EGYPT
OIL&GAS
NEWSPAPER

Celebrating 15 Years
OF CONTINUED GROWTH & SUCCESS

EXCLUSIVE

"WITH COVID ENDING, EGYPT PETROLEUM SECTOR PRECEDES A NEW IMAGE IN 2022"

AN INTERVIEW WITH

H.E. TAREK EL MOLLA

MINISTER OF PETROLEUM AND MINERAL RESOURCES - ARAB REPUBLIC OF EGYPT

EDITOR'S LETTER

Great Achievements and Promising Opportunities

In 2021, Egypt's petroleum sector recorded significant achievements. These achievements reflect promising opportunities at all levels in 2022. For instance, arrears to international oil companies (IOCs) were reduced by 87% to $845 million by the end of June 2021, in comparison to $6.3 billion in 2011. Moreover, the sector made a total of 52 discoveries, including 39 crude oil discoveries and 13 gas discoveries. These successes will be translated as an increase in the investments.

Hence, EOG's January issue is dedicated to discuss the achievements of Egypt's petroleum sector in 2021 and the potential of it in 2022. We are honored to have the chance to conduct an interview with H.E. Tarek El Molla. Minister of Petroleum and Mineral Resources. He shared with us the sector's successes in 2021 and the Ministry's plans for 2022. We also had a great chance to talk to Eleanor Rowley, Capricorn Egypt's Managing Director. Rowley highlighted Capricorn's strategy in the Egyptian market and the future plans for the global market

Our Research and Analysis team prepared a full report analyzing the economic performance of Egypt's petroleum sector. The technology section discusses the usage of synchronized hydraulic jacks. It enabled Egypt's Petroleum Projects & Technical Consultations Company (Petrojet) to raise the largest floating roof tank, which was awarded the Guinness World Record, for its crude oil storage facility in Sinai. T

EOG's team wishs you a year full of achievements!

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

EL MOLLA SHOWCASES EMGF'S ACHIEVEMENTS OVER PAST THREE YEARS

During the sixth ministerial meeting of the East Mediterranean Gas Forum (EMGF), Minister of Petroleum and Mineral Resources Tarek El Molla showcased the forum's accomplishments in the past three years.

El Molla referred to the completion of two studies about the possibility of using the infrastructures of the member countries to achieve economic growth and balance between supply and demand. He also referred to the establishment of four specialized working groups, and to the forum's global communication strategy.

These achievements reflect the level of integration and cooperation between the members and represent a driving force for achieving more joint success, noted El Molla.

The sixth meeting also witnessed the participation of several energy ministers as well as other senior officials.

PARLIAMENT APPROVES THREE EXPLORATION AGREEMENTS FOR GULF OF SUEZ, WESTERN DESERT, EASTERN DESERT

The Egyptian Parliament approved a draft law licensing Minister of Petroleum and Mineral Resources Tarek El Molla to contract the Egyptian General Petroleum Corporation (EGPC) and IEOC Production BV to conduct petroleum exploration activities in the Gulf of Suez and Nile Delta regions.

This contract will include petroleum exploration, development, and exploitation activities. The Parliament, being chaired by First Undersecretary Ahmed Saad El-Din, further approved a draft law submitted by the government licensing the minister to contract the EGPC and Apache Khaleda Corporation LDC to search for, develop, and exploit petroleum in the integrated research and development region of the Western Desert.

Additionally, the Parliament approved a draft law submitted by the government licensing the minister to contract the EGPC and TransGlobe West Bakr Inc, TransGlobe West Garb Inc and TGNW Garb Inc, to search for, develop and exploit petroleum in the development areas of Mena Bakr, West Ghareb, and North West Gharib Al-Barirah in the Eastern Desert.

PETROLEUM SECTOR WINS MENA OIL, GAS PROJECT OF THE YEAR AWARD

Egypt's Ras Badran Tank Farm has been named the MENA Oil and Gas Project of the Year at the MEED Projects Awards 2021.

This announcement came during MEED's event, which celebrates excellence in major projects in the MENA region as well as recognizes the most distinguished companies and sectors in all industrial and construction fields.

The award-winning project is affiliated with the Egyptian General Petroleum Corporation (EGPC) and implemented by Petrojet. It included the engineering, construction, and procurement of 29 crude oil warehouses in Agrood, Choucair, Ras Gharib, and Ras Badran, with a capacity of 175,000 cubic meters, equivalent to about 32 million barrels.

It is worth noting that the same project achieved the Guinness World Records certificate, which was received by Tarek El Molla, Minister of Petroleum and Mineral Resources in the field of manufacturing. The project introduced new technology in the construction of the double-deck floating roof.

EL MOLLA MEETS WITH PETROLEUM LEADERS AT WORLD PETROLEUM CONGRESS

Minister of Petroleum and Mineral Resources Tarek El Molla held several meetings with oil and gas leaders on the sidelines of the 23rd World Petroleum Congress.

El Molla's meetings included talks with Chevron International Chairman and CEO Mike Wirth, Cypriot Minister of Energy Natasa Pilides, President of Chevron International Company for Exploration and Production Clay Neve, and ExxonMobil Vice President for Research and Exploration John Ardill.

El Molla's discussions with Pilides and Neve involved the development of the Aphrodite gas discovery in Cyprus to accelerate plans to produce and transport gas to Egypt. Egypt will then use its facilities to liquefy the gas and re-export it to other markets.

The meeting with Wirth reviewed Chevron's activities in Egypt and its plans to increase exploration activities in its concession areas in the Western Mediterranean and the Red Sea. The meeting also discussed the company's plans to raise the quantities of gas transported to Egypt from the Eastern Mediterranean fields for re-exporting via Egypt's liquefaction plants, making Egypt a regional energy hub.

During a meeting with El Molla to review ExxonMobil's activities in Egypt, Ardill stated that Egypt is among the top priorities for the company. He highlighted that ExxonMobil is keen to accelerate its exploration plans, in light of Egypt's attractive investment climate and its robust infrastructure.

MINERAL OILS EXPORTS HIT RECORD HIGH IN 2021

Fuel and mineral oils came on top of the list of Egyptian exports in the first nine months of 2021 with $8.3 billion compared to $4.2 billion in the same period last year, according to the Central Agency for Public Mobilization and Statistics (CAPMAS).

The petroleum sector is one of the mainstays of economic growth. It contributed 24% of the country's Gross Domestic Product (GDP) in the fiscal year 2019/2020. Furthermore, the Ministry of Petroleum and Mineral Resources works towards magnifying the sector's contribution to GDP in order to turn Egypt into an energy trading hub.

A BLAST FROM THE PAST

In January 1974, Arab Petroleum Pipelines Company (SUMED) was established as one of the earliest joint Arab partnership models. The Egyptian General Petroleum Corporation (EGPC) takes a share of 50% of the company. Additionally, Mubadala, Saudi Aramco, and Kuwait Investment Authority all hold a 15% stake each. While the remaining 5% share is held by QatarEnergy. The company is a service provider which owns and operates two parallel pipelines linking Ain Sukhna to Sidi Kerir. It also owns and operates the Ain Sukhna Products Hub (ASPH) for the handling, transfer and storage of various petroleum products at Ain Sukhna terminal.

Each terminal of SUMED provides a capacity of 20 million barrels (mmbl) of crude oil tank capacity. Through its pipelines, it transports 70% of oil coming from the Arabian Gulf to Europe. Besides that, it plays a key role in supplying the Egyptian refineries with the needed oil.

Currently, SUMED is handling gasoil, liquefied petroleum gas (LPG), liquefied natural gas (LNG) and fuel oil at Ain Sukhna in addition to Euro Diesel at Sidi Kerir and it has plans to further expand in the oil products sector especially at its strategic Ain Sukhna location. In 2020, the company recorded net income of $166 million.

NUMBER OF THE MONTH

Egypt's transported natural gas quantities for exports increased dramatically to **4.65** billion cubic meters (bcm) in the fiscal year (FY) **2020/21** from **1.91** bcm.It is worth noting that the transported natural gas quantities for exports represent **7%** of the total transported quantities in FY **2020/21**, compared to **3.1%** of the total transported quantities in FY **2019/20**.

Total transported natural gas rose from **61.2** billion cubic meters (bcm) in FY **2019/20** to **66.7** bcm to FY **2020/21**. The quantities of transported natural gas are either allocated to the local market and another directed for exports. Natural gas directed to the local market reached **6.21** bcm in FY **2020/21**, compared **5.9** bcm in FY **2019/20**, according to the Central Agency for Public Mobilization and Statistics (CAPMAS).

COOPERATION

EL MOLLA, LUKOIL DISCUSS PROJECTS, INVESTMENT OPPORTUNITIES IN EGYPT

Minister of Petroleum and Mineral Resources Tarek El Molla met with Denis Rogachev, Senior Vice President for Overseas Oil, Gas Exploration & Production at Russian oil company Lukoil, and his accompanying delegation.

The meeting discussed the company's projects in Egypt, especially in its concession areas in the Western Desert, and its plans during the coming period, in light of its strong interest in expanding its investments in Egypt.

El Molla highlighted the importance of supporting relations with the Russian company on a larger scale, noting that he met with the President of Lukoil at Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) last month. They agreed to arrange this meeting to discuss new investment opportunities for the company in Egypt, El Molla added.

The minister further pointed out the oil and gas sector's readiness to expand horizons of cooperation in various fields of the petroleum industry. During the meeting, the development of the company's current business in Egypt in its concession areas Esh El Mallaha and Meleiha was reviewed.

"Lukoil has been operating in Egypt for more than 20 years, with an investment volume of about 600 million dollars, and is currently working in the Esh El Mallaha area and also in the Meleiha area, in partnership with Eni in the Western Desert region," Rogachev said.

EL MOLLA HOLDS BILATERAL TALKS WITH APACHE'S CEO

On the sidelines of the 23rd World Petroleum Congress, Minister of Petroleum and Mineral Resources Tarek El Molla held bilateral talks with John Christmann, President and CEO of Apache Corporation in Houston, Texas.

They discussed the company's plans to increase its investments in Egypt as well as intensify exploration and production activities in its concession areas.

Apache is one of the main partners in the petroleum sector, El Molla said, adding that it achieved distinguished results during its work period in Egypt, which extends for more than 25 years, especially in the Western Desert.

For his part, Christmann confirmed that Egypt has become the most important area in Apache's portfolio, pointing to the company's commitment to implementing its investment plans and raising the efficiency of operations in order to increase production rates.

In a related context, Christmann hosted El Molla at the Hall of Ancient Egypt at the Houston Museum of Natural Science. It should be noted that Apache Corporation is sponsoring the Hall to promote Egypt's cultural heritage in the US.

"As the largest oil producer and American investor in Egypt, Apache serves as a bridge between our two countries and promotes U.S.-Egypt business relations and economic cooperation," said Christmann.

"We are thrilled to showcase Egypt's vast, rich cultural heritage and the significant historical wonders of Egypt's ancient civilization for the American public," he added.

AGREEMENTS

BECHTEL, PETROJET SIGN COMMISSIONING TRAINING SERVICES AGREEMENT

Bechtel announced its selection to provide Commissioning Training Services to Petrojet to develop its Commissioning Department.

This is an ideal agreement with a local partner to provide capacity building of Petrojet's workforce, which will enhance its capabilities in commissioning, the company statement elaborated.

The signing of the agreement was attended by the Minister of Petroleum and Mineral Resources, Tarek El Molla. The agreement was signed by Petrojet Chairman Waleed Lotfy and Bechtel Egypt Country Manager Karim El-Dessouky.

The training will help enhance Petrojet's commissioning team such that it meets Bechtel's international standards. This will also assist Petrojet in creating a full set of commissioning procedures that will be followed by the company for any future project. It is expected that the fully-trained Petrojet commissioning team will provide support to Bechtel to execute commissioning activities on the Red Sea Suez Petro-Refinery project.

Bechtel, Enppi, and Petrojet have established a consortium to execute Africa's largest Petrochemicals complex.

"We are delighted to provide this service to our partner Petrojet and continue our support for the Ministry of Petroleum's Modernization Program. Egypt continues to be a key regional market for our Energy business and is at the core of our long-term strategic plan," El-Dessouky said.

PETROLEUM PROJECTS

SISI REVIEWS PETROLEUM PROJECTS UPDATES

President Abdel Fattah El Sisi held a follow-up meeting with Prime Minister Mostafa Madbouly and Minister of Petroleum and Mineral Resources Tarek El Molla to review the implementation status of several petroleum projects.

During the meeting, the President has directed to continue with the plan of connecting natural gas to households, especially in the villages targeted by the Haya Karima initiative.

In addition, he stressed the importance of expanding the number of natural gas service stations along the new roads and axes because of the health, environmental, and economic returns.

For his part, El Molla reviewed the work progress of the national project to deliver natural gas to homes, pointing out that the coming period will witness a quantum leap in the delivery rates through the Haya Karima initiative. He also presented the ongoing efforts to promote the expansion of natural gas stations, especially in vital areas.

SISI INAUGURATES HIGH-OCTANE BENZENE COMPLEX IN ASSIUT

President Abdel Fattah El Sisi inaugurated the high-octane benzene producing complex in Assiut. During the inauguration ceremony, Minister of Petroleum and Mineral Resources Tarek El Molla referred to the role of the oil and gas sector in developing Upper Egypt, especially the new benzene production complex project in the Assiut refinery.

The petroleum products' total consumption of the ten governorates in Upper Egypt amounts to 20% of Egypt's total consumption, El Molla noted. He pointed out the major challenges of providing petroleum products to the governorates of Upper Egypt, which were represented in providing fuel and the overcrowded stations; in addition to the increased pressure on roads as a result of transporting products from Cairo, Alexandria, and Suez, as well as the shortage of storage capacities.

El Molla explained that the total production of the new benzene production complex is 800,000 tons annually with various types of benzene, representing 13% of Egypt's total production and covering 100% of Upper Egypt's consumption and needs.

Egypt's local production of benzene increased by 55% from about 3.9 million tons in 2014 to 6 million tons in 2021, as a result of three major projects, including the new project in Assiut, the Egyptian Refining Company's (ERC) Mostorod refinery, and the expansions of the ANRPC plant in Alexandria.

PETROCHEMICALS

PM REVIEWS TCI SANMAR PETROCHEMICAL EXPANSION PLANS

Egyptian Prime Minister Mostafa Madbouly met with TCI Sanmar Petrochemical Chairman BS Jayaraman, and the company's Deputy Chairman Vijay Sankar to discuss future investments in Egypt.

The meeting was attended by the Egyptian Minister of Petroleum Tarek El Molla and a business delegation from the Indian company.

Madbouly praised the company's investments in Egypt, pointing out its strong contribution to the Egyptian economy.

