EGYPT OIL&GAS NEWSPAPER

DON'T PANIC BUT TAKE PRECAUTIONS

# BETWEEN RESOURCES & POTENTIALS

## REVIVING EGYPT'S GOLD MINING SECTOR

EGYPT OIL AND GAS TECHNICAL COMMITTEE

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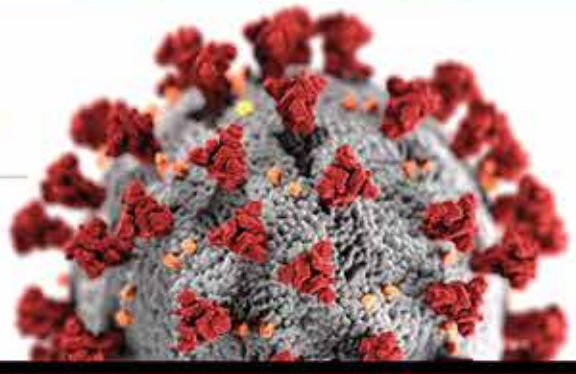
## COVID-19 (CORONAVIRUS) EMERGENCY RESPONSE PLAN



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An Exclusive Outlook: **THE ECONOMICS OF COVID-19 OUTBREAK** PAGE (28-31)

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# EDITOR'S **LETTER**

## DO NOT PANIC, BUT TAKE PRECAUTIONS!

The novel coronavirus, known as COVID-19, has been spreading throughout the world, sparking fears of health, economic and financial damage that will extend beyond this pandemic in both the short and long terms.

The global oil and gas industry is one of the main affected sectors by the virus outbreak. The international oil prices are falling. The biggest energy companies are cutting their budgets and reducing their investments. The unemployment rate in the industry is expected to increase immensely if this outbreak continued to loom its shadows until the end of 2020.

Thus, our April issue fully dedicates some of its sections to cover the COVID-19 impacts on the global energy industry. In the research and analysis section, we provide our readers with an analytical report about the economics of COVID-19 outbreak. Meanwhile, in our politics section we discuss the second part of the global damage caused by the virus, especially on the oil and gas industry.

The virus outbreak also boosted the gold prices, which opens the door for new investment opportunities in the Egyptian mining sector.

In February, the Minister of Petroleum and Mineral Resources, Eng. Tarek El Molla announced the launch of the international bid round No. (1) for the year 2020 for exploration of gold and associated minerals in Egypt.

The issue offers a glance at the recent mining developments, in addition to an overview of the history of gold mining in Egypt. We also provide our readers with a legal overview covering the evolution of the country's mining law, which will give the investors a better insight when taking any future financial decisions. As for gold investors, the issue includes a report about the resources and the potentials of Egypt's gold mining sector.

Egypt Oil & Gas interviewed Mark Campbell, President and CEO of Aton Resources, to examine the lost gold treasures in Egypt's mining sector. Moreover, the team interviewed Marks Lisnanskis, Chairman of SMW Gold Holdco, to dig dipper into the possibility of retaining gold's value proposition. A third interview was held with Ossama El Maghraby, Resolute Egypt Pty Ltd Director discussing the paradigm shift in the Egyptian mining sector.

Egypt Oil & Gas family's safety comes first. We are working from home to help in stopping the virus outbreak in our beloved Egypt. **Please stay safe! Stay at home!**

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




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EGYPT OIL&GAS NEWSPAPER

EGYPT'S LEADING OIL AND GAS MONTHLY PUBLICATION

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LEGAL ADVISOR

LINKS & GAINS
ATTORYNEYS AT LAW

# DOWNSTREAM

## EL MOLLA APPROVES NEW GAS TRANSMISSION TARIFF

The Gas Regulatory Authority (GASREG), headed by Minister of Petroleum and Mineral Resources Tarek El Molla, approved a transmission tariff for the natural gas grid in 2020, valued at 37.5 cents per million British thermal units.

This comes in line with GASREG's policies and procedures to gradually regulate and liberate the market according to international practices, taking into consideration Egypt's position to become a regional gas hub. The approved tariff aims to regulate the financial and commercial aspects of gas transmission, turning it into an economic value that covers the network's cost and achieve an economic return to the network owners.

## CABINET DENIES NATURAL GAS PRICES SURGE

The Cabinet's media center denied rumors about an increase in household natural gas prices.

The Cabinet affirmed that there is no correlation with the new gas transmission tariff and the household natural gas prices. The Ministry of Petroleum and Mineral Resources noted that they will implement a program to deliver natural gas to as many households as they can.

Furthermore, in order to replace butane with natural gas, the government has launched an initiative that allows household owners to pay fees in installments without a down payment. It is worth noting that natural gas delivery to households has increased by 12.6% to reach 1.7 million units in 2019. Natural gas was also delivered to 2013 commercial consumers, and 56 factories in 2019. Additionally, 16.7% of cars were converted to be running on natural gas, rounding up a total of 300,000 cars in 2019, compared to 257,000 cars in 2018.

## EGPC TO LICENSE NEW FUEL STATIONS

The Egyptian General Petroleum Corporation (EGPC) will license 60-70 new fuel stations all over Egypt, with minimum investments of EGP 180 million, said Adel Ayyad, Chairman of the Board of Directors of the Cooperation Company for Petroleum.

Ayyad noted that the company's role will be limited to the marketing campaign using the company's trademark, whereas other agents will be responsible for constructing, financing, and running the stations. It is expected that within this year, the agents will acquire all the needed permits to begin construction, he added. Moreover, the company plans to invest EGP 370 million to develop fuel stations and warehouse storage by next year. Additionally, it aims to earn EGP 60 billion in revenues during the next Fiscal Year (FY) 2020/21 and targets selling of 7.7 million tons of petroleum products, oils, chemicals, and bunker fuels.

## ECHEM PUTS NEW PROJECTS AS TOP PRIORITY FOR FY 2020/21

The Chairman of Egyptian Petrochemicals Holding Company (ECHEM), Saad Helaly, said that his company is putting the implementation of new projects as the number one priority in fiscal year (FY) 2020/21.

The new projects include a petrochemical and refining complex in Suez and Al-Alamein, in addition to a polyacetal production project in Damietta, which is considered the first of its kind in Egypt and Africa. Helaly mentioned that the company has signed an agreement with Bechtel for the refinery petrochemical complex project in Suez with a cost of $6.7 billion, in addition to an agreement with Shared Capital Cooperative and BSW companies to contribute in the establishment of refinery petrochemical complex project in Alamein with a cost of $8.5 billion.

Additionally, ECHEM will do a detailed feasibility study of the Polyacetal production project in cooperation with the United States Trade and Development Agency (USTDA), with an estimated cost of $400 million and production of 50,000 tons of polyacetal.

# INVESTMENTS

## EGAS TO SIGN SEVEN AGREEMENTS WORTH $690 MM IN FY 2020/21

The Egyptian Natural Gas Holding Company (EGAS) targets to sign seven agreements with a cost of $690 million and a signature bonus estimated at $16 million, EGAS Chairman Osama El Bakly said.

El Bakly clarified that the budget for Fiscal Year (FY) 2020/21 includes drilling 10 wells with a cost of $328 million, and signing four development contracts with total signature bonuses of $20 million. Two new projects are planned to be implemented, four wells are expected to be completed, as well as drilling 38 development wells with an initial production of 537 million cubic feet of natural gas per day (mmcf/d).

Additionally, the average production is anticipated to reach about 7.5 billion cubic feet per day (bcf/d) of natural gas and more than 100,000 barrels of condensates. The company plans to deliver natural gas to more than 1.2 million housing units across Egypt with investments of around EGP 4.7 billion.

El Bakly showcased the plans of H2 FY 2019/20. He remarked that EGAS aims at drilling five exploratory wells and starting to drill four wells for Ayok, Burullus, Edison, and Sea Dragon at the Mediterranean with a cost of $179 million.

Besides implementing three projects including nine wells, putting five development wells on the production line, delivering natural gas to 86 areas and transforming 25,000 vehicles to run on natural gas.

## TOWN GAS INVESTMENTS REACH EGP 1.2 B IN 2019

The Chairman and Managing Director of Town Gas, Yasser Bahnas, said that his company has achieved unprecedented results during 2019 for the second year in a row, in which natural gas was connected to 300,000 housing units with investments worth EGP 1.2 billion.

With the new investments, the company succeeded to save seven million butane cylinders and reduced the directed subsidy to the cylinders in addition to connecting natural gas to new areas.

Bahnas added that the company had finished implementing 550 projects for natural gas connection in the housing compounds, industrial entities, commercial malls as well as the Ministry of Defense and Ministry of Interior with costs of EGP 250 million.

Additionally, several protocols were signed with the New Urban Communities Authority to link natural gas to 105,000 customers at a cost of EGP 243 million.

Town Gas is targeting to link natural gas to 300,000 housing units in 2020 with investments of EGP 200 million to cover 31 new areas.

## ECHEM CONSIDERS ISSUING 1 B INSTRUMENTATION PROGRAM

The Egyptian Petrochemicals Holding Company (ECHEM) mulls the issuance of an instrumentation program worth EGP 1 billion to diversify its funding mechanisms. The company is going to request from the Financial Regulatory Authority to issue the first instruments to a state company, noting that ECHEM is currently communicating with several banks to contribute to the issuance process.

The projects that ECHEM intends to implement include a petrochemical and refining complex in Al-Alamein in addition to the Polyacetal production project in Damietta.

The amendments that have been done to the Investment Law in 2019 allowed the companies to issue instruments, which enable them to issue financial tools consistent with the new provisions in addition to the traditional ones.

## WINTERSHALLDEA 2019 RESULTS SHOW STRONG OPERATIONAL PERFORMANCE

Europe's leading independent oil and gas company, WintershallDea, has released the results for its Q4 and full year 2019 results that showed a strong operational performance. The company also said it aims to double its Egypt output within a few years by means of targeted investments and technical improvements, especially after obtaining the East Damanhour exploration block and during the first exploration phase of three years, the company plans to drill several exploration wells.

The 2019 summary of Wintershall Dea boasted a record high production of 642,000 barrels of oil equivalent per day (boe/d), a 9% growth year-on-year (YoY), and ahead of revised guidance of 640,000 boe/d. Furthermore, there were robust reserves replacement ratio of 109% increasing 2P reserves to 3.8 billion boe with an R/P of 17 years.

CEO Mario Mehren said that he is pleased with the results despite the challenging external environment. He said that he is implementing mitigating policies including a significant reduction in Wintershall's planned in-year capital investment program and suspension of their common dividend until further notice.

## EGYPT TO RESTART DAMIETTA LIQUEFICATION PLANT OPERATIONS

Eni company signed several agreements with the Egyptian General Petroleum Corporation (EGPC), the Egyptian Natural Gas Holding Company (EGAS), and the Spanish company Naturgy, to restart the operations in Damietta liquefaction plant in Egypt by June 2020.

According to the agreement, the participation of Union Fenosa Gas in the Damietta plant, which is 80%, will be transferred 50% to Eni and 30% to EGAS. The resulting shareholding of SEGAS will therefore be Eni 50%, EGAS 40% and EGPC 10%.

Additionally, the agreement stated that Eni will take over the contract for the purchase of natural gas for the plant and will receive corresponding liquefaction rights. The capacity of the Damietta liquification plant is 7.56 billion cubic meters (bcm) per year, and it has not been working since November 2012.

The Ministry of Petroleum and Mineral Resources added that once the agreement is implemented, international arbitration issued against Egypt, and disputes between the companies will be settled. These disputes are related to buying and purchasing natural gas as well as the utilization of the liquefication capacity of the plant.

## DNV GL FINALIZES ZOHR'S ASSESSMENT OPERATIONS

DNV GL finalized its assessment operations of Zohr field's installments at the beginning of February, the company's Vice President and Area Manager North Africa, Hisham El Grawany said.

He said that DNV GL is responsible for verifying the offshore installments for the new wells in Zohr field, under international standards and qualifications, from the project's early phases up till now.

He added that his company contributed to Egyptian Refining Company (ERC) through searching and issuing the project's related certifications.

El Grawany noted that the company is also partially responsible for presenting advice, consultations, risk assessments, safety elements, and confronting risks of the projects related to the energy industry in and out of Egypt.

Moreover, he said that the company offers engineering consultations in the field of renewable, solar, and wind energy.

## SDX PROVIDES UPDATE ON DRILLING OPERATIONS IN EGYPT

SDX Energy Plc, the MENA-focused oil and gas company, provided an update on its drilling operations in Egypt. The company said that SD-6X (Salah) exploration well at South Disouq has been drilled at a total depth of 3,167 meters. The well encountered 1.7 meters of net gas bearing sand in the Kafr El Sheikh formation, one meter of net gas bearing sand in the Abu-Madi Formation, which has 143 meters of high-quality net reservoir and 258 meters of high-quality net reservoir in the Qawasim Formation. The gas sands in both the Kafr El Sheikh and Abu Madi is considered to be sub-economic and the Qawasim has low gas saturation.

The Rabul-3 well in West Gharib concession has encountered approximately 116 feet of net heavy oil pay across the Yusr and Bakr formations. The development well was drilled at a depth of 5,129 feet and will be completed to begin production by the end of March. The well is connected to the central processing facilities at Meseda and is expected to be brought online at an average stabilized rate of approximately 300 barrels of oil per day (bbl/d), which is at the upper end of pre-drill expectations.

## MAERSK AWARDED DRILLING CONTRACT IN EGYPT

Maersk Drilling company announced that it has been awarded a contract for the semi-submersible rig Maersk Discoverer offshore Egypt estimated at around $3.8 million. The expected duration for the contract is 21 days and will start in March 2020, in direct continuation of the rig's current contract.

According to the statement, Maersk Discoverer, which is a DSS-21 column-stabilized dynamically positioned semi-submersible drilling rig that was delivered in 2009, is currently operating offshore Egypt. Following the completion of the additional Egyptian well, Maersk Discoverer will perform its scheduled Special Periodic Survey, after which the rig will move to Trinidad and Tobago.

## UOG COMPLETES ROCKHOPPER EGYPT ACQUISITION

United Oil & Gas Plc. (UOG) has completed the acquisition of Rockhopper Egypt Pty Ltd. And according to the company, Abu Sennan concession's production averaged 7,900 barrels of oil equivalent per day (boe/d) in the first half of February 2020. ASH-2 well in Abu Sennan has been able to double its production from the concession since the effective date of the acquisition. The well has been onstream at over 3,000 barrels of oil per day (bbl/d) since the beginning of January 2020, after testing a maximum gross rate of 7,027 bbl/d from the Alam El Bueib reservoir at the end of December 2019.

El Salmiya-5 spudded on February 3, targeting multiple reservoirs in a previously undrained area of the El Salmiya field. Moreover, construction of a gas pipeline on the Al Jahraa field is expected to be completed shortly. On a gross basis, this is expected to bring an additional of 1,000 boe/d of gas onstream. The Consideration Shares held by Rockhopper in United are subject to certain lock-up and orderly market disposal provisions for a period of up to 12 months from completion.

## ENI, SAÏD BUSINESS SCHOOL LAUNCH SCHOLARSHIPS TO STRENGTHEN BUSINESS LEADERSHIP IN AFRICA

Eni and Saïd Business School, University of Oxford, have announced ten new MBA scholarships to strengthen the future of business leadership in Africa including Egypt. The Eni-Oxford Africa Scholarship will cover MBA course fees, a living expenses stipend and one return air fare while the candidates must be resident in one of the African countries in which Eni operates. The School's aim is to help businesses grasp the opportunities of Africa's favorable demographics by supporting the education of talented African students.

## DNV INTRODUCES NEW DIGITAL TOOL TO MANAGE SAFETY, COST RISKS

DNV GL, the technical advisor to the oil and gas industry has introduced a new methodology designed to address the major safety threat and multi-billion-dollar cost posed by corrosion under insulation (CUI).

The company elaborated that the Recommended Practice (RP) DNVGL-RP--G109 was developed in collaboration with several regulatory bodies, international oil and gas operators and major players in the supply chain to deliver a practical and cost-effective methodology.

DNV said that CUI can take the form of localized external corrosion in carbon and low-alloy steels, external stress corrosion cracking (ESCC) or pitting in austenitic and duplex stainless steel. Additionally, DNV GL has developed a digital tool to support the implementation and use of its methodology. CUI Manager applies machine learning to CUI data gathered from operators with the methodology from DNV GL's Recommended Practice, to continuously assess and calculate the risk of CUI in process plants.

BAROID

HPHT Water-based Drilling Fluids

# BaraXtreme™ HPHT Water-Based Drilling Fluid System

## Challenge

In environmentally sensitive areas, drilling HPHT wells requires the use of water-based systems where conventional IEF systems are not suitable. In these extreme conditions, operators face several challenges, including:

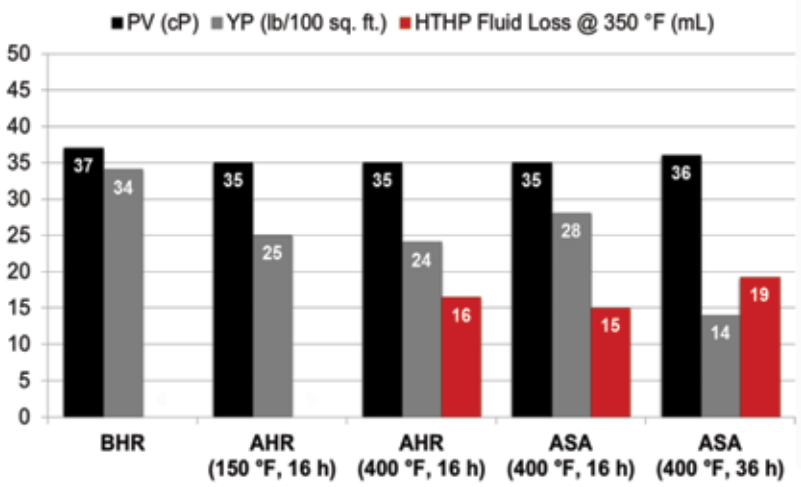
- High temperature fluid performance
- HPHT fluid loss control
- HPHT viscosity and rheology.
- Resistance to contamination

## Overview

Halliburton Baroid's BaraXtreme™ HPHT water-based drilling fluid system provides a customized HPHT solution to help reduce total costs for high temperature wells, help increase drilling efficiency and help ensure environmental compliance. This high performance drilling fluid system is composed of unique, temperature resistance polymers, which helps maintain rheological properties and reduces environmental impact.

