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ENHANCING UPSTREAM ACTIVITIES THROUGH SUSTAINABLE PRACTICES

UNDER THE HIGH PATRONAGE OF **HE. ENG. TAREK EL MOLLA** MINISTER OF PETROLEUM & MINERAL RESOURCES - ARAB REPUBLIC OF EGYPT

4TH UPSTREAM TECHNICAL CONVENTION

UNLOCKING VALUE **IN AN UNCERTAIN UPSTREAM ENVIRONMENT**

31 OCTOBER - 2 NOVEMBER 2021

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EDITOR'S LETTER

Onsite Events are Back

Since Egypt Petroleum Show (EGYPS) 2020, most of Egypt's petroleum events were canceled, postponed or held online. October is going to be a special month, as the fourth edition of the Upstream Technical Convention will take place between 24-26. The event is organized by Egypt Oil & Gas under the high patronage of H.E Eng. Tarek El Molla, Minister of Petroleum and Mineral Resources. We are looking forward to seeing you all.

Thus, EOG's October issue is dedicated to discuss different upstream related topics. In our industry insights section, we highlighted the upstream sustainable practices. Our Research and Analysis team prepared a full report analyzing Egypt's journey towards lower CO2 emissions.

In addition, our energy economics section discussed the future of green hydrogen as part of Egypt's energy mix. The overview of the month is explaining the reasons behind the Egyptian success in being a global Liquified Natural Gas (LNG) trader.

Wish you all an informative reader!

MAHINAZ EL BAZ
Acting Editor-In-Chief
Research & Analysis Manager

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EGYPT'S LEADING OIL & GAS MONTHLY PUBLICATION

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TOP 5

PETROLEUM, PLANNING MINISTRIES SIGN NATURAL GAS PROTOCOL

Minister of Petroleum and Mineral Resources, Tarek El Molla, and Minister of Planning and Economic Development, Hala El Said, witnessed the signing of a new protocol to finance natural gas connection projects.

The financing protocol was signed by Ahmed Kamali, Undersecretary for the Ministry of Planning, and Magdy Galal, Chairman of the Egyptian Natural Gas Holding Company (EGAS).

The total cost of the first phase of the project to connect the natural gas grid to 4 million housing units in the targeted villages was estimated at over EGP 17 billion, EL Said pointed out.

PETROMAINT ACQUIRES NEW CONTRACT IN IRAQ

Egypt's Alexandria Petroleum Maintenance Company (Petromaint)'s branch in Iraq achieved a new milestone by acquiring its second contract in Iraq this year.

The contract will allow the training of nearly one hundred engineers through specialized technical courses for Exxon Mobil in the sister country of Iraq

This comes in line with the directions of the political leadership and Minister of Petroleum and Mineral Resources, Tarek El Molla to expand the companies' activities outside Egypt. It further comes in continuation of the recent success of Petromaint's branches outside Egypt.

The contract was signed by Petromaint chairperson and managing director, Ahmed Fouad, at the company's headquarters in Alexandria.

SISI, ANASTASIADES HIGHLIGHT IMPORTANCE OF EXPEDITING WORK ON GAS PIPELINE

President Abdel Fattah al-Sisi and his Cypriot counterpart Nicos Anastasiades emphasized, during their meeting in Cairo, the importance of expediting the implementation of the pipeline project that will connect the Cypriot Aphrodite field to the Egyptian liquefaction stations in Idku and Damietta.

The two leaders held bilateral talks prior to the joint Higher Governmental Committee between Egypt and Cyprus, which is held for the first time at the presidential level.

The meetings of the Higher Governmental Committee reviewed various aspects of bilateral cooperation between the two countries, especially in areas that hold promising opportunities.

PRIME MINISTER, SIEMENS CEO DISCUSS GREEN HYDROGEN DEVELOPMENT IN EGYPT

Egyptian Prime Minister, Mostafa Madbouly, held a meeting with Siemens's CEO, Christian Bruch, to discuss green hydrogen development in Egypt.

Madbouly started the meeting by welcoming the Siemens delegation, praising the distinguished relations with Siemens, and the long history of partnerships in various fields.

Following the meeting, Madbouly and Shaker witnessed the signing of a memorandum of understanding (MoU) between the Egyptian Electricity Holding Company (EEHC) and Siemens.

The MoU comes within the framework of implementing Egypt's strategy to expand the fields of green energy, increase the contribution of renewable energy in the energy mix, and the attention given by the energy sector to diversifying sources of electricity production and benefiting from Egypt's natural wealth, Egyptian Cabinet Spokesman, Nader Saad, noted.

EGYPT, JAPAN SIGN BLUE AMMONIA MOU

Minister of Petroleum and Mineral Resources, Tarek El Molla and Deputy Japanese Ambassador in Cairo, Matsubayashi Kenichiro, witnessed the signing of blue ammonia production MoU.

The MoU was signed by the Egyptian Natural Gas Holding Company (EGAS)' chairman, Magdy Galal, the Egyptian Petrochemicals Holding Company (ECHEM)'s chairman, Saad Helal, and Toyota Tsusho Corporation Executive Consultant Yoshihiro Inoue.

According to the MoU, economic feasibility studies will be conducted and the best available opportunities in the oil and gas sector will be studied to implement projects for extracting and storing carbon dioxide to produce blue ammonia using the latest Japanese technologies.

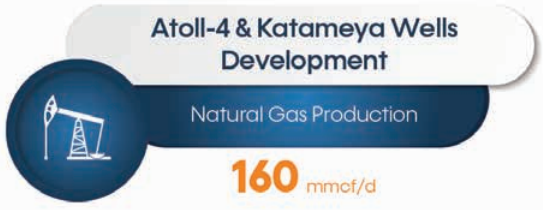
A BLAST FROM THE PAST

In October 2016, the Egyptian General Petroleum Corporation (EGPC) signed a farm-out agreement with Kuwait Energy company to acquire a stake of 20% from the SIBA oil field in Iraq. SIBA filed is located at Block 9 in Basra governorate at Southern Iraq. The field was discovered in 1968 with estimated reserves of 1.5 trillion cubic meters (tcm)of natural gas. The field was successfully tested in 2014.

The field is developed by Kuwait Energy company as the operator holding a stake of 25%, TPAO company taking 30%, Maysan Oil company holding 25% while the remaining 20% was given to EGPC. The agreement signed between Kuwait Energy and EGPC stated that peak production rates would be 100 million standard cubic feet per day (mmscf/d) and the two companies will receive $7.50 per barrel of oil equivalent (boe). This means that the two companies will receive $130,000 per day when it reaches to its peak.

The field started production in 2018 with initial output of 25 mmscf. Moreover, Petrojet company has been awarded the first engineering, procurement and construction (EPC) project in SIBA field for constructing a central processing facility (CPF) to produce 110 mmscf/d of processed gas. In 2017, it also announced that it finished design, fabrication, heat treatment, testing, delivering and installation of a liquefied petroleum gas (LPG Bullet) in the SIBA project.

NUMBER OF THE MONTH



Atoll-4 and Katameya wells development has had an increase in natural gas production to **160** million cubic feet per day (mmcf/d), since December **2020**. The two wells' drilling and completion processes were a part of the Ministry of Petroleum and Mineral Resources' (MoP)'s plan in field development projects.

Both wells are located in the North Damietta offshore concession in the Nile Delta. The Atoll field was discovered in March **2015** with an initial production of **350** mmcf/d of natural gas and **9,000** barrels per day (bbl/d) of condensates.

The Katameya field was discovered in **2017** and its first production was in October **2020**. Katameya field development costs reached USD **124** million in **2020**.

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HE. ENG. TAREK EL MOLLA

MINISTER OF PETROLEUM & MINERAL RESOURCES - ARAB REPUBLIC OF EGYPT

PART OF THE EGYPTIAN OIL AND GAS SECTOR
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AGREEMENTS

MOP SIGNS FOUNDERS AGREEMENT FOR MISR METHANOL AND PETROCHEMICALS COMPANY

Minister of Petroleum and Mineral Resources, Tarek El Molla, witnessed the signing of the founders' agreement for the Misr Methanol and Petrochemicals Company.

Helwan Fertilizer and Abu Qir Fertilizers companies will own a 35% stake for each, while Al Ahly Capital Holding Company will hold the remaining 30% stake.

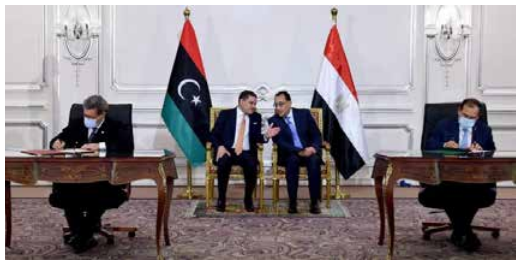
The investment cost of the first phase amounts to 1.6 billion, and it will have a production capacity of 1 million tons of ethanol and 400,000 tons of Ammonia per year.

The project is set to be established in the Suez Canal Economic Zone (SCZone), in Ain Sokhna.

EGYPT, LIBYA SIGN PETROLEUM COOPERATION MOU

Minister of Petroleum and Mineral Resources, Tarek El Molla signed a memorandum of understanding (MoU) with Libya's Minister of Oil and Gas Mohamed Oun, to boost cooperation between the two countries in terms of oil and gas.

The MoU was signed at the conclusion of the eleventh session of the Egyptian-Libyan Joint Higher Committee headed by Mostafa Madbouly, Egypt's Prime Minister, and Abdul Hamid Dbeibeh, Prime Minister of Libya.



During the Joint Higher Committee meeting, the two North African countries signed a total of 14 MoUs and 6 agreements in various fields.

EMRA, NIOF SIGN COOPERATION PROTOCOL

The Egyptian Mineral Resources Authority (EMRA) signed a cooperation protocol with the National Institute for Oceanography & Fisheries (NIOF).

The protocol was signed by EMRA's Chairman, Khaled El Sheshtawy, and NIOF's President, Amr Hamouda, in attendance of Minister of Petroleum and Mineral Resources, Tarek El Molla and Minister of Higher Education and Scientific Research, Khaled Abdel Ghaffar.

The protocol comes within the framework of the extended and fruitful cooperation between the two ministries to exchange expertise and jointly benefit from scientific, practical and technological expertise, especially in vital sectors such as mining.

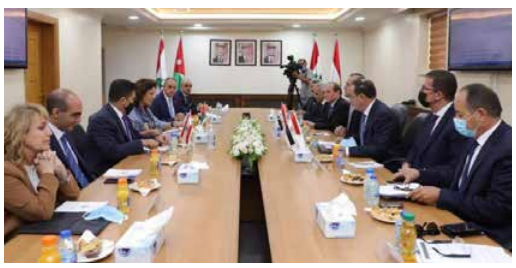
NATURAL GAS

ARAB ENERGY MINISTERS SET ROADMAP TO DELIVER EGYPTIAN GAS TO LEBANON

Energy Ministers of Egypt, Jordan, Syria and Lebanon agreed to deliver Egyptian natural gas to Lebanon via Jordan and Syria, and to present an action plan and timetable for implementation.

The meeting was attended by El Molla, Hala Zawati, Jordanian Minister of Energy and Mineral Resources, Raymond Ghajar, Lebanese Minister of Energy and Water, and Bassam Tohme, Syrian Minister of Oil and Mineral Resources.

"Egypt is working to speed up coordination for the arrival of Egyptian natural gas to Lebanon through Jordan and Syria as Egypt is keen on easing the burdens of the Lebanese people and



on contributing to Lebanon's support and stability," El Molla said.

EL MOLLA: NATURAL GAS STATIONS EXPANSION PROGRAM GOING AS PLANNED

During a regular meeting to follow up on the natural gas station expansion program, Minister of Petroleum and Mineral Resources Tarek El Molla stated that the efforts involved in increasing the number of fueling stations across the country are going according to plan.

This initiative is aligned with a presidential directive to expand and promote usage of natural gas as car fuel since it is less costly and more environmentally responsible. It was also noted during the meeting that the use of natural gas had already witnessed a recent increase.

FUEL

PRIME MINISTER FOLLOWS UP PRESIDENTIAL INITIATIVE TO CONVERT VEHICLES TO RUN ON CNG

Prime Minister, Mostafa Madbouly, held a meeting to follow up on the execution of the presidential initiative to replace old cars and convert vehicles to run on natural gas.

This is to keep track of the steps that have been taken in this regard, and the rates of car delivery to citizens.