Meanwhile, Jayaraman reviewed the company's work in Egypt, highlighting its industrial plant in Port Said, which produces three main petroleum products, polyvinyl chloride (PVC), caustic soda, and calcium chloride. Jayaraman pointed out the company's desire to establish an electricity generating plant to meet its electricity needs, in addition to establishing a loading, unloading, and exporting ethanol port at Gameel area in Port Said.

Meanwhile, El Molla praised the Indian firm's business in Egypt, pointing out its keenness to expand investments in the Egyptian market. He affirmed that the Egyptian government is keen to build strong relations between TCI Sanmar Petrochemical and the Egyptian Petrochemicals Holding Company (ECHEM).

EL MOLLA, BECHTEL'S CEO DISCUSS PROGRESS OF RED SEA PETROCHEMICAL COMPLEX

On the sidelines of the 23rd World Petroleum Conference, Minister of Petroleum and Mineral Resources Tarek El Molla met with Bechtel Chairman and CEO Brendan Bechtel to discuss the work progress of the Red Sea Petrochemical Complex.

During the meeting, El Molla stressed the importance of this large-scale project, saying that it will maximize the added value of Egypt's natural wealth. The complex, along with other major projects being implemented by the petroleum sector, will place Egypt among the petrochemicals-producing countries, El Molla noted.

Bechtel remarked that the Red Sea Complex is the largest project in the company's portfolio at the time. Bechtel, in cooperation with Enppi and Petrojet, is committed to the specified timetables for the project, as well as to providing training programs for workers.

On another note, the two sides discussed preparations for the climate change conference COP27. In this regard, El Molla said that the sector is working closely with its foreign partners to implement a number of projects, which will accelerate the transition to more clean energy resources.

ACHIEVEMENTS

MOP OUTLINES ENERGY SECTOR'S SUCCESS STORY AT ECONOMIC CONFERENCE

The Minister of Petroleum and Mineral Resources Tarek El Molla highlighted some of the sector's success stories that helped in improving the national economy and meeting the country's energy needs during the past few years.

El Molla's remarks came during his speech at the Akhbar Al Yom economic conference under the slogan "$100 Billion Exports... The Dream is Possible".

Despite the pandemic, the sector contributed 24% to the Gross Domestic Product (GDP) during the fiscal year 2019/2020. For the first time in years, the oil Balance of Payments runs a surplus of EGP 9.9 billion during 2018/2019.

Furthermore, Egypt established itself as the most growing liquefied natural gas (LNG) exporter in the Arab world during the Q3 of 2021.

The minister then pointed out the unprecedented results of the national project to expand the use of natural gas in homes and as fuel for cars, highlighting that the government connected 1.2 million households to the national gas grid in the last three years.

He added that the petroleum sector's adoption of programs and initiatives to expand the use of natural gas in homes and cars supports the trend of switching to low-carbon energy systems and reducing emissions. Meanwhile, the sector also launches other projects to improve energy efficiency and accelerate decarbonization.

With a clear vision and an ambitious action plan, the sector strives to increase its contribution to the country's GDP as well as maximizing the direct and indirect investments, noted El Molla.

EVENTS

EMGF MINISTERIAL MEETING DISCUSSES LONG-TERM STRATEGY, COP 27

The Sixth Ministerial Meeting of the East Mediterranean Gas Forum (EMGF) was convened in Cairo on the 25th of November, under the Presidency of Egypt's Minister of Petroleum and Mineral Resources Tarek El Molla.

The energy ministers participating in the EMGF showcased the outcomes of the first phase of the EMGF's long-term strategy, which reflects the basic objectives presented in the charter. Furthermore, the ministers confirmed the importance of natural gas during the energy transition as the least carbon-intensive fossil fuel.

The meeting was attended by Cypriot, Greek, French, Jordanian, Palestinian, and Israeli ministers of energy and foreign affairs. The United States, European Union (EU), and the World Bank attended as observers.

It should be noted that the ministers agreed to join forces to prepare initiatives for climate action in light of COP 27, which Egypt will host next year. Adding to that, they discussed the current status of the "Regional Natural Gas and Energy Supply and Demand Balance" study, currently in progress with the support of the EU.

Finally, the ministers expressed their deep appreciation to the Arab Republic of Egypt, under the leadership of President Abdel Fattah El-Sisi, for providing its utmost support as a host country for the EMGF, which contributed to establishing a sustainable regional market for gas and strengthening regional cooperation in accordance with international law.

MOBAREZ APPOINTED AS EMGF'S CHIEF

The Eastern Mediterranean Gas Forum (EMGF)'s members elected the Egyptian Osama Mobarez, the Undersecretary of the Egyptian Ministry of Petroleum and Mineral Resources, as the first Secretary-General of the forum.

Choosing Mobarez reflects the confidence of the EMGF's members in the Egyptian candidate.

Mobarez's mandate begins in early January 2022 and will continue until 2025.

In March, Mobarez was chosen as an Acting Secretary-General of the EMGF, during the fourth ministerial meeting of the forum.

EL MOLLA PARTICIPATES IN THE 23RD WORLD PETROLEUM CONGRESS

Minister of Petroleum and Mineral Resources Tarek El Molla participated in the 23rd World Petroleum Congress in Houston, Texas.

Being part of one of the world's most important oil and gas events, El Molla participated with David M. Turk, Deputy Secretary, Department of Energy, USA, in the opening session 'The Future of Energy in the World', which was moderated by Tor Fjæran, President of the World Petroleum Council.

During the session, El Molla reviewed Egypt's vision to contribute to promoting energy transformation and reducing emissions to combat climate change. He pointed out that Egypt aspires to contribute strongly to the realization of a safe, sustainable, and clean energy future for the world.

Egypt has a great responsibility and a prominent role in this regard, El Molla noted highlighting that Egypt will be hosting the World Climate Summit in Sharm El Sheikh (COP27) next year. He emphasized that Egypt has begun preparing for the summit in cooperation with a number of partners, led by the US.

ENI

EGPC, ENI SIGN $1B AGREEMENT FOR OIL EXPLORATION IN GULF OF SUEZ, NILE DELTA

The Egyptian General Petroleum Corporation (EGPC) and Italian energy company Eni have signed an agreement worth at least $1 billion for oil exploration activities in the Gulf of Suez and the Nile Delta.

The agreement was signed by Minister of Petroleum and Mineral Resources Tarek El Molla, EGPC Chairman Abed Ezz El Regal, and Eni CEO of Natural Resources Activities Alessandro Politi.

According to the agreement, Eni will pump a minimum of $1 billion in investments and will also spend an additional $20 million to drill four wells. The Ministry elaborated that this deal is part of its effort to boost production and to tackle the natural decline in wells by using the latest technologies.

ENERGEAN

ENERGEAN ANNOUNCES AMENDMENT OF NORTH IDKU CONCESSION AGREEMENT

With the consent of Minister of Petroleum and Mineral Resources Tarek El Molla, Energean Egypt Limited and Egyptian General Petroleum Corporation (EGPC) signed the second amendment of the concession agreement for petroleum exploration and exploitation in the North Idku offshore area of the Nile Delta, issued by Law 143 of the year 2021.

It is worth noting that this amended agreement, with the North Amriya Offshore Concession Agreement, will contribute to the development of a number of discoveries. This will be accomplished through an integrated project, including drilling 4 wells connected to the facilities of Abu Qir Company, which will contribute with daily production rates of approximately 90 million cubic feet of gas and 1,000 barrels of condensate.

With investments worth $236 million for this project, Energean has most certainly confirmed its commitment and keen interest in the Egyptian concession areas.

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SHELL

SHELL SIGNS FOAS WITH QATAR ENERGY IN EGYPT'S RED SEA

Shell Exploration & Production B.V., subsidiary of Royal Dutch Shell plc., signed farm out agreements (FOAs) with QatarEnergy, under which QatarEnergy will acquire a 17% stake in each of Shell-operated Block 3 and Block 4 in the Egyptian Red Sea.
The FOAs are subject to government and regulatory approvals, without prejudice to pre-emption rights.

This follows an earlier dilution of Blocks 3 and 4 to BHP Petroleum (Egypt) Limited, which is also subject to government and regulatory approvals. Shell will remain the operator in both blocks.

"Bringing such reliable partners into the project will enable us to leverage our joint expertise as we progress the opportunity. It is also worth highlighting that we were able to attract new market entrants thanks to the favorable investment climate in Egypt," Khaled Kacem, Shell's Vice President & Country Chair for Egypt, commented.

APA

APA RECEIVES PARLIAMENT APPROVAL FOR MODERNIZED PRODUCTION SHARING CONTRACT

APA Corporation announced that the Egyptian Parliament has approved the agreement to modernize and consolidate its current production sharing contracts (PSCs) with the government.

The PSC is now pending presidential ratification, which is the next and final step for the revised PSC terms to take full legal effect.

It is worth noting that the agreement was reached in principle with Egypt's Ministry of Petroleum and Mineral Resources (MOP) and the Egyptian General Petroleum Corporation (EGPC). Furthermore, the agreement terms included consolidating the majority of the concessions operated by APA's subsidiaries operating in Egypt ("Apache") into a single new concession, simplifying the contractual relationship with EGPC as well as other provisions.

ENOC

ENOC, ROYAL MARINE SERVICES SIGN AGREEMENT FOR LUBRICANTS DISTRIBUTION IN EGYPT

ENOC Group announced the signing of a three-year agreement with Royal Marine Services to distribute a wide range of marine lubricants in Egypt.

The agreement aims to boost the Group's lubricant product presence in a thriving market. The marine lubricants industry in Egypt has experienced growth at a steady pace with annual transactions, including local and international lubricants at over 24 million liters.

On this occasion, ENOC CEO Saif Humaid Al Falasi said: "Over the years we have strived to establish a strong presence across local and international markets to offer our customers a diverse portfolio of lubricants. Our latest partnership with Royal Marine Services is another milestone as we continue to support the overall growth of the maritime and shipping sector at an international level."

It is worth noting that ENOC Misr, a joint venture between Proserv Egypt Group and the UAE's Emirates National Oil Company (ENOC), is responsible for the local marine market. Royal Marine services will manage the international marine market for ENOC Group.

BECHTEL

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Bechtel, Enppi, and Petrojet have established a consortium to execute Africa's largest Petrochemicals complex.

"We are delighted to provide this service to our partner Petrojet and continue our support for the Ministry of Petroleum's Modernization Program. Egypt continues to be a key regional market for our Energy business and is at the core of our long-term strategic plan," El-Dessouky said.

TÉCNICAS REUNIDAS

EGAS, TÉCNICAS REUNIDAS SIGN EMISSIONS REDUCTION MOU

Minister of Petroleum and Mineral Resources Tarek El Molla witnessed the signing of a memorandum of understanding (MoU) between the Egyptian National Gas Holding Company (EGAS) and Spain's Técnicas Reunidas.

The MoU involves cooperation in emission reduction projects and the transition to clean energy. It was signed by EGAS Chairman Magdy Galal and Técnicas Reunidas Vice President Manuel Alapart.

According to the MoU, the two companies will conduct economic feasibility and technical studies to implement joint projects in hydrogen production as well as carbon capture, use, and storage (CCUS), in addition to energy efficiency and biofuel activities.

PXGEO

PXGEO TO CONDUCT 3D TOWED STREAMER PROJECT IN EGYPTIAN RED SEA

Seismic surveyor PXGEO has been awarded a contract to carry out 3D towed streamer project in the Red Sea.

Furthermore, the company, which provides both ocean bottom node and towed streamer seismic services, will use the seismic vessel PXGEO 2 for the survey.

The project will commence as of November 2021 and will last four months.

ORASCOM

ORASCOM JOINS GREEN HYDROGEN CONSORTIUM

Orascom Construction PLC announced that it has joined the Green Hydrogen Consortium with Fertiglobe, Scatecm and The Sovereign Fund of Egypt to develop Egypt's first green hydrogen production facility.

The production facility will be equipped with a 100 MW PEM (Polymer Electrolyte Membrane) electrolyzer, making it the world's largest independently owned facility and the first in Egypt.

Green hydrogen produced from this facility will be used as feedstock for up to 90,000 tons of green ammonia to EBIC, Fertiglobe's ammonia production facility in Ain Al Sokhna, Egypt.

It is worth noting Orascom Construction will execute the local works in order to showcase the green hydrogen facility during COP 27 in Egypt.

ENAP SIPETROL

ENAP'S ABUDINÉN RECOGNIZED AS ONE OF THE BEST 20 CHILEAN WOMEN EXECUTIVES IN 2021

Denisse Abudinén, CEO ENAP Sipetrol and General Manager ENAP Sipetrol Egypt branch, was recognized as one of the 'Best 20 Chilean Women Executives in 2021' due to her leadership and significant contributions.

"This is a very important recognition highlighting the important role of our executives inside the company and her impact in the countries where ENAP has operations," ENAP Sipetrol said.

'The Chilean Businesswomen Organization', which is a non-profit organization with the highest reputation in the country, jointly with the most important newspaper El Mercurio, and an external independent jury, comprised of the highest executives from different companies of Chile, have awarded the 100 Leaders Women in 2021.

ENAP ORGANIZES FIRST SUCCESSFUL PHYSICAL SCOUT CHECK MEETING AFTER COVID-19 PANDEMIC

On December 15th, Enap held the first physical Scout Check meeting after COVID-19 Pandemic in attendance of Abed Ezz El Regal, the Egyptian General Petroleum Corporation (EGPC)'s Chairman, Denisse Abudinén Butto, CEO ENAP Sipetrol and General Manager ENAP Sipetrol Egypt branch, Adel Ahmed Samaha, EGPC Deputy Chairman for Exploration & Supervisor for Agreement Division, Samir Raslan, EGAS' Vice Chairman for Exploration & Agreement and most of IOCs, EGPC Exploration department leaders.

The event, which took place at Dusit Thani Hotel in Cairo, was divided into three main parts: the first part Enap shared its history profile in Egypt since 1998 with different exploration activities in 5 blocks with focus on its drilling and production performance in East Ras Qattara Concession in the Western Desert and the latest seismic acquisition operations that took place in early 2021, through its joint venture (JV) Petroshahd over Shahd, Shahd SE, Diaa, and Al-Zahra Development leases.

WITH COVID ENDING, EGYPT PETROLEUM SECTOR PRECEDES A NEW IMAGE IN 2022

AN INTERVIEW WITH H.E. TAREK EL MOLLA

Minister of Petroleum and Mineral Resources

2021 was a year full of new challenges and promising opportunities. As Egypt's petroleum sector powered through the pandemic, it worked toward its goal of becoming a regional energy hub. As new windows of opportunity are about to be opened this year, promising the sector a more prosperous future, Egypt Oil & Gas talks to Minister of Petroleum and Mineral Resources Tarek El Molla to learn more about the sector's strategy in 2022.