## Features

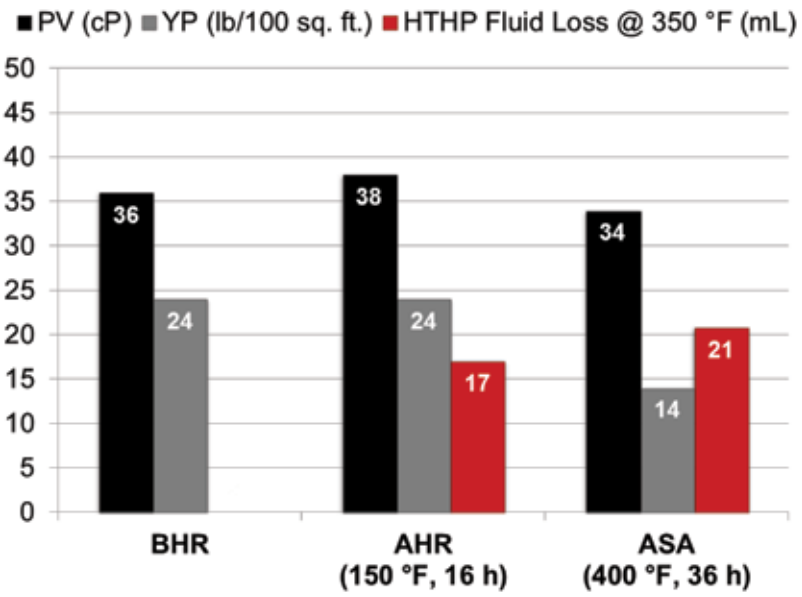
- Stable viscosity from 150 to 400°F+ (204°C) over 10-17 lb/gal densities
- System includes unique temperature resistant polymers
  - BDF-637 viscosifier helps maintain rheological properties
  - BDF-678 thinner works synergistically with BDF-637 for enhanced suspension properties




*14 lb/gal Fresh Water Formulations*

## Applications

BaraXtreme™ HPHT water-based drilling fluid system can be utilized in land and offshore drilling operations in fresh or sea water.




*14 lb/gal Sea Water Formulations*

## Benefits

**Stable Rheological Profile**

- Helps maintains rheological properties at temperature to prevent barite sag and differential sticking

**Helps Increase Drilling Efficiency**

- Enhances control of fluid loss and increases wellbore stability while increasing cuttings transport efficiency.

**Helps Reduce Total Costs**

- Minimizes maintenance costs with fewer products tolerant to higher temperature

**Environmentally Friendly**

- Contains no black powders or chrome-based products
- Helps increases environmental compliance over conventional IEF systems used in HPHT applications

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# A GLANCE AT MINING DEVELOPMENTS IN EGYPT

## EGYPT TO LAUNCH INTERNATIONAL BID ROUND FOR MINING

The Minister of Petroleum and Mineral Resources, Tarek El Molla, announced the launch of the first international bid round for gold mining under the new law in 2020. El Molla said that the bid round, that will cover a total area of around 56,000 kilometer square in the Eastern Desert and the Red Sea, will be posted for several sectors, adding that the bid round will take place from March 15 to July 15.

The minister declared that the bid will be held by a royalty and taxes system, noting that the companies that would like to participate should propose their offers to the Egyptian Mineral Resources Authority (EMRA). He stated that the new amendments in the Mineral Resources Law in addition to the Investment Law are making bid rounds more attractive to investors.

## SAWIRIS NEGOTIATES TO GAIN 51% OF SHALATEEN MINING COMPANY

Egyptian billionaire businessman, Nagiub Sawiris, said that he is negotiating with the government to acquire 51% stake in the state-owned Shalateen mining company, which comes in parallel with his objectives to enter the mining industry in Egypt.

This comes in line with Egypt's plan to post an international bid round for gold mining in the Western Desert during the first half of March.It is worth noting that Sawiris has previously said that he is willing to participate in the mining industry in any area that could be promising.Additionally, he noted that the Egyptian government started talks with him in order to promote the new tender.

## EGYPT PARTICIPATES IN PDAC, BIGGEST MINING EVENT

The Minister of Petroleum and Mineral Resources, Tarek El Molla, participated in PDAC, the World's Premier Mineral Exploration and Mining Convention, in Toronto, Canada, to showcase the ministry's achievements, encourage international investments, and promote the first mining bid round for 2020.

On the sidelines of PDAC, an Egyptian delegation from the Chamber of Petroleum and Mining at the Federation of Egyptian Industries (FEI) participated in a seminar to promote investments in the mining sector in Egypt.The delegation presented the recent updates and achievements in the mining sector under the Egyptian Modernization Project. The delegation also referred to the new mineral resources law and the executive regulation as well as the modifications to the investment law, which promote the investment climate.

## EL MOLLA INAUGURATES THE EGYPTIAN PAVILION IN PADAC

The Minister of Petroleum and Mineral Resources, Tarek El Molla, has inaugurated the Egyptian pavilion in PDAC.

The opening ceremony was attended by the Egyptian Ambassador to Canada, Ahmed Abu Zeid; the Deputy Minister for Mineral Resources Affairs, Alaa Khashab; the Board Directors' Chairman of Chamber of Petroleum and Mining in the Federation of Egyptian Industries (FEI), Tamer Abubakr; the Egyptian Mineral Resources Authority (EMRA) Head, Osama Farouk; in addition to the members of the Egyptian delegation who participated in the event.

El Molla showcased the new Egyptian model and reforms for developing the mining sector to improve the investment climate in this vital sector. He referred to Egypt's goal to attract international companies and investors to boost the Gross National Production (GNP).

## EL MOLLA HIGHLIGHTS GOLD MINING BID IN PDAC MEETINGS

The Minister of Petroleum and Mineral Resources, Tarek El Molla, met with international mining companies' heads, who could be potential participants in Egypt's gold mining bid round.

This came on the sidelines of PDAC, where the minister met with Rick Rule, CEO of Sprott US Holdings Inc., who hinted at the possibility for enrolling in Egypt's gold mining bid round. Additionally, Kinross Gold Corporation expressed its intention to invest in Egypt following the radical change that Egypt's mining licensing, financial and legal system went through.

Furthermore, El Molla noted during a meeting with Vincent Benoit, Executive Vice President Strategy & Business Development at La Mancha, and Ben Buckingham, who is responsible for investments, that Egypt will conduct a survey on the Western Desert, using remote sensors, which covers 500,000 km. This would support Egypt's future plans to host bid rounds in the area.

## EGYPT'S MINING BID ROUND SPARKS INTEREST AS PDAC WRAPS UP

Egypt's mining bid round became the highlight of PDAC, as the convention came to a close. On the sidelines of the convention, Minister of Petroleum and Mineral Resources, Tarek El Molla, met with Canada's Minister of Small Business, Export Promotion and International Trade, Mary NG, and discussed ways to reinforce the mining industry in both countries.

In a discussion with El Molla, Rob Krcmarov, Executive Vice President of Exploration & Growth at Barrick Gold Corp., expressed the company's interest in Egypt's mining market which is expected to flourish in the upcoming period.

Furthermore, Nicholas Cotts, Vice President of Sustainability and External Relations at Newmont Mining Corporation, mentioned the company's intent to enroll in the upcoming bid round, whereas Stan Bharti, Founder and Executive Chairman of Forbes & Manhattan, confirmed his enrollment in Egypt's mining bid round.

## SEVERAL COMPANIES REQUEST GEOLOGICAL MAPS FOR GOLD MINING

The Deputy Minister for Mineral Resources Affairs, Alaa Khashab, said that many companies had requested from the Egyptian Mineral Resources General Authority (EMRA), to obtain the geological maps and the studies related to the gold mining in Egypt. He added that these maps will help investors determine the areas of operations in addition to the areas where they can start new operations.

## CABINET ISSUES NEW DECISIONS FOR MINERAL RESOURCES LAW

The Prime Minister, MoustafaMadbouly, issued in January new decisions related to the executive regulations of the Mineral Resources Law.The regulation's provisions will be applied for search and exploitation licenses of ore mines, quarries, and navigation issued by the authority and the proceeds of their rents and royalty fees will be transferred to the state treasury.

The regulations stipulate that the competent agencies should prepare a request form for search licenses to be submitted and approved by the authority. The authority must prepare certified records stamped with serial numbers and their types, in addition to creating databases for raw materials and companies. The regulation gives the authority the right to establish or contribute in exploration and production (E&P) activities with a share from Public Fund of not less than 25%, except for the agreements issued by law.

A consultant committee will be formed and headed by the Ministry of Petroleum and Mineral Resources' representative with membership from several other ministries and agencies.

## MINERAL WEALTH LAW REFORMS PROMOTE INVESTMENT ZONES

The Ministry of Investment and International Cooperation ratified Law No. 145 of 2019, amending provisions of the Mineral Wealth Law promulgated by decree No. 198 of 2014 with a number of legislative reforms.

The amendments of the Mineral Wealth Law allow the exercise of its activities under the investment zones system listed in the decree number 72 of 2017 in the investment law. The addition of a new article will also be among the reforms.The investment zone board of directors shall manage the area and develop its work plan, in addition the Executive Office shall issue all approvals, licenses and permits necessary for the establishment of projects.

## EL MOLLA DISCUSSES MINERAL WEALTH LAW AMENDMENTS

Minister of Petroleum and Mineral Resources, Tarek El Molla, discussed in July 2019 new modifications of the mineral wealth law with the House of Representatives. The minister ensured that all the stakeholders, investors and the commerce chambers took part in planning for the modification process along with a specialized ministerial board.

El Molla explained that the new amendments focus on improving the financial system, granting work permits for miners through simplifying the procedures needed, in addition to separating between the licenses needed to search for mineral wealth and the licenses need to exploit them, giving investors more flexibility to research and explore mineral resources.

He also added that the government will have a maximum of 20% and a minimum of 5% of any exploration and production (E&P) investment, and will allocate from 1% to 6% to contribute to the community.

# BETWEEN RESOURCES & POTENTIALS: REVIVING EGYPT'S GOLD MINING SECTOR

BY **AMINA HUSSIEN, REHAM GAMAL & TASNEEM MADI**

Egypt is quite rich with mineral resources as it has reserves of 48 million tons (mmt) of tantalite, which is the fourth largest reserves in the world, in addition to 35 mmt of coal, according to the Australian Trade and the Investment Commission. Such resources support various industrial activities. Most of the mineral resources are found in the Eastern Desert, Sinai, and the Red Sea, according to the Egyptian Mineral Resources Authority (EMRA).

Egypt's gold mining production reached 15 tons in 2019, according to the International Financial Statistics (IFS). The country is considered a significant gold producer as it ranked the 36th in terms of gold mining production in 2018, according to Gold Hub's website. Moreover, the country acquires reserves of about 3,750 tons of gold ore (120 million ounce), according to EMRA.

The report tackles the development of the mining sector in Egypt over the period between 2010 - 2019, including gold international bid rounds and production as well as main gold sites and major mining companies in Egypt.

## HISTORY OF GOLD IN EGYPT

During the pharaonic era, Egypt was known as the richest country with gold in the Middle East and the Near East, as it was considered a major gold production player in the region. Between 1814 and 1820, the earliest geological map in the world with real geographical content was discovered, which was drawn more than 3,000 years ago, marking a gold mine at Bir Umm Fawakhir in the Eastern Desert, National Geographic reported in July 2016.

In the early 20th century, mining started in the previously discovered sites by the Pharaohs, including Al-Barami mines, located between Marsa Alam, in the Red Sea Governorate; Edfu, in Aswan Governorate; and Al-Fawakhir mines between Safaga and Qena, in Qena Governorate. Over the period from 1902 to 1927, 10 mines started gold production, where in 1902, seven tons of pure gold were extracted. Since then, there were several outbreaks that lead to the disruption and the discontinuation of some mines until 2004, according to a study named "Egypt on the global map of gold mining", published in the State Information Service in December 2018. In 2007, the first experimental ingot was produced. Production operations did not take place regularly until 2010, when it started to be in an organized manner.

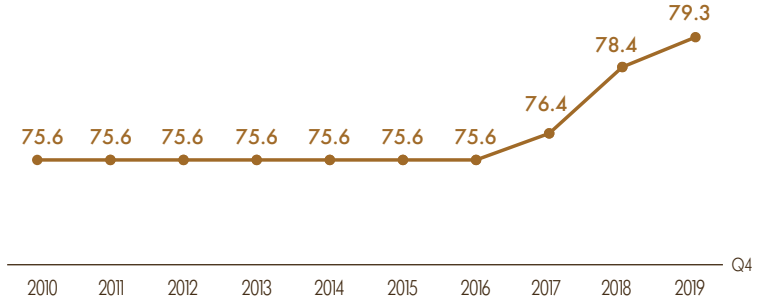
## THE IMPORTANCE OF GOLD FOR THE EGYPTIAN ECONOMY

Gold is considered as a tool for foreign reserves in the Central Bank of Egypt (CBE). These reserves are important for stabilizing its balance of payments, paying foreign debt and interests. In terms of gold reserves, Egypt ranked the fifth among the Arab countries, according to International Financial Statistics (IFS) data. In addition, gold is an important asset for investors to resist economic crises or inflation. At uncertain times, investors direct their investments from equity to gold as a form of financial security, according to an article titled "The Midas Touch: Gold and Its Role in the Global Economy", published by National Institute of Health (PMC), in 2017. Gold is also a major contributor to economic growth through providing job opportunities in the mining industry.

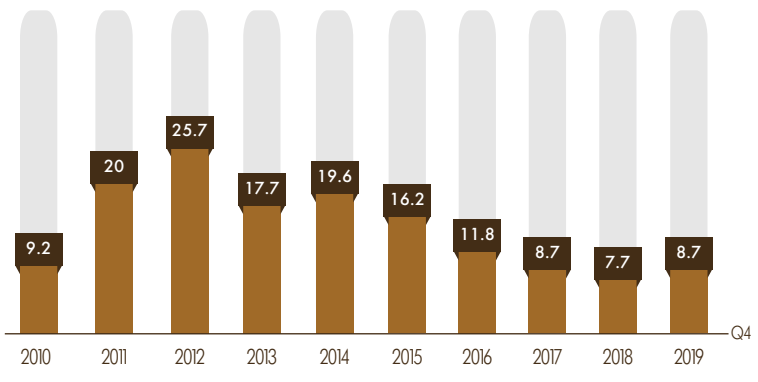
Gold reserves remained constant at 75.6 tons during the period from Q4 2010 to Q4 2016. Since then, gold reserves in Egypt have adopted an increasing trend. In Q4 2019, gold reserves reached its highest records to 79.3 tons, representing 8.9% of the country's total foreign reserves, according to IFS.

Over the period from (2010-2019), gold reserves averaged by 76.33 tons. In addition, gold's share in the total reserves reached its peak (25.7% of total reserves) in Q4 2012 compared to other years' share (ranging from 18% to 9%), according to the IFS data.

Egypt's Gold Reserves (tons)




Egypt's Gold Share in Total Reserves (%)




Gold was considered as one of Egypt's top exports in 2017, where it reached $2.78 billion, accounting for 9.2% of the total exports, according to the Observatory of Economic Complexity (OEC). Moreover, gold was ranked as one of the most important 20 industrial items of Egyptian's non-petroleum exports during January 2020, according to the General Organization of Export and Import Control (GOEIC).

## INTERNATIONAL BID ROUNDS AND INVESTMENTS

EMRA was established in 1896 to be responsible for developing the mining sector through preparing maps, grass-roots mineral exploration, geo-environmental studies, as well as hydro geological studies and services. Over the past year, there were many developments and actions taken to set the country on its path to be

an attractive mineral resources destination. For instance, in light of offering more exploitation opportunities for gold mining companies in Egypt, EMRA has launched two bid rounds over the past three years.


The first bid round for gold and associated minerals was launched in 2017, offering five concessions in the Eastern Desert and Sinai. The bid round resulted in awarding four concessions, one for each of Britain's Veritas Mining Limited, Ghassan Spain Investment, and Egypt's East Gas Co., while Resolute Egypt won two, as explained on EMRA's website.

In Early 2020, EMRA launched its second bid round that focused on gold mining. The bid round offered about 132 sectors which covered a total area of around 56,000 km$^2$ in the Eastern Desert and the Red Sea. This bid round will be under the new amendments of the Mineral Resources Law; and accordingly, it will be more attractive for investors to participate in, as stated by EMRA.

The amended mineral resources regulations issued under Law 198/2014, adopts the international system of royalties, taxes and leases, instead of the Production Sharing Agreement (PSA) system.

As per the 2014 law, royalties were set to be not less than 5% of the annual production of ores; and they did not have a maximum cap. The new law fixed that by stipulating that royalties will be at a minimum of 5% and capping at 20% of the annual production of ores, noting that the royalty fee is assigned depending on the ore extracted. Additionally, the old law required companies to pay additional royalty fees that are directed towards societal developments of the area where the project takes place. As for the new law, 1% and 6% of the royalty paid for mine exploration or exploitation, and 6% of quarries and salt pans royalty, respectively will be deducted for this purpose from the total royalty amount, according to article 10 for Law No. 145 of the year 2019.

The Minister of Petroleum and Mineral Resources, Tarek El Molla, declared that this modified law will be a new legislative framework for the mining sector. In addition, it is one of the steps taken for modernizing the sector to increase the sector's contribution to the Egyptian economy and to keep pace with Egypt's 2030 vision, according to a ministerial press release published in February 2020.

To flourish investments, in 2017, Egypt established a free economic zone dedicated to mining known as the Golden Triangle. The Golden Triangle is located between Qena, Safaga, and Al Qusair. This triangle is considered one of the richest areas in mining sources amounting to 75% of Egypt's mining minerals, stated the General Authority for Free Zones and Investment (GAFI) .

## MAIN LOCATIONS OF GOLD IN EGYPT

Egypt possesses more than 120 gold sites in which gold was explored. To exploit more gold sites, EMRA works on developing the sites' data base and research programs through sending annual field missions to various sites in Egypt's deserts, as stated by the Former Chairman of EMRA, Omar Teema, during a seminar titled "Gold Mines Agreements ... Opportunities and Challenges" in August 2017.

### i. Classification of Gold Sites

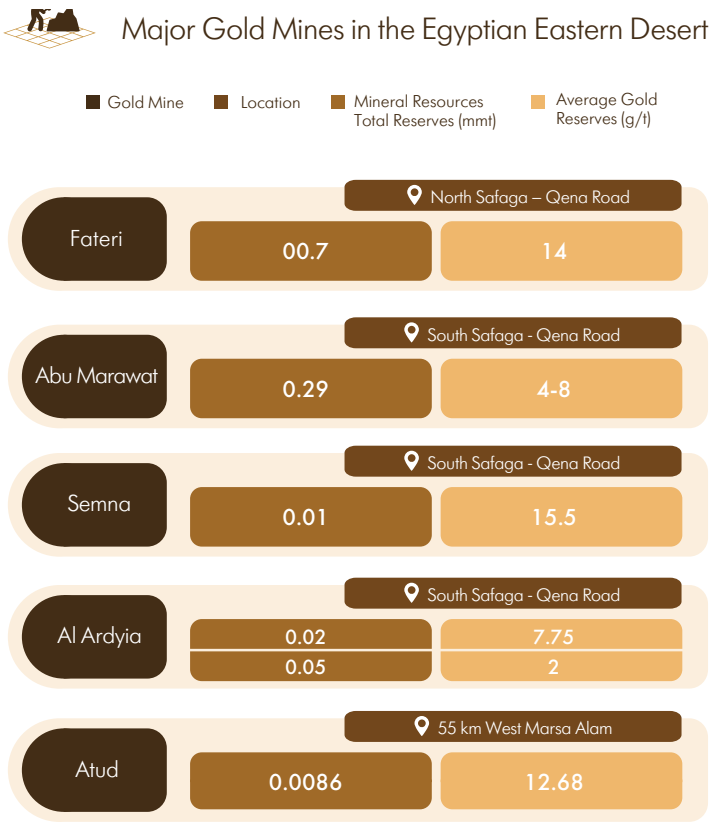

The gold sites in Egypt are distributed in the Eastern Desert across several sectors; including the northern sector, the middle sector, the southern sector, and the southeastern sector.

