Oslo. The move to withdraw from these massive reserves wasn't expected for "several more years," Aamdal said. Analysts had worked out Norway's budget to include projections for oil to be trading at roughly \$69 per barrel, but it's currently hovering at less than \$55, a drop of nearly 30%. The government is currently running a deficit of about \$22b, a record for the country. Norway's national currency—the Kroner—is down about 13% this year, a spectacu-

larly bad for performance for the historically stable unit. Market Watch noted that the country is aggressively combatting a slow-down in the economy by slashing taxes by some \$1b. "The 2016 fiscal budget will help dampen the macroeconomic effects of the decrease in activity in the petroleum sector, while allowing for necessary structural adjustments," said the Norwegian Minister of Finance, Siv Jensen.

Russian Oil and Gas Sector Faces Sanctions, Taxes

The Russian oil and gas industry keeps encountering impediments to growth. Oil and Gas Technology noted that the Russian energy industry is likely to be forced to restructure, even as production remains at a record high. Anna Belova, GlobalData's Senior Upstream Analyst covering the former Soviet Union, stated that Russia's response to sanctions is focused on addressing issues without affecting production numbers. "In addition to

strengthening and extending geopolitical ties on the international stage, Russia's oil and gas industry is actively seeking foreign participation in the domestic sector and lobbying for legal incentives to foreign investments," Belova said. "While domestic and foreign entities could provide capital inflow for the Russian upstream sector, both would require regulatory changes, and the sanctions could provide the impetus for a restructuring of the

subsoil law." Sanctions are not the only obstacle faced by the industry. Reuters has reported that a new tax hike will raise the liabilities of major producers such as Gazprom by nearly 40%. The new taxes are expected to raise an additional \$1.6b for the budget of 2016, and will only apply to those firms that export natural gas in its gaseous state. Gazprom is the only major firm that will likely be affected.

Lukoil Makes Large Gas Discovery Offshore Romania

Russia's Lukoil has announced the discovery of a new gas field off the Romanian coast, reported Penn Energy. The new discovery is in a deepwater area of the Black Sea—with depths ranging from 300-1,200 meters deep. Reserves are estimated to be nearly 30

bcm of natural gas. Exploratory drilling was carried out by by Lukoil, with well Lira-1X producing favorable results. The well is at 700 meters deep, and is named for the rock structure being drilled, the Lira formation. Oil & Gas Journal noted that the pro-

ject is a consortium composed of Lukoil with 72%, PanAtlantic Petroleum with 18%, and Societatea Nationala de Gaze Naturale Romgaz with 10%. SNGR is the largest natural gas producer in Romania.

INTERNATIONAL

US Oil Rig Count Drops to 5-Year Low

Rig counts for US oil drilling dropped to 614 nationwide earlier this month, the lowest level since 2010, Bloomberg reported. Rigs targeting natural gas also fell in the country, dropping to 809, the fewest since 2002. Rig counts are one of the most important indicators used by analysts to determine the health of different markets. The current drop off is seen as a major correction for the industry. "You're certainly seeing a right-sizing of the domestic oil industry, and that's where most of the pain has been felt," Matt Marietta, an analyst at Stephens Inc. in Houston, Texas. "This is a step in the right direction." The falloff bucks the previous six-week trend, the Wall Street Journal noted, sending prices modestly up. Prices for West Texas Inter-

mediate Crude, the most commonly used US price index, rose nearly a dollar on the news. The revised rig count means the industry is down about 62% from its highest point in October 2014.



Schlumberger Earnings Fall by Half

Schlumberger Ltd, the world's largest oil services company, said that its Q3 earnings have fallen by 49%, reported the Wall Street Journal. The French multinational firm has struggled in the low-price environment of the energy sector. Prices have persistently remained low for over a year, resulting in many firms shedding Schlumberger's efficiency and production services. "The business environment deteriorated further in the third quarter" CEO Paal Kibsgaard stated. Much of the drop in revenue came from Schlumberger's North American operations, a drop of 47%. North American producers, shale operators in particular, are paring down their footprint amid the supply glut. Revenue from business outside the continent fell 27%. While revenues are down, the company is still highly profitable. Profits were posted at just under \$1b, down from approximately \$2b a year before,

noted Reuters. The profits just beat analysts predictions. The company will be issuing a dividend of \$.78 per share for its stock, ahead of the expectations of \$.77. Industry rivals Halliburton and Baker Hughes were slated to release their earning reports later in the month.



Canadian Oil Sands Rejects Takeover Bid

Canadian Oil Sands, a major force in the oilsands business in several Canadian provinces, has rejected an unsolicited offer to buy it out, reported CBC News. The reason for declining the offer was not necessarily because of the terms of the buyout the company stated, but rather because it didn't have enough time to review it. Directly after the rejection, the company announced a new "shareholder rights plan

designed to ensure that [Canadian Oil Sands] shareholders and the board have adequate time to consider and evaluate" all buyout offers from any company. The new shareholder plan is set into motion if any company attains more than 20% of COS's stock. It allows current stockholders of COS to buy stock at a discount, thus making the acquisition less attractive to potential buyers. The offer was made by Suncor En-

ergy, another large oil sands competitor. According to Bloomberg, Suncor executives expected that the offer would be rejected by COS, particularly as the price was substantially lower than a similar offer made in April of this year. One executive with a major stake in COS added that the offer was "a little light," at only \$.25 per share.

Venezuela Succeeds in Call for OPEC Meeting

The Organization of Oil Producing Countries—OPEC—will hold a technical meeting on October 21st, France 24 reported. Venezuela's Minister of Mines and Petroleum—Eulogio del Pino—announced the meeting in a recent press conference. Pino added that he has spoken with his Russian counterpart, and that major

non-OPEC nations will also be present at the meeting. No details were given as to what countries will attend or where the meeting will be held. Venezuela has been publicly pushing OPEC to hold an unscheduled meeting. It recruited member state Algeria to also request a meeting for this past August, but failed to secure

enough support for the action, noted AFP. The government of the South American country is heavily reliant on oil, both for tax revenue and foreign currency. In late September president Nicolas Maduro called for a summit between major oil producers, with an aim to raise prices.

Oil Majors, Petrobras Skip Brazil Bid Round

Major oil companies like Shell, BP, and Total failed to submit bids for new blocks in Brazil's most recent auction yesterday, reported Bloomberg. The auction showed dismal results, with only 37 of the blocks being awarded, despite having more than 250 on offer. Of those awarded, most of them went to smaller domestic firms. A notable exception includes France's Engie—formerly known as GDF Suez. Brazil's state-run production and exploration firm Petroleo Brasileiro SA—more commonly known as Petrobras—also did not participate,

the first time in the group's history it has sat out on a Brazilian bid round. The new bid round comes amid turmoil in Brazil's oil industry. The sector is only just emerging from a massive corruption scandal involving the highest levels of Petrobras. Historically, foreign investors have preferred to partner with Petrobras in order to reduce risk, so when Petrobras sat out, most foreign companies did too. Petrobras is currently attempting to trim its operating costs, slashing its capital budget by \$3b for this year, noted Oil and Gas Journal. The group

is further expecting to decrease its spending by \$8b for 2016, drawing the budget down to \$18b overall. Just two years ago capital spending at the company was running at over \$40 billion. Financial services firm Raymond James & Associates Inc. stated in an Oct. 6 energy update, "To be sure, the Brazilian real's depreciation [down 32% year-to-date] plays a key role here, so in local currency terms the change is much smaller than in dollar terms," RJA said. Net income at Petrobras has dropped about 50% compared to last year.

EGYPT OIL AND GAS

PEOPLE DEVELOPMENT

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COMPETENCY AND DEVELOPMENT REQUIREMENTS FOR CAREER PROGRESSION



- Definitions of competency requirements for specific jobs.
- Competence and expertise assessments for individuals.
- Career path within organization.
- Retention of talented staff.

IOC/EGPC PARTNERSHIP



- Obligations within concession agreements.
- Defining roles of IOCs and government in people development within the JV environment.
- Barriers to personnel development.

DEVELOPMENT OF TECHNICAL AND NON-TECHNICAL STAFF



- Traditional focus is on professional level staff – G&G, Engineering etc.
- Field operations can also benefit from improved competence. How can that be achieved?
- Developing commercial and support staff such as contracting, agreements, finance, human resources and administration.

MAKING IN-COUNTRY TRAINING MORE EFFECTIVE



- The role of OGS.
- Support from international institutions.
- The role of academia in Egypt.

DECEMBER 2015

SkyPower to Build 200 MW of Solar Projects in Djibouti

SkyPower, the world's largest developer and owner of utility-scale solar photovoltaic (PV) energy projects, has signed a landmark agreement with the Republic of Djibouti for the development of 200MW of world-class solar projects to be built in four phases in Djibouti over the next four years. "Africa has become a global hub for the growth of clean, renewable energy, and many visionary leaders of African countries are making the

decision to harness the power of the sun to create a brighter future for the citizens of their countries," said SkyPower President and Chief Executive Officer Kerry Adler, according to a company statement. The 200MW solar project will represent an estimated investment of \$440m, which also includes corporate social responsibility investments of \$11m toward education, training, research, and development in Djibouti.

Chinese Hydropower Station Begins Operation in Guinea

The Kaleta Hydropower Station, the largest cooperative project between China and the Republic of Guinea, has started operation after three years of construction. All three of the plant's generators have begun to yield electricity and are expected to generate 965GW hours of power per year, stated the Export-Import Bank of China (China Exim Bank), which lent \$335m to the project, Xinhua agency reported. Its installation is intended to ease electricity supply shortages in Guinea and help improve the local economy and people's life. The West African country is one of the world's least developed countries. The country's more

than 10m inhabitants are subject to widespread rolling blackouts, which are common occurrences. During the commissioning ceremony President Alpha Conde said about 30% of Kaleta's output would go to neighboring Gambia, Guinea-Bissau, and Senegal. According to local news reports, the completion of the Kaleta scheme will boost Guinea's hydroelectric generating capacity from 2012 levels of 128MW to 368MW. Conakry is Guinea's largest city with a population of more than 1.7m and Kaleta will provide Conakry's residents with stable power for the first time ever.

UAE's Masdar in Talks with Morocco to Invest in Wind, Solar

Abu Dhabi-based renewables firm Masdar is currently in talks about taking part in Morocco's forthcoming wind tender as well as other wind and solar energy in-



vestments, local newspaper Aujourd'hui le Maroc reported. The 850MW tender includes five projects—the 150MW Tanger 2 in the northern part of the country, 300MW in Laayoune, 200MW in Essaouira, 100 MW near Boujdour, and 100MW in Midelt, some 400 km east of Casablanca. Another business opportunity that Masdar is eyeing is solar power plant development at a site in Ouarzazate. Masdar has already approached Spain's Acciona Energia, which is a pre-qualified bidder in the 850MW wind energy tender managed by Moroccan electricity and water utility company ONEE. Last March, Masdar and Morocco's Office National de l'Electricité et de l'Eau Potable (ONEE) have signed a partnership to design, supply and install 17,670 solar home systems across 940 villages in the North African country, Arabian Business reported.

UAE-New Zealand Renewables Cooperation Reaches Solomon Islands

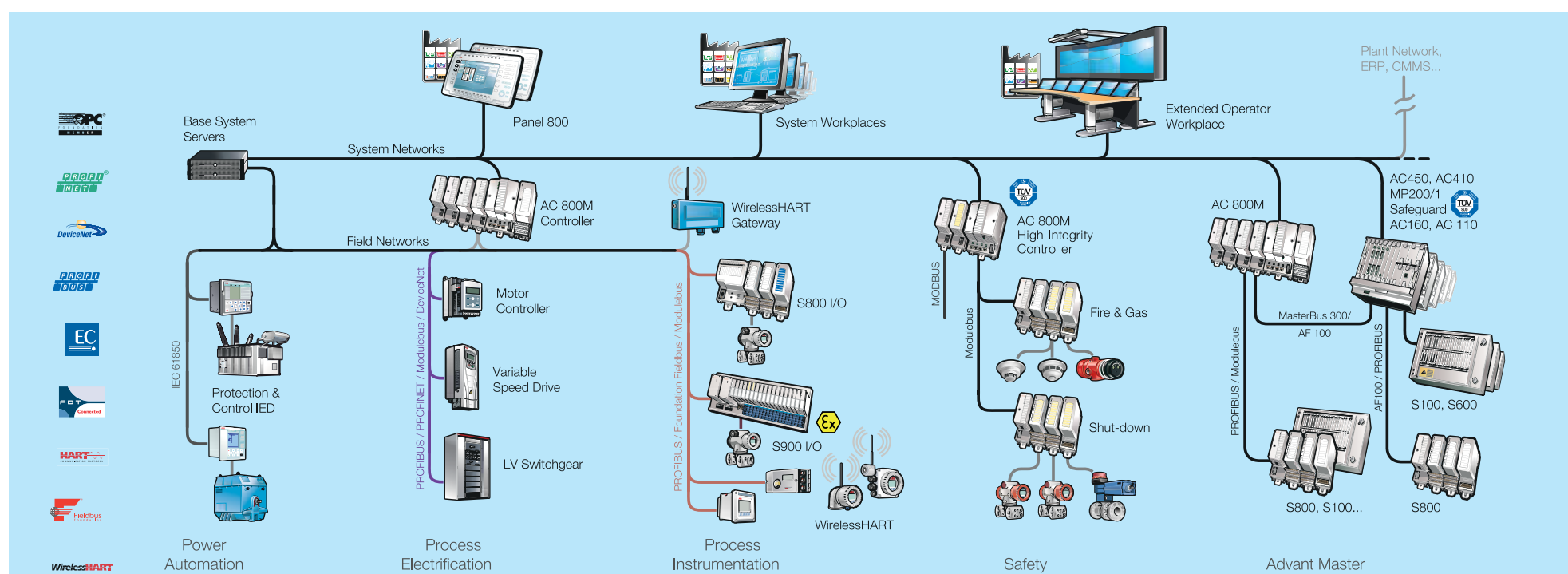
The United Arab Emirates and New Zealand have signed an arrangement for the development of a jointly funded 1MW solar photovoltaic (PV) power plant in the Solomon Islands, reported Trade Arabia. 600kW will be funded by the UAE and 400kW funded by New Zealand, through the New Zealand Aid Program. The power plant will be developed by Masdar, connected to the grid in Honiara, the capital of the Solomon Islands. "New Zealand is delighted to strengthen our cooperation with the UAE in the Pacific region through this initiative—providing clean renewable energy and reducing reliance on imported fuels to support sustainable development of the Solomon Islands," said Jeremy Clarke-Watson, New Zealand's Ambassador to the UAE. Dr Thani Ahmed Al Zeyoudi, UAE permanent representative to the International Renewable Energy Agency (IRENA) and

director of Energy and Climate Change at the UAE Ministry of Foreign Affairs added, "This project will deliver significant economic, social and environmental benefits to the people of the Solomon Islands. It will reduce their dependency on imported diesel, freeing up vital financial resources for other developmental projects. The UAE is honored to partner with New Zealand and support the government of the Solomon Islands in its efforts to accelerate economic development and to showcase the viability of this sustainable development model." According to Gulf News, the solar PV plant is part of the \$50m United Arab Emirates Pacific Partnership Fund, established in 2013, delivered by Masdar, and funded by the Abu Dhabi Fund for Development. This latest project is also part of New Zealand's wider \$100 m investment in renewable energy across seven Pacific Island countries.

Google to Invest in Africa's Largest Wind Project

Google announced that they are committing to invest in the Lake Turkana Wind Power Project in Northern Kenya, which will be their second clean energy investment in Africa, the company said in a statement. "When complete, Lake Turkana will bring 310MW of clean energy onto the Kenyan grid—enough to power more than 2m households across the country. Lake Turkana will help bring much needed capacity and stability to Kenya's energy supply, reducing reliance on fossil fuels and emergency diesel generation while providing some of the most cost effective power in the country." Google will join a diverse group of international investors, including

the Overseas Private Investment Corporation—the US government's development finance institution—and Vestas, which is also supplying the turbines for the wind farm. We will purchase Vestas' 12.5% stake in Lake Turkana once it comes online, becoming the first US private investor to support the project. Lake Turkana will use wind turbines supplied by Vestas. "As an investor in both the largest solar photovoltaic (PV) and wind farm projects in Africa, we are as optimistic as ever about the potential for these investments to accelerate progress toward a future of clean energy." Google noted in a statement.