Thanks to the oil and gas sector's commitment and persistence, the industry was able to attract major new investments. How did the ministry manage to gain the trust and attract these investors?

The Ministry of Petroleum and Mineral Resources has continued its efforts to reduce arrears to IOCs to motivate IOCs to pump more investments and intensify exploration and discovery activities. This will act as a catalyst to develop new discoveries that will thereby boost production. Through these efforts, the Ministry has successfully ensured compensation for arrears to IOCs from previous periods. Hence, arrears to IOCs were reduced by 87% to $845 million by the end of June 2021, in comparison to $6.3 billion in 2011.

Throughout the year, Egypt managed to make new discoveries and attract investments. Could you share with us some of the highlights of 2021?

The sector made 52 discoveries, including 39 crude oil discoveries and 13 gas discoveries, in the Western Desert, the Gulf of Suez, the Mediterranean, Sinai, and the Eastern Desert.

Thanks to the sector's commitment, seven petroleum agreements were signed with a total signature bonus of $16 million, minimum investments of $1.223 billion, and the drilling of 14 wells. Moreover, 17 development leases with a signature bonus of $7 million for the Eastern Desert and the Western Desert were signed. Also, all necessary measures are being taken to finalize 11 petroleum agreements with a total signature bonuses of $177.3 million and minimum investments of $3.5 billion; in addition to the drilling of 39 wells.

> *The energy cooperation between Egypt and the world powers, such as the US and EU, would contribute to making this Climate Change Summit a success, as most of the discussions and negotiations in this event revolve around the pivotal role of energy in driving the global climate pledge.*

> *We will maximize the value of our current resources of natural gas, which is considered a importanr fossil fuel in the energy transition process.*

With new discoveries and investments in 2021, how did our production of oil and gas in Egypt look like?

In 2021, production in the petroleum sector reached 82.4 million tons of oil equivalent (mmtoe), including 28.3 million tons of crude oil and condensates, 53.1 million tons of gas, and 1 million tons of butane (not including butane production from refineries and investment companies). Petroleum production rose by 8.4%, while natural gas production increased by 17.2% compared to 2020.

On the other hand, liquefied natural gas exports have made Egypt one of the leading Arab countries that have achieved the highest growth in natural gas export volume during Q3 of 2021, with natural gas exports reaching 1 million tons. This is a 900% increase in comparison to the same period in 2020.

And after an eight-year pause, Damietta's gas liquefaction plant has become fully operational again and has resumed its essential role in liquefying natural gas exports.

> *The sector managed to boost investment climate in oil and gas exploration and production (E&P) allowing giant IOCs to participate in Egypt's E&P activities for the first time such as ExxonMobil and Chevron.*

Local consumption of petroleum products increased by 6% during 2021. How could you cope with the increasing demands and ensure stability of local market?

During the current year, the petroleum sector managed to achieve complete stability in the local market, as it was able to meet the petroleum and gas needs of local market. Consumption increased by 6% in comparison to the previous year, reaching 75.8 million tons. This comes as petroleum products consumption in 2021 reached 27.8 million tons, which includes 6.8 million tons of petroleum products worth $5.3 billion imported to meet local demand. Overall, consumption in 2021 witnessed a 6.9% increase, compared to the previous year. Meanwhile, local natural gas demands were met by 48 million tons of natural gas, representing a 6% increase in comparison to the previous year. Production of electricity makes up 60% of total gas consumption.

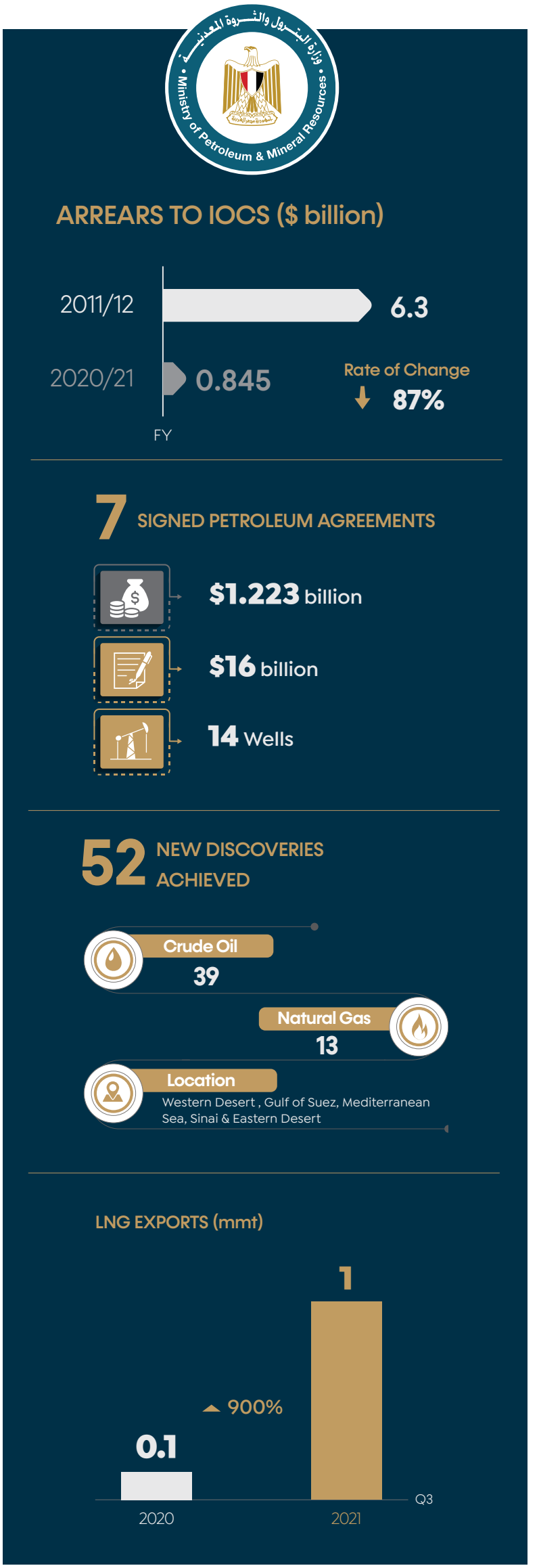
What are the latest updates in Egypt's efforts to deliver natural gas to households and factories? And how is the ministry reinforcing the national gas grid?

In continuation of the government's efforts to promote the use of natural gas, several accomplishments were made in 2021, including delivering gas to 1.2 million households, which is equivalent to 21 million cylinders that were replaced. Natural gas was delivered to 75 new areas for the first time. In 2021, gas has been delivered to 96 villages until now, and soon it will be also delivered to 241 other villages. Delivery to the remaining villages will be complete after works on their sewage systems are finalized. Hence, natural gas deliveries reached 2000 consumers and 100 factories. Moreover, Natural gas deliveries to bakeries have tripled in 2021 reaching 2,358 bakeries.

As for the national gas grid, 5 pipelines started operation in 2021 to support the national network for the transporting of natural gas, with a total length of about 185 km and a total cost of around EGP 3 billion.

How did the oil and gas sector develop infrastructure during 2021, and how far did the ministry go in the expansions in CNG projects to maximize its usage as fuel?

During 2021, 4 new pipelines started operation to transport crude oil and petroleum products, in addition to replacing and renewing a number of pipelines in order to maintain the operational capacity of the oil pipelines network. The total lengths of the pipelines amounted to about 295 km at a total cost of around EGP 1.6 billion. Egypt further established two crude warehouses at the Qarun station of the Petroleum Pipelines Company, with the aim of establishing new storage capacities inside the station, by constructing two



> *The sector made 52 discoveries, including 39 crude oil discoveries and 13 gas discoveries, in the Western Desert, the Gulf of Suez, the Mediterranean, Sinai, and the Eastern Desert.*

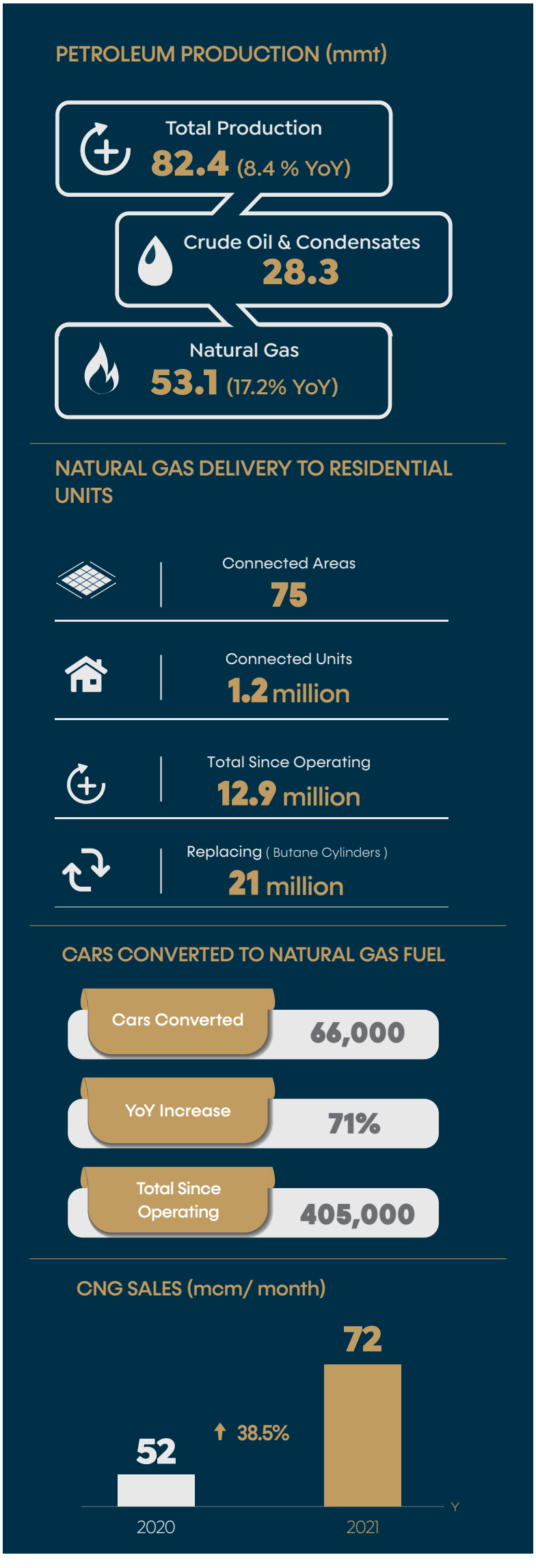
EGP 195 million crude warehouses, each with a capacity of 10,000 cubic meters. Egypt further established an EGP 98 million unit for receiving, mixing and shipping gasoline at El Nasr Petroleum Company in order to increase the storage capacities of 92-octane benzene to secure the local market's needs by constructing two naphtha tanks with a total capacity of 43,000 cubic meters.

Meanwhile, Petrojet obtained a certificate from the Guinness Book of World Records for its implementation of a crude oil storage warehouse in RasBadran, which set a record in its field as the largest floating storage warehouse in the world with a capacity of about 1.1 million barrels of crude oil. The initiative falls within the framework of a national project to establish crude oil depots for 29 warehouses in a number of regions across the country. Moreover, the MEED International Corporation awarded the petroleum sector the MENA Oil and Gas Project of the Year, due to the establishment of the RasBadran crude storage depots.

On the other hand, when it comes to the CNG expansions, the sector has made several accomplishments, such as converting 66,000 cars to run on CNG in 2021, which is a 71% increase in comparison to the previous year. This means that as of 2021, a total of 405,000 cars have been converted since the beginning of this initiative. Moreover, efforts to increase the number of natural gas car fueling stations have witnessed remarkable success with 530 stations completed from the beginning of the initiative until the end of 2021. This represents 53% of the total gas stations that have been completed over the past 25 years. The average monthly CNG sales increased by more than 38% to reach 72 million cubic meters (mmcm) in 2021, compared to 52 mmcm during the previous year. This was due to the conversion of automobiles running on liquid fuels (such as gasoline or diesel) to run on CNG.

Throughout 2021, the oil and gas sector managed to successfully complete several projects. Could you highlight some of the production and development projects that were completed in 2021?

Six projects for the development of oil and gas fields have been implemented and completed, with a total investment of about $4.2 billion. Egypt completed the development of the North Alexandria and West Nile Delta fields (the third phase - the Raven field) - in the Mediterranean. This project aims to produce 850 million cubic feet per day (mcf/d) of gas in addition to 24,000 barrels per day (b/d) of condensate. This is set to be achieved through drilling 8 new offshore wells and establishing onshore treatment facilities with a capacity of 900 mcf/dand investments of around $4 billion.



NATIONAL GAS GRID PROJECTS

Newly Operated Pipelines

5

Added Length

185 km

Investments

EGP 3 billion

PROJECT CRUDE OIL TANK ENTERS GUINNESS WORLD RECORDS

Reason	Capacity
Largest floating storage warehouse for crude oil in the world	1.1 mmbbl

IMPLEMENTED & COMPLETED DEVELOPMENT PROJECTS

No. of Projects	Investments
6	$4.2 billion

EMGF HEADQUARTER AGREEMENT WITH EGYPT

Signature Date: Jul **2021**

Approval Date: Nov **2021**

PETROLEUM SECTOR TECHNOLOGICAL DEVELOPMENTS

- EUG Launch
- Mop Stations Application Launch
- 1st E-system to Monitor Butane Trade Inauguration
- 14 Method to Report Gas Readings & Pay Bills by Petrotrade

The implemented projects further include the one to complete the development of North Sinai fields (the third phase). The project aims to produce quantities of natural gas amounting to about 45 mcf/d by drilling three wells, with the manufacturing and installation of three offshore platforms and linking them to the main pipeline, with investments of around $87 million. We also worked on the expansion of the treatment facilities in the Atoll field, which aim to recover 5 mcf/d of flare gas by constructing a condensate treatment unit, a gas recovery unit, tanks, and a treated condensate line with investments of about $43 million.

The oil and gas sector also saw the Northwest Seas Gas Exploitation Project (General Petroleum Company). The project aims to produce about 15 mcf/d of gas, 200 b/d of condensate, and 50 tons of propane and butane per day through 4 wells and connecting them to one of the processing plants to maximize the return, separate products, and push the remaining gas into the national grid through the construction of an 8-inches diameter pipeline, with a 15 km length. The project cost around $16.3 million in investments.

> *During the current year, the petroleum sector managed to achieve complete stability in the local market, as it was able to meet the petroleum and gas needs of citizens.*

On the other side, the refining industry also flourished. Could you share with us a brief on the most important refining project that are being implemented?

One of the important projects is completing the expansions of the MIDOR refinery. The project aims to increase the refining capacity of the plant by 60%. The project cost is $2.4 billion. Moreover, Egypt established a diesel production complex at ANOPC. The project aims to establish a complex for converting low-value mazut into high-quality petroleum products, with a feeding capacity of 2.5 million tons annually. The project's investments recorded around $2.9 billion.