### ii. Major Gold Mines

Gold in Egypt is found in more than 220 mines, which are rich with gold prospecting opportunities in different regions of the Eastern Desert, South Sinai, and Aswan. Most of Egypt's gold lies in the Eastern Desert in the Sukari, Hamash and Wadi Allaqi mines, the Former Chairman of EMRA stated.

Barramiya is also considered one of the richest gold mines in the Eastern Desert. It is located about 105 km east Edfu – Marsa Alam road. The mine embraces mineral resources' reserves in three sections. The first section holds about 14.8 mmt of reserves; with average gold reserves of 1.07 grams per ton (g/t). The second area has total reserves of 1.22 mmt and average gold reserves of 2.85 g/t. Finally, the third section has reserves of only 0.5 mmt, with average gold reserves of 3 gram per ton, EMRA stated.

In addition, Halayeb and Shalateen are two promising regions for gold production. Shalateen Mineral Resources Company operates five areas, including four areas in Halayeb, Shalateen, and one in Aswan.




## HIGHLIGHTING THE SUKARI GOLD MINE

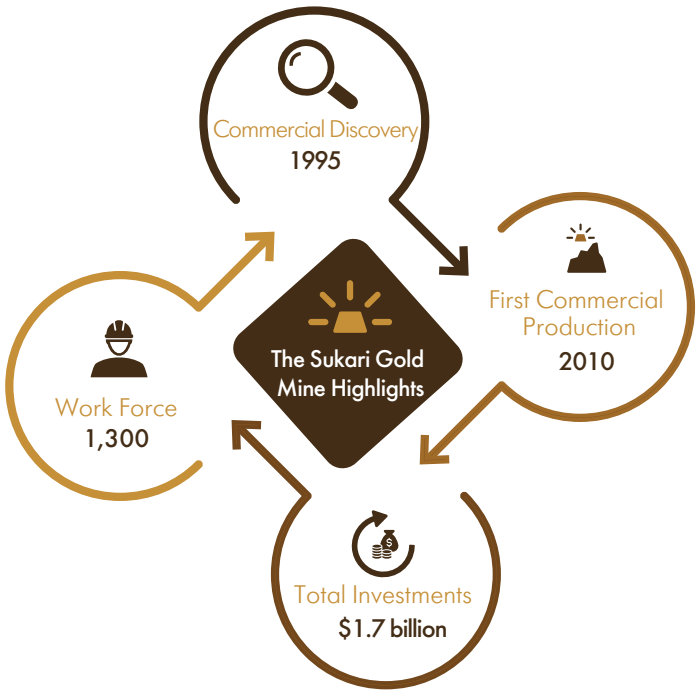
The Sukari Hill has been hosting mining activities since the Pharaohs to the Romans to the British colonialism, and to the modern ages. The Sukari gold mine is located in the Sukari Hill in the Eastern Desert. The Sukari mine was the only gold mine operated by the government until its production was halted in 1954. The mine was officially announced to have made a commercial discovery in 1995. The Sukari is considered one of the largest gold mines in the world in terms of reserves and production, according to Centamin's official website.

Following the official discovery of the mine, Sukari Gold Mine Company, Centamin's subsidiary, was established in June 1995 when the 160 km$^2$ Concession Agreement was ratified by the Egyptian House of Representatives as Law no. 222, as mentioned in Centamin's 2018 Annual Report.

The operations in the Sukari mine started in 2009, where a plant was established to produce precious metals including gold, silver, and copper. Subsequent to the first commercial production in 2010, the processing capacity of the plant was increased in a staged manner.

The Sukari, the only operating gold mine in Egypt, has a large reserve and resource base. In 2018, the total resources in the Sukari were estimated at 343.75 tons (11 million ounces), while the total mineral reserves are estimated at 226.6 tons (7.25 million ounces), underpinning at least a 15-year lifespan of the mine, according to Centamin's 2018 Annual Report.

The Canadian company invested around $1.7 billion over the period from 2010 to 2017 in the project, which provides around 4,500 direct and indirect job opportunities, as stated by Dr. Ali Barakat, Chairman of Sukari Gold Mining Company, during a visit to the Sukari site in March 2017.



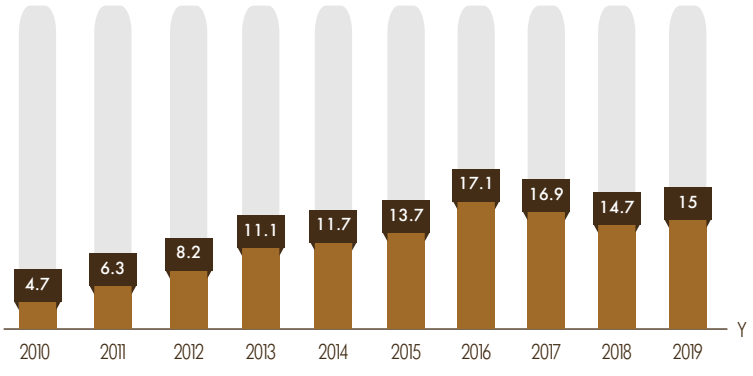

## GOLD MINING PRODUCTION

Over the period from 2010 to 2019, Egypt's total production of gold, which 100% comes from the Sukari mine, recorded 119.4 tons. Over the referred period, the mine's annual average production of gold reached 11.9 tons, according to the IFS data and Centamin Egypt press releases.

The mine's lowest production rate was in 2010 when it recorded 4.7 tons. On the other hand, its highest rate was recorded in 2016 with a production of 17.1 tons of gold. Following 2016, the production level tended to slightly decline as it has fallen to 14.7 tons in 2018 with a negative growth rate of 15.8% compared to the 2016 production rate, according to the press releases.

The decline in production was mainly driven by the delay in operating processes developments, which decreased the targeted production of the operating company, according to a press release by Centamin. From 2010 to 2019, the rate of production increased by 219.1%, according to the IFS data.

Egypt's Gold Mining Production (tons)




## MAJOR EXPLORATION AND PRODUCTION GOLD COMPANIES

Many international companies are operating in Egypt's gold sites. Two major companies are working in gold production, namely Centamin and the Cypriot company Matz Holding. For exploration of gold, there are many active companies in Egypt; two of the earliest are the Canadian Aton Resources and the United Arab Emirates' (UAE) Thani Dubai. It is worth mentioning that there are other mining companies such as SMW and Resolute Egypt, in addition to other companies working in the gold industry in Egypt, such as Gold Pyramid Group.

### i. Centamin

Centamin is a mining company which is listed in London and Toronto Stock Exchange. As one of the first gold producing mines in Egypt, the company commenced production from the Sukari mine in June 2009, according to Cenatmin's website.

Thanks to the developments of the Sukari mine, EMRA's profit share from Centamin increased by 14%, from $76.4 million in 2018 up to $87.1 million in 2019. After distributing Sukari's profit share and Centamin Group investing activities, the group's free cash flow recorded $74.3 million in 2019 compared to $63.4 million in 2018. In addition, Centamin's royalties paid to Egypt rose by 7%, from $18.4 million in 2018 up to $19.7 million in 2019, as stated in Centamin's 2018 Annual Report and Q4 2019 Results Report.

Centamin plans to pump investments of $190 million in Egypt in 2020. The company allocated $150 million out of the $190 million to be only invested in the Sukari mine, according to the Q4 2019 Results Report.

### ii. Matz Holding

Matz Holding is a gold producing company that operates in Egypt through Hamash Co, a joint venture (JV) with EMRA. Hamash was established under the law No. 2 of 1992 when EMRA got 50% share in it, as stated by EMRA.

Hamash targets gold and mineral resources production from Hamash mine in the Eastern Desert. The first experimental gold bar was produced for the first time in Egypt from Hamash mine in 2007 after 50 years gold production hiatus. Afterwards, the company has completed infrastructure projects to increase the gold ore reserves. In 2012, the company's production from Hamash amounted to about 0.125 tons (4,000 ounces), according to a book published by EMRA in 2014, titled "Mineral Resources in Egypt". In early 2018, Hamash mine produced 0.005 tons (160 ounces).

### iii. Aton Resources

Aton Resources significantly helps in transforming the resource-rich country into a significant gold producer. Since 2007, the company has been engaged in gold exploration and development activities in Abu Marawat concession (100% stakes). The concession includes Hamama and Abu Marawat deposits as well as the Rodruin project in addition to more than 16 other potential sites, according to Aton's website.

Abu Marawat concession is located in the central Eastern Desert; about 200 km north of the Sukari mine. Aton observed a considerable amount of mineral resources within the concession. For instance, Abu Marawat's deposit alone holds 2.9 mmt with gold of 1.75 g/t, according to Aton's website.

In December 2017, the company discovered the Rodruin project where exploration activities were accelerated by drilling the first well in August 2018. The results, announced in December 2018, showed 12.47 g/t of gold extracted from the main zone of high-grade ancient workings at Aladdin's Hill, as explained on the website.

In 2020, Aton was granted a license for 20 years with an optional 10-year extension period. The license will allow the company to continue development of the Hamama deposit and Rodruin project within Abu Marawat concession, Aton announced.

### iv. Thani Dubai

Thani Dubai is a gold exploration company which has been operating in the Eastern Desert since 2006. In 2006, the company was awarded a Hodine concession to explore the Hutite and Anbat prospects. The Hodine concession is located in the Egyptian Eastern Desert inland of the Red Sea settlement of Shalateen. The concession covers an area of 1,190 $km^2$. Since 2014, Thani Dubai has been carrying out exploration activities within the concession, according to the company's website.

The Anbat–Shakoosh district, which is located in the Hodine concession, currently has three prospects; North Anbat, Anbat, and Shakoosh. North Anbat was newly discovered in 2015, 5 km north of Anbat. The Anbat-Shakoosh belt holds a non-Joint Ore Reserves Committee (non-JORC) compliant resource of about 15 tons (540,000 ounces) of gold. For the Hutite prospects, it is located 60 km northwest of Shalateen in the central area of the Hodine concession. The prospect has a non-JORC compliant resource of about 14 tons (520,000 ounces) of gold, as stated by the company.

The Ministry of Petroleum and Mineral Resources (MoP) is exerting a great effort in modernizing the mining sector. The mining sector's modernization is supported by practicing different regulatory, fiscal, governance and licensing reforms. Moreover, the country's new mining law is expected to attract investors and international companies by giving them more opportunities to increase their exploration and production (E&P) in the field of mineral extraction. By attracting investments, this will boost the national economy and international exposure.

EMRA plans to implement a group of activities in FY 2019/20, such as signing 86 contracts for exploitation under special conditions, signing three agreements for gold exploration, and two agreements for exploiting and producing gold. The authority also agreed to specify 11,500 $km^2$ as a total area for mining activity, and to provide 253 exploring and exploiting licenses for various mining services. Thus, at a global level, Egypt's rank improved by three positions, ranking 41$^{st}$ in Q4 2019, against 44$^{th}$ in Q4 2018, according to the IFS. As a result of such future actions and plans, further improvements in the mining sector are yet to come.

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# EXHUMING LOST GOLD:

## AN INTERVIEW WITH **MARK CAMPBELL,** PRESIDENT AND CEO OF ATON RESOURCES


BY **JACK BECKFORD AND MAI EL GHANDOUR**

### How do you see the gold market in Egypt changing over the years?

You can go back to the pharaonic times, there is no doubt that gold has played a major part in the history of Egypt. You have this time from the pharaonic period to the Romans, and then you have the early Arab period. And this is where gold mining re-emerged again and activity accelerated a lot. Egyptians became known as miners, they worked in various places because of their expertise in mining. Going back to the pharaohs, gold is in the Egyptian DNA. But Egypt is rich in copper, zinc, lead, and lots of other things that nobody had even looked for. If you had a copper mine, everyone would be happy! It does not really matter whether you are looking for precious metals, base metals, or industrial minerals. There is something for everybody here. So the goal is to attract people to come look for all this and spend the money in the country.

After the early Arabs, for some reason mining disappeared, and it was not just gold, they also had mined copper, zinc and gem stones. Egypt actually has a huge amount of peridot, but it also has historically produced emeralds and rubies. What happened was it sort of fell off and then the British arrived and established a geological survey and in the late 19 century began mining. In our concessions, we have three old British mines; two of which are gold dating to the early 1900s. A lot of Egyptians will tell you there is gold everywhere, the thing is in those days, we did not have the technology we have today. Now the ability to process it is much more sophisticated, though the basis of mining remains and that is moving dirt cheaply and one of the things about Egypt is a lot of it is at surface, you do not have to dig down.

The modern era really begins in the 1980s and the key to understanding where we are today is in the 1970s when Governments in developing countries, did not think that they were getting their fair share of profits from oil & gas based upon royalties. So, there was a move to something that was seen as fairer, the production sharing agreement (PSA). But in 1982 the Egyptian Government decided to apply the PSA to mining, which was never going to work. The problem with the PSA is that the economics between oil & gas and mining are mutually exclusive. Thus, that is what pushed away mining investments in this country. It is not that Egypt does not have mineral potentials; it does. But it simply was very oil-centric; if it worked for oil and gas, it had to work for mining; which is like saying if it works for British Airways, it works for Uber because they both transport people.

### How does the PSA affect Aton Mining?

Well, it does not affect us as we are under the old law. Our concession agreement was agreed to in 2007 so we are under the old concession. But if we tried, we could probably migrate to the new law through negotiation. This said, despite being part of the old legislation we will still bid in the upcoming bid round.

### Where do you think Africa's next gold mine will be?

It is very hard to say but there are a lot of projects on the go. In actual fact, it has been a very tough ten years for the mining and mineral exploration industry. Exploration companies like us, even though we are listed on the Toronto Stock Exchange, we live a hand to mouth experience. Your success depends on how much positive work you do and then you have to raise money for exploration. Thirty years ago, oil and gas and mining were where you used to put your risk money, however, there is a much broader investment market these days. We are effectively the venture capital of the mining industry, the people who take the initial high risk with the hope of finding something we can commercialize. Either we will bring in a farm-in partner and they will have a stake and bring it to fruition or we will sell the project to somebody and go off and do more exploration or sell the company to a bigger mining company. As I say, it is like venture capital. This said, I believe in what Egypt has to offer and the opportunity here is huge, and not just for us, but for the country in general. It will not be a straight line, it will not happen overnight, but it will get there.

### The Bedouins around Rodruin have always talked about a lost mountain of gold. Why do you think Rodruin fits that description?

Fast-forward to 2018, we have just made what we considered to be our largest discovery; which is Rodruin. Rodruin was an interesting one because it combined archeology with geology. We had a large processing area and the tailings were running at seven grams a ton, and that is quite good. You cannot see the gold, but it is in there. With a satellite imagery and Google Earth, we worked out that there were manmade trails that went up to this mountain 3 km away. We climbed up and it was very steep, and there it was; the oh my god moment. The place was honeycomb with ancient workings. It must have been hundreds of people working for thousands of years. There is so much there and nobody even knew about it; that is why it is called Rodruin. There was no Arabic name for it, but people always talked about that there was a lost mountain of gold, so the Bedouins knew about it but they did not know where it was. And I am sure there is more like that in the country.

### Do you think Egypt is under explored?

Without doubt it is. There should be a more holistic approach to mining. The reason that gold is $1700/Oz is because it is rare and it is difficult to find. I think you have to look at the industry as a whole. There is an abundance of other minerals within Egypt such as, silver, lead, copper, zinc and possibly nickel, just to name a few. But there is also a lot that has not been explored, for example at Fayoum you will probably find Borax, which is an indicator for Lithium and subsequently battery production. This said, the Egyptian Mineral Resources Authority (EMRA) has to get rid of or certainly reduce the ground rent costs during the exploration phase, which are extortionate and will deter investment.

### What about the potential of Shalateen?

Shalateen (situated near to the border line between Egypt and Sudan in the Halayib Triangle) has a high potential for gold. The interesting thing about Shalateen is the area Anbat (being explored by Thani Stratex) is that it is not polymetallic but purely gold.

### Where do you see the industry 20 years from now?

I think that you will have one or more mines of different minerals other than gold. They may be small or medium but it all generates tax revenue and also creates localized jobs. What I would like to see is by that point, young Egyptian geologists and mining engineers have been trained up so that in addition to the international companies working here, we will have domestic companies competing here as well. It took years for this to happen in oil and gas, but now you have the International Egyptian Oil Company(IEOC) among others who are now producers and not just service companies and I can see this being replicated in the mining industry, no doubt. But also, I do not think you can underestimate the importance of the PSA amendments for the future of Egyptian mining.

### What can be done to fast track the industry?

You can fast track it by making what data there is easily available and not by having any Government involvement and let companies get on and do their work. Mineral exploration is a much longer process than oil & gas and on average it takes from the beginning of exploration to having an operating mine, 10-15 years. It is also much higher risk and in Egypt, for every 100 gold explorations projects that begin, only 1 will become an actual real operating mine. One problem, is the amount of available data. The Russians did the best work back in the 70s but outside of that not much has been done since the 1930's. At present no one in Egypt understands this business because it has not really existed for 100 years. The fact of the matter is that they need to digitize this information and they have to make it easily accessible but most importantly, they have to refrain from selling this information to foreign investors, as most countries give it away and this is to promote investment in the country. The key is to attract investors to come to Egypt like EGPC managed to do so in oil & gas.

### What are the future plans of Aton Resources?

We have an area called Hamama, which is an area we have looked at a lot. It depends whether we can migrate to the new law. As a sense, right now we are looking to build a small heap leach, a very simple and cheap way to extract gold from a certain type of rock. In addition to this, we believe our primary exploration targets at Rodruin and Abu Ghaharish have the potential to become much larger mines and so we will continue to aggressively explore them as well as the 17 additional exploration targets that we have.

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# RETAINING GOLD'S VALUE PROPOSITION:

## AN INTERVIEW WITH **MARKS LISNANSKIS,** CHAIRMAN OF SMW GOLD HOLDCO

**SMW Gold has been investing in Egypt since 2007, what made you set eyes on Egypt as an investor?**

We first came to Egypt in 2006 to discuss with El Mex Salines the possibility of using their brine for production of magnesium in Egypt. However, nearest deposit of magnesite ore was approximately 1,000 km away, so we had ultimately decided to put that project on hold due to poor economic feasibility.

At that time, we held some meetings with the Egyptian Mineral Resources General Authority (EMRA) and became aware of the upcoming bid rounds. SMW geologists carefully analyzed the fields being offered. Starting from 1956 there has been strong friendship between the Soviet Union and Egypt, with much assistance coming to Egypt from the USSR. Thus, Russian geologists conducted various exploratory works in the Eastern Desert in the 1970s. We were able to find relevant and compelling records in Moscow – and ultimately became convinced of the very high potential that Umm Balad and El Fawakhir deposits possess.

Thus SMW proceeded to participate, to bid and to win. We had originally also won the rights to El Barameya; but some months later, EMRA asked us to give it up because they changed their mind (had some other plans for developing that field) – so we signed it back over to EMRA.