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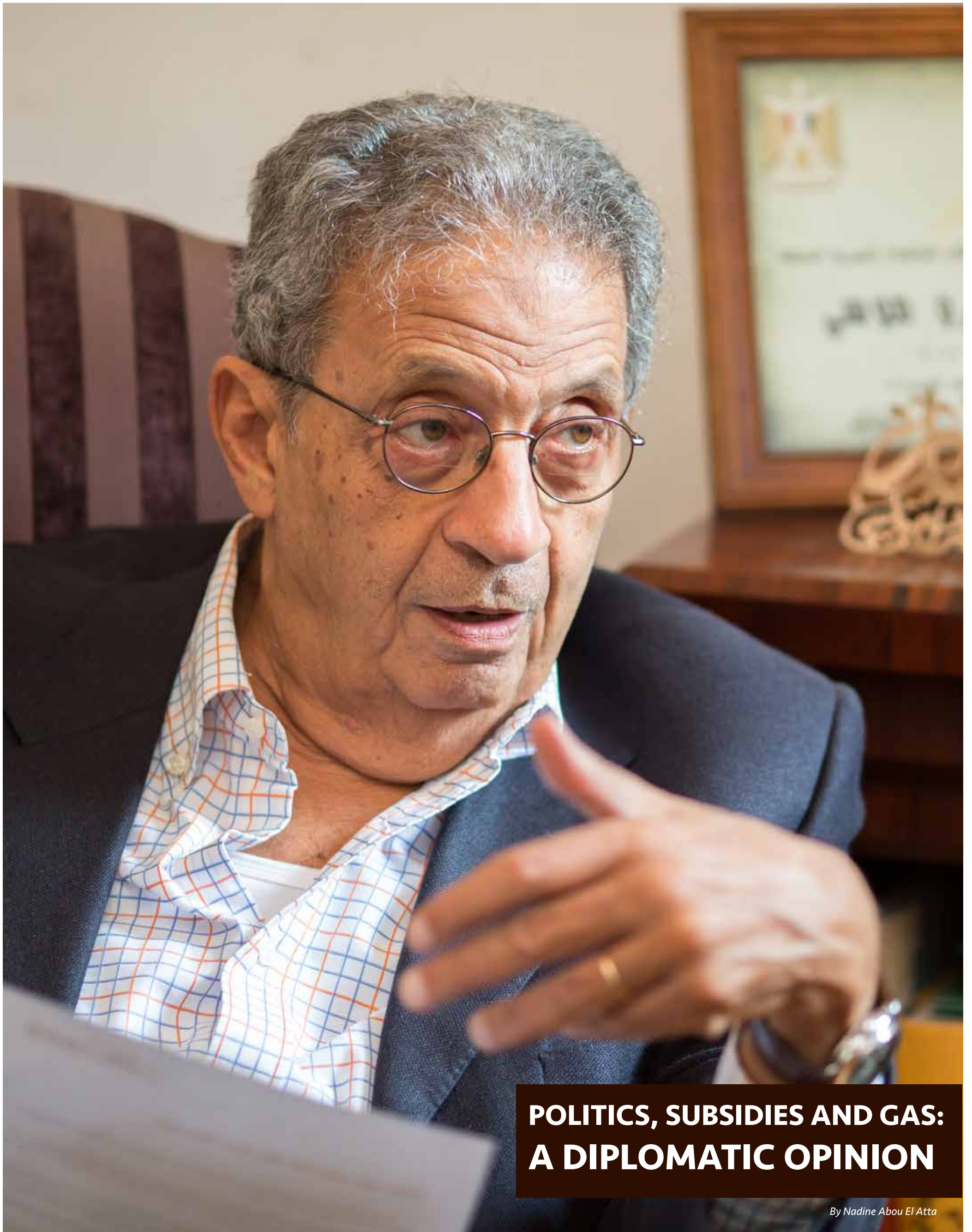


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POLITICS, SUBSIDIES AND GAS: A DIPLOMATIC OPINION

By Nadine Abou El Atta

It is often said that politics and the economy are two sides of the same coin. With a clear focus on energy, Egypt Oil & Gas sat down with one of Egypt's leading political minds, Amre Moussa, to explore the other side of the Egyptian coin.



Economic and Political Aspects of Zohr

The interview began by a review of the impact of Eni's latest massive gas discovery in Egypt "Zohr". Moussa expressed his happiness as a citizen after hearing about the discovery, emphasizing the timing of the discovery. "I feel that the discovery came at the right moment, given the economic difficulties Egypt is facing. This discovery opens the door for our needs to power generation, our needs for energy, sustainable development. In addition, the discovery also adds to the strength of the economy."

The mega gas discovery is believed to have the ability to change both the economic and political scene for Egypt; a very influential factor for the region would be the decision to export part of Zohr's production. Moussa addressed the issue by pointing out that the decision to export natural gas should only be dealt with according to a plan, after conducting studies, and based on the country's local needs, as well as the policy for exporting. "The priority should be for the citizens to feel that their lives is going in a better direction, and that the discoveries they are reading or hearing about have brought them more benefits; on the other hand, we cannot restrict chances for export."

Recently Cyprus' Energy Minister, Yiorgos Lakkotrypis, stated that there was a high probability that the Shorouk block --where the Zohr discovery is based in-- extends to the Cyprus's Exclusive Economic Zone. Currently the country is still trying to prove its claim. When asked about the political implications if the claim was proven true, Moussa declined to delve into a topic that has yet to become fact; pointing out that, "the topic should only be addressed by the foreign company that made the discovery and by the Egyptian government. This is a very complicated issue, and also a very promising one."

Subsidies, Prices and Politics

Shifting to local issues, Egypt Oil & Gas asked Moussa his thoughts on the topic of subsidies. Given the new discovery, average Egyptian citizens now feel that Egypt is rich with natural gas and will soon overcome its energy crisis. At the same time the government is in the process of removing subsidies, and thus increasing prices.

"Let us not confuse the issues, by talking about subsidies, production and aspirations of people," Moussa said. "First we have to have solid information, and not to exaggerate. We have to be vigilant about so many complications affecting the issue. Not to mention, the gas from the field is not going to be produced tomorrow."

"I believe that the way the government is dealing with this issue is a very wise one. I also believe the government has to share with the population the correct information about new and previous findings, thus, allowing the average citizen to celebrate the new find without building high expectations."

As for the political ramifications of subsidies, Moussa explained, "the issue is not a black and white one. The current system of subsidies is benefiting those who do not need subsidies, therefore it has to be rearranged, so that the subsidies would reach the poor people who need help."

"The issue of subsidies has a lot of elements. It has to be dealt with caution; however, we also have to be up to the challenge. In a poor country like ours the government cannot afford to shoulder all these subsidy policies, the issue has to be intelligently managed. Subsidies cannot continue, on the other hand a large part of the population is poor and need subsidies. The challenge here is how to do that and be a well-functioning economy," said Moussa. He continued by pointing out "that the rich part of our society should carry part of the burden, bearing in mind that our real problem is poverty."

The Energy Crisis

The government is working intensively on increasing gas production; however, given the natural gas shortage the country is currently experiencing, the decision to choose between allocating

gas to electricity generation versus energy intensive factories is an ongoing issue. When asked about the topic Moussa responded, "it is an issue of management, one issue should not come at the expense of another. A good policy can satisfy both or at least establish a way not to harm industries, as well as investments in Egypt," adding that, "The population needs a stable source of energy to meet their different life aspects, and this should be the priority. It is one issue but with many vessels."

To resolve the gas supply situation, the Egyptian government is working on developing a way for factories to import their own natural gas, a move to liberalize the gas market in Egypt. "These issues should have been considered much earlier, but the government today is reconsidering all issues related to the topic and opening up. This is an important step, I agree with it," said Moussa.

Discussions about importing natural gas would not be complete without pointing out the possibility of importing from the Israeli Leviathan and Tamar fields, given the convenience of existing infrastructure.

During his time as Petroleum Minister, Sherif Ismail discussed in an interview with Daily News Egypt, the idea of allowing factories to import their needs from both Israel and Cyprus. Moussa commented on the topic briefly by agreeing with the Prime Minister, pointing out that the issue should be based on purely economic considerations, and whatever the political repercussions may be, they should not be the driver of the decision.

Many attribute ongoing decline in oil prices to be some sort of political game. When Egypt Oil & Gas asked Moussa about his opinion on the matter, he had a concise response. "When analyzing a situation we should not start with conspiracy theories, we have to start by looking at many considerations, including politics."

Sustainable energy is another topic of importance for the energy sector in Egypt. The Egyptian government has a target to produce 20% of its energy from renewable sources by the year 2020. While this is an ambitious goal to reach, the country is indeed attracting significant investments for this field. Moussa commented on the topic, noting that "this country will reach 100m people by 2020, and we are now in 2015. A government of 100m people has to have

a plan. We have to deal with all the files pertaining to rebuilding the country. I believe that we have to put the country on the right track, and push the crate to move."

Investors and the Parliament

Moving the discussion to the soon-to-be elected parliament, Egypt Oil & Gas asked about the new parliament's role in improving the investment environment in Egypt. Moussa began by explaining that the parliament is expected to be of a special nature, due to the new parties. "The new parliament is expected to have no majority. It will have a life of its own. A parliament by default is a reflection of the image of society, we simply cannot keep saying that the parliament is bad."

Moussa continued, "Life today imposes new challenges on the parliament, on the government, and on us in the streets. Issues and problems should be lobbied to parliament members. I believe the ministry should raise these questions to parliament. Members of the parliament themselves will raise these issues as they are of their concern."

Responding to questions about the impact of the new constitution on current investments in Egypt, especially once the parliament is in place, Moussa stated, "law and order are very important. The issue is about the economic policy, open economic policy, bearing in mind the elements of social justice."

In closing, Moussa was asked about the static nature of the Egyptian government, a major obstacle to businesses. "This is a big challenge, it is called bureaucracy, and this bureaucracy is indeed a major challenge in the face of a government that needs to move as quickly as it can towards development, change, and linking up to the 21st century," said Moussa

"It is one of the main elements that are in the way of progress," he continued. "We definitely need a major change in the way bureaucracy is being handled, otherwise we won't be able to move forward. Resolving this issue will impose many difficulties; however, I believe we will see some actions against bureaucracy soon. Any government that wants to succeed will do this," Moussa concluded.



ARCTIC SEA ENERGY: a Dream or a Nightmare?



By Amanda Figueras

Laying beneath the approximately 15,558,000 square kilometers of frozen Arctic Sea is 30% of the planet's undiscovered natural gas reserves and 13% of its undiscovered oil, according to US Geological Survey. For some, developing Arctic resources is essential to securing energy supplies for the future, especially in a world where demand is growing without an end in sight—due to increased pressure from emerging markets in China and India. But others consider the potential risks abhorrent; enough reason to abandon the idea of drilling in the wild north altogether.

For oil companies, this hesitance is not due to worries over the global environment, but rather because of the high costs necessary for such activities, especially when oil prices are so low. This makes the Arctic a less than thrilling prospect for most major oil and gas companies. Despite this, a relatively concentrated group of businesses have begun to look to a future under the ice.

The Arctic is one of the world's largest remaining areas of untapped, accessible oil and gas reserves. This makes for a very interesting business prospect for countries that border the area: Canada, Denmark, Norway,

Russia, and the United States of America have all staked claims on Arctic land.

Do we need to drill in the Arctic to satisfy energy demands and consumption? Is this too big a risk in both expense and logistics? Can we afford another major oil catastrophe? What does the future hold for this key region?

Shell Abandons Expensive Arctic Adventure

After seven years of preparation and \$7b spent, Shell recently decided to abandon its exploration program in the Arctic "for the foreseeable future." This announcement once again placed the Arctic debate on the front pages of the world's newspapers.

Initially, the company drilled for two months at the Burger J Well, located 150 miles northwest of Barrow, Alaska, in the Chukchi Sea. After this period, however, Shell indicated that while the evaluation of all data revealed "indications" of oil and gas, there was not enough present to justify further activity in today's low price environment. "This is a clearly disappointing exploration outcome for this part of the basin," said Marvin Odum, director of Shell Upstream America in a press release.

"The current, federal permitting system brings high levels of operational uncertainty to offshore Alaska planning. In a normal course, this exploration program would have taken significantly less time," a source from Shell explained to Egypt Oil & Gas, indicating another factor in their disappointment.

Indeed, the regulatory rules keep changing. The BP Gulf of Mexico oil spill, as well as the grounding of Shell's Kullak drilling rig off the Alaskan coast in 2013 both greatly affected offshore drilling legislation in the United States.

"There was no spill and no environmental damage, but regulation tightened after this [Kullak] incident. Environmental groups did play a role here, in arguing for such tightening, and against any Arctic drilling of course. Their voices were not the only ones, but they were among the loudest and most articulate," said Scott L. Montgomery, an affiliate faculty member at the Jackson School of International Studies, University of Washington.

To him, Shell's decision to leave the Arctic is hardly surprising and has ramifications well beyond the Chukchi Sea: "It helps show that

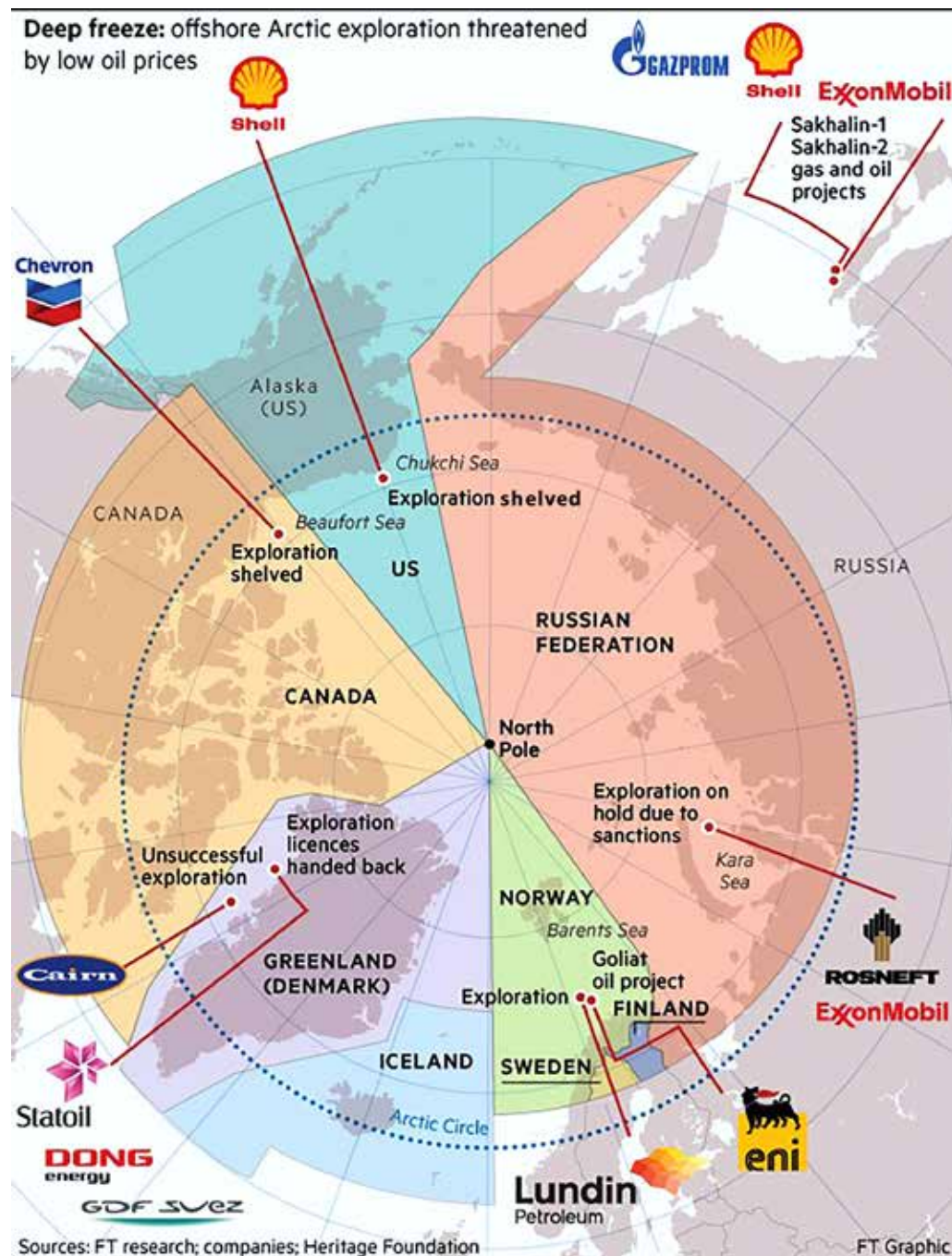
the widely proclaimed "land rush" to the Arctic, aimed at oil and gas most of all, is a myth."