Madbouly noted that the initiative was expected to witness an increase in demand, but what has been done, so far, indicates that the delivery rates are proceeding unsatisfactorily.

This needs to take faster measures to increase the delivery rates according to the clear directives from the president in this regard.

EGYPT TREASURY SPENDS EGP 115 M ON VEHICLE REPLACEMENT INITIATIVE

Egypt's Public Treasury has spent EGP 115 million in green incentives to replace 5,000 obsolete taxis and private cars as well as 180 minibuses with natural gas vehicles, Minister of Finance Mohamed Maait announced.

He added that 300 minibuses will be delivered to beneficiaries during September.

"This initiative serves as a model of developmental partnership with the private sector, aimed at boosting domestic vehicle manufacturing, increasing production capacity and maximizing local components in all industries," Maait remarked.

Most importantly, the initiative also intends to stimulate green economy-related projects, thus, raising Egypt's economic growth and mitigating the impacts of carbon emissions.

EL MOLLA INAUGURATES NEW INTEGRATED FUEL STATION IN ALEXANDRIA

Minister of Petroleum and Mineral Resources, Tarek El Molla inaugurated an integrated fueling station in El Max neighborhood in Alexandria, after developing it to provide compressed natural gas (CNG) fueling option, the ministry said in a statement.

The station, operated by Cooperation Petroleum Company (Copetrole) and Cargas, is compatible with the ministry's program to spread CNG car fueling stations. The program aims at developing current fuel stations are developed to provide natural gas services, El Molla pointed out.

The development of the station, which is located near the port of Alexandria, also aims to keep pace with the current developments and expansion witnessed by the port and to provide distinguished services that meet the needs of the port, El Molla noted.

GENERAL ASSEMBLY

PHARAONIC PETROLEUM GAS OUTPUT REACHES 162 BCF IN FY 2020/21

Pharaonic Petroleum Company's total gas output reached 162 billion cubic feet (bcf) during FY 2020/21, the company's chairman, Essam Eldeen El Agrawy, stated.

The company's production levels exceeded the fiscal year's plans, according to El Agrawy, who noted that the overall output of condensates reached 3.3 million barrels.

The company succeeded in decreasing the natural decline in production and developed the daily production levels. It further boosted the efficiency of the processing

station, which had a positive effect in preserving the production stability.

In the field of projects, the drilling and completion of Atoll-4 and Kattameya wells have been completed, which has contributed to the addition of 160 million cubic feet per day (mscf/d) of gas since December 2020, EL Agrawy noted.

PETROGAS RESULTS SHOW STRONG PERFORMANCE IN 2020/21

Petroleum Gas Company (PETROGAS) provided 3.7 million tons of butane in 2020/21, the Head of the Company, Raafat Abdel Hady, announced during the General Assembly meeting, chaired by Minister of Petroleum and Mineral Resources, Tarek El Molla.

Abdel Hady reviewed the performance of the company and shed light on its accomplishments, which include modernizing the loading and unloading processes of butane tank trailers and installing smart control links "Q.C" at regional

filling stations, fields, and tanker trailers.

In addition, the company has increased the cylinder distribution outlets to a total of 3092 throughout the country.

AGIBA PETROLEUM GAS PRODUCTION RECORDS 17 MCF/D IN FY2020/21

Agiba Petroleum Company's average production of natural gas reached 17 million cubic feet per day (mcf/d) during FY 2020/21, Ahmed Mostafa, Agiba Petroleum's Chairman, stated.

This comes as El Molla chaired the general assembly meeting of Agiba Petroleum, through video conference, to review the company's performance in FY2020/21.

The company's investments reached $269 million during the FY, Mostafa noted, adding that Agiba produced an average crude oil production recorded 40,000 barrels per day (bbl/d).

Agiba added around 6 million barrels of crude oil and 4.2 billion cf of natural gas to its recoverable reserves.

RASHPETCO, BURULLUS ATTAIN 405 MCF/D NATURAL GAS OUTPUT IN FY2020/21

Rashid Petroleum (Rashpetco) and Burullus Gas Company's natural gas total output reaches 405 mcf/d in FY 2020/21, the company's chairman, Mohamed Samir, said.

This came during the general assembly meeting chaired by Minister of Petroleum and Mineral Resources, Tarek El Molla, via video conference, to review the company's performance in FY2020/21.

The company further produced 9,600 barrels per day (b/d) of oil condensates, despite the challenges imposed by the Coronavirus Pandemic.

EL MOLLA REVIEWS PETROLEUM GRID PERFORMANCE

The Egyptian petroleum grid was used to transport around 60 million tons of crude oil, condensates, petroleum products, and butane in FY 2020/21.

This included about 28 million tons of crude oil and condensates, and 31.8 million tons of petroleum products and butane gas, with total revenues of around EGP 2.8 billion, a 12% increase compared to the previous year.

Petroleum Pipelines Company (PPC) Chairman, Mohamed Maged, reviewed the efforts exerted to develop the Egyptian crude oil and petroleum products transporting grid during the general assembly meeting chaired by Minister of Petroleum and Mineral Resources, Tarek El Molla to review the company's performance during 2020/21.

PETROLEUM FACILITIES

SISI VISITS PETROLEUM FACILITY IN ALEXANDRIA PORT

Egyptian President, Abdel Fattah El Sisi, visited and followed up on the oil and gas facility in the Alexandria Port.

Minister of Petroleum and Mineral Resources, Tarek El Molla welcomed the president, stating that based on the presidential directives to turn Egypt into a regional oil and gas trading hub, the oil and sector set a plan, five years ago, to develop all the petroleum ports.

Egypt was able during the period from 2015 to 2021 to boost ports' capacities by 85%, increasing from 45 million tons/year to 76 million tons per year, El Molla noted, adding that the development is ongoing.

NEW LOGO

MODERN GAS LAUNCHES NEW LOGO

Modern Gas Company has launched its new logo with a modern design that expresses the ambitious vision for the future of the company.

The company has also taken a verbal slogan for its activities, "We work together for a better future," which reflects concerted efforts to achieve the strategy of the Ministry of Petroleum and Mineral Resources to expand the delivery of natural gas to households.

Modern Gas' current activities are covering the fields of natural gas delivery to houses, commercial and industrial facilities, after its establishment as a new entity from the merger of the regions gas companies, Cairo Gas and Sinai Gas, the company's chairman, Mohamed Kandil, stated.

REFINING

EL MOLLA INSPECTS MIDOR REFINERY, MIDTAP PLATFORM IN ALEXANDRIA

Minister of Petroleum and Mineral Resources, Tarek El Molla has inspected the workflow at Middle East Oil Refinery Company (Midor) and the Middle East Oil Tankage & Pipelines Company (MIDTAP) platform in Deikheila Port in Alexandria.

El Molla's visit aimed to check the progress in both sites that targets increasing the production capacity of high-quality petroleum products that match the highest international standards.

During his visit to the MIDTAP platform, El Molla affirmed the ministry's continuous support to the petroleum sector infrastructure capabilities.

Besides building new projects, the ministry is supporting the established projects with the most recent technologies as well as enhancing the health, safety and environment (HSE) measures to achieve the national target of converting Egypt into a regional hub for trading oil and gas.

ENAP

ENAP SIPETROL ACHIEVES EARNINGS OF ALMOST $60 M IN THE FIRST SEMESTER OF 2021

The first-semester net income of Enap Sipetrol reached $ 57.1 million, completing three years with good results which had not been recorded since 2014.

The subsidiary, founded in 1990 which has branches in Ecuador, Egypt and Argentina expect to reach results during 2021 similar or even higher than pre-pandemic levels, the net income of this first semester was led by Ecuador, with profits of $ 36 million. It was followed by Egypt, with almost $ 17 million, and Argentina, with about $ 4 million.

In 2019, prior to the COVID-19 pandemic, Enap Sipetrol reached its highest historical production level, with a net income of $ 73.5 million. Last year, despite the health crisis, the company managed to maintain its operations and production in all its subsidiaries, reaching a net income of $ 73.3 million, thanks to optimization and cost management measures and the rigorous prioritization of high-return investments within the portfolio. Along with this, proven oil and gas reserves have grown by more than 220% between 2010 and 2020, thanks to the contribution of cash flows generated by each subsidiary that allowed self-financing of new investments and projects.

ENERGEAN

ENERGEAN PRODUCTION FROM EGYPT REACHES 31.4 KBOED IN H1 2021

Energean Egypt's working interest production from the Abu Qir area averaged at 31, 400 barrels of oil equivalent per day (31.4 kboed), of which 87% were gas, during 1H 2021 with full-year production guidance maintained at between 27 – 30 kboed.

The company's total actuals in the first six months of 2021 recorded 44 kboed, from Egypt, Italy, Greece and Croatia, as well as UK.
The shallow-water NEA/NI satellite tie-back project is progressing in line with expectations; one well is anticipated to produce its first gas in H2 2022, while the remaining three wells are expected in Q1 2023.
The project was sanctioned in January 2021 and an EPCI contract for the four subsea wells and the associated tie-back to the Abu Qir platform and associated infrastructure was awarded to TechnipFMC in 1Q 2021.

UOG

UOG PRODUCES 2730 BOE/D FROM ABU SENNAN IN H1 2021

United Oil & Gas (UOG) produced an average of 2730 barrels of oil equivalent per day (boe/d) from Abu Sennan license in Egypt during H1 2021. UOG production came higher than H1 guidance, which was between 2300 and 2500 boe/d.

The company owns 22% net working interest in the Abu Sennan license, which has 7 producing wells. UOG further reported 3 successful wells in H1 2021, the ASH-3 and AJ-8 development wells, as well as the ASD-1X exploration well. Moreover, the company had a successful workover at the ASH-1ST2.

TAQA POWER

EIGHTEEN, TAQA POWER SIGN LONG-TERM AGREEMENT FOR ENERGY SOLUTIONS

EIGHTEEN, a joint real estate venture of Egypt-based Ora Developers, and Saif Group and Kohistan Builders (KBD) of Pakistan, has signed an agreement with TAQA Power for the electrification of "EIGHTEEN project" and to put in place an effective distribution network to meet the developers needs with a highly reliable & effective power solutions.
Located just 10 minutes from the New Islamabad International Airport, the grand project occupies a focal place in the twin cities.

Under the agreement signed between Eighteen's CEO Tarek Hamdy and TAQA Power's Managing Director, Samy Abdelkader, TAQA Power will provide the full energy solution for EIGHTEEN which includes designing and building of a distribution network as well as a power source, including backup generation and solar plant for both a reliable and green solutions for Eighteen's customers.

CAIRN ENERGY

CAIRN ENERGY TO COMPLETE SHELL EGYPT ACQUISITION IN Q3 2021

Cairn Energy PLC is expecting to complete the acquisition of Shell Egypt's Western Desert assets in Q3 2021.The transaction was pending regulatory and governmental approvals.

"Our significant acquisition in Egypt, which we expect to complete shortly, adds material gas-weighted production, low-cost, near-term growth and attractive exploration potential, in a region with strong demand trends. We intend to use our differentiated financial flexibility to add further scale to our production base and look forward to the next phase of strategic delivery," Simon Thomson, Chief Executive at Cairn Energy PLC, said.

SHELL

EGYPT CLAIMS FIRST RUNNER-UP IN SHELL INTERNATIONAL COMPETITION 'IMAGINE THE FUTURE'

The American University in Cairo AUC-07 team has claimed the first runner-up position in Shell's "Imagine the Future" global competition for the 2020/2021 season.

The competition was held virtually on August 26th, where the team presented their project which discussed the future of the Egyptian city of Alexandria in 2050. The AUC-07 team qualified after winning the local competition, claiming the title after competing with over 800 students from 61 teams. It is worth mentioning that a team from Thailand won first place in the global competition.

Shell's "Imagine the Future" competition is part of the company's social investment initiatives. The competition aims to support creative and innovative thinking among university students and convey their vision of the future. The AUC team presented scenarios and ideas that provide more efficient and sustainable energy solutions for the challenges that Egypt could be facing by 2050.

ADNOC

ADNOC DRILLING, HELMERICH & PAYNE ENTER INTO STRATEGIC ALLIANCE

The Abu Dhabi National Oil Company (ADNOC) and its subsidiary ADNOC Drilling Company (ADNOC Drilling) along with Helmerich & Payne, Inc. (H&P) have announced formation of strategic alliance.

According to the transaction, ADNOC will acquire eight FlexRig® land rigs from H&P worth $86.5 million and H&P will make a $100 million cornerstone investment into ADNOC Drilling's recently announced Initial Public Offering (IPO).