**How is SMW Gold dedicated to the development of multi-million ounce of gold deposit in Egypt?**

After the Parliament of Egypt ratified our Production Sharing Agreements (PSA) with EMRA, we had promptly brought in a team of the very top Russian geologists and geophysicists, and actively advanced to implement the Phase 1 exploration program, far exceeding the minimum requirement imposed by EMRA (in both, capital invested and works accomplished). Between 2008 and 2010, SMW has done much work -- collected and analyzed many samples, performed geophysical and geochemical and satellite imagery analysis, etc. In the autumn of 2010, we raised capital on the Vancouver Stock Exchange, to supplement our own financial resources – in order to proceed with at least 100,000 meters of JORC-compliant drilling. HSBC Bank wrote a letter to EMRA, as did we, confirming that all is ready to proceed, but a timely response did not come; and several weeks later a revolution transpired in Egypt. We were forced by the circumstances to halt our activities in Egypt, while we awaited reestablishment of secure environment. Indeed we remain very dedicated to developing these assets to the fullest potential.

**What are the latest updates on your operations in the Eastern Desert?**

Several years after President Abd El Fattah El Sisi ensured stability, we have signed an agreement with an investment group to allocate sufficient funding toward the implementation of an extensive drilling program. The first letter of guarantee for $5 million was issued last year; and we are awaiting government approvals to begin work. The next step will be to separate the two concessions into two separate companies, so that both fields can each be developed in a large way, as they deserve to be, thus enabling us to invite several different strategic investors to participate in each of the two, respectively.

One of the largest drilling and geological services companies in Russia is ready to conduct the works on good terms, at both deposits; and possibly also to join forces with us to organize a prominent drilling services company in Egypt.

SMW Gold projects enjoy full support of the respective Russian government agencies. And Rosgeo, a government-owned corporation, has officially expressed interest in taking part.

**How do you think the new amendments of the mining law impact investments in Egypt and its mining bid rounds?**

Certainly, the new regulations (Mineral Resources Act) signify excellent news for the industry. This legislation greatly improves the potential for Egypt to attract foreign investment into the country and to develop its natural resources in a very substantial way. National income from the mineral resources sector (mining) can potentially contribute over 10% to the national gross domestic product (GDP) of Egypt (as the case is in Russia) rather than the current < 1%. A number of large international mining companies, which did not consider investing here in the past decades because of difficult legislation, have now declared their interest. This is a clear indication that the government is on the right track. If it were not for the current calamities in the world (the rapidly-spreading epidemic), we would not have any doubts about the anticipated success of the upcoming bid rounds (competition among bona fide participants).

**Egypt is rich with mineral resources; how could it be better exploited economically?**

Currently, there are no local service providers (such as certified laboratories) or equipment manufacturers in the field of exploration and mining; and there is a limited number of post-processing of raw materials (manufacturing). Both market segments can be developed and can bring high economic benefits for the country.

Considering the very impressive presence of mineral resources, Egypt can benefit from more professionally-oriented education programs with emphasis on mineral resource exploration and management.

**In what way does your company utilize technology in its mining exploration?**

We started out many years ago as an engineering company, so we are well equipped to keep a close eye, up to date, on all the latest advancements and new technologies. There are some new equipment-related developments that make exploration and mining processes more efficient and economical.

I can provide one simple example pertaining to the oil and gas sector, as it might be more interesting. SMW Engineering, a sister company of SMW Gold, has developed ultra-light magnesium drill pipes employed for extra deep drill holes – they are almost 20% lighter than the comparable aluminum tubes typically used for respective applications. Halliburton was our first customer.

**Do you believe that investment in gold is more beneficial than other sorts of investments? Could you please elaborate on that?**

Yes, gold retains its intrinsic value proposition. It has always been the ultimate hedge against calamities and instability; and nowadays the market is proving us right. Historically, gold has always been in demand as jewelry, currency, collateral and various innovative industrial use (electronics, etc.). As current international finance markets become unstable and volatile, gold is in more demand. With the emergence of various gold-based investment vehicles (dedicated funds, ETFs and such), this demand will continue to increase.

The emerging markets such as China and India are continuously increasing consumption of gold -- to increase its share/allocation of national reserves. China's gold reserves have been growing at a remarkable rate, doubling every two years or so. The US holds more than half of its national reserves in gold. China would need to be buying gold to the extent of at least $500 billion in order to bring its gold investment to a 15% allocation of its total foreign reserves. Such quantity inevitably attracts the attention of the markets and positively impacts the future value of gold.

According to the World Gold Council, annual demand for gold is above the $100 billion mark and is expected to continue increasing.

**In your opinion, how should the mining sector cope with the coronavirus pandemic?**

All the precautionary measures must be taken in order for employees/workers to stay safe. However, in terms of the gold value, we believe that in times of a pandemic, the price of the commodity is very likely to continue increasing -- since gold is one of the most liquid assets known to the history of mankind. Over the centuries, gold has proven to outperform other markets in the times of crisis, and we do expect it to be the same this time around, in these difficult times.

# A PARADIGM SHIFT IN EGYPTIAN MINING:

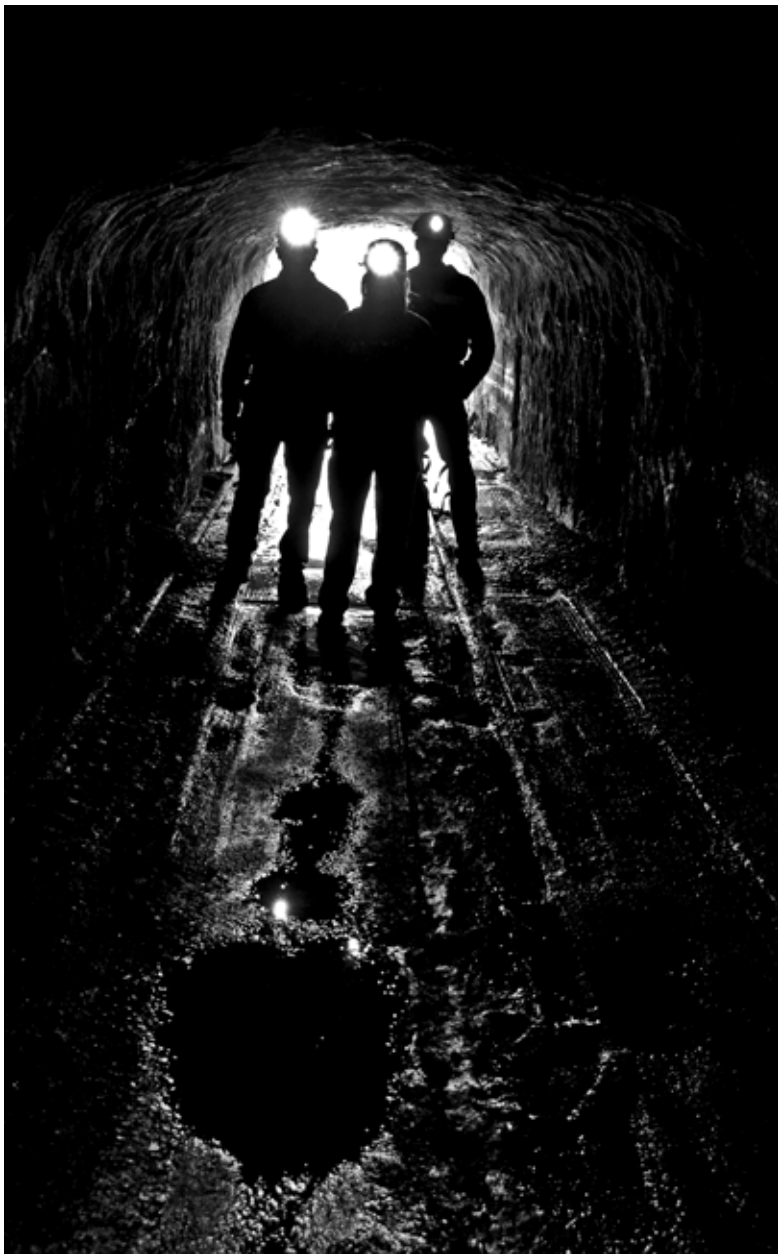
## AN INTERVIEW WITH **OSSAMA EL MAGHRABY,** RESOLUTE EGYPT PTY LTD DIRECTOR

**Resolute believes the Arabian Nubian Shield (ANS) could be the next major exploration frontier in Africa. Can you elaborate on that?**

The ANS is usually labeled as the last unexplored frontier which it truly is. It has all the right signs and definitely has a few world-class mines, but its full potential hasnot been realized yet, but what everybody needs to understand about gold mining is that securing an exploration license doesnot mean it must turn into a gold mine.

**Resolute Mining was awarded its two concessions back in 2017. Will the company be submitting further offers in the coming bid rounds?**

The 2017 bid round was cancelled so the awarding process was not completed. We understand this was done to pave way for a better mining code for the betterment of Egypt and to realize more economic benefit for the investor and the Egyptian people. So, despite the cancellation of the 2017 bid round, Resolute is very keen to explore for gold in Egypt and we will be bidding in the 2020 bid round. At Resolute Mining Limited we remain committed to investing in Egypt and working with the Egyptian people and government.



**How do you think these bid rounds could further expedite investments in the mining sector?**

Yes, it will. The main reason of attraction is the development of a modern mining law which ensures the fair treatment of the investor without the wavering of the economic benefits for the Egyptian people.

**What is your take on Egypt's new mining law and its executive regulations?**

The new law is very modern and investment-friendly, it is very similar to the Queensland mining code which is very transparent and has yielded positive results for the Queensland government and the investors.

**Rewinding on your previous tenure, you were responsible for developing a scoping study for Al Sukari operations. Can you tell us how this boosted Centamin's production?**

I was part of a team that developed the stage four scoping study at Sukari which increased the plant capacity from 5 million tons per annum to 10 million tons per annum, leading the Sukari mine to become one of the top 20 producing gold mines in the world. I am very proud of my tenure there and that we achieved this with very challenging conditions; it also proves that you can operate a large-scale gold mine very successfully in Egypt.

**According to the Minister of Petroleum and Mineral Resources, Egypt expects the contribution of its mining sector to the gross domestic production (GDP) to rise to $7 billion by 2030. How do you suggest this target can be achieved?**

His Excellency Eng Tarek El Molla, the Minister of Petroleum and Mineral Resources, has been a true change agent and visionary, he changed a practically dead sector into a sector with global appeal. The rewriting of the mining code and executive regulations is a paradigm shift in Egyptian mining and we hope to see the results within the next decade.

**In your opinion, how will the coronavirus affect the mining sector globally? And what can Egypt do to stand against this?**

Of course, there is an impact due to the travel restrictions and there are many expatriates who work in mining, also on mines many laborers live in close proximity to each other on camps which may be a cause for the spread of the virus. Luckily in mining we are notoriously focused on health, safety and environment (HSE), I believe all major mines around the world are taking the necessary precautions to prevent the spread of the virus. Finally, many mining operations are affected by the delayed supply out of China and also the delay in Chinese imports of raw ores mainly iron and copper.

# EGYPT: A GREEN ENERGY MINE

BY **JASMINE SHAHEEN**

Egypt has a vast wealth of mineral resources including gold, copper, silver, zinc, platinum and several other precious minerals and base metals. These resources are largely located in the Arabian-Nubian Shield (ANS), otherwise known as the Eastern Desert and the Sinai Peninsula. Having such a large expanse of mineral wealth could mean a promising future for Egypt's economy. This is especially interesting with the new mining bid round, which could result in an abundance of exploration and exploitation.

However, as much as mining boosts the country's economy, its environmental impact remains challenging. As one of the 198 countries that signed the Paris Agreement for combating climate change, Egypt adheres to implementing efficient energy technologies to keep a global temperature rise this century well below 2 degrees Celsius. This should push Egypt further to tap into its natural resources by utilizing green energy to create a new economic market and contribute to the global environmental initiative.

## GREEN ENERGY IMPLEMENTATION

Imagining a future where green energy is the norm could be quite difficult for some countries as natural resources are necessary to generate green energy. Rich with the ability to produce and generate solar and wind power, Egypt does not face this problem. Currently, the New and Renewable Energy Authority (NREA)'s strategy is to supply 20% of the electric energy demand from clean energy sources; 12% from wind power and 8% from others such as solar or hydropower.

Egypt might be wealthy in terms of its available mineral resources, but it also has an abundance of sunshine that could be utilized to produce electricity in the mining process. Integrating solar energy within mining is not a revelation. In fact, Australian mining companies have been relying on solar power to produce electricity as it is more efficient, reliable and environmentally friendly.

On the other hand, most mining sites are located in remote areas away from electric grids, so they rely on diesel-powered plants to produce electricity. This method could be effective for temporary uses, but it poses many challenges such as cost and transportation, in addition to being not eco-friendly.

Wind energy powered grids are another manifestation of utilizing green energy in mining. Wind energy is considered as one of the most popular methods for generating electricity in mines, as it is used to reduce Greenhouse Gas (GHG) emissions in mines. Egypt is encouraging the implementation wind energy as well. As per the International Energy Association (IEA) data and research, Egypt has produced electricity estimated at 2,570 Gigawatt hours (GWh) via wind energy in 2017.

Besides, the IEA reports that the offshore wind market has been sustainably increasing between the period of 2010 and 2018; increasing by 30% per year. Not only that, but it has the potential to deliver more than 18 times the global electricity demand today, generating more than 420,000 Terawatt hours (TWh) per year worldwide.

## FINANCIAL AND ENVIRONMENTAL BENEFITS

In line with the Paris Agreement and UN Sustainable Development Goals (SDG's) towards combating climate change, replacing fossil fuels with clean energy sources is a must. According to the NREA, by utilizing various clean electricity-generating energy sources, Egypt has avoided approximately 8.4 million tons of carbon dioxide ($CO_2$) emissions and saved over 4,600 million tons of oil equivalents (mmtoe) in 2018. There is also a financial advantage for implementing clean energy; as renewable energy costs have been declining each year making clean energy a formidable force against fuel-based energy.

According to the International Renewable Energy Agency's (IRENA) 2018 Renewable Power Generation Costs report, the cost of electricity produced by Concentrated Solar Power (CSP) has declined by 26% when compared to the previous year. Additionally, solar Photovoltaic (PV) panels and onshore wind declined by 13%, while hydropower also decreased by 16%. Not only that, but IRENA's report forecasts that by 2025, cost reductions will be immense and could potentially fall by 26-59%.

"Most of the countries' efforts are to exceed the remaining carbon budget of nearly 800 gigatons (GT) before 2050. So, replacing the traditional fossil fuels sources by clean energy sources is the primary solution to limit global warming," Karim Hassan, Solar Project Developer at Ever-Green Energy commented.

Hassan added that "[Egypt has] already has set a renewable energy target in 2014 to achieve 42% of the electricity mix by 2035. However, based on the fallen costs of renewable since 2014. This target can be increased to reach nearly 50%-60% by 2030." Egypt's wealth of natural resources could turn this vision into a reality and increase clean power sources.

## CASE STUDY

Chile is on track to becoming the leading country in clean energy implementation. As part of its initiative to go green by 2050, the country is trying to integrate clean energy in various fields, including mining. In 2019, the first-ever pilot PV plant has been built over a tailings pond and installed on Las Tórtolas pond at Los Bronces copper mine. It is expected that this project will reduce $CO_2$ emissions by 58 tons per year (t/y), reduce water evaporation in the area it covers by 80%, as well as generate electricity estimated at 150,000 kilowatts-hour per year (KWh/y).

## RAISING AWARENESS AND ECONOMIC SUSTAINABILITY

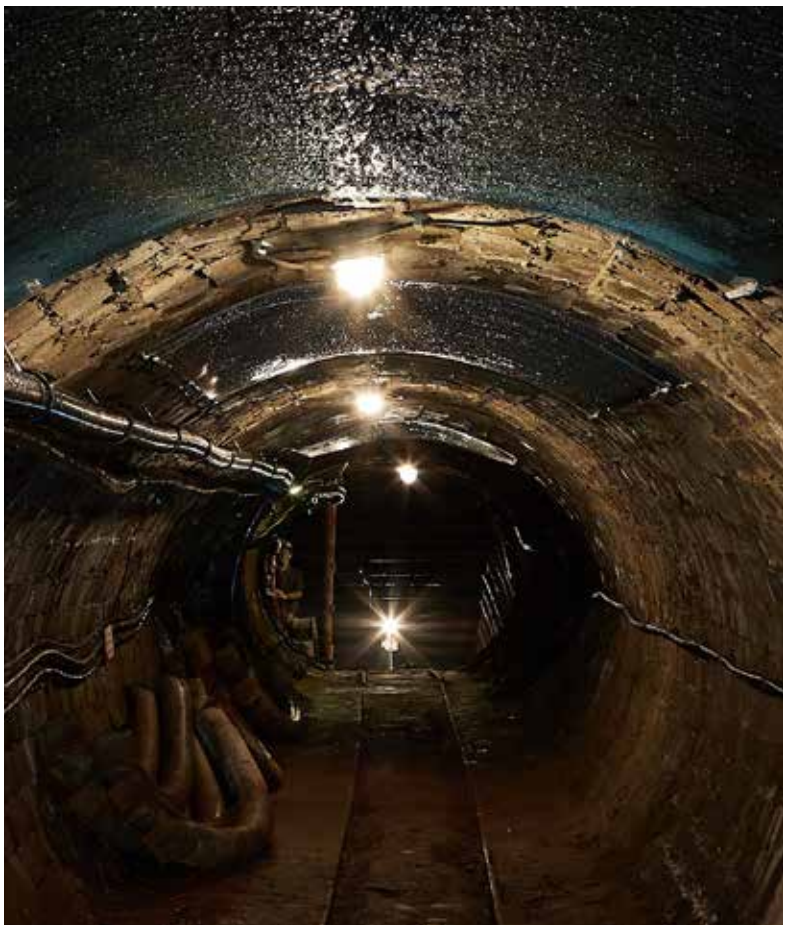
One significant aspect of implementing green energy lies in the hands of the government and its role to raise awareness. "There are not enough NGOs in Egypt that focuses on green energy sustainability, in addition to the lack of media coverage. There is also the issue of the language barrier; as most of the academia is in English and are not translated into our native language," said Sina Hbous , Sustainable Development Consultant and Advisor to Chairman at Egyptian Financial Regulatory Authority.

Hesham Ahmed, Head of the Qualitative Council of Climate Change and Sustainable Development at the Arab Council for Green Economy, explained that raising awareness could take many shapes; one of them is "[through increasing] subsidies on energy use and thus rationalizing consumption, which is what the state is currently doing." Echoing the sentiment, Hbous added that "part of our job is to increase awareness on sustainable financing; including green projects and especially green energy as it is the most active field."

Furthermore, utilizing green energy in the mining process will boost the economy significantly; by creating a new market, the country is also providing a new source of income, which means an opportunity for new jobs, explained Ahmed. Hbous, meanwhile, reiterated the thought adding that this will support research and innovation, and encourage entrepreneurs and companies to develop cheaper and local newer technologies.

# MINING TO PRODUCE RENEWABLE ENERGY TECHNOLOGIES: A CONTROVERSY

BY **RANA AL KADY**



## GENERAL OVERVIEW OF THE MINERAL RESOURCES IN EGYPT

To begin with, Egypt is one of the most mineral-wealthy countries in Africa. In fact, Egypt is not only abundant in the amount of mineral resources available, but in the variety of these resources. The primary essential mineral resources found in Egypt mainly consist of metallic and non-metallic mineral resources. Metallic mineral resources include materials such as copper, lead, nickel, cobalt, gold and silver, while non-metallic metals typically are those of limestone, sandstone and gravel dolomite.