Prices, the Real Key

In an article published in The Conversation, an Australian-based website featuring news, analysis and comment, Montgomery explained that economics and geopolitics have made clear that the greater part of the Arctic would remain closed to hydrocarbon drilling—at least in the near term. "No company, American or foreign, will rush to replace Shell in the Chukchi Sea."

Similar moves have happened before. Oil companies drilled in America's corner of the Arctic Ocean in the 1980s and 90's, Shell amongst them. Around 30 offshore wells were drilled in the US portion of the Beaufort Sea and five in the Chukchi, according to Popular Mechanics. Some oil production already takes place on artificial islands in the Beaufort Sea. For instance, BP operated the Endicott site in 14 feet of water, and the Northstar operation took place in just 39 feet of water over the course of decades. But none of the wells drilled farther away from the coast resulted in oil or gas production, mainly because the price of oil dropped

Deep freeze: offshore Arctic exploration threatened by low oil prices



roughly in half from the early 1980s to the early 1990s. Drilling in the Arctic is economically sound only when the price of oil is high, because operations in the frigid water are very expensive.

In late July this year, Ann Pickard, Shell's top executive for the Arctic, told Bloomberg Businessweek that if oil prices remained below \$50 a barrel, the offshore adventure would have to end. At \$70, Chukchi oil would be "competitive," and at \$110—a reasonable projection, according to the company's economists—it would be a huge winner. But of course, with prices currently hovering around \$45 a barrel, Pickard was talking about prospective prices up to 15 years from now.

Shell chose to leave much earlier, but it could go back; the company is still holding 275 Outer Continental lease blocks. Marvin Odum, director of Shell Upstream Americas, said in the written statement that the company "continues to see important exploration potential in the basin, and the area is likely to ultimately be of strategic importance to Alaska and the US."

The Chukchi Basin is largely unexplored, with an estimated mean of 29b barrels oil equivalent potentially recoverable. Shell spent \$2.1b to lease 275 offshore blocks and another \$1 billion in preparations and drilling, The Conversation noted.

The Burger J well was drilled in 150 feet of water to a depth of 6,800 feet. Though located substantially offshore, the area is shallow, a factor which makes it attractive due to the reduced drilling costs. Besides "indications" of hydrocarbons, the company undoubtedly recovered significant amount of valuable data, useful to grow its knowl-

edge base for the future.

The main challenges for offshore drilling in the Arctic are well known; these include cold temperatures, sea ice, and, in some areas, permafrost on the seabed. Major international oil companies, like Shell, Exxon, and BP have developed advanced and specialized technologies to deal with these challenges, but in Montgomery's opinion this investment is not cost effective at prices below \$80–\$90 per barrel.

Shell's answer to Egypt Oil & Gas when asked if pressure from environmentalist groups affected their departure was clear: "No. Shell understands managing exploration risk. Dry holes as well as discoveries are part of exploration outcomes."

Hundreds of protesters, lately including 'kayaktivists' paddling in front of an icebreaker to block its path, have rallied against Shell operations. Many groups have consistently and constantly run campaigns against drilling in the Arctic, mainly fearing oil spills and other risks to wildlife. These protests and boycotts show no signs of abating.

"There's no doubt that the global protest movement that rose up against Shell's Arctic plans had a role in its decision. The company said so itself, admitting it had been surprised by the reputational damage Arctic drilling was doing. Without the millions of people who helped make its plans so visibly toxic," Dave Walsh, Greenpeace's International Communications and Strategic Advisor said by email to Egypt Oil & Gas.

"Of course, other factors were involved," Walsh admitted. "Shell didn't find as much oil as it had hoped; working in the Arctic is very expensive and there are, quite rightly, very strict rules on what oil drillers can and

can't do there; the low oil price made people, especially major investors, question the logic of exploring in the Arctic; and there was growing political uncertainty around support for Shell as people like Hillary Clinton openly spoke against its plans. These issues, together with the wrecking ball that public protest put through Shell's reputation, caused the company to cut its losses and walk away."

Reasons Not to Drill

Whenever environmental disasters are discussed, one in particular stands out. In March 1989 the Exxon Valdez oil spill marked the birth of ecological awareness, as Spanish journalist Eduardo Suárez—who won the Gabriel García Márquez Journalism Award with his investigative article about the accident—said.

The oil tanker spilled between 260,000 and 900,000 barrels of crude oil inside of a few days. Even today, it is still considered to be one of the most devastating human-caused environmental disasters of all time.

The Valdez spill was the largest in US waters until the 2010 Deepwater Horizon oil spill—measured by volume released. However, the Exxon Valdez case caused more ecological damage as the remote location—accessible only by helicopter, plane, or boat—made government and industry response efforts extremely difficult and severely taxed existing plans for response.

Could something like this happen in the Arctic Sea? Could the drillings lead to spills whether from blowouts, pipeline leaks or shipping accidents? According to a report about the operations in the Chukchi Sea done by US Department of the Interior and published on February 2015: there is 75% chance of a major spill occurring over 77 years of the studied scenario—at least one spilling more than 1,000 barrels of oil. Despite this, last May the Obama administration gave Shell approval to restart drilling in the Arctic Sea.

In fact, US President Barack Obama has been accused of flip-flopping on this issue, as he favors aggressive actions on climate change—including a 26% to 28% reduction in carbon emissions by 2025 from 2005 levels—while simultaneously supporting measures to open oil drilling in the Arctic, a move condemned by environmentalists angered over the danger of a disastrous oil spill and the threat of more carbon emissions, Time reported.

According to the cited document, the 75% chance of a disaster that would threaten the very existence of multiple endangered Arctic species represents a "reasonable balance" between environmental and energy demands.

The Arctic is home to mammal and marine life found nowhere else in the world. All of them depend on sea ice to survive: polar bears, orcas, foxes, reindeer, and whales—many of which are endangered. Experts warn that polar bears alone could completely disappear from the Arctic in the next 100 years if action isn't taken to resolve the issue.

Greenpeace summarizes the organization's point: "We oppose drilling for oil in the icy waters of the Arctic for two simple reasons. Firstly, as scientists have said, we cannot burn the oil that might be found under the Arctic and expect to keep global warming under a 2°C limit. A safe climate is incompatible with Arctic oil."

"Secondly, it is impossible to drill safely in

the freezing waters of the far north. There is no proven way to clean up oil spilled in ice and even Shell has admitted that spills there would be likely in the future as a result of its operations."

Ecological Disaster

The nature conservation group World Wildlife Fund (WWF), also pointed out that there is no proven method for containing and cleaning up an oil spill in icy water. Besides, the distance from where response capacity is stationed in the icy north Arctic would mean it could take days or weeks to respond to a spill, even during ice-free periods.

According to the group, many challenges would remain even if a spill was cleaned up and it would take many decades for Arctic regions to recover from habitat disruption, tundra disturbances, and oil spills.

"Offshore oil exploration, drilling, and production can disturb the fish and animals that are cornerstones of the subsistence and cultural livelihoods of Indigenous peoples in the Arctic. Arctic fisheries, providing both food and economic value far beyond the Arctic, are also at risk," WWF added.

Other main concerns include the mammals unique to the area; whales and other marine mammals that use sound to navigate, find mates and food in the often-dark waters of the ocean. Much of this occurs by sonar and other sound sensing. Noises like the air guns currently used by oil and gas companies to explore for oil offshore can be deafening for these species. Excessive noise levels from oil and gas exploration and drilling could cause injury, confusion, and even death.

"There are always risks involved in drilling an environment as challenging as the Arctic. Oil companies certainly do not want an accident to happen, of any kind. Shell's well in the U.S. Arctic had to obey many new demands for safety-related equipment and vessels on site, and they drilled the Burger J well without incident," Montgomery said.

In his opinion, global oil companies do have the technology now to drill safely in Arctic conditions. "We should remember, too, that the spill that everyone brings up in discussions, the Exxon Valdez, was not a drilling accident but a tanker accident. The greater worry for the Arctic, therefore, may be the increased tanker traffic in the decades ahead as climate change increasingly opens the Northwest and Northeast commercial trade routes," he added.

To Michael LeVine, Pacific Senior Counsel Oceana Staff, a Washington-based environmental group, we have just being so lucky so far. "Shell's experiences highlight the significant risks of searching for oil in remote and dangerous places like the Arctic Ocean. As we unfortunately learned in 2010 when the Deepwater Horizon exploded and sank in the Gulf of Mexico, exploration drilling—exactly what Shell was doing in the Chukchi Sea—creates the very real risk of a catastrophic accident. We may have gotten lucky this year and avoided a spill, but there is no reason to continue taking that chance," Levine noted in an email to Egypt Oil & Gas.

As Montgomery concluded, cheap oil seems a friend to the people who oppose Arctic drilling. The only problem is that it is also the comrade of higher consumption and demand. That means at some point, higher oil prices, driven by demand, may again make the Arctic more tempting in the future.

BRIDGING THE GAP: 2015 ANNUAL GLOBAL WORKING CAPITAL SURVEY OF THE OIL & GAS SECTOR

The oil and gas industry is currently facing tough challenges following the fall in oil prices that commenced in the second half of 2014. With no expectations of a price rebound, exploration and production (E&P) companies in the sector are being forced to re-evaluate major capex projects, and implement long term cost reduction strategies as they get used to a life of lower prices for longer than expected. Meanwhile oil field service companies (OFS) are beginning to feel the margin pressure passed down from E&P companies implementing cost reduction strategies.

All of these pressures lead to one conclusion, the industry needs cash to support itself and invest for the future. Working capital can assist in tapping into this valuable resource. Globally, PwC is working with many companies to help optimize working capital and achieve sustainable performance improvement. What would you do if you could realize the equivalent of 5% of revenue from working capital?

With many projects now unprofitable, we have seen a large number of projects decommissioned and unhedged production revenue reduced up to 50%. And with sanctions against Iran being dropped—adding further supply to the global market—the likelihood of prices bouncing back in the short term are slim.

For oil and gas companies, cash is particularly key right now. With the sharp decline in oil prices, many projects are becoming increasingly unprofitable, and debt is becoming more expensive. Cash is a viable source of cheap financing, and working capital optimization can help unlock cash to assist getting through these uncertain times.

In this study we look at E&P and OFS companies across the world (both listed and unlisted) with revenue greater than \$100m in 2014. Whilst our findings show considerable results from working capital improvements in recent years, there is still plenty to go for. Our results show both cash opportunities and performance gaps that the industry needs to bridge. We estimate that up to \$338b of cash can be unlocked by both E&P and OFS companies moving to the next performance quartile.

Having already helped to release over \$28b of working capital benefits to companies around the world, we believe that we are in the best position to help your company tap into this cash reservoir.

Middle East Oil and Gas Firms Can Dive into Billions of Reservoir Potential by Tightening up Working Capital

- Firms Missing Out on Opportunities to Tap into Global Working Capital Reserves Totaling \$338b

Middle East oil and gas firms are sitting on a war chest of billions that could be released by simply improving their working capital management according to new research released by PwC.

With no sign of an oil price rebound in sight, E&Ps and OFSs are facing a longer term trading challenge than anticipated, resulting in an increasingly pressing need for them to focus on cost efficiency and be "Fit for \$50." As a result, debt is becoming more expensive and many are re-evaluating major capex projects and implementing long term cost reduction strategies.

The Middle East is not alone. According to the report, Working Capital in the Oil & Gas industry, other territories also need to address working capital in order to achieve a more sustainable business model; it reveals a hefty \$338b global reservoir waiting to be tapped by savvy organizations. There are, however, measures business leaders can take to optimize their cash flow, releasing their capacity to adapt and grow.

This includes completing a robust working capital benchmarking exercise and diagnostic reviews to identify quick wins and deliver longer term strategies that will both boost and sustain revenue performance; creating and embedding a "cash culture" within the organization. This is in addition to optimizing the trade-offs between cash, cost, and service.

Ross Hunter, global oil and gas leader at PwC, stated, "Working capital is the lifeblood of every company and is a barometer for how freely cash flows. In efficiently run businesses, cash runs freely; in others, cash gets trapped in working capital, restricting the company's ability to grow."

"Oil and gas firms are facing a future of lower oil prices and, as a result, being cost effective in a \$50-\$60 barrel world will be vital; every move they take to achieve this will be crucial in securing their short term prosperity and, potentially, long term survival," explains Hunter, "as they respond to this challenge, many operators and supply chain businesses are under pressure to make transformational changes to their business models and secure a 30-40% sustainable reduction

in their cost base. Working capital management can assist in releasing valuable cash resources, providing much needed headroom and funding in this critical transformational period."

The report tracks the success of companies in optimizing working capital across territories; covering different types of companies such as E&Ps, OFSs, and downstream, covering refineries and product distribution.

While the findings show considerable results from working capital improvements in recent years, there is still plenty to go for. Across E&P and OFS companies alone, as much as \$338b of cash could still be unlocked.

Other Findings Include:

- Service companies hold five times more working capital on average than other oil and gas sectors, largely due to outstanding sales; a total of \$54b could be unlocked.
- Africa lags behind other countries in terms of working capital performance, but it is quickly catching up.
- Australasian firms outpace OFS companies across other territories with the lowest net working capital (NWC) ratio.
- Across listed oil and gas entities that posted Q1 results, revenues have fallen by 20% in Q1 2015 compared to the same period last year.

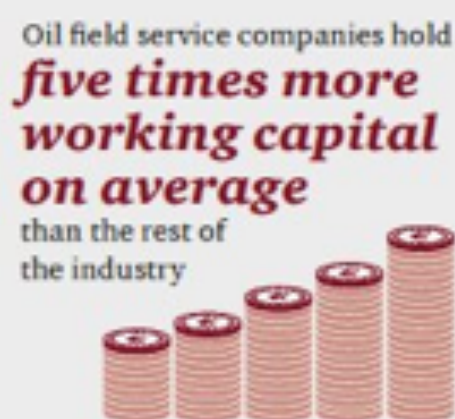
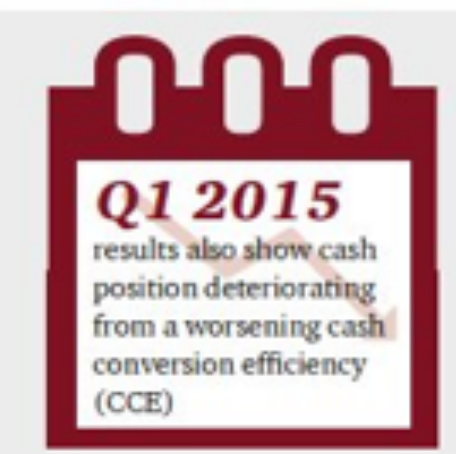
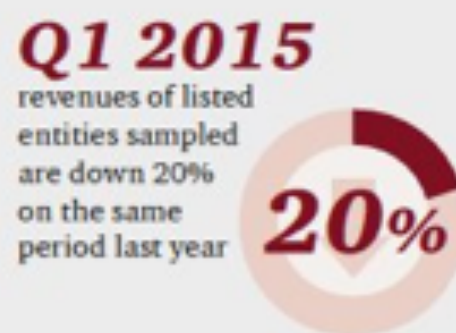
According to the report authors, OFS firms have higher working capital balances than E&P companies, largely due to the purchasing power of oil majors, which allows for easier stretching of payment terms. Working capital issues are also compounded by E&P firms re-negotiating supply

chain costs downwards.