The projects further included the expansions of SOPC. The project aims to achieve the continuity of the safe operation of the production equipment in the coking complex and to reach the design feeding capacity of 1.5 million tons annually of mazut to maximize the quantities of middle distillates, especially diesel; butane; and gasoline, in order to cover the needs of the local market of petroleum products. The project's investments are about $1.8 billion.

Additionally, ASORC, Enppi, and Petrojet signed a memorandum of understanding (MoU) to establish a new atmospheric distillation project at the Assiut Refinery at an investment cost of about EGP 6 billion and a design capacity of 5 million tons of crude annually. This project aims to contribute to the sustainability of the operation of current and future projects, including a gas recovery unit (butane).

As the EMGF is gaining more momentum, how did the oil and gas sector contribute to Egypt's leading role in the Eastern Mediterranean region?

Egypt initiated the idea of the Eastern Mediterranean Gas Forum (EMGF) two years ago during the tripartite summit between Egypt, Cyprus and Greece on the island of Crete. The idea was widely accepted by most of the countries in the region, whether producers, consumers or transit countries.

On July 6, 2021, the Egyptian government signed the forum headquarters agreement with the EMGF, which was approved by the House of Representatives in its session on November 2, 2021.In addition to the launch of the forum's website, 2021 witnessed the nomination of the Egyptian Osama Mobarez as the first Secretary-General of the forum for a period of three years, starting from January 2022.

since its launch, the forum has attracted global interest, represented in the desire of several countries such as France, the United States and the United Arab Emirates, to join the forum. While France joined as a member, the United States of America, the European Union and the World Bank participated as observers. In addition, many international companies and entities took part in the forum through the Gas Industry Advisory Committee launched in November 2019 to allow effective cooperation between the governments of the member countries and the gas industry leaders in the region. The EMGF's participants have reached 32 of the largest companies and international entities.

In 2016, the Egyptian petroleum sector started an ambitious program aiming at comprehensively updating and modernizing the sector in order to increase its contribution to the comprehensive development of Egypt. Could you share with us some of the recent updateson the sector's Modernization program?

In 2021, many achievements have been fulfilled in this regard. The sector managed to boost investment climate in oil and gas exploration and production (E&P) allowing giant IOCs to enter E&P field in Egypt for the first time such as ExxonMobil and Chevron. Also, there are other companies working in Egypt such as Eni, BP, Apache and others, which continue to pump investments confirming their continuous trust in the Egyptian petroleum sector. This comes as the petroleum sector has used new solutions to promote its E&P opportunities. On 17 February, the Egypt Upstream Gateway (EUG) was launched to provide all needed geological data for the companies interested in investing in Egypt.

We also launched the Mop Stations application, which is the first of its kind, to find the locations and places of the fuel supply stations. It can be used by all types of smart mobile phones. Also, an electronic system has been launched to control and follow up the trade and distribution of butane locally at all its phases to monitor the transported quantities.

In the frame of enhancing the performance of NOCs, reducing expenses, and maximizing the benefits of sector's assets and resources, some companies working in the same activity, have been merged such as the merge of companies Gas Regions, Sinai Gas, and Cairo Gas under the name of Modern Gas as well as the merge of Khalda Petroleum Company and Qarun Petroleum Company.

What does Egypt plan for the upcoming period?

We are interested in having an opportunity to maximize the value of our current resources, such as natural gas, which is considered a fossil fuel yet is an important factor in the energy transition. Natural gas emissions are less harmful than those of typical fuels and coal. At the same time, we are committed to the Paris Agreement and the UN Framework Convention on Climate Change, and we are committed to reducing greenhouse gas emissions. Therefore, we are only asking for reasonable and doable measures for the outcome of decisions made in climate summits to have a reasonable timeframe.

> *The Ministry of Petroleum and Mineral Resources has continued its efforts to reduce arrears to IOCs to motivate them to increase their investments and intensify exploration and discovery activities.*

Which initiative does Egypt plan to highlight in COP27?

We have several initiatives we are preparing like carbon-capturing, utilization, energy efficiency, which are among the initiatives we would like to highlight in COP27.

How does Egypt coordinate its efforts with international partners regarding COP27 preparations?

I held a series of key meetings with the world's energy leaders at the UN Climate Change Conference COP26 in Glasgow. For instance, I met with the US Secretary of Energy Jennifer Granholm to discuss energy cooperation. In addition, I participated in the Net Zero World Initiative, launched by the United States.

During a ministerial panel discussion, U.S. Special Presidential Envoy for Climate John Kerry praised Egypt's efforts to combat climate change as well as its key role at relevant conferences and initiatives. He stressed U.S. support for Egypt, especially in the fields of capacity building and technological applications.

Most importantly, I had a meeting with the European Union's (EU) Commissioner for Energy Kadri Simson. This meeting mainly reviewed ways of cooperation with the EU to support Egypt's hosting of the upcoming COP27. The energy cooperation between Egypt and the world powers, such as the US and EU, would contribute to making this Climate ChangeSummit a success, as most of the discussions and negotiations in this event revolve around the pivotal role of energy in driving the global climate pledge. It can be said that these discussions helped in forming a clear vision for Egypt's future energy strategy.

تحت رعاية فخامة الرئيس عبد الفتاح السيسي رئيس جمهورية مصر العربية
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Gabriel Mbaga Obiang Lima
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His Excellency
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BUILDING ON EGYPT'S OIL & GAS POTENTIAL

AN INTERVIEW WITH ELEANOR ROWLEY

Capricorn Egypt's Managing Director

Capricorn

Taking pride in working closely with Egypt's oil and gas sector, Capricorn Energy is working hard to build on the success that the industry has enjoyed. Our interview with Capricorn Egypt's Managing Director Eleanor Rowley reveals the company's strategy to continue its work in enhancing the sector and unlocking the potential that the Egyptian market can use to become more globally competitive.

Can you tell us a little about Capricorn Energy?

Capricorn Energy PLC is the new name as of 13th December 2021 of Cairn Energy PLC, and I will discuss the reasons for the name change later in the article. What is important to know about us is that we are one of Europe's leading independent oil and gas exploration, development and production companies. We have been listed on the London Stock Exchange for more than 30 years and are a member of the FTSE 250 index. The company has explored for, discovered, developed and produced oil and gas in a variety of locations throughout the world as an operator and partner in all stages of the oil and gas lifecycle. Our production, development, and exploration activities are focused on Egypt, with further exploration activities in the UK North Sea, West Africa, and Latin America.

The company is well known for its exploration successes, including creating a world class oil province in Rajasthan, the largest onshore discovery in India for more than 25 years with the potential to provide more than 30% of India's daily crude oil production. More recently, the company made play-opening discoveries offshore Senegal which will lead to the country's first offshore oil and gas development.

Right now, we are evolving and in September 2021, we entered Egypt, acquiring a 50% working interest in Shell's Western Desert assets for an acquisition value of $323 million, with our partner Cheiron acquiring the other 50% working interest. This is the most important asset in the Capricorn business, and we are focussed on its success in the years to come.

I am very proud to be leading the Capricorn Egypt Limited subsidiary. We are currently recruiting, and I am delighted that our investment in the country will allow us to add many talented Egyptians who will be at the heart of building a successful business for the company in Egypt.

How encouraging do you see your new partnership with Cheiron in Egypt?

The partnership of Cheiron and Capricorn, brings together an experienced Egyptian operator that has significant mature field management capability with a nimble international operator, strong in exploration, and keen to invest and expand our production base. Together we very quickly identified and agreed that there was strong potential in the assets, and we were able to develop a shared vision on production ramp up, value-adding exploration, as well as the need to initiate decarbonization projects.

Another key partner is our Joint Venture Company – Badr El Din Petroleum Company (BapetCo). BapetCo has had a long and successful relationship with Shell of more than 35 years. We wanted to ensure that the transition went smoothly and BapetCo staff understood our ambition to invest in the assets and really open up a new and exciting chapter of growth. We

> *"Our production, development, and exploration activities are focused on Egypt, with further exploration activities in the UK North Sea, West Africa, and Latin America."*

are very pleased with the first 100 days where BapetCo has successfully ramped up production by around 8,000 barrels of oil equivalent per day (boepd) at the time of writing, with a plan to further ramp-up in 2022. In addition, we wanted to reassure them that the high technical standards, including best practices in health, safety, security, and environment (HSSE), would continue under the new partnership.

I also want to acknowledge the very positive engagement we have had with the Egyptian General Petroleum Corporation (EGPC) from taking over the assets. They have been supportive of our plans for the operations, which we have very much welcomed.

Could you highlight the significance of your acquisition of the Western Desert assets from Shell?

Strategically, the acquisition is a first step in Capricorn's goal of diversifying and prolonging our production base and will also provide near-term development and significant exploration potential for both oil and gas. Importantly, it also adds significant gas production volumes to Capricorn's current portfolio. The Western Desert is attractive as we wish to rebuild an onshore presence with assets that are resilient through the energy transition. Successful exploration onshore the Western Desert is lower cost, with short tie-in times and gives us access to an extensive infrastructure network that will allow us to commercialize new discoveries quickly. In other words, the resources we target through the exploration and production (E&P) cycle here are advantaged barrels, and we are delighted to have acquired this material position that offers potential growth.

Capricorn will operate the majority of the exploration assets (West El Fayum, South East Horus and South Abu Sennan) whilst Cheiron will operate the North Um Baraka concession located adjacent to the Obaiyed field. The operated exploration blocks have a total area of more than 8,700 square kilometers and we intend to acquire two new, state-of-the-art wide azimuth seismic surveys as well as drill up to nine new exploration wells. An additional seismic survey and 1 exploration well will be drilled in the Cheiron operated block..

As we ramp up production and re-invigorate operations, we need to be mindful of the carbon footprint. I am pleased that Bapetco is already taking steps to decarbonize, with a large program of diesel to gas turbine replacement. Beyond that, we are assessing additional decarbonization projects, including solarization, removal of permanent flaring, and carbon capture and storage (CCS). We want to move quickly in this space, and it's wonderful to see Egypt hosting COP 27 which we believe presents an opportunity to accelerate the pace of our investments.

Capricorn Energy has set the ambition to become Net Zero in our Scope 1 and 2 operated emissions by 2040 or earlier, so decarbonization is a key strategic pillar now and for the future.

What are your plans for developing the new assets in Egypt and what potential opportunities are there for this?

Our plans can be summarized into 3 main areas: increase production, add value through exploration, and decarbonize.

Through BapetCo, our plans to increase production are already being realized as we approach 100,000 boepd. In 2022, we will add three rigs to the two rigs we currently have drilling, which will allow us to drill 40 - 50 wells next year across development, water injection, near field exploration, and wildcat exploration. In addition, we will take our workover rig count from four to five.

In parallel, we want to introduce technologies such as deviated wells, newer fracking approaches, and real-time operations to improve productivity and efficiency. In two of our assets, we are working alongside partners - Apache in the NEAG concession and Neptune and Zhenhua in AESW - and we would like to ensure that their ideas and experience on the assets is used to the advantage of all.

> *"The acquisition is a first step in Capricorn's goal of diversifying and prolonging our production base and will also provide near-term development and significant exploration potential for both oil and gas."*

Of course, underpinning all our operational plans and activity is the importance of delivering safely.

Capricorn is also excited to contribute to Egypt's Sustainable Development Strategy and we are looking at ways that we can target our social investment programs to contribute to the pillars of education and health.

Do you have any plans to further expand in Egypt?

We were attracted to the Western Desert because we have a strong belief that it is a basin where there is opportunity to grow, in a country that offers a strong investment proposition. The company is currently focused on using its strong balance sheet to pursue value accretive acquisitions of production assets with attractive growth potential, that could sit alongside the assets in Egypt.

> *"Capricorn is also excited to contribute to Egypt's Sustainable Development Strategy and we are looking at ways that we can target our social investment programs to contribute to the pillars of education and health."*

What is your outlook for Egypt's oil and gas industry?

Through our acquisition of the Shell assets, Capricorn is sending a clear message that we believe in a strong E&P industry in Egypt.

I first came to work in Egypt in 2000 and I can say that more than 20 years later the industry is as vibrant and dynamic as it was then, if not more so. The Modernization program of H.E. Eng Tarek El Molla will ensure the industry continues to evolve and remain competitive. Underpinning the E&P outlook is the fact that Egypt is blessed with two of the world's super basins – the Nile Delta and the Western Desert - and both continue to have significant remaining potential for both oil and gas. Coupled with the stable regulatory and fiscal environment, the strong support of the

Ministry and government authorities to grow the industry responsibly, Capricorn was convinced that Egypt is an attractive place to invest.

It's a very interesting time as we navigate the journey of the global energy transition. It's clear there is a determination to capture the opportunities of renewables development here, as well as make progress on decarbonization of oil and gas over time whilst maintaining a vibrant oil and gas sector. We plan to play our own part in this journey, and we look forward to COP 27 acting as a catalyst to drive a new wave of investment that Capricorn will be a part of.

> *❝ Egypt is a very important first step in the extension and diversification of our producing asset base and we will continue to pursue opportunities to add further scale to our global operations. ❞*

Why are you going to rebrand your company? And how can such a step affect the company's future?

We renamed the company Capricorn Energy PLC on 13 December 2021, changing from Cairn Energy PLC. The change followed an agreement made at the time of the initial public offering of our Indian business that the name would ultimately be changed. The majority of our subsidiary companies had been known as Capricorn for many years, so the change was very deliberately one of continuity and evolution, rather than signalling any radical change to how the company operates or our strategy.