However, there is an enormous interest in metallic mineral resources, especially with the advancement of Renewable Energy Technologies (RETs). This is mainly due to the fact that RETs are constructed from metallic mineral resources such as copper, aluminum and zinc. Despite the fact that the mining process is not exactly considered to be the most environmentally friendly activity due to the ecosystems that are disturbed and the environment that is polluted and torn, mining is essential in manufacturing RETs to help combat climate change. Without mining for such mineral resources, the existence of renewable energy technologies would – if not reduced – come to a halt. As a result, this very concept leaves various countries in a difficult dilemma: to mine or not to mine?

## MINERAL RESOURCES IN RET

Before analyzing the key concerns over mining for mineral resources to manufacture RETs, it is important to understand the kind of mineral resources required, its availability and the ease of extraction process. For instance, copper, zinc and aluminum are necessary to manufacture Solar PV Panels. The byproduct of copper, zinc and aluminum are tellurium, germanium and cadmium, respectively. The latter three mineral resources are used to manufacture most Solar PV Panels.

At the moment, according to the Egyptian Mineral Resources Authority (EMRA), it was estimated that Egypt has over 224 million metric tons (Mt) of various heavy metal mineral resources; these include: aluminum, copper, lead, thallium as well as zinc. In fact, in 2015 alone, it was noted that Egypt's Mineral Trade was inclusive of exported aluminum at a value of $403 million, exported copper at a value of $10.7 million and zinc at a value of $87.81 million. While these prices and amounts of mineral resources have been decreasing over the last few years, Egypt remains abundant in mineral resources and has continued to mine for such resources at a steady pace.

However, it is predicted that by 2050, there will be a drastic increase in the percentage of the world's mineral resource production. In order to meet the demands, mining activities will need to increase in frequency between now and 2050. In fact, it is hypothesized that there will be a growth in demand for copper mineral resources by nearly 7%, while 93.7% of the copper demand in 2050 is expected to come from different forms of RETs; 38.8% for Solar PV Panels, 35.2% for wind turbines, 10.2% for CSPs (Concentrated Solar Panels), 4.4% from Hydro technologies, 3.8% for storage technologies and batteries and, finally, 1.3% for Geothermal technologies. These figures not only show the importance of copper and other essential mineral resources for the future, but also indicate that the key to clean energy is metal mineral resources that are attained from mining and excavation processes.

A report by the GIZ confirmed that the shift to a lower carbon footprint economy will ensure more job opportunities and better job security in emerging countries in Africa, where the supply of mineral resources is plentiful and readily available for extraction. In fact, now, over 70% of the global cobalt supply lies in Africa, along with other essential mineral resources that have a high global demand.

## THE CONTROVERSY

While many can agree that the implementation of RETs is the way to a low-carbon emission future, there is a controversy over the fact that the materials or mineral resources required to manufacture RETs are extracted through a non-environmentally friendly process: mining. Mining required a wide space of empty land, meaning any or all flora and fauna are negatively impacted by drilling the ground, along with its nuisance, emissions from machines, habitat destruction, etc. After concluding that the environmental impact of mining is negative, many wonder whether mining for mineral resources is better for a cleaner environment (by manufacturing RETs) or limit mining for a cleaner environment (by limiting emissions and physical damage to the earth). The mining process seems to minimize the positive effect of RETs, if not, cancel it out.

According to Mostafa Abdelhafiz, Research Associate at Drilling Simulator Celle, "Drilling can cause some environmental impacts. As an example, changing the earth's in-situ stresses can create micro-seismic activities and that may lead to earthquakes, reactivating the faults and may also damage the underground water resources. All these impacts can be avoided with better knowledge. You cannot eliminate the risk by 100%, but you can reduce it".

Another concern revolving around the continuation in the growing demand for mineral resources is that all mineral resources are finite and would eventually be depleted. Many have considered that dependence on mineral resource extraction over the course of the coming years will not guarantee a future with profuse RETs. As a result, two plausible solutions are suggested: either limit the mining process for purposes other than clean energy or develop RETs to be composed of other materials that are more-environmentally friendly.

Despite the positive intention of limiting mining, it is a difficult task to carry out because mining brings out mineral resources essential to manufacture technologies necessary for hospital equipment, transportation vehicles, communication wires and much more. However, the suggestion to create RETs from other minerals is a viable solution. For instance, there have been several studies introducing the implementation of recyclable materials from old RETs into new ones. By recycling the blades of a wind turbine alone, this could save up to 55,000 tons of glass and carbon fiber composites. This is one of many alternates for the use of green materials in RETs, it is just a matter of developer awareness and implementation.

## CASE STUDY ON A MINERAL-RICH COUNTRY AND ITS USES

In a case study conducted on the transition to the implementation of more RETs, it was found that Chile could supply its own local copper and lithium mineral resources – and even possibly provide a global supply in the future. While copper and lithium are essential in manufacturing various RETs such as Solar PV Panels and batteries, the mineral resources would be used for other purposes and are found in large amounts in Chile. Now, Chile's copper resources account for just over 10% of the country's GDP, however, it is expected to rise by over 20% in 2030. In fact, Chile's profuse supply in copper resources has provided the country with an incentive to have a 70% share in the Renewable Energy market by 2050 due to the availability of resources.

Another example of a mineral wealthy economy is in Peru. This Latin-American country is wealthy in mineral resources such as copper, iron, lead and zinc. Peru, like Chile, has an abundance of mineral resources. Most of such mineral resources can be used for RETs in the country that has long coast lines with potential for hydro power production. This is yet another example of a mineral rich country that has potential to use its mining resources for renewable energy to counteract the negative impacts and emissions released from the mining process.

## FUTURE IMPROVEMENT AND CONCLUSION

As for the future improvement in mining, it is important to recognize the global potential for mineral resources because each country has its own resources to offer. According to Abdelhafiz, Drilling can be extremely harmful with the lake of knowledge. And it can be extremely safe if the driller and the well construction engineer are aware of the environmental impacts." It is not feasible to stop the mining process altogether for the purpose of controlling emissions. In fact, mining for mineral resources is beneficial in creating RETs to counteract such emissions over a long period of time. A plausible solution, however, could be to carry out the mining and extraction processes in a more environmentally friendly way, using efficient technologies, limiting waste, and reducing the disturbances in the ecosystem of all living things. If such precautions are taken, then the future of mining could be more beneficial and less detrimental to the environment.

# REMOTE SENSING VS GEOGRAPHICAL INFORMATION SYSTEM (GIS): WHICH IS BETTER FOR MINING INDUSTRY?

BY **FATMA AHMED**

**In light of the global intensive need for the resources and energy, new technologies are developed for the sake of maximizing the production and compensate such needs at the lowest costs. In the mining industry, there has always been a need for developing the exploration and production methods along with their respective new technologies aiming at increasing the outputs.**

The mining industry, which comprised of three main stages: exploration, mining and processing, can benefit greatly from the implementation of modern technologies.

These innovative technologies should help in delivering savings, productivity and safety improvements in the mining industry as well as allow to revive the industry. Developing new technologies fits well with the strategy of the Egyptian Ministry of Petroleum and Mineral Resources (MoP) to develop the mining sector to be able to contribute to the Gross National Production (GNP) through the exploration of more mines and enhancing productivity.

## EXPLORATION PROCESS TECHNOLOGIES

To begin with, the exploration process is considered the most important stage in mining; it is the process from which the entire industry begins. In this stage, there are many technologies that can be used.

Preliminary data collection is one of the most important steps that helps in reducing the cost of exploration and the time spent on operations as it helps in discovering the mines faster with less efforts. Data can be used and collected in different methods. For example, data about the geological history of ore would be beneficial, not only to the mining industry, but also to the land-use planners and environmental scientists.

Geochemical analysis can provide sufficient data about the soil, rock, water, vegetation and vapor which allow for the amount of metals or other elements to be tracked and could also indicate the presence of a buried ore deposit. These techniques are key elements in discovering several mineral deposits and are still used in exploration. Laser fluorescence scanning and portable X-ray fluorescence are examples of the equipment used to provide such relevant data.

Other forms of geophysical surveying methods include the use of magnetic surveys which could be conducted by flying aircrafts, like drones, at a fixed distance above the ground to obtain the optimal data. Also, remote sensing is a geophysical surveying technique which records the spectral data form the surface of Earth through airborne platform. Landsat thematic mapper, enhanced thematic mapper multispectral imager, high-resolution panchromatic imaging technology (SPOT) as well as RadarSat are examples of remote sensing technologies. Additionally, there are hyperspectral technologies that can gather additional data to map the mineralogy of the ground surface.

In Egypt, most of these technologies are applied. "For exploration, we used many types of technologies based on type of ores and scale of deposits. Photo-geology, sampling, trenching, sampling, drilling are examples for those new technologies," Ahmed Fakhr Eldin, a Mine Geologist in Mining Gate Company (MGC) said.

Tarek Sedki, an Exploration Geologist in Shalateen Mineral Resource company, said that, "In exploration, we are using new techniques in Geophysics and Developed GIS".

These technologies are continuously being developed. However, there remain two main surveying techniques that reign supreme; the use of the Geographical Information System (GIS) technology and remote sensing technologies.

## GIS

GIS is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. It can map where things are located, such as quantities and densities. GIS can also discover what is below the surface and nearby potential resources available. In addition, GIS can track changes that may occur to specific area by considering future conditions.

In the mining industry, GIS is used for collecting data and mapping in project planning, mining operations, transportation management and risk analysis. It is an optimum tool for integrating the various datasets needed in the explorations phase like geophysical images, geochemistry, geological maps, radiometric surveys, boreholes and mineral deposits.

## GIS: PROS AND CONS

As mentioned above, GIS technology has many advantages such as integrating software, hardware and data to get all the needed information, as well as helping in answering questions and solving problems. However, it has its own disadvantages. First of all, GIS might be considered to be an expensive software. It also requires a huge amount of input data in order to be practical in certain tasks. As the earth is round, when GIS images are taken on a large scale, geographic errors might occur due to curves of the earth's shape as seen from a distance. Finally, there might be a failure in anticipation which results in a lack of accurate data produced.

## REMOTE SENSING

Remote sensing technique is very important in the mining process. Research groups in the United Nations (UN) use satellites to carry out remote sensing applications on the earth. The UN defines remote sensing as the emission of electromagnetic signals at certain wavelengths of observed objects or near-earth objects (i.e. from ultraviolet ray to microwave wavelengths).

Consequently, remote sensing in the mining industry can be used to gather valuable data which can be analyzed to provide insights throughout the exploration process. This can happen through mapping and analyzing the geology, faults and fractures of one or more ore deposits as well as recognizing hydrothermally-altered rocks by tier spectral signature.

## REMOTE SENSING: PROS AND CONS

This technology is distinguished by its ability to cover large areas, which allows for repetitive coverage and the collection of different data in terms of scales and resolutions. Final data is then analyzed using a computer to benefit different applications; this means the data can be inputted into other softwares for flexible use. On the other hand, it is very expensive, especially when measuring small areas. Remote sensing also requires a special kind of training to be able analyze the images as well as it is expensive to analyze repetitive layers of images. Sometimes the emitted radiations may affect the phenomenon from being investigated. Also, it may provide inaccurate or incomplete data when used without a proper understanding of potential anomalies.

## REMOTE SENSING VS GIS

The two technologies seem to be similar, however there are some differences between them. For instance, GIS is a computer-based tool for mapping and analyzing features event on earth, but remote sensing is the art and science of making measurements of the earth using sensors which can collect data transformed into images.

Regarding their efficiency, some experts prefer using one of them, some prefer both, while others use different technologies. Sedki said that "GIS is more efficient as remote sensing covers a limited area at a time, less robust, less ideal for communicating information between departments."

While Fakhr Eldin, said that "In general, we use Remote Sensing data (satellite image) to interpret data about fracture identification, trace analysis and channel". Such data are combined with high attitude photography to detect gold zone by a method called photogeology.

Some experts see that the two technologies can be integrated to get the best results. Ahmed Hamdy, Mining Geologist at the Egyptian Mineral Resources Authority (EMRA) said that "GIS helps you to locate the geological units and samples in maps, but Remote Sensing helps you to know some information and data about ore before you visit it, So we can't prefer one over the other."

Hassan said that "They [the two softwares] are always used together", noting that this has a major economic impact by saving time and money as well as providing accurate data.

Fakhr Eldin mentioned that "we are already use them together" elaborating that most of companies use other technologies like drilling or sampling as they are more economical.

Biased to GIS, Sedki had another point of view saying that when it comes to the basic economic principle "I think GIS is enough."

## EYEING THE EGYPTIAN FUTURE

Other technologies have emerged these days, which will revolutionize the mining industry; including artificial intelligence (AI), Internet of Things (IoT), robotics, drones, as well as developed GIS.

"In the modern era, Egypt is late to keep pace with recent global developments since the 1960s in the field of mining technology, especially in gold and other mineral" Hassan noted. He added, however, that in mid-nineties, Egypt started to track the new developments after contracting with some foreign companies to explore and exploit gold, especially for Sukari gold mine.

Using modern techniques in the mining industry in Egypt can usher in a promising future. Sedki said that the "Mining industry in Egypt is now in progress and the government encourage the investor to invest in Egypt, so I think that will give GIS more importance than previously."

Additionally, Hassan expected more developments for those technologies through the upcoming years, predicting that by the year 2050 this technology will be widely used in the field of mining using robots for operating mines while reducing human elements.

"Also, Egypt now have highly qualified technical cadres in the use of these technologies, and we hope that Egypt will invest these cadres to help mining and other scientific and research fields. Egypt has managed recently to enter the field of space research and was able to launch its first remote-sensing satellite and another satellite for communications during the past year and we hope that these efforts will continue during the coming years", Hassan concluded.

# THE EVOLUTION OF EGYPT'S MINING LAW

BY **JASMINE SHAHEEN**

Introducing newlawsis a lengthy and challenging process that could face any country, and Egypt is no stranger to the world of the ever-changing laws that vied several times to keep up with international standards. One clear example of that is the change the Mining Law and its Executive Regulationshas been through over the years.

## The Old Laws

Egypt's mining law along with its executive regulations has changed multiple times since the early 1900s. The mining law of 1956stated that any company should hold a prospecting license for exploration, which should not exceed four years. However, for mining companies, this caused a big inconvenience as the exploration process may take a minimum of 10 years. The law also stipulated that the licensee should only extract the licensed ores, while in case of finding any mixed ores; the licensee will not have any rights to obtaining neither of the ores; licensed or unlicensed.

This law failed to attract foreign investments to the sector, however, the law remained in place until the introduction of the 2014 mining law. According to a research by MowafaTaib, Mineral Industry Analyst, titled The Mineral Industry of Egypt, the 2014 law seemed promising as it addressed issues related to revenue sharing between the state and the licensees. However, despite being investment-driven; the law failed to attract foreign investments as intended. This was largely a result of failing to consider the other party in the process; investors.

Until recently, the mining law remained the same until the issuance of the new mining law of 2019, and its executive regulations in 2020. The new law is said to rectify the errors of the previous laws, paving the way to foreign investments and useful exploitation of Egypt's rich mineral wealth.

## Exploration and Exploitation

One of the issues that faced the mining companies under the old laws was the longevity of converting contracts with the government into laws as it could take up to two years to do so. Under the new law, however, exploration licenses for precious metals, precious stones, and for mines less than one-kilometer square, will not be needed to convert into laws. This is considered a milestone in the mining sector, as it creates a welcoming investment-climate.

Furthermore, many changes were implemented in the exploration and exploitation licensing process as well. Under the new law, exploitation license for mines, quarries, and salt pans less than 16 kilometers square will be issued by the Competent Body for a period not exceeding 15 years. However, the exploitation of precious metals and precious stones mines exceeding the aforementioned area must be licensed by a special law.

Another big gain for the mining companies is the possibility of amending the exploitation license in case an unlicensed ore is mixed with the licensed one needed for extraction. Analysts see that easing up laws and regulationswill result in a better opportunity for developing the mining sector as the ministry has done to the petroleum sector.

## Economic Aspect

The new law states clear and direct fees for the investing companies, unlike the 2014 mining law which left the door open for speculation regarding the royalties for mines, quarries, and salt pans. Per the 2014 law, royalties were set to be not less than 5% of the annual production of ores; and it did not have a maximum cap. The new law fixed that by stipulating that royalties will be at a minimum of 5% and capping at 20% of the annual production of ores, noting that the royalty fee is assigned depending on the ore extracted.

Additionally, the old law required companies to pay additional royalty fees that go towards societal developments of the area where the project takes place. Per the new law, 1% of the royalty paid for mine exploration or exploitation, and 6% of quarries and salt pans royalty will be deducted for this purpose

The 2019 law offers a specific rental fee for every exploration period beginning with EGP 5,000 per kilometer square in the first year, and capping at EGP 20,000 per kilometer square in the fourth year. In addition to the exploration fees, the rental for exploitation fees has increased from EGP 10,000 to EGP 25,000 per kilometer square.

Moreover, the new law also clarified a set amount for the exploitation of white sand, which was not directly stated in the previous law, accounting for EGP 9 per meter square. It should be noted that these rental fees are subject to change every three years, instead of four, by a decree from the Prime Minister upon the competent minister's recommendations.

As for quarries' rental fees, the new law stipulates that licenses for exploration will not be issued for quarries under 5 kilometers square. The rental fees for quarries will depend on the ores located at each area, valued between EGP 4 and EGP 12 per meter square. The royalty amount for quarry exploitation will remain the same at 13% of the ores' annual gross production. Additionally, salt pans rental fees are set at EGP 125,000 per kilometer square.

The executive regulations also state that for areas leased outside the limits of exploration and exploitation and the licensed areas; licensee would pay a sum of EGP 15,000 per kilometer square for lands and buildings for storage purposes.

Furthermore, per the new law and its executive regulations, investors are allowed to benefit from Law 72 of 2017, known as the investment law which offers a myriad of financial and logistical incentives depending on the location of the project's area.

The new law is seen as the first step towards modernizing the mining sector in accordance with the Ministry's Mining Modernization Project and Ministry's vision 2030.It has already set the scene for current mining bid round and it is expected to boost investments and enhance Egypt's economy. The launch of the mining Modernization Project aims to adopt a fiscal system that contributes to the highest possible overall revenues. In addition to setting a high-level strategy for downstream metals processing, as well as,tackling illegal mining through Asset Strategy Management (ASM) strategy.

# THE GOLDEN YEARS: EGYPT'S GOLD MINING THROUGHOUT HISTORY

BY **JACK BECKFORD**

For millennia, ancient Pharaohs built powerful kingdoms made possible by the unparalleled riches of the Egyptian gold deposits. More recently, however, active gold mining has been recorded throughout the 20th Century when British mines were producing gold. However, despite the obvious prosperity that lies underfoot, modern Egypt has seen little in the way of active gold mining over the last 100 years, with only the Sukari mine producing gold at present. This overview intends to examine how gold mining has ebbed and flowed from the very beginning up until the modern day and the reasons for its evolution.

## EARLY DYNASTIC PERIOD (3100 BC-2686 BC)

In the beginning, the earliest discoveries of gold nuggets was in the Eastern Desert of Egypt. There existed a common pattern to the location of these gold mines with the similar geological environments present at all the sites. These geological sites usually consisted of high levels of quartz-veins or, alternatively, granodiorite and neoproterozoic granites. In terms of extraction, this period included the very notable two-handed stone hammers; their length reached up to 40 cm and weighed up to 8 kg, meaning that they could only be properly manipulated with both hands.