The statement elaborated that this alliance will support ADNOC's target of reaching 5 million barrels per day (mmbbl/d) production capacity and gas self-sufficiency for the UAE by 2030, along with its plans to unlock its unconventional oil and gas resources.

It also will empower the company in driving operational excellence through maintenance efficiencies, supplementing supply-chain capabilities, and adding engineering and rig design competencies

ADNOC DRILLING TO SELL 7.5% OF SHARES THROUGH IPO

Abu Dhabi National Oil Company (ADNOC) Drilling Company announced that it plans to offer 7.5% of its shares through initial public offering (IPO) to be listed for trading on the Abu Dhabi Securities Exchange (ADX).

The company elaborated that 7.5% of its shares will be included in the Offering to individuals and other investors in the UAE and to ADNOC Group Companies Employees and ADNOC Group UAE National Retirees (as defined in the UAE Prospectus) (as part of the UAE retail offering) and to qualified institutional and other investors (as part of the qualified investor offering).

The statement noted that ADNOC or the selling shareholders have the ability to increase the size of the offering at any time before pricing of the Offering.

ADNOC ANNOUNCES OFFER PRICE PER SHARE FOR ADNOC DRILLING IPO

The Abu Dhabi National Oil Company (ADNOC) announced that it has set the offer price per share for the initial public offering (IPO) of ADNOC Drilling Company at AED2.30, implying an equity value of $10 billion.

The statement elaborated that the company set this price after seeing strong demand from local and international investors for the shares before the start of subscription period.

The ADNOC and ADNOC Drilling believe the offer price per share provides investors with a highly attractive value proposition that reflects ADNOC's long-term confidence in ADNOC Drilling's growth trajectory. This also affirms one of ADNOC's key objectives to further support the growth, strength and diversification of the UAE and Abu Dhabi equity capital markets.

According to the statement, the IPO opens on 13th of September and will be closed on 23rd of September for UAE retail investors and on 26th September for qualified domestic and international institutional investors. The company is expected to be listed on the ADEX on or around 3rd of October.

ARAMCO

ARAMCO SIGNS 23 AGREEMENTS FOR EXPANDING INVESTMENT PROGRAM

Aramco announced that it has signed 22 new Memoranda of Understanding (MoUs) and one joint venture (JV) agreement with the aim of expanding its industrial program "Aramco Namaat".

The statement added that the MoUs covered developing advanced non-metallic Materials, establishing a local industrial logistics and procurement hub, evaluating Carbon Capture & Sequestration (CCS) opportunities, Engineering, Procurement and Construction (EPC) and developing digital solutions. Additionally, the JV agreement was signed between SeAH and Dussur to localize stainless steel seamless tube and pipe manufacturing. Namaat program aims to unlock the opportunities of investments in Saudi Arabia to create new value, and drive economic expansion and diversification. It focuses on investments in four key areas that align closely with Aramco's objectives including sustainability, Technology, Industrial, Advanced materials.

ENI

MUBADALA PETROLEUM, ENI SIGN MOU FOR COOPERATION IN ENERGY TRANSITION

Mubadala Petroleum has signed a Memorandum of understanding (MoU) with Eni company to find cooperation opportunities in the energy transition including the fields of hydrogen and carbon capture, utilization and storage.
The agreement covers possible joint opportunities in the Middle East, North Africa, South East Asia, Europe and other regions of mutual interest.

ENI ACHIEVES NEW OIL DISCOVERY IN OFFSHORE IVORY COAST

Eni company announced that it has achieved a major oil discovery in block CI-101 offshore Ivory Coast. The block is operated by Eni with Petroci Holding, who hold 90% and 10% respectively in the exploration phase.

The discovery well "Baleine-1x" has been drilled on the Baleine prospect and discovered light oil in two different stratigraphic levels.
The two companies have conducted studies for fast-track development of the discovery and it proved potentials estimated at between 1.5 and 2.0 billion barrels of oil in place and between 1.8 and 2.4 trillion cubic feet (TCF) of associated gas. Eni elaborated that an evaluation program will be conducted to asses the significant upside potential of the whole structure which extends into block CI-802 which is also operated by Eni and Petroci.

TOTALENERGIES

IRAQ, TOTALENERGIES SIGN MAJOR AGREEMENTS FOR PROJECTS WORTH $27 B

TotalEnergies company, Iraqi Ministers for oil and electricity, and the country's National Investment Commission have signed four major agreements for developing oil and gas as well as solar energy projects worth $27 billion with expected revenues of $95 billion. According to the statements, TotalEnergies has signed three contracts with the oil ministry in addition to a contract with the electric ministry for achieving the optimum investment of Iraq's natural resources and secure a high level of stability for electric power needs.

TotalEnergies, with the support of the Iraqi authorities, on the one hand will invest in installations to recover gas that is being flared on three oil fields and as such supply gas to 1,5 GW of power generation capacity in a first phase growing to 3 GW in a second phase, and, on the other hand, will also develop 1 GWac of solar electricity generation capacity to supply the Basra regional grid.

EGYPT'S JOURNEY TOWARDS LOWER CO_2 EMISSIONS

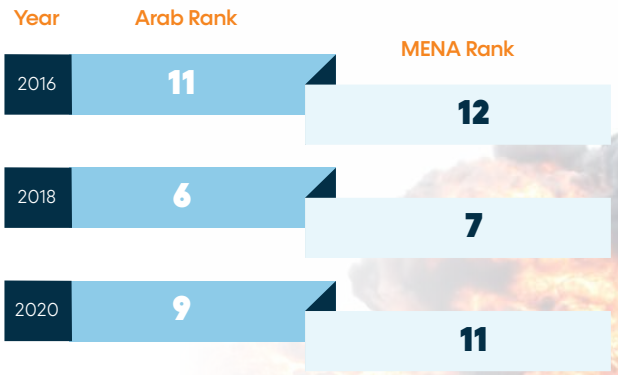
BY: AMINA HUSSEIN, REHAM GAMAL, AND TASNEEM MADI

EGYPT'S POSITION IN ENVIRONMENT RELATED INDICES

1. ENVIRONMENTAL PERFORMANCE INDEX (EPI)

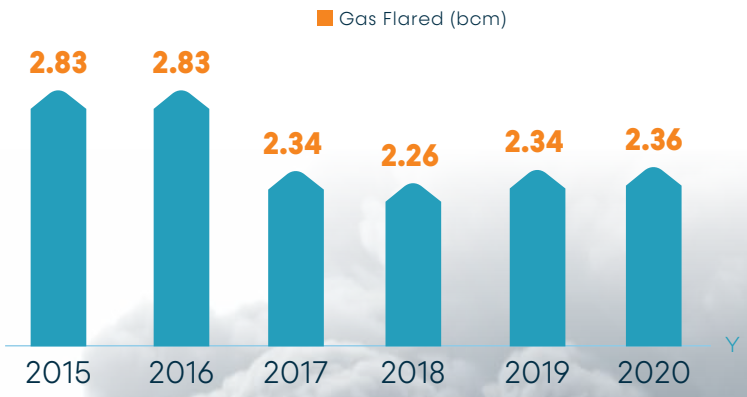
EGYPT'S GLOBAL PERFORMANCE

EGYPT'S REGIONAL RANK

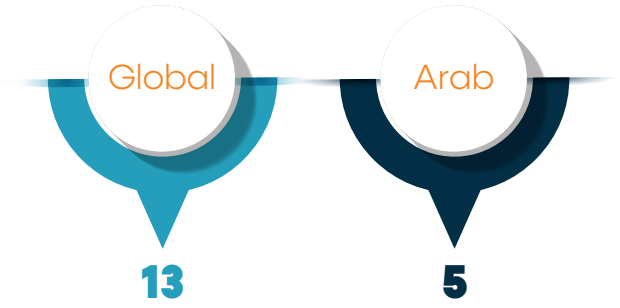


2. GAS FLARING INDEX

EGYPT'S GAS FLARING VOLUMES (BCM)



EGYPT'S RANK AMONG TOP GAS FLARING COUNTRIES IN 2020



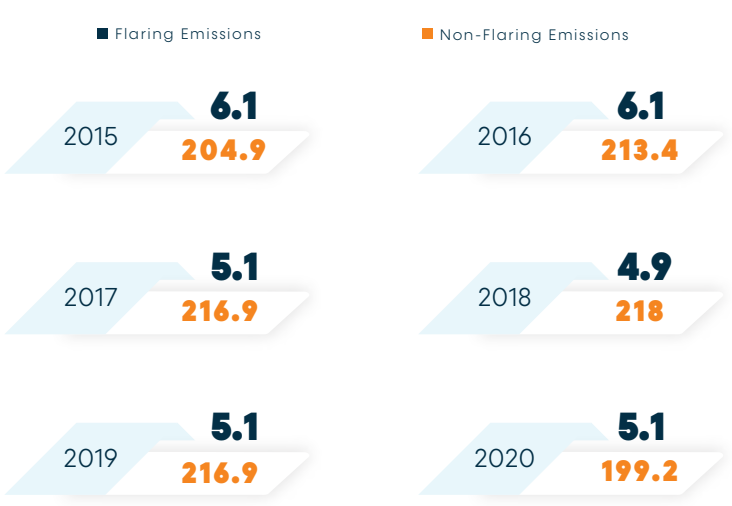
EGYPT'S FLARING INTENSITY* (M^3/BBL)

*Gas flared per barrel of oil produced and measures by cubic meters of gas per barrel (m3/bbl)

3. CO_2 EMISSIONS

EGYPT'S CO_2 EMISSIONS (MMT)

EGYPT'S CO_2 EMISSIONS BY SOURCE (MMT)

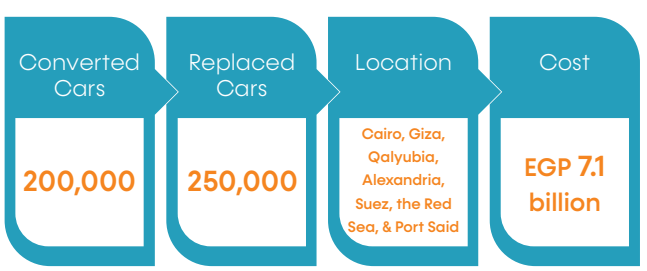


GOVERNMENT NATIONAL & REGIONAL EFFORTS

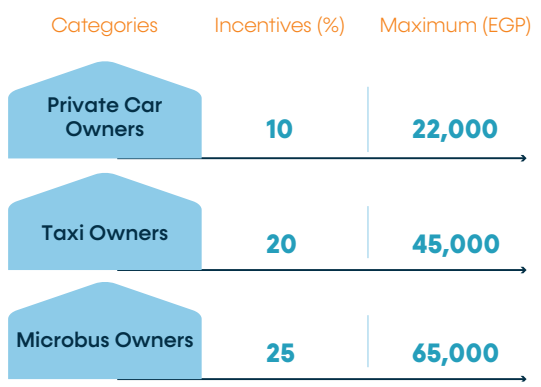
1. TRANSITION TO NATURAL GAS AS A CLEANER FUEL

A. BOOSTING CNG USE AS A SUSTAINABLE FUEL

1ST PHASE OF THE PRESIDENTIAL INITIATIVE FOR CNG CONVERSION OVER 3 YEARS



GREEN INCENTIVES



CONVERTED CARS TO CNG & FUELING STATIONS

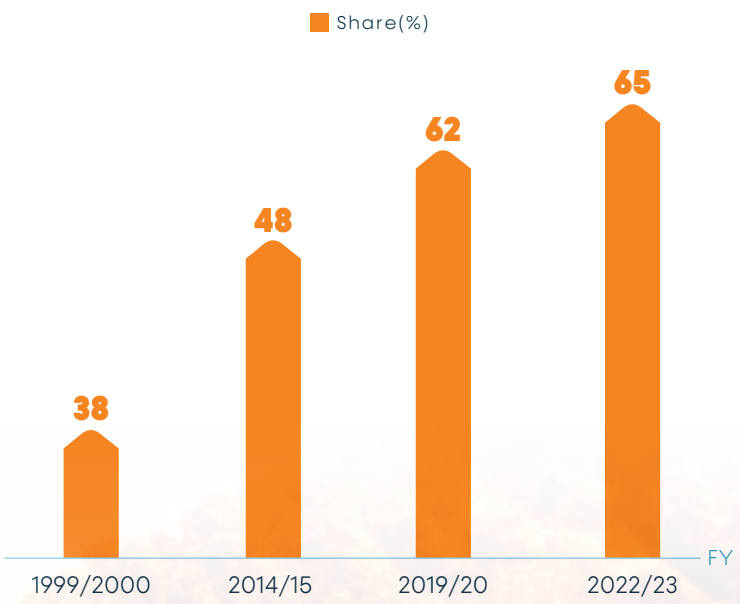
Duration	Cars Converted	Fueling Stations
In FY 2020/21	51,000	27
Total Until June 2021	370,000	105