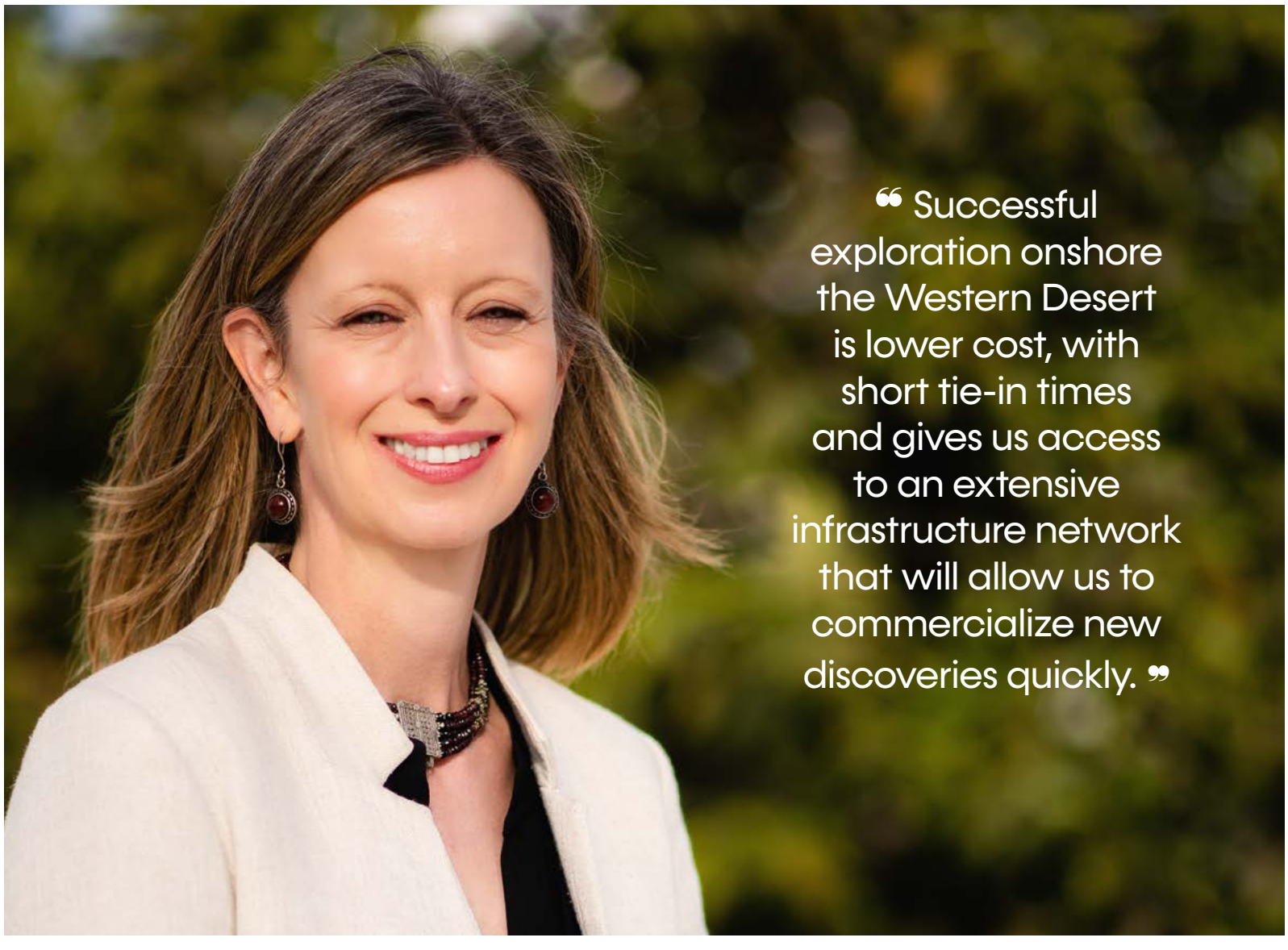
> *❝ Capricorn will operate the majority of the exploration assets (West El Fayum, South East Horus and South Abu Sennan) whilst Cheiron will operate the North Um Baraka concession located adjacent to the Obaiyed field. ❞*

We chose Capricorn because it is already an established and respected name across our global operations, which will help to maintain stakeholder confidence in how we operate and our long-standing reputation for respect, relationships and responsibility.

What are the company's future plans to expand its global position?

We have always been a business that thrives on creating, adding and realizing value through active management of our portfolio, and maintaining a very strong balance sheet. We have demonstrated the capability to operate with success in a number of locations worldwide, and always actively consider the best fit for our business to continue to create value for our stakeholders.

Egypt is a very important first step in the extension and diversification of our producing asset base and we will continue to pursue opportunities to add further scale to our global operations.



AN ECONOMIC OUTLOOK ON EGYPT'S OIL & GAS INDUSTRY PERFORMANCE

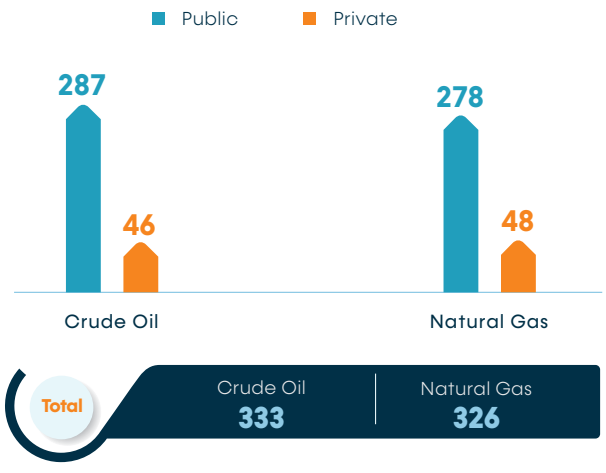
BY AMINA HUSSEIN, REHAM GAMAL, AND TASNEEM MADI

PETROLEUM EXTRACTIONS GDP

1. PETROLEUM EXTRACTIONS GDP OVER FYS (2019/20-2020/21)

GDP (EGP billion)

PETROLEUM EXTRACTIONS GDP PER SECTOR (EGP billion)



Average Share of Oil & Gas Extractions in Petroleum Sector GDP* **57%**

*Includes Oil & Gas Extractions & Petroleum Refining

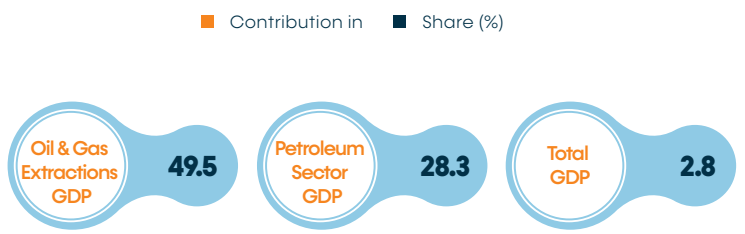
PETROLEUM EXTRACTIONS GDP AMONG OTHER SECTORS

2. NATURAL GAS EXTRACTIONS GDP OVER FYS (2019/20-2020/21)

GDP (EGP billion)

NATURAL GAS EXTRACTIONS GDP BY SECTOR

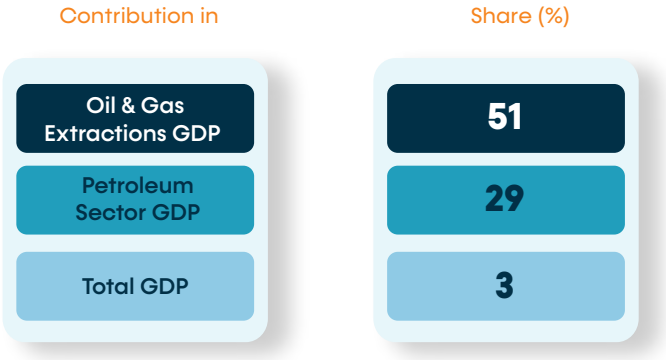
NATURAL GAS AVERAGE SHARES IN GDP



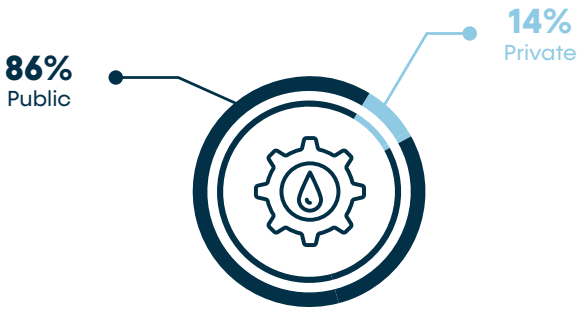
3. CRUDE OIL EXTRACTIONS GDP OVER FYS (2019/20-2020/21)

GDP (EGP billion)

CRUDE OIL EXTRACTIONS GDP AVERAGE SHARES

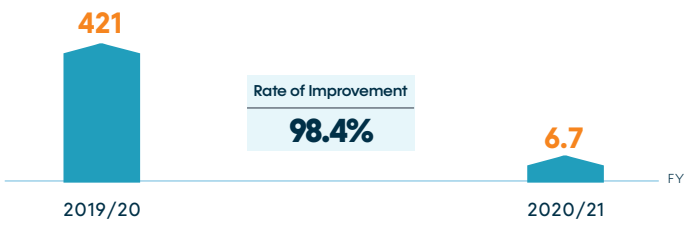


CRUDE OIL EXTRACTIONS GDP BY SECTOR

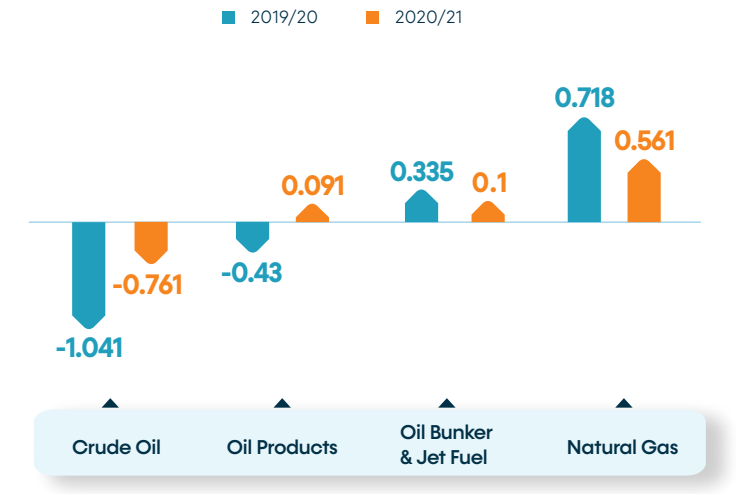


PETROLEUM TRADE BALANCE

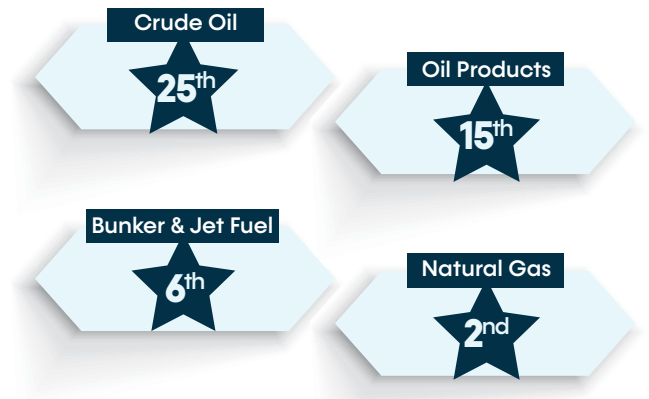
PETROLEUM TRADE DEFICIT ($ million)



PETROLEUM MERCHANDISE TRADE BALANCES ($ billion)



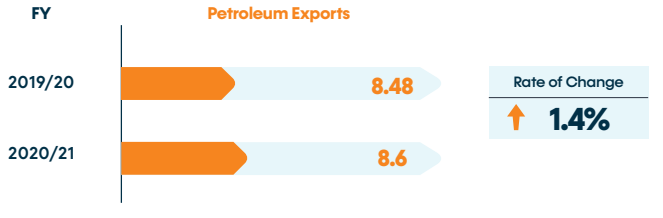
PETROLEUM MERCHANDISE TRADE BALANCES RANKS IN FYS (2019/20-2020/21) (Out of 36 Products)

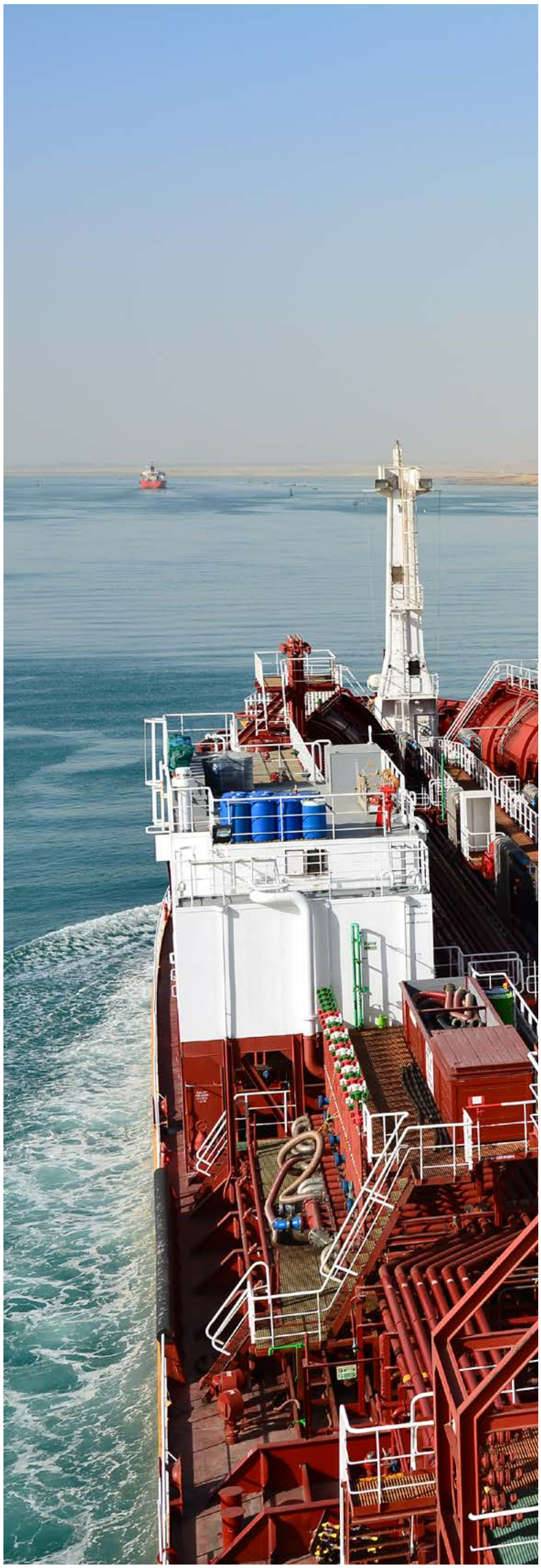


PETROLEUM MERCHANDIZE EXPORTS

1. PETROLEUM EXPORTS

TOTAL PETROLEUM EXPORTS ($ billion)





PETROLEUM EXPORTS RANKING AMONG PROCESSING DEGREE CATEGORIES OVER FYS (2019/20-2020/21)

Category	Exports ($ billion)	Rank
Finished Goods	21.1	1st
Fuel, Mineral Oils & Products*	17.4	2nd
Semi-Finished	10.7	3rd
Raw Materials	5.9	4th
Undistributed	2.7	5th

* Fuel, mineral oils & products include crude oil & oil products

2. PETROLEUM EXPORTS BY PRODUCT

PETROLEUM EXPORTS BREAKDOWN BY MERCHANDISE

PETROLEUM MERCHANDISE EXPORTS PERFORMANCE OVER FYS (2019/20-2020/21)

	Crude Oil	Oil Products	Bunker & Jet Fuel	Natural Gas
Total ($ billion)	5.93	8.2	0.91	2.04
Average ($ billion)	2.97	4.1	0.5	1.02
Average Share in Total Merchandise Exports (%)	13	18	2	5

PETROLEUM EXPORTS RANKING AMONG MERCHANDISE EXPORTS OVER FYS (2019/20-2020/21) (Out of 27 Goods)

Merchandise	Rank in FY 2019/20	Rank in FY 2020/21
Petroleum Products	1st	1st
Crude Oil	2nd	2nd
Natural Gas	9th	4th
Bunker & Jet Fuel	11th	19th

THE UPHILL QUEST FOR NATURAL GAS

BY RANA AL KADY

Although the hydrogen sector is generating a lot of hype and millions of dollars, not even all hydrogen is made equal. Although hydrogen is by far the most plentiful resource in the world, it must be separated from its source, which requires energy. At the present, it's largely made from grey hydrogen, which comes from fossil resources like natural gas as well as oil.