## NEW KINGDOM (EIGHTEENTH TO TWENTIETH DYNASTY)

The mining extraction was shaped in the New Kingdom by the historical context; the conquest of Nubia during the eighteenth dynasty, gold mining subsequently expanded on an unprecedented scale into the southern territories. Due to the gold-hungry conquest of Nubia, one witnessed the depletion of the Middle Kingdom mines which then fostered a need for further exploration. Thus, this led to targeted exploration with the purpose of testing selected quartz samples. Copper samples were no longer the sole litmus test for prospective mining. One also witnessed a change in mining paraphernalia. This can be explained by chisel marks found in the New Kingdom, pointing to the use of metal chisels. Outside the mine, the quartz chunks were crushed to smaller, more manageable fragments on flat stones. The gravel was then further crushed in special mills to such a size that the gold was extractable. This period represented a watershed moment in Egyptian mineral exploration with the introduction of Nubia into the Egyptian Empire at the beginning of the New Kingdom and subsequently the introduction of new mining fields.

## PTOLEMAIC PERIOD (~300–30 BC)

The gold mining industry in the Ptolemaic Period is also assumed to have had a relatively high output, allowing the ptolemies to exert political and military might. By this time though, mining had retracted mainly to the southern regions of the Central Eastern Desert. There were considerable structural advancements that occurred in this period with the introduction of abutments, which gave extra support to the mine and permitted much deeper drilling into the mountain. This had the consequence of enhancing security significantly within the mines and thus permitted expeditions to embark on deeper mining projects. This said, the depth to which workers could dig was hindered by the quality of ventilation. Archeologists believe that there was also a slight change to extraction techniques, with mallets and chisels being used in tandem. The evidence for this is the more elongated chisel marks than those found during the New Kingdom.

## ROMAN-BYZANTINE AND EARLY ARAB PERIODS

During the Roman Period gold mining in Egypt descended into a phase of decline. In the Nubian Eastern Desert it partly even came to a standstill. In the Early Arab Period, gold exploration moved south to areas such as Wadi Allaqi and the Nubian Desert. It was in this period that processing technology underwent a final, but fundamental improvement by means of the rotary quern; a two piece round mill consisting of a flat, stationary stone accompanied by a rotary disc with a handle, which ground the quartz. Such was its success that this technique remained widely used for the coming centuries until the Early Arabic Period in both Egypt and Nubia. This development ultimately improved the effectiveness of the rotary motion resulting in a finer quartz powder fraction to higher proportions of released gold.

## MODERN DAY MINING

If one looks at modern mining in Egypt, alteration zones are considered the most promising areas for mineral exploration in the Central Eastern Desert (CED). Ancient gold miners in Egypt targeted the smoky quartz veins that contain large amounts of gold; however, they left the alteration areas untouched.

A much larger emphasis is placed on mapping, as much of the readily available reserves have already been extracted. Remote-sensing techniques have been employed such as image rationing, principal component analysis, and image classifications to enhance one's ability of locating gold.

The evolution of gold mining has been shaped by the historical context of the time, whether it be the improvements in technology allowing development of more advanced extraction techniques or the drive for gold during time of expansion such as during the conquest of Nubia. With this said, there needs to be a more holistic approach to future mining in gold-centric Egypt. Expeditions that have started in the Sinai have indicated the presence of zinc, tin, lead, and copper deposits and no doubt there is a whole plethora of unexplored materials throughout the region.

# HALLIBURTON'S WOMEN SHARING EXCELLENCE

BY **MAI EL GHANDOUR**

**Halliburton held a Women Sharing Excellence (WSE) event under the high patronage of H.E. Tarek El Molla, Minister of Petroleum and Mineral Resources, celebrating Women's International Day on March 8 at the JW Mariott Hotel in Cairo, as Halliburton continues to build on its strong, diversified and inclusive culture.**

"This is not just about celebrating what has happened in the past; we want to talk about how this changes the future," Halliburton Vice President of Egypt and Libya Colby Fuser said in his opening remarks. Fuser further took the opportunity to shed light on Halliburton's programs that give employees a voice. One of the programs that stood out was WSE.

Colby then presented the WSE board. The board chairperson Rim Henri, a wireline and perforations Field Professional, welcomed and thanked everyone for attending. Attendees included Omnia Nabil, Human Resources manager for Egypt & Libya and WSE advisor; Gihan Bahr, HRD manager and also WSE advisor; Lojaine Bayoumy, Cementing Engineer and WSE Communication and Marketing Head; Fatma Taraman, HR business partner and CSR head for WSE; and Ahmed Ezz, Business Development manager and Leadership head for WSE.

The CEO Assistant for HSE at EGPC, Gamal Fathy, expressed his gratitude for being invited to the event saying, "I want to respect the spirit of women in driving a better HSE culture in our society." He further acknowledged the need for the petroleum sector to change and upgrade the health, safety, and environment (HSE) culture in society, stressing that women have an integral role in developing the HSE culture. Fathy concluded his speech by emphasizing the importance of the nine lifesaving rules which are essential in the HSE culture.

Injy Farid, Owner and VP, Egypt and Libya at Hotshot, shared her career path with the audience; starting from being the only female in a male-dominated workplace to leading her own business. She spoke of the challenges she faced along the way, as well as how she overcame them, advising the attendees to be confident, trust themselves, respect their time, and listen carefully. She also asked men to "never ever underestimate us, [but] be helpful and fair and listen to us. We are calling for gender parity."

Fuser moderated an executive panel of five leading women depicting how good bosses are indispensable for the empowerment of women. The panelists were Sarah El Kholy; Commercial Advisor at Winetshall Dea; Nihad Shelbaya, Public and Government Affairs Manager at ExxonMobil; Nehal Khalil, Media Division General Manager at Petrojet; Heba Salah Eldin, Assistant General Manager at ENPPI; and Hala Khalifa Supply Chain Senior Director North West Europe at Pepsico.

Speaking of the importance of gender diversity in the workplace, El Kholy said that the same issues arise throughout the world, however with the right mentoring programs she came to feel that she is on an equal footing with her male coworkers. Shelbaya, on the other hand, stressed the importance of remarkable men who advocate for women. "Diversity of thought makes us more resilient once we acknowledge that difference is power. We see the same challenges across the world, sadly some inhibitions come from the women themselves," she added. On that note, Khalifa argued that globally, there is a strong agenda towards empowering women. However, it is a journey and it takes time.

The five ladies wrapped up the panel with their advice on how leaders can bridge gaps. Khalifa suggested that women should always stick together, regardless of their positions. This sentiment was echoed by Salah Eldin, who said that in order to build a strong team, leaders should leave the chance to their subordinates. Nihal, on the other hand, stated that companies must change mindsets to bridge the gap. Likewise, Nihad and Sarah emphasized that leadership involves two-way communication: both giving and receiving support.

As an honorable guest speaker, Mona Makram Ebeid, Egyptian Senator and Former Member of Parliament, then delivered a powerful speech, sharing her accomplishments and stating how she feels absolutely delighted and privileged to be given the opportunity to share some thoughts on the importance of empowering women.

"Women remain dramatically underrepresented in high-level jobs. That is why I felt particularly elated that Halliburton has strong gender policies and supports gender equality in a male-dominated sector, which is the petroleum industry," Ebeid said. Ebeid ended her speech with a message for ambitious young professional women, which is persistence. "Do not take no for an answer. Continue to fight, with a smile," she concluded.

Eng. Abed Ezz El Regal, CEO of the Egyptian General Petroleum Company (EGPC), ended the day by thanking all the women whose work speaks on their behalf. He recognized the efforts of the qualified candidates whom he ensured will take up leadership positions in the future and gave out certificates of appreciation to the day's speakers.

Fuser concluded by thanking the attendees from the 25 companies and institutions who attended the event. He shared that WSE Egypt is the first chapter of its kind in the Middle East, which is a significant step towards diversity and inclusion in the region. "Its members are working hard to make a difference, with leadership, networking, as well as corporate sustainability events aimed at increasing women's representation and development in the oil and gas sector in Egypt," he said. Fuser also noted, "Our work to promote gender equality demonstrates our alignment with the ministry's focus on female representation in the sector and commitment to developing future leaders from all areas. A diverse workforce strengthens our core values of creativity and collaboration and helps set us on the right path for the next century."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# DATA INTEGRATION:
## AN INNOVATIVE WAY TO MAP MINERAL RESOURCES IN ARID REGIONS

BY **JACK BECKFORD**

Mineral exploration is the process undertaken by companies, partnerships or corporations to find commercially viable concentrations of minerals through mining. Satellites or reconnaissance aircraft play a significant role in aiding our understanding of mineral mapping due to their capability of detecting hydrothermal alteration minerals and of the sensing surface and subsurface fault zones. Mineral exploration and extraction are an integral part of many countries' economic make up and thus optimizing research methods in order to yield optimum returns is of paramount importance. The Egyptian government intends to invest in Golden Triangle (GT), which covers 6,000 square km between the cities of Qena, Safaga and Quseir. Within this investment, the government intends to establish industrial, tourism, agricultural and urban zones by way of optimizing natural resources in the area.

Thus, new and innovative models have been invented in order to modernize mineral mapping. One of these approaches is data integration, as discussed in the paper "An Integrated Approach for Mapping Mineral Resources in the Eastern Desert of Egypt" by Mohamed Abdelkareem, Gamal Kamal El-Din and Ibrahim Osman. The paper was published by the International Journal of Applied Earth Observation and Geoinformation in 2018.

The paper aims to display the key role of an integrated approach for exploring mineral resources in arid regions by analyzing different Geographic Information System (GIS) software packages.

## OVERVIEW OF REMOTE SENSING DATA

In recent decades, we have witnessed a huge improvement in image processing techniques that allow us to visualize and interpret data remotely. This helps to ascertain probable resources prior to embarking on costly ground investigations. Satellites are used as a means to present spectral and geometric information by way of characterizing the hydrothermal alteration minerals which, in turn, provides the exact location of hydrothermal deposits. A form of this technology is Advanced Spaceborne Thermal Emission and Reflection (ASTER). This imaging system allows characterization of specific mineral alterations that confirms hydrothermal activities and thus aids the accurate plotting of mineral resources.

Detecting areas of high mineral resources is a challenge in regions which are difficult to access, and the use of geologic maps does not suffice. The pre-existing problem with geologic maps is that they produce generic information about the area and often contain anomalous data, therefore making it difficult for stakeholders to identify areas of potential mineralization. That is why integration of mapping techniques is paramount to increase yield and profitability.

## DATA INTEGRATION

Data integration is the process of combining data from different sources into a single, unified view. In this case study, it is the unification of ASTER and aeromagnetic data in order to produce a mineral prospect map. Remote sensing data represented by ASTER data will be used to delineate significant areas of alteration zones and marked lithologic contacts. The aeromagnetic data will be used to extract subsurface fault/ fracture zones that represent conductors for hydrothermal solutions. In addition, the study will use geologic, geochemical and field data to compliment the results.

## STUDY AREA

Abu Marwat, the area chosen as the fieldwork location, is situated in the northern section of the Central Eastern Desert (CED) of Egypt, about 400 km south-southeast of Cairo, 70 km from Safaga, and 135 km from Qena.

The study maintains that Egypt needs to modernize and implement integrated data before field investigations. Thus, the main target of the research is to detect the potential areas rich in mineral resources by way of using integrated approaches that have been quantitatively assessed by applying GIS techniques and further validated by field/lab data.

## PROCEDURE'S ELABORATION

For the process of mineral exploration, a series of evidential maps were obtained to ascertain the potential areas of mineralization. The input data, or in this case evidential maps, contained indirect information on the mineral resources that were to be sourced. This controlled the occurrence of mineral resources. In the study's model, the mineral deposit relates to the set of geological processes which occur during the rock formation and varies depending on different geological factors such as energy and fluid flows. Based on this concept, fluid movements are more prevalent at areas of intense density within fracture/fault zones as opposed to those of low density. Considerable sizes of fluid run are present at deep-seated geologic structures which then link deep reservoirs in the intermediate crust to the sink zones located at the upper crust.

Therefore, in order to achieve an efficient mineral predictive map several data sets were integrated into two GIS layers including (1) fracture/fault zones; and (2) hydrothermal alteration zones (HAZ). Each one represents an evidence map (predictor) that converts to a GIS based database. Predictive mapping requires the implementation of highly precise and detailed data/ images in digital formats with various spatial resolutions. Knowledge-driven multi-criteria (multiclass overlay) that deals with selecting evidence from advanced transformation characterize a mineral system model.

## CASE STUDY RESULTS

The integration of ASTER, geologic and aeromagnetic data enabled the characterization of the optimum areas of mineral resources in the central eastern desert of Egypt. The use of integrated data clearly delineated areas of hydrothermal alteration. Furthermore, ASTER data clearly delineated the Subsurface geologic lineaments that were extracted using aeromagnetic data. Overall, results revealed that integration of remote sensing and aeromagnetic anomalies along with field, geologic and geochemical data allowed the mapping of the optimum area of mineral resources. Thus, data integration is crucial in accurately revealing potential areas of mineral resources in arid regions.

# THE ECONOMICS OF COVID-19 OUTBREAK

In late December 2019, a new outbreak known as novel coronavirus or COVID-19, which was derived from a virus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), appeared in Wuhan, China. The economic impact of COVID-19 is yet to be unfolded.

The outbreak that typically causes human flu-like symptoms, took its toll on travel movement, world stocks and oil prices with estimates that, in case of turning into a pandemic, could cause an average annual economic loss of 0.7% of the global gross domestic product (GDP) — or $570 billion in 2020, according to the World Economic Forum's (WEF), on March 4.

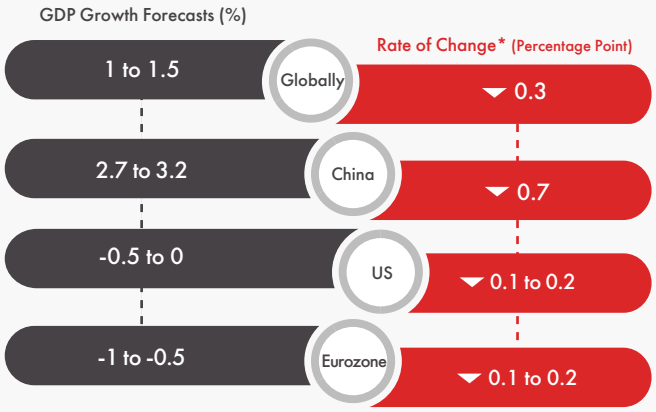
According to a situation report published by the World Health Organization (WHO) on March 23, the disease has spread virtually to more than 180 countries, territories, and areas, where 332,930 cases around the world were infected with the disease.

The WHO assessed the global risk situation as "very high", and described the virus as a pandemic for the first time since its spread across more than 110 countries, the WHO declared in a press conference on March 11. Global panic has been increasing since then due to the rise of COVID-19 outside mainland China.

Accordingly, this report sheds the light on the most important effects of COVID-19 on the international and national economic indicators.

## IMPACT ON INTERNATIONAL ECONOMY

### THE IMPACT ON THE BASELINE GDP GROWTH RATE IN 2020



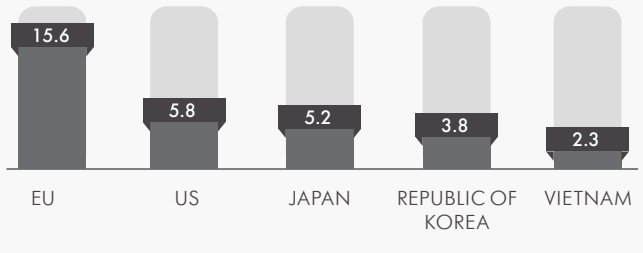

*The rate of change between the forecasted GDP growth rates

### THE IMPACT ON INTERNATIONAL TRADE


* On March 4, 2020

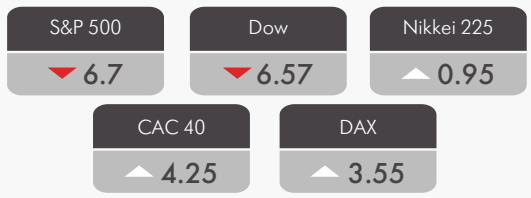
### TRADE IMPACT ($ BILLION)

(4TH OF MARCH)

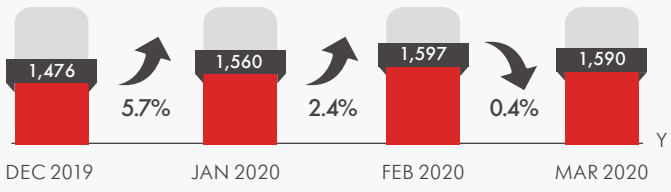



### CHANGES IN INTERNTIONAL STOCK MARKET (%)

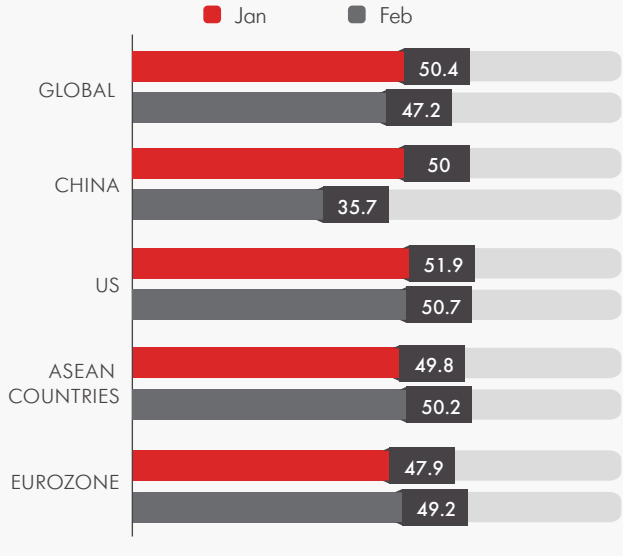
(FROM 18TH-23RD MARCH)




### GOLD REFERENCE PRICE ($/TROY OUNCE)




### EFFECTS ON MANUFACTURING PMI (POINT)

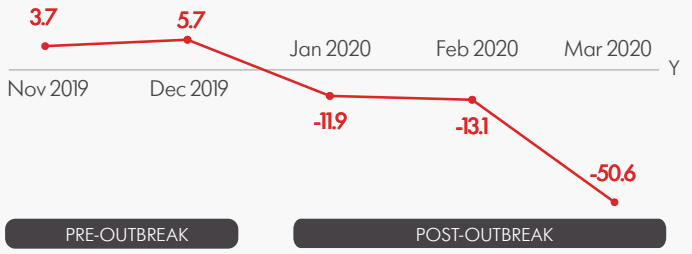



**The figures were last updated on March 29, 2020 and they may differ due to the dynamics of the outbreak.

Sources : S&P Ratings, UNCTAD, The Telegraph, GoldHub, IHS Markit & National Bureau of Statistics of China

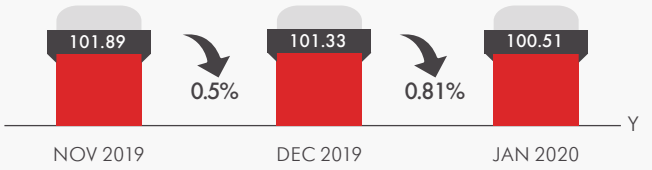
# IMPACT ON INTERNATIONAL OIL & GAS MARKET