B. NATURAL GAS DELIVERY TO RESIDENTIAL UNITS

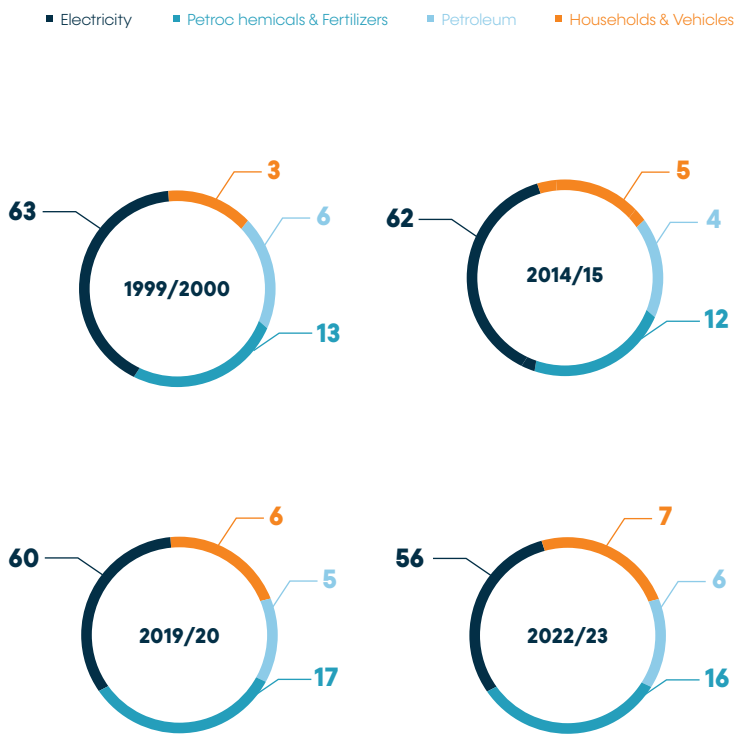
RESIDENTIAL UNITS CONNECTED TO NATURAL GAS GRID (MILLION)

C. NATURAL GAS CONSUMPTION

NATURAL GAS SHARE IN TOTAL CONSUMPTION OF PETROLEUM PRODUCTS



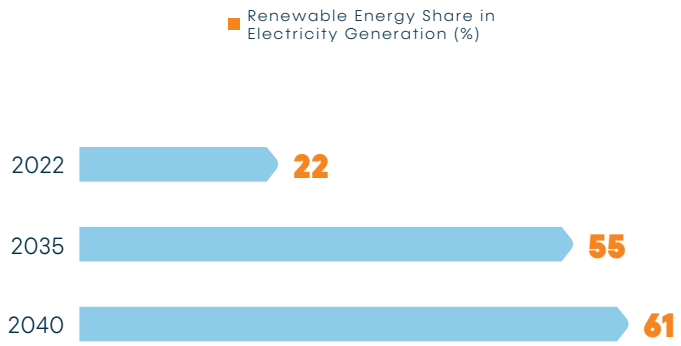
PROGRESSION OF NATURAL GAS CONSUMPTION PER TOP SECTORS (%)



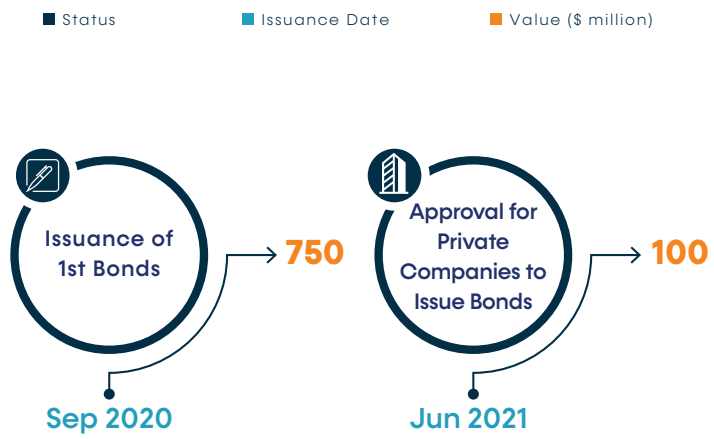
2.DECARBONIZATION ACTIVITIES

EGYPT'S DECARBONIZATION STRATEGIC ACTIVITIES

EGYPT'S INTEGRATED SUSTAINABLE ENERGY STRATEGY TARGETS



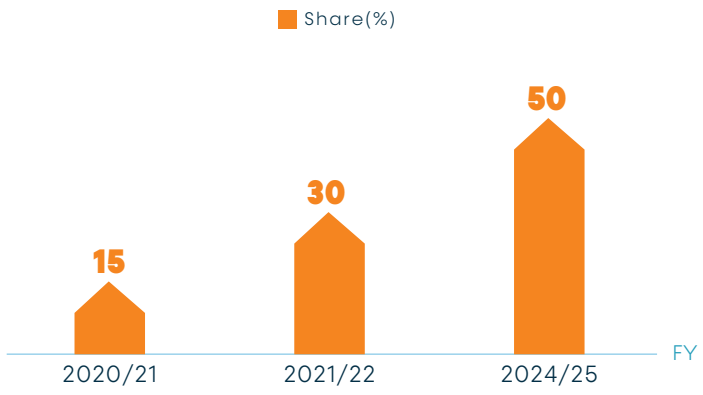
GREEN BONDS DEVELOPMENT IN EGYPT



3. GREEN INVESTMENTS, INCENTIVES & GREEN BONDS

GREENFIELD INVESTMENTS INFLOWS ($ BILLION)

GREEN INVESTMENTS SHARE IN MPED'S INVESTMENT PLAN (%)



LEGAL FRAMEWORK & INCENTIVES OF GREEN BONDS IN EGYPT

Article **(23)** of Capital Market Law No. **95** of **1992** & its Executive Regulations

Exempt green bond issuers from **50%** of services and examination fees in the FRA

4.INITIATIVES TO REDUCE CO_2 EMISSIONS

EMGF PROGRAMS & INITIATIVES FOR DECARBONIZATION

Decarbonization in the Eastern Mediterranean

LNG as Fuel For Vessels

- Promote the natural gas & LNG use
- Decarbonize Gas Industry
- Accelerate Energy Transition

ZERO ROUTINE FLARING BY 2030 INITIATIVE

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SAFETY OF THE UPSTREAM:

AN INTERVIEW WITH HSE, AIM EXPERTS

BY SARAH SAMIR

The oil and gas upstream sector deals with the exploration and production (E&P) of the world's hydrocarbon wealth. A global key concern to the oil and gas leaders is sustainability and the safety of staff, assets and the environment. Egypt Oil and Gas interviewed health, safety, and environment (HSE) specialists, in addition to asset integrity management experts to explore the effect of these fields on the upstream sector and how can they lead to a sustainable future.

Ensuring Safety during in the Upstream Sector

The upstream activities have a high-risk nature if proper HSE measures are not implemented. HSE failure "can not only put an employee out of work for a while and impact their quality of life; it may also damage your business's productivity, finances, and reputation – all of which can be difficult to recover from," Nabil Elbaz, Offshore HSE Manager at A Subsea 7 Company, told Egypt Oil & Gas.

Elbaz noted that the safety culture starts from leadership. He stated that the oil and gas sector "should develop a strong safety culture at site, and start with leaders. Supervisors and managers have to set an example for everyone else. They demonstrate the model for safe behavior that everyone else will follow based on the safety program to transform a company's safety culture."

In addition, Elbaz pointed out that the Occupational Safety and Health Administration (OSHA) "passed a regulation that prohibits employers from discouraging workers from reporting injuries and illnesses and also requires employers to inform their employees of their right to report any incidents."

Moreover, Elbaz highlighted the importance of training when it comes to safety. "Every new safety protocol will require a training session or workshop. However, when you are introducing a new major practice or policy, training may be needed." He further encouraged "leveraging existing communications devices "such as advanced location tracking, automated check-ins, and panic buttons."

Upstream safety does not only revolve around physical injuries. "Due to the widespread isolation and loneliness of the pandemic, safety managers are talking more about how to support the mental and emotional well-being of workers, which impacts their physical safety as well as the productivity and caliber of their work," according to Elbaz.

The upstream business does not only require the safety of people but the high integrity of assets. "There is a link between asset integrity management (AIM) and HSE, especially around Management of Change, as this has a direct impact on personnel and or staff and it normally needs to have input from both teams. However, the management of asset integrity is not a safety process, AIM's main effort is in establishing the condition of the assets and assisting in the establishment of ongoing safe operating limits for each individual asset and the plant as a whole," Patrick Gill, Former Asset Integrity Manager at Belayiem Petroleum Company (Petrobel), told Egypt Oil & Gas.

Therefore, it is crucial to maintain AIM for the upstream business to go on. "Since AIM aims into enhancing the reliability of the most important and critical equipment and elements safety functions in any field, it directly affects the upstream industry by providing and maintaining safe operations. Moreover, it plays a key role in the asset management process leading to optimizing the use of the resources assigned for maintenance and inspection," Muhammad Ismael Sallam, Asset Integrity Department Manager Petrobel, told Egypt Oil & Gas.

Challenges & Sustainability in the Upstream Sector

Although the upstream sector revolves around production, operators cannot ignore the challenging world around them. "The world is evolving rapidly, with the global population expected to rise nearly 30% by 2050. So are the challenges, harmful emissions chief among them. And hence, so must the solutions," Elbaz stated. Therefore, the oil and gas sector is keen to preserve the environment while it maintains growing production.

HSE and AIM engineers are hindered when the sustainability culture is not adapted in leadership positions. "The main challenge that faces asset integrity engineers is the lack of support from senior management. This lack of support can be budgetary constraints; however, it is usually a total lack of understanding by senior management, they always assume that asset Integrity equates to QC (quality control), and is therefore considered an obstacle to maximizing production, when in reality AIM, if supported is a very powerful tool to ensuring long term maximum production," Patrick explained.

Additionally, applying HSE standards does not decrease production. "If the Company fails to recognize the importance of health and safety, the business may face a decrease in productivity and an increase in staff turnover," Elbaz pointed out.

While HSE contributes to the sustainability goals relate to emissions and climate change, AIM also ensures that the upstream industry is sustainable. AIM "decreases the failures of the assets which increase their lifetime. Furthermore, decreasing the failures and loss of control of the assets leads to decreasing the implications on the people and their environment," Sallam explained.

Following HSE standards and ensuring asset integrity is very effective for the development of the upstream sector. As experts discussed, it does not hinder production. On the contrary, following these measures guarantees the safety and sustainability of the oil and gas industry, which is profitable to the investors in a safe and environmentally friendly way.

PATRICK GILL
Former Asset Integrity Manager at Belayiem Petroleum Company (Petrobel).

NABIL ELBAZ
Offshore HSE Manager at A Subsea 7 Company.

MUHAMMAD ISMAEL SALLAM
Asset Integrity Department Manager Petrobel.

HOW THE TIDES HAVE TURNED:
HOW EGYPT BECAME A GLOBAL LNG LEADER

BY FATMA AHMED

In May 2021, the Organization of Arab Petroleum Exporting Countries (OAPEC) announced that Egypt has become one of the most growing Arab exporters of liquefied natural gas (LNG) during Q1 2021.

This came after achieving a 400% increase in Egyptian exports, which is about 2 million tons of LNG compared to the previous year. The report stated that this increase is due to the operation of Egypt's Idku LNG plant at its full capacity, in addition to the reoperation of the Damietta LNG plant after an eight-year halt.

LNG IN EGYPT OVER THE YEARS

In Egypt, natural gas is one of the most significant energy resources after its first discovery in Abu Madi field in 1967. Egypt's natural gas production has been steadily increasing to the point that the country became one of the world's leading LNG exporters. In 2009, the Egyptian economy experienced fluctuation in the production of natural gas, due to political instability as well as the reduction of upstream investment and increase in demand. As a result, Egypt shifted from being one of the largest LNG exporter countries in the region to a net importer in 2016.