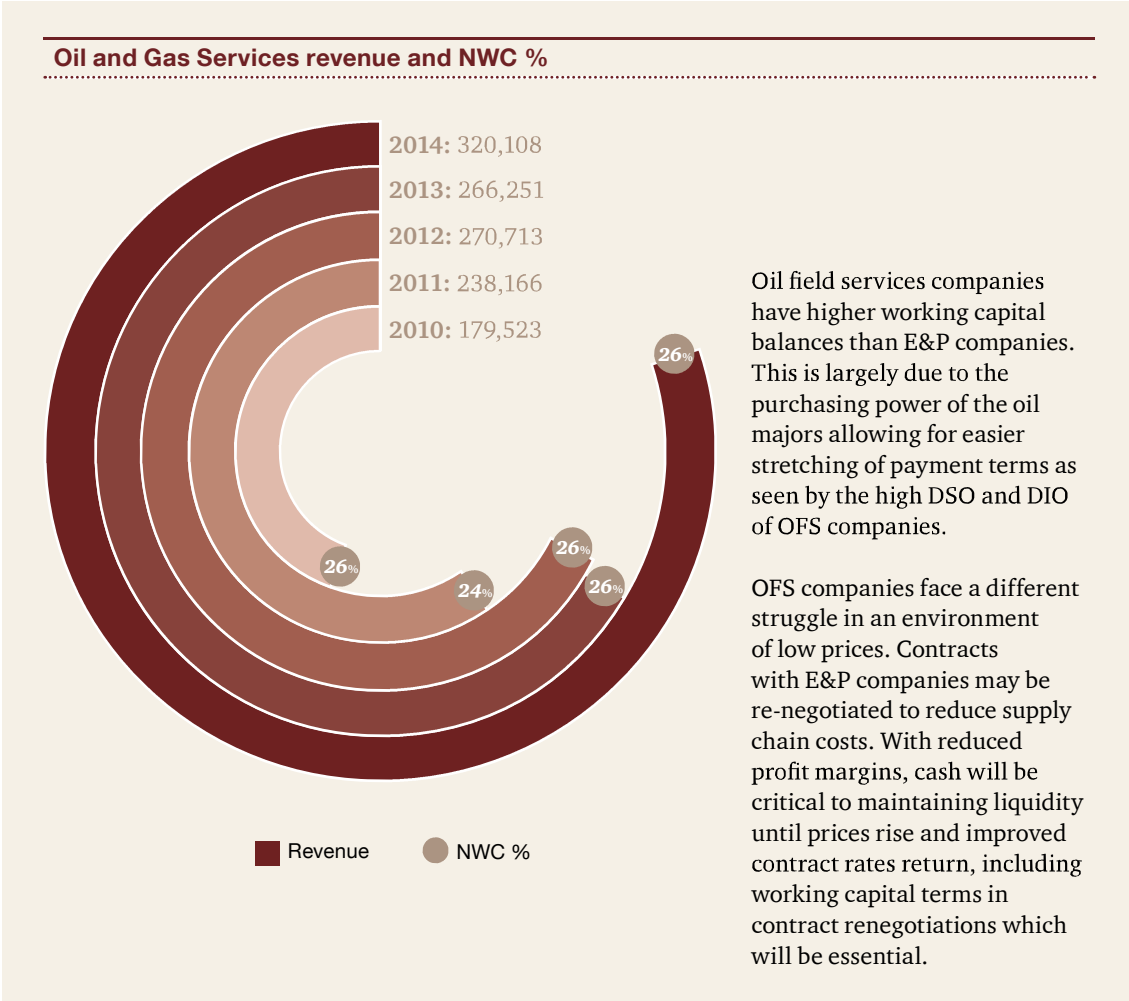
With reduced profit margins, cash will be critical to maintaining liquidity until oil prices rise and contract rates improve, particularly when it comes to working capital terms in contract renegotiations.

According to Daniel Windaus, Working Capital Partner at PwC, the oil and gas industry has the power to get their working capital back on track, but they need to act now. "It is clear that that oil and gas firms can and should unlock cash from working capital across the board, particularly given the real economic cash constraints being placed on the industry as a result of low oil prices," said Windaus, adding "our team has already helped firms across the globe to release almost \$29b in cash tied up in working capital, showing it can be done and that the process needn't be painful either."

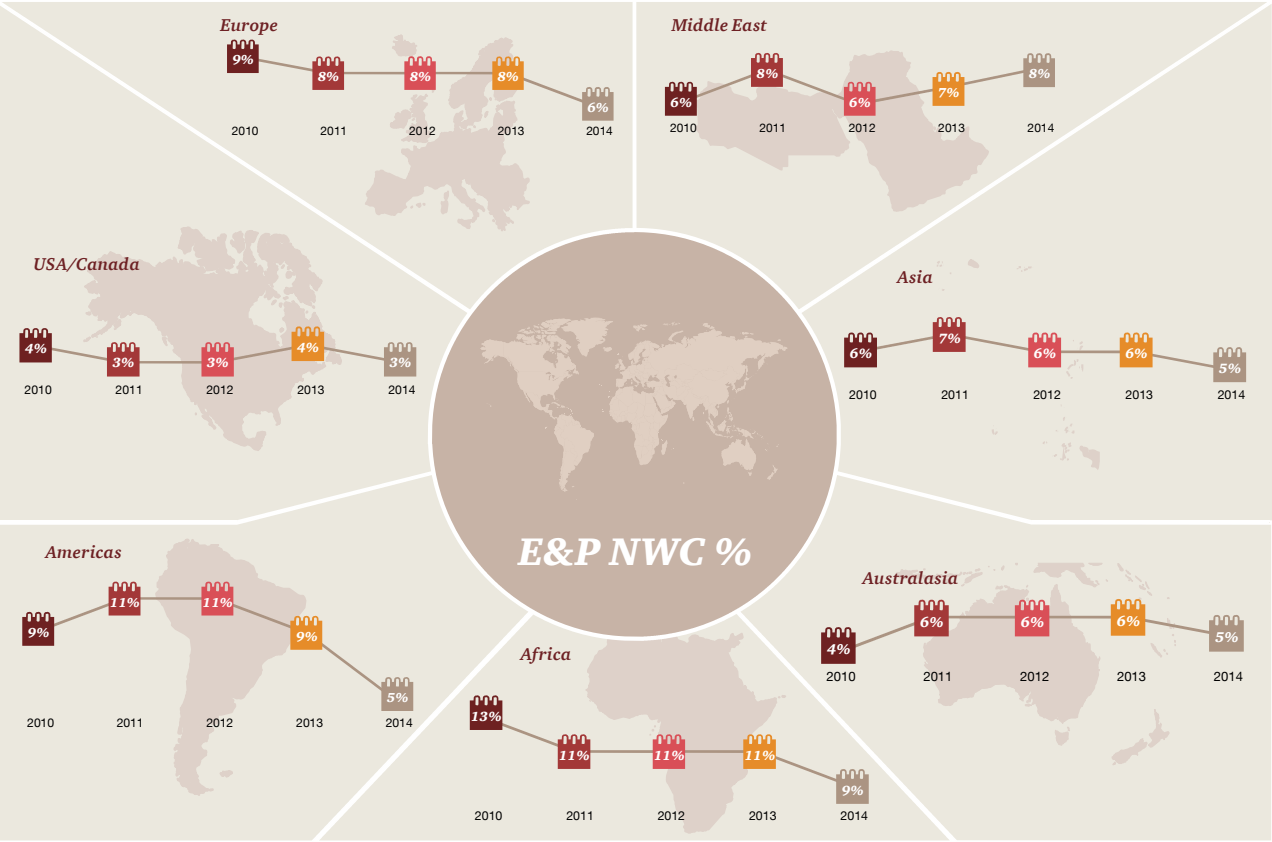
"Regardless of the sector, it's vital that oil and gas industry players pay special attention to the efficiency of their working capital management if they wish to successfully navigate this lower oil price environment and consolidate a sustainable, long term future for their business," explains Windaus.



SOFS companies have higher levels of working capital, largely driven by elongated billing and collection cycle



E&P companies in the Americas have improved by 4%, the greatest improvement in the regions



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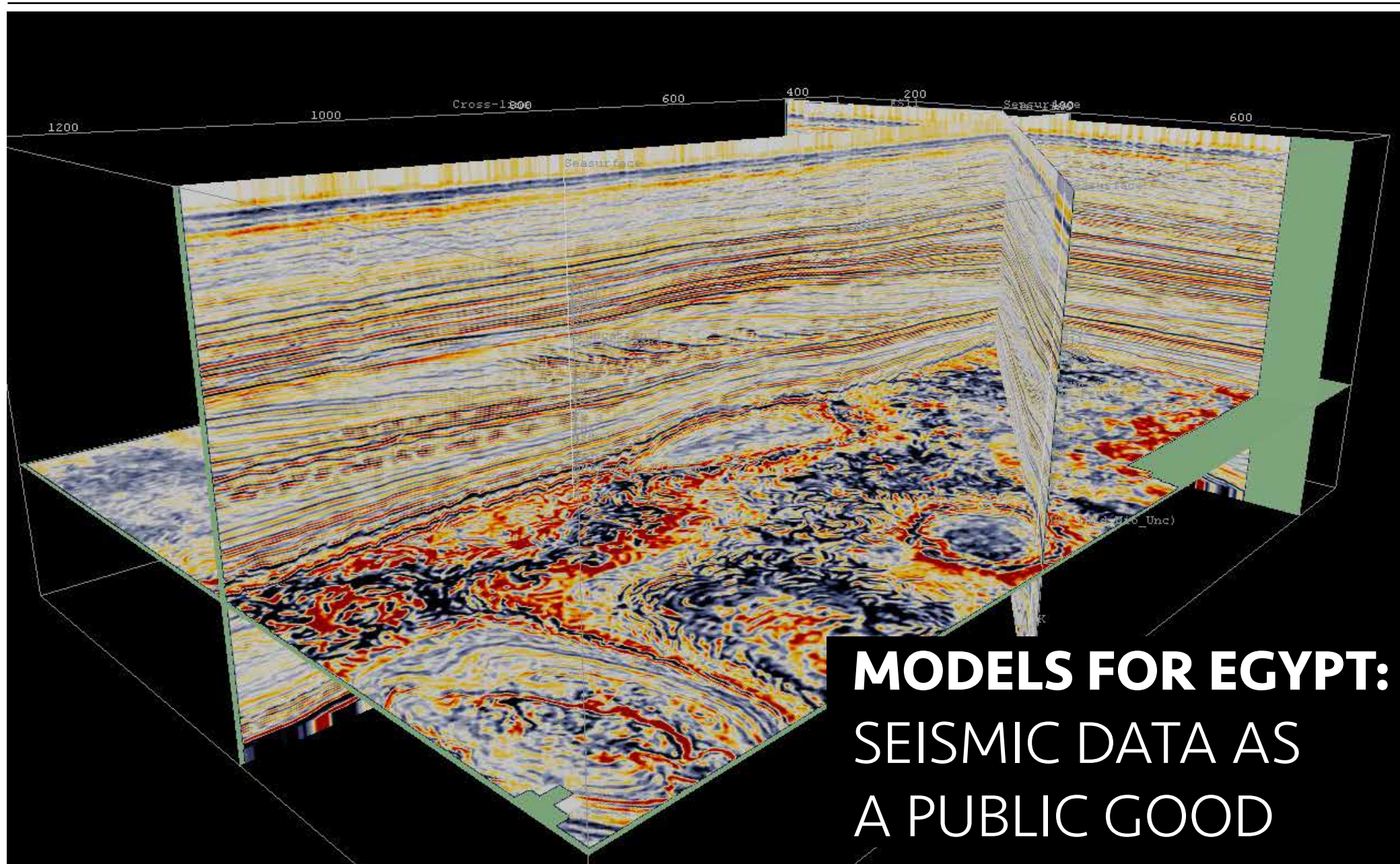
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MODELS FOR EGYPT: SEISMIC DATA AS A PUBLIC GOOD

By Emad El-Din Aysha, PhD

In February of 2015 we posed the question on the Egypt Oil & Gas website whether Data Packages for new bid rounds should be free, with these answer categories – Disagree, Agree, and Strongly Agree. The results have come in: 64, 109, 74. The majority agreed with our proposal while those who disagree were still outnumbered by those who strongly agree!

Remember that one of the arguments for pricing data is that it functions as a filter to screen out weak or bogus candidates. The Egyptian system is built on a series of filters or safeguards – beginning with data pricing, followed by bid rounds, and capped off by Production Sharing Agreements (PSAs), insuring the Egyptian side is in control of the whole process. The reality, however, is that these lines of defense can and have been breached thanks to flaws inherent at each stage of the process. Dr. Shawky Abdeen, PICO International Petroleum's General Manager, has been a long-time advocate of providing seismic and well data for free or minimal cost, not least in these pages. His argument—as always—is that even a small oil or gas field discovery is “much more valuable than a few thousand dollars to collect from data sales.” This doesn't mean that free data is a panacea though; there are still defects in the system. Information has to be combined with auction design (tenders and competitive bidding) and modifications to the overall regulatory framework.

Dr. Abdeen himself advocates studying the different country models on offer and the legal mechanisms involved to see which is most suited to Egypt's situation. It's all a question of balancing long-term revenue streams with short-term profits, issues that are now being raised round the globe by oil producing nations—and even by oil companies.

Size and Seismology

As we have established before, overpricing seismic and well data scares away the smaller, innovative, more flexible firms that can actually accommodate themselves to an individual country's needs. This creates problems for the bidding process and even for PSAs. A 100-page study of auctions in the Indian petroleum sector by An-

upama Sen and Tirthankar Chakravarty, of the Oxford Institute for Energy Studies found that companies in bid rounds actually had more information than the government, resulting in a handful of already well-established Indian operators dominating upstream oil and gas. E&P was being starved of foreign knowhow and money, with charges of corruption and collusive behavior to boot.

Part of the problem is that India's Directorate General of Hydrocarbons does not enjoy a clear mandate over overseeing data collection or setting prices for bid rounds, in marked contrast to the US Lease Licensing Authority or the Norwegian Petroleum Directorate. Data is too dispersed across the system, with the Indian Directorate “staffed through secondments from ONGC and OIL,” meaning that there is “no clear separation of the regulatory function.” As a consequence the country's oil and gas sector liberalization policy (from 1999) failed to boost reserves. Only estimated reserves went up; while actual commercially viable finds were few and far between, leaving India a net importer of fuel attempting to satisfy ever rising local demand.

Sen and Chakravarty were writing in 2013, before the January 2015 corporate espionage scandal that rocked the entire energy sector in India. According to Reuters, the government documents leaked by corrupt civil servants and former oil consultants were “used by some of India's biggest oil companies to pre-empt unfavorable decisions or hurt rivals.” Even data on India's coal production, power projects, and matters pertaining to national security—budget statements and top-level ministerial papers—were found, with fears that such “secrets may have fallen into the hands of foreign intelligence agencies.”

In Egypt's case data packages and studies conducted on them are already traded internationally, during the duration of a concession contract, as the foreign companies in question legally own that information. An anonymous source, with experience in the public and private sectors, adds that IOCs only hand over a copy of the new data they have compiled to EGPC once their contract expires, although they are obliged to purchase

the latest data packages for an area to enter a new bid round. This leads to needless duplication of effort, and expenses, while opening up even more perfectly legal avenues for information to be traded around thanks to mergers and acquisitions. EGPC and the Petroleum Ministry, moreover, have no way of knowing if a new entrant has access to this data, while companies that fail to strike oil don't even have to hand over the original data packages when they leave.

Therefore, the Sen and Chakravarty position that seismic and well data should be treated like a “public good”—in line with Dr Abdeen's opinion—is not to be trifled with. They also recommend that governments, as much as is possible, generate their own data instead of relying exclusively on the seismic studies conducted by international oil companies (IOCs). An example worth referencing here is Indonesia, said Lauti Nia Sutedja, Head of Information and Socio Cultural Affairs at the Indonesian embassy. The Center of Data and Information at Indonesia's Ministry of Energy and Mineral Resources is in charge of seismic data generated by companies operating in the country. The Special Task Force for Upstream Oil and Gas (SKK Migas) at the energy ministry, however, produces its own “seismic line” data, information that is later turned into data packages in preparation for offering oil and gas blocks.

Information also helps level the playing field for small players competing against oil majors as it tempers larger companies bargaining power. Nigeria is a case in point, since a contributing factor to the civil war was the federal government's 1965 decision to increase taxes levied on oil companies, which Royal Dutch Shell actually supported. The US embassy later discovered that Shell had been in “super-secret” negotiations over this law for over a year, hoping to harm its smaller American competitors, to cite Kairn A. Klieman.