Furthermore, it should be noted that Egypt is Africa's biggest hydrocarbon user. As a result, the necessity to increase the nation's productivity to fulfill this need has become more obvious, particularly as energy consumption grew in the years prior to the coronavirus. Natural gas consumption increased from 40.9 billion cubic meters in 2009 to 58.9 billion cubic meters (bcm) in 2019, culminating at 59.6 bcm in 2018. Rising population, industrial growth, and hydrocarbon-extraction operations, as well as a spike in the proportion of automobiles on the road, all contributed to increased demand.

GENERAL REVIEW OF NATURAL GAS

First of all, Egypt was ready to cease importing LNG in October 2018 and resume exporting it in January 2019 as a result of natural gas breakthroughs and large increases in productivity over the preceding years. Egyptian exports accounted for 1% of the global economy in 2019, despite the country's larger objective of positioning itself as the regional hub for natural gas liquefaction and LNG exports. Egypt now has two LNG facilities at Idku and Damietta. Between 2013 and 2019, the former was operating at roughly 15% capacity, while the latter had been shut down from November 2012. Idku, on the other hand, was said to be working at 90% capacity in September 2019.The Idku factory reopened in February 2021, following a temporary halt in processes to the pandemic. At the same time, the Damietta plant reopened.

Over the medium to long term, the government has promised to boost LNG exports from either of the two projects to 12.5 million tonnes. In addition to local natural gas, the nation's long-term goal to become a significant LNG exporter calls for it to obtain natural gas from reserves being developed by neighbouring Mediterranean nations such as Cyprus, and Greece. Egypt also intends to use its existing gas infrastructure and local relations to develop itself as a major hub for the refining and export of Mediterranean LNG to International markets. Egypt exported 1.3 million tonnes of LNG to the EU in 2019, with 0.6 million and 0.3 million tonnes going to Pakistan and Singapore, accordingly. As projected by a Petroleum Scientist in the Egyptian Oil and Gas industry, "I believe that the industry will be projected to be driven by a lot of variables like strong regulatory programs and strategies to increase natural gas and oil [output] with future initiatives."

Nevertheless, the economy's growth is projected to be limited in the future years by the significant capital expenditure necessary, as well as a shortage of funding owing to a global financial recession in the case of the COVID-19 pandemic.

Thus far, North America has topped LNG export growth, with US LNG production increasing by over a third year on year (y-o-y) in the first half of 2021. Africa's LNG exports increased by 9% (y-o-y), owing to a strong resurgence in Egyptian LNG exports, which has been strengthened even more by the inauguration of the Damietta facility in February 2021. During the first half of 2021, LNG supply in the Middle East increased by 2% y-o-y as Qatar generated above nominal capacity.

FUTURE POTENTIAL OF NATURAL GAS

As a result of a significant rebound in demand, harsh weather occurrences, and unforeseen supply interruptions, the Q4 2021 begins with record-level seasonal gasoline prices. These concerns can be seen as are a warning that stability of supply continues to remain a big issue for gas markets, just a year after a record decline in sales and oversaturated markets.

The series of changes in market conditions so far this year has highlighted the need for adaptability in guaranteeing resource security and consistency. Liquefied natural gas trade elasticity, along with other key aspects of the gas adaptability toolkit like interconnectors and storage space, has been and continues to be critical in reacting to unforeseen market fluctuations. As networks in transition shift to low-carbon gas to achieve net zero emission goals, providing secure and convenient supply is going to become increasingly difficult.To maintain grid stability in a transitional gas system, regulators should take a cautious and defined approach to market design.

To conclude, gas networks in the future will be more complicated and decentralized, with unidirectional networks. Due to the wide range of low-carbon gas sources of supply and the existing lack of hydrogen mixing criterion standardization during the transition period, maintaining consistent performance standards is projected to be more challenging. The process parameters of low-carbon gas production may limit the ability to offer flexibility. To assure security and sustainability in transitional gas lines, authorities should use a wise and extensible market design strategy.

To achieve the goal of net zero pollutants by 2050, a large-scale distribution of low-carbon emissions is required to decarbonize the present gas infrastructure. To plan for this major change in gas networks and industry, policies established in the following few years must facilitate this implementation. Authorities should examine the latest safety of supply problems that are expected to develop throughout this shift in this respect.

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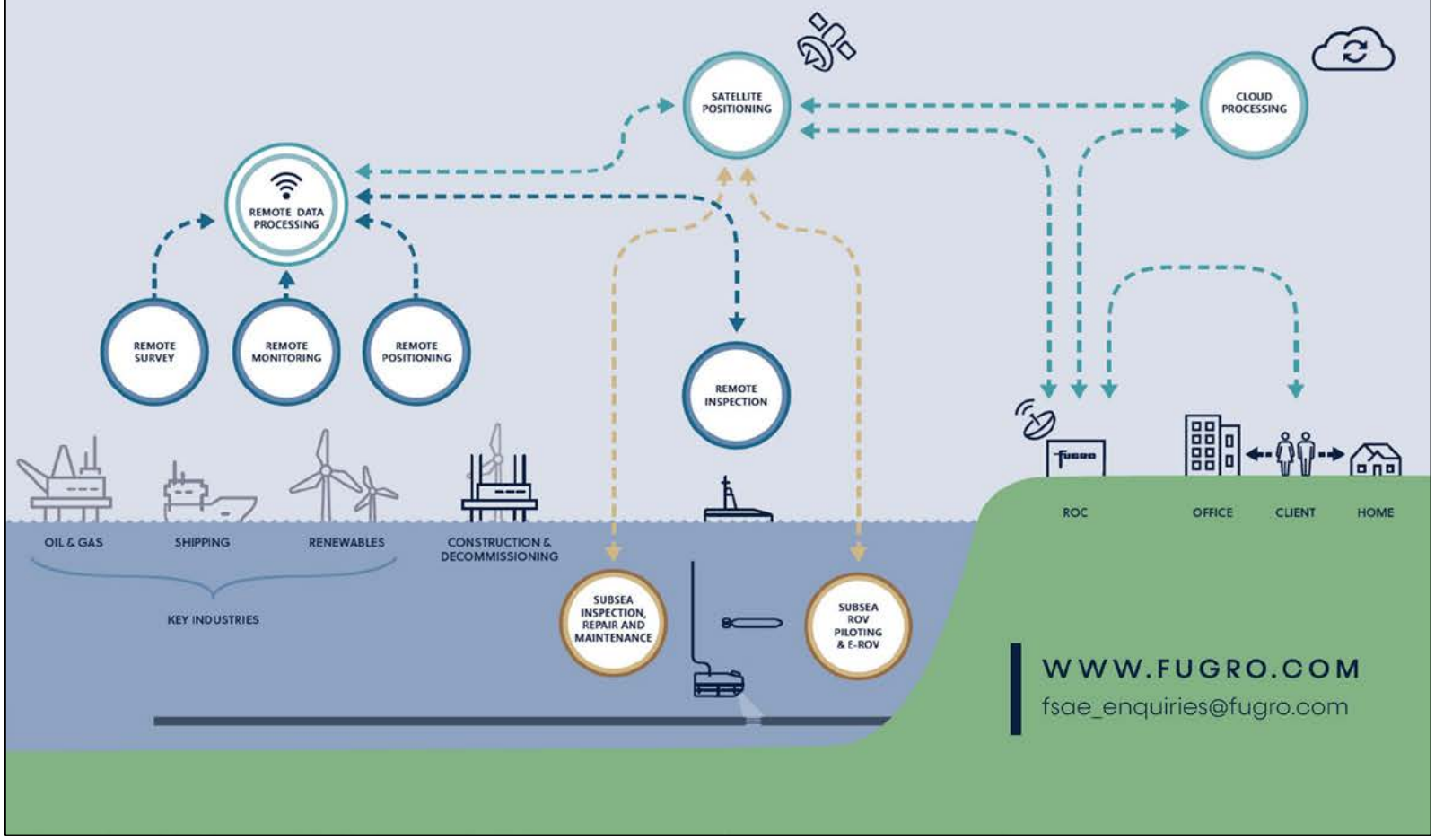

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VYING FOR MAJOR RECOVERY IN 2021

BY REHAM GAMAL, FATMA AHMED

In 2020, the world economy sufferedfrom the COVID-19 pandemic, which caused cracks in most of the industries, one of which is the oil and gas industry. The economy witnessed lockdowns associated with lower performance and production rates. However, by the start of 2021, the economy commenced its recovery trip thanks to the emergence of the vaccine and the early governments support packages, which were the main drivers for such a recovery. The International Monetary Fund (IMF) estimated that the global economy has grown by 5.9% in 2021, which is the highest in the past ten years, after the sharp decline of the global gross domestic product (GDP) in 2020 recording -3.1%.

A GLIMPSE INTO THE OIL AND GAS MARKET IN 2021

Due to the lockdowns and low demand for oil, 2020 has witnessed a high fall in prices especially West Tax Intermediate (WTI). In April 2020, the WTI crude oil price recorded negative levels for the first time in history. This also led to a cut in production and postponed many investments which led to a decline in the global supply in the near and medium-term.

"In 2021, with the introduction of COVID-19 vaccines, and the removal of lockdowns and travel restrictions saw an increase in oil and gas demand and an upturn of the oil and gas market throughout the year," Najeeb Ayinde, Oil and Gas Economist, said.

By the start of Q3 2020,oil and gas activitiesbounced back with the oil production exceeding five consecutive quarters due to an increase in the global oil consumption rates. This resulted in petroleum stock withdrawals that averagedat 1.7 million barrels per day (mmbl/d) over this period. These withdrawals drove the oil pricesup again from Q3 2020 to Q3 2021, according to the US Energy Information Administration (EIA). However, the oil prices decreased slightly during Q3 of 2021 after the emergence ofthe Omicron variant.

A DEEP LOOK INTO PERFORMANCE

Regarding the global industry performance, most oil and gas activities experienced an improvement, which is represented in the global rig count. According to data released by Baker Hughes statistics, the rig count declined by 53% during Q3 2020 reaching 3,099 rigs compared to 6,585 rigs in Q3 2019. Yet, the rig count rose by about 37% to record 4,262 rigs in Q3 2021,which was driven by the policies and strategies to flourish the sector globally.

Regarding the financial performance, international oil and gas companies (IOCs) went to take several decisions during 2020, after precepting the global recession and drop in oil demand. These decisions included, but were not limited to, suspending share buybacks, reducing capital spending by a quarter on average, cutting operating costs, in addition to securing access to liquidity through new credit lines and bond placements, according to Scope Ratings.

In 2021, IOCs started to follow more disciplined strategies with production and capital guidance. Scope Ratings revealed that, in 2021, the drilled but uncompleted shale wells have decreased by 37% during the period between January 2020 and September 2021; the production level is steady and expected to increase by 2-3% and the global upstream capex is predicted to jump by 4%.

In this regard, the economist advised the companies to "be more disciplined with their capital and reduce the cost of operation, restructure and enhance their portfolios, digitizing their operations" for the next year.

EGYPT'S SCENE

Although the crises of the pandemic affected the global oil and gas sector, the Egyptian situation shows more robustness. The Egyptian oil and gas sector managed to transform the crisis into a chance due to the reforms adopted by the Egyptian government since 2014.

The oil sector contributed 24% of the Egyptian GDP for the fiscal year (FY) 2019/20. It was able to attract new research and exploration investments for the first time. Also, the industry achieved the highest production rate in the history of Egypt during the FY 2019/20, with a total production of 1.9 million barrels of oil equivalent per day (mmboe/d).

The decline in oil prices, due to the appearance of Omicron, has positive effects on Egypt as it would decreasethe cost of oil subsidies, which will help reduce the budget deficit.

2022 OUTLOOK

For 2022, there is an expectation that the demand will increase even at a slow pace despite Omicron's appearance. Based on this projection, OPEC+ decided to adjust upward the production by 0.4 mmbl/d in January 2022. Ayinde expected that the oil and gas sector's recovery would still be in good shape in 2022 because of the increased rollout of booster shots of vaccines in several countries.

The Energy International Agency (EIA) predicted that this scenario could cause a limited upward price pressure in the coming months, adding Brent prices will remain near current levels at an average of $70 per barrel. It is also projected that the global oil stock will increase at an average of 0.5 mmbl/d by the start of Q2 2022 through Q4 2022 as production begins to increase faster than global demand.

Additionally, natural gas prices have increased at the end of the year. According to Fitch Ratings Expectations, it is likely to remain high in Q1 2022, particularly in Europe and Asia, driven by high demand in Asia, as well as a fairly low amount of gas in European storage facilities. However, its prices are projected to be moderate between March and April as the average prices for the year will remain high before returning to normal in 2023. As for the refining industry, refinery production is expected to grow 3.7 mmbl/d in 2022.

All the mentioned actions pave the way to a more stable year for the global oil and gas market either for the upstream activities or the implemented investments in addition to achieving a balanced supply and demand.

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HYDRAULIC JACKS ENABLE RAS BADRAN TANK FARM

BY SARAH SAMIR

Using synchronized hydraulic jacks, Egypt's Petroleum Projects & Technical Consultations Company (Petrojet) was able to raise the largest floating roof tank, which was awarded the Guinness World Record, for its crude oil storage facility in Sinai. To lift heavy loads that are vital to any industry, operators study the best fitting lifting system in the market. Usually, hydraulic jacks are chosen over normal jacks, for their ability to lift heavier loads to a great height. Hydraulic lifting jacks do not use a huge amount of force, yet they achieve their targets. They have been used in several industries such as oil and gas, mining, construction, automotive manufacturing, and more.

PETROJET AND GUINNESS WORLD RECORDS

A floating roof tank is a type of storage tank that uses pontoons in order to ensure having a seal against the wall of the tank in an attempt to decrease evaporation. The floating roof tank further prevents "the buildup of dangerous gases that often occur with flammable liquids," according to ScienceDirect's 'Pipe Drafting and Design, Third Edition'.