However, in 2015, the tides of the natural gas market turned in Egypt's favor with the discovery of the Zohr field in the Mediterranean. Widely believed to be one of the largest natural gas discoveries in the region, Zohr field was a turning point for the country. In 2018, the Minister of Petroleum and Mineral Resources, Tarek El Molla announced achieving self-sufficiency of natural gas and that Egypt stopped importing LNG from abroad, due to the increased production of Zohr gas field. In 2017, natural gas represented 53% of the energy mix, while its contribution increased to 56.9% of the energy mix in 2020.

EGYPT'S CRUCIAL LNG TERMINALS

In North Africa, Egypt and Algeria are the only countries which have LNG terminals. Egypt has two main LNG facilities, the Idku and Damietta plants. These two terminals have been closed since 2012 due to market fluctuation, but they returned back to operation in 2020.

Located east of Alexandria, ELNG's Idku Terminal was opened in 2001 with estimated investments of $2 billion. It was developed by Egyptian General Petroleum Corporation (EGPC) in partnership with Shell, Petronas, Edison and Engie; it is managed by the Egyptian Liquefied Natural Gas Company (ELNG). The plant consists of two LNG trains with a combined capacity of 7.2 million tons per year (mmt/y). This means it has the capability to export up to 10 billion cubic meters (bcm) of gas to the global market. Also, it was designed to accommodate four more trains. The terminal is supplied by Simian Sienna Gas Field and Sapphire Gas Field. The first cargo from this terminal was shipped on May 29th, 2005 carrying 129,000 cubic meters of gas.

SEGAS' Damietta Terminal started construction in 2001 in Damietta, with investments of $1.3 billion and came on-stream during 2004. It was established to export natural gas to the Spanish and European markets. This terminal was operated by the Spanish Egyptian Gas Company (SEGAS), which is controlled by Union Fenosa Gas in partnership with Eni, EGPC and Egyptian Natural Gas Holding Company (EGAS). It is supplied with natural gas from the Temsah fields and Ha'py Development Area through the national gas grid, in addition to the Scarab and Saffron fields in the West Delta region. The plant has exporting capacity of 7.56 billion cubic meters per year (bcm/y). The first cargo from this terminal was shipped in 2004.

EGYPT'S LNG EXPORTS

During the past few years, Egypt registered unprecedented natural gas production rates reached to 7 billion cubic feet per day (bcf/d) at the end of 2020. During the period between 2015-2017, Egypt turned from an LNG importing country to a key player in the natural gas sector. In 2019, Egypt became second in Africa, the fifth in the Middle East and the 13th on a global level in terms of natural gas production. The average of Egyptian LNG exports during the period from 2016 to 2020 reached 2.06 bcm. Egypt recorded the highest rate of LNG exports in 2019 with a total amount of 4.5 bcm, representing 1% of the global supply in this year.

The rate decreased in 2020 by 60.4% to 1.8 bcm, due to lower oil prices as a result of the pandemic. However, Egyptian exports have increased during Q1 2021, after the reopening of Damietta plant ahead of successful negotiations that resulted in the signing of a settlement agreement at the end of 2020, according to an OAPEC report. The plant sent five shipments since the start of 2021 with a total volume of 300,000 tons. Bloomberg reported that when the Damietta plant reaches the peak of production, Egypt will be one of the top 10 LNG exporters in the world.

Currently, the Idku plant and the Damietta plants have a total LNG export capacity of 12.5 mmt/y. In addition, Fitch Solutions forecasted that in the short-term Egypt's net LNG exports will reach a peak of 8 bcm/y by 2022, which will allow Egypt to fully "utilize its two LNG liquefaction facilities to target markets in both Asia and Europe. Both facilities benefit from being in close proximity to Europe, whilst also having easy access to lucrative markets in Asia through the Suez Canal."

ENHANCING UPSTREAM ACTIVITIES THROUGH SUSTAINABLE PRACTICES

BY RANA AL KADY

To begin with, the upstream sector in the oil and gas industry is presently confronted with some of the most serious environmental, health, and safety issues it has ever faced. The oil and gas sectors continue to be a major source of revenue for the global economy. On the one hand, worldwide demand for fossil fuels continues to rise. At the same time, firms encounter difficult investment hurdles due to the tough operating environment of exploration and production operations.

GENERAL OVERVIEW

These environmental issues that have taken place over the last several decades have caused many people to demand demonstrable improvements in performance as well as more accountability and operational efficiency in the oil and gas sectors in order to ensure their long-term viability. As a result, the oil and gas sectors, like other businesses, have changed their company's growth plan to focus on long-term sustainability, while some have responded to operational critiques.

Numerous variables, including rising population, intensifying competitiveness, global climate change, and companies to invest, as well as intraregional patterns, are all sustainable factors that have created a risky and tense economic climate. For oil and gas businesses, anticipating and tackling issues is a never-ending struggle, and they are continuously updating their strategic plans to make them as thorough and accurate as possible. This article examines the analytical findings of a survey on a few of the sustainability principles and sheds light on the current problems.

CHALLENGES IN THE INDUSTRY

The petroleum sector has encountered a number of difficulties in recent years. The oil industry now must invest substantially to the global increase in energy consumption, and in light of more competition in such industries, that should minimize the overall cost of the output of petroleum products while complying with environmental rights and regulations.

Because of the high operating temperatures of deep wells, and the use of a number of contaminants to reliably excavate and yield hydrocarbons, the output of each barrel of oil, refining, and shipping of petroleum goods to the consumers is a sector that induces pollutants and emissions. The problems of sustainable development in the petroleum industry include spills, validating greenhouse gases, disposal of petroleum products storage tanks, flaring, venting, handling drilling fluids, etc.

Furthermore, some of the world's largest oil corporations have taken judgments regarding each of these issues, and vast sums have been spent on upgrading procedures and technology, as well as interacting with native communities nearby oil and gas installations. In addition, national oil firms under political pressure and multinational oil and gas businesses under societal and legislative stress have made a number of steps to face the difficulties of sustainable development in the hydrocarbon market in recent years.

SUSTAINABLE SOLUTIONS

The oil and gas industry is noticing a growing number of oil and gas businesses trials and success with a growing set of technologies and services that are becoming greener, save expenditures, and reduce carbon emissions. With several OPEC members in the Arab World accelerating their economic transformation efforts, we can anticipate a larger and swifter implementation of sustainability measures throughout the sector, thus we can predict a lot more enterprises looking into various innovative sustainable solutions or green alternatives.

For instance, tackling the subject of over-consumption of clean water in the upstream sector becoming more critical. Water is used in a variety of oil output techniques, including fracking and isolating oil from all other components in oil sands. It can be noted that, on a daily basis, gallons of water are used, although the worldwide oil and gas sector now recycles the great majority of this water – approximately 87% – businesses are reconsidering the extraction method to decrease groundwater use from the beginning.

Also, methane leaks are a huge concern considering the influence on greenhouse gas emissions and the surrounding site. For this reason, this is a cost-efficient chance for the sector to seek solutions to decrease methane leakage. According to recent statistics from the International Energy Agency (IEA), reducing oil and gas methane leaks with presently known and future technology is economically sustainable.

Additionally, in terms of Renewable Energy Technologies (RETs), biofuel advancements are also intriguing, as they may facilitate much significantly bigger oil production in the coming years. A great existing example of this is that of Exxon Mobil; at the moment, Exxon Mobil is actively expanding its Calipatria facility and expects to be able to produce 10,000 barrels of biofuel per day by 2025, thanks to recent big achievements. This is a critical step in establishing a biofuel economy that is fully sustainable and renewable. As stated by a Renewable Energy Expert in the Sustainability Industry who preferred anonymity, "petroleum companies try their best to have solar panels or other kinds of green technologies to make the activities greener. The problem is that the companies only have small renewable technologies in their projects, but they need to have bigger volumes of renewable source technologies to cover for the toxic gasses and balance the work done."

Moreover, both water and oil recycling is a popular topic in the industry. In terms of water recycling, oil and gas organizations are looking at more efficient tactics of reusing and recycling water for industrial processes in an attempt to lessen freshwater use. Organizations have begun seeking to utilize non-potable water by upgrading purification technologies and improved chemical-free water purification solutions to neutralize microbial pollutants including mitigating sulphate components and iron-oxidizing microorganisms. In terms of oil recycling, a growing number of businesses are turning to small-scale waste oil micro-refinery machines to convert wasted oil into diesel. This technology also provides fuel for ongoing activities and it is also a cost-effective option to even more conventional oil disposal options.

In conclusion, sustainable development necessitates inter and multi-disciplinary strategies, and several of the issues addressed by the SDGs are well past the capacity or authority of any single firm. Oil and gas firms must take an active part in interactions with key stakeholders domestic and abroad to recognize sustainable objectives and jointly define potential strategies for responding to the SDGs in the given context to reach success to make a significant contribution to the accomplishment of the desired goals.

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GREEN HYDROGEN: THE FUEL TO POWER EGYPT'S FUTURE ECONOMY

BY YARA ALI, REHAM GAMAL

Hydrogen as an energy carrier and feedstock has clearly gained momentum in the past years. It is referred to as the "missing link" in the transformation of the energy system. Alan Finkel, Australia's Chief Scientist, describes it saying, "imagine a zero-emissions fuel that exists on earth in abundance can be easily extracted using basic chemistry and offers jobs... It's called hydrogen." Not only can a hydrogen-based economy play a vital role in mitigating the impacts of global warming, but it can also reinvigorate the world economy.

NEW ALLY FOR DECARBONIZATION

To start with, the necessary shift of today's global markets towards a sustainable future can only be achieved by integrated hydrogen production systems. In order to achieve the net-zero emissions goal by 2050, hydrogen would have to play a bigger role in the world's energy market, according to a report by the International Energy Agency (IEA, 2019).

Hydrogen is regarded as the key to decarbonizing hard-to-abate sectors, as the Hydrogen Council expects that this promising fuel will contribute greatly to the transportation, industrial, and energy sectors.

Therefore, large-scale production of hydrogen is crucial to meet the rising demand for it in all sectors. However, the challenge with hydrogen is that it is mainly produced through fuel-based processes, such as methane reforming, coal and biomass gasification; all of which will increase carbon emissions. For further illustration, hydrogen produced from hydrocarbon resources is classified as "grey" hydrogen, which makes up the majority of global hydrogen production.

On the other hand, green hydrogen is carbon-neutral fuel, as it is produced from hydrocarbon-free renewable resources or via electrolysis of water. Hence, the future lies in the transition from 'grey' to 'green' hydrogen.

Catherine Robinson, Executive Director on the Gas, Power, and Energy Futures team at IHS Markit, noted that green hydrogen is a real game-changer for future fuels. "Investment in electrolysis is booming around the world," Robinson said. "The pipeline through 2030 is for over 23 GW of capacity to be developed—more than 280 times the current capacity." Furthermore, investment in green hydrogen production is set to exceed $1 billion per year by 2023, according to American-British information provider IHS Markit.

Several countries have recently published national hydrogen strategies, including Argentina, Australia, Chile, and China. Having seen clean hydrogen as a new commodity, other countries are expected to follow in the same footsteps. For instance, Egypt plans to take measured steps toward developing a hydrogen-based economy.

GREEN HYDROGEN OPPORTUNITY IN EGYPT

Realizing that hydrogen and renewable energy will be the main drivers toward global reductions of greenhouse gas emissions, Egypt invests in renewable markets and has set targets to increase its renewable energy share, as part of its Integrated Sustainable Energy Strategy 2035. To illustrate, the government has set a target for renewables to make up 42% of the country's production of electricity by 2035, based on rapid wind and solar deployment.

Dr. Samir Tantawi, UNDP Project Manager, affirmed that "Egypt has a promising potential in renewable energy, particularly wind and solar projects, such as the wind farms installed in Gabal Elzeyt and Zafranaa (Suez Gulf) and PV solar energy projects in Benban (Aswan) and small-scale PV project under the net-metering scheme."

Researchers suggest that wind will be at the center of the green hydrogen revolution. As a manifestation, Siemens Gamesa and Siemens Egypt are developing an innovative solution that fully integrates an electrolyzer into an offshore wind turbine as a single synchronized system to directly produce green hydrogen.

In addition, Egypt doesn't have only the capability to produce its own hydrogen fuel, but it has also the potential to export hydrogen to other countries. Moving forward, Egypt's long-term strategic policies and investments seek to play a bigger role in the world's energy market. To achieve this aim, Siemens Energy has signed a memorandum of understanding with Egyptian Electricity Holding Company (EEHC) to jointly develop a pilot project, compromising 100 to 200 MW of electrolyzer capacity. Additionally, Italian energy giant Eni has also signed an agreement with the EEHC and the Egyptian Natural Gas Holding Company (EGAS) to assess the technical and commercial feasibility of projects for the production of hydrogen in the country. The study will also try to investigate what potential hydrogen has in terms of local market consumption and export opportunities.