Egypt almost fell into this trap with Bechtel, reveals Dr. Mustafa El-Rifai, former Enppi CEO and Egypt's Minister of Industry and Technology from 1999-2001. In his book *Crossing the Technological Gap* he documents how Bechtel objected to rival companies from Europe or Japan partnering

with Enppi. It dragged its feet over agreements previously made and busied itself instead with cataloguing the composition of the Egyptian petroleum sector, trying to cultivate connections at the ministerial level, specifically to scare off competitors.

Auctions and Alternatives

Egypt, like India, could do with a dose of data centralization too. GUPCO Chairman Abed Ezz El-Regal, at the EOG optimization convention, himself advocated for the pooling of data between Egyptian petroleum companies and authorities, along with the revisiting of old data for closed wells. This data could be shared with foreign firms, on occasion, speeding up the E&P cycle considerably, especially for marginal fields in the Gulf of Suez and Western Desert.

The Indian—and Egyptian experience—becomes all the more clear in light of the resounding failure of Mexico's first experiments with competitive bidding, part of its own energy liberalization policy. Juan Carlos Zepeda, head of the country's National Hydrocarbons Commission, told the *Financial Times* that this time around they made sure to disclose the “minimum price” early on. This is what is known as the “reservation price, below which you refuse to sell,” an important hedge against collusive behavior, says journalist and author Tim Harford.

Previously in these pages Harford had argued that auctions by themselves could not eliminate the possibility of cheating, especially when the number of bidders is small. Here bidders “only pretend to compete but instead are taking turns to win or instead share the prizes with each other.” A reasonable reserve price “limits the loss to cheats.” Note that with Mexico's first auction only 2 out of 14 blocks were awarded, a predictable result given the small number of contestants. Sen and Chakravarty noted early on that a failing in the Indian system is that it does not rely on “reserve prices”—a character trait shared with the Egyptian oil sector. They advocate penalties for “defaults on commitments to drill wells” as another hedge against cheats, including non-financial punishments such as “requiring defaulters to carry out surveys in lieu” or imposing “re-

strictions on bidding.”

That being said, auctions’ underperformance is not the only problem. Another curious finding Sen and Chakravarty made was that many bidders regularly overvalue blocks “based on other objectives (sources of valuation), such as increasing an asset portfolio in the short term, or maintaining market share.” This can also result from internal corporate wrangles, to cite Dr. El-Rifai again. He found this in his experience with Braun Egypt, a joint venture company established in 1979 between Braun, EGPC and Petrojet.

Much like the Enron fiasco, Braun Egypt was practically bankrupt after a spending spree in under a year and half—to the point that both Braun and the Egyptian authorities had to send in crisis teams to audit the company accounts and purge managerial staff. Braun Egypt had its own accounts that were independent of the home company’s supervision, creating an opportunity for business figures eager to climb the corporate ladder and jump ship at the first sign of trouble.

General Manager of Beach Energy Samir Abd El Moaty voices other criticisms of the Egyptian bid rounds system. The whole process of relinquishing blocks, evaluating bids, and approving and ratifying new concession agreements can stall production for up to three years as these procedures are only sorted out one by one. Operators are already winding down their activities as contracts came to an end—disinvestment caused by cost-recovery considerations. A way to avoid these problems entirely is to grant extensions for 5 or more years as an incentive to drill new exploration wells, provided a company has a proven track record. As for bid rounds, the authorities now have a substantially large enough database to calculate what a block should cost, another tool to speed up the process.

On average it takes 3-6 months for a tender to take place and that is not taking into account the timeframe for approval by the Exploration Man-

agement and Bid Committee, adds Dr. Abdeen, noting that added incentives are called for with high-risk investments such as deepwater and offshore exploration.

Offshore Exceptions

Sen and Chakravarty themselves cite how a “giant” offshore gas find made in 2004 took “two full exploration cycles” for the discovery to be made following the launch of the liberalization policy in 1999. Production itself only began in 2009, and the development currently has just three producing blocks. More generally they found that auction results vary widely when it comes to “onshore, shallow-water offshore, and deep-water offshore.” Note that Egypt has been in competition with Israel and Cyprus in the Mediterranean since 2004, with internationally funded seismic studies going back to 1999.

The two authors also caution that offshore and deep-water auctions are more susceptible to collusive behaviour. Researchers, and regulators have repeatedly found that implicit market-sharing schemes often develop with firms that remain outside of the bidding process partnering with the winners afterwards. Restrictions on joint bids and the size of bidders are additional safeguards that have been used in the past. Israel’s persistent failure to market its natural gas finds, the largest in the Mediterranean until Egypt’s 2015 Zohr discovery, have resulted in part from anti-monopoly considerations and with some justification. There have been “rumors” of market-sharing schemes from the very beginning with data being traded around too, reveals another anonymous source.

The solution—again—is information; as the sheer size of offshore exploration blocks and the technological costs scare off medium and small companies from participating, says Michael Enachescu in the Canadian Society of Exploration Geophysicists (CSEG) Recorder. The oil juniors, moreover, are more sensitive to price fluc-

tuations. In the 1990s many Canadian offshore E&P firms went bankrupt due to low oil prices, prompting many to “donate” their geological data to universities and government agencies so that future explorers would not have to start from scratch. Many in the industry then have advocated expanded models similar to the National Data Library used in Norway and China and the revival of the older Canadian system over the “mandatory release” of information—“reports and data resulting from most offshore technical programs, including seismic surveys”—with terms of confidentiality varying from 5 to 10 years from the date a program is completed.

It must be understood that foreign investors are data-hungry, says Dr. Magdi Nasrallah, energy expert and petroleum engineering professor. Even surface data is of use to them since such regional studies give them critical geological and geophysical information that helps reduce exploration costs considerably and avoid blowouts and other environmental costs. Tertiary or enhanced oil recovery (EOR) is particularly data-sensitive, explains Dr. Nasrallah, since specialized EOR firms need accurate estimates of how much oil is left in a depleted reservoir. Regular oil companies likewise need such data to avoid such costly reservoirs and tap into “virgin” wells instead.

According to Dr. Ahmed Noah of the Petroleum Research Institute, such generic regional studies are conducted in Egypt to gather geological data from time to time, but the studies are not proper seismic surveys. The high-tech equipment needed is simply out of the country’s financial reach. Mexico’s energy reforms, reveals The Oil and Gas Year, are in part meant to draw in companies with seismic expertise, both to generate new data and integrate “old” data into new models.

Enachescu cites the Australian model too as it relies on reinvesting the royalties governments earn from offshore leases into their own seismic research facilities, as well as hiring specialized seismic firms to build up their databases over

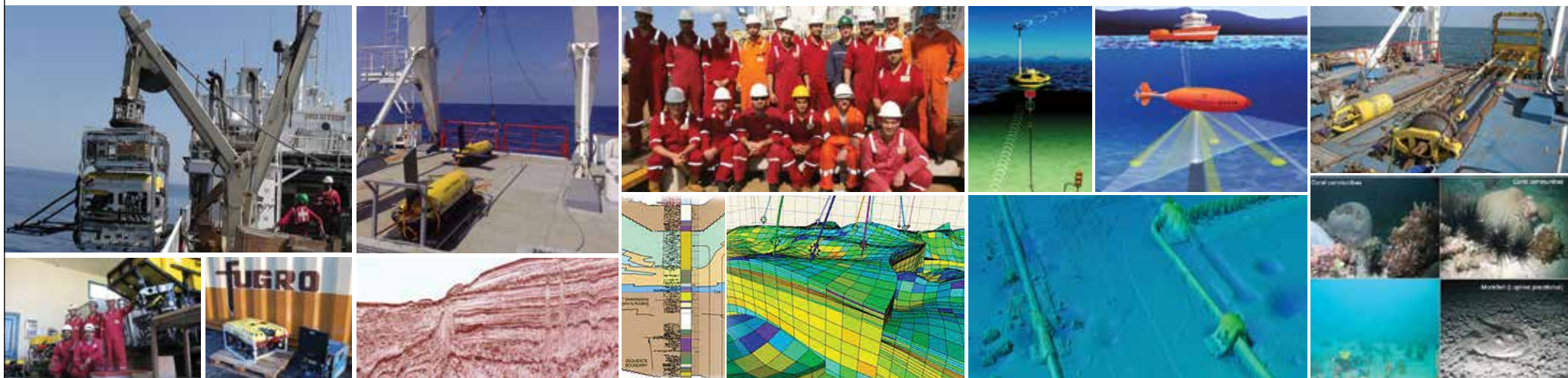
time. Ahmed Farid Moaaz, Country Manager and Director for Sea Dragon Energy Inc., has argued before that the Tax and Royalty system should take the place of the PSA model for offshore E&P. The share of profits and production spelled out in the PSA system simply won’t cover the risks and costs involved, Moaaz argues. The same holds true of tertiary oil recovery, he says, preferring a gradual move from PSAs to service agreements to royalty payments over the duration of an oil-field’s lifecycle.

PSAs technically leave the government in control, but as Dr. El-Rifai found, the devil is always in the details. The Egyptian side has to insist on oversight over staffing and accounts, both during negotiations and after the contract signing stage. He even lists access to the foreign company’s mainframe and engineering blueprints as key criteria for approving partners to a joint venture, from experience with other recalcitrant IOCs and service providers who prefer to keep such critical information to themselves. Other preconditions he lists include a detailed appraisal of a company’s assets, contractual fees, engineering facilities and staff, their willingness to train Egyptian graduates and—last but not least—how “flexible” a company is when it comes to participating in projects requested by the Egyptian side.

Money, then, is no guarantee of sincerity. The larger the corporate winner, the more negotiating power it has over the government. The money Egypt makes from selling data is negligible when weighed against the long-run hidden costs of the policy. Moreover, the ultimate objective is to accumulate knowledge. That information can then be turned into profitable opportunities, and even more data along the way.

Special thanks to Wael El-Serag and Dr. Mahmoud Abu El Ela.

WHEN ADAPTABILITY COUNTS...



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EGYPT'S IMPORT SOLUTION: FSRUs



By Nicholas Linn

The age of natural gas has come. Once considered a useless byproduct of drilling, natural gas was burned off during the course of oil production. But as oil has become scarcer and more difficult to access, natural gas has skyrocketed in value. Prized for its easy extraction, simple carbon structure, and clean-burning emissions, natural gas has become a natural choice.

Within Egypt, production of the fuel has increased dramatically over the past two decades. Starting in the mid-1990's, the Egyptian government increasingly prioritized extraction of the gas, putting it to use as a way to generate electricity. Concessions in the Western Desert, Gulf of Suez, and Nile Delta were all developed to produce natural gas.

Egypt hasn't been alone in this phenomenon; natural gas production is expected to increase globally by about 2% per year, with major markets demanding ever more of the stuff, especially the rapidly growing markets in East Asia. With many of those markets lacking the reserves necessary to supply their growth, LNG is the fastest growing subset of the behemoth industry.

The investment bank Goldman Sachs states that the LNG industry is expected to grow by at least 5% per year. The report also underlined the importance of LNG as a commodity in its own right. While current prices for LNG are based solely on the price for oil—typically with a 6-9 month delay—the Goldman expects the newly-found importance to translate into its own commodity pricing.

Oil majors have seen the writing on the natural gas wall for years, in a recent press release BP CEO Bob Dudley noted the increasing importance of natural gas "Fossil fuels are projected to provide the majority of the world's energy needs, meeting two-thirds of the increase in energy demand out to 2035. However, the mix will shift. Renewables and unconventional fossil fuels will take a larger share, along with gas, which is set to be the fastest-growing fossil fuel," he said.

"[Gas] will meet as much of the increase in demand as coal and oil combined," Dudley finished.

Egypt Growth

At approximately 85 million strong, Egypt's population is massive, the third largest in Africa. Coupled with a birth rate of 1.6%, the current and future energy demands of the nation are massive. During the population boom of the last 20 years, the government ramped up construction of natural gas powered electricity stations. As Egyptian natural gas reserves were plentiful—around 70 tcf—and largely untapped, the arrangement was a cheap and efficient way to supply electricity. However, many of the fields that once supplied unlimited amounts of natural gas have since matured, with production falling off dramatically, especially in the tapped out fields in the Western Desert and Gulf of Suez.

With production dropping off and domestic demand rising, Egypt has been forced to end its once thriving gas exports. In 2012 Egypt stopped exporting gas to its neighbor Jordan, even though it was contracted to supply the nation with up to 240 bcm/d through 2019. Exports resumed briefly a year later, but with production continuing to decline, the country has quickly reversed its role as an energy exporter to become that of an importer.

There are two options for importing natural gas. Traditionally pipelines are built between countries, with a receiving terminal built at the point where Egypt could begin pumping imports directly into the national grid. However, the rise of LNG in recent years has overshadowed traditional pipeline networks. LNG changes the finance requirements of importing natural gas, as it has no

need of expensive pipelines and no construction downtime. Importing LNG shipments are relatively easy, only requiring a way to turn the LNG back into a gas.

A Floating Storage Regasification Unit (FSRU) is the makes the importing and processing of LNG even more accessible to countries not accustomed to importing. FSRUs are generally considered a more attractive alternative to conventional onshore facilities for their lower up-front cost and the ability to bring capabilities online virtually immediately. The potential pitfall of course, is the significantly more expensive long-term cost. However, as former petroleum minister Sherif Ismail has stated publically, Egypt hopes to be weaned off of LNG imports by 2020.

This goal seems unlikely to be met, but Ismail has hedged his bets by adding the caveat that discontinuing LNG imports would happen only if there is no need for additional demand. The American Security project has deemed it "a goal unlikely to be achieved."

The port of Ain Sokhna was selected for docking the FSRU, an ideal location both for its proximity to the Nile Delta area—including Cairo—and for its location directly next to major energy infrastructure.

The FSRU Choice

A bid round for the first FSRU in Egypt was held in early 2014. The market is quite a new one, and the first auction showed just how nascent the process can be. The Norwegian company Hoegh LNG won the tender, perhaps only as a result of the submitted price per Btu. The company proposed a regasification price of \$.31 per Btu, significantly cheaper than other companies. A strong competitor was Qalaa Holdings. However, Qalaa's price per Btu was originally a full \$1. Even after the Egyptian government asked the firm to lower its price, the cost quoted was still higher than Hoegh's, at \$.45 per Btu. The Norwegian firm won out.

"We are very proud to have commenced commercial operations on our third FSRU in the last six months, which shows the strength and depth of our technical and operational expertise," said Sveinung J.S. Støhle, President and CEO of Hoegh LNG. "In addition, our project with EGAS is a prime example of the speed and flexibility an FSRU solution offers for importing LNG; the contract was signed only five months before commercial operations commenced."

500m of gas is being processed daily by the Hough LNG FSRU. Then-EGPC head Tarek El Molla stated in March that the budget for the regasification ships would be approximately \$60m a year, or \$5m a month.

After commencing operation of the Hoegh ship, EGAS and the Petroleum Ministry decided that at least one additional FSRU would be needed. Another tender for the FSRU was held in mid-2015. The auction however, failed to attract bidders due to the complications of docking a second FSRU in the already-crowded port of Ain Sokhna.

"There is limited access to the industrial area now. There is only one place available and the first terminal is already there. It takes quite some time to access Ain Sokhna now as the port is too congested," EGAS head Abdel Badie stated. "Technical difficulties will handicap [finding a port for a second terminal]."

While the possibilities of docking the vessel elsewhere were discussed—focusing particularly on the port of Abadiya in the Sinai—officials eventually decided that it would be wisest to try and accommodate the vessel in Ain Sokhna. Time is of the essence for the Egyptian state, and changing the location of the FSRU would be costly in both

money and (especially) time.

Power outages have been largely tamed for ordinary citizens, but the gas shortage is having an outsized effect on industries such as cement, steel, and fertilizer production. Factories in these sectors have been working below capacity for quite some time, with some factories idled completely. Business owners have been hurting, and they have aggressively lobbied the government for more consistent access to natural gas. Immediately getting more gas into the national grid is a priority for the Sisi administration.

In August of 2015, EGAS announced that the carrier BW Gas would be providing a second FSRU to import LNG. The vessel would in fact join the first one in the port of Ain Sokhna. It is reported to have a capacity of 750 mcf/d, over than 30% more than the Hoegh unit. When announced, it was expected to be delivered by the end of September. However, the ship actually arrived in October. Reuters and other local news agencies have reported that the contract will run for five years. Norway-based BW Gas is a very large force in the international gas shipment industry, with a fleet of over 150 vessels and a history dating back to the 1950's.