Petrojet implemented the largest floating roof tank in Ras Badran. The tank has a capacity of 175,000 m³, which is equivalent to around 1.1 million barrels of crude oil. Moreover, the Ras Badran floating tank's diameter reached 115 meters and its weight exceeds 3000 tons.

The Ras Badran floating tank was ranked as the world's largest floating roof tank in the Guinness World Records. Moreover, during the MEED Projects Awards 2021, the floating tank was named the MENA Oil and Gas Project of the Year.

In order to efficiently establish the Ras Badran floating roof tank, Petrojet utilized a double-deck floating system using over 240 hydraulic jacks.

HYDRAULIC JACKS

Jacks are used in lifting or moving heavy equipment and loads. Hydraulic jacks use liquids like jack oil or hydraulic fluid to achieve force multiplication.

Hydraulic jacks differ from the other jacks' types due to their higher lifting capacities, which made them the perfect choice for the implementation of the Ras Badran roof floating tank.

The way hydraulic jack operates is based on a fluid mechanics concept called Pascal's Principle. When two cylinders are linked through incompressible fluid, the pressure applied on one of these cylinders is imparted to the second cylinder via the connecting fluid. Although the pressure in the two cylinders is the same, the produced force is greater at the cylinder with the larger area. Thus, "the lifting force of a hydraulic jack is amplified directly by the ratio of the surface area of the two pistons," according to Ed Edwards article published by Thomas.

Hydraulic jacks have two common types, bottle jacks and floor jacks, as well as less common types such as toe lifting hydraulic jacks, leveling jacks, scissor jacks, screw jacks, and rachet jacks.

Hydraulic jacks have proved efficient in many industries. They work to help many industries lift loads in no time and with no hazards. From construction, mining, as well as oil and gas, hydraulic jacks keep succeeding. In the petroleum sector, hydraulic jacks have been a convenient tool to success, helping the Ras Badran floating roof stand out.

OIL & GAS IN 2022: NEW HOPES, OLD CHALLENGES

BY IHAB SHAARAWY

While the defeat of the latest covid variant seems to be imminent, the oil and gas sector is regaining some confidence and vies for recovery in 2022. However, the sector still has several risks to watch for in the new year.

As the impact of the new Omicron variant is likely to be mild and short-lived, the Organization of Petroleum Exporting Countries (OPEC) increased its forecast for global oil demand in the first quarter of 2022 substantially. OPEC boosted consumption estimates for the period by 1.1 million barrels a day -- equivalent to annual world consumption growth in a typical year before the pandemic.

The oil exporters' group expects oil demand to average 99.13 million barrels per day (bpd) in the first quarter of 2022, while demand growth remained unchanged at 4.2 million bpd and a total global consumption of 100.6 million bpd.

However, even though the world becomes better equipped to manage Covid-19 and its related challenges, the dynamics of oil and gas in 2022 may still be vulnerable to several geopolitical risks that are expected to further escalate in the coming period.

As usual, OPEC politics are still on top of the risks that can change the course of the oil and gas market. In 2022, oil and gas markets also have to watch out for risks such as the potential lift of Iran sanctions, which could bring up to 1 million b/d of crude to market within months, and the geopolitics risks resulting from conflicts between Russia and Ukraine, China and Taiwan and power race between US, Russia and China.

THE RETURN OF OPEC POWERS

The dynamics of the oil economy are known to be different and more complex than other commodities and the oil price determination process goes beyond the usual market rules of demand and supply, though at its most primal level the market is the final arbiter of the price of oil.

Hence, OPEC+ members, who are the world's top exporters, are still the key players in the process of oil price determination.

Crude oil prices rocketed in 2021, gaining more than 50 percent as demand recovered and oil-producing nations led by OPEC and allies boosted supplies modestly.

Even as the energy transition is gathering pace, the Organization of the Petroleum Exporting Countries and allies like Russia are finding greater chances to flex their muscles.

Under the latest climate pledges, the world is still expected to need 75 million barrels of oil per day by 2050, according to the International Energy Agency.

Building on such realities OPEC+ group is still having influence over oil markets. There are experts who think that the organization is likely to use this influence to compensate their losses during the pandemic or to achieve economic or political gains.

The group's refusal to accede to US President Joe Biden's calls to boost output to help ease pressure on gasoline prices triggered the decision by the US and other major energy-consuming nations to tap strategic oil reserves.

The situation displayed the group's market power. However, Omicron has put OPEC and Russia on the back foot again.

Nonetheless, the strength of the group is projected to increase, especially as the climate crisis is prompting other producers to trim output, either because of pressure from financial backers or in anticipation of a decline in demand.

Pressure on big oil and gas companies in Europe and the US to rethink their strategies in light of the climate crisis is having an impact. In a report published recently, the IEA found that major oil and gas companies are holding aggregate oil and gas spending flat in 2021. Their share of industry-wide spending on exploration and production is now at 25%, compared to nearly 40% in the mid-2010s.

Meanwhile Saudi Aramco, for example, is working to boost its production capacity. Data from the IEA shows that OPEC and Russia's share of oil production could climb from 47% in 2020 to 49% in 2030 if countries meet all of their announced climate pledges in full. By 2050, OPEC and Russia are expected to make up 58% of output.

As always, though, the group's power is dependent on politics and the ability of its members to play as one team. Breaks between Saudi Arabia and Russia in March 2020 caused prices to collapse.

GEOPOLITICAL RISKS TO WATCH IN 2022

As the year 2021 concluded, the world was watching the news closely for dangerous escalations between the US and Russia, who has been moving troops

toward the border with Ukraine while demanding Washington guarantee that Ukraine will not join The North Atlantic Treaty Organization (NATO) and that the alliance will refrain from military activities in and around Ukrainian territory.

The crisis has provoked fears of a renewed war on European soil.

In a telephone call with Russian President Vladimir Putin amid mounting tensions at the border, US President Joe Biden insisted that the US and its allies are prepared to respond "decisively" should Russia invade Ukraine.

The Ukraine crisis comes amid controversy around Russia's role in Europe's soaring gas prices. Some European officials have accused Russia of withholding additional volumes as it aims to launch the controversial Nord Stream 2 pipeline to Europe, whose approval by German regulators is on hold.

The pipeline is built and being filled with natural gas. However, Russia's Nord Stream 2 faces a rocky road before any gas flows to Germany, with its new leaders adopting a more skeptical tone toward the project.

The pipeline opposed by Ukraine, Poland and the U.S. awaits approval from Germany and the European Union to bypass other countries and start bringing natural gas directly to Europe.

Pipeline critics say it increases Russia's leverage over Europe, pits member states against each other and deprives Ukraine of key financial support.

The new year may also witness a new episode of escalation between the US and China, who claims the island of Taiwan as its own territory and has vowed to seize it one day by force if necessary.

Biden said the US would defend Taiwan if China attacked. The US has a law that requires it to help Taiwan defend itself.

China, meanwhile, insisted that the US will "face an unbearable price" over its actions towards the self-ruled island of Taiwan.

Of course, any military confrontation in Ukraine or Taiwan would be a shock to the global economy that could have devastating repercussions on energy markets.

The market is also watching out for the results of the new round of the Iran nuclear talks. Although risks of no-deal are still high, a deal is still possible given Biden's desire for a diplomatic solution. Such a solution can add 1.4 million b/d of Iranian supply in 2022.

Iran has already demanded that world powers allow it to sell oil on international markets to replenish its dwindling foreign currency reserves, as talks resumed in Vienna aimed at reviving the 2015 deal to curb Tehran's nuclear program.

The oil and gas industry has rebounded strongly throughout 2021, with oil prices reaching their highest levels in six years. However, given the accelerating geopolitical risks, uncertainty remains high over market dynamics in the coming year.

WHY GREEN HYDROGEN?

BY AYMAN HUSSEIN - MEDIA GENERAL MANAGER - GAS REGULATORY AUTHORITY

There is no doubt that the world is moving towards renewable energy that does not negatively impact the environment and humans, which makes the move forward occur with utmost enthusiasm and speed. It is worth mentioning that the production of green hydrogen has succeeded in many countries around the world for its many advantages.

The most important advantage is that it does not emit polluting gases, whether during combustion or production. It is also storable since hydrogen is easy to store, allowing it to be used later for other purposes. Moreover, it is versatile; it can be converted into electricity or synthetic gas to be used for domestic, commercial, industrial, or transportation purposes. In addition to its portability, it can be blended with natural gas in proportions of up to 20% using the same gas pipelines and infrastructure.

However, we have to know what green hydrogen is, its nature, and how to produce it. Green hydrogen is a light and highly reactive global fuel, produced through a chemical process known as electrolysis. This method uses an electric current to extract hydrogen from water, in which water is broken down into oxygen and hydrogen.

Hydrogen is the most abundant element in the universe, but on Earth, it does not appear pure in nature and requires energy to be separated. Through electrolysis, all you need is water to produce large amounts of hydrogen, a large electrolyzer, and a plentiful supply of electricity. As long as electricity is produced from renewable sources such as wind or solar energy, then hydrogen is effectively green.

One main difficulty is that large electrolyzers are scarce, and ample supplies of renewable electricity still come at a very expensive price compared to other production processes.

One of the reasons green hydrogen, in general, is green is that it contains nearly three times the energy of fossil fuels, which makes it more efficient, according to an article published by Columbia Climatic College.

We can also use green hydrogen on a large scale, which increases the benefits that we will get after its production. For instance, cars and electric trucks can operate on hydrogen fuel cells, container ships can run on liquid ammonia made of hydrogen, and "green steel" refineries can burn hydrogen as a heat source instead of coal. Furthermore, hydrogen-powered electric turbines can generate electricity at times of peak demand to help stabilize the power grid. It can also be used as an alternative to natural gas for cooking and heating in homes.

Natural gas is currently the main source of hydrogen production, representing about 75% of the annual global production of hydrogen.

But if we look at how much green hydrogen is produced now, we will find that it only represents a small percentage of total annual hydrogen production, according to Wood Mackenzie, a global research group for energy, chemicals, renewable materials, metals, and mining consultancy. Based on forecasts by Wood Mackenzie, this percentage will increase significantly in production in the coming years.

There is no doubt that green hydrogen is on everyone's mind at the moment, especially in Egypt where we see significant planning and action with direct support from the political leadership. Egyptian President Abdelfattah Elsisi requested the preparation of an integrated national strategy for the production of green hydrogen in Egypt, where the government is looking to launch an initial phase of projects that may amount to $3-4 billion.

We also see some important steps in this project, such as the signing of a memorandum of understanding between the Egyptian Natural Gas Holding Company (EGAS), the Egyptian Electricity Holding Company, and the Italian company Eni, to cooperate in the production of green and blue hydrogen. This initiative will involve technical and commercial feasibility assessments of its targeted production projects in Egypt and under this protocol. The cooperation will be through conducting a study on joint projects for the production of green hydrogen using electricity generated from renewable energy sources. There is also cooperation between the Egyptian government and the private sector, as several companies in the private sector signed a memorandum of understanding to work on this ambitious project, including Siemens, Eni, Demi, Hyundai Rotem, and Sanam.

Some local companies in the field of energy are also cooperating with other foreign firms in this regard, including TAQA Power, which signed a memorandum of understanding with the German company MAN Solutions to launch a pilot project to produce green hydrogen in Egypt. The cooperative efforts to find a national strategy for the production of green hydrogen can and will bring about huge opportunities for electricity generation from renewable energies.

Though green hydrogen may have its advantages, we have to shed light on some of the disadvantages that have to be overcome, such as high costs. Energy from renewable sources is essential for generating green hydrogen through the costly process of electrolysis. Developments will take time and the International Energy Agency has said electrolyte costs could be cut in half by 2040.

Regarding safety, we should also note that hydrogen is a highly volatile and flammable element, and therefore, strict and comprehensive safety measures are required to prevent leakage, explosions, and other potential hazards.

It should also be noted that the Egyptian steps towards a green economy have been strengthened in response to Article (32) of the constitution, which stipulates the preservation and proper exploitation of natural resources, not depleting them, and observing the rights of future generations in them, with a commitment to optimal use of renewable energy sources, and stimulating investment in them. And encouraging scientific research related to it. Therefore, it is necessary to enact legislation regulating the process of producing green hydrogen and everything related to it. Therefore, green hydrogen is considered to be the fuel of the future due to its significant advantages. This is why Egypt sought to be one of the first countries in the world in this industry to complement the various development programs in all fields that Egypt is witnessing at the moment.

SAFE AND RELIABLE RADIO COMMUNICATIONS FOR THE OIL INDUSTRY

The oil and petroleum industry requires safe, robust, and reliable communications to support efficient day-to-day operations, enhance productivity, and to coordinate a fast and effective response to any emergency. Digital two-way radio solutions using intrinsically safe devices enable workers to communicate safely even in potentially explosive environments.

Efficient communications are essential to the smooth and safe operation of oil and petroleum facilities. This is the case all along the supply chain from exploration, extraction, and refining to transportation, product manufacturing, and distribution to power stations, industrial sites, homes, and petrol pumps.

Installations are complex and the materials involved are hazardous, so very high levels of safety are required to protect the workforce, facilities, and the wider environment. Machinery and operational processes must be closely monitored and critical performance data sent to control centers, often in real time.

The workforce needs highly available, highly resilient communication systems, so they can stay in touch with each other at all times and carry out their work efficiently and safely. Digital two-way radio networks based on the TETRA or Digital Mobile Radio (DMR) standards are the best way to ensure this.

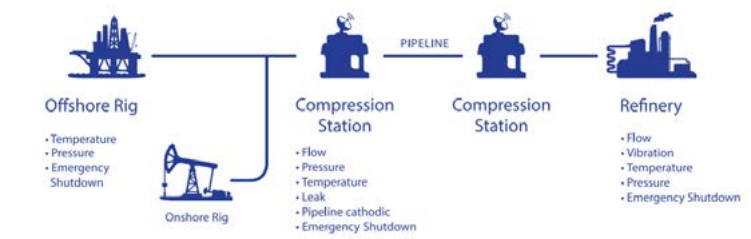
A private two-way radio network enables signal coverage and capacity to be tailored to the exact requirements and configurations of any oil or petroleum installation. The network is fully controlled by the user organization without the need to rely on third party providers. The solution provides wide area coverage for secure voice and data communications across dispersed facilities in different locations.

Hytera terminals are rugged, durable, and easy to use with a long battery life and noise cancelling technology to provide loud, clear audio. They also feature GPS location technology, so workers can be tracked and monitored, especially when working alone. Personal safety features such as Emergency Button, Man Down, and Lone Worker protection alarms are also available.

Oil and petroleum installations are potentially explosive environments. Mobile phones and ordinary radios can create a spark, which may ignite explosive gases, vapors, or combustible dust. However, Hytera has developed ATEX intrinsically safe, anti-explosion TETRA and DMR terminals and accessories (including wired and wireless earpieces), which enable safe communications in these hazardous environments.