Moving to solar energy, Egypt's Solar Atlas states that Egypt is considered a "sunbelt" country with 2,000 to 3,000 kWh/m²/year of direct solar radiation. Egypt also has the world's largest solar park, Benban. Composed of 32 individual plants, each producing 20-50 MW, the park generates almost 1.5 GW of power. Sunlight can directly or indirectly provide the energy to produce hydrogen. Using solar energy, experts will have the power they need to produce hydrogen through processes including solar thermochemical production, photoelectrochemical production, electrolysis, and photobiological production.

That is to say, Egypt has a rich mix of renewable energy resources, a strong industrial base, and access to markets. These three factors provide a solid foundation for the country to build a robust green hydrogen industry.

On a global level, Egypt, as Tantawi stated, is a main player in climate change negotiations under the United Nation Framework Convention on Climate Change (UNFCCC), and potentially designated to host the next Conference of Parties (CoP) of the UNFCCC – COP23 in Sharm Elsheikh in 2022.

With a well-planned roadmap, Egypt is heading towards green recovery.

CHALLENGES AND PROSPECTS

There are still some challenges that hinder the realization of a hydrogen-based economy, which include safety concerns and large-scale hydrogen production costs.

The potential hazards involved with hydrogen production is an important challenge that must be addressed before any widespread use can be achieved. As far as flammability and explosion risk factors are concerned, hydrogen resembles natural gas to some extent. Although hydrogen is a flammable gas with a wide flammability range (4–75% by volume) and relatively low ignition energy (0.02 millijoules) (Schmidtchen, 2009), it disperses very quickly when released. In case of leaks, it was found that hydrogen fuels are safer than hydrocarbon-based fuels, such as gasoline, because they rise rapidly and dissipate quickly into the atmosphere (Pozzi, 2017).

The production costs are another challenge facing the role of green hydrogen in the energy market. The IEA announced that the recent drop in electricity prices due to renewables, such as solar and wind, indicates that production costs maybe 30% lower within a decade. Thus, the integration of renewable energy resources is the key to making economic and sustainable process for hydrogen production.

Experts have thus concluded that green hydrogen is one of the most suitable energy carriers from both the technological and environmental perspectives.

PRACTICAL INSIGHTS ON THE PRINCIPLE OF ENERGY JUSTICE

BY DR. MOSTAFA ELSHAZLY Senior Associate, Zaki Hashem and Partners Law Firm- Visiting Lecturer of Business and Energy Law

Energy justice is among the main concepts that are usually referred to, directly or indirectly, in most energy regulations and statutes.

The term "Energy Justice" refers principally to providing all individuals, across all areas in the country, with safe, affordable and sustainable energy regardless of the source of such Energy. It addresses fairness and equity concerns within the current energy system and incorporates aspects of deep democracy and cooperation between all stakeholders.

NUMEROUS ASPECTS FOR ENERGY JUSTICE

Learned jurists indicate that Energy Justice is likely framed by the following two elements;

A. Distribution of costs, or how the energy projects related hazards and externalities are disseminated throughout society.

B. Distribution of benefits, or how individuals are benefiting from energy projects and the wealth yielded therefrom.

Involuntary resettlement and dispossession of private-owned lands for energy projects use, energy poverty, fossil fuel pollution, nuclear waste and energy products subsidize can be classified as pressing justice concerns that seriously affect Energy Justice. These examples as will be elaborated hereinafter are not meant to be exhaustive and cover only a range of notable concerns on place. That said, Energy Justice is an extendable and variable principle that is subject to the evolution in the energy industry globally.

Apart from that, each energy source is inevitably imbued with its own justice challenges. These challenges and the volume thereof differ from one country to another.

In some countries, the execution of Energy projects may require the displacement of individuals from their homes to other zones or the government may seize privately owned lands for sake of Energy projects. In many instances, this happens without obtaining the consent of the affected inhabitants nor paying appropriate compensation.

The Energy injustice is crystal clear in some rural and remote areas, particularly in African and other developing countries, in which the residents are suffering from a lack of electricity access and/or essential petroleum products unlike the situation in central areas and zones.

According to the "ENERGY PROGRESS REPORT" issued by the World Bank in 2021, 759 million people still live without electricity, and there remain some 2.6 billion people who cook mainly with polluting fuels and technologies, using traditional stoves fueled by charcoal, coal, crop waste, dung, kerosene, and wood. Most of these communities live mainly in rural areas in Asia and Sub-Saharan Africa. The economic costs of household reliance on these traditional fuels are estimated to negatively affect the surrounding environment and health, lose the productivity of women and losing the opportunity to receive good education and jobs.

Another clear application of energy injustice is derived from the fact that some natural resources rich countries are suffering from poverty, despite the considerable revenues yield from the exploitation of their natural resources. This is known as "Natural Resources Curse". Such a situation usually occurs in countries with low institutional quality and those who are suffering from internal disturbances. These countries usually lack transparency on the revenues received from companies in return for the exploitation of their natural resources.

Similarly, despite the technological advances in the whole chain of energy projects, in several occasions, such projects cause environmental damage onsite. Such a situation could be a possible threat for Energy Justice by potentially affecting basic human rights for the individual who are living or conducting their daily activities nearby the areas where such projects are executed.

In addition to the abovementioned challenges, that negatively affect Energy Justice, unequal distribution of subsidized energy products to individuals or small size companies who are suffering economically, is another aspect of energy injustice.

ENERGY JUSTICE IN LAWS AND REGULATIONS

Notably, energy laws usually identify the aspects of Energy Justice associated with the exploitation of energy resources. It regulates the allocation of rights and duties and other considerations related to the ideal exploitation of energy resources by the host governments and the IOCs. However, there are different aspects relate to energy justice which may be scattered in areas of law as diverse as human rights, consumer protection law, international law and trade law, etc.

The concept of Energy Justice has been well developed, accepted and adopted by the United Nations "UN" appearing in the Sustainable Development Goals "SDGs". "Affordable and clean energy" is the seventh goal of SDGs, it aims principally at expanding infrastructure and upgrading technology to provide clean, more efficient and cheap energy to the increased populations in all countries, yet explicit references to the ideas of Energy Justice and Equity are notably considered by the UN.

Apart from that, the Egyptian constitution issued in 2014, as an instance, includes a comprehensive legal framework that supports the general framework for the principle of Energy Justice, throughout the promotion of individual equality, human rights, achieving sustainable development through the ideal exploitation of natural resources, and environment protection against maritime, land and air pollution and other contaminations.

The treatment set by the Egyptian constitution with regards to the principles of Energy Justice paved the way for other internal legislations to align with the same principles accordingly. This has been shown apparently in the E&P contracts issued by virtue of private law, the Petroleum Law, the Environmental law and the Penal Act.

THE WAY FORWARD TO PROMOTE ENERGY JUSTICE.

Energy Justice seeks basically to ensure the efficiency of any decisions that may be reached by the policymakers to the extent that do not harm the individual's interests, ensure transparency on petroleum projects gains, guaranteeing the ideal exploitation of natural resources and achieving Energy Justice goals. Energy Justice, though, necessitates effective institutional monitoring. Moreover, it necessitates that communities must be involved in deciding about projects that will affect them.

Furthermore, it is quite important to effectuate the social responsibility for energy companies. The drivers of such social responsibility are the mix of incentives and requirements. Energy companies shall strive to minimize the environmental impact over the full life cycle of their operations in compliance with the applicable laws by using the advanced technology to that effect in order to ensure the stability, health, and prosperity of the communities in which they exist. Energy projects shall also promote locally manufactured goods and materials required for energy projects in addition to giving priority for nationals over foreigners on jobs.

On the other hand, host governments may apply some incentives in terms of providing tax credits to energy companies in return of the construction of roads, schools, bridges, hospitals in zones where the operations are taking place. Such actions indeed will have a positive impact on Energy Justice for communities who are affected by the operations of energy projects.

CONCLUSION

The Energy industry has faced a variety of concerns related to achieving Energy Justice. Environmental, economic and social concerns have been raised as barriers to achieving Energy Justice. The communities surround energy projects sometimes face environmental, health and safety risks, and poverty, which are integral part from the principle of Energy Justice.

Therefore, to achieve Energy Justice, the energy industry is expected to meet higher standards of performance and it is important to recognize that governments play an important role as well to maintain the Energy Justice protected.

INTELLIGENT SYSTEMS PUSH ON WELL RECOVERY OPTIMIZATION

BY FATMA AHMED

Digitalization and the use of advanced technology has become one of the important pillars of the oil and gas industry. It is a global trend among the petroleum operators to keep production sustainability in a safe and easy environment. Nowadays, advanced technology is a key factor in wells' drilling, operation and production. Advanced technology has become necessary especially for optimizing production from deep-water, high-risk, complicated and uneconomical wells. In response to this, Smart wells have evolved.

SMART WELLS: NEW EVOLVED TECHNOLOGY

Smart wells, also known as 'intelligent wells', are wells equipped with pre-installed high technology devices in the wellbore, which allow engineers to monitor and control the well from the surface electrically or hydraulically. Also, they have the ability to self-control, collect and analyze the data. According to a paper talking about smart oil and gas wells published by the International Journal of Petrochemistry and Research, the idea of smart wells started with real-time gauges which can be installed downhole to read the pressure and temperature. It also described the term 'smart well' to include smart ways of the drilling process.

A study entitled "Review of Intelligent Well Technology" explained how smart wells are working. It stated that the "data such as downhole temperature, pressure, flow, composition collected by the well sensor is fed back to the uphole system in real time. Then, this data will be deeply processed, analyzed and judged on the software platform. After that, a reservoir management decision instruction is formed and transmitted to the downhole production tool for remote operation via the wireless communication control system."

SMART WELL SYSTEM COMPOSITION

According to the previously mentioned review, the smart well system consists of two parts: ground equipment and downhole equipment. This equipment includes downhole information detection and acquisition system, production fluid control system, data information transmission system and uphole data analysis system. When the formation pressure is not enough, the reservoir energy can be restored through updating the production rate. This may effectively control the interlayer interference, delay the water breakthrough, prevent the water content, prolong the high-efficiency drilling time of the reservoir, optimize production of the oil well and, therefore, boost oil and gas production.

REMARKABLE FEATURES

As noted previously, smart well systems have significant characteristics. The main important benefit is that it can be managed remotely without intervention, which is economical especially when we deal with deep-water platforms and risky reservoirs, like in oceans. In addition, smart well allow for the installation of valves thousands of feet below the surface through hydraulic and electric power. A paper written by Ellie Kitanidis about smart wells elaborated that these valves can be adjusted to minimize the production of water and any other unwanted outflows, which impact the volume of oil recovery.

According to Schlumberger, intelligent well systems can increase production by 20%, decrease the amount of water by 90% and decrease water injection by 60%; so that it can increase the profitability of the investment. It can also increase the Net Present Value (NPV) by reducing the number of the drilled wells, workovers and intervention operations. So, smart well systems are excellent solutions that result in optimizing the production and recovery of unconventional reservoirs to meet the growing demand for oil and gas.

AFGHANISTAN CRISIS TREMORS TO BE FELT IN ENERGY MARKETS

BY IHAB SHAARAWY

With the Taliban's swift takeover of Afghanistan after a chaotic and tragic US withdrawal, images of civilians fighting desperately to board planes leaving the airport raised questions about the future waiting for the Afghan people after the return of the radicals to rule the country.

The takeover of Afghanistan after twenty years of war with the US has deepened the humanitarian and economic crisis in the country. This leaves many Afghans profoundly concerned about their human rights, particularly women, ethnic, and religious communities. The return of the hardliners has also put the political and economic situation in the country at risk.

But many experts see that Afghans will not bear the pain alone, as the crisis will soon be felt on a wider scale. This remote, mountainous country with a GDP of $19 billion and 38 million people has proven time and again that it has an outsized impact on the world. The Afghanistan crisis has implications that are expected to affect global security from both political and economic perspectives. And although it has never been a significant energy producer, the new destiny of the country will play a decisive role in what may happen in future energy markets as many analysts have noted.

THE LITHIUM TROVE

The fact that Afghanistan is sitting on mineral deposits estimated to be worth $1 trillion or more can put it at the forefront of the future energy market as one its key players.