Egypt is reported to be considering another FSRU tender for the beginning of 2016, but this has yet to be stated publically. The head of EGAS, Abdel Badie, has said that the state will not pursue a fourth FSRU.

LNG Imports

The first LNG tender was to provide 75 LNG car-

The other firms confirmed to have won contracts include Singapore's Nobel Group—with 40 cargoes, BP with 16, and Netherland's based energy firm Vitol.

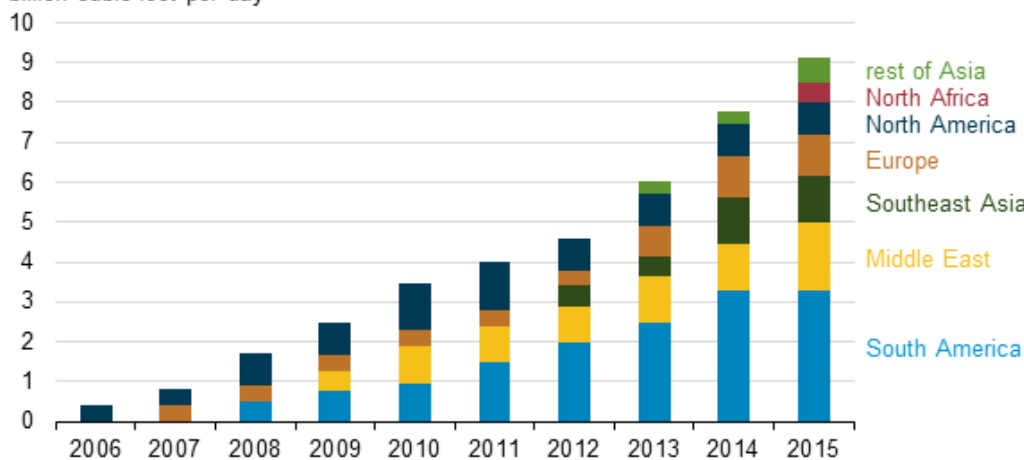
There has been one additional LNG tender since the original in October 2014, the results of which have yet to be made public. The government has announced that it signed contracts for 55 cargoes of LNG during the auction, and that 7 major international firms are participating to supply those shipments. In addition to the companies listed above, the EGPC noted that Gas Natural, Shell, and PetroChina all have contracted to deliver LNG shipments.

Not all deals are negotiated solely through bid rounds however, some of them are business arrangements that occur outside that process. Qatar gave Egypt 5 shipments of LNG outright during the turmoil of 2013. That has proven especially true to nationalized firms such as Gazprom, which negotiated with EGAS for many months. Eventually the state-backed firm agreed to provide 35 cargoes, more than almost any other supplier. Another other major firm confirmed to be supplying Egypt is Algeria's Sonatrach—with at least 6 cargoes expected in 2015, and an additional 6 currently under negotiation for 2016.

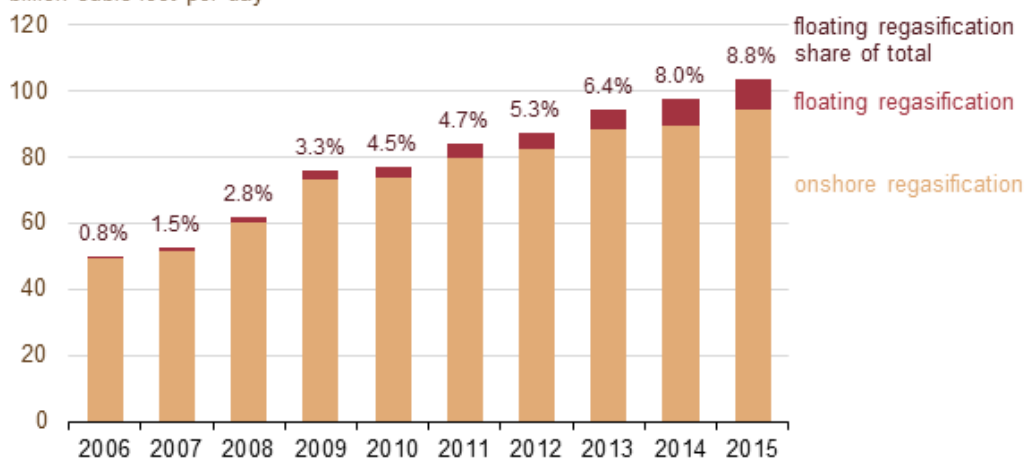
Domestic Production

Egypt has recently made a series of high profile gas discoveries, most notably BP's North Alexandria concession and Eni's Zohr discovery in the Shorouk block. These have added greatly to the national reserves of natural gas, and in the future

Floating LNG regasification capacity by region
billion cubic feet per day



Total global LNG regasification capacity
billion cubic feet per day



goes and was worth \$2.2b. It was announced by EGAS in October 2014 and awarded to four firms in January. The deal cemented the delivery of at least four shipments per month to Ain Sokhna.

A month later, EGAS revealed that nearly half of the shipments would be provided by the Dutch trading conglomerate Trafigura. The company has agreed to deliver 33 cargoes from 2015 through 2016.

should help alleviate the need for LNG imports.

This is certainly the hope and plan of the Egyptian government, which is continuing plans to only import with FSRUs in the immediate future. Whether these domestic fields will actually live up to their outsized expectations is unclear, but even if they do, they'll be unlikely to sustain the rapidly growing, energy hungry Egyptian population. It seems that FSRUs are here to stay.



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ROLE AND CONTRIBUTION OF DEPOSITIONAL SYSTEMS AND FACIES DEVELOPMENT IN IMPROVING HYDROCARBONS PRODUCTIVITY FROM RAS FANAR FIELD

By Saber Moustafa Selim, Suez Oil Company (SUCO).

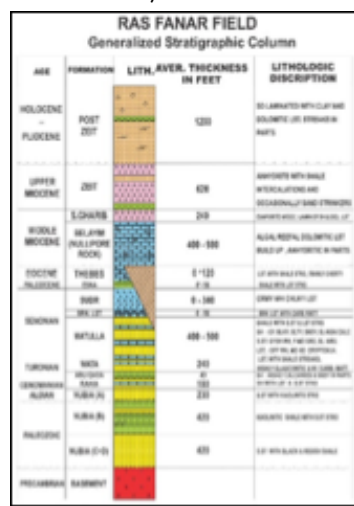
Introduction:

Depositional system recognition and facies development play an important role in defining, in a comprehensive manner, the details and distribution of reservoir rock and fluid content with the ultimate goal of a reservoir management scheme. This recognition aims to provide facts, information, and knowledge necessary to control production operation and to optimally develop any oil or gas field by obtaining the maximum possible economic recovery from reservoir units. Additionally, it helps in the reservoir characterization modeling process which embodies the integration of the technical disciplines of the development phase.

General Outline for the Ras Fanar Field:

Location:

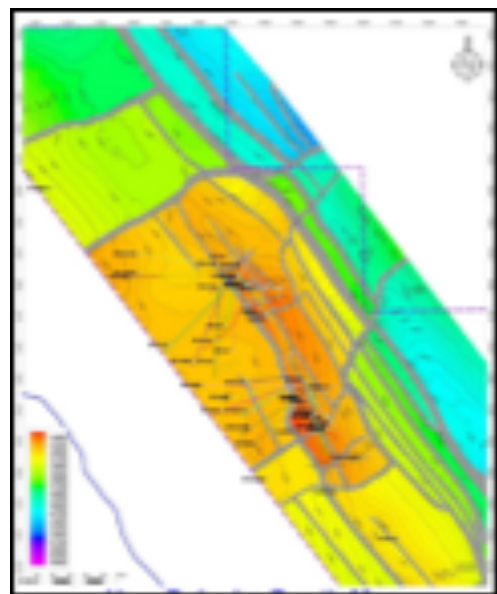
The Ras Fanar oil field is located in the western offshore concession area, some 3.5km east of the Ras Gharib shoreline in a water depth of about 100 ft. It is present in the Belayim dip province of north-east direction, which includes most of the famous oil field.



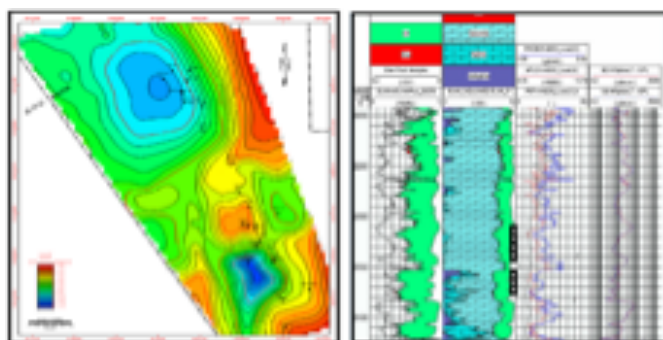
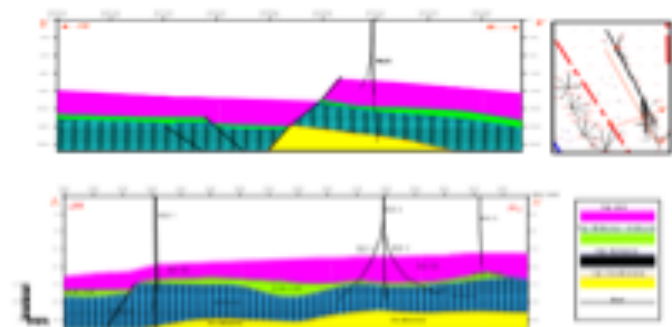
Stratigraphic Sequence:

The stratigraphic section of Ras Fanar Field is the Recent – Upper/Middle Miocene sequence. Post-Zeit to modern.

It is composed of coarse clastics and underlain by the evaporites of Zeit and South Gharib formations.



The "Nullipore" carbonates occur below South Gharib evaporites and range in thickness from over 980 ft to some 400 ft. Various pre-Miocene strata subcrop is extended over the field extent, below the Miocene unconformity.



Structural Setting:

The Pre-Miocene strata were uplifted, faulted, and deeply eroded during the Oligocene. Then the carbonate rocks were built up as "Nullipore" of Belayim Formation along the eroded horst block.

With the available well data and seismic control, the Ras Fanar structure was mapped on top of the "Nullipore" of Belayim Formation as a narrow elongated rectangular horst blocks trending northwest-southeast (Gulf of Suez trend) and tilted to the north-east. The structure and trap geometry are illustrated by strike and dip sections.

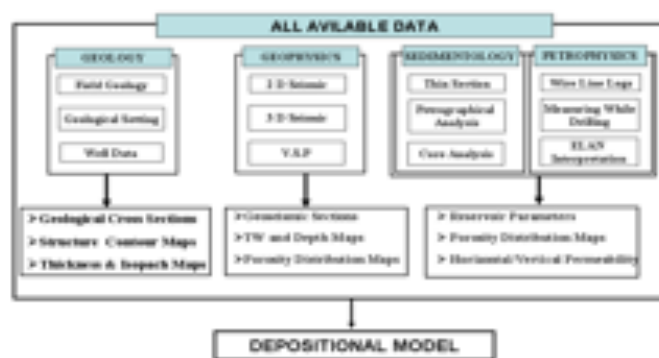
Reservoir Units:-

The main reservoir unit consists of a thick sequence of oil bearing Middle Miocene Carbonate "Nullipore."

A thin sand reservoir of secondary importance is also present near the base of the Zeit formation.

Methodology and Application:

Depositional Modelling Flow Chart

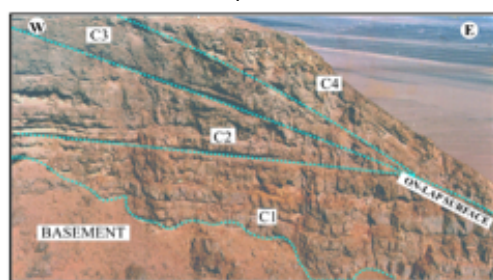


Geological Evaluation

The term "Nullipore" rock has been applied by Moon and Sadek (1923 and 1925) in reference to local carbonate (pre-Evaporite sequence) facies or build-up which equivalent to Hammam Faraun member of Belayim formation reflecting shallow marine warm water conditions favorable for reefal development with slight changes to shallow neritic and/or littoral environment.

Type section (about 130 m thickness) is represented in Wadi Gharandal area and was described from top to bottom as follows:-

- Massive white limestone, mottled with pink stained bands.
- White gypseous limestone, yielding numerous fossils.
- Yellowish calcareous marl, well bedded and fossiliferous.
- Siliceous and flinty beds.

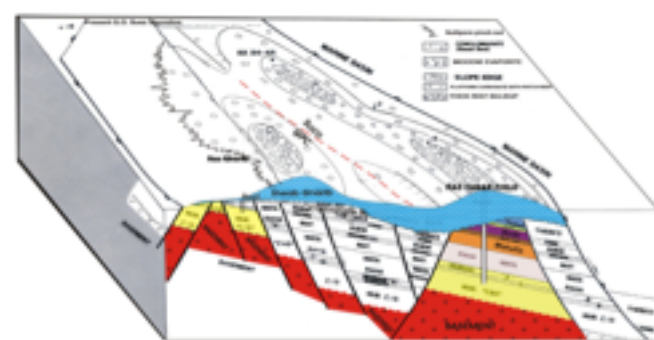


At the type section, this member reflects the shallow marine warm water conditions favourable for reefal development with slight changes to shallow neritic and/or littoral environment.

Very similar Middle Miocene carbonates sequence on the Abu Shaar, Esh El-Mellaha area can be observed

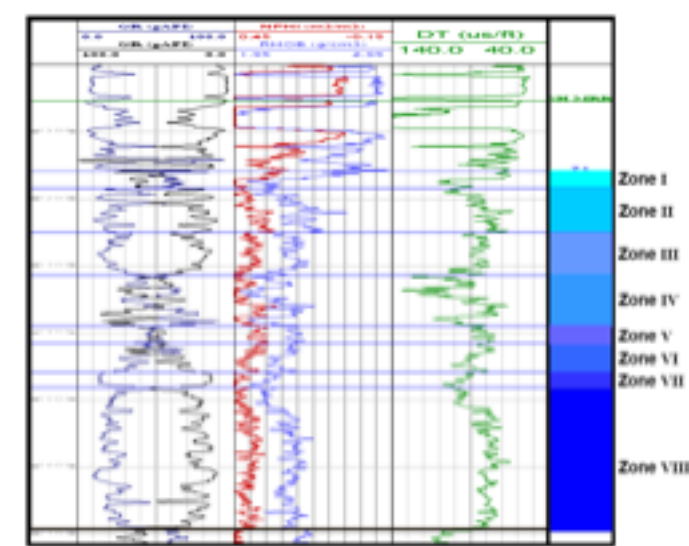
Geologically, the shallower "Nullipore" rock was built up and grown as scattered; with leaps from various shapes and thickness.

Structurally, it is probable that a marine embayment is a part of the platform and the "Nullipore" carbonate could have formed in the lower part of the Miocene



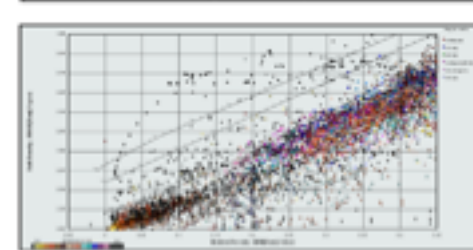
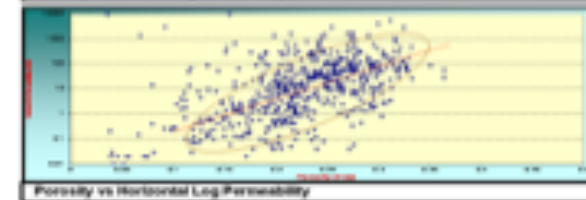
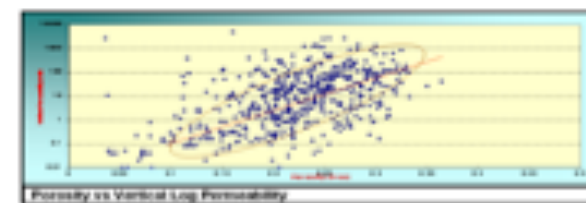
Petrophysical Evaluation

Detailed examination of the sonic and porosity logs reveals that the "Nullipore" sequence can be subdivided (from top to bottom) into 8 electro-lithofacies zones.