## CHANGE IN BRENT PRICES* (%) (MoM)

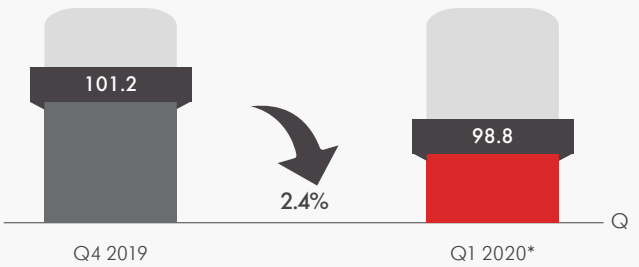



*Calculated using prices at the end of the month

## GLOBAL OIL SUPPLY (MMBBL/D) (MoM)

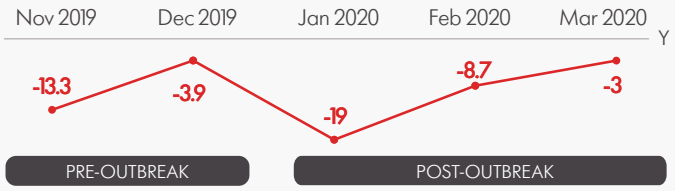



## GLOBAL OIL DEMAND (MMBBL/D) (QoQ)




*IEA Forecasts

## CHANGE IN NATURAL GAS PRICES* (%) (MoM)

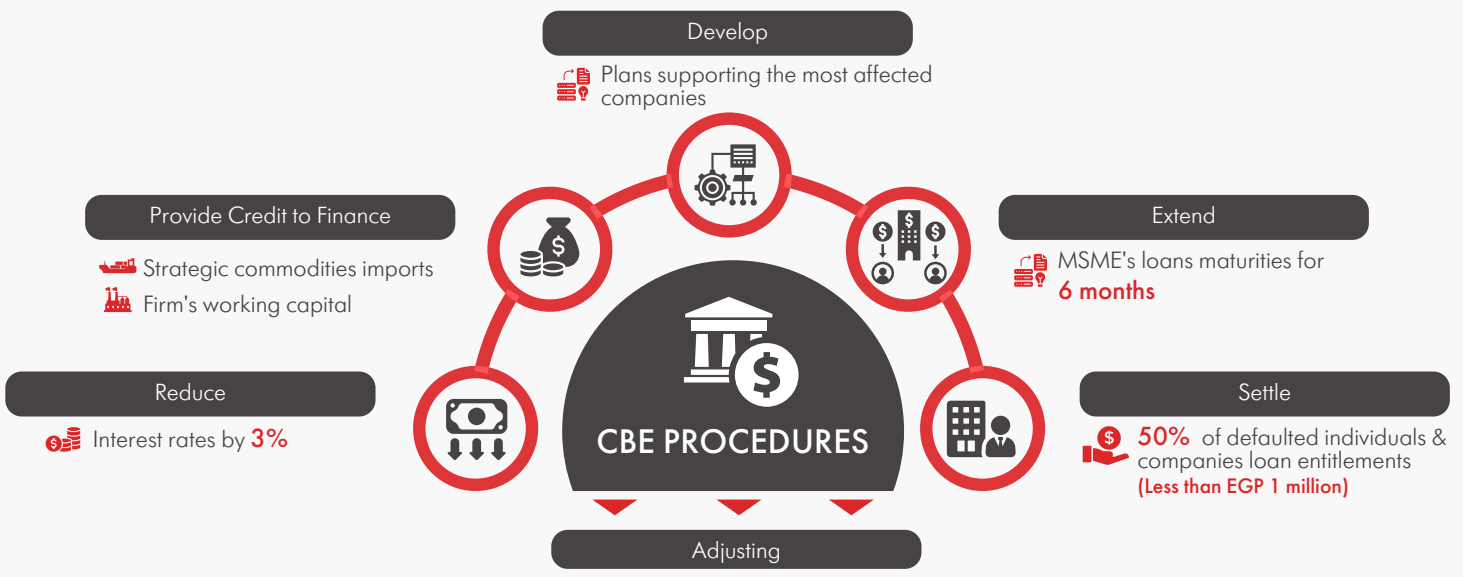



*Calculated using prices at the end of the month

**21 IOCs announced cut spending in March.**

# ECONOMIC PROCEDURES TAKEN BY THE EGYPTIAN GOVERNMENT TO COMBAT COVID-19

**EGP100 billion** was allocated to finance a plan to face the COVID-19 outbreak.




Sources: Bloomberg, IEA, Reuters, CBE &The Egyptian Cabinet

## CABINET PROCEDURES

**Trade**

- **Allocating** EGP 1 billion for exporters in March-April to pay back debts

**Labor Force**

- **Allocating** EGP 500 payment for 120,000 seasonal workers
- Monthly Payment for **Female Leaders** (EGP)

| Pre-Outbreak | Post-Outbreak |
|---|---|
| 300 | 900 |

**Industrial**

- **Lowering Prices**
  - Natural Gas to **$4.50 per mmBtu**
  - Electricity by **EGP 0.1**
- **Postponing** Property tax on factories & tourist facilities for 3 months

**Stock Market**

- **Allocating** EGP 20 billion to support EGX
- **Lowering** Transaction costs
- **Cutting** Tax on dividends for companies listed to 5%

Stamp duty (EGP/EGP 1,000)

| | Foreign | Local |
|---|---|---|
| Pre-Outbreak | 1.5 | 1.25 |
| Post-Outbreak | 1.5 | 0.5 |

- **Canceling** the suspension mechanism for stocks whose prices soar +5% cap

## GOVERNMENT FINANCING INITIATIVES

### Real Estate for Middle-Income Citizens

| Amount | Repayment Period | Rate of Return |
|---|---|---|
| EGP 50 billion | 20 years | 10% |

### Tourism

| Amount | Lending Cost |
|---|---|
| EGP 50 billion | 8% |

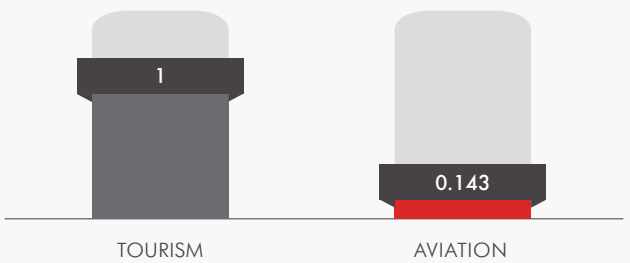
### Private Industrial Sector

| Target | Amount | Rate of Return |
|---|---|---|
| Private Manufactures with EGP 50 million - 1 billion annaul Revenue | EGP 100 billion | 10% |

## IMPACT ON THE EGYPTIAN ECONOMY

The estimated cost of COVID-19 is **$6.4 billion (EGP 100 billion)**

### ESTIMATED MONTHLY LOSS IN TOURISM & AVIATION SECTORS IN 2020 ($ BILLION)




### EFFECTS ON THE SUEZ CANAL REVENUES

**PRE-OUTBREAK**
REVENUES IN 2019:
$5.7 BILLION

**POST-OUTBREAK***
GLOBAL TRADE ↓
REVENUES ↓

*Expected

### EFFECTS ON RETAIL SECTOR

- MERCHANDIZE STOCKS ↓
- PRICES 5-7% ↑

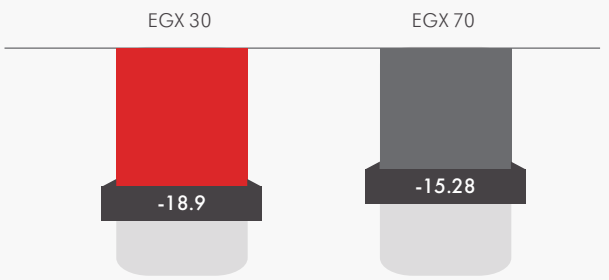
### EFFECTS ON REMITTANCES FROM EGYPTIANS ABROAD

| PRE-OUTBREAK | POST-OUTBREAK* |
|---|---|
| REMITTANCES IN Q1 2019/20 $6.7 BILLION | REMITTANCES ↓ |

*Expected

Sources: The Egyptian Cabinet, Cairo Center for Economic & Strategic Studies, Ministry of Tourism, Reuters & CBE

## CHANGES IN CAPITAL MARKET INDICATORS FROM 1-26 MARCH (%)




The Capital Market lost **EGP 127 billion** from 1-26 March.

# IMPACT ON THE EGYPTIAN OIL & GAS MARKET

## POSITIVE IMPACTS

### PRICING INDEXATION MECHANISM

| Upcoming Meeting | Factors Affecting the Mechanism | Expectation |
|---|---|---|
| April 2020 | Brent Oil Price ▼<br>Exchange Rates ▲ | Fuel Prices ▼ 10% |

### PETROLEUM IMPORTS

| | |
|---|---|
| Q1 2019/20 | Reached **$3 billion** |
| Q3 2019/20* | Oil Imports Cost ▼<br>Budget Deficit ▼<br>Stable Oil Trade Balance |

*Expected

### EGYPT'S OIL PRICE HEDGING WITH CITIGROUP INC. AND JP MORGAN CHASE & CO.

**Oil Price Hedging**
FY 2018/19: $70 per bbl
FY 2019/20: $68 per bbl

| Pre-Outbreak | Post-Outbreak |
|---|---|
| | Egypt might cease hedging as oil prices go down |

## NEGATIVE IMPACTS

### IOCS CUTTING SPENDING

| PETROLEUM SECTOR NET FDI ▼ | PETROLEUM SECTOR'S SHORT-TERM GROWTH ▼ |
|---|---|

### PETROLEUM EXPORTS

| Q1 2019/20 | Q3 2019/20* |
|---|---|
| Reached $2.4 billion | Quantity Exported ▼<br>Exports Revenues ▼ |

*Expected

Sources: Shuaa Securities, HC Securities & Investment Bank, CBE & Bloomberg

# CORONAVIRUS HAUNTS GLOBAL ECONOMY, DAMPENS OIL & GAS PROSPECTS: PART II

BY **IHAB SHAARAWY**

**In nearly three months, the novel coronavirus or COVID-19 was able to confine a third of humanity to their homes. By the end of March, the disease spread to nearly 200 countries and territories with the global infection toll surpassing 500,000 and more than 25,000 deaths.**

The unprecedented public health challenge, which originated in China has turned into a global threat and was labelled a pandemic by the World Health Organization (WHO).

The pandemic wreaked havoc on world economy, as the only way to contain the virus comes at the price of slowing economic activity, no matter whether social distancing and reduced mobility are voluntary or enforced.

The virus that shocked markets worldwide, with stock prices and bond yields plunging, prompted unprecedent governmental measures worldwide including historic stimulus packages and rate cuts.

Fall in oil prices propelled a political tension between big oil producers and caused a blow for oil companies that scrambled to cut spending and investment.

The disruption of food supply chains and empty supermarket shelves have become a symbol of the crisis around the world.

Although there is no agreement about a final date for the crises to end, there is a strong belief that the world will never be the same again.

## HEADING TO RECESSION

With severe impact on human health, the virus also hit an already weakened global economy, affecting it both from the supply and demand side, hurting global trade and fueling stock markets turmoil.

The dire situation of the world economy drove the International Monetary Fund (IMF) to declare that the global economy is "clearly in a recession". The IMF chief Kristalina Georgieva elaborated that the global economy has experienced a "sudden stop" and that the 2020 recession and its implications are likely to be worse than the consequences of the global financial crisis of 2008.

Georgieva referred that emerging countries needed a minimum of $2.5 trillion in financial resources to endure the pandemic. She added that internal reserves and borrowing in local markets will not be enough, so substantial funding from the IMF, other institutions and bilateral creditors will be required.

The World Trade Organization (WTO) chief, Roberto Azevedo, agreed with IMF chief that projections show the economic downturn and job losses caused by the coronavirus pandemic would be worse than the 2008 recession.

However, the WTO chief stressed that countries could take important steps to limit immediate economic damage and lay the foundations for a long-term recovery, urging them to work together. "Coordinating efforts will increase our collective recession-fighting power," he said in a video message filmed from his home and posted on the website of the body.

Many countries have already taken extraordinary monetary and fiscal policy measures to mitigate the effect of the economic shock.

G20 countries also announced the injection of over $5 trillion into the global economy to cushion the impact of the novel coronavirus. "The steps to support our economies also include protecting workers, businesses, especially micro-, small and medium-sized enterprises, and the sectors mostly affected," according to a statement by the G20 leaders' virtual summit in Riyadh.

The European Central Bank (ECB) announced an economic stimulus program worth EUR 750 billion. The ECB said in a statement that the governing council had decided to launch a temporary asset purchase program to navigate the economic downturn across the eurozone.

US President Donald Trump signed off on a $2.2 trillion coronavirus relief bill, the biggest economic rescue package in US history.

Global markets were able to recover some ground after the US Senate passed the $2 trillion coronavirus aid bill, but some analysts have warned that markets could be volatile until the pandemic is contained.

Some analysts are forecasting a recovery as early as Q3 2020. However, a variety of factors, such as government stimulus, consumer confidence, and the number of COVID-19 cases, will play into this timeline.

However, economists see a glimmer of hope coming from China. The Asian giant, once the epicenter of the COVID-19 pandemic, now shows sharp improvement with steel demand and coal consumption recovering back towards normal levels.

Rising domestic air travel, traffic congestion and pollution also suggest China's coronavirus-hit economy is coming to life again as factories, ¬offices and shops reopen after the number of new COVID-19 infections has fallen sharply.

## ABNORMAL OR NEW NORMAL?

Since the emergence of the coronavirus pandemic, the oil and gas sector has been one of the worst affected sectors. In March 18, oil plumbed an 18-year low as international benchmark Brent crude shed 14.1% or $4.07, to trade at $24.67, according to a CNBC report. The drop in prices, a result of demand-shock and the price war between Saudi Arabia and Russia, has seen Saudi Aramco flooding an already oversupplied world with oil that no one needs.

Analysts at IHS Markit, a research firm, recently forecast that demand for oil could fall by as much as 14 million barrels a day in the second quarter.

The price war between Saudi Arabia and Russia has exacerbated the situation. The Saudis are cutting prices and threatening to increase oil output by about 25% to 12 million barrels a day.

The fast-rising tide of cheap crude oil is filling up storage tanks around the world and putting a strain on the global refining system.

Oil exporting countries and the Gulf Cooperation Council (GCC) countries especially are expected to face a drastic slowdown in economic growth due to the plunge in oil prices and global oil demand, according to the Institute of International Finance.

Giant international oil companies (IOCs), meanwhile, announced plans to sharply cut spending and freeze their share buyback plans. The moves, analysts say, signal how the cratering demand from coronavirus and the collapse in prices are upsetting the outlooks for companies large and small.

Meanwhile, the first oil refinery shutdowns in India and Europe were announced in response to plunging demand.

According to a Bloomberg report, the coronavirus pandemic is even delaying vital maintenance across the oil and natural gas industries in Europe and North America as companies are now having to set priorities because of the coronavirus.

Despite the current drop in greenhouse gas (GHG) emissions due to low demand, the low cost of oil has raised fears about the future of clean energy deployment and climate action.

For the oil sector, the coronavirus has left an already volatile industry wondering where the bottom is, whether normality will ever return and what comes next?

Hopes for a quick recovery in the oil and gas sector lies on hopes that big producers could agree on the necessary production cuts, which may be achievable after reports on Russia's readiness to negotiate the matter with Saudi Arabia once again.

But until reaching an end to the virus crisis or prices war, oil companies have to find ways to cope with what seems to be the new normal.

However, cutting spending and investments may not be the only solutions, as resorting to new technologies to cut production costs may be an effective tool, too.

## CHANGING THE WORLD FOREVER

Experts around the world are still uncertain about how and when they can win their war against COVID-19. But one certain thing is that the world can never be the same again.

In a Foreign Policy column, Stephen M. Walt, sees that COVID-19 will create a world that is less open, less prosperous, and less free.

The coronavirus pandemic could be the straw that breaks the camel's back of economic globalization, says Robin Niblett in the same newspaper.

Some other analysts think that the role of government and the economy models are going to change forever after the pandemic. Some predict we will see a society that shows more solidarity and a new economic model that works for all, and perhaps better chances for international cooperation.

Some refer to the virus as a bliss in disguise that will lead to cleaner environment stronger healthcare systems and more digitalized services.

More people will be ordering online, working from home and learning remotely.

More people will be concerned about adopting healthier eating habits in order to strengthen their immune system, while more countries will think of ways to deploy artificial intelligence to guard humanity against similar future crises.

# TO ENLIGHTEN THE PATH FOR NEW GENERATIONS

**Educational initiatives always help new generations of young aspiring calibers go beyond their limits. The petroleum industry particularly needs practice with data more than theories. In addition, these initiatives push students and young professionals to thrive in downturns. There is always hope to enlighten the way for talented and determined minds, enabling them to take the lead in the near future. The Society of Petroleum Engineer's (SPE) stewardship of delivering the opportunity and best quality of learning experience is just like a trigger which makes volunteers motivated and eager to give more.**

The interesting thing about such programs is to find more energetic volunteers joining the board each year with new ideas and diverse specializations. It is unique to find teams from different companies and with a varying managerial scale working together until the closing of each program. On the other hand, selecting the right potential candidates is the other side in the success equation. People are the core factor of sucess for any volunteering program, and the candidates of yesterday are the organizers today.

Educational week (EW) is one of the core activities of SPE's Young Professionals team in Egypt. It is tailored to qualify the participants with the practical work sense and give them a clear insight into the oil and gas industry with streams for geologists, geophysicist, reservoir engineers, drilling engineers, production engineers, and processing engineers. The program is mainly for senior students and young professionals to work on their competencies. EW in 2020 has witnessed 468 applications, where 228 applicants passed the technical exam and 140 candidates were qualified to attend the program and the final project. The closing competition was at The Egyptian Natural Gas Holding Company (EGAS) premises in the Arab in Act event with noticeable attendance from industry leaders and SPE Egypt's board.

On the soft skills perspective, the Leadership Development Program (LDP) has attracted an increasing interest from different levels starting from students and fresh graduates to middle managers and young professionals. This year's LDP consists of different batches. It started from a program targeting students and fresh grads and then to a middle management program for developing the young professionals aged from 30 to 40. The amazing thing about this year's LDP is the spirit of the team and their eagerness to give more. The idea of having a supportive team with passionate leaders is worth all the efforts.

SPE Egypt Young Professionals

# EGYPT SHOULD MOVE TOWARDS EXPLOITING SHALE GAS POTENTIAL

**Once the availability and cost of conventional gas become a major problem, Egypt should begin planning for the gradual replacement of this gas through the exploitation of other sources in order to secure energy supplies. The exploitation of shale gas is among the objectives that must be developed. Egypt has large reserves of shale gas, and exploiting this unconventional vital source, as an alternative to conventional gas, is one of the most important concerns of the country.**

## Egypt's Potential of Shale Gas

Egypt has large attractive rock formations of about 100 trillion cubic feet(tcf), as estimated by the US Energy Information Administration (EIA). The most attractive formations are located in the northwest of the country, but they are far from water resources .Yet, many international oil companies (IOCs) have expressed interest in undertaking explorations in those areas.

In view of some decline in the production of conventional gas before the recent entry of Zohr gas field, as well as the production of conventional oil reserves at the stage of plateau, the Egyptian petroleum sector has to attract foreign investors and IOCs. Egypt's vision of producing the shale gas started to be clearer after the new explorations, which proves the attractiveness of the shale potential.