Supplies of iron, copper and gold are scattered across the country's mountains. There we can also find rare earth minerals and, perhaps most importantly, one of the world's biggest deposits of lithium — an essential but scarce component in rechargeable batteries and other technologies vital to tackling the climate crisis like electric vehicles and solar power.

Most experts insist that the demand for lithium will only increase. Afghanistan's estimated reserves will easily help it become one of the richest countries in the area within a decade, if the metal can be extracted.

In the past, security challenges and lack of infrastructure have prevented the extraction of these valuable minerals. However, today there's an interest from countries, including China, Pakistan, and India, which may try to engage despite the chaos.

There is also an interest from the Taliban itself to use the mineral wealth for achieving economic development and gaining international recognition. However, it is extremely difficult for the Taliban alone to successfully launch commercial lithium mining.

China, being the world's second most powerful economy and a neighbor of Afghanistan, stands as the most capable runner in the contest for these minerals. The Chinese have also proven to be leader in mining rare earth metals and maintains its status as the largest producer of lithium cells.

In succeeding to align itself with the Taliban and brokering a productive relationship to tap into the nation's mineral resources, China will gain a nearly undefeatable position in the global clean energy race. The opportunity to seize further control over these critical minerals can be seen as a determining factor in China's warming relations with the Taliban.

China was one of the first countries that expressed willingness to engage diplomatically with the Taliban. Some experts have claimed that China may also be trying to protect itself from terror attacks by building a relationship with the Islamist group. However, Afghanistan's staggering mineral wealth cannot be ignored by an economic powerhouse such as China.

BRINGING THE TAPI TO LIFE

China also is seen as the potential financer for a mega project that can change the dynamics of natural gas trade. The Taliban's officials have recently renewed discussions about the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline. With new regime being quick to quench its thirst for cash, Taliban officials said that TAPI is a "long-term priority project".

For more than three decades, energy companies have tried to think of routes to send natural gas from gas-abundant yet land-locked Turkmenistan to energy-poor Pakistan and India. As these efforts were proven unsuccessful due to political, security, and financial challenges, this dream fizzled down to an unrealizable fantasy.

Over a long period of time, the TAPI dream was impossible to realize, due to the regional volatility, with the worsening tensions between India and Pakistan as well as the deteriorating security situation in Afghanistan. In such an environment, finding the sufficient funds to finance the project with the billions of dollars was an impossibility.

However, the situation is different today as the Taliban is thirsty for funds needed for the current transitional period. A giant project such as TAPI

could reassure the global business community that Afghanistan is now stable. It is for this reason that the Taliban is committed to protecting the pipeline from any attacks.

Other projects that the Taliban also have a keen interest in include the Turkmenistan-Afghanistan-Pakistan high-voltage power transmission lines (TAP) and railways from Turkmenistan to Afghanistan.

All these projects seem to fit well with China's Belt and Road Initiative (BRI), a $900 billion program to open channels between China and its neighbors, mostly through infrastructure investments.

The "Belt" part of the Belt and Road Initiative, introduced by Chinese President Xi Jinping in 2013, refers to a network of overland roads, railways, and oil/ natural gas pipelines planned to run along the major Eurasian land bridges. Hence, comes expectations for China to give a hand to these projects, but many experts still have speculations about China's ability to really engage with the radical militants in real business.

Many have noted that the relationship between China and an Islamist militant group such as the Taliban will be complicated, as Beijing targets what it calls "religious extremism" among ethnic Uyghur Muslims in Xinjiang. China is worried that Afghanistan will turn into a haven for Uyghur extremists, who could launch attacks in response to the repression of their people.

According to Chinese officials, they have maintained contact and communication with the Taliban on the basis of fully respecting the sovereignty of Afghanistan and the will of all factions in the country. The Taliban reassured Beijing that it would "never allow any force to use the Afghan territory to engage in acts harmful to China."

Still, Beijing might wait to see real commitments that the Taliban is going to act like 'a normal government' rather than a militant Jihadist group, before formalizing its diplomatic recognition or pouring millions in investments.

MAJOR GEOPOLITICAL CHANGES

The future behavior of the Taliban can lead to different scenarios. Turning the country into haven for extremists and terrorist groups, who normally make oil and gas facilities their prime targets will certainly put more pressure on oil-rich countries concerned about the security situation. The scenes of chaos in Afghanistan are bound to affect oil markets that primarily rely on stability and risk assessment.

The US withdrawal from Afghanistan has already caused a lot of geopolitical changes that may sooner or later have direct or indirect effects on energy markets.

Afghanistan's situation will have a big impact on US politics and the Biden administration's ability to get things done. It's expected now to find Gulf countries, for example, reassessing about their old alliances and seeking to build new ones with countries, such as Russia and China.

The Afghan crisis could harden Iran's stance in its nuclear negotiations with the US, which may push the Biden administration to impose more sanctions, potentially making Iranian oil more difficult to export.

Afghanistan also has the potential to destabilize neighboring countries and other places as far as Europe, which may revive fears of a refugee crisis and consequently extremist terrorism.

Still, no one knows how the developments in Afghanistan may unfold, but it's clear that this landlocked mountainous country is likely to hold a major position in global affairs with an outsized impact far from its borders.

TOWARDS A SUSTAINABLE OIL, GAS FUTURE

BY SARAH SAMIR

Schlumberger and the Egyptian Ministry of Petroleum and Mineral Resources co-hosted a virtual Sustainability Webinar on August 2-3, 2021. Covering various topics over the course of the two days of sessions, both Schlumberger and the Ministry highlighted their various joint efforts to raise awareness of sustainability development.

COMMITMENT TO SUSTAINABILITY DEVELOPMENT

The first session, entitled "Demonstrating a Commitment to Sustainability Development," was an introduction to sustainable development and business values, as well highlighting opportunities for the Egyptian oil and gas sector to align with the United Nations Sustainable Development Goals (SDGs).

Lees Rodionov, Vice President Global Stewardship at Schlumberger, started the session with a brief overview of the company's sustainability strategy.

Describing the company's approach, Rodionov said that sustainability "works when it is embedded within the business, it is not an activity that just sets off to the side." She explained that sustainability includes environmental priorities, financial priorities, and social priorities, pointing out that leaders at "Schlumberger try to embed sustainability as a thought process; and incorporated into their existing processes, guidelines and operations, ensuring that decision-making finds that intersection that accounts for these priorities as much as possible."

Schlumberger focuses on several sustainability points, including environmental ones, such as getting to net-zero carbon emissions, understanding climate change and energy transition risks, as well as investing in the energy transition to low-carbon. Moreover, the company focuses on creating opportunities and empowering local teams to focus on sustainability aspects.

In February during EGYPS 2020, the Ministry of Petroleum and Mineral Resources signed a memorandum of understanding (MoU) with Schlumberger to collaborate in sharing experiences and enhance awareness about sustainability and its value across Egypt's oil and gas sector. "Part of this is to organize events like the webinars of today and tomorrow on the different levels," Osama Mobarez, Undersecretary and Modernization Program Lead at the Ministry of Petroleum and Mineral Resources, said.

"The Egyptian oil and gas sector believes that sustainability is no longer a luxury, but a necessity" Mobarez noted, agreeing with Lees that it should be embedded in the business. That is why the sector needs to nurture this culture. Mobarez highlighted that Egypt's petroleum sector "considers all aspects of sustainability both in its vision and strategy to achieve this vision". Mobarez pointed out that "One of the main objectives of the webinar is to encourage all sector companies to continue integrating sustainability into their culture, policies and strategies".

"The Ministry of Petroleum and Mineral Resources and Schlumberger are very much aligned because sustainability is at the heart of everything we do," Karim Badawi, Enterprise Digital Performance Director at Schlumberger, commented.

Badawi highlighted Schlumberger's purpose to work together with the oil and gas sector to unlock access to energy for the benefit of all, pointing out the role of the partnership spirit in Egypt in promoting sustainability.

Meanwhile, Becci Collacott, Senior Manager – Sustainable Development at the International Petroleum Industry Environmental Conservation Association (IPIECA) expected that "the focus on sustainability is only going to intensify in the years ahead as the climate emergency become ever more apparent," and following the aftermath of COVID-19. Therefore, she participated in the webinar and talked about IPIECA's SDG roadmap for the oil and gas sector that was launched recently.

The IPIECA's SDG Roadmap has been under development for the past two years in cooperation with the World Business Council for Sustainable Development (WBCSD). The SDGs are a part of the 2030 Agenda for Sustainable Development. They have been adopted by the 193 United Nations countries in September 2015. "They are intended to be achieved by the year 2030, and the decade from last year is named the decade of action as the world vamps up efforts to achieve these by the deadline," according to Collacott.

The first session went on smoothly with participant keynote speakers including Nicholas Abrahams, Schlumberger Global Director Social Sustainability, Leticia Neves, Sustainability Analyst at Schlumberger, Ashraf Ramadan, Assistant Chairman for health; safety; and environment (HSE) at the Egyptian Natural Gas Holding Company (EGAS), and Mohamed Hamamy, Assistant General Manager for Planning and Projects (Sustainable Development) at the Egyptian General Petroleum Corporation (EGPC).

CLIMATE ACTION PROGRESS

"To simplify the sustainability, we can actually divide it into three major parts which are climate change, inequality, and nature loss," said Marina Bulova, Science-based Target Initiative Manager at Schlumberger.

The second session, entitled ' Driving Measurable Progress Related to Climate Action' was held on August 3rd. It covered environmental challenges and Schlumberger's carbon emissions footprint. It further discussed science-based emission reduction targets.

"Egypt's petroleum sector views climate change as a valuable opportunity to create more value within the sector's full value chain activities" said Mobarez during the opening of the second session. "The sector already implemented several actions and initiatives to capitalize on such opportunities" he added.

Bulova explained how the climate is affected by the emissions, saying that "in 2019, around 55 GIGA tons of CO2 equivalent were emitted into the atmosphere overall worldwide, around 70% of this amount was absorbed by the oceans or forests." She pointed out that the remaining amount could affect the climate, warming it up by two degrees within the coming 20 years, which will have a huge effect on the planet's ecosystem.

Meanwhile, Diane Frachon, Sales and Marketing Manager at Schlumberger, talked about exploring low-emissions pathways and the initiatives that Schlumberger is driving to deploy reduced-impact technologies supporting the path to reducing emissions. "As part of our response to the low carbon imperative and as a service and technology provider, Schlumberger is committed to helping our customers and the whole industry to achieve their own sustainability goals," Frachon explained.

She added that using Schlumberger's transition technologies help both sustainability and production sustainment. "Schlumberger's Transition Technologies* portfolio helps customers drive efficiency, reliability, performance, sustainably."

Energy efficiency can help reduce greenhouse gas (GHG) CO2 emissions. The oil and gas sector is working on conducting comprehensive energy efficiency activities, according to Ahmed Abdrabo, Assistant Chief of Petroleum Central Department at the Egyptian Ministry of Petroleum and Mineral Resources. He talked about the sector's total energy consumption in 2019, pointing out the highest consuming companies and affirming that they are taking energy efficiency measures.

"As a means of encouraging energy efficiency measures, the ministry was very much keen to implement no-cost/low-cost measures and these measures were very strong messages to all the companies that energy efficiency is cost-effective, and that energy efficiency in the sector is achievable," Abdrabo noted, adding that the sector was able to "conduct several no-cost/low-cost energy efficiency measures in 17 companies and three large investment energy efficiency projects ."

As sustainability matters to the oil and gas leaders, Schlumberger, along with the Egyptian ministry of petroleum are exerting efforts to preserve energy and reduce CO2 emissions. Accordingly, the two parties are committed to the sustainability goals and to achieve a more sustainable oil and gas future.

Signing an agreement with the German company 'Siemens' will give a strong impetus to the close relations between the two sides, especially since green hydrogen is the future of energy.

MOSTAFA MADBOULY

Egyptian Prime Minister

Commenting on the MoU between Siemens and EEHC

A $27.5 million was achieved through the use of modern technologies and designs in drilling operations, increasing equipment efficiency and using alternative solutions..

AHMED MOSTAFA

Agiba Petroleum's Chairman

Announcing the company's performance in fiscal year 2020/21

Badr Petroleum Company (BAPETCO) continues to implement its plan to increase production while giving top priority to the fields of occupational safety, health, and environment (HSE), the safety of assets, and providing a safe work environment,

SALAH ABDEL KEREEM

BAPETCO's Chairman

This came during the company's general assembly

Our significant acquisition in Egypt, which we expect to complete shortly, adds material gas-weighted production, low-cost, near-term growth and attractive exploration potential, in a region with strong demand trends. We intend to use our differentiated financial flexibility to add further scale to our production base and look forward to the next phase of strategic delivery..