The porosity/permeability and density/neutron relationships reveal that typical "Nullipore" reservoir is that unit with porosity of 20-30% and permeability of 0.1 to 1000 millidarcy.

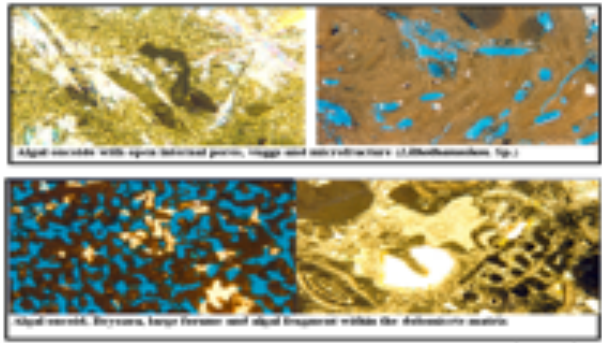
However, vugs and fractures in the bulk rock increase the porosity and the permeability. Hence, the "Nullipore" reservoir of the Ras Fanar field is considered to be a moderate to excellent reservoir.



Sedimentological Evaluation

Paleontological and paleonological investigation reveal that the "Nullipore" carbonate is a bioclastic dolomitic limestone (pack-stones) rich in calcareous algae nodules and fragments and rarely intercalated with marl and chert bands.

Frequent occurrence of red algae some coral – algal intervals indicate a shallow marine, normal slime depositional environments of moderate to low energy for the "Nullipore" sequence. Small patch of reefs or biostrames (without reef talus debris) grew on this carbonate platform

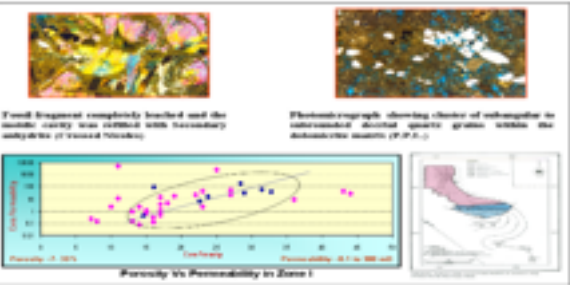


Based on works of Dunham (1962), Wilson (1975) and Pettijon (1975), Five main facies types are recognized in the “Nullipore” named:-

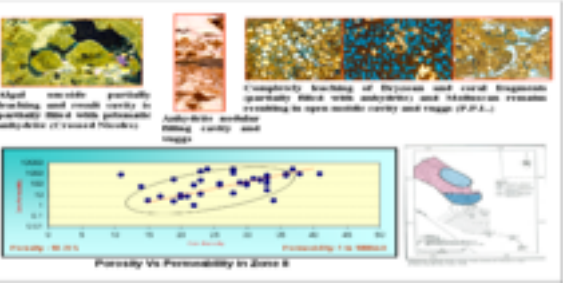
- Lime mudstone facies.
- Mudstone to wackstones facies.
- Packstones facies.
- Boundstones facies, and
- Packstones to boundstones facies.

The integrated petrographical and sedimentological evaluations reveal that the “Nullipore” can be subdivided (from top to bottom) into the following lithofacies zones that represent more or less successive sedimentary cycles.

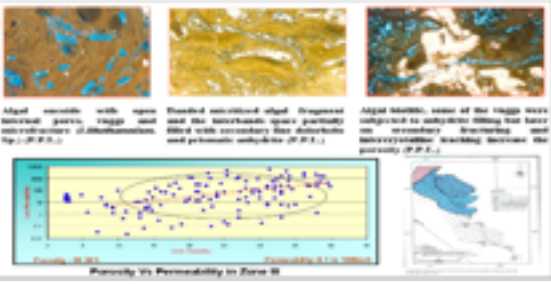
Zone 1 Sandy Mudstone to Wackstones (Biomicrite)



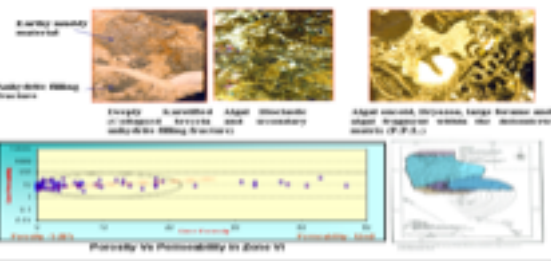
Zone 2 Dolomitic Packstone (Molluscan Biomicrite)



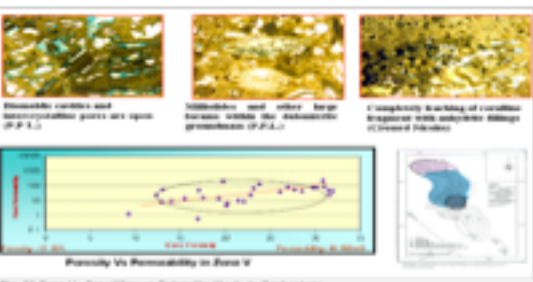
Zone 3 Fossiliferous Packstones to Boundstones (Algal Biomicrite)



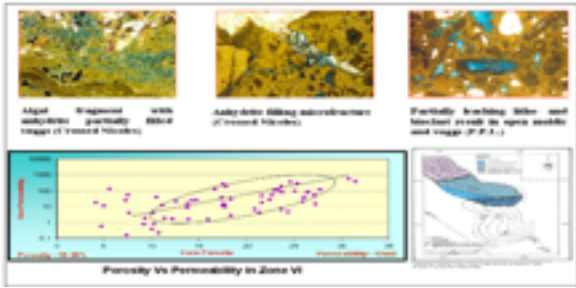
Zone 4 Deeply Weathered Dolomitic Wackstones to Packstones (Biomicrite)



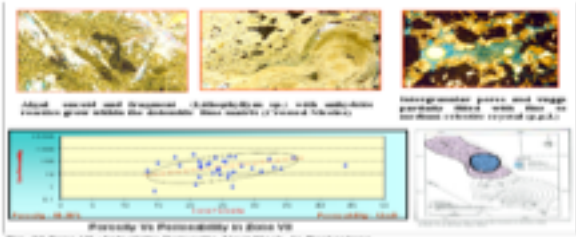
Zone 5 Fossiliferous Dolomitic Wackstones to Packstones (Biomicrite)



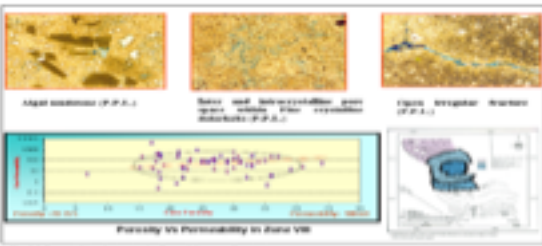
Zone 6 Anhydritic Fossiliferous Packstones to Boundstones (Algal Biomicrite)



Zone 7 Anhydritic Dolomitic Wackstones to Packstones (Algal Biomicrite)

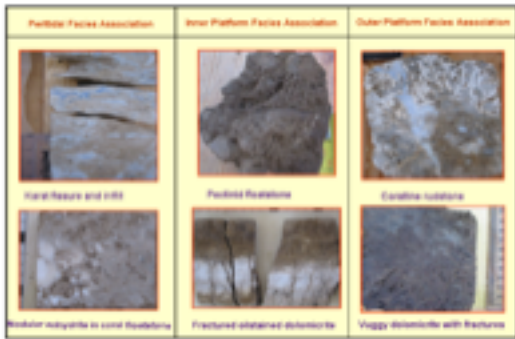


Zone 8 Anhydritic Dolomitic Packstones (Biomicrite)



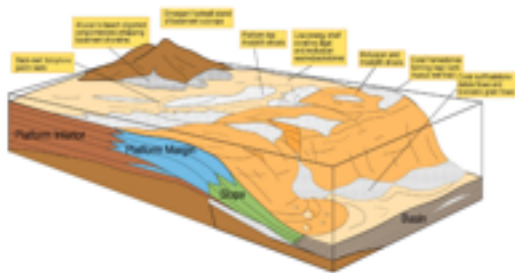
The post-depositional history of the “Nullipore” reservoir is complex. It is composed of several diagenetic processes (pre-uplift and post-uplift) that have greatly affected their reservoir properties.

These changes are either porosity-destructive or porosity-constructive, which has resulted in an extremely heterogeneous reservoir rock.

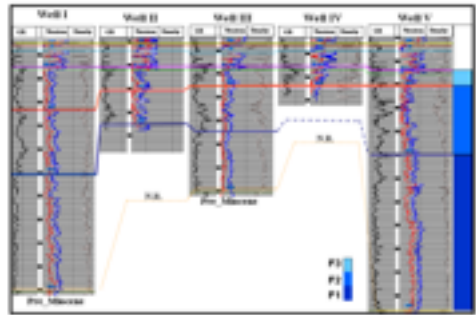
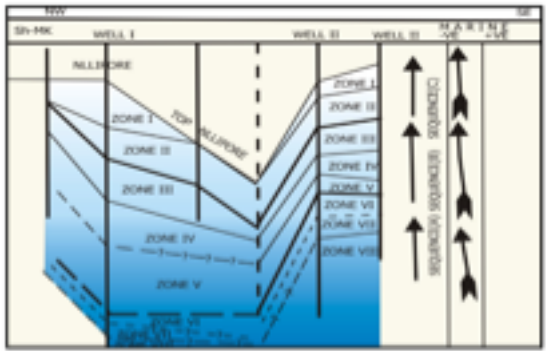


The facies associations indicate a relatively low energy, mud dominated peritidal region passing seaward to a platform interior area of muddy lime sands and lime muds and then to a more open marine outer platform region. A facies and facies association reveal that the “Nullipore” depositional environment can be subdivided into peritidal, inner, and outer platform environments.

Facies model for Ras Fanar field “Nullipore” sequence has been assessed along the following profile.

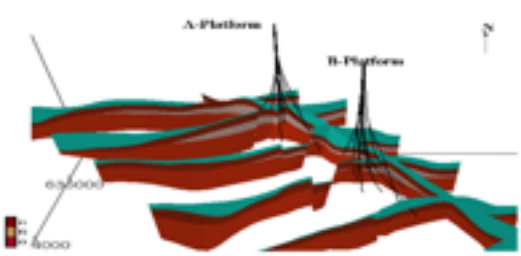
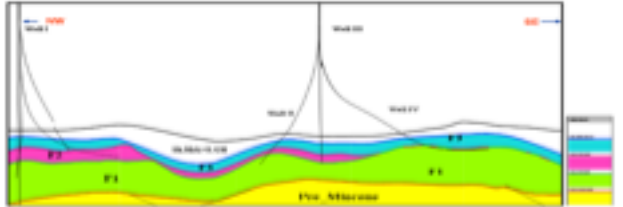


The lithofacies characteristics of this “Nullipore,” its floral content and structural setting indicate that the “Nullipore” can be broadly divided (from bottom to top) into three regressive sequences. The boundaries of these sequences coincide with those of the delineated electro-lithofacies zones.

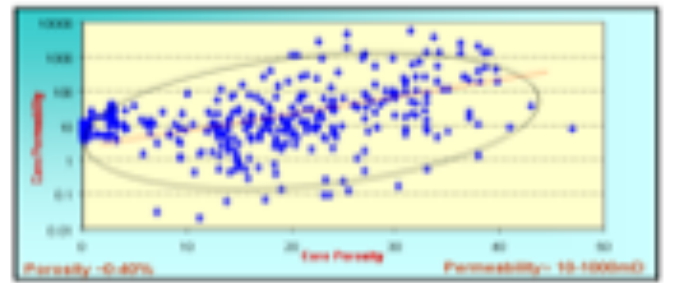
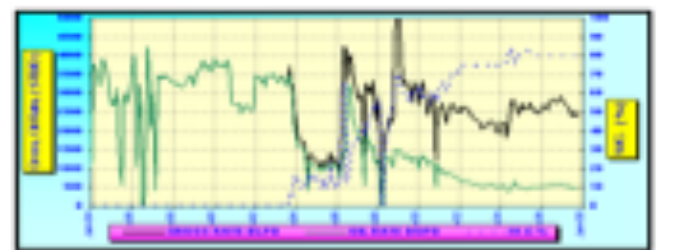
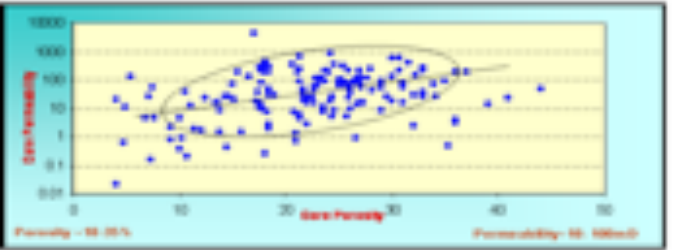
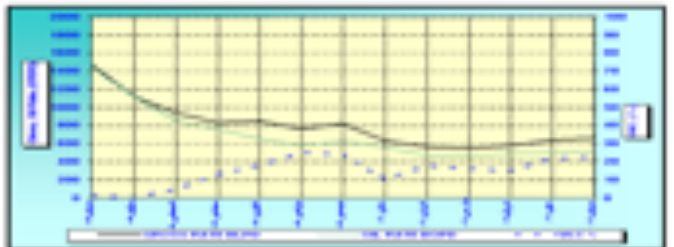


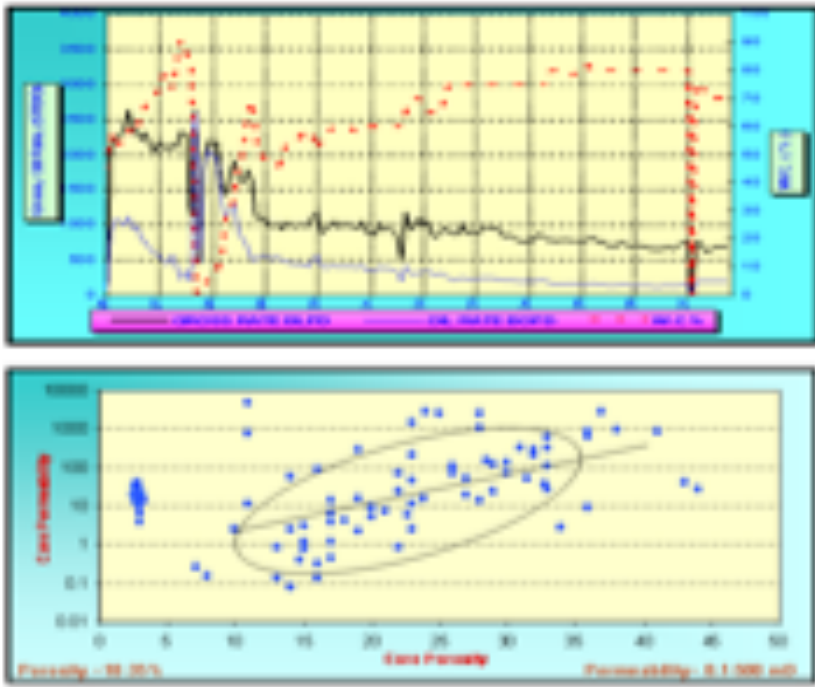
However, these sequences represent environmental variations from inner to mid ramp. Some wells show a complete regressive sequence of inner-to mid-ramp.

Hence, the “Nullipore” reservoir can be subdivided, for simplicity, into three main facies F1, F2, and F3. It has been assessed along the following profiles.