Hytera offers the first ATEX radios to be certified for use in Intrinsically Safe Zone 0, where high levels of hazardous product are continuously present, as well as the more usual Intrinsically Safe Zones 1 and 2. The radios also conform to the 'ia' certification, meaning the radio circuit has three protective measures, allowing for the occurrence of two faults during operation without risking the user's safety.

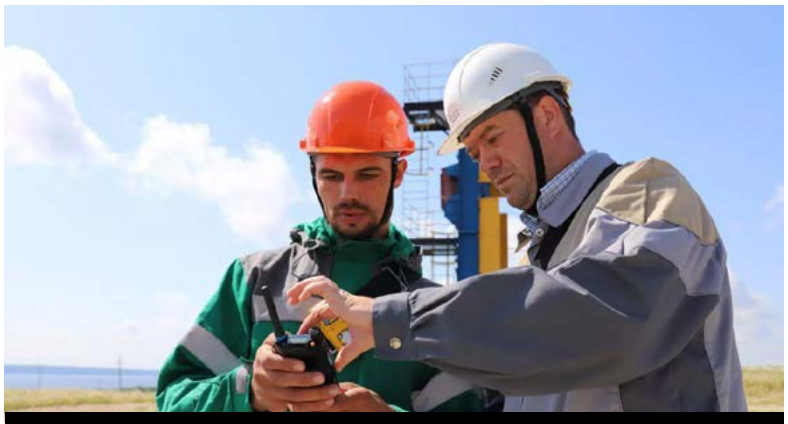
Another benefit of deploying digital two-way radio networks is that one radio channel can be allocated to collect and send back SCADA (supervisory control and data acquisition) information. They can also be used to control and automate oil and petroleum field production processes and parameters, including flow, pressure, vibration, and temperature in remote locations from a single central point. The network can also transmit alarms in the event of machine failure, fire, leak, or spillage.



SCADA used in all sections

Two-way radio systems can also be integrated with other technologies using Hytera unified communications platforms and dispatch systems. An oil facility can connect multiple vendor systems and devices, including DMR, TETRA, cellular and PSTN networks, PA intercoms, CCTV and mobile video cameras, and a host of sensors and alarms.

For example, Hytera provided an integrated broadband LTE and narrowband TETRA solution for Russian oil and gas company Tatneft. Hytera multi-mode TETRA/LTE terminals allow workers to access both voice and data services on the same device. Terminals support a workflow management application to assign tasks to the workforce and receive status updates, work completion messages, alarms, and access SCADA data from the field provided by Hytera BT500 Radio Data Modems.



Tatneft staff are working with a Hytera PTC760 TETRA/LTE terminal

Hytera has considerable experience of deploying communications for oil and petroleum customers around the world, including supplying two-way radio networks and explosion proof devices for Abu Dhabi Oil Company, the Saudi Aramco Jubail Refinery Company, and for SONAREP Oil & Gas Company in the Republic of the Congo. Hytera's flexible approach enables it to create bespoke solutions to accommodate the needs of any oil and petroleum customer.

ABOUT HYTERA

Hytera Communications Corporation Limited (SZSE: 002583) is a leading global provider of professional communications technologies and solutions. With voice, video and data capabilities, we provide faster, safer, and more versatile connectivity for business and mission critical users. We enable our customers to achieve more in both daily operations and emergency response to make the world more efficient and safer.

CONTACT US TO LEARN MORE:
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CONDENSATE BANKING EFFECTS AND EVALUATION OF THE POTENTIAL MITIGATION METHODS

Natural gas is one of the mainstays of global energy that accounts for a big percentage of the world's commercial energy supplies and it is an energy source most favored by environmentalists. A gas condensate reservoir is a special type of hydrocarbon system with a unique thermodynamic behavior and phase envelope, which controls the depletion process of the reservoir. This type of reservoir is usually encountered at high pressures and temperatures and the fluid system is commonly found in near-critical conditions.

Condensate banking is the liquid drop out in the reservoir rock near the wellbore leading to a rapid decline in well productivity, due to a reduction in effective permeability to gas. A minor droplet of condensate is shaped and accumulated adjacent to the wellbore, once the reservoir pressure dropped below the dew point pressure. These processes continue and the saturation of the liquid will grow and affect productivity.

Well deliverability can be reduced by 50-80% as a result of this near-wellbore choking. The condensate blockage can have a more severe negative impact at low permeability reservoirs in comparison to moderate to high permeability reservoirs. This is due to the formation of an additional skin as a ring leading to a reduction in the gas flow rates.

Once the condensate saturation reaches the critical saturation, it begins to flow through the porous system toward the producers, but it may be also pulled down because of gravity.

We can divide the wellbore drainage area into four different condensate saturation regions around the wellbore. Region-1 is the original reservoir itself that contains a single gas phase and the initial liquid saturation. Region-2 is closer to the well, where the liquid saturation increases rapidly leading to a reduction in gas relative permeability considerably, but with no liquid mobility because the saturation of condensate is still lower than its critical value. Region-3 is the area directly surrounding well and the liquid saturation will exceed the critical saturation and be able to flow as gas. Region-4 is formed in the immediate vicinity of the sand face of the well, where the positive coupling effect creates a considerable increase in well deliverability of the gas.

The well deliverability is most affected by region-3, as gas and condensate flow together in a steady-state flow.

Numerous techniques have been used successfully to prevent this problem, such as pressure maintenance schemes involving the introduction of an injector well with fluid composition the same as the original reservoir fluid to keep the reservoir pressure at or above the dew point pressure.

Another way is the Huff-Puff technique, which involves a gas cycling process intended to reduce the liquid dropout by revaporization of the condensate liquid into the gas phase, where the same well is used as both injector and producer and the technique is only effective when initiated before the maximum liquid dropout is reached.

Using the CO2 in a huff-and-puff process is particularly effective in mitigating condensate banking, due to the ability of CO2 gas to reduce the dew-point pressure of condensates. Pure carbon dioxide was the most effective injection gas in reducing the dropout by approximately 26% also; the effectiveness of the other gases was increased substantially when combined with CO2.

Methanol solvent stimulation treatment is one of the most successful ways when injected into low permeability formations as it removes the condensate through miscible displacement, where solvent allows fluids to mix freely as a mixture and these processes need to be applied at least once per year to improve the gas well deliverability by a considerable factor and increase the plateau period, which has a positive effect on the overall investment.

MOHAMED ALI AAMER TAHA.

Senior Petroleum Engineer-EGPC

GAMIFICATION IN THE OIL AND GAS INDUSTRY

Nowadays everything is changing in our world. People are getting ready to face the new digital era every single day, as keeping ourselves away from it is not an option anymore. Today, the technological revolution invades our lives without our permission, and adapting to it has become a must to survive.

Mark Zuckerberg introduced Metaverse to the world almost two months ago where everyone started to imagine their own avatar, wondering what their future lives will be like.

So, let's agree that it's time to do our best to think positively and change our minds to adapt to the new era and be proactive.

One of the most helpful and interesting topics that we shall consider related to virtual reality trends is game-based learning platforms for adults, especially in a critical industry such as oil and gas; with such specific training nature which subjects trainees to fatal risks that require aggressive, expensive and complicated precautions.

Gamification terminology refers to tailoring the gaming platform by personalizing its elements to simulate a specific experience to achieve a certain set of goals. It can be used as a tool for various purposes. Nowadays, the most common objectives adopted are for marketing and brand awareness, which add a unique experience to your target customers.

The second major purpose that gamification is used for currently is training purposes, which has had a major impact on the quality of the trained profiles.

In traditional training methods, the trainee either will learn using theoretical or practical methods or both. When it comes to theoretical training, the trainee loses many elements that will affect the learning experience, as trainers will not be able to interact with the environment, which might affect their response to critical situations later on. Although theoretical training might be limited, practical training has its own disadvantages, as it consumes a lot of money, time, and effort; in addition to the risk factors that cannot be disregarded from the equation.

Gamification came to propose a new approach that will eliminate the disadvantages of theoretical and practical learning while combining the advantages of each method. It increases a trainee's understanding of the plant, enhances his/her ability to deal with critical on-site situations, supports all operational procedures, and increases the capability of the trainee to handle hazards efficiently and safely at the same time.

There are also some aspects that should be considered in designing the training over the gaming platforms, such as the content which should be impressive, relevant, and challenging to enrich the trainee's experience. With passion, the eagerness to compete, and the commitment to help companies to make an impact, gamification could enhance a trainee's attitude toward the value of the training and could be a good data source that can tell business owners and managers more about their employees' talents, personalities, and weakness points. This will help them enhance their development and training roadmaps to optimize their resources smartly and efficiently, which will enhance the quality of their employees. Meanwhile, gamification will positively affect the whole business as it will help simulate the company's new projects and include employees to take part in R&D plans. In addition, it will reduce the plant downtime, which will proportionally boost profits as a result of increasing the engineers' awareness, particularly in critical cases.

Finally, it is a super cost-effective alternative as it is considered a learning asset that can be used by hundreds of users with no need to re-invest in the learning process.

SAMA AHMED Sales Manager - Khwarizm Consulting Company

EGYPT OIL&GAS
RESEARCH & ANALYSIS

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

VALUE TRADED (EGP BILLION)

% OF TOTAL VALUE TRADED
0.93

VOLUME TRADED (BILLION SHARES)

% OF TOTAL VOLUME TRADED
0.66

Performance of Petroleum Companies in the Egyptian Exchange in Nov 2021

NATIONAL DRILLING

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

ALEXANDRIA MINERAL OILS CO.

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
EGP	3.48	▲ 11.54

EGYPT GAS

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
EGP	35.44	▼ 18.66

SIDI KERIR PETROCHEMICALS

CURRENCY	CLOSE PRICE	YTD PRICE CHANGE (%)
EGP	6.78	▼ 27.18

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

MAIN ECONOMIC INDICATORS

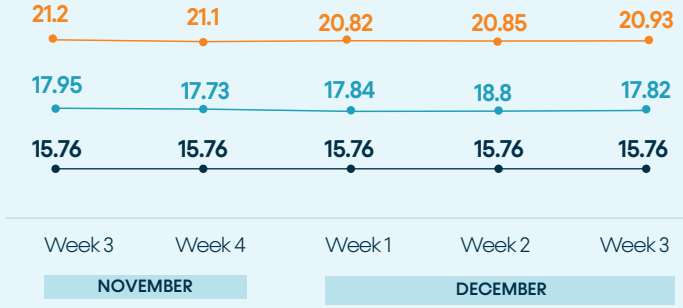
October 2021 | November 2021

ANNUAL INFLATION HEADLINE CPI (%)
6.3 ▼ 5.6

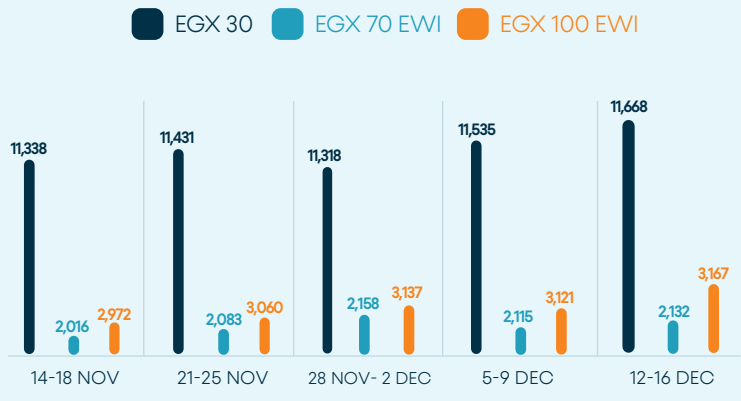
NET INTERNATIONAL RESERVES ($ BILLION)
40.85 ▲ 40.91

NON-OIL PRIVATE SECTOR PMI (POINTS)
48.7 - 48.7

EXCHANGE RATES



CAPITAL MARKET INDICATORS



SIGNING AN AMENDMENT AGREEMENT FOR NORTH IDKU CONCESSION

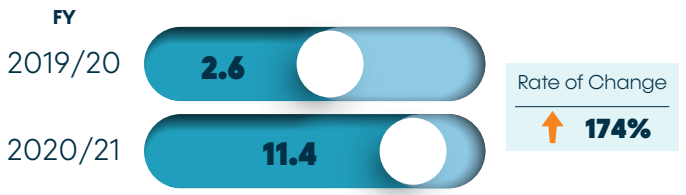
Companies	Energean, EGPC
Area	The Nile Delta

NI/NEA CONCESSIONS DEVELOPMENT PROJECT

Drilling	**4** wells
Production Rates	**90** mmcf/d of **natural gas** **1,000** bb/d of **condensates**
Investments	$**236** million

FUEL & MINERAL OILS EXPORTS HIT A HIGH RECORD ($ BILLION)

A BOOM IN PUBLIC INVESTMENTS IN OIL REFINING (EGP BILLION)



TRANSPORTED PETROLEUM PRODUCTS BY MEANS OF TRANSPORTATION IN FY 2020/21

	Transported Quantities (mmt)	Rate of Change (YoY) (%)
Pipelines	59.8	1.2
Lorries	22.5	17.2
Coastal Tankers	8.6	10.5
Railway Tankers	0.325	17.5

Total Quantity (mmt)	Cost (EGP billion)
91.2	30.6

MSMEDA SIGNS AN AGREEMENT TO FINANCE VEHICLE FUEL CONVERSION INITIATIVE

Partners	Car Gas, Gastec
Financing Value	EGP **200** million

MSMEDA'S PORTFOLIO

Converted Vehicles	Period	Value
150,000	3 years	EGP 1.2 billion

INTERNATIONAL OIL PRICES

	BRENT PRICES ($/BBL)	OPEC BASKET PRICES ($/BBL)	NATURAL GAS PRICES ($/MMBTU)
06 October	81.08	80.63	5.68
29 October	84.38	82.87	5.43
04 November	80.54	81.48	5.72
26 November	72.72	76.09	5.45
03 December	69.88	71.65	4.13
17 December	73.52	74.23	3.69

COMPETITIVE ADVANTAGE THROUGH THE GAS VALUE CHAIN

SHELL IS A PIONEER AND A LEADER IN THE GAS INDUSTRY WITH OVER 100 YEARS' EXPERIENCE. WE FOCUS ON PROVIDING EFFECTIVE SOLUTIONS FOR MONETISING GAS RESOURCES.

We can provide a portfolio of integrated solutions across the full gas value chain, from finding and producing gas through to the marketing of products. Shell technologies can help a country boost its economy by building up local gas-based industry. In addition, we bring skills transfer and people development which are key for creating in-country value. Shell plays a role in supporting the natural gas industry in many countries and is proud of how these strong, mutually beneficial relationships have developed.