SIMON THOMSON

Chief Executive at Cairn Energy PLC

Commenting on the acquisition of Shell assets in Egypt

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CONSORTIA CONCEPT FOR DEVELOPING EGYPTIAN OIL INDUSTRY RESEARCHES

The high energy demand nowadays made the oil industry a high-technology industry, where companies and universities have new challenges to defeat to find and produce energy successfully and with cost-efficiency. Research and development (R&D) departments in international services companies and international oil companies, as well as university departments, are exerting hard work to find new techniques or develop the current ones to increase petroleum production, make oil and gas production more economically efficient for the investors and decrease the environmental footprint of the industry.

No operator company can efficiently reach its targets without the R&D departments which seek to apply the newly developed techniques in exploration and development for their concessions and in the end to increase the efficiency of their economic model. However, most investors -especially the smaller ones- do not create that department in their organization structure in order not to be added to their economic risk especially with the lack of awareness of the vitality of local R&D.

Each company should have a social contribution to develop society. It is a part of the social responsibility of each investment, which in simple terms means the business's obligation to pursue achievable and good long-term goals for its community and the whole world at large.

On the other hand, Petroleum Engineering departments in Cairo university, Al-Azhar University, and Suez university award each year many masters and doctorate degrees to their graduate students after a lot of research studies which rarely can enhance the oil industry techniques in Egypt. That is a normal result as the oil industry in Egypt -which is based on joint ventures between IOC and NOC- normally develops concession without any help from universities and at the same time these universities suffer from the lack of real experience as most of their professors did not work enough in the industry and suffer from the lack of financial support to develop their labs and equipment.

So, I recommend applying the concept of the consortia between petroleum companies and petroleum departments in Egyptian public universities. Simply, each company (such as Khalda, AGIBA, Petrobel...etc.) should enter into protocols to support the research work at universities to help researchers be more capable of solving the problems facing the oil industry in Egypt. It is a win-win contract for all parties. It is economically feasible for the industry because a problem in the oil and gas industry that may cost millions can be avoided by a research study that may cost only thousands of dollars. The quality of the researches will be dramatically improved and be more realistic and applicable.

MOHAMED ADEL GABRY.MSC.

Section Head
Khalda Petroleum Company

CORPORATE GOVERNANCE IN EGYPT'S NOCS: WHAT'S NEXT?

An extra-ordinary general assembly for all three holding companies, Egyptian Natural Gas Holding Company(EGAS), Egyptian Petrochemicals Holding Company (ECHEM) and Ganoub El Wadi Petroleum Holding Company (Ganope), convened on September 5th, 2021. The purpose was to approve amendments to their respective statutes of incorporation. These amendments incorporate the latest legislative requirements of Law no. 185-year 2020, issued on the 6th of September 2020, related to the application of corporate governance to most types of government entities, including amending law no. 203-year 1991.

The State, represented by the government and legislative bodies, decided to play a pivotal role in adopting a clear approach for the development of a system of corporate governance. The new legislation requires government bodies, including oil and gas sector holding companies, to apply good governance as an integrated approach towards growth and sustainability. With the aim of firmly establishing the concept of prudent management and minimizing corruption.

Corporate governance is all about accountability and control. Managers/executives are separate from – and accountable to the owners (board and the shareholders). Several types of control are exercised to manage risks and compliance. Corporate governance's main principles are having in place an effective corporate governance framework that ensures transparency and efficiency; the rights and equitable treatment of shareholders are respected; disclosure and transparency; the responsibilities of the board of directors are clearly defined.

Egyptian national oil companies (NOCs) ought to implement governance principles, not just for the sake of complying with laws and regulations, but because these principles bring to the company numerous benefits. They attract investments of international oil companies (IOCs) and other investors. They protect the rights of the company's shareholders and other stakeholders, such as IOCs, investors, customers, creditors and other state bodies. They improve companies' efficient operation and strengthen control on their performance; facilitate obtaining the necessary funding and reduce capital cost; mitigate the impact of risks and crisis and seek to avoid conflict of interests in respect of transactions of insiders and related parties.

However, NOCs will not benefit from these positive effects of good governance without introducing corporate governance codes, charters and policies: code of ethics and business conduct, board of directors' charter, committees' charters, succession planning policy, disclosure policy and conflict of interest policy. What lies ahead for the NOCs is:

- ☑ Selection of truly effective and diversified boards, comprised of non-executive and independent directors to achieve the company's objectives.
- ☑ Placing greater emphasis on the main role of the board, responsible for the application of governance principles.
- ☑ Clearly define the roles and responsibilities of the board & the managing director.
- ☑ Placing more focus on the components of "control environment": internal control, risk management, audit, governance and compliance.
- ☑ Tackling the various disclosure methods and tools and highlighting the importance of non-financial disclosure, clarifying the material information that should be disclosed.
- ☑ Spreading the awareness and knowledge of concepts and terminologies of corporate governance throughout the holding companies.

Nonetheless, it will take quite some time for these concepts and principles to be absorbed and infiltrate the corporate cultures of the NOCs, creating the paradigm shift.

MOHAMED ALI AMER

Petroleum engineer (Subsurface operations and production) Al Mansoura Petroleum Company

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EGYPT OIL&GAS RESEARCH & ANALYSIS

Value and Volume of Shares Traded for Energy & Support Services Sector in Aug 2021

VALUE TRADED (EGP BILLION)

% OF TOTAL VALUE TRADED **0.8**

VOLUME TRADED (BILLION SHARES)

% OF TOTAL VOLUME TRADED **0.76**

Performance of Petroleum Companies in the Egyptian Exchange in Aug 2021

NATIONAL DRILLING

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
USD	4.69	-

ALEXANDRIA MINERAL OILS CO.

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
EGP	3.68	▲ 17.95

EGYPT GAS

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
EGP	50.43	▲ 15.74

SIDI KERIR PETROCHEMICALS

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
EGP	10.52	▲ 13

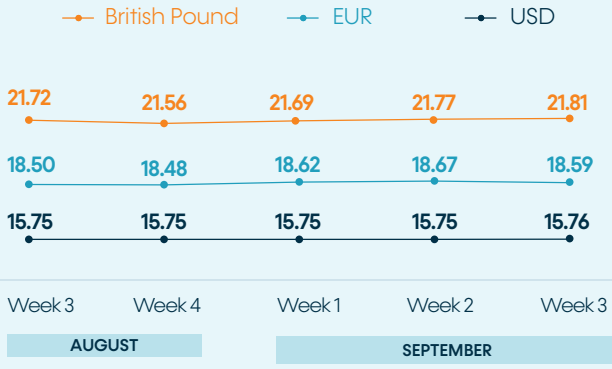
Source of Raw Data: CBE, CAPMAS, Egyptian Exchange, IHS Markit

MAIN ECONOMIC INDICATORS

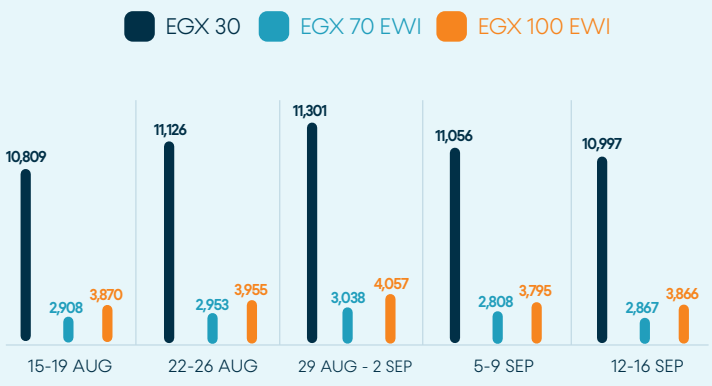
July 2021 | August 2021

	July 2021	August 2021
ANNUAL INFLATION HEADLINE CPI (%)	5.4	5.7
NET INTERNATIONAL RESERVES ($ BILLION)	40.61	40.67
NON-OIL PRIVATE SECTOR PMI (POINTS)	49.1	49.8

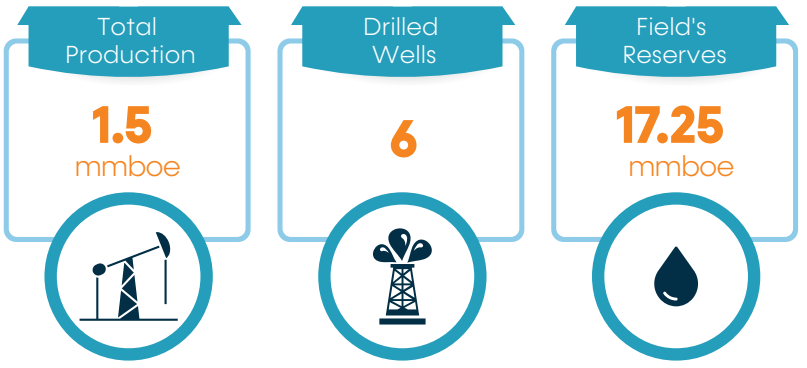
EXCHANGE RATES



CAPITAL MARKET INDICATORS



BADR-1 FIELD PERFORMANCE IN FY 2020/21



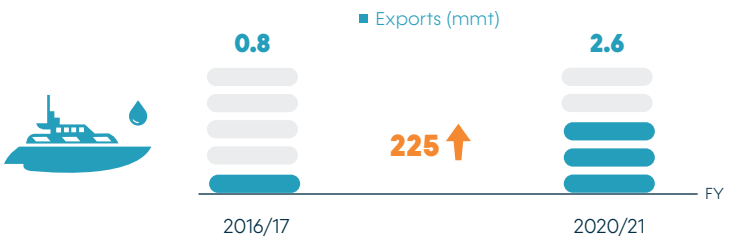
ABU QIR AREA DEVELOPMENT IN H1 2021

31.4 kboe/d

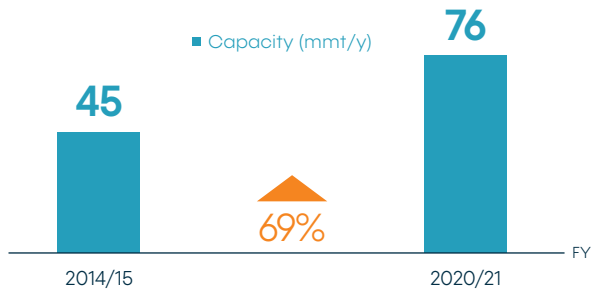
87% gas

PRODUCTION

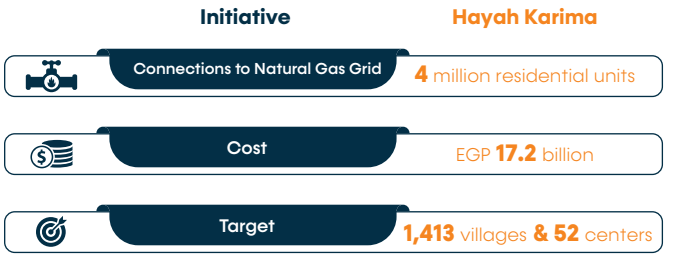
DEVELOPMENT OF PETROLEUM EXPORTS THROUGH PETROLEUM GOUNA ZONE



BOOST IN PETROLEUM PORTS CAPACITY OVER 7 YEARS



MOP, MPED SIGN NATURAL GAS PROTOCOL



NATURAL GAS DELIVERY TO RESIDENTIAL UNITS (MILLION)

GREEN INCENTIVES FOR CNG VEHICLES ANNOUNCED IN SEPTEMBER

INTERNATIONAL OIL PRICES

	BRENT PRICES ($/BBL)	OPEC BASKET PRICES ($/BBL)	NATURAL GAS PRICES ($/MMBTU)
02 July	76.17	75.21	3.70
23 July	74.10	73.03	4.06
10 August	70.63	70.13	4.09
27 August	72.70	71.48	4.37
08 September	72.60	71.17	4.91
17 September	75.34	74.14	5.11

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With a strong track record of growing reserves and resources, Energean is focused on maximizing production from its large-scale gas-focused portfolio to deliver material free cash flow and maximize total shareholder return in a sustainable way. ESG and health and safety are paramount to Energean; it aims to run safe and reliable operations, whilst targeting carbon-neutrality across its operations by 2050.

ENERGEAN