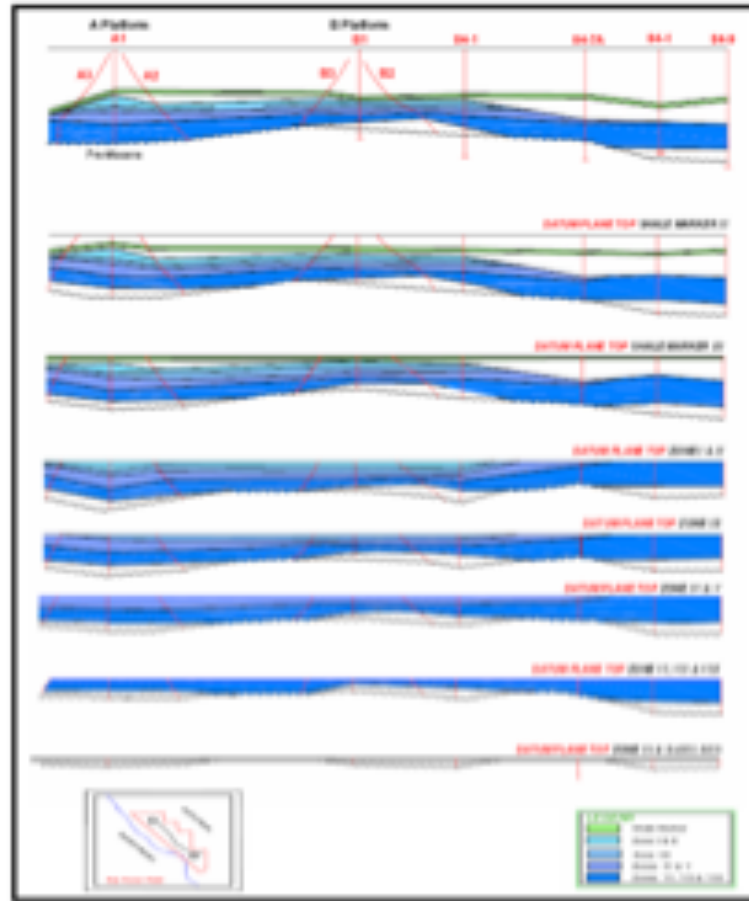


Porosity/ Permeability cross plots and Gross/Net Oil/W.C % against time were constructed to evaluate the production performance of each facies.





These relationships reveal that the best production performance is clearly related to the oil produced from "Nullipore" of Facies 2. This is due to its porosity (average 35%) and permeability (average 600m D.) reflecting a good reservoir.



RESULTS and CONCLUSIONS:

- It is concluded that the marine model is the most acceptable one for the environmental modeling of the "Nullipore" sequence.
- The depositional history of Ras Fanar field Nullipore sequence has been assessed along the following NW-SE profile
- Petrophysically, petrographically and sedimentologically, the "Nullipore" sequence can be subdivided (from top to bottom) into 8 lithofacies zones that represent more or less successive sedimentary cycles.
- Mapping of the delineated Lithofacies zones and Isochore map for the "Nullipore" sequence reflect general westward increase in thickness and the Isochore map of the underlying anhydrite shows an eastward increase in thickness.
- The porosity/permeability and density/neutron relationships reveal that the typical "Nullipore" reservoir is that of a unit with a porosity of 20-30% and permeability of 0.1 to 1000 m D.
- Detailed petrographic examination

tion of the Nullipore" sequence shows that its post-depositional history is complex as it comprises several diagenetic processes (pre-uplift and post-uplift) that largely affected the reservoir properties. These changes are either porosity-destructive or porosity-constructive which has resulted in an extremely heterogeneous reservoir rock.

- Environmentally, the "Nullipore" sequence is of proper marine conditions suitable for reef and the diagenetic history reflects the main role of the fluctuations in the hydraulic meteoric/marine interfaces.
- The vertical distribution of the distinct facies indicates a cyclic sedimentation pattern for the Nullipore.

- The "Nullipore" reservoir can be subdivided, for simplicity, into three main facies F1, F2 and F3 and the best production performance is clearly related to the oil produced from Facies 2.

RECOMMENDATIONS:

It is highly recommended to drill wells that encounter the Facies 2 formation type to get the highest production performance.



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Projects and Exploration Manager, **La Societe Global Petroleum**



Mohamed Al-Amir Al-Khiat
Inspection Section Head (Acting Department Asset Integrity Department), **Qarun Petroleum Company, JV Apache Corporation, USA**



Sherif Amin
HSE Director, **PICO Petroleum Company**



Zakarya Hiba
Asset Integrity Head, **Saudi Aramco**

Attend this conference to:

- **Ensure** correct design, construction and operation of the whole life-cycle of the asset through case study presentations to minimise costs of remedial work and equipment replacement
- **Learn** the importance of incorporating asset management (ISO 55001) and Risk Based Inspection (RBI) in Asset Integrity Management (AIM) for greater plant safety and optimisation
- **Consider** the latest RBI, corrosion, coatings, In-line Inspection (ILI) and NDT technologies and innovations to protect and extend the life-cycle of the assets
- **Upgrade** inspection and turnaround planning through value-added methodologies to support the decision making process over the life-cycle of the asset
- **Develop**, optimise and manage effective maintenance programmes for new and in-service assets based on risk and cost-benefit principles to enhance production of assets

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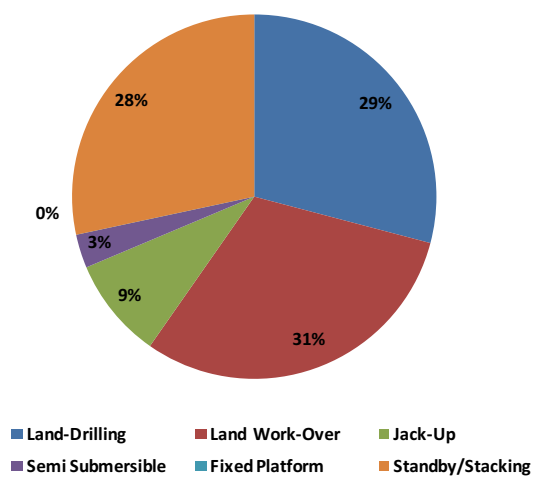
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Rigs per Specification October 2015



EGYPT STATISTICS

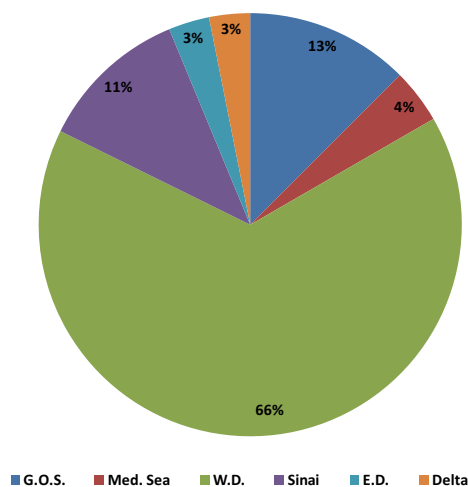
Egypt Rig Count per Area - October 2015

Area	Total	Percentage of Total Rigs
Gulf of Suez	12	13 %
Mediterranean Sea	4	4 %
Western Desert	63	66 %
Sinai	11	11 %
Eastern Desert	3	3 %
Delta	3	3 %
Ganoub El Wadi	0	0 %
Total	96	100%

EGYPT
OIL & GAS
RESEARCH & ANALYSIS

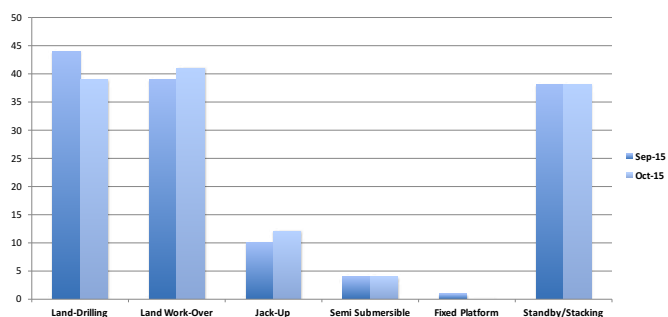


Rigs per Area October 2015 (Total of 96 Working Rigs)

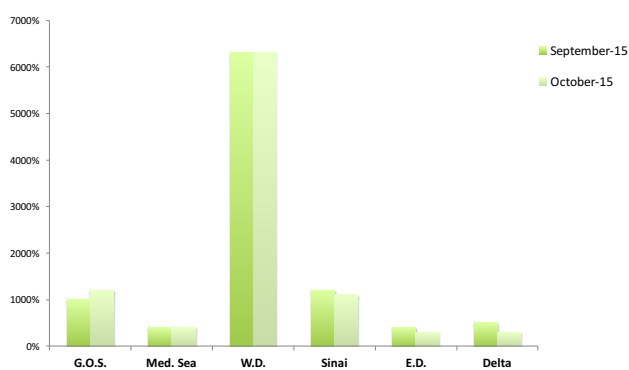


	Oil Barrel			Equivalent Gas Barrel			Condensate Barrel			Liquefied Gas Barrel		
	September-13	September-14	September-15	September-13	September-14	September-15	September-13	September-14	September-15	September-13	September-14	September-15
Med. Sea				19509464	15453929	12060000	1146947	814751	661138	360500	312008	236887
E.D.	2527618	2110996	1993134	59821	43214	27143	3295	3123	1908	9439	7829	5574
W.D.	9055637	9214904	10114972	6935179	6879643	7710536	1311602	1326412	1580931	684056	505461	626152
GOS	4237517	4292766	4028021	412143	474107	510536	70522	68237	71388	207904	238435	254319
Delta	62846	35602	36453	1927143	2309107	2381964	167808	175834	150341	117106	109206	112076
Sinai	2045814	2165543	2141199	15536	5357		31821	29465	28500	87116	71441	66673
Upper Egypt	11513	9815	9145									
Total	17940945	17829626	18322924	28859286	25165357	22690179	2731995	2417822	2494206	1466121	1244380	1301681

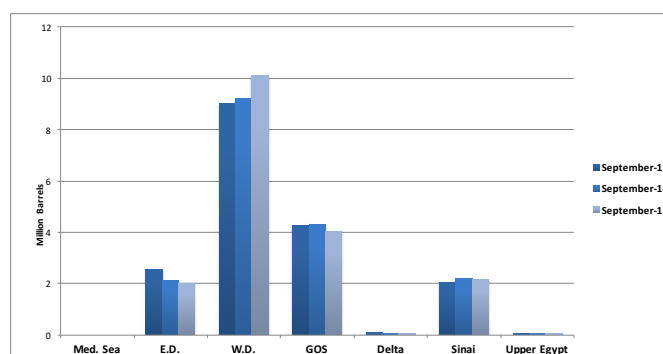
Rigs per Specification September 2015 - October 2015



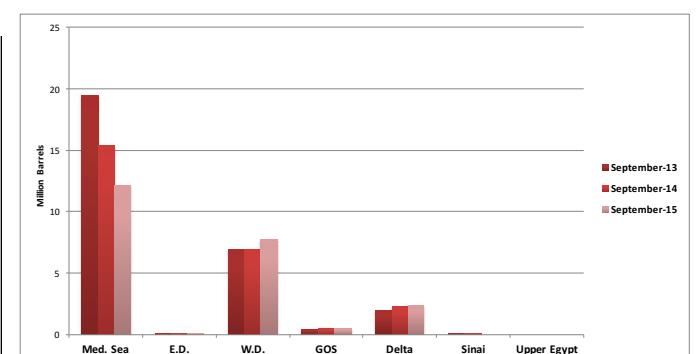
Rigs per Area September 2015 - October 2015



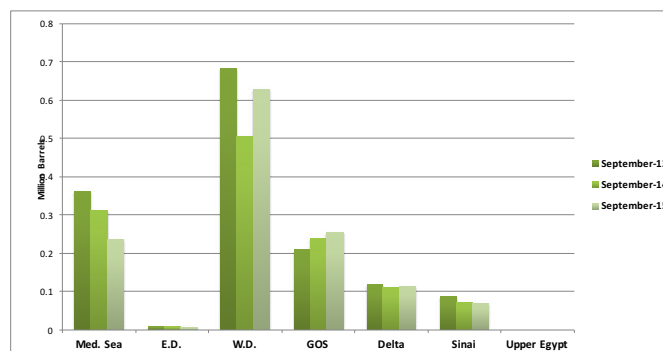
Oil Production September 2013 - 2015



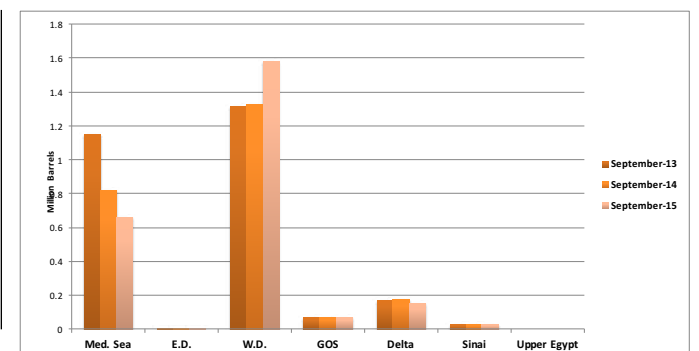
Equivalent Gas Production September 2013 - 2015



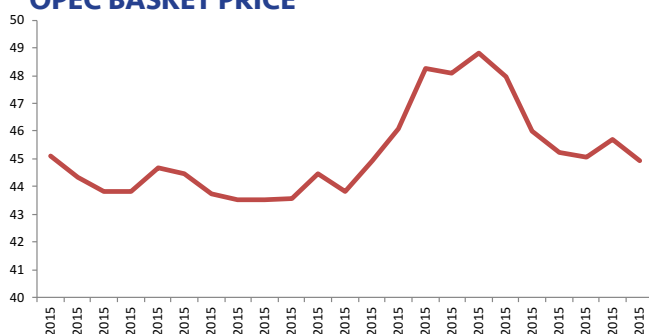
Liquefied Gas Production September 2013 - 2015



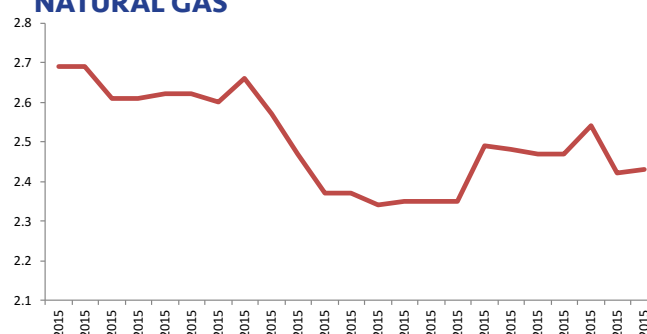
Condensates Production September 2013 - 2015



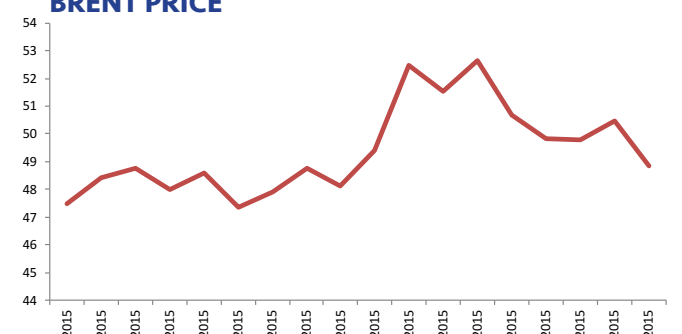
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NATURAL GAS

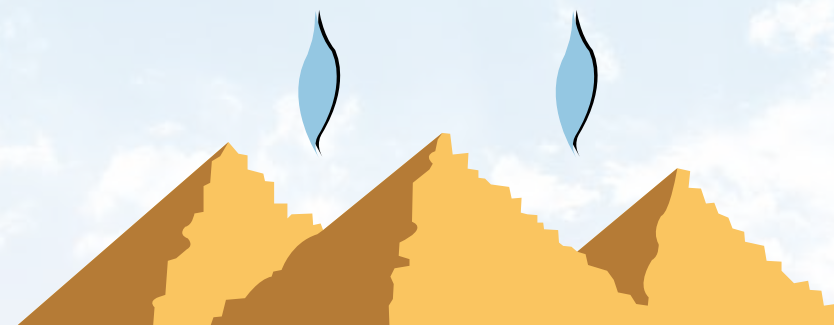


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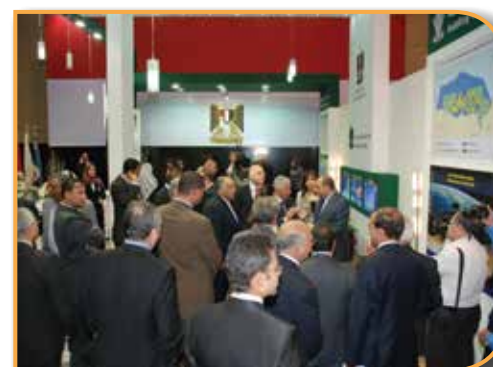


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