In this regard, the necessary precautions and preventive measures must be taken during the exploitation of this energy source to preserve the environment and groundwater. Some fear the impact of shale gas on the environment, agriculture, groundwater and human resources. Extraction of shale gas is believed to affect the groundwater, agricultural land and oases that permeate the area.

According to regional technical studies by some international organizations, the available data indicates significant national capabilities of shale gas, and show promising prospects in terms of recoverable quantities. Confirming the commercial quantities of these resources requires a program that includes drilling a number of wells and an exploration plan for between five to 15 years. A report by the US Department of Energy on the reserves of unconventional hydrocarbons confirmed that Egypt's reserves exceed 100 tcf of recoverable shale gas, where Egypt ranks 17th in the world.

According to the report, these reserves are located in the northwest basins of the Western Desert.

## Benefiting from IOCs

The techniques and technologies for the exploitation of shale gas can be available anywhere in the world, being used by major companies around the world. Horizontal drilling technology may be the easiest one to transfer, but the high cost of equipment and materials used in cracking limit the possibility of making them available in some places in the world. Thus, the largest operating companies in Egypt can be utilized by adopting policies to attract foreign investors, providing the necessary climate.

Hassan Salem

Reservoir Engineering Studies General Manager at Egyptian General Petroleum Corporation (EGPC)

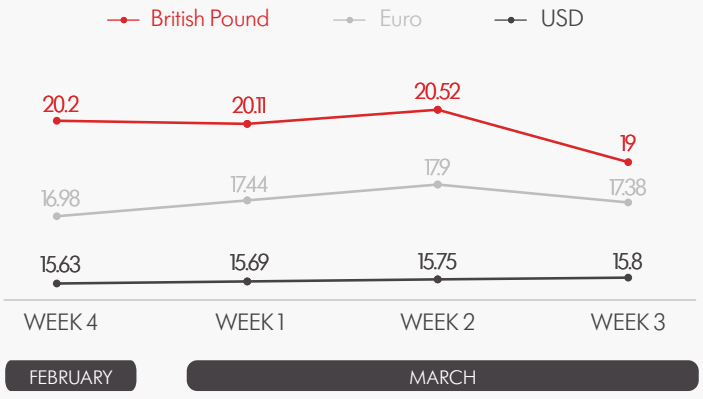
EGYPT OIL&GAS
RESEARCH & ANALYSIS

**Annual Inflation Headline CPI (%)**
JAN 2020 7.2 ↓ FEB 2020 5.3

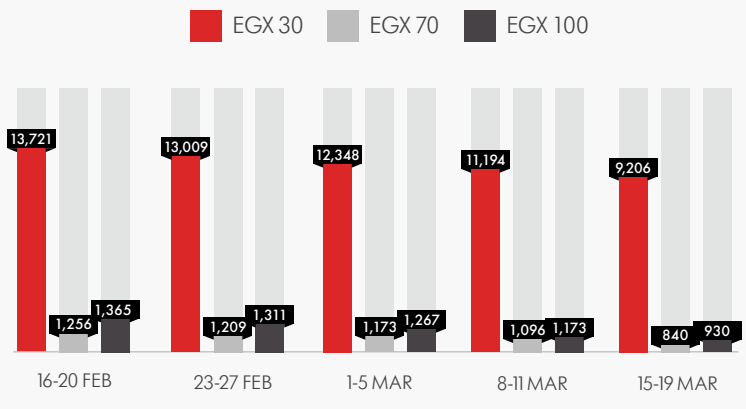
**Net International Reserves ($ billion)**
JAN 2020 45.46 ↑ FEB 2020 45.51

**Non-Oil Private Sector PMI (Points)**
JAN 2020 46 ↑ FEB 2020 47.1

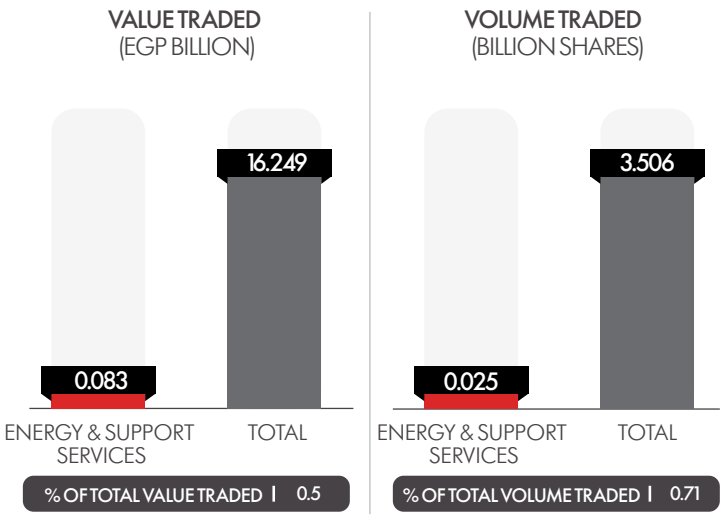
## Exchange Rates




## Capital Market Indicators




## Energy & Support Services Sector Financial Performance in February 2020




## National Drilling

| CURRENCY | CLOSE PRICE | YTD PRICE CHANGE (%) |
|---|---|---|
| USD | 4.96 | 0 |

## Alexandria Mineral Oils Co.

| CURRENCY | CLOSE PRICE | YTD PRICE CHANGE (%) |
|---|---|---|
| EGP | 2.94 | ▼ 19.01 |

## Egypt Gas

| CURRENCY | CLOSE PRICE | YTD PRICE CHANGE (%) |
|---|---|---|
| EGP | 53.12 | ▼ 4.29 |

## Sidi Kerir Petrochemicals

| CURRENCY | CLOSE PRICE | YTD PRICE CHANGE (%) |
|---|---|---|
| EGP | 7.94 | ▲ 11.58 |

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

# NOCS ACHIEVEMENTS & PLANS IN FY 2019/20

## EGAS

### ACHIEVEMENTS IN H1 2019/20

- Signed Petroleum Agreements: 5
- Implemented Projects: 8
- Drilled Exploratory Wells: 5
- Vehicles Converted into Natural Gas: 25,000
- Development Wells were Put on Stream: 3
- New Gas Fueling Stations: 5
- Natural Gas Delivered to:
  - 1 bcf/d Initial Production
  - 630,000 Residential Consumers
  - 31 Industrial Facilities
  - 1045 Commercial Units

### PLANS FOR H2 2019/20

Drilling **4 Wells**

- Companies: IEOC, Burullus, Edison & Sea Dragon
- Location: The Nile Delta & The Mediterranean
- Cost: $179 million

Implementing **3 Projects**

- Initial Production: 1.2 bcf/d

## KHALDA

### ACHIEVEMENTS IN H1 2019/20

- Drilled Exploratory & Development Wells: 30
- Natural Gas Production: + 40 mmcf/d

### PLANS FOR FY 2019/20

- Targeted Investments: $732 million
- Drilling 67 Wells
  - 30 Exploratory
  - 37 Development

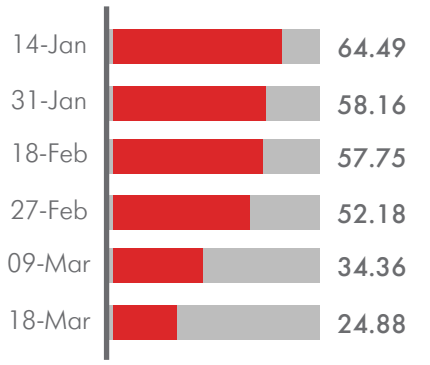
## RASHPETCO

### PLANS FOR FY 2019/20

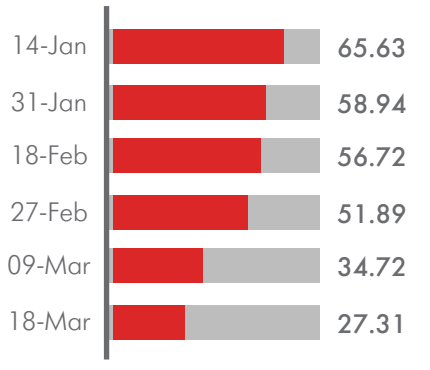
- 9B Phase Project in WDDM
  - Drilling: The final 3 wells
  - Production Rate: 180 mmcf/d
- Targeted Investments: $167 million
- Drilling Monteau well
  - Initial Cost: $99 million
- Phase 10
  - Drilling: 7 wells
  - Initial reserves: 236 bcf

# INTERNATIONAL OIL PRICES

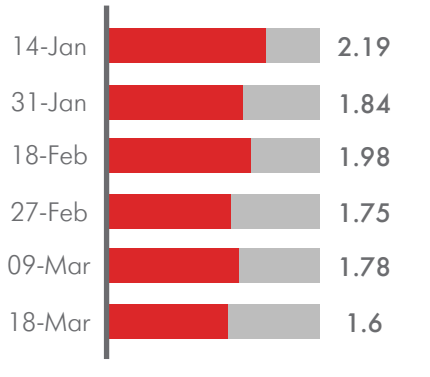
## BRENT PRICES ($/bbl)



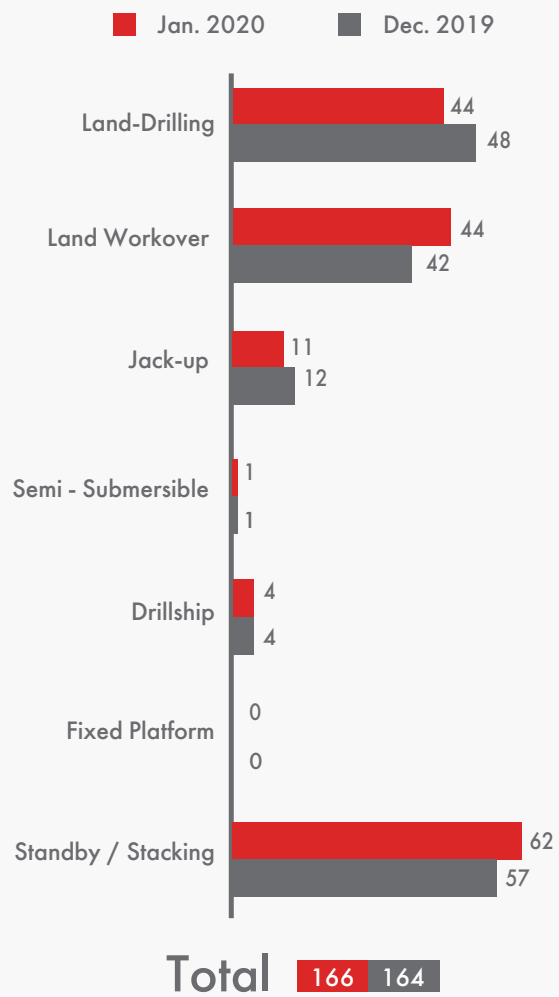

## OPEC BASKET PRICES ($/bbl)



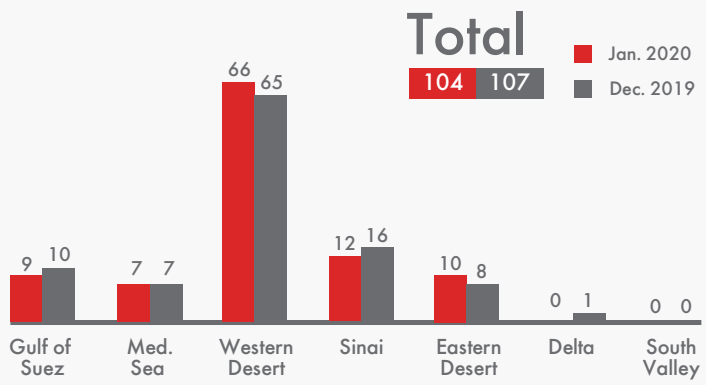

## NATURAL GAS PRICES ($/mmBtu)



## EGYPT RIG COUNT PER TYPE Jan. 2020

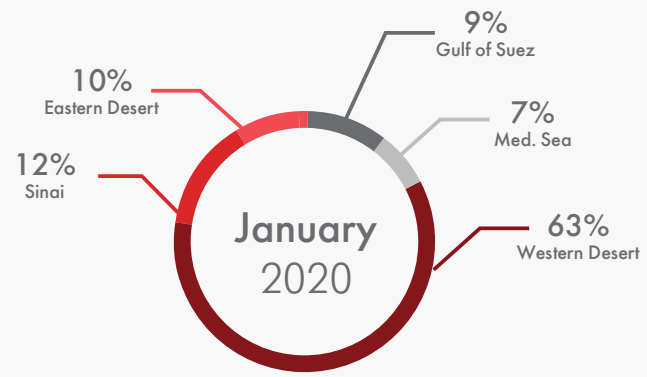



## EGYPT RIG COUNT PER AREA Jan. 2020




The difference between the total of rigs per area and per type is due to the Stand By / Stacking number.

## Distribution of Rigs




## EGYPT PRODUCTION FEB. 2020

**Total**

| | |
|---|---|
| 540,349 | BBL/D |
| 6.2039 | BCF/D |
| 6,053 | MMF/D |
| 85,826 | BBL/D |

Numbers are calculated per day on average.

| | CRUDE OIL | NATURAL GAS | SOLD GAS | CONDENSATES |
|---|---|---|---|---|
| MEDITERRANEAN SEA | 357 | 4.0442 | 3946 | 34,886 |
| EASTERN DESERT | 63,047 | 0.0112 | 11 | 39 |
| WESTERN DESERT | 303,262 | 1.2210 | 1191 | 39,707 |
| GULF OF SUEZ | 122,323 | 0.1659 | 162 | 1,791 |
| DELTA | 172 | 0.7616 | 743 | 8,807 |
| SINAI | 51,027 | 0 | 0 | 596 |
| UPPER EGYPT | 160 | 0 | 0 | 0 |

## DRILLING UPDATE FEB. 2020

| REGION | COMPANY | WELL | WELL TYPE | RIG | DEPTH | WELL INVESTMENTS (M$) |
|---|---|---|---|---|---|---|
| EASTERN DESERT | GPC | T-EAST-1X | EXP | EDC - 16 | 10,007 | 1.309 |
| MEDITERRANEAN | EDISON | AMEEQ-1X | EXP | MAERSK DISCOVERER | 5,209 | 50.643 |
| | PETROBEL | BASHRUSH-1 | EXP | KS-MEDSTAR | 3,000 | 2.001 |
| | RASHPETCO | SAPPHIRE EAST DC | Development | DS-7 | 2,950 | 17.600 |
| | | SAPPHIRE DO | EXP | DS-7 | 2,943 | 15.140 |
| WESTERN DESERT | KHALDA | BERENICE - 11 | Development | EDC-11 | 11,610 | 2.230 |
| | | AG-145 | Development | EDC- 47 | 10,780 | 3.193 |
| | | BARAKAT DEEP - 1X | EXP | EDC- 17 | 4,720 | 2.886 |
| | | ACTIS- 1X | EXP | EDC- 54 | 2,649 | 2.225 |
| | | KADESH AQSA - 1X | EXP | EDC- 58 | 15,310 | 2.222 |

EGYPT OIL AND GAS
TECHNICAL COMMITTEE

HSE
EGYPT OIL & GAS
HSE SUBCOMMITTEE

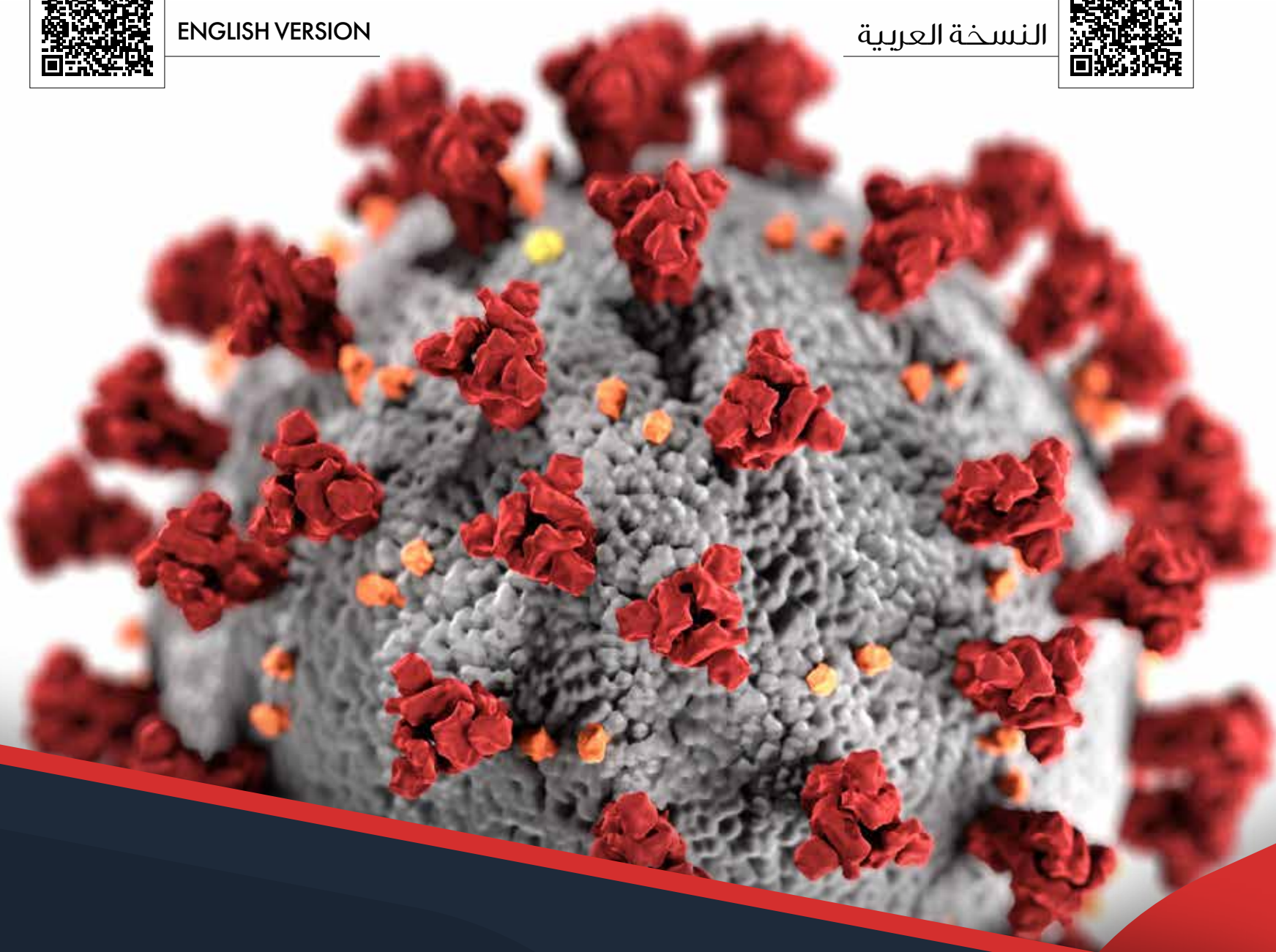
# COVID-19
# CORONAVIRUS
# EMERGENCY
# RESPONSE PLAN

ENGLISH VERSION

# كوفيد ١٩
# فيروس كورونا

خطة طوارئ وزارة البترول و الثروة المعدنية (لمواجهة جائحة فيروس كورونا المستجد)

النسخة العربية



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